

PRE-MONKMAN BELLCOURT
78(1)A
GEOLOGICAL DATA
1978

1978 Exploration Report
543

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 543

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

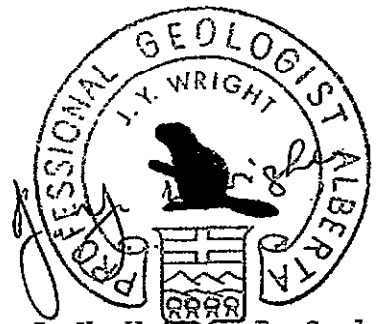
1978

NTS 93I/7, 8, 10 and 15

COAL LICENCES:

3131 - 3135	3177 - 3184
3138 - 3139	3187 - 3190
3141 - 3149	3193
3151 - 3155	3195 - 3207
3157 - 3164	3209 - 3264
3166 - 3168	3264 - 3960
3170 - 3174	3190 4518 - 4523

Submitted March 15, 1979



J. Y. Wright, P. Geol.

Chief Mining Geologist

OPEN FILE

MONKMAN COAL PROJECT
1978 EXPLORATION REPORT

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SUMMARY

Pacific Petroleum Ltd.'s Monkman Coal Project is located in the southern part of the Peace River coalfield approximately 630 kilometres by air north-northeast of Vancouver, British Columbia. Coal licences forming the property are located to cover coal bearing Gates Member and Gething Formation strata in two principal structural features referred to as the Duke Mountain Block and the Wapiti Dip Slope.

Pacific Petroleum Ltd. has conducted exploration in the form of drilling, mapping, aditing and trenching throughout the coal licences from 1976 to the present, following the negotiation of an option agreement with Canadian Superior Oil Ltd. and McIntyre Mines Ltd., signed in 1976. Pacific completed the requirements within this option in 1978 deriving a fifty-percent interest in the coal property which covers an area of 34,497 hectares within one hundred and fifty coal licences.

Exploration to date has identified as many as thirteen Gates Member coal seams and six Gething Formation seams. At the present time six of the Gates Member seams located in the Duke Mountain Block are being explored to determine their economic mining potential. The remaining seams are usually too thin to be mined although local thicker sections may be incorporated in the final mining product.

The Duke Mountain Block consists of a large and complex anticlinal box fold located adjacent to a concentrically folded syncline. The structures trend in a south easterly direction and are complicated by a series of thrust faults and smaller scale folds. The Wapiti Dip Slope consists of a series of large south-easterly trending synclines located west of the Duke Mountain Block and developed in an en echelon fashion. The central portion of the Wapiti Dip Slope is affected by a large scale thrust fault which places older Paleozoic sediments over the coal bearing Cretaceous and Jurassic strata.

A resource base of 2.8 billion tonnes of coal in place to a depth of 500 m has been estimated for the property as a whole while reserves, in various categories, of 1.12 billion tonnes of in place coal have been calculated to a depth of cover of 500 metres in the Duke Mountain Block. The following table summarizes those reserves:

DUKE MOUNTAIN BLOCK RESERVES

(Million Tonnes)

GATES COAL SEAMS

<u>AREA</u>	<u>PROVEN</u>	<u>INDICATED</u>	<u>INFERRED</u>	<u>TOTAL</u>
Duke Pit Area	97.35			97.35
South Duke Area		48.61		48.61
Fearless Pit Area		195.00		195.00
Quintette Area			260.57	260.57
Duke Syncline			114.25	114.25
North Boomerang			95.85	95.85
South Boomerang			126.34	126.34
East Boomerang				
	<u>97.35</u>	<u>243.61</u>	<u>783.73</u>	<u>1,124.69</u>

Analyses from core and adit bulk samples have shown that the coal in the Gates Member seams in the Duke Mountain Block is a medium volatile coking coal which can be washed economically to the following specifications:

Moisture	6%
Volatiles	23.5%
Fixed Carbon	62%
Ash	8.5%
Sulphur	0.5%
F.S.I.	6

Thus it can be seen that the Monkman coal property contains large tonnages of an excellent quality coking coal much of which are contained within geological structures that appear to be amenable to both surface and underground mining methods. In addition the property is suitably located to take advantage of infrastructure developments generated either from the west, at Prince George, B.C. or the north, at Chetwynd, B.C.

INTRODUCTION

2.1 Location and Means of Access

The Monkman Coal Project is located in the southern part of the Peace River Coalfield, approximately 630 km by air north-northeast of Vancouver, British Columbia. (Figure II.2-1).

The property is more or less equidistant by all-weather dirt roads from Beaverlodge, Alberta and Tupper, B.C. which are situated on the major highway connecting Grande Prairie and Dawson Creek. The distance from pavement is approximately 125 km to the campsite on the Kinuseo Falls road, 11 km west of Stony Lake. A third route, from Dawson Creek, the Fellers Heights road, is also passable and is being improved by the B.C. Ministry of Mines and Petroleum Resources.

2.2 History of Land Tenure

In 1970, McIntyre Mines Ltd. acquired 134 coal licences from the Government of British Columbia. In 1975, Canadian Superior Oil Ltd. acquired a 66-2/3% interest in the property, which was reduced to 119 licences. Pacific Petroleums Ltd. entered into an option agreement with McIntyre and Canadian Superior in 1976 and by the end of 1978 had earned a 50% interest in the property, the shares of the partners being reduced to 16-2/3% and 33-1/3% respectively. In 1978, 31 licences were added to the property, bringing the total to 150. The licences cover 34,497 ha, of which the Duke Mountain Block, currently the centre of attention, comprises 15,740 ha.

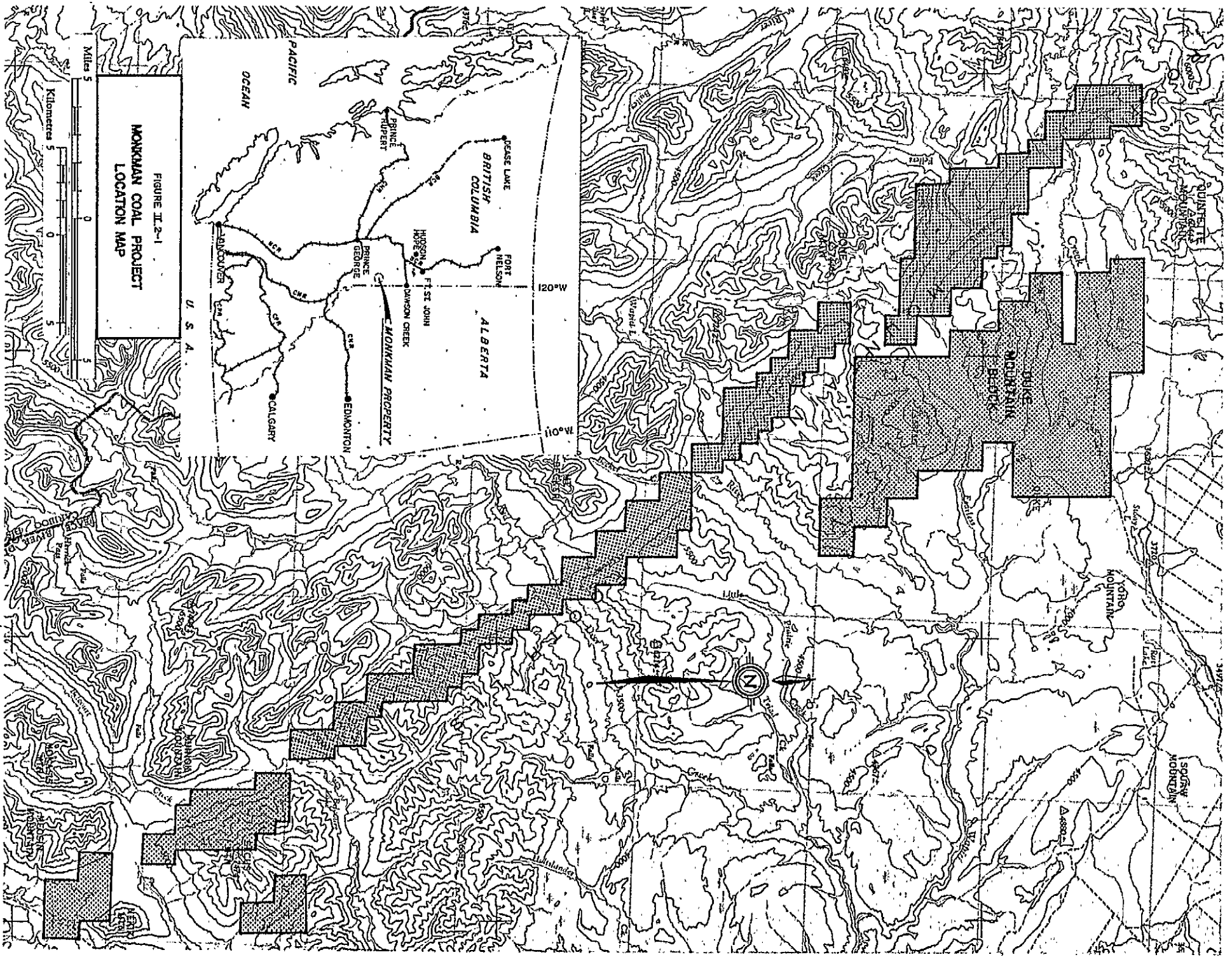


FIGURE II-2-1
MONKMAN COAL PROJECT
LOCATION MAP

The groupings in effect for this report are listed in Table II.2-1 and are shown on the map in Figure II.2-2. The uniform date for submission of assessment work on all the licences is December 16th. The Administrator for Coal has kindly granted an extension of time for the preparation of this report.

2.3 Topography

The Monkman property is situated in the inner foothills of the Rocky Mountains, in an area of rugged topography. The property is approximately 80 km long, stretching from the southern slopes of Quintette Mountain in the northwest to the Narraway River south of Nekik Mountain in the southeast (see Figure II.2-1). The property is situated on a dissected belt of highlands which rises from a valley floor elevation of 950 m at Kinuseo Creek to a maximum of 2250 m on Secus Mountain. The highlands are cut by seven streams which are, from north to south, Kinuseo Creek, Fearless Creek, Dokken Creek, the Wapiti River, Red Deer Creek, Belcourt Creek and the Narraway River.

The Duke Mountain Block, 17 km in length and 10 km wide includes the valleys of Kinuseo, Fearless and Dokken Creeks and Duke and Duchess Mountains. Its southerly limit is the major river of the area, the Wapiti. The highest point is 1791 m, on Duchess Mountain. The valleys and lower slopes are heavily forested with black spruce and jackpine. Treeline is at 1400 m above sea level.

TABLE II.2-1

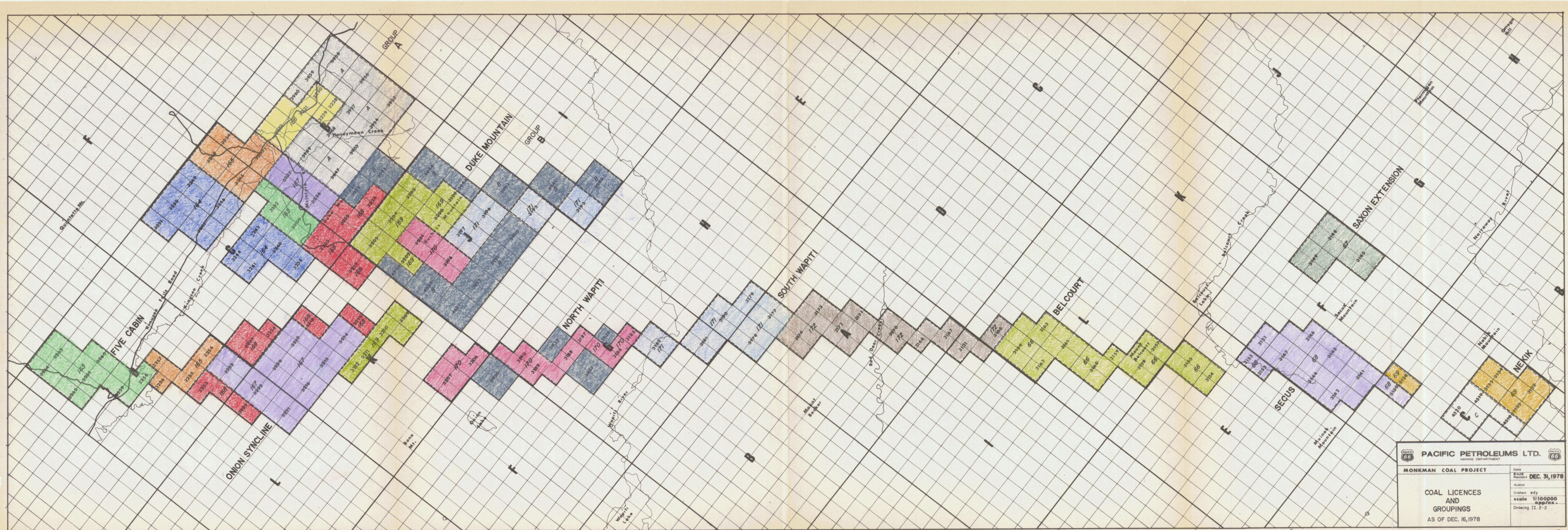
MONKMAN COAL PROJECT



Groupings as of December 16, 1978

<u>Group</u>	<u>Licences</u>	<u>Work Acreage</u>
66	3154, 3155, 3157, 3158, 3159 3160, 3161, 3162, 3163, 3164	5582
67	3145, 3148, 3149	2235
68	3139, 3141, 3142, 3143, 3144 3146, 3147, 3151, 3152, 3153	5222
69	3132, 3133, 3134, 3135, 3138	2242
163	3239, 3242, 3258, 3259, 3260 3261, 3262, 3263, 3264	4796
164	3238, 3240, 3241, 3243, 3244 3246, 3247, 3249, 3250, 3251	5531
165	3233, 3245, 3234, 3248, 3254 3255, 3256, 3257	3883
166	3228, 3229, 3230, 3231, 3232	1815
167	3214, 3215, 3216, 3219, 3220 3221, 3222, 3226, 3227, 3252	7387
168	3213, 3217, 3218, 3223, 3224 3225, 3235, 3236, 3237, 3253	5171
169	3199, 3200, 3202, 3203, 3204 3205, 3209, 3210, 3211, 3212	5176
170	3183, 3184, 3187, 3188, 3189 3190, 3198, 3201, 3206, 3207	5182
171	3177, 3178, 3179, 3180, 3181 3182, 3193, 3195, 3196, 3197	7036
172	3131, 3166, 3167, 3168, 3170 3171, 3172, 3173, 3174	5013
A*	3947, 3948, 3949, 3953, 3954, 3955, 3956, 3957, 3958, 3959, 3960	7041
B*	3940, 3941, 3942, 3943, 3944, 3945, 3946, 3950, 3951, 3952, 4521, 4522, 4523	6650

* Groups A & B are under application and have not been confirmed.

<u>Individual Licences</u>	<u>Work Acreage</u>
3936	740
3937	741
3938	186
3939	370
4518	374
4519	374
4520	747



 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
Date	DEC. 31, 1978
Author	
Drafted by	
scale	1:100000 approx.
Drawing	II. 2-2
COAL LICENCES AND GROUPINGS AS OF DEC. 16, 1978	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

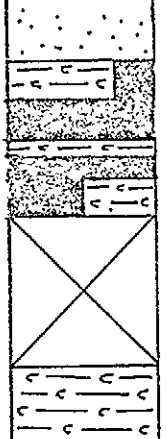
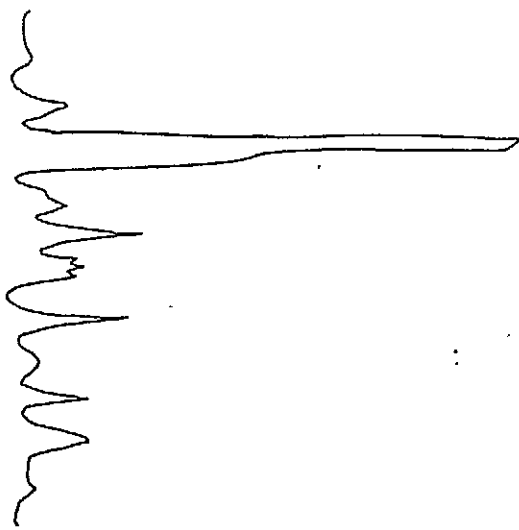
2.80

2.90

3.00

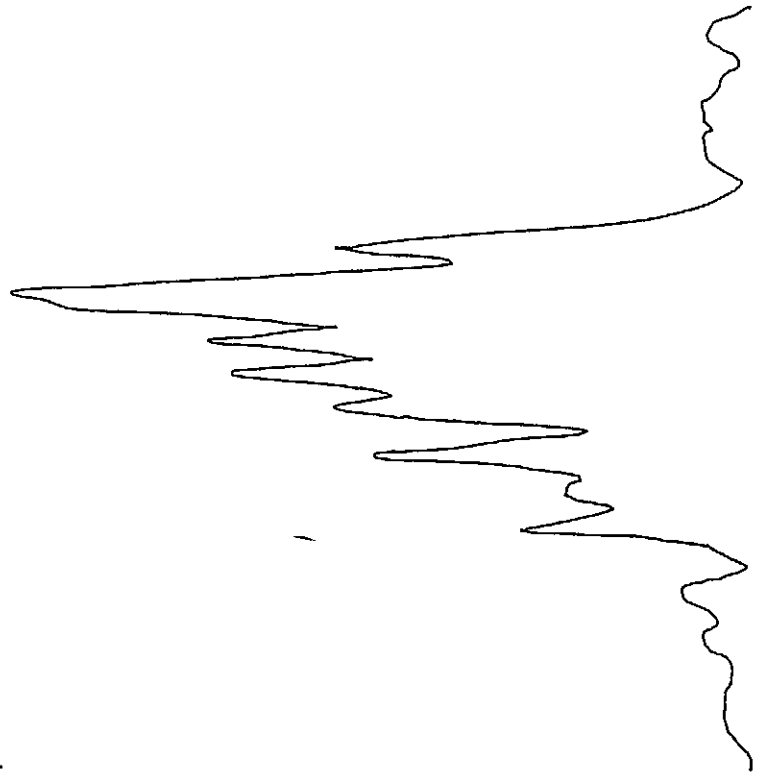
3.10

3.30



87.88

91.88



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MUD 78-14

SEAM SECTION B 8

DATE 14

2.4 Exploration History

The Monkman area was mapped in the course of a regional study by the Geological Survey of Canada and reported on by Stott in 1968. In 1970, McIntyre Mines Ltd. sent in a small prospecting crew to examine the area for coal and initial licences were acquired. McIntyre carried out trenching and geological reconnaissance in 1973, then, in 1975, turned over the exploration work to Canadian Superior, which completed a program of three diamond drill holes. Pacific took over management of the project in 1976 and drilled twelve diamond drill holes in addition to mapping and hand-trenching. The program continued in 1977 when eight holes were drilled in the Duke Mountain Block, which was mapped in some detail. A major program of 24 diamond drill holes, 22 hammer holes and two adits was carried out on the Duke Mountain Block in 1978, as well as six diamond drill holes on the remainder of the property.

1978 EXPLORATION PROGRAM

3.1 Objectives

The objectives of the 1978 program were:

- 1) To delineate the extent of strip and underground coal reserves on the Duke Mountain Block.
- 2) To evaluate the coal quality, washability and coking characteristics of major seams in the Gates Member. Adit driveage and bulk sampling had been planned in the B3, B4 and B9 seams.
- 3) To carry out environmental and engineering studies to meet the British Columbia Government's Stage I submission requirements.
- 4) To complete detail mapping of those areas of the property that contain high volatile bituminous coal.
- 5) To further delineate, by drilling, the development and quality of coal seams in the Gates Member which are found along the Wapiti Dip Slope.

3.2 Field Camp and Ancillary Services

The 1978 program commenced on May 23rd. A 50 man Nodwell Bros. wheeled camp was set up at 93-I-15, d-68-B on the south side of the Kinuseo Falls Road. The camp remained on site until all work was complete and all equipment was removed on October 23rd.

Table II.3-1 on the following page lists the temporary and permanent personnel employed to carry out the field work and subsequent office compilation. A total of 17 technical and support staff supervised the field work and analyzed the data. A list of all contractors who provided services for all aspects of the work is shown on Table II.3-2. Details of their contributions are described in subsequent sections of this report.

The catering staff was provided by a local firm, Via Delle Camp Catering, while Pacific Petroleums Ltd. provided all supplies. This arrangement proved more efficient with lower total costs than by contract catering services.

Helicopter support for all phases of the work was provided by Liftair International of Calgary, with other chartered aircraft companies being employed when necessary. Hughes 500C and Bell 206B machines were employed for personnel movement and light lifting duties while Bell 205A and Sikorsky S58T aircraft carried out drill rig moves.

Four-wheel drive vehicles were leased in Calgary and Grande Prairie to provide light all-weather transport. Access to the areas with more hazardous terrain was provided by a leased K6x6 Hillbrand A.T.V. Maintenance problems were encountered with the latter machine which seriously affected its utilization.

TABLE II.3-1

LIST OF PERSONNEL EMPLOYED

Office Staff

J. Y. Wright	Chief Geologist
L. A. Smith	Senior Geologist
A. E. Bienia	Geologist
P. J. Proudlock	Geologist
J. L. Reid	Geologist
A. G. Speed	Engineering Supervisor
E. J. Allen	Senior Mining Engineer
D. C. Kinton	Senior Landman
C. M. E. Kassam	Clerk
E. E. Topacio	Draftsman
M. A. Yancie	Secretary

Field Staff

Permanent

L. A. Smith	Senior Geologist
A. E. Bienia	Geologist
P. J. Proudlock	Geologist
J. L. Reid	Geologist
A. G. Speed	Engineering Supervisor
B. Balabas	Senior Technician

Temporary

D. E. Bell	Geologist
K. LaDouceur	Assistant
C. Reidiger	Assistant
K. Samson	Assistant
K. Tymofichuk	Assistant
P. Shankel	Assistant
L. E. Scorgie	Operator
B. Lokhorst	Labourer
D. Douglas	Camp Manager

TABLE II.3-2

LIST OF CONTRACTORS AND SERVICES

Adit Driveage

A & B Contractors	Calgary
Target Tunnelling	Calgary

Aircraft Charter

Associated Helicopters	Edmonton
Kenting Helicopters	Calgary
Highland Helicopters	Chetwynd
Liftair International	Calgary
Pacific Petroleum Ltd.	Calgary
Okanagan Helicopters	Kelowna

Camp and Catering

Nodwell Bros.	Calgary
L. I. Adam Contractors	Calgary
Sprung Instant Structures	Calgary
Via Delle Camp Catering	Hythe

Coal Quality Studies

Birtley Coal and Mineral Testing	Calgary
Cascade Coal Petrography	Calgary
Energy Mines and Resources	Ottawa
Loring Laboratories	Calgary
Roke Oil Enterprises	Calgary

TABLE II.3-2 (cont'd.)

Consultants

IEC Ltd.	Richmond
G. R. Jordan Consultants	Calgary
Majury and Hardcastle Ltd.	Calgary
Teckman Ltd.	Calgary

Drilling

D. W. Coates Enterprises	Richmond
Interior Water Wells	Prince George

Mapping Services

McElhanney Surveying	Vancouver
R. M. Hardy and Associates	Vancouver

Miscellaneous Services

Bagni Drafting	Calgary
Beaver General I.G.A.	Beaverlodge
E. G. Whalley & Sons	Vancouver
Fosters Feed and Seed	Beaverlodge
Lodge Lumber	Beaverlodge
Kinnear Drafting	Calgary
Northern Metallic	Grande Prairie
Northern Restaurant Service	Edmonton
Silljer Enterprises	Grande Prairie
Sorenson Drafting	Calgary
Windsor Ford	Grande Prairie

TABLE II.3-2 (cont'd.)

Rentals

Bowmac Truck Rentals	Grande Prairie
Hillbrande Industries	Edmonton

Road Construction and Maintenance

Grizzly Valley Contractors	Grande Prairie
Hackwell Constructions	Grande Prairie
L. I. Adam Contractors	Grande Prairie
Tompkins Contractors	Fort St. John

Trucking

Dakota Contracting	Grande Prairie
Edgar and Sissell	Grande Prairie
Gangster Transfer	Grande Prairie
L. I. Adam Contractors	Grande Prairie
Overland Towing	Calgary
Wally's Trucking	Grande Prairie

NE

SW

Ground Surface

8.6m (Approx.)

SEAM B4
9.15 m.
Dip 34°

SEAM B3
3.97 m.
Dip 30°

B3 X-CUT

DRIFT
FROM
PORTAL
33.75 m

Elev. 1250 m.



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

Date Feb. 14, 1979.

ADIT No. 1 (B4/B3-78-1)

Revised

Author J. Wright

Drafted edy

Scale 1:200

SECTION ON AZ. 231°
THROUGH B4 RAISE
AND B3 X-CUT

Fig. II.6-7



ADIT 1978 BA/83-1
ADIT 1978 89-1

MAP No.	HOLE No.
1	MDD 76-10
2	MDH 76-12
3	MD 75-2
4	MDH 78-1
5	MDH 78-6
6	MDD 77-1
7	MDH 78-11
8	MDH 78-10
9	MDH 78-9
10	MDD 78-1
11	75-1
12	MDD 78-1
13	MDD 78-12
14	MDH 78-21
15	MDH 78-12
16	MDD 78-24
17	MDD 78-3
18	MDD 77-7
19	MDD 78-2
20	MDD 77-8
21	MDD 78-28
22	MDH 78-4
23	MDH 78-3
24	MDH 78-5
25	MDH 78-2
26	MDH 78-1
27	MDD 77-3
28	MDD 78-7
29	MDD 76-11
30	MDD 78-9
31	MDD 78-8
32	MDD 78-15
33	MDD 78-4
34	MDD 78-5
35	MDD 78-23
36	MDD 78-6
37	MDD 78-13
38	MDH 78-14
39	MDH 78-15
40	MDH 78-11
41	MDD 78-10
42	MDD 78-22
43	MDD 76-9
44	MDD 77-4
45	MUH 78-19
46	MUH 78-18
47	MUH 78-20
48	MUH 78-17
49	MUH 78-16
50	MUH 78-15
51	MUH 78-15
52	MDD 77-4
53	MDD 78-21
54	MDD 78-19
55	MDD 77-5
56	MDD 78-16
57	MDD 78-16
58	MDD 78-16
59	MDD 78-20
60	MDD 77-6
61	MDD 78-17
62	75-3
63	MDD 76-8
64	MDD 76-6
65	BWD 76-5
66	BWD 76-4
67	MWD 78-30
68	MWD 78-29
69	BBD 76-3
70	MDD 78-28
71	BBD 76-1
72	BSD 76-2
73	MDD 78-23
74	MND 76-26
75	BXD 76-7
76	MXD 78-27

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT

DRILL HOLE and ADIT LOCATIONS

Date: DEC. 31, 1978
Author: L. A. S.
Drafted: edy
Scale: 1:100000 approx.
Fig. II 3-1

5 KM.



EXPLORATION WORK - ROADS BUILT 1978

~ Roads: 1978

- - - Roads: 1977 & earlier

Figure II.3-1

McElhanney Surveying produced a new set of aerial photographs for the Duke Mountain Block. This survey was flown on September 12, 1978, producing photographs at a scale of 1:40,000.

3.5 Geological Mapping

The 1978 exploration program included extensive geological mapping in the Onion Syncline, Wapiti Dip Slope, Belcourt, Secus, Nekik and Saxon Extension areas at a scale of 1:5000. The mapping and subsequent interpretation were carried out by Pacific's staff and the interpretation was done with substantial assistance from G. R. Jordan Consulting Services Ltd.

The mapping employed the chain and portable map table method and was carried out by a number of two-man crews. All field observations were plotted directly on 1:5000 scale indexed map cards. The information was then transferred onto 1:5000 scale base maps. The results of the geologic mapping are described in Part 4 of this volume.

3.6 Diamond Drilling

D. W. Coates Enterprises Ltd. of Richmond, B.C. provided a Longyear Super 38 and a Longyear 44 drill for the diamond drill coring program. HQ wireline core was extracted using a standard Longyear core barrel. The program started on June 10, 1978 with one drill, and the second drill joined the program on June 16th. A total of 16 holes were drilled in Gates Member and Gething Formation strata on Duke Mountain. Fifteen of these holes were located on the east facing dip slope of Duke Mountain. One hole was drilled on the east side of the Duke Syncline. A further eight holes were drilled on Duchess Mountain. Road access was provided to all of these drillsites.

TABLE II.3-3

SUMMARY OF DIAMOND DRILL HOLE DATA

Hole No.	Location (N.T.S.)	Li-cence	Eleva-tion (m)	In-clina-tion (°)	Di-rec-tion (°)	Depth (m)	Core Size	Over-burden (m)	Casing Left (m)	Geophysical Logging Program				Comple-tion Program	Reclama-tion Program
										Cal./Dens. (m)	F.B.L. (m)	G.R.N. (m)	Devia-tion m		
MDD 78-01	93-I-15, c-59-D	3227	991.96	-90	-	267.0	HQ	35.1	34.5	1-265.0	35.5-265.0	0-265.0	-	2	1,2,3
MDD 78-02	93-I-15, a-50-D	3227	1021.43	-90	-	356.5	HQ	30.8	31	0-350.5	31.2-350.5	0-351.5	50-349	2,4	1,2,3
MDD 78-03	93-I-15, c-50-D	3227	1022.37	-90	-	332.3	HQ	21.3	21.3	0-330.0	182.5-331.0	0-331.0	10-329	2	1,2,3
MDD 78-04	93-I-15, d-30-B	3226	1238.60	-90	-	401.0	HQ	3.4	2.7	0-400.0	3.5-400.0	0-400.0	50-398	2,4	1,2,3
MDD 78-05	93-I-15, c-29-D	3226	1245.94	-90	-	268.0	HQ	26.5	25.0	0-265.5	25-265.5	0-265.5	10-260	2	1,2,3
MDD 78-06	93-I-15, a-29-D	3226	1301.76	-90	-	366.9	HQ	3.7	3.0	0-365.0	51.2-366.0	0-366.0	55-365	2	1,2,3
MDD 78-07	93-I-15, c-21-C	3239	1404.12	-90	-	208.2	HQ	9.1	8.2	0-206.0	51.3-206.0	0-206.0	11-200	2	1,2,3
MDD 78-08	93-I-15, c-20-D	3225	1466.01	-90	-	175.9	HQ	4.6	4.0	0-171.0	47.0-171.0	0-170.5	-	2	1,2,3
MDD 78-09	93-I-15, d-11-C	3235	1552.90	-90	-	239.9	HQ	5.3	8.2	0-237.5	7.5-237.5	0-238.0	20-235	2	1,2,3
MDD 78-10	93-I-15, a-18-B	3946	1575.50	-90	-	239.9	HQ	4.6	7.3	0-59.0	25.0-142.0	0-142.0	-	2	1,2,3
MDD 78-11	93-I-15, b-18-B	3224	1558.82	-90	-	227.7	HQ	4.1	4.3	0-225.5	50.0-226.0	0-226.0	10-225	2	1,2,3
MDD 78-12	93-I-15, d-50-B	3227	1003.56	-90	-	357.5	HQ	83.5	2.7	0-256.0	83.0-256.0	0-256.0	100-250	1,2	1,2,3
MDD 78-13	93-I-15, c-18-B	3946	1439.48	-90	-	209.4	HQ	6.1	6.1	0-207.0	6.0-207.0	0-208.0	15-200	2	1,2,3
MDD 78-14	93-I-10, b-84-J	3944	1532.12	-90	-	288.6	HQ	3.7	3.7	0-284.0	30.0-284.0	0-284.0	10-280	2	1,2,3
MDD 78-15	93-I-10, b-65-J	3200	1693.15	-90	-	382.0	HQ	3.8	3.0	0-380.0	50.0-380.0	0-380.0	25-375	2	1,2,3
MDD 78-16	93-I-10, c-56-J	3197	1741.81	-90	-	404.5	HQ	3.0	3.7	0-400.0	24.0-400.0	0-400.0	25-400	2	1,2,3
MDD 78-17	93-I-10, d-47-J	3198	1566.29	-90	-	450.2	HQ	8.2	6.7	0-447.5	30.0-447.5	0-448.0	50-445	2	1,2,3
MDD 78-18	93-I-10, b-55-J	3197	1572.31	-90	-	300.8	HQ	11.0	10.7	0-299.0	28.0-299.0	0-300.0	25-275	2	1,2,3
MDD 78-19	93-I-10, c-53-J	3196	1411.14	-90	-	232.5	HQ	22.8	22.9	0-220.0	22.0-222.0	0-221.0	25-220	2,3	1,2,3
MDD 78-20	93-I-10, d-58-J	3198	1635.36	-90	-	398.0	HQ	4.2	7.3	0-383.5	33.0-384.0	0-384.0	25-380	2	1,2,3
MDD 78-21	93-I-10, b-74-J	3199	1642.62	-90	-	335.9	HQ	5.4	5.2	0-335.0	86.0-334.0	0-335.0	25-335	2	1,2,3
MDD 78-22	93-I-15, d-7-B	3224	1437.12	-90	-	439.5	HQ	3.2	1.5	0-437.0	0-437.0	0-437.0	25-435	2	1,2,3
MDD 78-23	93-I-15, d-29-B	3226	1194.02	-90	-	392.3	HQ	8.2	7.6	0-390.0	8-390.0	0-390.0	25-390	2	1,2,3
MDD 78-24	93-I-15, c-50-B	3227	1012.45	-90	-	261.2	HQ	80.8	0	60.0-258.5	80.0-259.0	80.0-259.0	25-250	1	1,2,3
MDD 78-25	93-I-8, c-20-F	3142	1440	-90	-	346.6	NQ	21.1	18.9	-	-	-	-	2	1
MDD 78-26	93-I-8, b-96-C	3138	1609.5	-72	050	387.4	NQ	3.2	1.8	0-381.5	-	0-382.0	25-375	2	1
MDD 78-27	93-I-8, a-61-P	3148	1495	-65	050	459.3	NQ	8.5	9.8	0-456.0	0-456.0	0-456.0	25-450	2	1
MDD 78-28	93-I-8, c-28-L	3160	1550	-70	050	428.0	NQ	5.5	5.2	0-427.5	-	0-428.0	25-425	2,3,4	1
MDD 78-29	93-I-10, d-46-A	3172	1130	-70	050	200.0	HQ	30.0	13.7	-	-	-	-	2	1,2
MDD 78-30	93-I-10, c-55-A	3172	1205	-70	050	393.0	HQ	32.0	32.6	0-392.5	32.5-393.0	0-392.5	25-390	2	1,2

In late August the Super 38 was converted for airborne rig moves, and commenced drilling on the extreme southern part of the property. In September the 44 rig was moved to the Red Deer Creek area by bulldozer. It was subsequently serviced by helicopter and by the Hillbrand. The locations of these drill holes are shown on Figure II.3-1.

A total of 9644.6 m were completed by diamond drilling in 30 holes for an average depth of 321.5 m per drill hole. The average core recovery, in coal, was 74%.

3.7 Rotary Drilling

Interior Water Wells of Prince George provided a TH60 Sanderson Cyclone truck-mounted drill rig for the rotary drilling program. Six - inch casing was hammered into bedrock and the holes were drilled open from that point. The maximum depth drilled by this method was 200 metres.

A total of 22 rotary holes was completed. Several of these holes were used to locate seam outcrops for adit locations, while others supplied stratigraphic data in proposed pit and adjacent areas. No attempt was made to use these holes to obtain coal quality data. Geophysical logging was the only form of testing carried out. The cost of drilling using this technique was under \$32.20/metre. It should be noted that some difficulties were experienced with driving casing through overburden. Another problem resulted from a lack of hammer bits which necessitated drilling with rock bits in very hard sandstone. The costs of materials for this rock-bit drilling were thus higher than anticipated.

TABLE II.3-4

SUMMARY OF ROTARY DRILL HOLE DATA

Hole No.	Location (N.T.S.)	Elevation (m)	Depth (m)	Hole Size (mm)	Overburden (m)	Casing Left (m)	Geophysical Logging Program (interval in m)				Reclamation Program	
							Cal./Dens.	F.B.L.	G.R.N.	Deviation		
MDH 78-01	93-I-15, b-40-B	3226	1447.79	48.9	152	2.25	11.7	0-47.5	11.7-48.9	0-48.5	run	1,2,3
MDH 78-02	93-I-15, c-40-B	3226	1151.26	30.5	152	1.60	1.6	0-29.0	-	0-29.5	-	1,2,3
MDH 78-03	93-I-15, c-40-B	3226	1151.27	28.4	152	1.50	5.0	0-23.3	-	0-23.5	-	1,2,3
MDH 78-04	93-I-15, c-40-B	3226	1150.28	12.2	152	no info	-	-	-	-	-	1,2,3
MDH 78-05	92-I-15, c-40-B	3226	1149.23	36.6	152	3.00	3.0	0-35.5	-	0-36.0	-	1,2,3
MDH 78-06	93-I-15, d-68-B	3232	995.96	182.8	152	25.9	25.0	0-180.0	25-156.0	0-181.0	run	1,2,3
MDH 78-07	93-I-15, c-80-B	3233	993.49	183.0	152	6.3	6.2	0-153.0	-	-	-	1,2,3
MDH 78-08	93-I-15, a-69-B	3233	996.28	no info	152	-	-	-	-	-	-	1,2,3
MDH 78-09	93-I-15, c-68-B	3232	998.98	182.9	152	30.5	30.5	0-182.0	-	0-182.0	-	1,2,3
MDH 78-10	93-I-15, d-68-B	3232	997.40	79.2	152	30.0	30.0	missing	-	0.77.5	-	1,2,3
MDH 78-11	93-I-15, b-66-B	3232	1016.06	184.0	152	27.4	27.2	0-182.5	-	0-183.0	-	1,2,3
MDH 78-12	93-I-15, c-50-B	3227	1009.84	no info	152	OB only	no info	-	-	0-183.0	-	1,2,3
MDH 78-13	93-I-15, c-9-B	3225	1609.27	177.2	152	5.5	5.5	0-176.8	-	0-177.0	-	1,2,3
MDH 78-14	92-I-15, a-20-B	3225	1508.26	184.4	152	9.0	9.0	0-175.0	-	0-175.0	-	1,2,3
MDH 78-15	93-I-15, a-30-B	3226	1372.82	183.0	152	23.0	23.0	0-181.5	23.0-159.0	0-182.0	-	1,2,3
MDH 78-15	93-I-10, c-74-J	3199	1512.88	103.6	152	1.8	1.8	0-100.5	14.0-102.0	0-102.5	-	1,2,3
MDH 78-16	93-I-10, c-74-J	3199	1518.95	94.5	152	1.8	1.8	0-89.5	-	-	-	1,2,3
MDH 78-17	93-I-10, b-84-J	3944	1490.10	63.4	152	2.5	2.5	0.57.5	-	-	-	1,2,3
MDH 78-18	92-I-10, a-85-J	3203	1476.17	39.6	152	0.8	0.8	0-37.0	-	0-37.0	-	1,2,3
MDH 78-19	92-I-10, a-85-J	3203	1445+/-	152.2	152	0.0	0.0	0-12.5	-	-	-	1,2,3
MDH 78-20	92-I-10, a-85-J	3203	1522.02	79.2	152	0.6	0.6	0-74.5	43.0-74.5	-	-	1,2,3
MDH 78-21 (MDH '24)	93-I-15, c-50-B	3227	1012.45	63.3	152	80.92	61.6	Cal. only 0-63.0	-	-	run	1,2,3
MDH 78-22	93-I-15, c-74-C	3246	976.01	183.0	152	2.3	2.3	0-174.0	2.3-175.0	0-175.0	-	1,2,3

Reclamation Program: 1-litter removed; 2-trees slashed and site levelled; 3-access road cross ditched, site and road seeded and fertilized

3.8 Bulk Sampling

Two adits were driven on the Duke Mountain Block; Adit 1 on Duke Mountain and Adit 2 on Duchess Mountain. A & B Contractors of Calgary carried out the adit driveage and subsequent bulk sampling. That company commenced work on July 30th and terminated in late August. The average driveage was six metres in coal and 2.5 metres in rock per shift. Doubts as to the quality of the first bulk sample resulted in the hiring of Target Tunnelling Ltd. to resample Adit 1 in September.

3.9 Trenching

No trenches were dug in 1978, however numerous coal seams were exposed by the roadbuilding program. It is expected that these outcrops will be mapped, trenched and sampled in 1979.

3.10 Coal Quality Studies

Coal quality studies were carried out on the cores and on channel and bulk samples collected in the adits. The objectives of these studies were to determine from the cores and the bulk samples raw and washed coal characteristics for each seam, as well as coking characteristics. These studies are discussed in some detail in Section 6.

3.11 Cost Breakdown and Application of Work Credit

Table II.3-5 shown on the following page gives the total cost breakdown per licence group. It should be noted that no work was done on Group C since these licences were not granted until the completion of the field season.

Total expenditures on the project in 1978 were \$2,094,537.06. Drilling and geological mapping were carried out on the Wapiti Dip Slope and Saxon Syncline areas in order to improve the knowledge of the Monkman Coal property as a whole.

3.12 Reclamation

The reclamation work was carried out under the supervision of International Environmental Consultants Ltd. Their report, entitled: "A Report on Reclamation of Coal Exploration on the Duke Mountain Block of the Monkman Coal Project in 1978" is presented as a separate volume.

TABLE II-3-5
MONKMAN COAL PROJECT
1978 COST BREAKDOWN

SUBFEATURE ITEM	290	301	304	306	376	430	437	439	440	459	460	490	502	515	537	572	582	641	655	1978 CREDITS \$/ACRE		
	SURVEYING	LOCATION COSTS	GEOPHYSICAL LOGGING	CAMP	OUTSIDE LABOUR	DRILLING	ASSAYING	ADITS	CONSULTING	CONSUMABLE MATERIALS	OTHER SERVICES	AIRCRAFT CHARTER	LABOUR	TRAVEL	FREIGHT	RENTAL EQP.	COMMUNICATIONS	INSURANCE	ADMIN.		78 TOTALS	ACREAGE
GROUP 66	12000.00	0.00	2670.00	11000.00	1000.00	27770.00	2500.00	0.00	5000.00	7000.00	400.00	21000.00	10000.00	3100.00	9900.00	15000.84	2900.00	54.00	13300.00	144594.84	5582	25.90
67	4800.00	0.00	2798.00	5500.00	1000.00	29100.00	5000.00	0.00	946.74	0.00	0.00	12000.00	3000.00	200.00	1000.00	2000.00	0.00	0.00	350.00	67694.74	2235	30.29
68	11220.00	0.00	2115.00	6000.00	1000.00	22000.00	4300.00	0.00	8000.00	6000.00	600.00	26000.00	15000.00	1200.00	910.00	15000.00	4836.52	715.00	15000.00	139896.52	5222	26.79
69	4815.00	0.00	2347.00	5500.00	1000.00	24405.00	5000.00	0.00	2000.00	2983.00	1333.00	13200.00	5000.00	472.00	1000.00	0.00	0.00	0.00	350.00	69405.00	2242	30.96
163	1075.00	5000.00	1260.00	6900.00	1300.00	13185.00	10000.00	0.00	4500.00	11320.81	0.00	14500.00	17300.00	800.00	1000.00	2000.00	0.00	0.00	6600.00	96748.81	4796	20.17
164	2150.00	5000.00	1115.00	11000.00	1700.00	5925.00	5000.00	0.00	10000.00	14000.00	0.00	19500.00	14700.00	1000.00	10000.00	6000.00	0.00	0.00	10200.00	117290.00	5531	21.21
165	0.00	5000.00	1335.00	1000.00	347.85	7090.00	10000.00	0.00	1200.00	10000.00	0.00	10000.00	15000.00	2000.00	10000.00	405.00	0.00	0.00	10000.00	83377.85	3883	21.47
166	0.00	5182.00	3830.00	1503.53	0.00	20332.00	15000.00	0.00	3000.00	2000.00	0.00	1848.78	5090.00	100.00	271.47	1000.00	0.00	0.00	1000.00	60067.78	1815	33.10
167	0.00	1500.51	20412.00	400.00	0.00	199441.00	10999.61	31206.49	1500.00	0.00	0.00	4000.00	2884.00	0.00	4000.00	1000.00	0.00	0.00	2162.00	279505.61	7387	37.83
168	0.00	1500.00	10050.00	2600.00	0.00	93365.00	10000.00	0.00	1500.00	0.00	0.00	4000.00	2884.00	0.00	1000.00	1000.00	0.00	0.00	2162.00	130061.00	5171	25.15
169	0.00	1500.00	6790.00	2000.00	0.00	58276.00	22974.00	31206.49	1500.00	0.00	0.00	3000.00	2884.11	900.00	1000.00	1000.00	0.00	0.00	162.00	133192.60	5176	25.23
170	11135.00	0.00	5095.00	11000.00	0.00	63000.00	5000.00	0.00	4000.00	13000.00	500.00	17000.00	15500.00	320.00	2000.00	21000.00	3000.00	0.00	201.95	161751.95	5182	31.21
171	15125.00	0.00	5711.00	14000.00	0.00	59402.00	4300.00	0.00	5000.00	7000.00	0.00	18000.00	20000.00	4055.35	5000.00	23000.00	5000.00	362.00	12800.00	198755.35	7036	28.25
172	10750.00	0.00	3626.00	11000.00	0.00	37723.00	2000.00	0.00	12000.00	2000.00	1000.45	33000.00	4800.00	1000.00	1000.00	22000.00	1000.00	0.00	4000.00	146099.45	5013	29.14
A	10750.00	7000.00	0.00	40263.71	1000.00	0.00	0.00	0.00	18000.00	5000.00	0.00	9000.00	15000.00	0.00	9190.00	2000.00	2226.00	0.00	15000.00	126429.71	7041	17.96
B	10750.00	8000.00	3608.30	12135.00	1000.00	35575.55	2865.00	0.00	0.00	0.00	0.00	14000.00	5000.00	1000.00	2000.00	3000.00	0.00	0.00	5819.00	104752.85	6550	15.25
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1495	0.00
LIC. 3926	1721.71	0.00	0.00	6458.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3000.00	1000.00	0.00	0.00	0.00	0.00	0.00	400.00	12580.00	740	17.00
3927	1700.00	0.00	0.00	6448.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3000.00	1000.00	0.00	0.00	0.00	0.00	0.00	500.00	12648.00	741	17.07
3928	495.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2000.00	500.00	0.00	0.00	0.00	0.00	0.00	300.00	3395.00	186	18.25
3929	795.00	0.00	0.00	1695.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3000.00	500.00	0.00	0.00	0.00	0.00	0.00	300.00	6290.00	370	17.00
TOTAL	99281.71	39682.51	72770.30	156503.53	9347.85	686589.55	114938.61	62412.98	70146.74	80303.81	3833.45	231048.78	156152.11	16147.35	59271.47	115405.84	18962.52	1131.00	100606.95	2094537.06		

GEOLOGY

4.1 Regional Geology and Structural Setting

The Monkman coal property is located in the Rocky Mountain Foothills coal belt of northeastern British Columbia. This portion of the foothills strata has been subjected to extensive exploration for coal, oil and gas during the last decade and, in fact, is one of the major coking coal prospects, on a world-wide basis, which has been evaluated during that time span.

The foothills strata were deposited during Jurassic and Cretaceous times when a shallow sea existed between the eastern stable shelf area and the actively developing uplift areas of central British Columbia. Clastic sediments from the erosion of the western highlands were transported eastward by streams and river and deposited over older marine sediments, possibly in an extensive deltaic environment, at the margins of the uplift area. Large accumulations of plant debris formed in this region at that time between phases of deposition of the continental clastic sediments. This trend of sedimentation was interrupted from time to time by periods of subsidence which allowed transgression of the continental sediments.

The most significant coal accumulations are found in continental clastic sediments of the upper Minnes Group to Gething Formation and the Gates Member of the Commotion Formation. These two phases of continental sedimentation overlie older marine sediments and are separated by the marine deposits of the Moosebar Sea, with another marine cycle being represented by the Hulcross sediments at the top of the coal-bearing sequence.

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

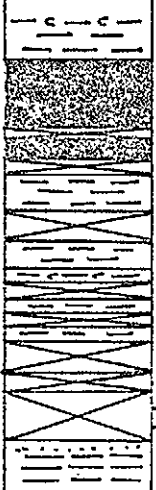
260

270

280

290

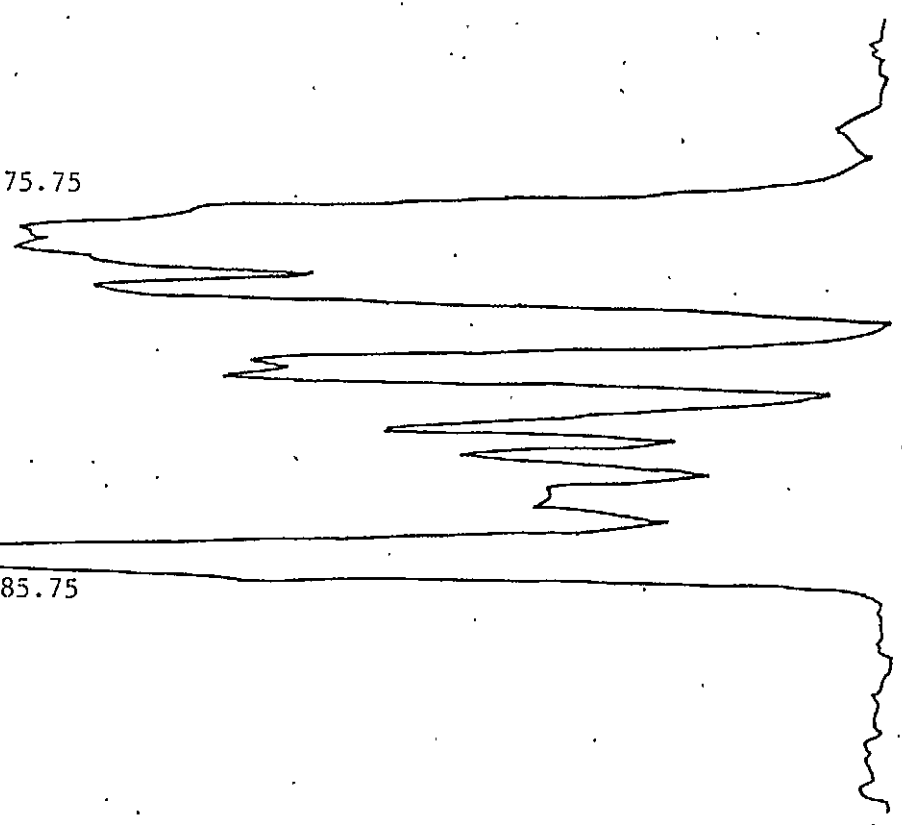
300



30

175.75

185.75



PACIFIC PETROLEUMS LTD.



MONKMAN COAL PROJECT

SEAM SECTION B 4

MDD 76-11

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4.2 Stratigraphy

4.2.1 General Statement

The Monkman coal property lies within the tectonically disturbed Foothills strata of northeastern British Columbia. The property contains the clastic sediments and coal seams of the Lower Cretaceous Minnes, Bullhead, and Ft. St. John Groups, as shown on the stratigraphic column included as Table II.4-1.

The Minnes Group forms the base of the geological section within the Monkman coal property. Overlying the Minnes Group are the Cadomin, Gething, Moosebar and Commotion Formations, with an eroded section of Shaftesbury Formation lying at the top of the sequence. The Commotion Formation includes the Gates, Hulcross and Boulder Creek Members.

The Gething Formation and the Gates Member of the Commotion Formation are the principal coal-bearing units on the property.

4.2.2 Minnes Group (Nikanassin Formation)

An incomplete section of Minnes Group strata is exposed at various locations on the Monkman coal property. Erosion has exposed at least 1000 metres of the Minnes Group section which is known to have a total thickness of approximately 2000 metres in this area.

Although the Minnes Group is a coal-bearing sequence of strata, very little exploration work has been carried out to define the nature of this stratigraphic unit on the Monkman coal property. More information will be required concerning the numerous coal seams within the Minnes Group before their economic significance can be assessed.

TABLE II 4-1

STRATIGRAPHIC COLUMN

PERIOD	GROUP	FORMATION	LITHOLOGY	UNIT THICK'N (m)
LOWER CRETACEOUS	Fort John	Shaftesbury	Dark grey marine mudstone; sideritic concretions; some sandstone grading to silty dark grey marine mudstone and siltstone in lower part; minor conglomerate at base.	+ 250
		Boulder Creek	Fine to coarse nonmarine sandstone; mudstone, carbonaceous claystone, and conglomerate; few thin coal seams towards base.	+ 200
		Hulcross Member	Dark grey marine mudstone interlayered with fine-grained sandstone and siltstone; gradational change to nonmarine mollusc-bearing sandstone & mudstone in South.	10-70
		Gates	Fine to coarse nonmarine sandstone; conglomerate, major coal seams, siltstone, and mudstone.	290
		Moosebar	Dark grey marine mudstone with sideritic concretions in the lower portion; gradational increase in sandstone and siltstone at top; base defined by Kaolinitic beds.	120
		Bluesky	Glauconitic fine-grained sandstone, varying locally to glauconitic cobble-conglomerate.	0.10
	Bullhead	Gething	Fine to coarse brown sandstone, coal, carbonaceous mudstone and conglomerate.	165
		Cadomin	Massive conglomerate containing chert and quartzite pebbles interbedded with quartzose sandstone.	40
	Minnes	Nikanassin	Conglomerate, carbonaceous, clay-claystone, thin-bedded grey and brown sandstone; contains numerous coal seams.	+2000

The Minnes Group as a whole consists of coarse-grained continental sandstones and conglomerates interbedded with abundant plant-bearing siltstones, carbonaceous mudstones, and coal seams throughout the upper two-thirds of the sequence. The lower third of the Minnes Group section includes an increasing abundance of marine bioturbated sandstones and marine mudstones.

4.2.3 Cadomin Formation

The Cadomin Formation is the oldest fully-exposed formation on the Monkman coal property. This formation is approximately 40 metres thick and unconformably overlies the Minnes Group strata. The lithology of the Cadomin Formation consists of conglomerate interbedded with coarse-grained quartzose sandstones. The conglomerate contains clasts of chert and quartzite ranging in size from 1 to 20 centimetres included within a sandstone matrix. The sandstone matrix and the intraformational sandstone beds and lenses appear to be similar lithologically to the clasts, consisting mainly of chert and quartz grains.

The Cadomin Formation forms a pronounced topographic expression since it is especially resistant to erosion. As a result, this unit has been utilized in aerial photograph interpretation to define geological structures that occur within the Monkman coal property. The formation is usually 40 metres thick on the property.

4.2.4 Gething Formation

The usually non-marine sedimentary rocks of the Gething Formation conformably overlie the Cadomin Formation. The approximate thickness of the Gething Formation is 165 metres on the Monkman coal property. The formation consists of brown-weathering calcareous lithic sandstone ranging from fine to coarse in grain size, interbedded with conglomerate, siltstone, mudstone, and claystone.

Several coal seams of economic thickness occur within the Gething Formation. Limitations of time have not allowed a complete evaluation of the economic potential of these coal seams. Information to date indicates that although these seams have superior coking characteristics, the seam thicknesses are usually significantly less than those of the principal coal seams of the Gates Member.

The most prominent coal-bearing horizon of the Gething Formation appears to be consistently present near the top of the formation and may be a time-stratigraphic equivalent of the Bird Seam found on coal properties near the Sukunka River. It is noteworthy that in other areas of the Peace River coalfield this seam is characterized by sulphur values ranging from 1.5 to 3 percent. The percentage of sulphur on the Duke Mountain Block is considerably less. These low sulphur values appear to be caused by the presence of a thick unit of conglomerate immediately overlying the seam in this area, which has protected the coal from marine influences during the transgression of the Moosebar Sea.

Considering the preliminary results of coal quality testing of the Gething Formation coal seams from the Duke Mountain Block, a thorough evaluation of their economic potential will be necessary.

4.2.5 Moosebar Formation

The Gething Formation is overlain by the marine Bluesky and Moosebar Formations. The poorly-developed Bluesky Formation consists of approximately 10 centimetres of glauconitic conglomerate overlying the non-glauconitic conglomerate and sandstone of the Gething formation. The Bluesky formation is abruptly overlain by the dark grey mudstone of the Moosebar Formation.

The lower third of the Moosebar Formation consists of a monotonous sequence of recessive dark grey marine mudstone containing sideritic concretions. The upper two-thirds of the Moosebar Formation are characterized by increasing amounts of interbedded siltstone and sandstone as the gradational contact with the overlying non-marine Commotion Formation is approached. These two units of the Moosebar Formation have been given member status on the Monkman coal property and are termed the Lower and Upper Moosebar Members respectively. The contact between the two members is defined by a pair of closely spaced thin beds of white kaolinite, which are easily recognizable on geophysical logs and in drill core.

An additional pair of white kaolinitic beds, each about 20 cm thick, is found within the Lower Moosebar Member near the contact with the Bluesky Formation. The lower bed lies about 20 cm above that glauconitic formation and the upper bed is located a further 20 cm up the section.

As a whole, the Moosebar Formation is about 120 metres thick on the Monkman Coal property.

4.2.6 Commotion Formation

The Commotion Formation contains the coal seams of principal economic interest on the Monkman coal property. This formation has been divided into three members, these being the coal-bearing Gates Member, the marine Hulcross Member, and the non-marine Boulder Creek Member. The total formation is about 560 metres thick, and the thickness of the Gates, Hulcross, and Boulder Creek Members are 290 metres, 70 metres, and about 200 metres respectively.

4.2.7 Gates Member

The Gates Member is the principal coal-bearing unit of strata on the Monkman coal property. This member consists of brown-weathering sandstone interbedded with mudstone, siltstone, conglomerate and coal seams. The coal seams have been numbered from 1 to 13 with the first coal seam lying near the base of the member.

The basal unit of the Gates Member is a resistant, massive sandstone referred to as the "Torrens Member". This unit is approximately 25 metres thick and conformably overlies the interbedded mudstone, siltstone, and sandstone of the Upper Moosebar Member. The "Torrens Member" is an especially distinct unit which has been mapped consistently throughout the Foothills coal belt of northeastern British Columbia and now warrants member status within a redefined Gates Formation.

The upper contact of the Gates Member with the Hulcross Member is a thin argillaceous pebble-conglomerate bed from 0.1 metres to 0.3 metres in thickness.

Due to the economic significance of this member particular attention has been paid to the correlation of the various intramember beds. The methods employed to achieve this correlation have included a detailed interpretation and comparison of various geophysical logs as well as complementary investigations of core hole data.

For correlation purposes and investigation of detailed lithofacies environments, gamma ray and neutron as well as density geophysical logs show extremely reliable patterns which "fingerprint" various beds within the Gates Member. The stratigraphic correlation chart, Figure II.4-9, illustrates these features. It should be noted that this correlation includes drillholes from the north of the property to its southern extremity.

The detailed investigation has shown that although several of the coal seams tend to split or coalesce from the northern end of the property to the south, most of the interseam units maintain consistent patterns, i.e. although the thicknesses change, the detailed nature of the lithologies tend to be consistent. Two horizons in particular have been found which show significant and rapid facies variations. These two units include the interseam sediments between seams 1 and 3 and between seams 4 and 6 respectively. Usually each of these units consists pre-dominantly of mudstone. The lower unit between seams 1 and 3 also includes interbeds of siltstone as well as minor sandstone phases towards the centre. However, in an area between Duke and Duchess Mountains an influx of medium to coarse-grained sandstone displaces the usual amount of finer-grained clastics in both of these intervals. These sand units appear to represent the penecontemporaneous erosion and redeposition of channel deposits over a widespread area. In fact, where these sand bodies achieve their maximum development, Seam 2 as well as Seam 5 and the upper portion of Seam 4 have been completely removed. This feature is best observed in drillholes located on the western flank of Duchess Mountain.

The features described above appear to be localized within the Duke Mountain Block, since a normal stratigraphic sequence is observed towards the south, along the Wapiti Dip Slope. The most significant variations in the latter area include the apparent coalescing of seams B1, B2, and B3 near Mount Belcourt, and a dramatic change in the sedimentation of the beds lying above seam 9; it has been found impossible to correlate the sequence above seam 9 in the southern extremities of the property with the normal sequence found farther towards the north.

Throughout the Monkman coal property, the Gates Member has developed to a surprisingly uniform thickness of approximately 290 metres even though some significant facies variations can be observed from the north to the southern extremity of the property, a distance of approximately 75 kilometers.

Details of the coal seam stratigraphy as well as the stratigraphic variations for each seam are discussed in the section of this report entitled "Coal Seam Stratigraphy".

4.2.8 Hulcross Member

The recessive Hulcross Member conformably overlies the Gates Member. In the north, where it is about 70 metres thick, and throughout most of the Monkman coal property, the Hulcross Member consists of a marine sequence of thinly laminated interbeds of mudstone, siltstone, and fine-grained sandstone. The unit thins toward the south, and a gradual change takes place over a distance of about 20 km near Mount Belcourt where marine deposition ended and the Hulcross horizon is represented by about 10 metres of sandstone, siltstone, dark grey mudstone, and some conglomerate. The mudstone contains abundant mollusc fossils. This transition can be seen in drill hole 78-28.

Drillhole 78-28 contains a normal marine Hulcross sequence overlying a relatively thin sequence of nonmarine strata including fresh water pelecypods. This relationship shows the transgressive nature of the Hulcross Sea from the northern end of the Monkman property towards the south.

The small conglomerate unit which has been observed at the Gates-Hulcross contact is an ubiquitous feature observed in areas north of the Monkman property and along the Foothills trend as far south as the Alberta Provincial Boundary. In the vicinity of Mount Belcourt and extending throughout Denison Mines Limited's Saxon coal property the conglomerate contains broken and reworked fragments of the pelecypod fauna which are usually more clearly observed within the thin overlying mudstones.

4.2.9 Boulder Creek Member

The Boulder Creek Member is the youngest fully-exposed unit on the Monkman coal property and conformably overlies the Hulcross Member. This unit consists of nonmarine sandstone interbedded with siltstone, mudstone, minor coal seams and conglomerate. The strata of the Boulder Creek Member are fairly resistant to erosion and tend to form ridges and dip slopes. The Boulder Creek Member has not been studied in detail on the Monkman coal property, but is estimated to be on the order of 200 metres thick.

4.2.10 Shaftesbury Formation

The youngest stratigraphic unit on the Monkman coal property is the Shaftesbury Formation which disconformably overlies the Boulder Creek Member. Erosion has left an incomplete sequence of Shaftesbury Formation on the Monkman coal property, but at other locations in the Foothills this formation has a thickness of approximately 250 metres.

The Shaftesbury Formation consists of dark grey marine mudstone containing sideritic concretions and some sandstone phases. In the lower portion of the formation these lithologies grade into silty dark grey marine mudstone and siltstone with sandstone and minor conglomerate near the base.

4.2.11 Coal Seam Stratigraphy

The Gates Member coal seams are numbered 1 to 13 from the base of the section. The prefix letter "B" simply indicates that the seams are located within the Gates Member as opposed to the Gething Formation. Most of the information concerning seam thickness variations as well as variations of their internal characteristics applies to the Duke Mountain Block of the Monkman coal property where the major exploration effort has been concentrated to this time. Each of the coal seams for the Duke Mountain Block is described below. Additional comments concerning these seams in the other structural blocks are made where pertinent data are available.

The internal characteristics of each seam are illustrated on the drill-hole seam profiles included at the end of this report as Appendix A. Variations of the seam characteristics for the Duke Mountain Block are shown on the seam correlation charts included as Drawing II.4-8, while the mining thickness variations for each of the major economic seams are illustrated on the isopach maps included as Drawing II.4-5.

Seam B1

Seam B1 lies immediately above the clean sands of the "Torrens Member" at the base of the Gates Member. This seam has been intersected in all drillholes which have penetrated the whole of the Gates Member section throughout the Monkman coal property. The seam has also been described at numerous outcrop locations and is known to exist on both of Denison's Quintette and Saxon coal properties. Information available at the present has established that this coal seam is continuous throughout the Monkman coal property.

Seam B1 varies from 3.00 metres in total thickness in the vicinity of Duke Mountain to 8.00 metres on Duchess Mountain. The seam is characterized by an abundance of mudstone and carbonaceous claystone rock bands. The floor of the seam occurs at a sharp lithological break between coal and the underlying medium-grained massive sandstones. The roof usually consists of silty mudstones with frequent carbonaceous phases and thin coal bands.

The economic potential of the B1 seam is greatly retarded by the high frequency of rock bands which constitute in-seam dilution. At a limited area only within Duke Mountain is it possible to mine this seam by surface methods where any coal split has achieved a sufficiently thick development.

Seam B2

Seam B2 is poorly developed throughout the Monkman coal property. This seam rarely develops a thickness in excess of one metre and is known to be discontinuous from place to place. The most significant cause for discontinuities within Seam B2 is the deposition of channel sands at this stratigraphic level.

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Seam B2 has potential for commercial extraction at only a few localities where it is sufficiently close to Seam B1 to be mined in conjunction with the latter seam.

Seam B3

Like Seam B1, Seam B3 has been found throughout the Monkman coal property. On the basis of data available at the present this seam is also believed to be continuous within this area. The maximum thickness intersected to date is 12.69 metres at MDD 78-2, and the seam averages 5.00 metres thick on the Duke Mountain Block. The seam is characterized by three distinct splits which have been often used as a diagnostic marker on the various geophysical logs. The roof, floor, and rock bands usually consist of silty or carbonaceous mudstones.

On the Duke Mountain Block Seam B3 is located 50 metres stratigraphically above Seam B1. However, B1, B2, and B3 tend to coalesce with a gradual subsequent reduction of the interseam sediments in the vicinity of Mount Belcourt. On the Duke Mountain Block Seam B3 appears to have the potential to be economically mined by both surface and various underground methods.

Seam B4

The most prominent coal seam on Duke Mountain is Seam B4. In the Duchess Mountain area, however, penecontemporaneous erosion and deposition of channel sands appear to have removed the upper portion of the seam. At Duke Mountain Seam B4 has an average thickness of 8.50 metres, with the maximum thickness recorded being 12.69 metres in drill-hole MDD 78-2. The maximum and average thicknesses at Duchess Mountain are 9.42 metres and 8.00 metres respectively. Seam B4 has been intersected throughout the Monkman coal property and is a prominent feature of the stratigraphic section in the Mount Belcourt area.

Where Seam B4 achieves its most complete development it consists of an upper clean coal split and a lower split which contains numerous thin rock bands. A large parting of approximately 1.5 metres of siltstone separates these two coal leaves. The lower rock bands and the floor consists mainly of silty and carbonaceous mudstones. The roof strata are normally a monotonous sequence of mudstone similar in appearance to the Lower Moosebar Member. In places, however, clean channel sands of medium grain size replace mudstone as the roof lithology.

Seam B4, like Seam B3 appears to have the potential to be mined by both surface and underground methods. Seam B4 is located 20 metres above Seam B3.

Seam B5

Seam B5 is usually poorly developed and is known to be discontinuous within the Monkman coal property. At many locations penecontemporaneous erosion has removed this seam. Seam B5 achieves its maximum development at Duke Mountain where it has an average thickness of 2.25 metres. The most distinctive feature of this seam is its response to density geophysical logs. On those logs, the seam appears to be particularly dirty with wide gradational contacts from coal to rock at the roof and floor.

MXD 78-27 (cont'd.)

220.33 - 220.41	0.08	Coal: dull, 10% bright, broken																				
220.41 - 220.45	0.04	Coal: dull, powdery																				
220.45 - 220.53	0.08	Coal: dirty with 10% bright bands																				
220.53 - 220.71	0.18	Coal: dull, 5% bright																				
220.71 - 220.76	0.05	Mudstone: with 5% bright bands																				
220.76 - 220.91	0.15	Coal: 95% bright																				
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0679</td> <td>219.79 - 220.33</td> <td>0.54</td> <td>36.2</td> <td>4½</td> </tr> <tr> <td>0680</td> <td>220.33 - 220.76</td> <td>0.43</td> <td>39.4</td> <td>6½</td> </tr> <tr> <td>0681</td> <td>220.76 - 220.91</td> <td>0.15</td> <td>10.4</td> <td>9</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0679	219.79 - 220.33	0.54	36.2	4½	0680	220.33 - 220.76	0.43	39.4	6½	0681	220.76 - 220.91	0.15	10.4	9
Samples	Interval	Width	Dry Ash	F.S.I.																		
0679	219.79 - 220.33	0.54	36.2	4½																		
0680	220.33 - 220.76	0.43	39.4	6½																		
0681	220.76 - 220.91	0.15	10.4	9																		
220.91 - 221.12	0.21	Siltstone: with minor fine sandstone and plant fragments.																				
221.12 - 221.18	0.06	Coal: broken, powdery, 50% bright.																				
221.18 - 221.28	0.10	Siltstone: with minor fine sandstone and plant fragments.																				
221.28 - 224.92	3.64	Sandstone: fine, minor siltstone, abundant plant fragments, some bioturbation near top, bedding banded to indistinct, BCA 65°-75°.																				
224.92 - 225.73	0.81	Mudstone: minor siltstone, abundant plant fragments, minor carbonaceous fragments, 0.01 dull coal at 225.35 meters																				
		COAL SEAM B-10																				
225.73 - 225.78	0.05	Coal: dull																				
225.78 - 226.06	0.28	Coal: bright																				
226.06 - 226.26	0.20	Mudstone: carbonaceous with plant fragments																				
226.26 - 226.35	0.09	Coal: dull and dirty with 5% bright bands																				
226.35 - 226.56	0.21	Mudstone: carbonaceous with plant fragments																				
226.56 - 226.58	0.02	Coal: bone																				
226.58 - 226.65	0.07	Coal: bright																				
226.65 - 226.74	0.09	Coal: dull, 10% bright bands																				

Seam B9 has the potential to be mined by both surface and underground mining methods. The seam is located 110 metres above the B4 seam.

Seams B10, B11, B12 and B13

These thin seams show extremely variable development throughout the Monkman coal property and no positive correlation has been completed with the data available at present. The seams are usually less than one metre in thickness and rarely exceed 1.5 metres. It is believed that each of these seams is discontinuous within the property. Similar seams located within this portion of the stratigraphic column south of Mount Belcourt do not appear to have a direct correlation with Seams B10, B11, B12 and B13.

It may be possible to mine portions of these seams economically at a few locations on the property where the thickness of each is sufficient to warrant coal extraction by surface methods and where Seam B9 and other seams are the primary mining targets.

4.3 Structural Geology

4.3.1 Major Structural Elements

The Monkman coal property consists of a continuous dip slope structure termed the Wapiti Dip Slope, trending in a southeasterly direction through the western and southern coal licences, and a complexly folded sequence of strata located within the Duke Mountain Block. Further subdivision of each of these areas is necessary to adequately describe the structural geology. Those divisions are described in the following section of this report.

The Wapiti Dip Slope appears to be an extensive syncline which has been truncated on the western flank by the main thrust fault which places Paleozoic sediments over Cretaceous and Jurassic strata. The syncline remains intact only at its northern and southern extremities. Elsewhere only the west dipping limb remains intact.

An addendum to the Wapiti Dip Slope includes the Saxon Extension coal licences. These coal licences cover the northern extremity of the main Saxon Syncline and are separated from the Dip Slope proper by a broad thrust-faulted anticlinorium containing only Minnes Group strata.

The Duke Mountain Block includes an extensive and poorly-developed anticlinal box fold which is present on both Duke and Duchess Mountains although the continuity of the structure is disrupted by several smaller tectonic features. Several large concentric folds, developed in an en echelon pattern, lie adjacent to the anticlinal box fold.

All of the major structural features trend in a southeasterly direction although local variations are observed and will be described.

4.3.2 Definitions of Structural Areas

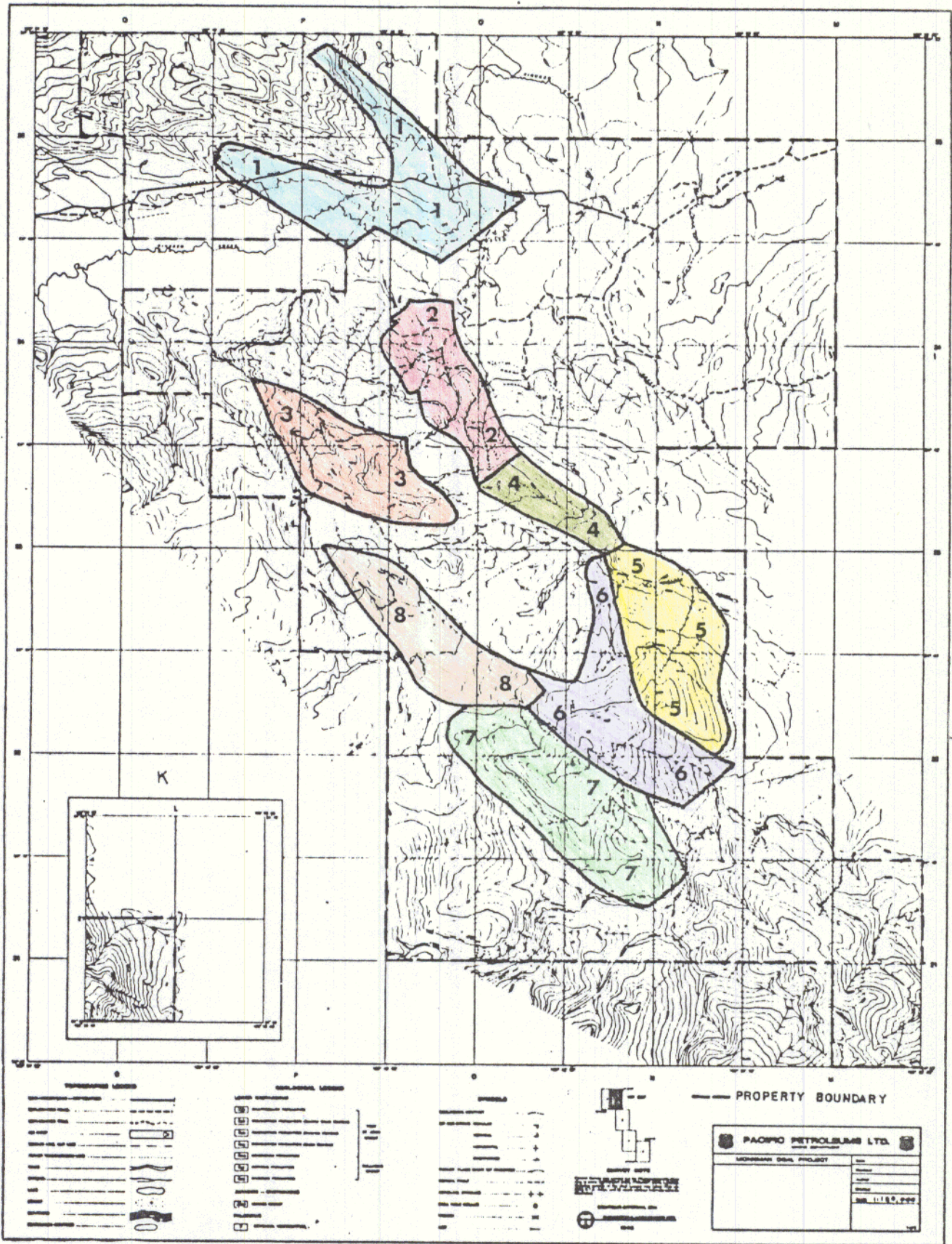
The Wapiti Dip Slope has been subdivided into several units on the basis of various topographic features for the purpose of exploration and potential mine development. Those blocks, illustrated on Drawing II.4-10, are listed from north to south as follows:

- 1) The Five Cabin Syncline
- 2) The Onion Syncline
- 3) The North Wapiti area
- 4) The South Wapiti area
- 5) The Belcourt area
- 6) The Secus area
- 7) The Nekik area
- 8) The Saxon Syncline Extension

The Duke Mountain Block, illustrated on Drawing II.4-11 is similarly subdivided:

- 1) Quintette area
- 2) Duke Syncline
- 3) Duke Mountain area
- 4) South Duke area
- 5) Duchess area
- 6) North Boomerang Prospect area
- 7) South Boomerang Prospect area
- 8) East Boomerang Prospect area
- 9) Dokken Creek area

Each of these blocks is defined by both topographic and structural features.



STRUCTURAL AREAS - DUKE MOUNTAIN BLOCK

- | | |
|-------------------|-------------------|
| 1 Quintette | 5 Fearless Pit |
| 2 Duke Pit | 6 East Boomerang |
| 3 Duke Syncline | 7 South Boomerang |
| 4 South Duke Area | 8 North Boomerang |

Figure II.4-11



PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
STRUCTURAL AREAS	Date: March /79 Base: Dec 31, 1978 Author: A.B., G.J. Drafted: Edy Scale: 1:100000 approx. Drawing: II.4-10

4.3.3 Structural Geology of the Wapiti Dip Slope

The Wapiti Dip Slope consists in detail of a series of smaller en echelon structural features each trending in a southeasterly direction. At the northern end of the Wapiti Dip Slope trend is the Five Cabin Syncline. This large synclinal feature is assymmetric in nature since the western limb is found to dip at approximately 65° towards the east while the eastern limb displays dips of approximately 20° towards the west. The syncline plunges towards the north at a shallow angle and, although thick overburden masks the Cretaceous strata, the southerly termination appears to be located in the vicinity of the Kinuseo Falls Road.

The Onion Syncline forms the next portion of the Wapiti Dip Slope in a southerly direction. This syncline appears to have its northernmost development near the southern limit of the Five Cabin Syncline. The Onion Syncline also trends in a southeasterly direction but is more symmetrical in nature since its limbs each dip at approximately 50° . The northern limit of the Onion Syncline is also obscured by thick overburden but the trend of the fold axes of both this and the Five Cabin Syncline appear to show a displacement along the structural trend suggesting an en echelon development. The plunge of the northern end of the Onion Syncline cannot be observed but at the well-exposed southern limit the plunge is approximately 20° towards the north.

The North Wapiti, South Wapiti, Belcourt; Secus and Nekik areas appear to constitute a single structural feature only subdivided topographically by the Wapiti River, and Red Deer and Belcourt Creeks.

These areas consist of a single elongated syncline which has been thrust faulted from the west. The major thrust fault has removed most of the easterly dipping western limb and placed Paleozoic strata above the remaining Cretaceous and Jurassic sediments. In the North Wapiti Block and Nekik Block remnants of the western limb of the synclinal structure appear to be preserved. The westerly dipping eastern limb extends continuously between these areas. The syncline is doubly plunging with a steep northerly plunge at the southern termination of the syncline in the Nekik Area and a shallow southerly plunge at its northern termination in the North Wapiti Area. The en echelon development of this syncline can be clearly observed in the North Wapiti Area where the northern limit of this structure is clearly displaced from the southern limit of the Onion Syncline located towards the east. Throughout the North Wapiti, South Wapiti, Belcourt, Secus and Nekik areas the remaining eastern limb of the syncline dips at about 45° towards the west. Only one structural feature interrupts the continuity of the Dip Slope in these areas. A major thrust fault, the Saxon Thrust, displaces the coal-bearing strata in the Mount Belcourt region.

The Saxon Extension Area does not constitute a structural element within the Wapiti Dip Slope. However that area is discussed in this section since it constitutes only a small portion of the Monkman coal property and is located geographically close to the Wapiti Trend. The Saxon Extension coal licences are located to cover Cretaceous coal-bearing Gates Member and Gething Formation strata at the northern extremity of the Saxon Syncline. In this area the syncline plunges in a southerly direction and trends towards the southeast. The eastern limb of the

syncline dips at approximately 50° . A large north dipping thrust fault, trending towards the west, truncates the western limb and places Minnes Group strata over the upper Commotion Formation sequences at the centre of the syncline. The thrust fault appears to be continuous with the Saxon Thrust in the Mount Belcourt region. The central portion of the syncline is complicated by a series of smaller parallel trending anticlines. Thus the Saxon Syncline can be more accurately described as a synclinorium.

4.3.4 Structural Geology of the Duke Mountain Block

The Duke Mountain Block consists of three main structural elements: The Quintette Area, The Duke Mountain Area, and The Duchess-Dokken Area. The structural features of the Duke Mountain Area and the Duchess Area appear to be essentially continuous, while the features of the Quintette Area are separate and unrelated.

The Duke Mountain Block consists of a large anticlinal box fold in the east which trends in a southeasterly direction, lying adjacent to a large syncline which trends in a parallel direction.

C. D. A. Dahlstrom (1970) described the box fold style of crustal shortening and suggested that this shortening mechanism was typical of many folded sequences in the Rocky Mountain Foothills. One of the examples of this type of structure cited by Dahlstrom is Babcock Mountain, which is currently being explored and developed as a coal property by Denison Mines Limited. A further example is Mount Spieker, where Ranger Oil Canada Limited is currently developing its Mount Spieker coal property.

The upper strata of box folds are characteristically flat lying and are bounded by steeply dipping, relatively planar limbs. The junctions

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 3.35	3.35	OVERBURDEN
		<u>GATES MEMBER - COMMOTION FORMATION</u>
3.35 - 5.62	2.27	Sandstone: fine grained, medium grey, carbonaceous stringers and partings, minor flow features; core fairly solid. BCA = 56°
5.62 - 7.62	2.00	Sandstone: very fine grained, medium grey, carbonaceous stringers and partings, some vitreous coal bands, minor ferruginous staining, core broken.
7.62 - 8.95	1.33	Sandstone: very fine to fine grained, medium grey, ferruginous staining common, carbonaceous stringers and partings, flow features, vitreous coal bands 2 - 3 cm in width.
8.95 -10.82	1.87	Sandstone: fine to medium grained, ferruginous staining throughout, flow features, rip-up clasts, carbonaceous stringers and partings, occasional pyrite speck, core fairly solid. BCA = 60°
10.82-15.28	4.46	Sandstone: medium grained, carbonaceous partings and stringers, numerous fractures filled with carbonaceous material, vitreous coal bands 3 - 4 mm in width, pyrite specks and disseminations, minor slickensides. BCA = 63°
15.28-17.85	2.57	Sandstone: fine grained, flow features, minute fractures filled with calcite, occasional carbonaceous speck or stringer, core solid. BCA = 68°
17.85-21.25	3.40	Sandstone: very fine grained, with 20% siltstone interbeds, minute fractures filled with calcite, occasional carbonaceous speck and stringer, core solid.
21.25-24.81	3.56	Sandstone: very fine grained, flow features, some vitreous stringers, core solid.
24.81-25.54	0.73	Siltstone: carbonaceous specks and stringers, pyrite disseminations, minor slickensides, core broken.
25.54-29.06	3.52	Siltstone with some fine grained Sandstone Bands: carbonaceous, plant fossils, flow features, pyrite specks and stringers.
29.06-29.43	0.37	Siltstone: some vitreous bands, slickensides, core broken and crushed.

between the steeply dipping and the flat lying strata form abrupt monoclines. The geometry of such folding requires that the monoclinial axes approach each other at depth, so that disharmonic folding and high angle reverse faulting are typical of the deformation of the older strata lying within the core of the anticline. Drawing II.4-12 is a diagrammatic illustration of the nature of the deformation that is found within an anticlinal box fold.

The Duke Mountain anticlinal box fold is further complicated by a series of thrust faults dipping in an easterly direction along the eastern limb and in a westerly direction along the western limb.

The synclinal structure trending along the western margin of the box fold is called the Duke Syncline. This structure is nearly symmetrical with dips of 55° on the eastern limb and 45° on the western limb. The plunge is usually shallow and variable along the hinge line. A large thrust fault dipping in an easterly direction lies adjacent to the western limb of syncline. At the southern end of the Duke Mountain Area the thrust fault appears to change trend towards an easterly direction, truncating both the syncline and the anticlinal box fold, meeting the east dipping limb of that anticline in the vicinity of Fearless Creek. From there, the trend of the fault appears to turn abruptly back to a southeasterly direction and continue along the structural trend, leaving the property in the Dokken Ridge Area. A splay from this thrust fault may continue in an easterly direction at Fearless Creek.

The structure at Duchess Mountain appears to be similar to the Duke Mountain Area, complicated only by a more intense level of thrust faulting and folding. The tendency towards more complicated structural features being developed in a southerly direction can be clearly seen in exposures at the northern end of Dokken Ridge along Dokken Creek. The Boomerang and Duchess Prospect Areas are located over potentially mineable equivalents of the anticlinal box fold and adjacent syncline in the Duchess Mountain Area.

At the northern end of the Duke Mountain pit area a series of high angle reverse faults have been observed in outcrop and in drill core. These structures effectively separate the Duke Mountain Block from the Quintette Area. The structure of the Quintette Area consists of a large southerly plunging anticline lying adjacent to a southerly plunging and regularly folded syncline on the east side. Information available at the present suggests that the anticline may also have a box style configuration; the broad hinge area of the fold dips at about 20° towards the east before the dip abruptly increases to a near vertical orientation. The western limb dips at about 50 degrees. Exposure of the strata along the Kinuseo Falls Road in this area is marked by thickly developed glacial overburden and the exact relationship between the Duke Mountain area and the Quintette area cannot be clearly resolved. However, the trends of the various fold axes appear to be displaced in this region and therefore a large fault may be present which separates these two blocks.

The geological and structure contour maps illustrate the structural geology of the Monkman coal property as well as the location of the various prospect areas within the property. Cross-sections spaced at intervals of 1000 metres throughout the Monkman property and at intervals of 500 metres for the Duke and Duchess Mountain areas also illustrate the various features of the structural geology and are included within the map pocket of this report.

4.3.5 Faulting

On the Monkman coal property insufficient data are available at the present time to allow an accurate representation of the relationships between bedding and fault orientations to be made. However, mechanisms and theories of fault orientation which have been used to aid cross-section construction will be discussed at this point.

The cross-sections show, in most instances, that the faults have a dip of 15° to 20° where the strata are flat laying. The dip directions of the structures have been assumed to lie in the same direction as the major faults which have been clearly observed in the field and on aerial photographs.

Small scale structures which have been proven by drilling on both the Sukunka and Babcock coal properties have similar orientations to those suggested for the Monkman coal property. In addition, studies in rock mechanics conducted on the failure of rocks by brittle deformation under compression indicate that failure planes are generated at approximately 26° to the direction of the primary maximum principal stress.

Further, given a pronounced, suitably oriented anisotropy such as bedding, the angle between failure planes and the maximum principal stress direction can be reduced to as little as 10° . Hence it is only necessary to demonstrate that the primary maximum principal stress direction was subhorizontal at the time of deformation for the proposed fault orientations to become those most likely to be present. Detailed studies at Sukunka indicate that the primary remanent principal stress direction is subhorizontal. Mining conditions encountered during trial mining have confirmed that stress orientation. Since the primary remanent principal stress direction can only reflect the direction of the primary maximum principal stress at the time of failure, the conclusion must be drawn that the primary maximum principal stress had a horizontal orientation at deformation. Consequently, it must be anticipated that the small scale structures, and indeed the large scale thrust faults, will be oriented between 10° and 26° to the orientation of bedding.

A similar orientation of faulting with respect to bedding can be anticipated, and in fact is found in steeply dipping and flat lying strata on other coal properties along the Rocky Mountain Foothills trend, i.e., the bedding dips at an angle of say 50° while thrust faults penetrate those beds at 15° for a dip of 65° . It is not known within the Rocky Mountains whether the faulting originally developed in a near-horizontal orientation and was later folded to a steeper orientation, or whether the anistoropy of the rocks was sufficiently great to cause a local modification of the deformation stress field parallel to bedding.

4.3.6 Folding

A variety of fold styles have been observed on the Monkman coal property, including concentric folding, chevron folding, and box folding. Box and chevron folding are both related, being formed by buckle fold mechanisms during brittle deformation. Concentric folding is commonly encountered during brittle deformation. Thus it should be expected that these fold styles will be encountered in strata such as those which have been subject to brittle failure. In fact, these fold styles are common to all strata situated along the Rocky Mountain Foothills coalfield of northeastern British Columbia.

RESERVES AND RESOURCES

5.1 Total Coal Resources Monkman Coal Property

Most of the exploration carried out on the Monkman Coal property to date has been concentrated within the Duke Mountain block of coal licences, with a much lower exploration emphasis being placed on the Wapiti Dip Slope. The principal reason for this approach is the concentration of apparently attractive mining structures in the Duke Mountain Block. As a result, a relatively close spacing of data points displaying seam thickness and quality is present in the Duke Mountain Block while only a small number of widely spaced data points is available throughout the extensive Wapiti Dip Slope Area. Consequently two separate calculations of reserves and resources have been made for the property. The first of these calculations establishes a resource base for the whole of the Monkman Coal Property and includes all seams in excess of one metre encountered to a depth of cover of 500 metres.

The resource evaluation does not include any allowance for mining or plant losses etc. and has been made, in fact, without regard for the potential mineability of any area when compared with other areas.

On this basis the total resource potential of the Monkman Coal Property is 2804 x 10⁶ tonnes.

The second calculation, the reserves of the Duke Mountain Block, is described in a following section of this report.

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

00 543

5.2 Resource Evaluation Method of Calculation

The calculation of total coal resources has been made using the cross-section method. This method involves the measurement of seam lengths on each section within the property area to an absolute limit of 500 metres of cover. The lengths were converted to areas by applying seam thicknesses determined in the various drill holes. For sections lying between adjacent drill holes seam thickness values for each section have been calculated by interpolation of the thicknesses at each hole.

The cross-sections were constructed at a spacing of 1000 metres for all areas of the Monkman coal property except the Duke and Duchess portions of the Duke Mountain Block. In the latter areas the density of drilling is sufficiently great to allow meaningful sections to be constructed at a spacing of 500 metres. Areas of influence for each cross-section of either 1000 metres or 500 metres, depending on the section spacing, have thus been used to determine total coal resource volumes. Finally, the resource potential in tonnes has been determined by applying a specific gravity of 1.4 gm/c.c. for in situ coal throughout the property.

5.3 Coal Reserves of the Duke Mountain Block

For the purpose of reserve calculations the Duke Mountain Block has been subdivided into a number of areas on the basis of topography, geologic structure or the current level of exploration. Those areas are listed as follows:

- 1) Quintette area (Kinuseo and Honeymoon Prospects)
- 2) Duke Syncline
- 3) Boomerang North Prospect
- 4) Boomerang South Prospect
- 5) Boomerang East Prospect
- 6) Fearless Pit
- 7) South Duke Area
- 8) Duke Pit

The current intensity of exploration increases through the areas listed above with few widely spaced drill holes for those areas at the top and a high density of drilling for the areas at the base of the list. Reserves have been calculated for each of the areas and those reserves are categorized according to standards established by the Geological Survey of Canada. Thus areas Nos. 1 to 5 are categorized as inferred, areas Nos. 6 and 7 are placed in an indicated category and area 8 is considered to contain proven reserves.

The figures quoted below are considered to be "geological" reserves, that is, they represent tonnes of coal in place. No calculations for product coal involving allowances for geological, mining or plant losses have been made. In addition, although parameters and limits have been applied which reflect various mining methods for the reserve figures in different portions of the Duke Mountain Block, only a very preliminary judgement has been made concerning the applicability of those mining methods.

The method of calculation used to determine the in situ reserves is the cross-sections method which is fully described in the following section of this report. The parameters and limits applied to the calculation are also described.

DUKE MOUNTAIN BLOCK RESERVES

(Million Tonnes)

GATES COAL SEAMS

<u>AREA</u>	<u>PROVEN</u>	<u>INDICATED</u>	<u>INFERRED</u>	<u>TOTAL</u>
Duke Pit Area	97.35			97.35
South Duke Area		48.61		48.61
Fearless Pit Area		195.00		195.00
Quintette Area			260.57	260.57
Duke Syncline			114.25	114.25
North Boomerang			95.85	95.85
South Boomerang			126.34	126.34
East Boomerang	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	<u>97.35</u>	<u>243.61</u>	<u>783.73</u>	<u>1,124.69</u>

The reserve areas and their geographical relationships are shown on Drawing II.4-7 (map box). Appendix E at the end of this report includes various tables showing in detail the reserve calculations for each reserve block.

5.4 Method of Reserve Calculations

The cross-section method has been used to calculate reserves throughout the Duke Mountain Block. Cross-sections were constructed at regular intervals of 500 metres for all areas except the Quintette area where a limited amount of drill hole and surface data is available. In the latter area the section spacing is 1000 metres.

Using the cross-section calculation method, total coal tonnes are determined by applying a coal specific gravity and a sectional area of influence to the coal area shown on each cross-section according to the following formula:

$$\text{Coal in Place} = \frac{\text{Coal Area}}{\text{Sectional Influence Distance}} \times \text{Sectional Specific Gravity}$$

The sectional influence area for any section is determined to be equal to the distance between mid points to the adjacent cross-sections. The specific gravity used in this calculation is 1.5 gm/c.c. which is equal to the run-of-mine specific gravity established for both the Duke and Fearless pits.

Where sufficient drill hole data is available a series of mining section isopach maps have been prepared for use in determining seam thicknesses per section. The intersection of the cross-section and isopach lines have been projected to the pertinent seam on the cross-section and the mean value of the interval between adjacent isopach contours applied to each seam portion. The total coal area per section has then been determined by summing each seam slice length multiplied by the relevant thickness. Coal tonnages per seam in each section as well as a total tonnage figure for each reserve block were thus calculated.

This method of calculation could be used for Seams No. B1, B3, B4, B5 and B9 on the Duke Pit and for seams B1, B3, B4 and B9 in the Fearless Pit. In other seam calculations there is only sufficient data to determine seam thickness per section line by interpolation of thickness values between adjacent drill holes.

An absolute depth limit of 500 metres was used in all the reserve calculations and an allowance of 15 metres vertically at the seam outcrops applied to compensate for oxidized coal.

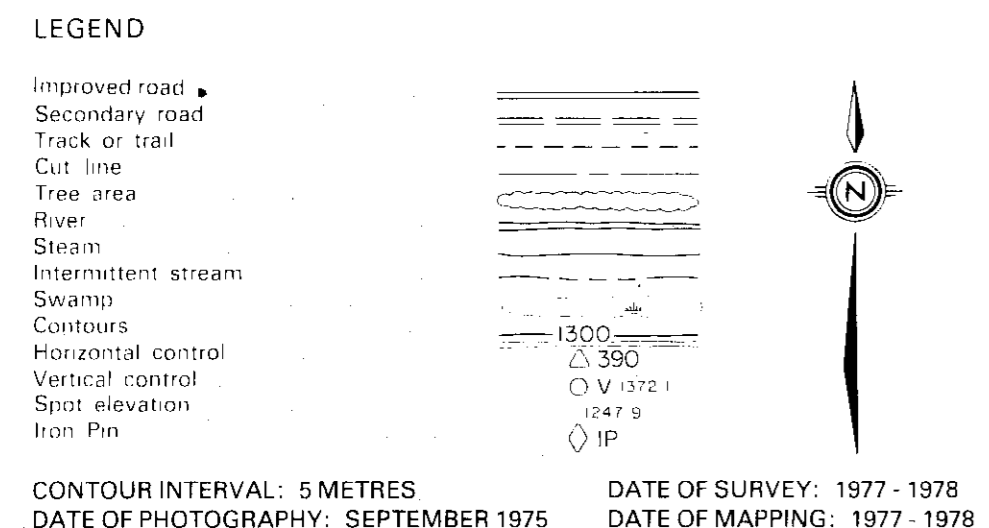
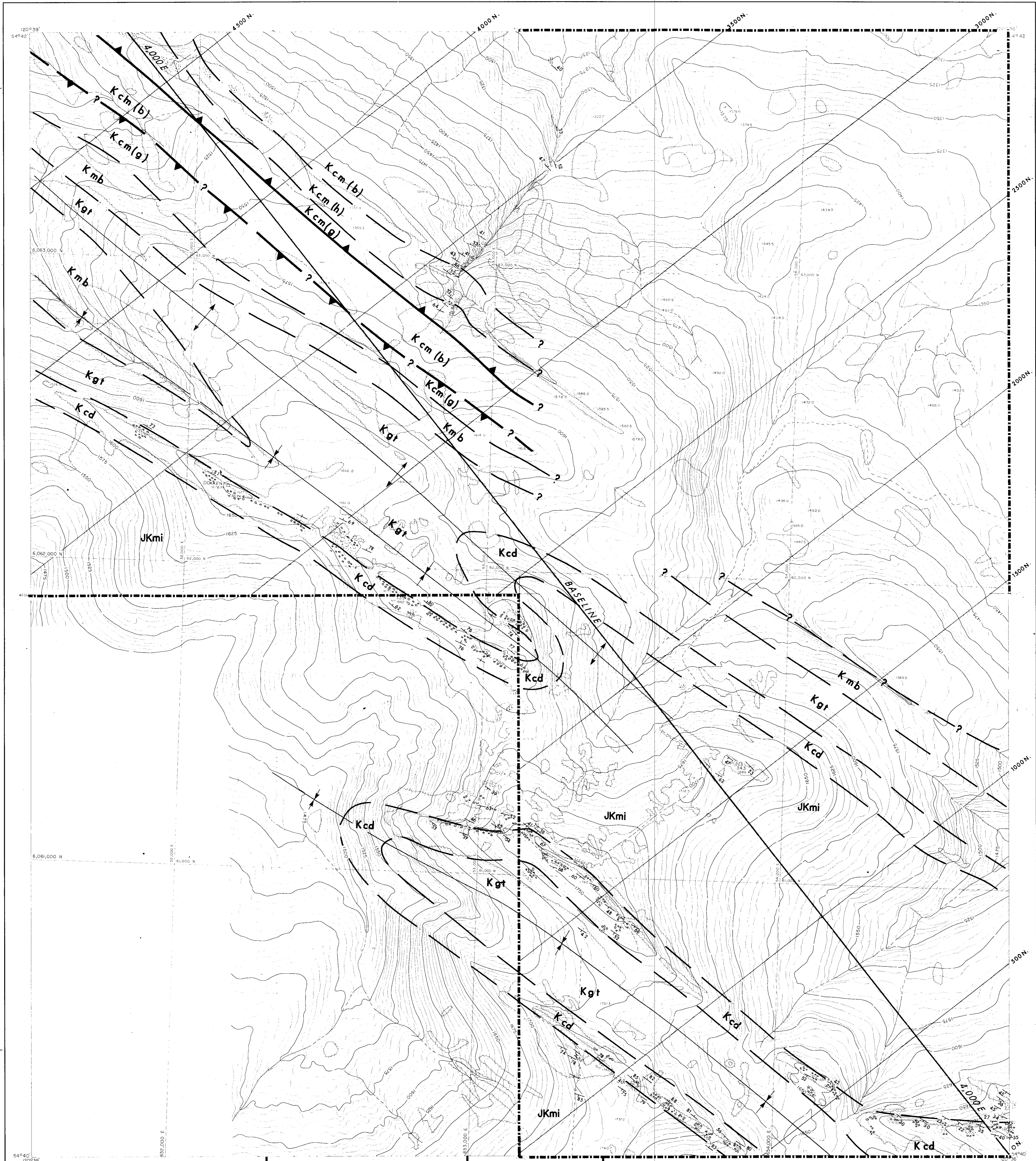
The reserve calculations include all the reserve calculations and an allowance of 15 metres vertically at the seam outcrops applied to compensate for oxidized coal.

The reserve calculations include all seams with thicknesses greater than one metre located within the boundaries of a 13/1 high wall ratio pit in the Duke-Duchess area as outlined by the mining engineers. Seams to a minimum of one metre are included in the calculation in the Duke Syncline and the north Boomerang Prospect where there appears to be a reasonable potential for surface mining. A one metre limit was also applied to a depth of 200 metres in other areas with apparent potential for surface mining methods of extraction. Outside those areas only seams with a thickness of three metres or greater have been included.

CONCLUSIONS

Exploration on the Monkman coal property to date indicates the presence of large tonnages of prime medium volatile coking coal in place. Some of the potential mining structures have been explored to date, however further work will be required to fully evaluate the coal reserves as well as to develop a fully integrated mine plan.

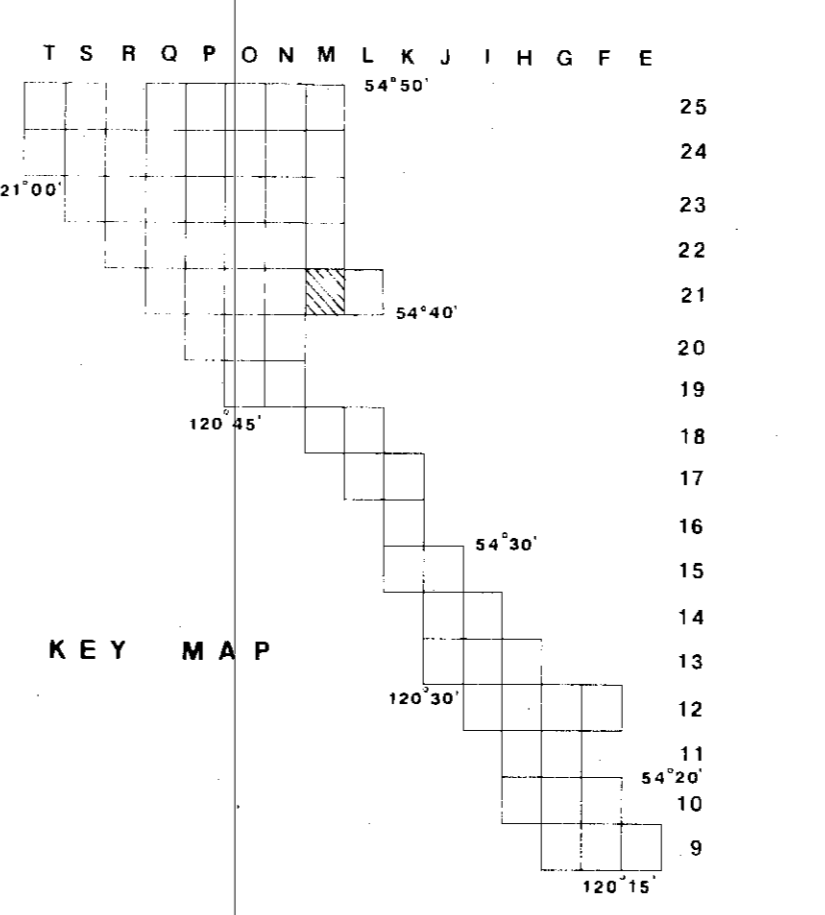
In the Duke Pit area additional exploration will be necessary to clarify a number of geological problems and further data is necessary in all other areas to bring the reserves to a proven category. This work will be undertaken during the 1979 and subsequent field programmes.



CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

GEOLOGICAL LEGEND	
LOWER CRETACEOUS	
[Ksh]	SHAFTESBURY FM.
[Kcmb]	COMMOTION FM. (Boulder Creek Member)
[Kcmh]	COMMOTION FM. (Hulcross Member)
[Kcmg]	COMMOTION FM. (Gates Member)
[Kmb]	MOOSEBAR FM. (u) upper lower
[Kgt]	GETHING FM.
[Kcd]	CADOMIN FM.
JURASSIC-CRETACEOUS	
[JKmi]	MINNES GROUP (undivided)
PALEOZOIC, MISSISSIPPIAN	
[P]	DEVONIAN, MISSISSIPPIAN

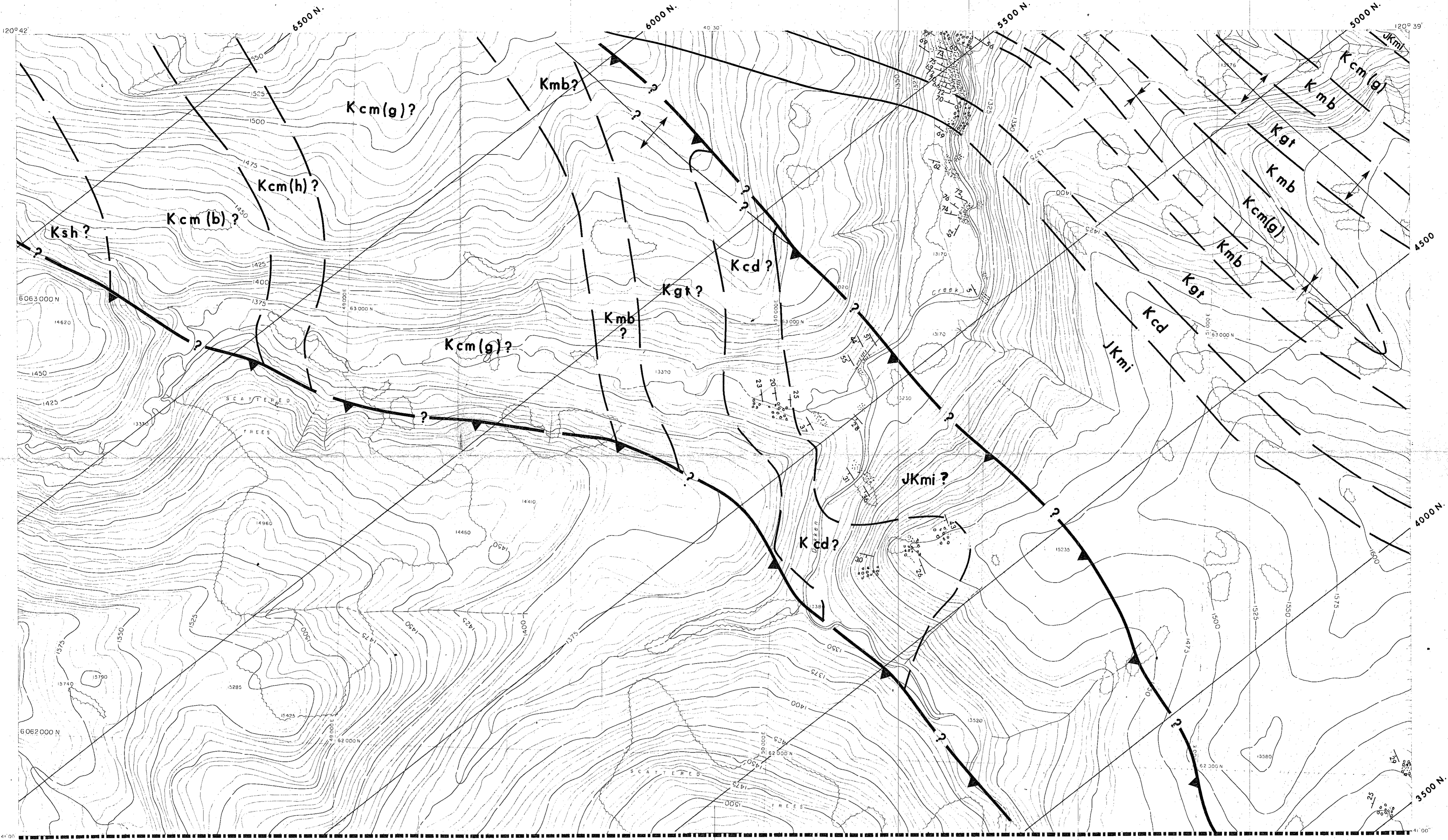
LITHOLOGIC LEGEND	
—B1—	COAL SEAM SUBCROP
—	GEOLOGICAL BOUNDARY
—▲—	THRUST FAULT - UPPER TRACE
—▲—	THRUST FAULT - LOWER TRACE
—	SYNCLINAL, ANTICLINAL AXIS
—	DIP & STRIKE (Dipping, Vert., Horiz.)
—	DRILL HOLE LOCATION
—	TRENCH LOCATION
—	ADIT LOCATION
—	CONGLOMERATE
—	SANDSTONE
—	SILTSTONE
—	MUDSTONE
—	COAL



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DR - DOKEN RISE BELCOURT TX (2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DOKEN RIDGE AREA GEOLOGICAL MAP	
Date: MAR. '79	Revised:
Author: G.J., A.B.	Drafted: J.W.K.
Scale: 1:5,000	II 4-2



LEGEND

Improved road
Secondary road
Track on road
Cut line
Tree area
River
Stream
Intermittent stream
Swamp
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pin

CONTOUR INTERVAL: 5 METRES
DATE OF PHOTOGRAPHY: SEPTEMBER 1975

DATE OF SURVEY: 1977-1978
DATE OF MAPPING: 1977-1978

SURVEY NOTE

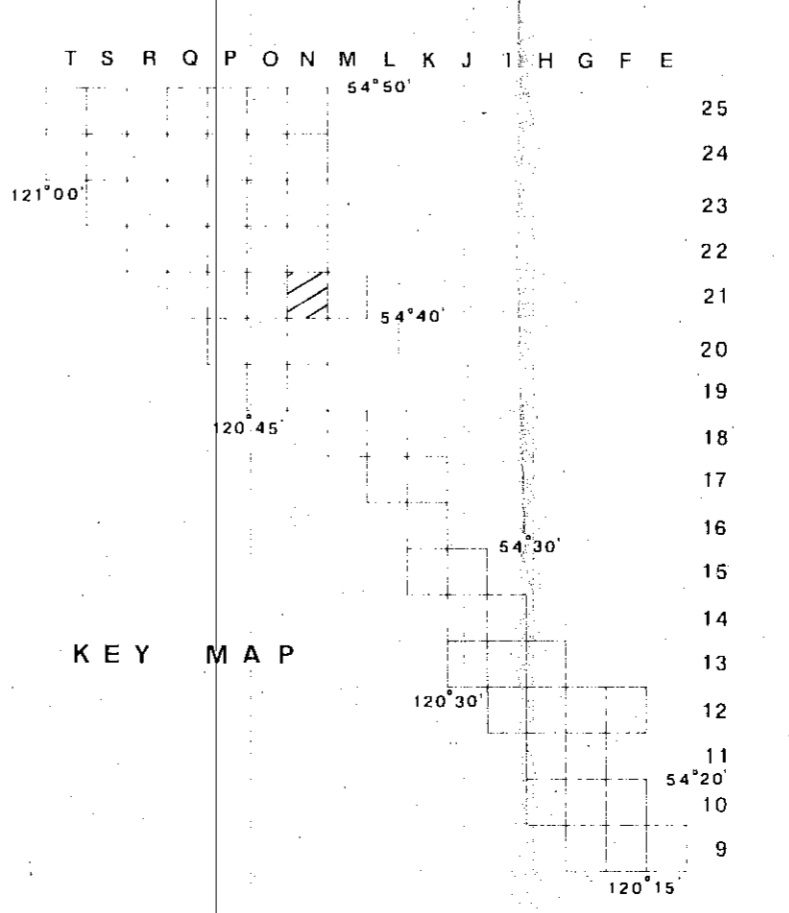
The Horizontal and Vertical Coordinates were established by D. W. Watson B.C.L.S. using conventional and I.B.M. survey equipment. Horizontal and vertical coordinates and elevations are derived from Trig Stations Quarterly & Quarterly S.W. Merise, Huxon, Marica, Kinross. All coordinates referred to Universal Transverse Mercator Grid Zone 18. Elevations are above Mean Sea Level were established by trig leveling; vertical angles were measured at both ends of each source simultaneously.

GEOLOGICAL LEGEND

LOWER CRETACEOUS	FORT ST. JOHN GROUP
Ksh SHAFTESBURY FM.	
Kcmb COMMOYON FM. (Boulder Creek Member)	
Kcm(h) COMMOYON FM. (Hulcross Member)	
Kcm(g) COMMOYON FM. (Gates Member)	
Kmb MOOSEBAR FM. (upper/lower)	
Kgt GETHING FM.	
Kcd CADOMIN FM.	
JURASSIC - CRETACEOUS	BULLHEAD GROUP
JKmi MINNES GROUP (undivided)	
PALEOZOIC	MINNES GROUP
P DEVONIAN, MISSISSIPPIAN	

LITHOLOGIC LEGEND

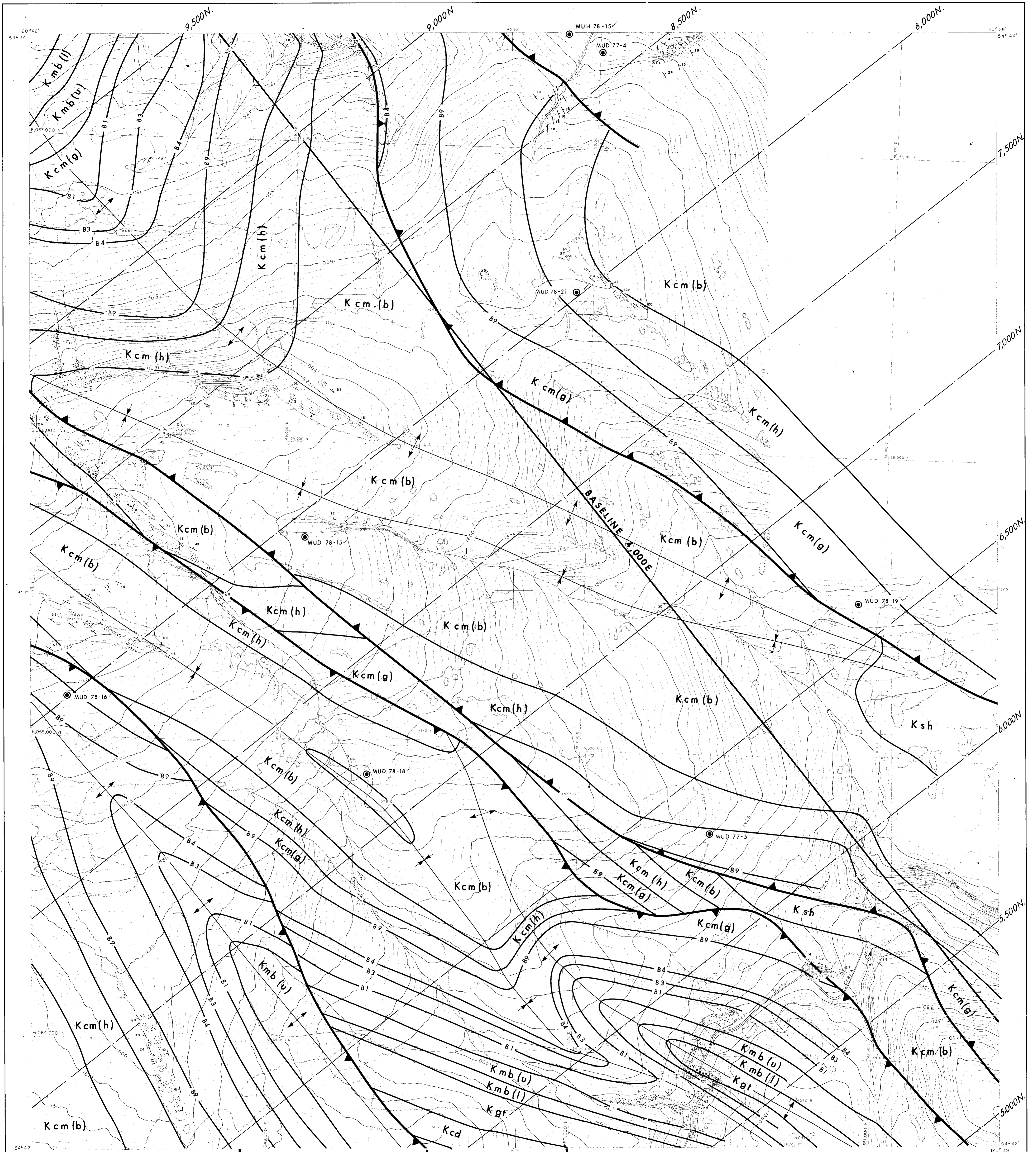
—B—	COAL SEAM SUBCROP
—	GEOLOGICAL BOUNDARY
—▲—	THRUST FAULT - UPPER TRACE
—▼—	THRUST FAULT - LOWER TRACE
—	SYNCLINAL, ANTICLINAL AXIS
—	DIP & STRIKE (Dipping, Vert., Horiz.)
⊙	DRILL HOLE LOCATION
—	TRENCH LOCATION
—	ADIT LOCATION
—	CONGLOMERATE
—	SANDSTONE
—	SILTSTONE
—	MUDSTONE
—	COAL



543

Re DOKEN RIDGE BELCAIR 78 (2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date	MAR. '79
Revised	
Author	G. J., A. B.
Drafted	J. W. K.
Scale	1:5,000
	II 4-2
N 21	



LEGEND

Improved road
Secondary road
Track or trail
Cut line
Trench
River
Stream
Intermittent stream
Swamp
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHY SEPTEMBER 1975
DATE OF SURVEY APRIL 1977
DATE OF MAPPING MAY 1977

SURVEY NOTE

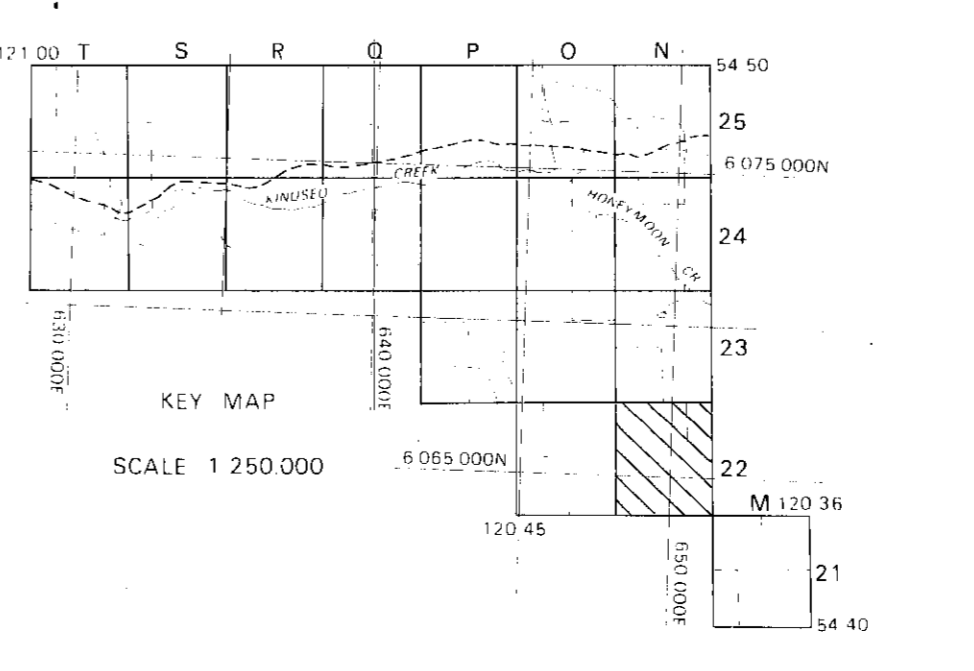
The Horizontal and Vertical Coordinates were established by D. W. Watson, B.C.S., using conventional and I.C.M. surveying methods. Horizontal and vertical coordinates and elevations are referred to True Stationing (Quadrant E. Quarter S.W. 1/4, Monks, Hawk Marsh, Kinross). All vertical elevations referred to Universal Transverse Mercator Datum 1983. Elevations are above Mean Sea Level were established by trig leveling, vertical angles, from level of high water of each channel, respectively.

GEOLOGICAL LEGEND

LOWER CRETACEOUS	SHAFTESBURY FM.	Fort St. John Group
Ksh		
COMMOTION FM. (Boulder Creek Member)		
Kcm(b)		
COMMOTION FM. (Hullcross Member)		
Kcm(h)		
COMMOTION FM. (Gates Member)		
Kcm(g)		
MOOSEBAR FM. (u) upper		
Kmb		
MOOSEBAR FM. (l) lower		
Kmb(u)		
GETHING FM.		
Kgt		
CADOMIN FM.		
Kcd		
JURASSIC - CRETACEOUS		
MINNES GROUP (undivided)		
Jkm		
PALEOZOIC		
DEVONIAN, MISSISSIPPIAN		
P		

LITHOLOGIC LEGEND

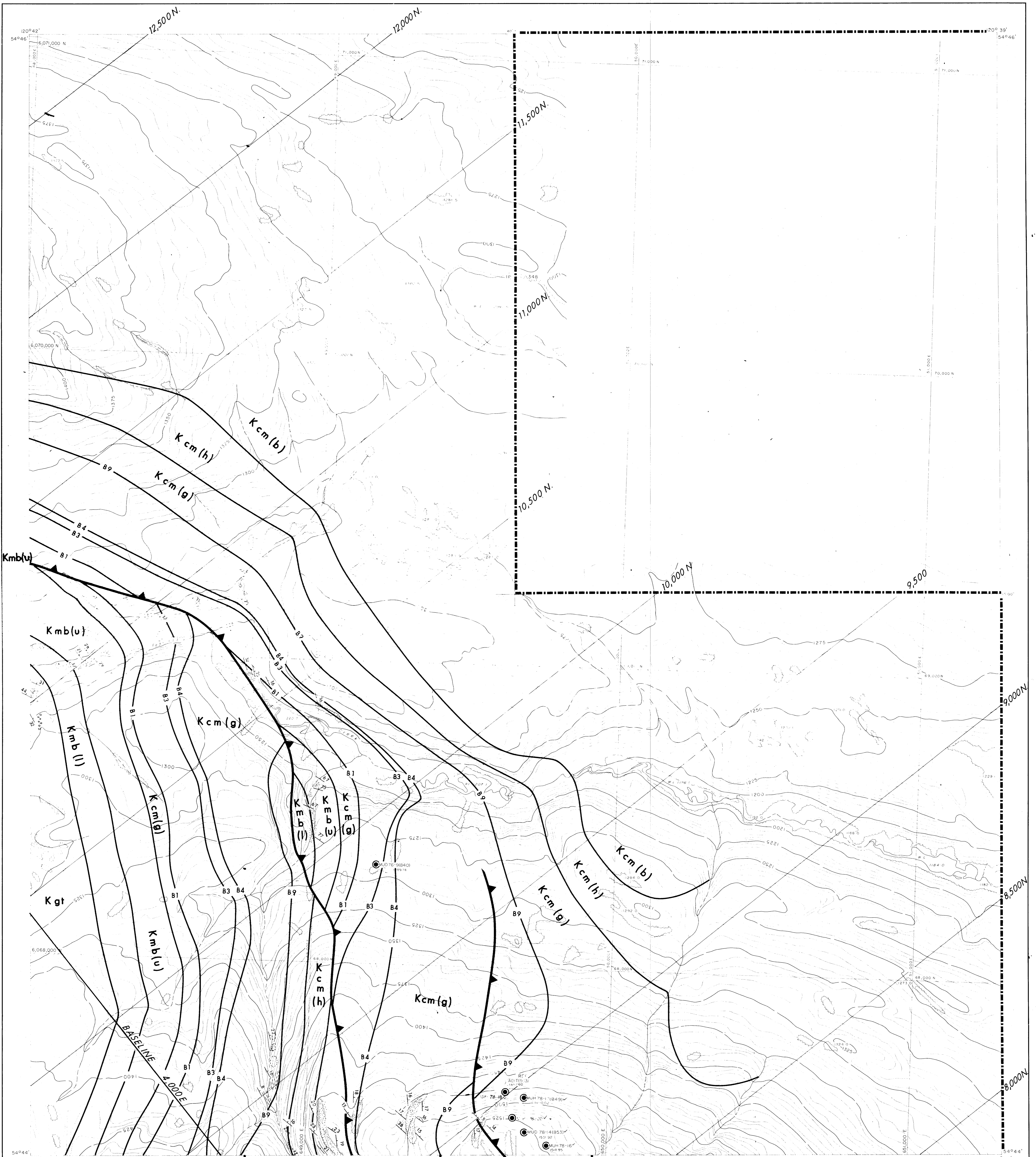
COAL SEAM SUBCROP
GEOLOGICAL BOUNDARY
THRUST FAULT - UPPER TRACE
THRUST FAULT - LOWER TRACE
SYNCLINAL, ANTICLINAL AXIS
DIP & STRIKE (Dipping, Vert., Horiz.)
DRILL HOLE LOCATION
TRENCH LOCATION
ADIT LOCATION
CONGLOMERATE
SANDSTONE
SILTSTONE
MUDSTONE
COAL



543

Mc DONALD BELLEVUE 71 (2) A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date MAR. '79	Revised
Author G. J. A. B.	Drafted J. W. K.
Scale 1:50,000	Drawing II.4-2
DUCHESS MOUNTAIN GEOLOGY	
N 22	



LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

SURVEY NOTE
 The Horizontal and Vertical Control points were established by D. W. Watson, B.C.L.S. using conventional and I.D.M. surveying equipment. Horizontal and vertical coordinates and elevations are derived from Trig Stations + Quaternary E. (Quaternary S.W. Marker, Hawk, Marica, Kincaid). All co-ordinates refer to Universal Transverse Mercator Grid Zone 18. Elevations are above Mean Sea Level unless otherwise stated. Vertical angles were established by trig leveling. Vertical angles (level) are of both ends of each course simultaneously.

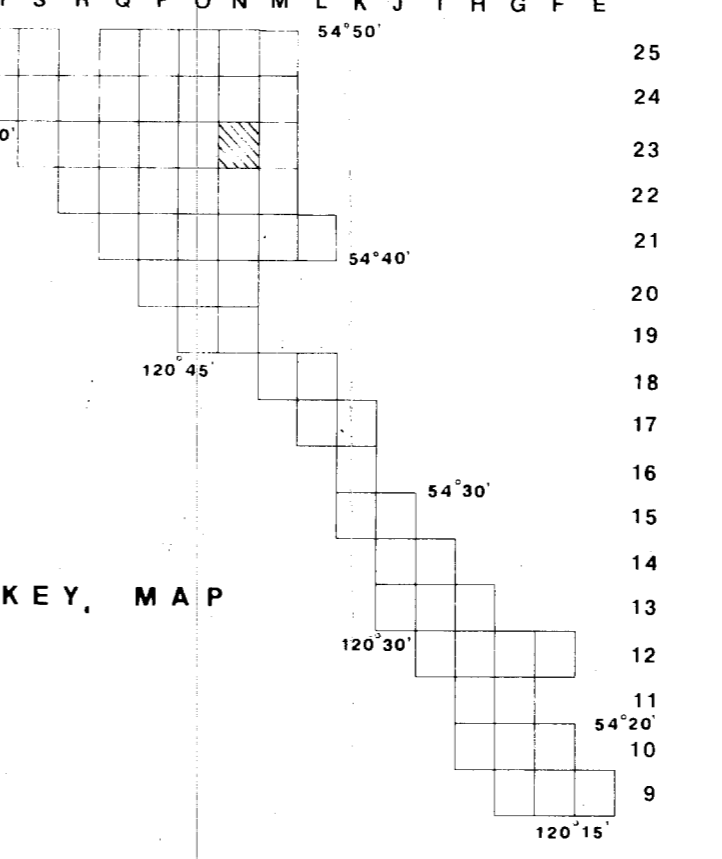
GEOLOGICAL LEGEND

- | | | |
|--|---------------------------------|------------|
| LOWER CRETACEOUS | SHAFTESBURY FM. | Ksh |
| COMOTION FM. (Boulder Creek Member) | Kcm(b) | |
| COMOTION FM. (Hulcross Member) | Kcm(h) | |
| COMOTION FM. (Gates Member) | Kcm(g) | |
| MOOSEBAR FM. (u) upper | Kmb | |
| MOOSEBAR FM. (l) lower | Kmb(l) | |
| GETHING FM. | Kgt | |
| CADOMIN FM. | Kcd | |
| JURASSIC - CRETACEOUS | MINNES GROUP (undivided) | JKm |
| PALEOZOIC | DEVONIAN, MISSISSIPPIAN | P |

LITHOLOGIC LEGEND

- B1** COAL SEAM SUBCROP
- GEOLOGICAL BOUNDARY
- ▲** THRUST FAULT - UPPER TRACE
- ▼** THRUST FAULT - LOWER TRACE
- ↕** SYNCLINAL, ANTICLINAL AXIS
- ↖ ↗** DIP & STRIKE (Dipping, Vert., Horiz.)
- DRILL HOLE LOCATION
- TRENCH LOCATION
- ADIT LOCATION
- CONGLOMERATE
- SANDSTONE
- SILTSTONE
- MUDSTONE
- COAL

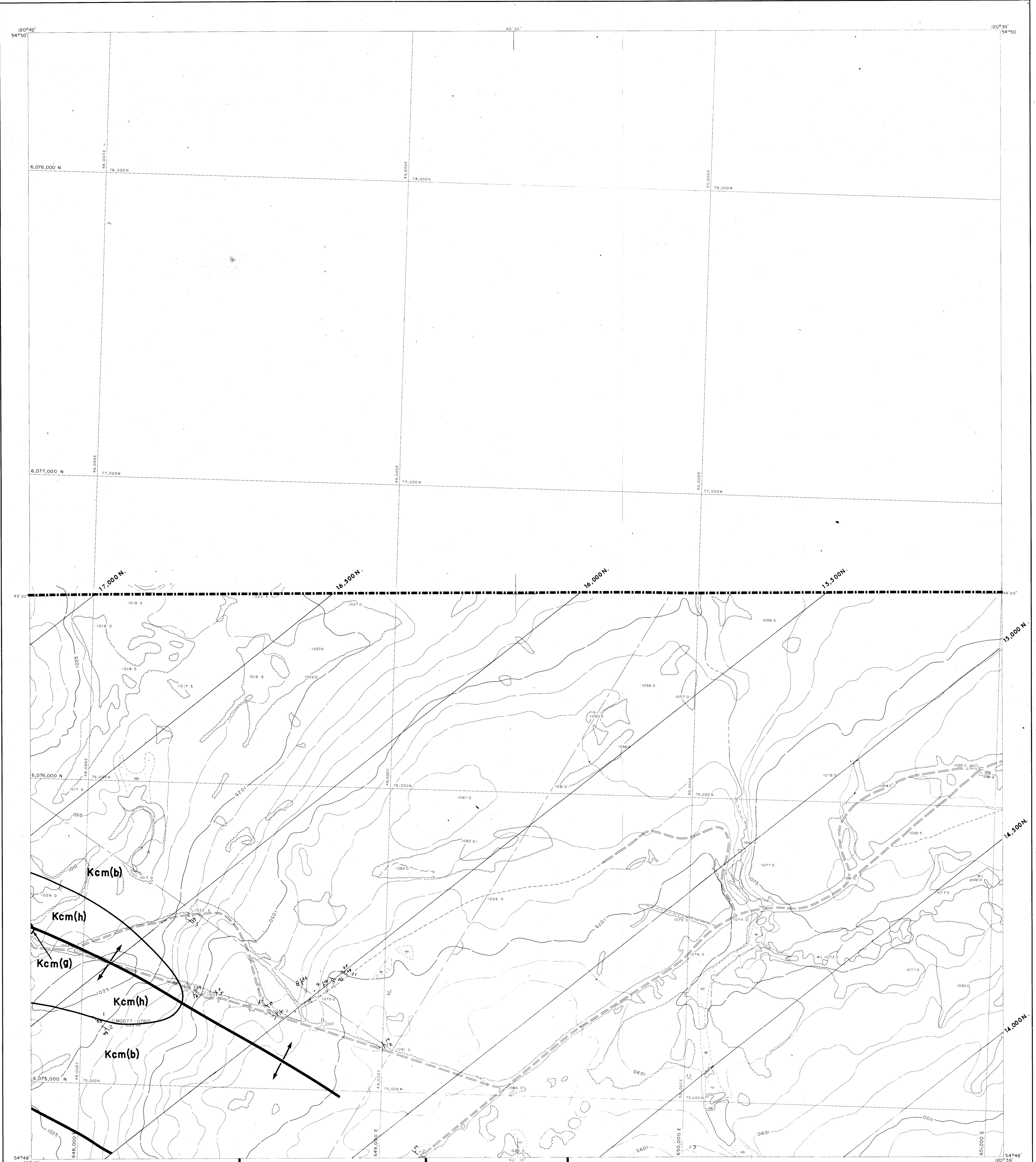
KEY MAP



543

PR - MONKMAN BELLEVUE 71 (2A)

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date: MAR. '79	Revised:
Author: G. J., A. B.	Drafted: J. W. K.
Scale: 1:5,000	Drawing: II.4-2
N 23	



LEGEND

Improved road
Secondary road
Track or trail
Cut line
Tree area
River
Stream
Intermittent stream
Swamp
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pin

DATE OF SURVEY: 1977-1978
DATE OF PHOTOGRAPHY: SEPTEMBER 1975
DATE OF MAPPING: 1977-1978

SURVEY NOTE

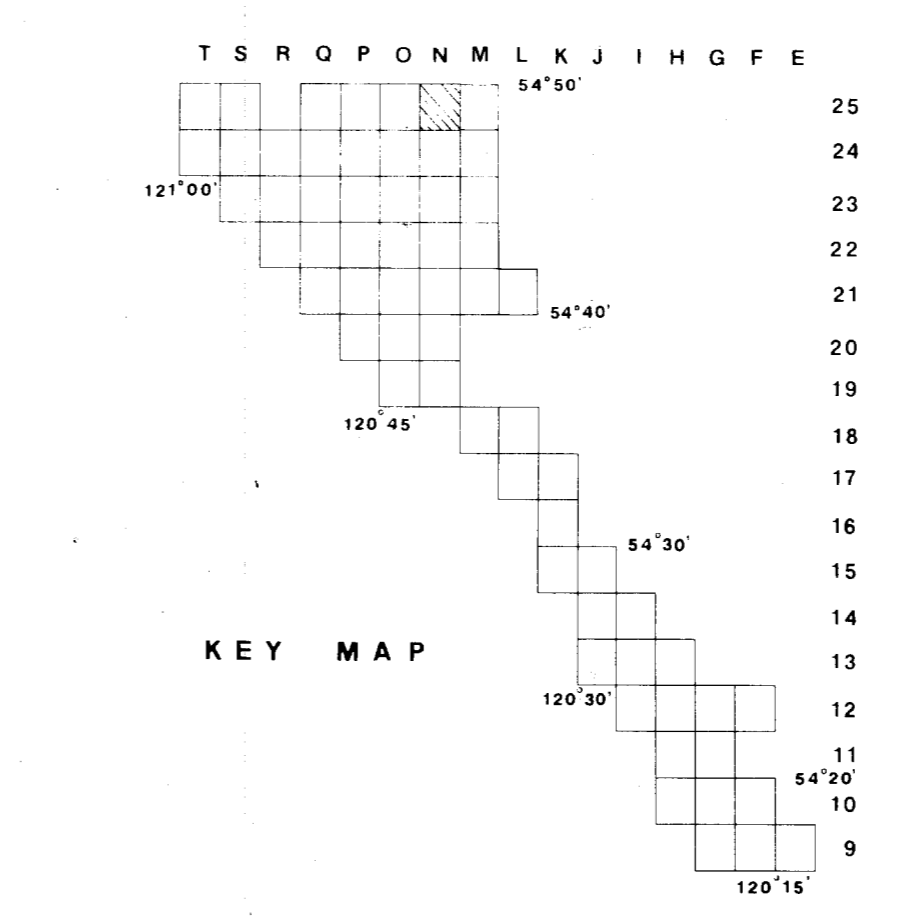
The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S., using conventional and EDM survey equipment. Horizontal and vertical co-ordinates and elevations are derived from Trip Stations Quintette S. Co-ordinate S.W. Marker, Hawk, Mania, Kinuso. All co-ordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trip leveling, vertical angles being read at both ends of each course simultaneously.

GEOLOGICAL LEGEND

LOWER CRETACEOUS	SHARTESBURY FM.	Fort St. John Group
Ksh		
Kcm(b)	COMMOTION FM. (Boulder Creek Member)	Bullhead Group
Kcm(h)	COMMOTION FM. (Hulcross Member)	
Kcm(g)	COMMOTION FM. (Gates Member)	Minnes Group
Kmb	MOOSEBAR FM. (u) upper	
	(l) lower	
Kgt	GETHING FM.	
Kcd	CADOMIN FM.	
JURASSIC-CRETACEOUS		
JKm	MINNES GROUP (undivided)	
PALEOZOIC		
P	DEVONIAN, MISSISSIPPIAN	

LITHOLOGIC LEGEND

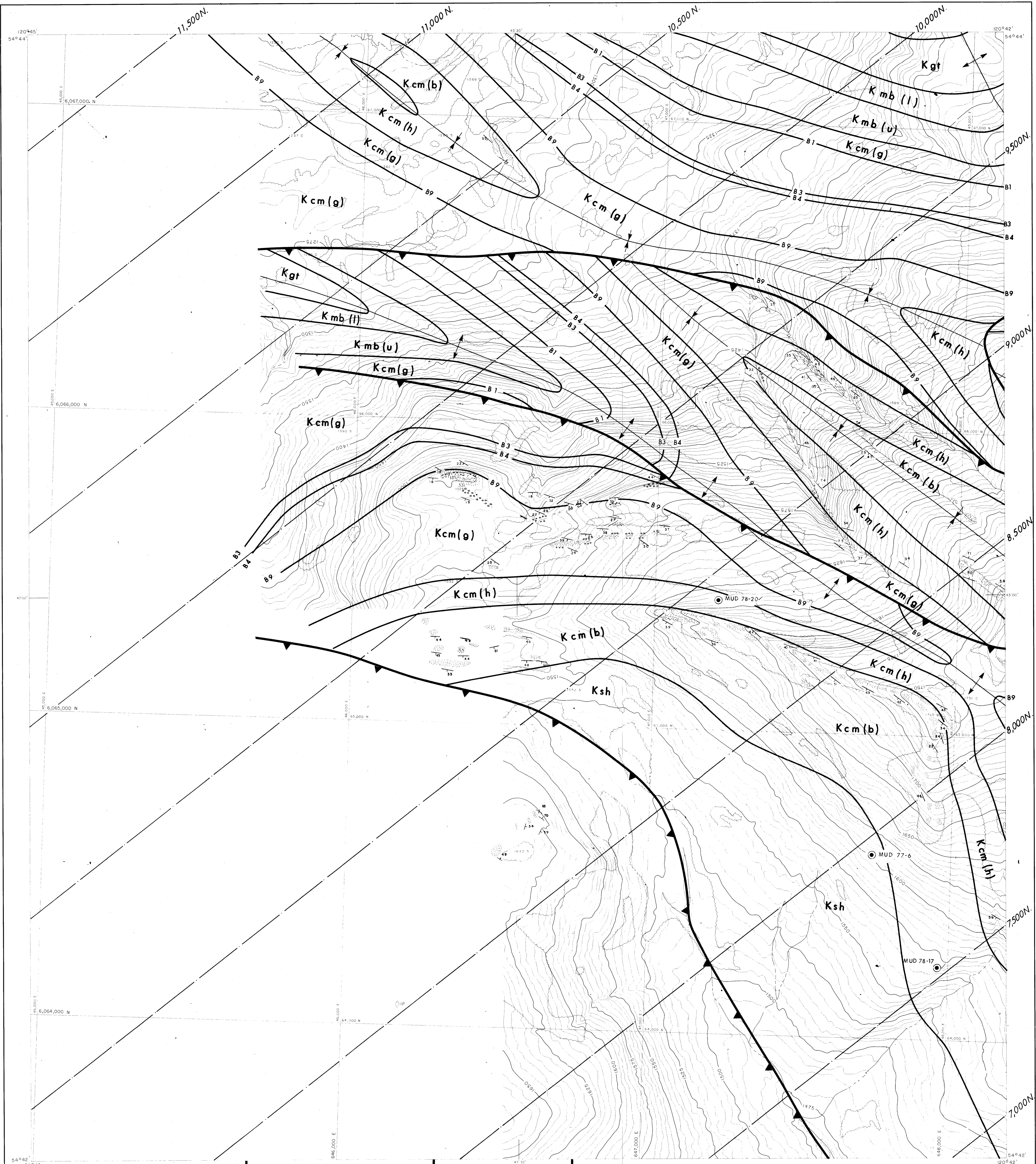
B1	COAL SEAM SUBCROP
—	GEOLOGICAL BOUNDARY
▲	THRUST FAULT - UPPER TRACE
▼	THRUST FAULT - LOWER TRACE
~	SYNCLINAL, ANTICLINAL AXIS
↖ ↗	DIP & STRIKE (Dipping, Vert., Horiz.)
⊙	DRILL HOLE LOCATION
—	TRENCH LOCATION
—	ADIT LOCATION
⊙	CONGLOMERATE
—	SANDSTONE
—	SILTSTONE
—	MUDSTONE
—	COAL



543

PR. QUINETTE-BELLEVILLE TR. (2) B.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date FEB. '79	Revised
Author G. J., A. B.	Drafted L. B.
QUINETTE GEOLOGY	
Scale 1:5,000	Sheet I.4-2
N 25	



LEGEND
 Improved road
 Secondary road
 Tracks on trail
 Cut line
 Tree area
 River
 Steam
 Intermittent stream
 Swamp
 Contours
 Horizontal control
 Vertical control
 Spot elevation
 Iron Pin

CONTOUR INTERVAL 5 METRES
 DATE OF PHOTOGRAPHY SEPTEMBER 1975
 DATE OF SURVEY APRIL 1977
 DATE OF MAPPING MAY 1977

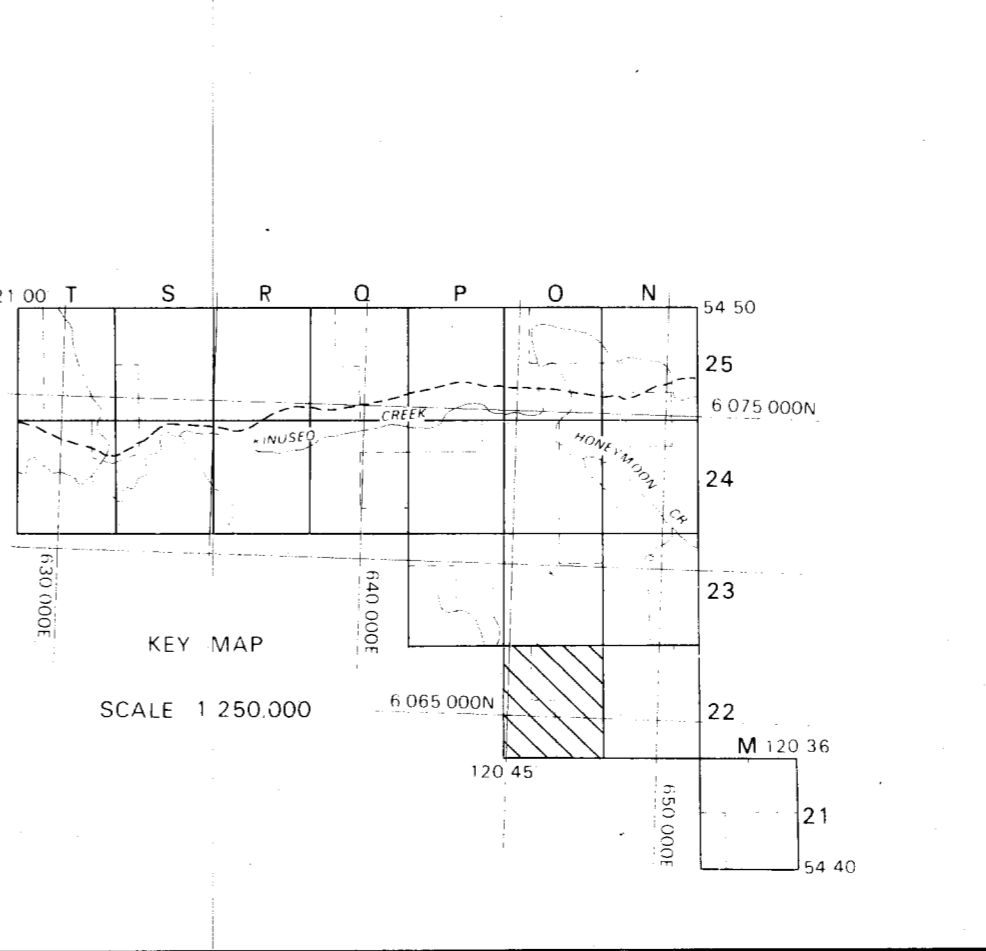
SURVEY NOTE
 The horizontal and vertical coordinates were established by D. W. Watson, B.C.L.S. using conventional and I.D.M. survey equipment. Horizontal and vertical coordinates and elevations are derived from Trig. Station Quarter E, Quarter S.W. Mine, Hawk, Malack, Kruuse. All coordinates referred to Universal Transverse Mercator Grid Zone 13. Elevations are above Mean Sea Level were established by trip leveling; vertical angles from that of both ends of each double simultaneous.

GEOLOGICAL LEGEND

LOWER CRETACEOUS	SHAFTESBURY FM.	FORT ST. JOHN GROUP
Kcm(b)	COMMOTION FM. (Boulder Creek Member)	
Kcm(h)	COMMOTION FM. (Hulcross Member)	
Kcm(g)	COMMOTION FM. (Gates Member)	
Kmb	MOOSEBAR FM. (u) upper	BULLHEAD GROUP
Kmb(l)	MOOSEBAR FM. (l) lower	
Kgt	GETHING FM.	
Kcd	CADOMIN FM.	MINNES GROUP
Jurassic-Cretaceous		
Jkm	MINNES GROUP (undivided)	
Paleozoic		
P	DEVONIAN, MISSISSIPPIAN	

LITHOLOGIC LEGEND

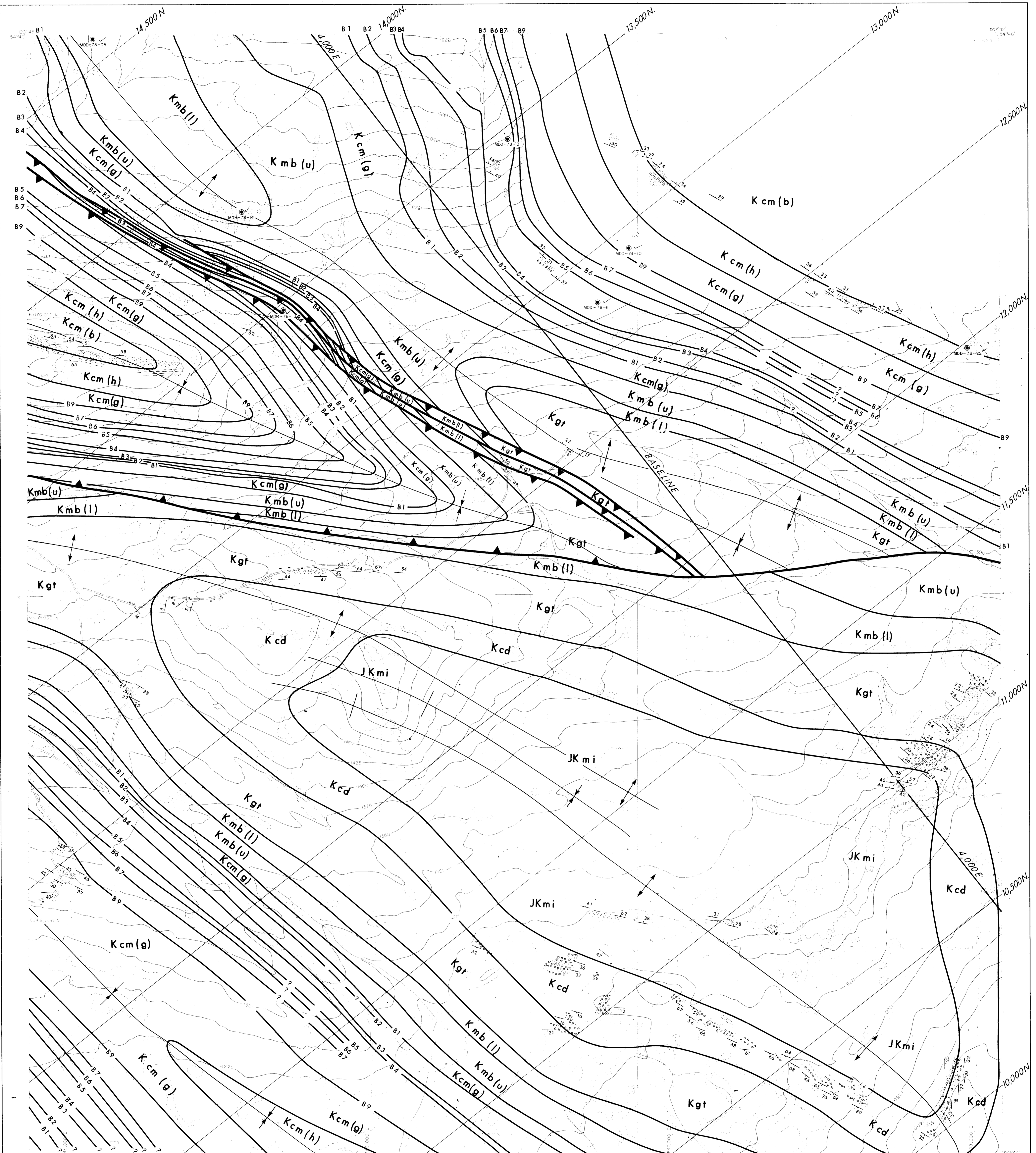
B1	COAL SEAM SUBCROP
Geological Boundary	GEOLOGICAL BOUNDARY
Thrust Fault - Upper Trace	THRUST FAULT - UPPER TRACE
Thrust Fault - Lower Trace	THRUST FAULT - LOWER TRACE
Synclinal, Anticlinal Axis	SYNCLINAL, ANTICLINAL AXIS
Dip & Strike (Dipping, Vert., Horiz.)	DIP & STRIKE (Dipping, Vert., Horiz.)
Drill Hole Location	DRILL HOLE LOCATION
Trench Location	TRENCH LOCATION
Adit Location	ADIT LOCATION
Conglomerate	CONGLOMERATE
Sandstone	SANDSTONE
Siltstone	SILTSTONE
Mudstone	MUDSTONE
Coal	COAL



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RR DONKOH BELCOURT 7(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date MAR. '79	Revised
Author G. J. A. B.	Drafted J. W. K.
Scale 1:5,000	Drawing II 4-2
DUCHESS MOUNTAIN GEOLOGY	
O 22	



LEGEND

Improved road
Secondary road
Track and trail
Fence line
Dike area
River
Stream
Intermittent stream
Sewer
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pit

CONTOUR INTERVAL: 5 METRES
DATE OF SURVEY: APRIL 1977
DATE OF PHOTOGRAPHY: SEPTEMBER 1976
DATE OF MAPPING: MAY 1977

SURVEY NOTE

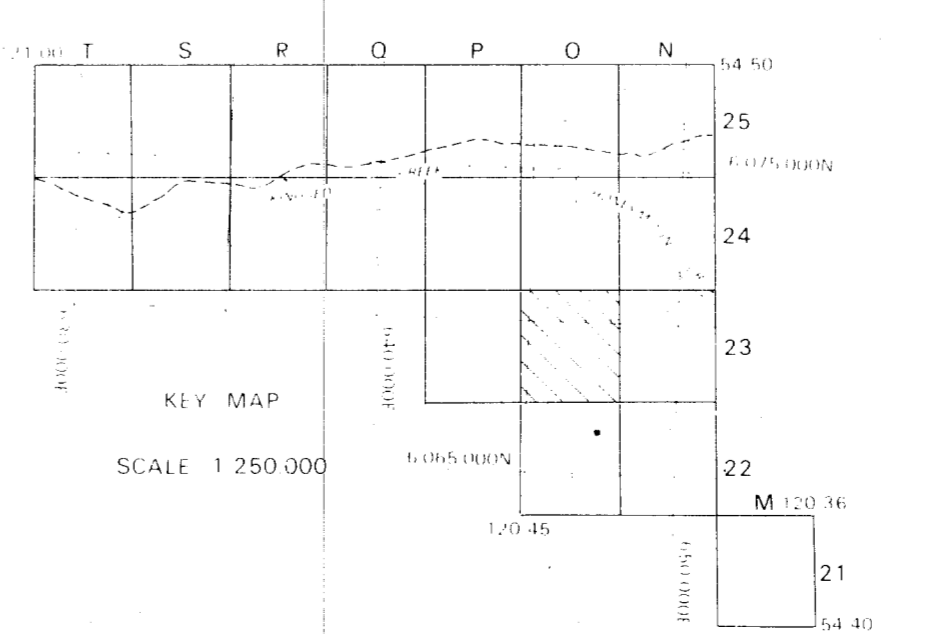
1. The contours on this map were established by D.W. Wilson, B.C.E.S., using conventional and trigonometric methods. The spot elevations were obtained from a survey conducted by J. Williams, B.C.E.S., in 1976. The map is a reproduction of a map prepared by the author for the purpose of this project. The author is not responsible for any errors or omissions in this map.

GEOLOGICAL LEGEND

LOWER CRETACEOUS	JURASSIC - CRETACEOUS
Ksh SHAFTESBURY FM.	JKmi MINNES GROUP (undivided)
Kcm(b) COMMOTION FM. (Boulder Creek Member)	P DEVONIAN, MISSISSIPPIAN
Kcm(h) COMMOTION FM. (Hulcross Member)	
Kcm(g) COMMOTION FM. (Gates Member)	
Kmb MOOSEBAR FM. (u) upper	
Kmb MOOSEBAR FM. (l) lower	
Kgt GETHING FM.	
Kcd CADOMIN FM.	

LITHOLOGIC LEGEND

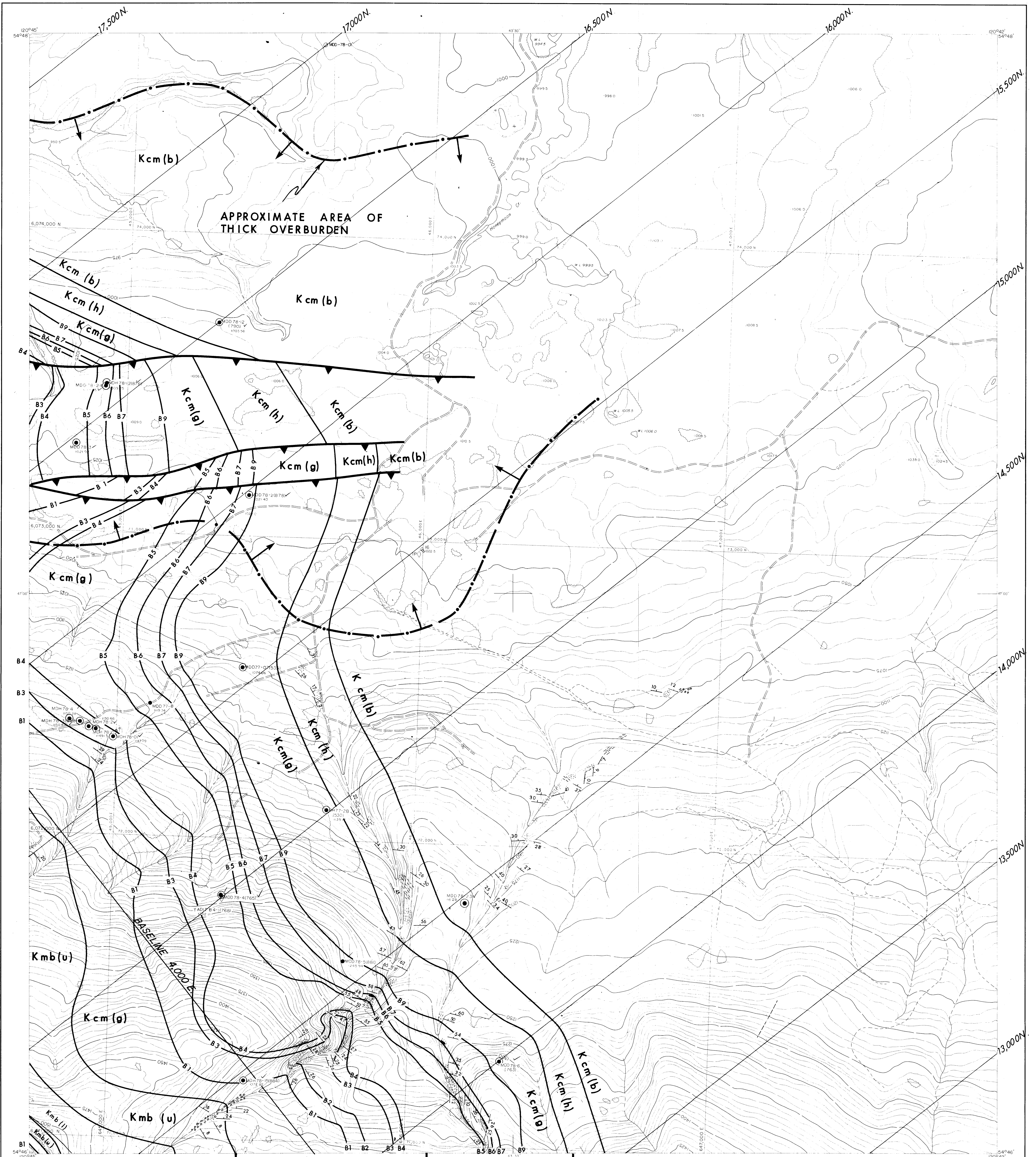
—B1— COAL SEAM SUBCROP	— SANDSTONE
— GEOLOGICAL BOUNDARY	— SILTSTONE
— THRUST FAULT - UPPER TRACE	— MUDSTONE
— THRUST FAULT - LOWER TRACE	— COAL
— SYNCLINAL, ANTICLINAL AXIS	
— DIP & STRIKE (Dipping, Vert., Horiz.)	
— DRILL HOLE LOCATION	
— TRENCH LOCATION	
— ADIT LOCATION	
— CONGLOMERATE	



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PR. DANKRAN-BELLEVUE 71(2)A

PACIFIC 66	PACIFIC 66
PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date: MAR. '79	Revised:
Author: G.J., A.B.	Drafted: J.W.K.
DUCHESS & DUKE MOUNTAIN GEOLOGY	
Scale: 1:5,000	Drawing II.4-2
O 23	



LEGEND

Improved road
Secondary road
Track or trail
Cut line
Tree area
River
Stream
Intermittent stream
Swamp
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pin

CONTOUR INTERVAL: 5 METRES
DATE OF PHOTOGRAPHY: SEPTEMBER 1975

DATE OF SURVEY: 1977-1978
DATE OF MAPPING: 1977-1978

SURVEY NOTE

The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S. using conventional and C.M. survey equipment. Horizontal and vertical co-ordinates and elevations are derived from Trip Stations Quinlan & Quinlan S.W. Main & Main Mine. All co-ordinates referred to Universal Traverse Meridian Grid Zone 10. Elevations are above Mean Sea Level were established by trip leveling vertical angles level road at both ends of each course simultaneously.

GEOLOGICAL LEGEND

LOWER CRETACEOUS

Ksh SHAFESBURY FM.
Kcm(b) COMMOTION FM. (Boulder Creek Member)
Kcm(h) COMMOTION FM. (Hulcross Member)
Kcm(g) COMMOTION FM. (Gates Member)
Kmb MOOSEBAR FM. (u) upper (l) lower
Kgf GETHING FM.
Kcd CADOMIN FM.

JURASSIC-CRETACEOUS

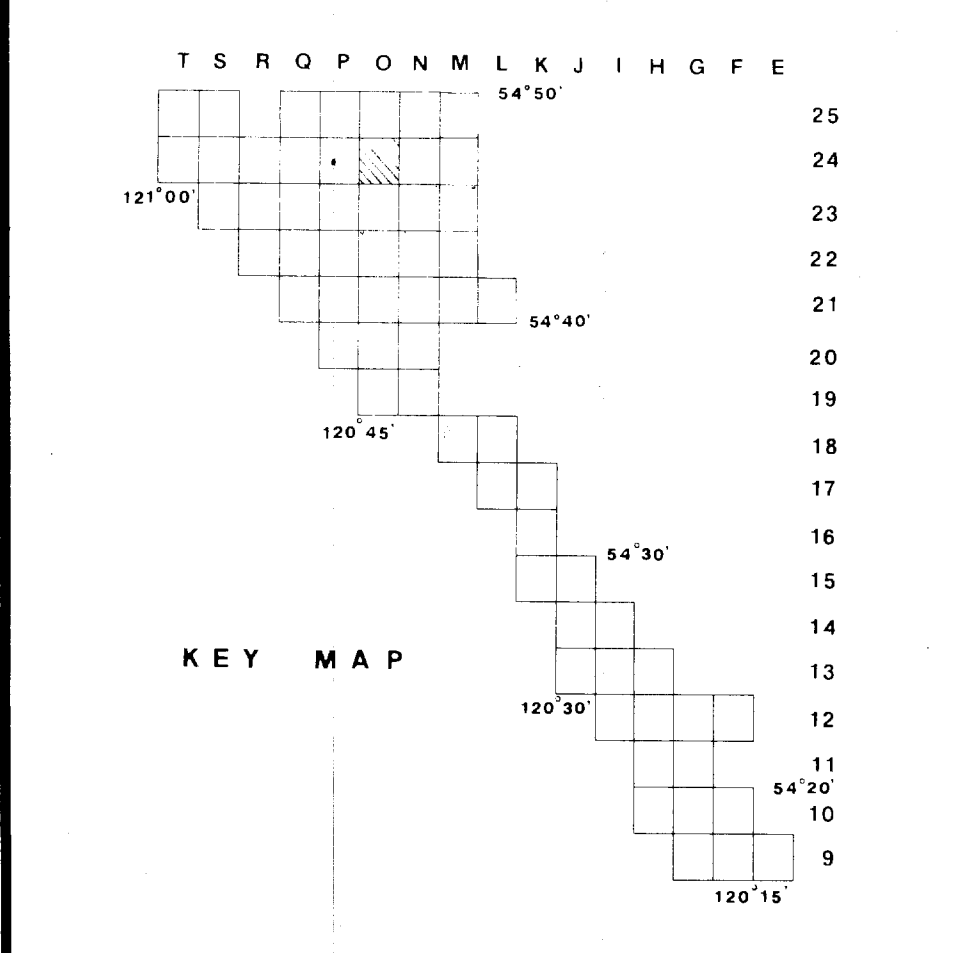
JKm1 MINNES GROUP (undivided)

PALEOZOIC

P DEVONIAN, MISSISSIPPIAN

LITHOLOGIC LEGEND

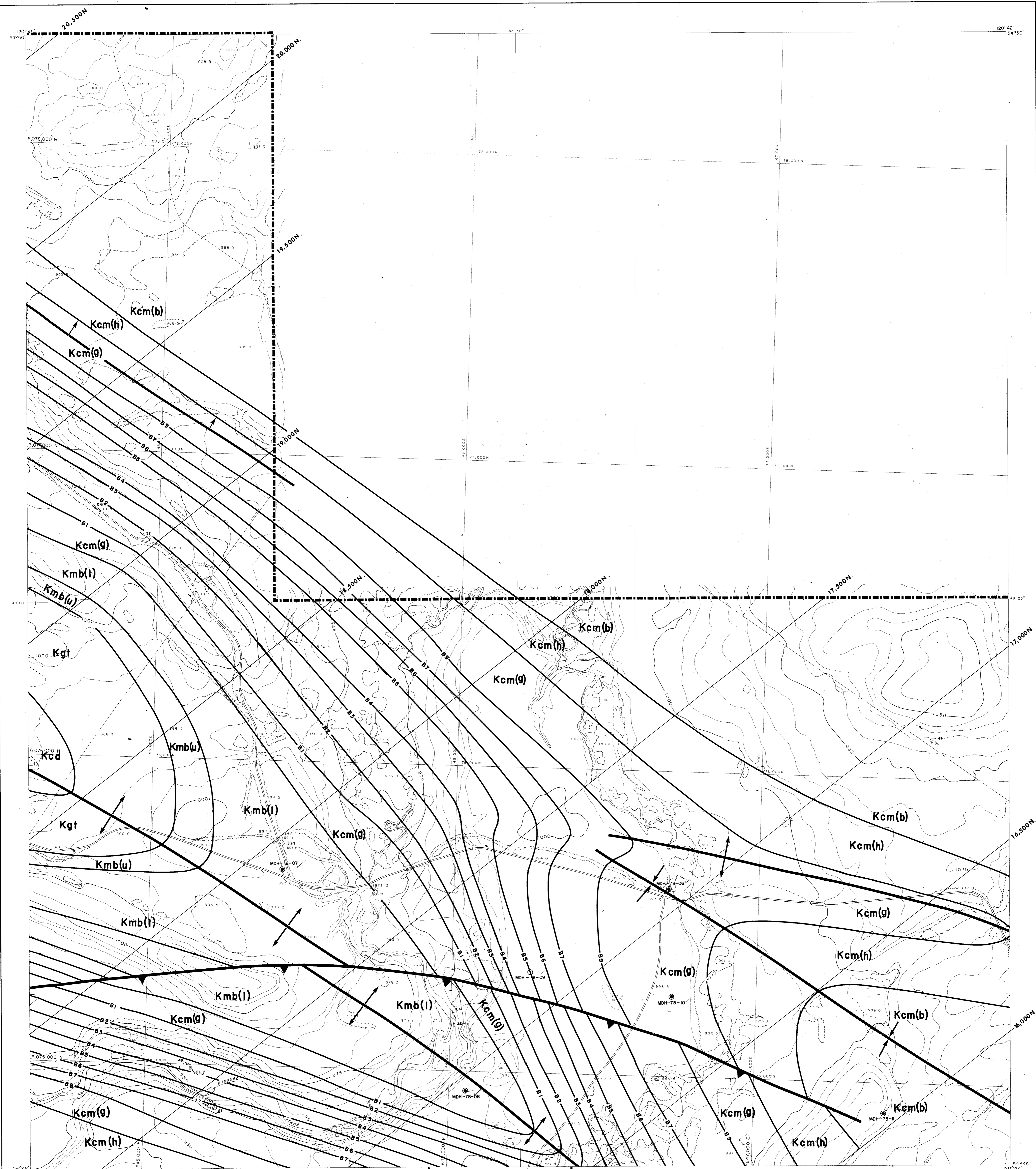
—B1— COAL SEAM SUBCROP
— GEOLOGICAL BOUNDARY
— THRUST FAULT - UPPER TRACE
— THRUST FAULT - LOWER TRACE
— SYNCLINAL, ANTICLINAL AXIS
DIP & STRIKE (Dipping, Vert., Horiz.)
● DRILL HOLE LOCATION
— TRENCH LOCATION
— ADIT LOCATION
— CONGLOMERATE
— SANDSTONE
— SILTSTONE
— MUDSTONE
— COAL



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PR- DUNSMuir BELLCOURT 78(e) A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date MAR. '79
DUKE MOUNTAIN GEOLOGY	
Revised Author G. J., A.B. Drafted J. W. K. Scale 1:5,000 Drawing II.4-2	O 24



LEGEND

Improved road
Secondary road
Track or trail
Cut line
Tree area
River
Stream
Intermittent stream
Swamp
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF SURVEY APRIL 1977
DATE OF PHOTOGRAPHY SEPTEMBER 1975
DATE OF MAPPING MAY 1977

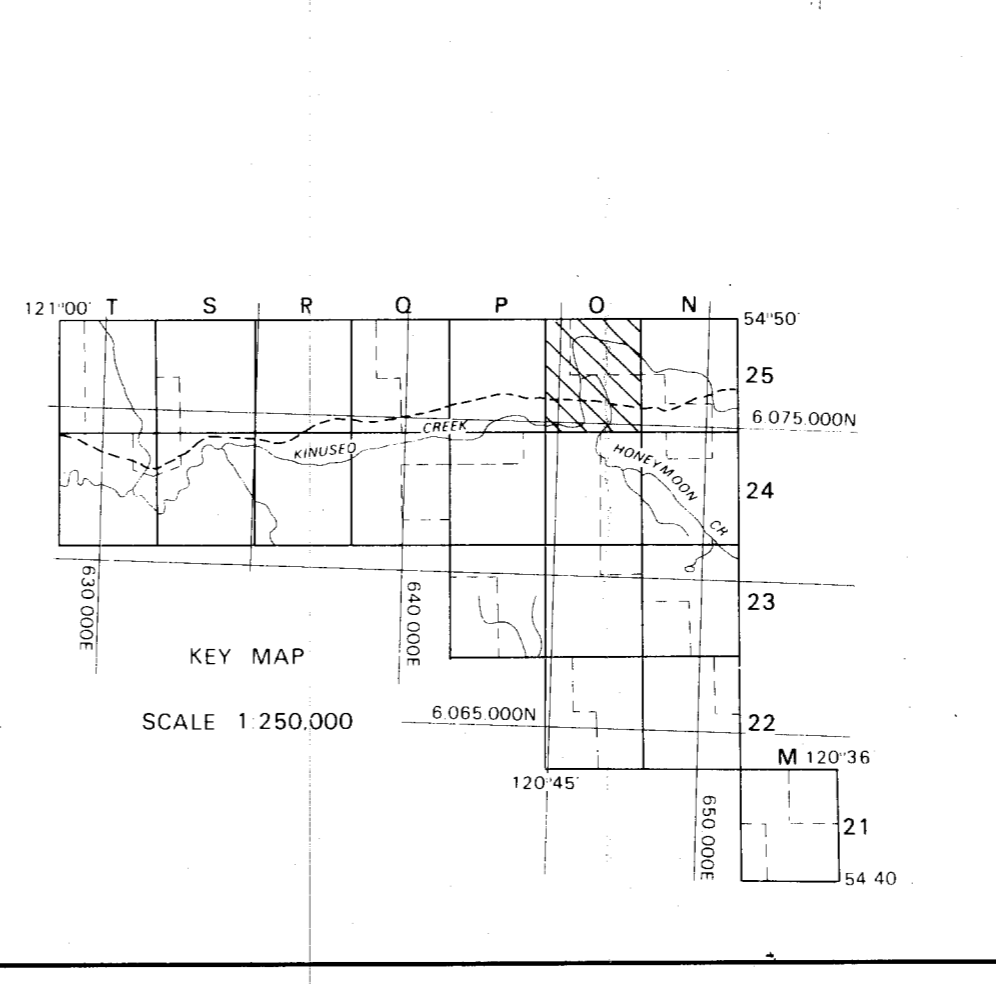
SURVEY NOTE
The Horizontal and Vertical Coordinates were established by D. W. Watson B.C.L.S. using conventional and E.D.M. survey equipment. Horizontal and vertical coordinates and elevations are derived from Trig Stations Quintette S.W. Main, Hawk, Marica, Kincora. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling, vertical angles were read at both ends of each course simultaneously.

GEOLOGICAL LEGEND

LOWER CRETACEOUS	SHAFTESBURY FM.	FORT ST. JOHN GROUP
COMMOTION FM. (Boulder Creek Member)		
COMMOTION FM. (Hulcross Member)		
COMMOTION FM. (Gates Member)		
MOOSEBAR FM. (u) upper		
MOOSEBAR FM. (l) lower		
GETHING FM.		
CADOMIN FM.		
JURASSIC-CRETACEOUS		
MINNES GROUP (undivided)		
PALEOZOIC		
DEVONIAN, MISSISSIPPIAN		

LITHOLOGIC LEGEND

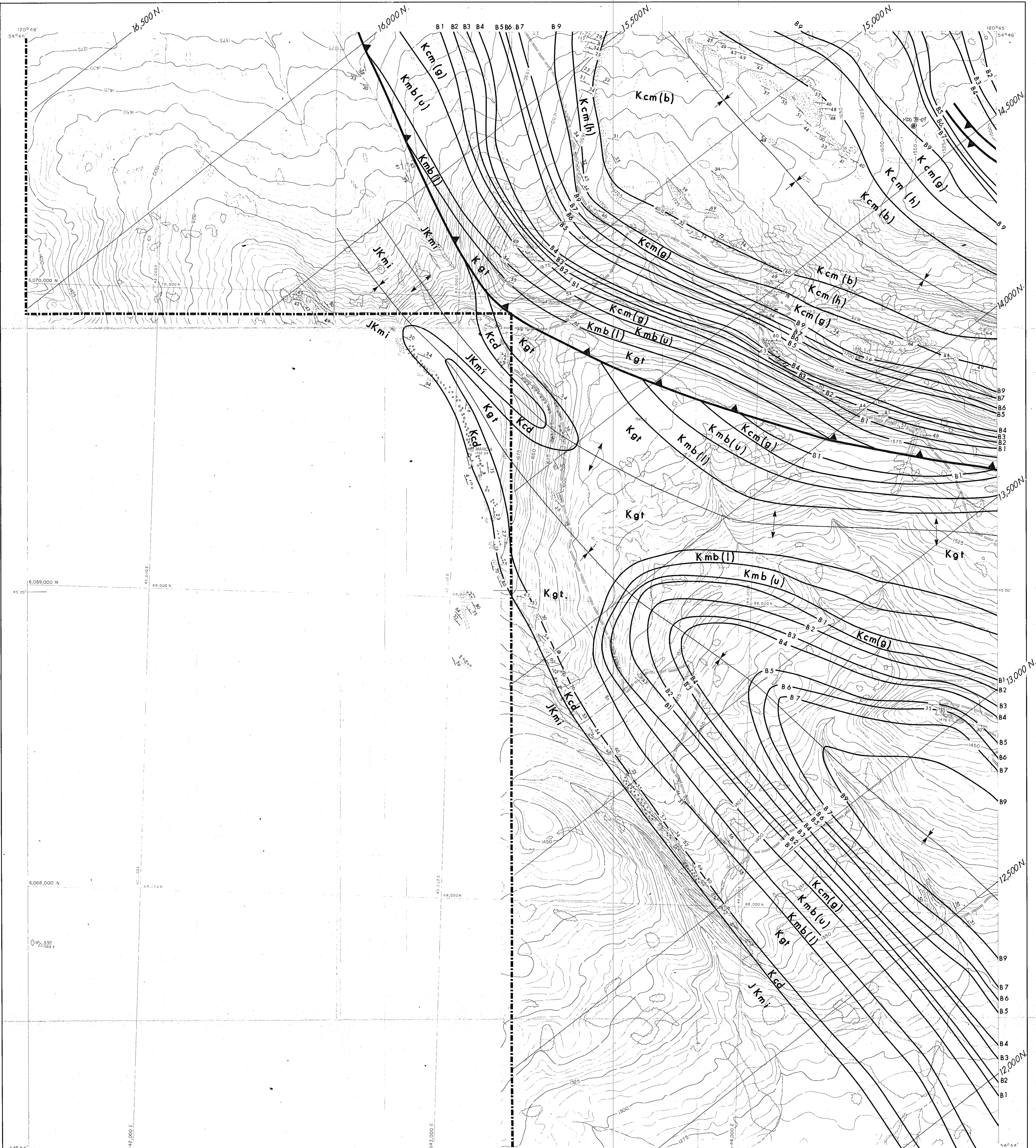
COAL SEAM SUBCROP	
GEOLOGICAL BOUNDARY	
THRUST FAULT - UPPER TRACE	
THRUST FAULT - LOWER TRACE	
SYNCLINAL, ANTICLINAL AXIS	
DIP & STRIKE (Dipping, Vert., Horiz.)	
DRILL HOLE LOCATION	
TRENCH LOCATION	
ADIT LOCATION	
CONGLOMERATE	
SANDSTONE	
SILTSTONE	
MUDSTONE	
COAL	



543

PK - MONKMAN - BELLEVUE 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date FEB. '79
QUINTETTE GEOLOGY	Revised
	Author G.J. A.B.
	Drafted L.B.
	Scale 1:5,000
	II.4-2
	O 25



LEGEND

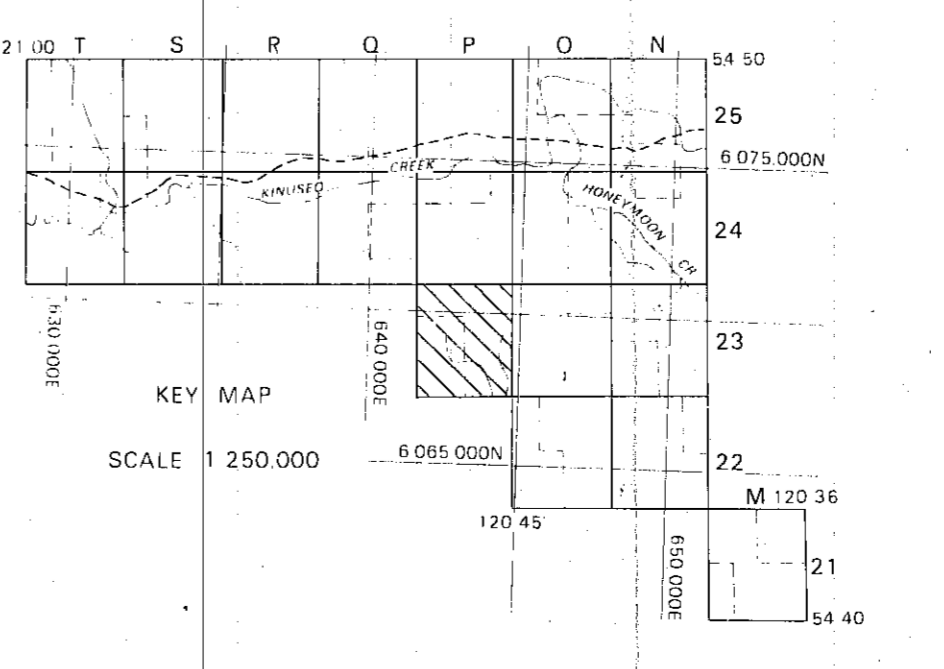
Improved road
Secondary road
Track or trail
Cut line
Tree area
River
Stream
Intermittent stream
Swamp
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pin

CONTOUR INTERVAL: 5 METRES
DATE OF PHOTOGRAPHY: SEPTEMBER 1975
DATE OF SURVEY: APRIL 1977
DATE OF MAPPING: MAY 1977

SURVEY NOTE
The Horizontal and Vertical Control points were established by D. W. Wilson, R.C.I.S. using conventional and I.D.M. survey methods. Horizontal and vertical coordinates and elevations are derived from Trig. Station D-10-11, Quarter 5 W. Mining. Plans. Main a. Group. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level. All readings were established by the leveling party at both ends of each course simultaneously.

LOWER CRETACEOUS		FORT ST. JOHN GROUP
Ksh	SHAFESBURY FM.	
Kcm(b)	COMMOTION FM. (Boulder Creek Member)	
Kcm(h)	COMMOTION FM. (Hulcross Member)	
Kcm(g)	COMMOTION FM. (Gates Member)	
Kmb	MOOSEBAR FM. (u) upper lower	
Kgt	GETHING FM.	
Kcd	CADOMIN FM.	
JURASSIC-CRETACEOUS		BULLHEAD GROUP
JKmi	MINNES GROUP (undivided)	
PALEOZOIC		WILFRIES GROUP
P	DEVONIAN, MISSISSIPPIAN	

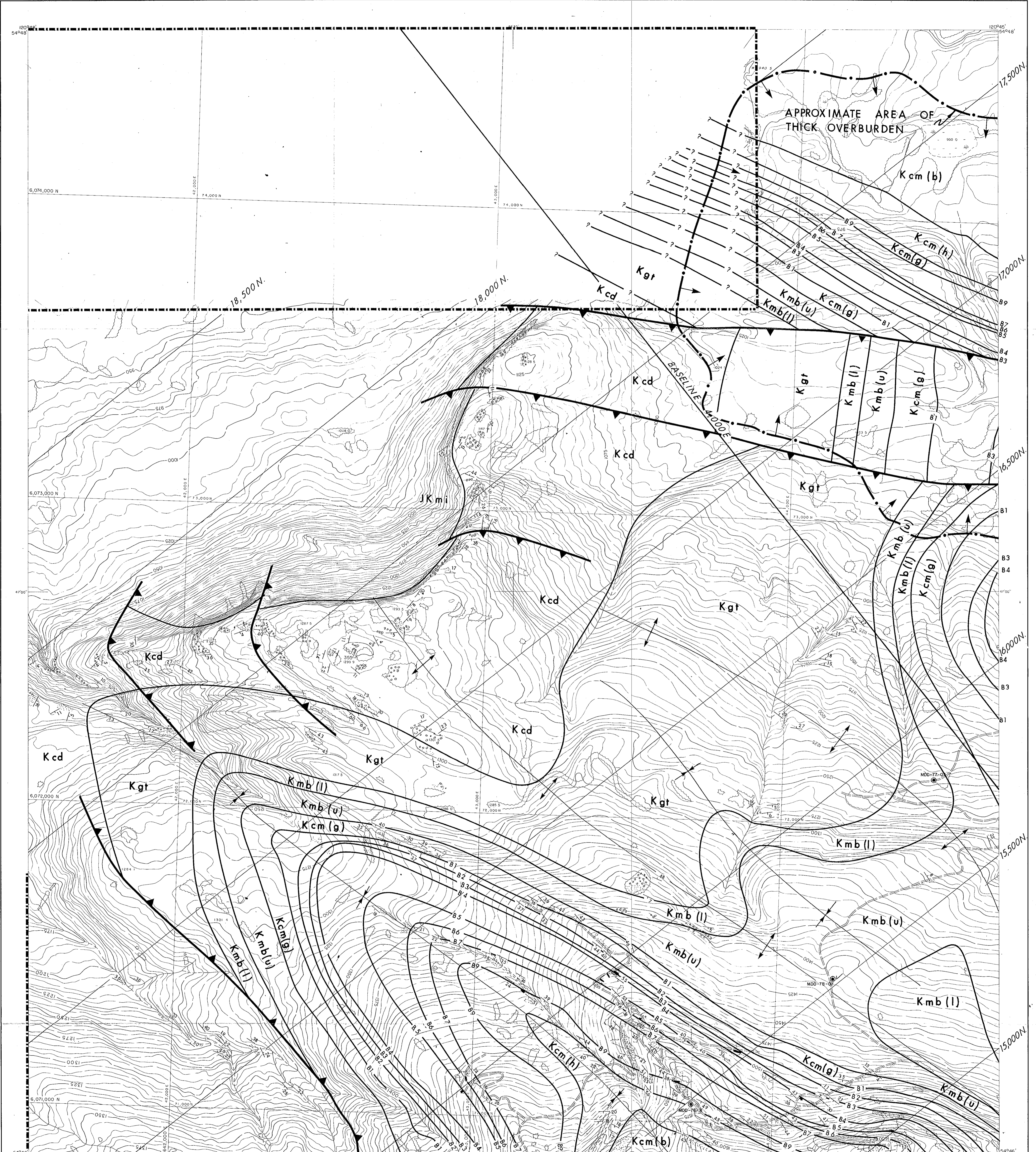
LITHOLOGIC LEGEND	
B1	COAL SEAM SUBCROP
—	GEOLOGICAL BOUNDARY
—	THRUST FAULT - UPPER TRACE
—	THRUST FAULT - LOWER TRACE
—	SYNCLINAL, ANTICLINAL AXIS
⊙	DIP & STRIKE (Dipping, Vert., Horiz.)
⊙	DRILL HOLE LOCATION
⊙	TRENCH LOCATION
⊙	ADIT LOCATION
⊙	CONGLOMERATE
⊙	SANDSTONE
⊙	SILTSTONE
⊙	MUDSTONE
⊙	COAL



543

PL. MONKMAN RECONSTRUCT 7E (2) A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date: MAR. '79	Revised:
Author: G.J., A.B.	Drafted: J.W.K.
Scale: 1:5,000	Drawing: II.4-2
DUKE MOUNTAIN GEOLOGY	
P 23	



LEGEND

Improved road
Secondary road
Track or trail
Cut line
Tide area
River
Stream
Intermittent stream
Swamp
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHY SEPTEMBER 1975
DATE OF SURVEY APRIL 1977
DATE OF MAPPING MAY 1977

SURVEY NOTE
The Horizontal and Vertical Coordinates were established by D. W. Watson, B.C.L.S. using conventional and EDM survey equipment. Horizontal and vertical coordinates and elevations are derived from Trip Station D-10, Quarter 3 W. Main, Hava, Marco, Kinross. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level as established by trig leveling, vertical angles being read at both ends of each course simultaneously.

GEOLOGICAL LEGEND

LOWER CRETACEOUS

- Ksh SHAFFESBURY FM.
- Kmb(b) COMMOCTION FM. (Boulder Creek Member)
- Kmb(h) COMMOCTION FM. (Hulcross Member)
- Kmb(g) COMMOCTION FM. (Gates Member)
- Kmb(u) MOOSEBAR FM. (upper/lower)
- Kgt GETHING FM.
- Kcd CADOMIN FM.

JURASSIC - CRETACEOUS

- JKmi MINNES GROUP (undivided)

PALEOZOIC

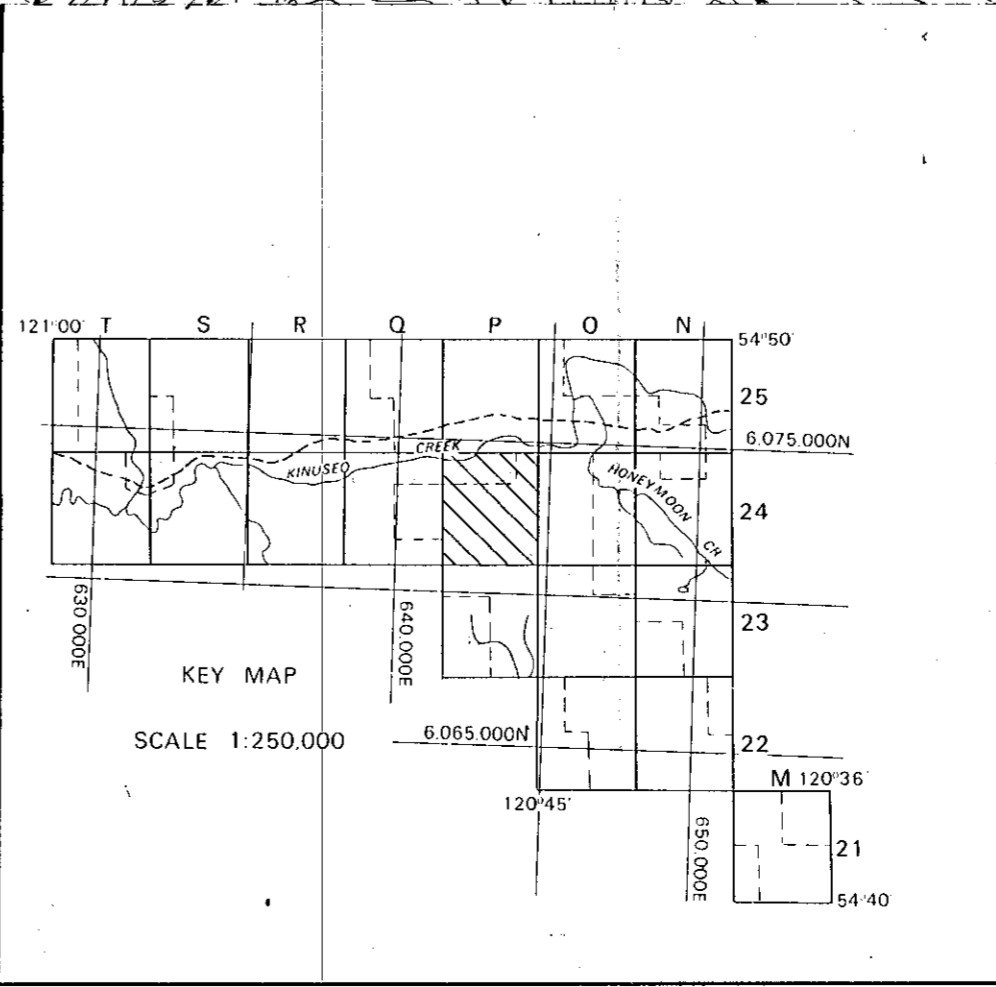
- P DEVONIAN, MISSISSIPPIAN

FORT ST. JOHN GROUP

- BULLHEAD GROUP
- MINNES GROUP

LITHOLOGIC LEGEND

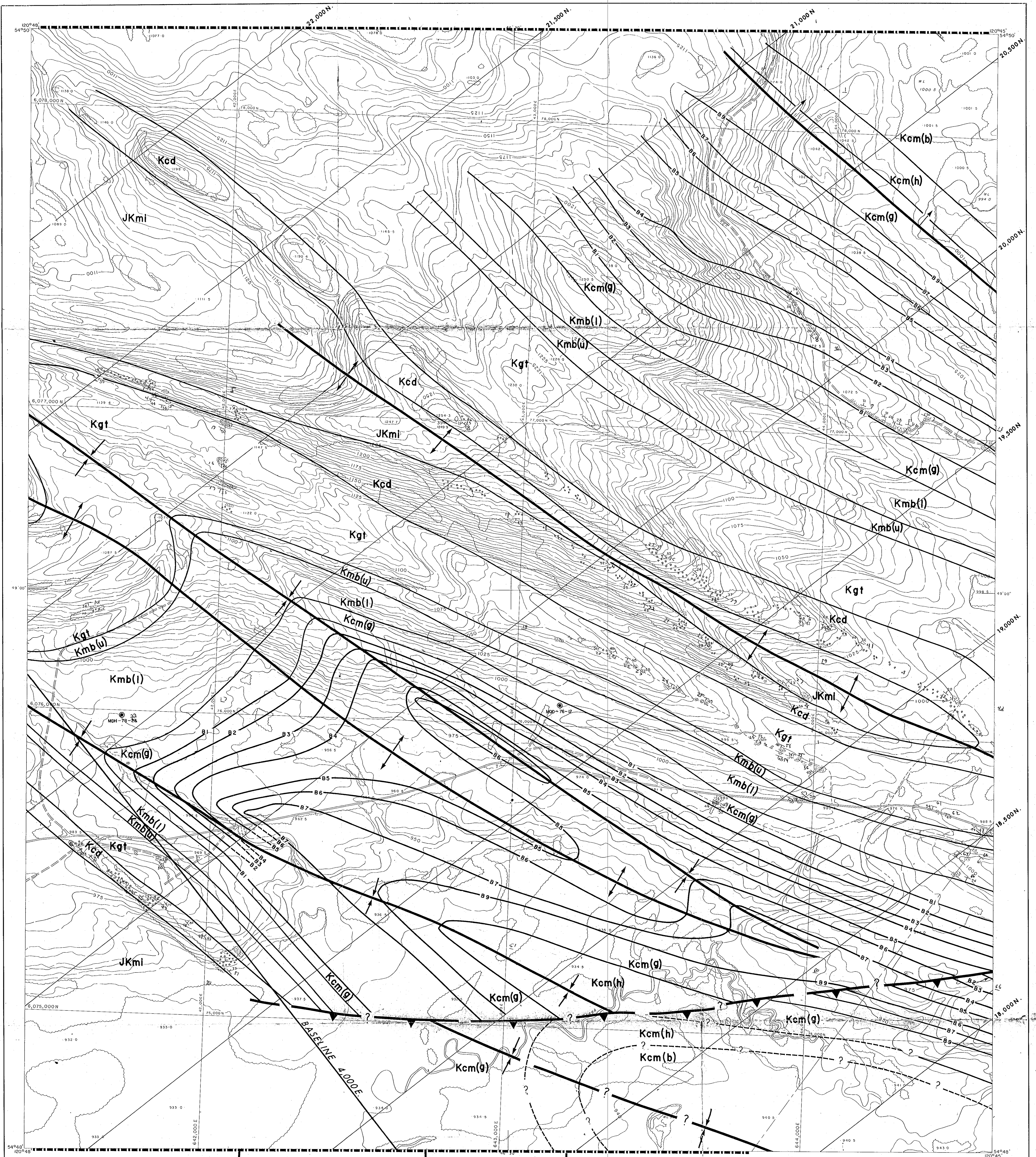
- B1— COAL SEAM SUBCROP
- GEOLOGICAL BOUNDARY
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- SYNCLINAL, ANTICLINAL AXIS
- DIP & STRIKE (Dipping, Vert., Horiz.)
- DRILL HOLE LOCATION
- TRENCH LOCATION
- ADIT LOCATION
- CONGLOMERATE
- SANDSTONE
- SILTSTONE
- MUDSTONE
- COAL



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12 - DANKOON BALBOAT 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MOUNTAIN GEOLOGY	
Date MAR. '79	Revised
Author G. J., A. B.	Drafted J. W. K.
Scale 1:5,000	
Drawing II.4-2	
P 24	



GEOLOGICAL LEGEND

- LOWER CRETACEOUS**
- Ksh** SHAFESBURY FM.
 - Kcm(b)** COMMOYON FM. (Boulder Creek Member)
 - Kcm(h)** COMMOYON FM. (Hulcross Member)
 - Kcm(g)** COMMOYON FM. (Gates Member)
 - Kmb** MOOSEBAR FM. (u) upper (l) lower
 - Kgt** GETHING FM.
 - Kcd** CADOMIN FM.
- JURASSIC-CRETACEOUS**
- JKmi** MINNES GROUP (undivided)
- PALEOZOIC**
- P** DEVONIAN, MISSISSIPPIAN

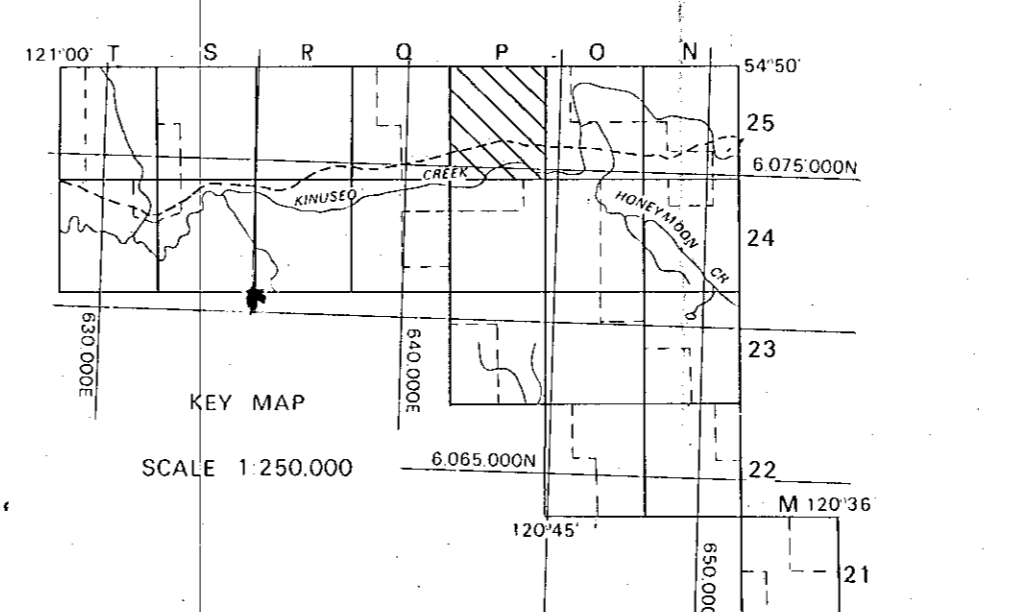
LITHOLOGIC LEGEND

- B1** COAL SEAM SUBCROP
- GEOLOGICAL BOUNDARY
- ▲ THRUST FAULT - UPPER TRACE
- ▼ THRUST FAULT - LOWER TRACE
- ~ SYNCLINAL, ANTICLINAL AXIS
- ↖ ↗ DIP & STRIKE (Dipping Vert., Horiz.)
- DRILL HOLE LOCATION
- TRENCH LOCATION
- ADIT LOCATION
- CONGLOMERATE
- SANDSTONE
- SILTSTONE
- MUDSTONE
- COAL

- LEGEND**
- Improved road
 - Secondary road
 - Track or trail
 - Cut line
 - Tree area
 - River
 - Intermittent stream
 - Swamp
 - Contours
 - Horizontal control
 - Vertical control
 - Spot elevation
 - Iron Pin

CONTOUR INTERVAL 5 METRES DATE OF SURVEY: APRIL 1977
 DATE OF PHOTOGRAPHY SEPTEMBER 1975 DATE OF MAPPING: MAY 1977

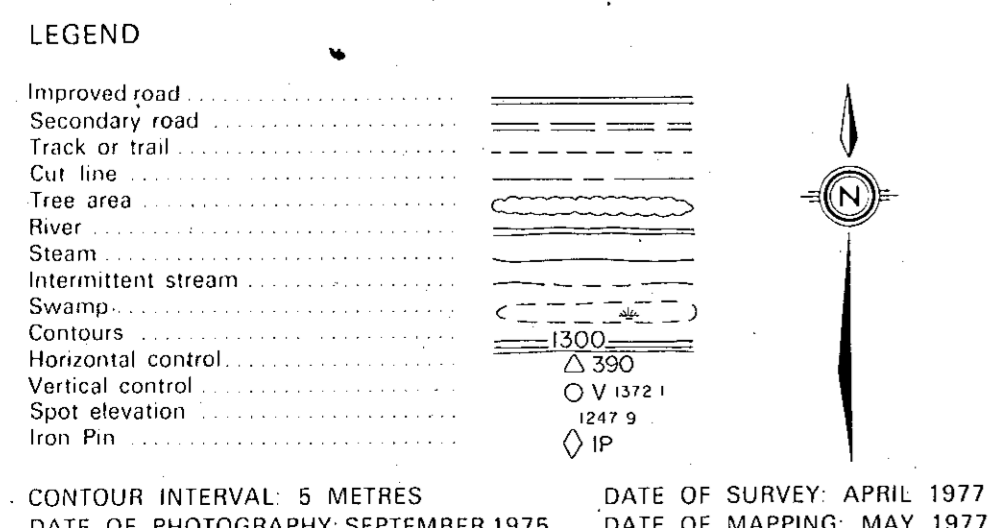
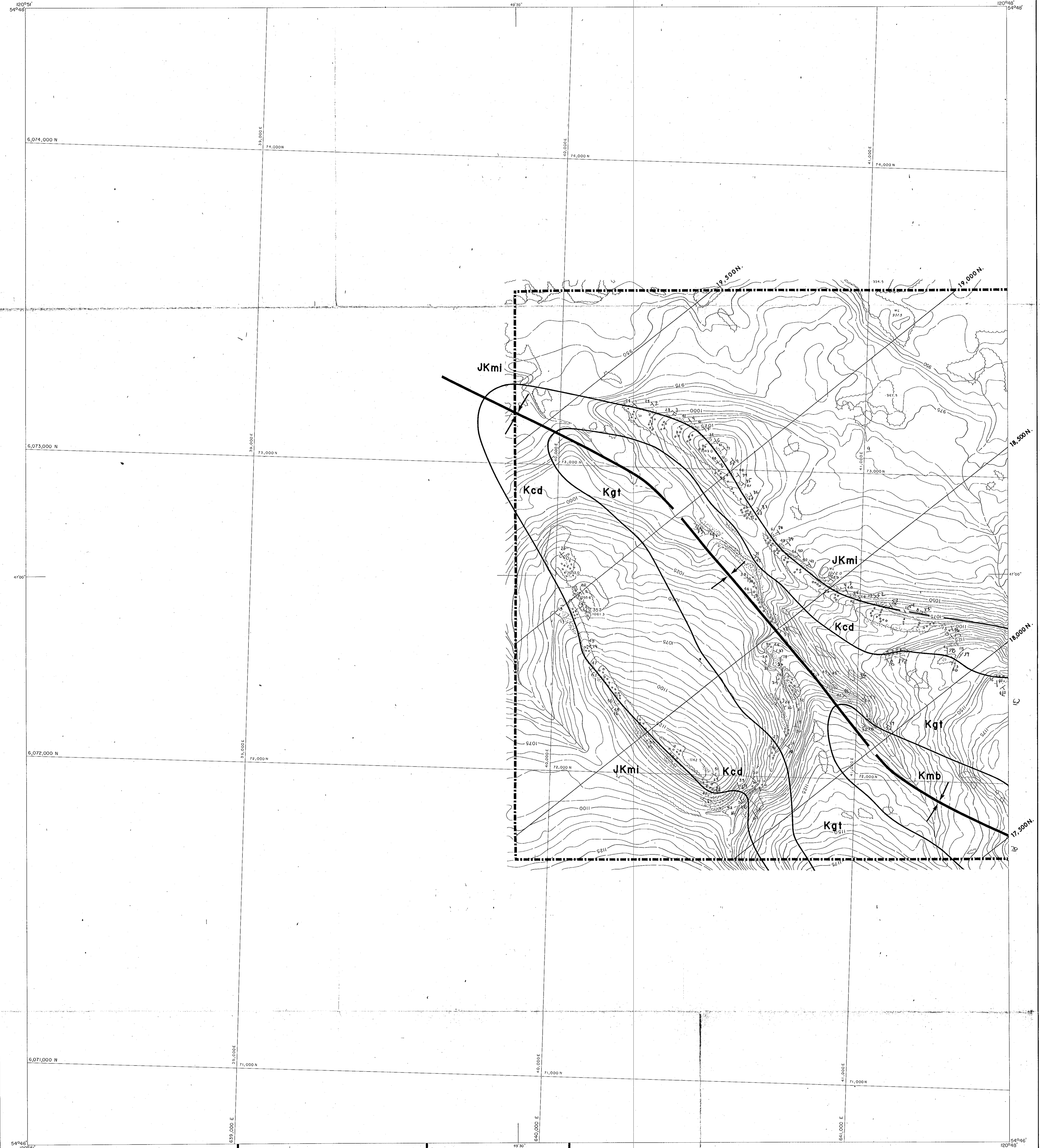
SURVEY NOTE
 The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S. using conventional and EDM survey equipment. Horizontal and vertical co-ordinates and elevations are derived from Trig. Stations Quinette E, Quinette SW, Minne, Hawk, Hullo, Kinross. All co-ordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig. leveling; vertical angles were read at both ends of each course simultaneously.



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12 MONKMAN BELLEVUE TR (2) A.

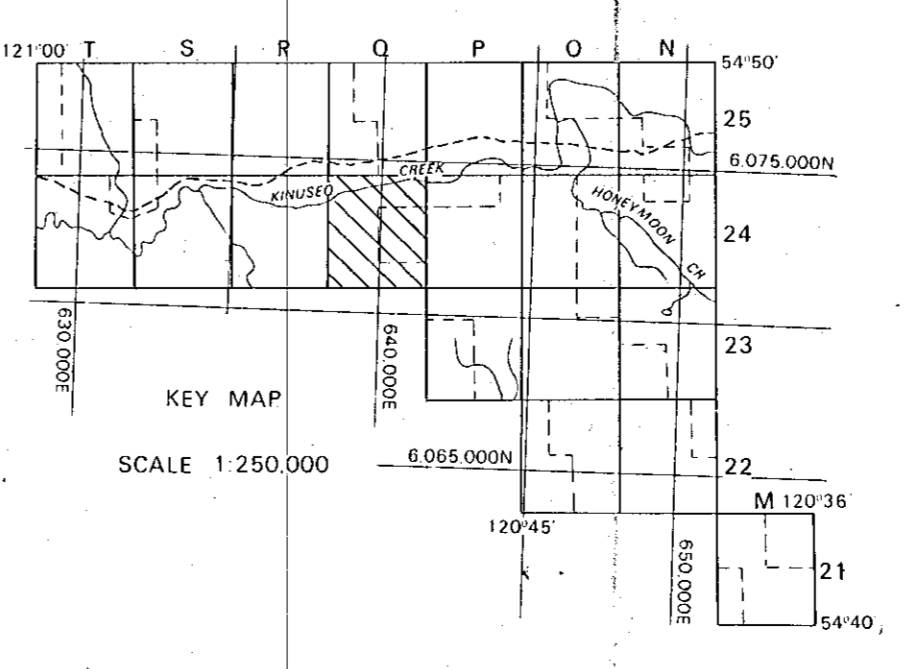
PACIFIC PACIFIC PACIFIC	
PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date	
Revised	
Author	
Drafted	
Scale	1:5,000
QUINETTE GEOLOGY	
II-4-2	
P 25	



CONTOUR INTERVAL 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: APRIL 1977
 DATE OF MAPPING: MAY 1977

LOWER CRETACEOUS	
Ksh	SHAFESBURY FM.
Kcmbl	COMMOTION FM. (Boulder Creek Member)
Kcmh	COMMOTION FM. (Hulcross Member)
Kcmg	COMMOTION FM. (Gates Member)
Kmb	MOOSEBAR FM. (upper/lower)
Kgt	GETHING FM.
Kcd	CADOMIN FM.
JURASSIC - CRETACEOUS	
JKmi	MINNES GROUP (undivided)
PALEOZOIC	
P	DEVONIAN/MISSISSIPPIAN

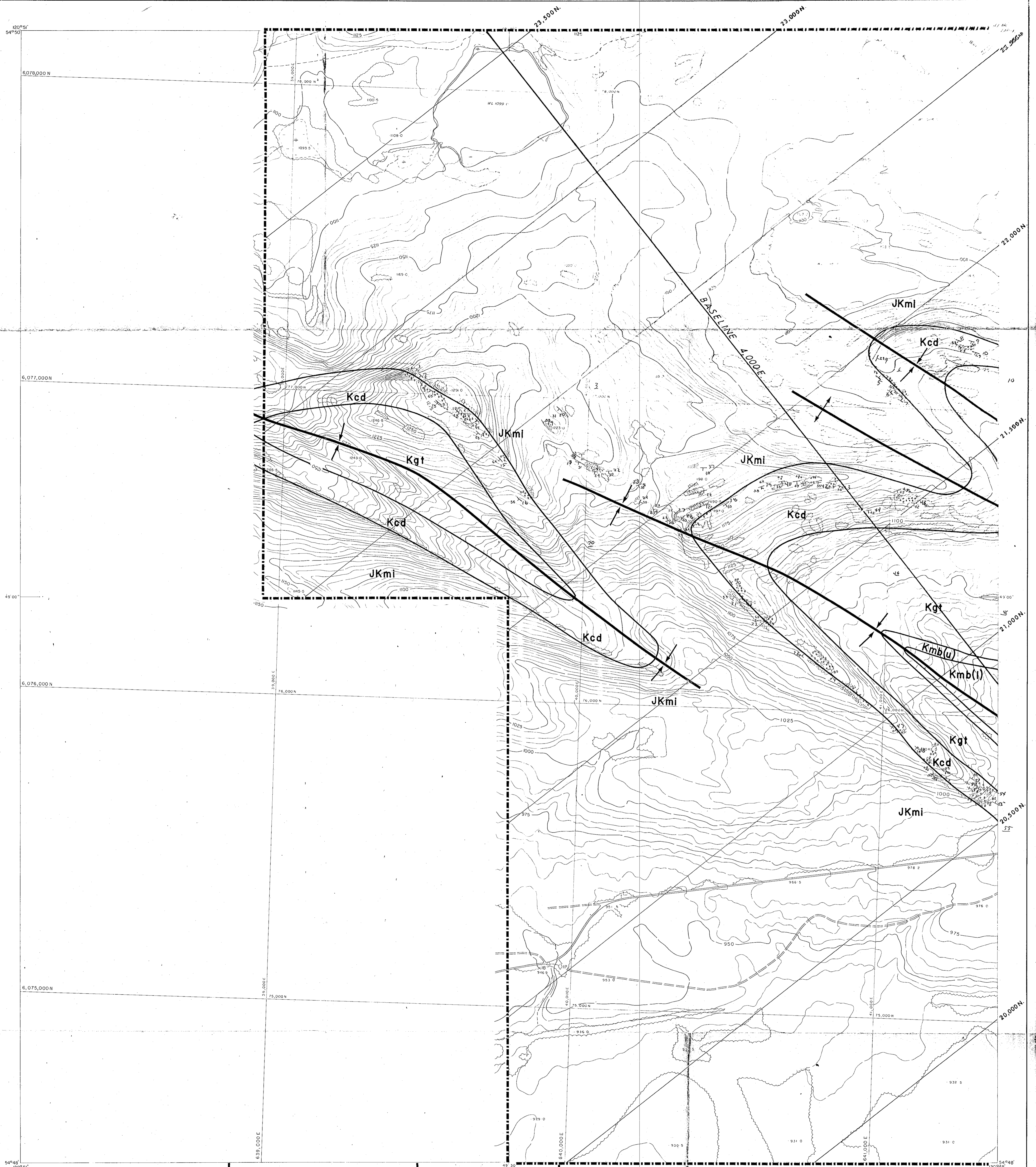
LITHOLOGIC LEGEND	
—|—	COAL SEAM SUBCROP
—|—	GEOLOGICAL BOUNDARY
—|—	THRUST FAULT - UPPER TRACE
—|—	THRUST FAULT - LOWER TRACE
—|—	SYNCLINAL, ANTICLINAL AXIS
—|—	DIP & STRIKE (Dipping, Vert., Horiz.)
○	DRILL HOLE LOCATION
○	TRENCH LOCATION
—|—	ADIT LOCATION
○	CONGLOMERATE
○	SANDSTONE
○	SILTSTONE
○	MUDSTONE
—|—	COAL



543

PR - MINNEAPOLIS - BELLEVUE 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date FEB. '79
Quintette Geology	Revised
	Author G. J. A. B.
	Drafted L. B.
	Scale 1:5,000
	II 4-2
	Q 24



LEGEND

Improved road
Secondary road
Track or trail
Culvert
Tree line
River
Stream
Intermittent stream
Swamp
Contours
Horizontal control
Vertical control
Spot elevation
Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHY SEPTEMBER 1975

DATE OF SURVEY APRIL 1977
DATE OF MAPPING MAY 1977

SURVEY NOTE

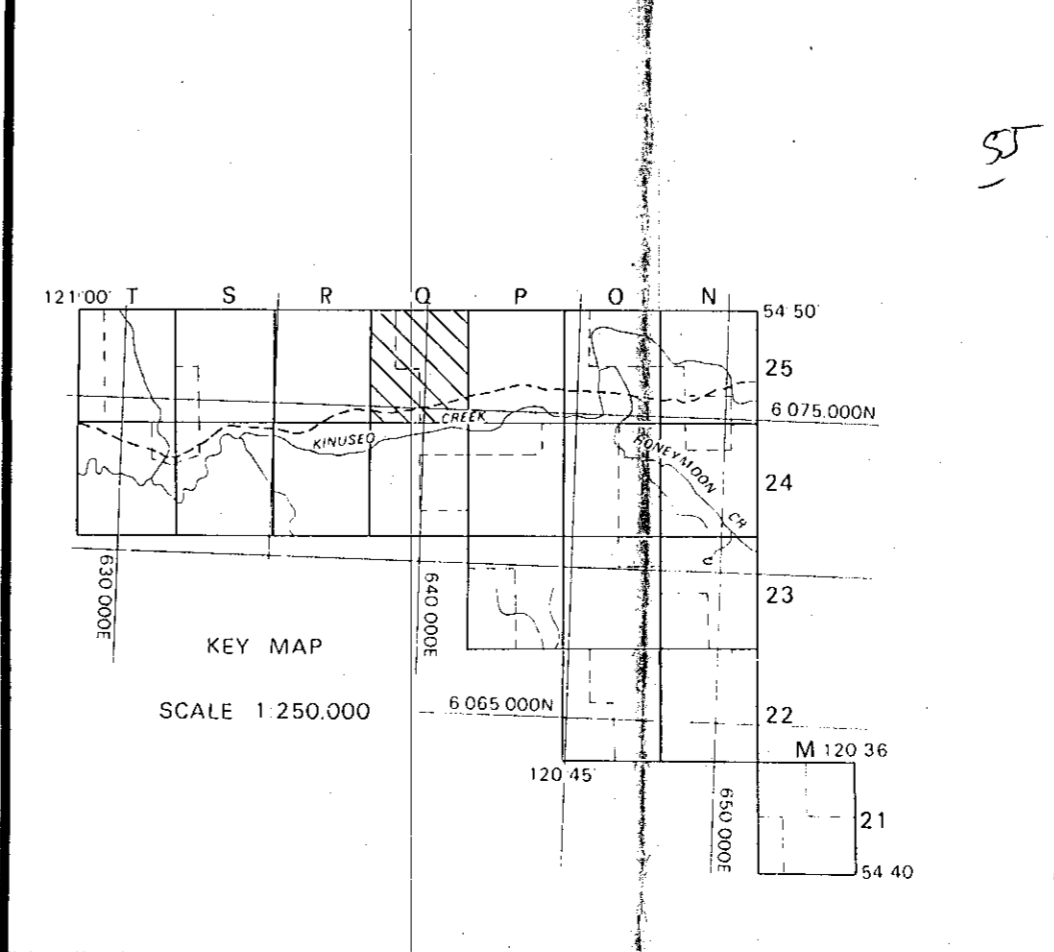
The Horizontal and Vertical Coordinates were established by D. W. Watson, B.C.L.S. using conventional and E.C.M. survey equipment. Horizontal and vertical coordinates and elevations are derived from Trig. Station Dismette E. Quinette S.W. Mine. Hawk. Manica. Kinuso. All coordinates referred to Universal Transverse Mercator Grid Zone 18. Elevations are above Mean Sea Level were established by trig. leveling, vertical angles from real at both ends of each course simultaneously.

GEOLOGICAL LEGEND

LOWER CRETACEOUS		FORT ST. JOHN GROUP BULLHEAD GROUP MINNES GROUP
Ksh	SHAFESBURY FM.	
Kcn(b)	COMMOTION FM. (Boulder Creek Member)	
Kcn(h)	COMMOTION FM. (Hulcross Member)	
Kcn(g)	COMMOTION FM. (Gates Member)	
Kmb	MOOSEBAR FM. (u) upper (l) lower	
Kgt	GETHING FM.	
Kcd	CADOMIN FM.	
JURASSIC - CRETACEOUS		
JKmi	MINNES GROUP (undivided)	
PALEOZOIC		
P	DEVONIAN, MISSISSIPPIAN	

LITHOLOGIC LEGEND

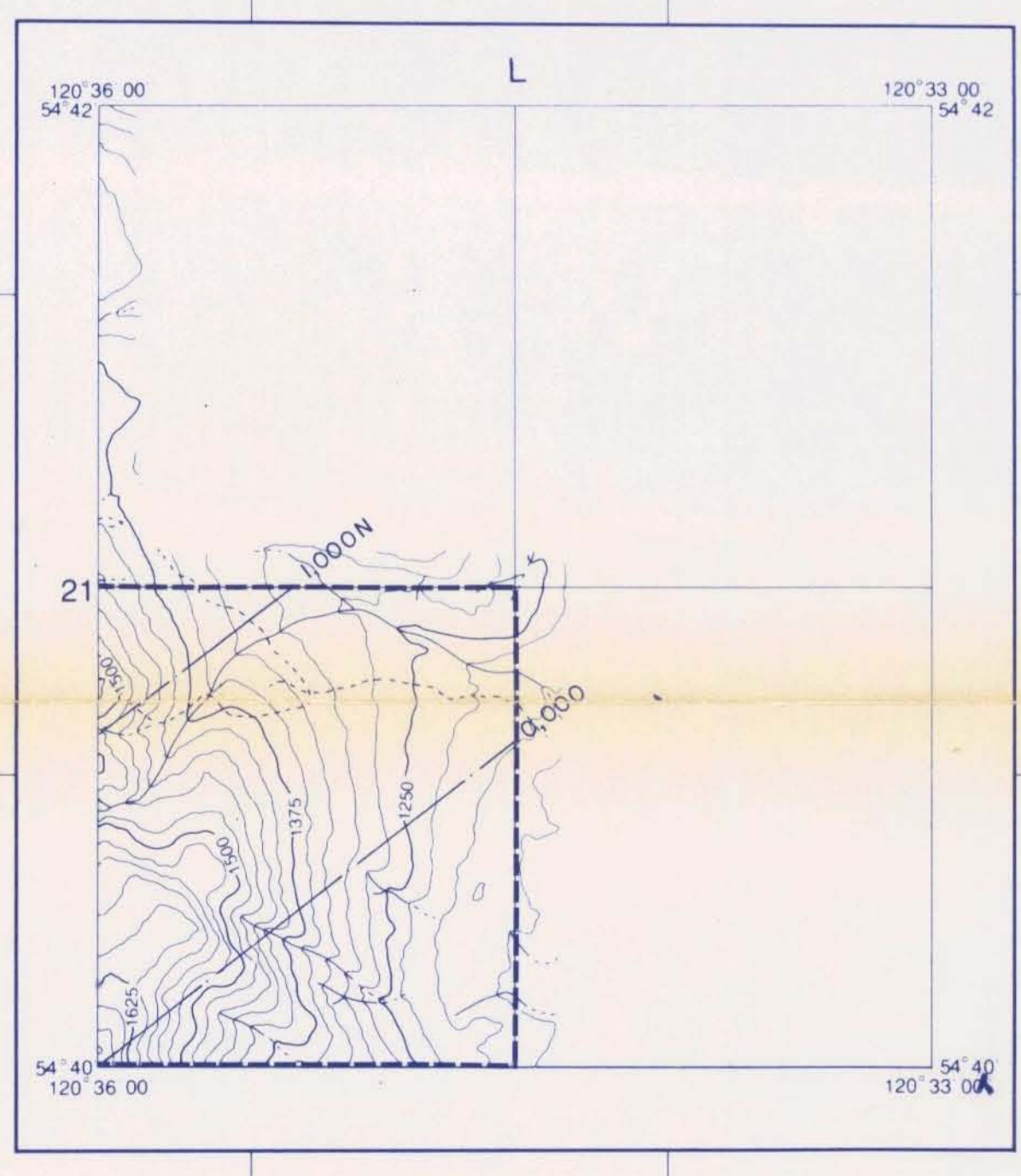
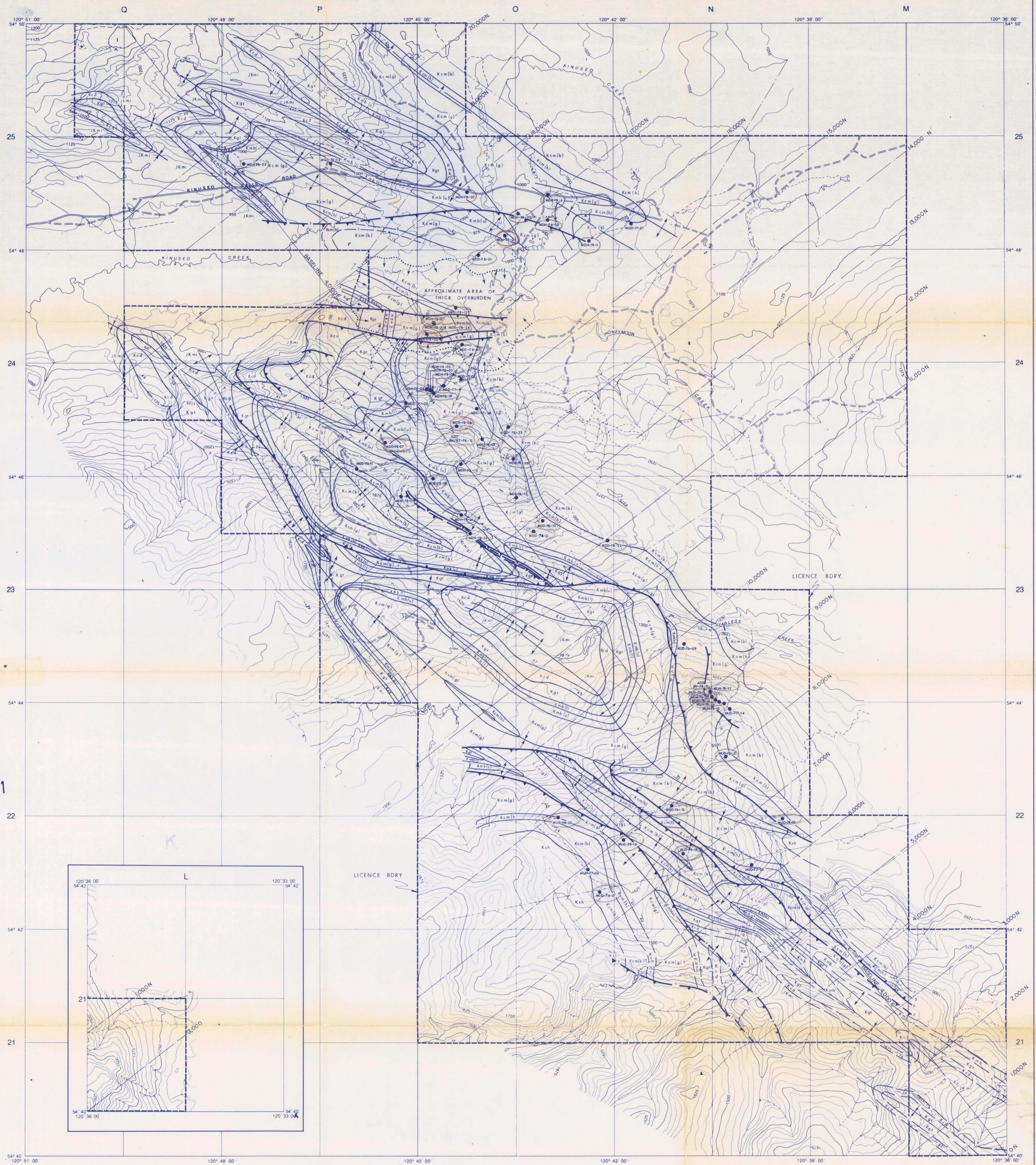
—B1—	COAL SEAM SUBCROP
—	GEOLOGICAL BOUNDARY
—▲—	THRUST FAULT - UPPER TRACE
—▼—	THRUST FAULT - LOWER TRACE
—+—	SYNCLINAL, ANTICLINAL AXIS
—|—	DIP & STRIKE (Dipping, Vert., Horiz.)
⊙	DRILL HOLE LOCATION
—	TRENCH LOCATION
—	ADIT LOCATION
⊙	CONGLOMERATE
⋯	SANDSTONE
—	SILTSTONE
—	MUDSTONE
—	COAL



543

PK-DUNKAN-BELLEVUE TR(2)A

PACIFIC PACIFIC PACIFIC	
PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date FEB. '79	Revised
Author G. J., A. B.	Drafted L. B.
Scale 1:5,000	II.4-2
QUINTETTE GEOLOGY	
<i>outside</i>	
Q 25	



TOPOGRAPHIC LEGEND

- MAIN ACCESS ROAD — DRY WEATHER
- EXPLORATION ROAD
- EXPLORATION TRAIL
- AIR STRIP
- SEISMIC LINE, CUT LINE
- POWER TRANSMISSION LINE
- RIVER
- STREAM
- LAKE
- SWAMP
- CONTOURS
- DEPRESSION CONTOUR

GEOLOGICAL LEGEND

- LOWER CRETACEOUS**
- [Ksh] SHAFESBURY FORMATION
 - [Kcm(b)] COMMOTION FORMATION (Boulder Creek Member)
 - [Kcm(h)] COMMOTION FORMATION (Hulcross Member)
 - [Kcm(g)] COMMOTION FORMATION (Gates Member)
 - [Kmb] MOOSEBAR FORMATION
 - [Kgt] GETHING FORMATION
 - [Kcd] CADOMIN FORMATION
- JURASSIC — CRETACEOUS**
- [JKmi] MINNES GROUP
- PALEOZOIC**
- [P] DEVONIAN, MISSISSIPPIAN

FORT ST. JOHN GROUP
BULLHEAD GROUP

SYMBOLS

- GEOLOGICAL CONTACT**
- DIP AND STRIKE: REGULAR
 - VERTICAL
 - HORIZONTAL
 - OVERTURNED
 - THRUST: FLAGS SHOW DIP DIRECTION
 - NORMAL FAULT
 - ANTICLINE, SYNCLINE
 - DRILL HOLE COLLAR
 - TRENCH
 - ADIT



543

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT

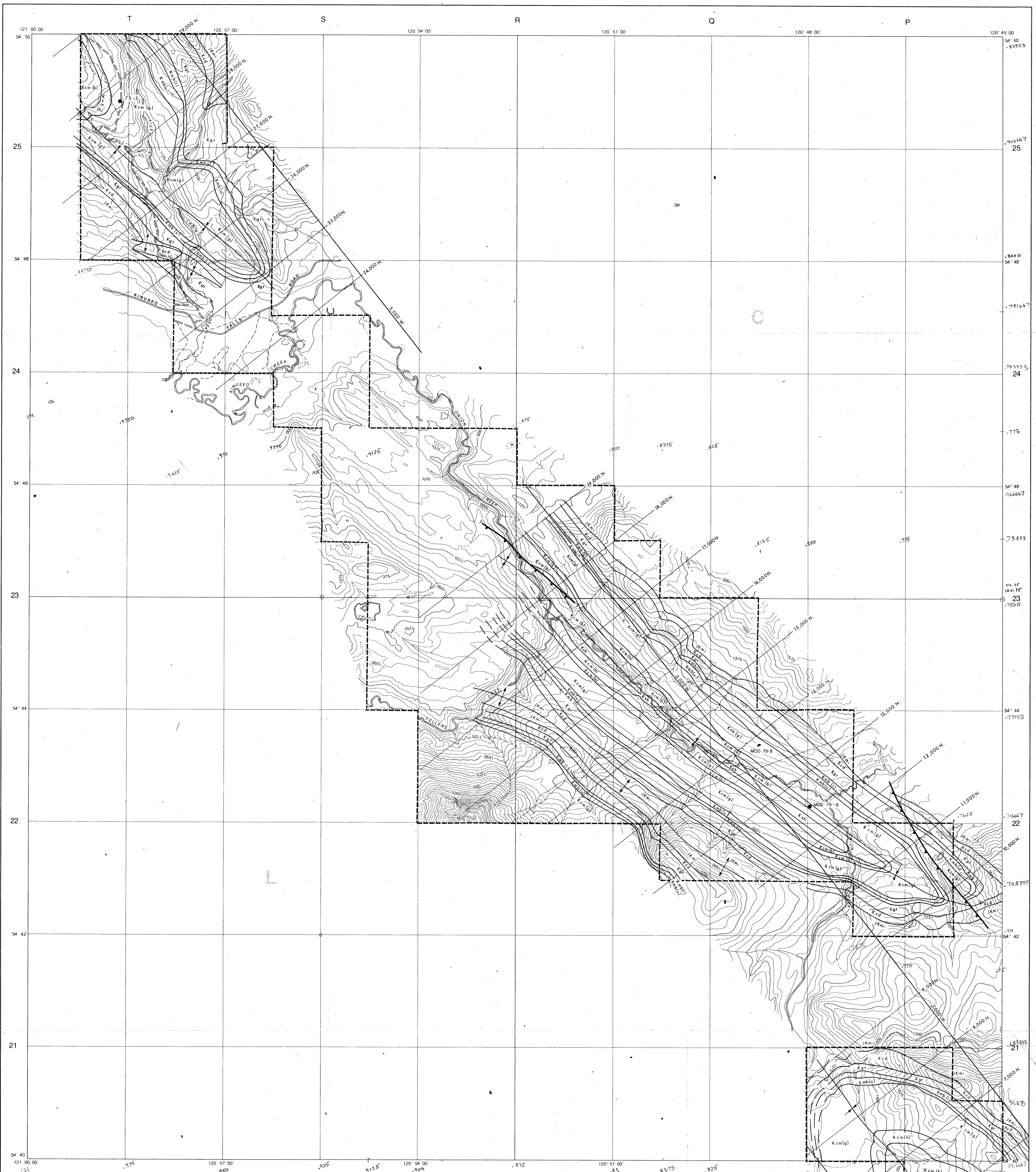
MONKMAN COAL PROJECT

GEOLOGY
Area Contour Map

SURVEY NOTE
Control Survey was carried out for Photogrammetric Mapping to cover MONKMAN COAL PROJECT COAL LEASES. Mapping outside of the Coal Leases was taken from existing N.T.S. maps, and 25 metre contour intervals were interpolated.

CONTOUR INTERVAL 25m
R.M. HARDY & ASSOCIATES LTD.
1978
BASE REVISED MARCH 1979

Date	MAR '79
Revised	
Author	G. J., A. B.
Drafted	J. W. K.
Scale	1:25,000
DRWG	II. 4-1.1



TOPOGRAPHIC LEGEND

MAIN ACCESS ROAD — DRY WEATHER	.....
EXPLORATION ROAD	-----
EXPLORATION TRAIL	-----
AIR STRIP	.....
SEISMIC LINE, CUT LINE	.....
POWER TRANSMISSION LINE	.....
RIVER	~~~~~
STREAM	~~~~~
LAKE	.....
SWAMP	.....
CONTOURS	.....
DEPRESSION CONTOUR	.....

GEOLOGICAL LEGEND

LOWER CRETACEOUS	PALEOZOIC
Ksh SHAFESBURY FORMATION	P DEVONIAN, MISSISSIPPIAN
Kcm(b) COMMOTION FORMATION (Boulder Creek Member)	
Kcm(h) COMMOTION FORMATION (Hulcross Member)	
Kcm(g) COMMOTION FORMATION (Gates Member)	
Kmb MOOSEBAR FORMATION	
Kgt GETTING FORMATION	
Kcd CADOMIN FORMATION	
JURASSIC — CRETACEOUS	
Jkm MINNES GROUP	

SYMBOLS

GEOLOGICAL CONTACT	.....
DIP AND STRIKE: REGULAR	.....
VERTICAL	.....
HORIZONTAL	.....
OVERTURNED	.....
THRUST: FLAGS SHOW DIP DIRECTION	.....
NORMAL FAULT	.....
ANTICLINE, SYNCLINE	.....
DRILL HOLE COLLAR	.....
TRENCH	.....
ADIT	.....

KEY MAP

SURVEY NOTE

Control Survey was carried out for Photogrammetric Mapping to cover MONKMAN COAL PROJECT COAL LEASES. Mapping outside of the Coal Leases was taken from existing N.T.S. maps, and 25 metre contour intervals were interpolated.

CONTOUR INTERVAL 25m

R.M. HARDY & ASSOCIATES LTD.

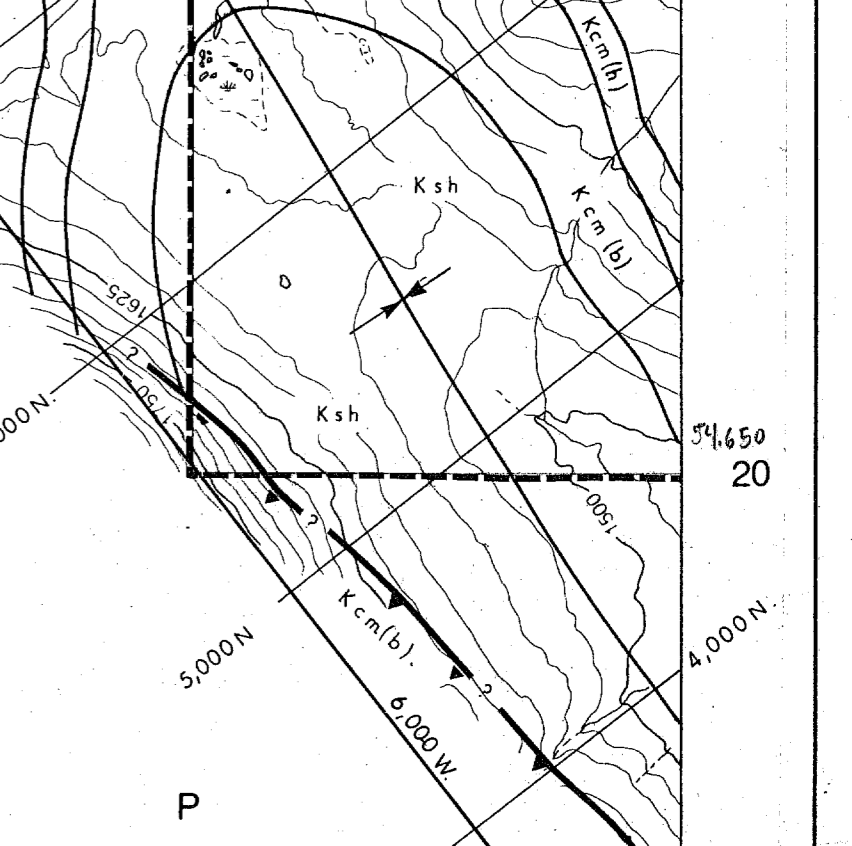
1978

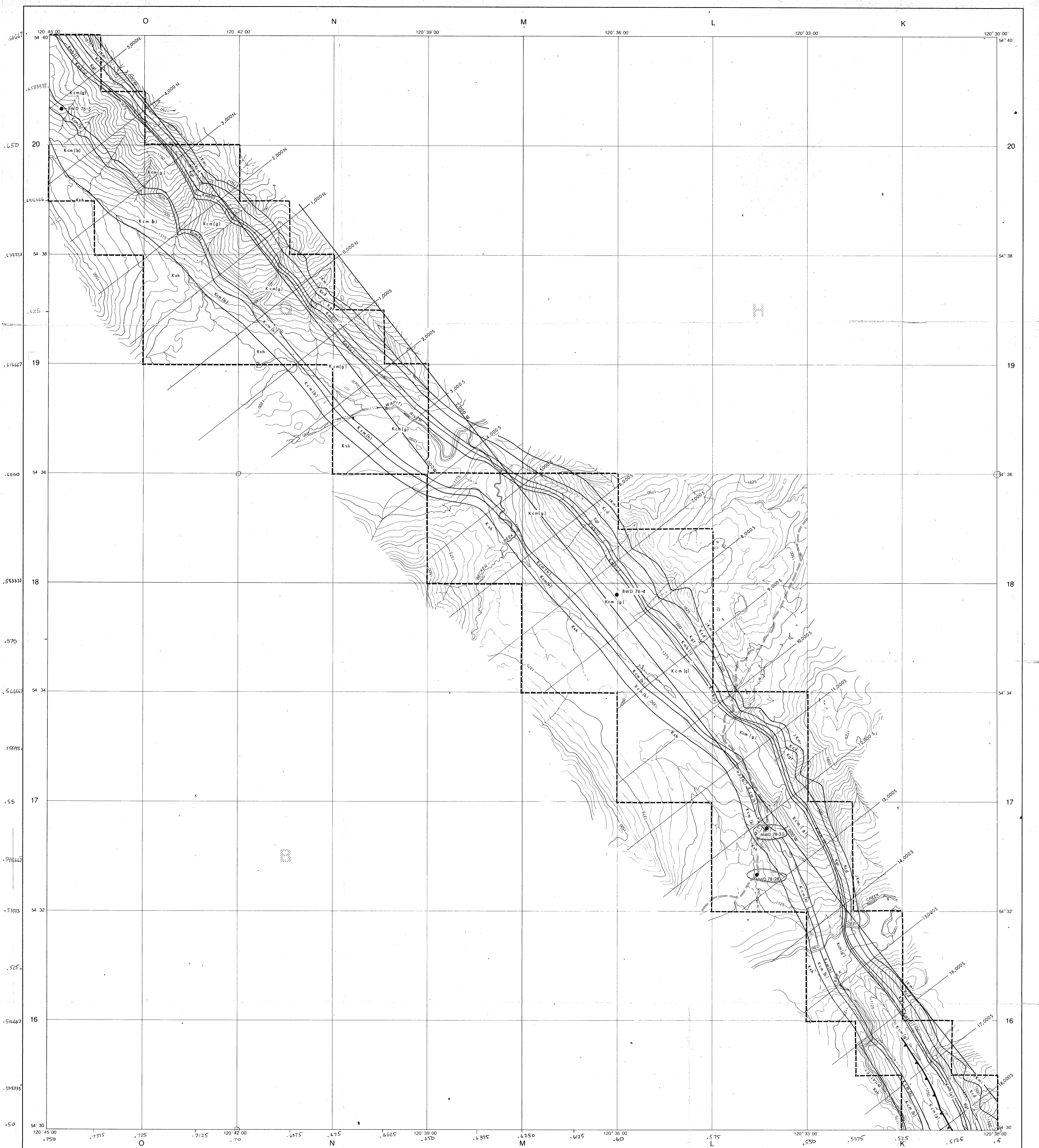
543

THE MONKMAN BECOWITZ TRACT

PACIFIC 66 PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date: MAR. '79	Revised
Author: G.J. A.B.	Drafted: J.W.K.
Scale: 1:25,000	DRWG. II.4-1.1
2 of 5	

DIGITIZED





TOPOGRAPHIC LEGEND

- MAIN ACCESS ROAD - DRY WEATHER
- EXPLORATION ROAD
- EXPLORATION TRAIL
- AIR STRIP
- SEISMIC LINE, CUT LINE
- POWER TRANSMISSION LINE
- RIVER
- STREAM
- LAKE
- SWAMP
- CONTOURS
- DEPRESSION CONTOUR

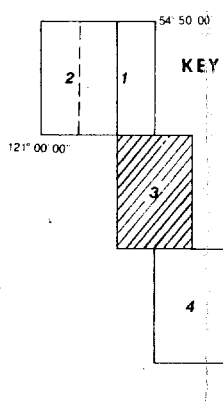
GEOLOGICAL LEGEND

- LOWER CRETACEOUS**
- Ksh SHAFESBURY FORMATION
 - Kcm(b) COMMOTION FORMATION (Boulder Creek Member)
 - Kcm(h) COMMOTION FORMATION (Hutcross Member)
 - Kcm(g) COMMOTION FORMATION (Gates Member)
 - Kmb MOOSEBAR FORMATION
 - Kgt GETHING FORMATION
 - Kcd CADOMIN FORMATION
- JURASSIC - CRETACEOUS**
- JKm MINNES GROUP
- PALEOZOIC**
- P DEVONIAN, MISSISSIPPIAN

FORT ST. JOHN GROUP
BULLHEAD GROUP

SYMBOLS

- GEOLOGICAL CONTACT
- DIP AND STRIKE: REGULAR
- VERTICAL
- HORIZONTAL
- OVERTURNED
- THRUST: FLAGS SHOW DIP DIRECTION
- NORMAL FAULT
- ANTICLINE, SYNCLINE
- DRILL HOLE COLLAR
- TRENCH
- ADIT



SURVEY NOTE

Control Survey was carried out for Photogrammetric Mapping to cover MONKMAN COAL PROJECT COAL LEASES. Mapping outside of the Coal Leases was taken from existing N.T.S. maps, and 25 metre contour intervals were interpolated.

CONTOUR INTERVAL 25m
R.M. HARDY & ASSOCIATES LTD.

1973

543

RE-MONKMAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT

515HAPS.06F-QUIKMA06Base file PLYLIMS 168/1215

Date MAR '79

Revised

Author G. J. A. B.

Drafted J. W. K.

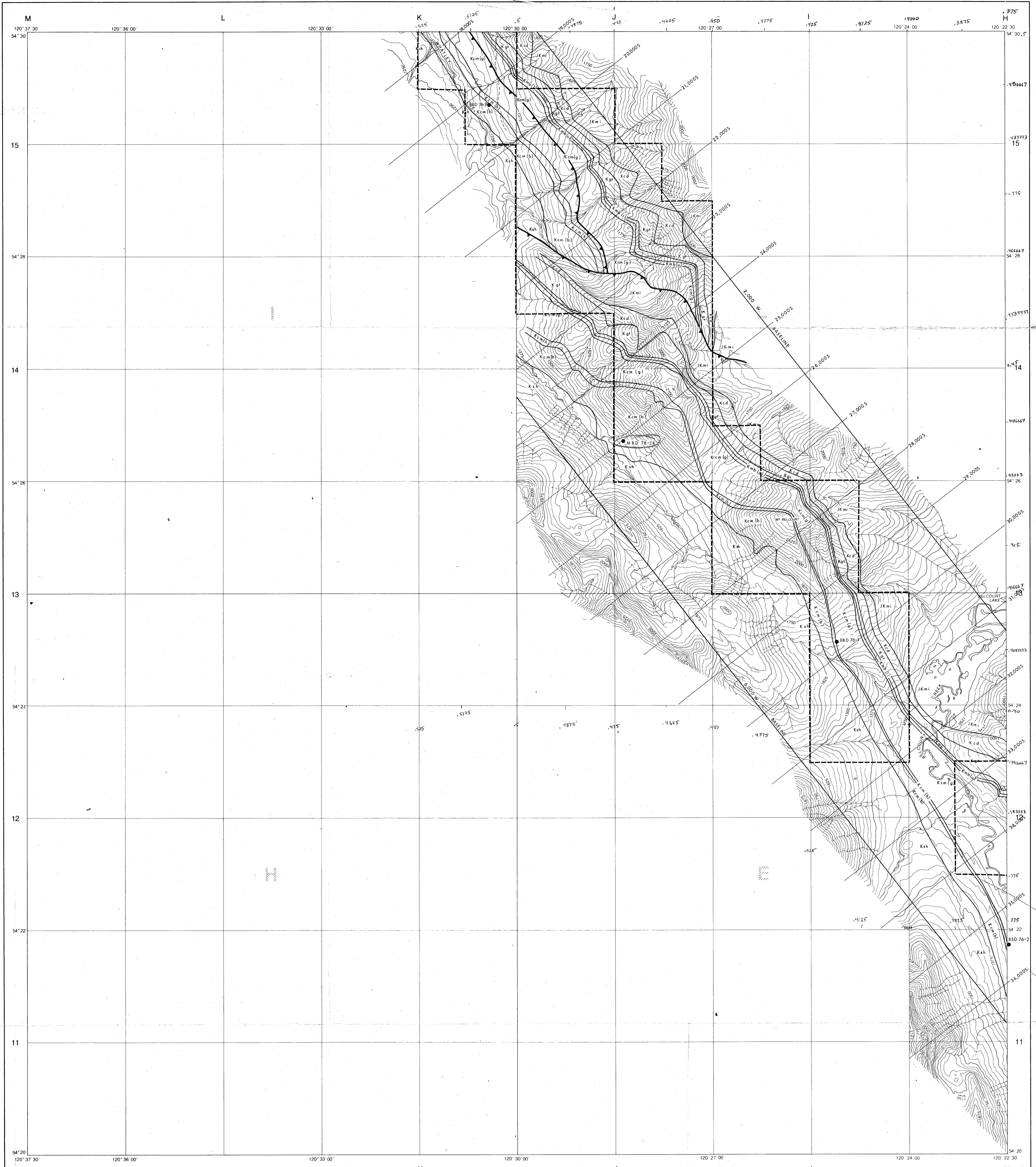
Scale 1: 25,000

DRWG II 4-1.1

GEOLOGY

3 of 5

D1617ZE



543

TOPOGRAPHIC LEGEND

- MAIN ACCESS ROAD — DRY WEATHER
- EXPLORATION ROAD
- EXPLORATION TRAIL
- AIR STRIP
- SEISMIC LINE, CUT LINE
- POWER TRANSMISSION LINE
- RIVER
- STREAM
- LAKE
- SWAMP
- CONTOURS
- DEPRESSION CONTOUR

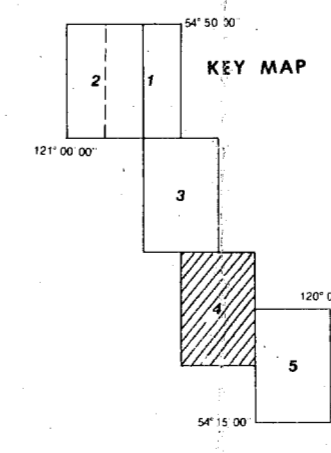
GEOLOGICAL LEGEND

- LOWER CRETACEOUS**
- Ksh SHAFTESBURY FORMATION
- Kcm(b) COMMOTION FORMATION (Boulder Creek Member)
- Kcm(h) COMMOTION FORMATION (Hulcross Member)
- Kcm(g) COMMOTION FORMATION (Gates Member)
- Kmb MOOSEBAR FORMATION
- Kgt GETTING FORMATION
- Kcd CADOMIN FORMATION
- JURASSIC — CRETACEOUS**
- JKmi MINNES GROUP
- PALEOZOIC**
- P DEVONIAN, MISSISSIPPIAN

FORT ST. JOHN GROUP
BULLHEAD GROUP

SYMBOLS

- GEOLOGICAL CONTACT
- DIP AND STRIKE: REGULAR
- VERTICAL
- HORIZONTAL
- OVERTURNED
- THRUST: FLAGS SHOW DIP DIRECTION
- NORMAL FAULT
- ANTICLINE, SYNCLINE
- DRILL HOLE COLLAR
- TRENCH
- ADIT

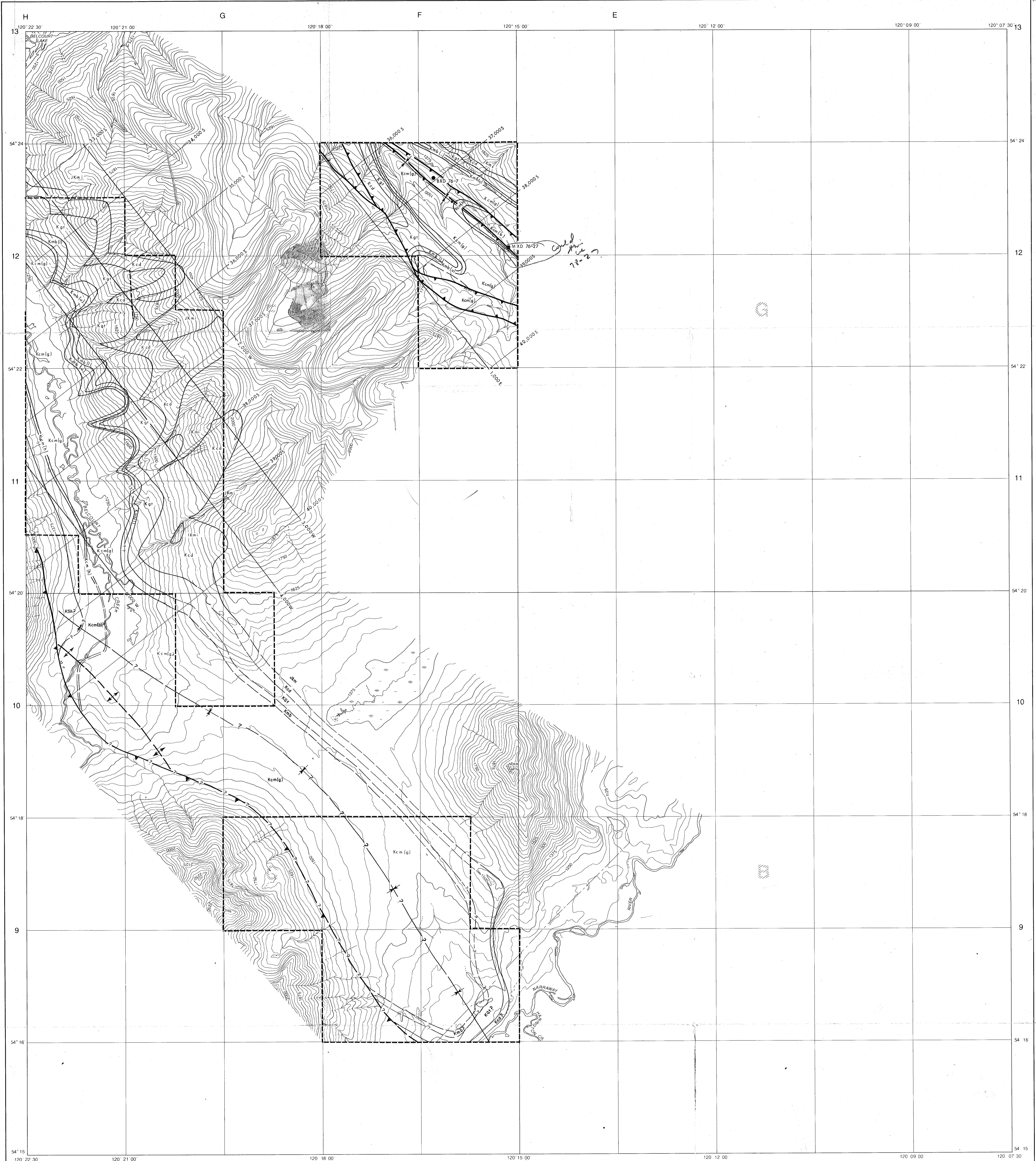


SURVEY NOTE

Control Survey was carried out for Photogrammetric Mapping to cover MONKMAN COAL PROJECT COAL LEASES. Mapping outside of the Coal Leases was taken from existing N.T.S. maps, and 25 metre contour intervals were interpolated.

CONTOUR INTERVAL 25m
R.M. HARDY & ASSOCIATES LTD.
1978

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date MAR. 79 Revised Author G. J., A. B. Drafted J. W. K. Scale 1: 25,000 DRWG. II. 4-11
GEOLOGY	
4 of 5	



TOPOGRAPHIC LEGEND

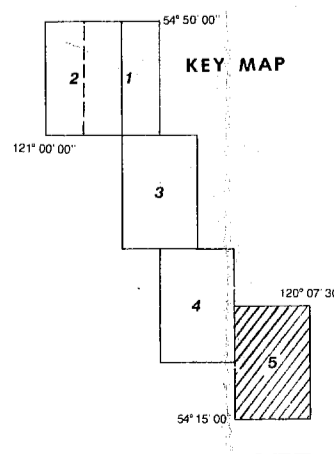
- MAIN ACCESS ROAD - DRY WEATHER
- EXPLORATION ROAD
- EXPLORATION TRAIL
- AIR STRIP
- SEISMIC LINE, CUT LINE
- POWER TRANSMISSION LINE
- RIVER
- STREAM
- LAKE
- SWAMP
- CONTOURS
- DEPRESSION CONTOUR

GEOLOGICAL LEGEND

- LOWER CRETACEOUS**
- Ksh SHAFESBURY FORMATION
 - Kcm(l) COMMOTION FORMATION (Boulder Creek Member)
 - Kcm(h) COMMOTION FORMATION (Hulcross Member)
 - Kcm(g) COMMOTION FORMATION (Gates Member)
 - Kmb MOOSEBAR FORMATION
 - Kgt GETHING FORMATION
 - Kcd CADOMIN FORMATION
- JURASSIC - CRETACEOUS**
- JKmi MINNES GROUP
- PALEOZOIC**
- P DEVONIAN, MISSISSIPPIAN

SYMBOLS

- GEOLOGICAL CONTACT
- DIP AND STRIKE: REGULAR
- VERTICAL
- HORIZONTAL
- OVERTURNED
- THRUST: FLAGS SHOW DIP DIRECTION
- NORMAL FAULT
- ANTICLINE, SYNCLINE
- DRILL HOLE COLLAR
- TRENCH
- ADIT



SURVEY NOTE

Control Survey was carried out for Photogrammetric Mapping to cover MONKMAN COAL PROJECT COAL LEASES. Mapping outside of the Coal Leases was taken from existing N.T.S. maps, and 25 metre contour intervals were interpolated.

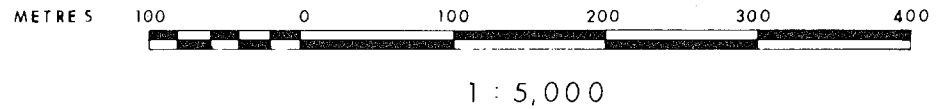
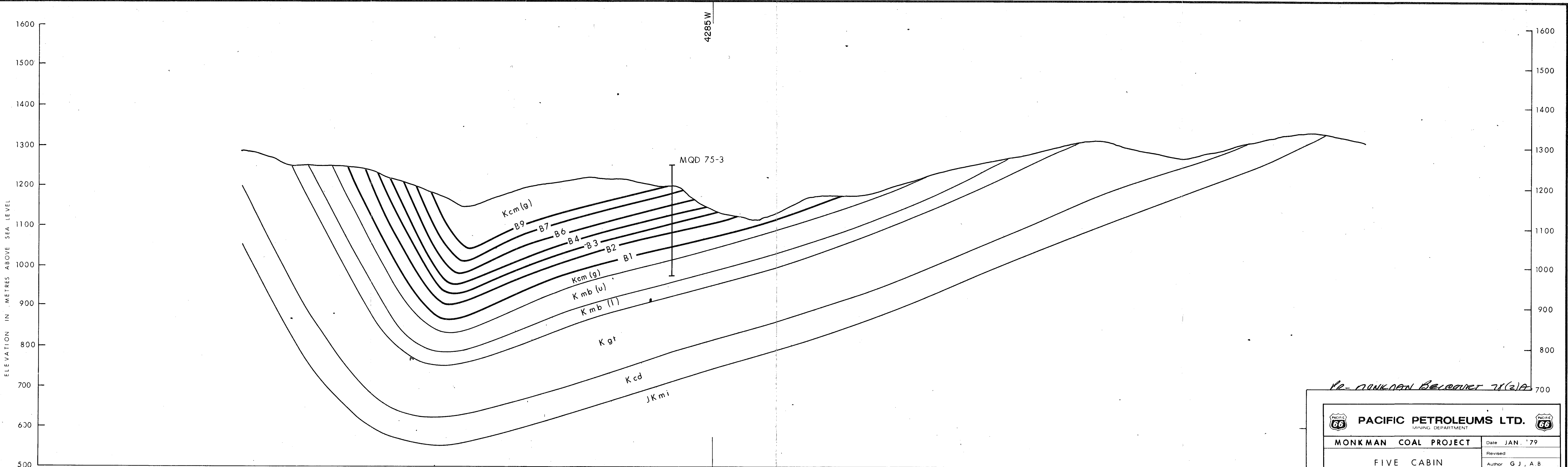
CONTOUR INTERVAL 25m
R.M. HARDY & ASSOCIATES LTD.

1978

543

Re MONKMAN BELCOURT 78(2)P.

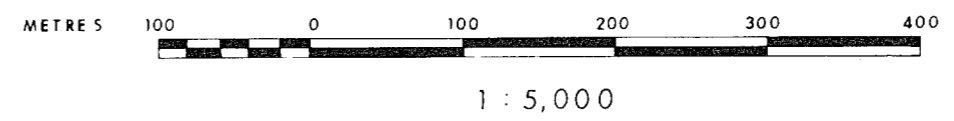
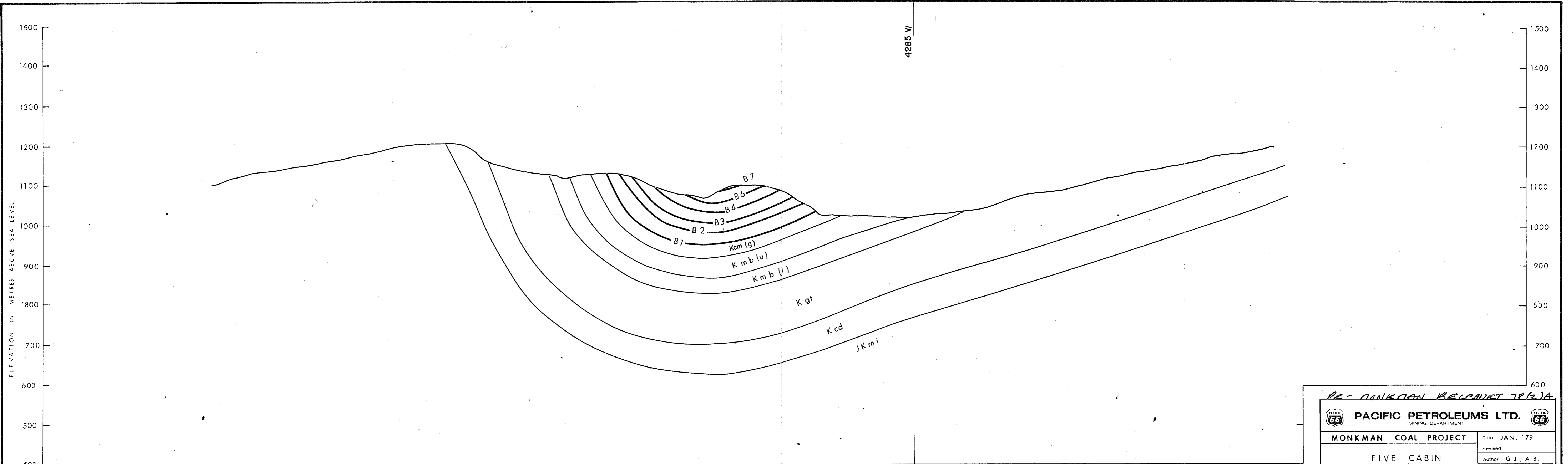
PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date MAR. '79
	Revised
	Author G.J., A.B.
	Drafted J.W.K.
	Scale 1:25,000
	DRWG. II 4-11
GEOLOGY <i>Count by original map 545 with letter g.</i>	5 of 5



543

Re-Monkman Belvedere 78(2)A

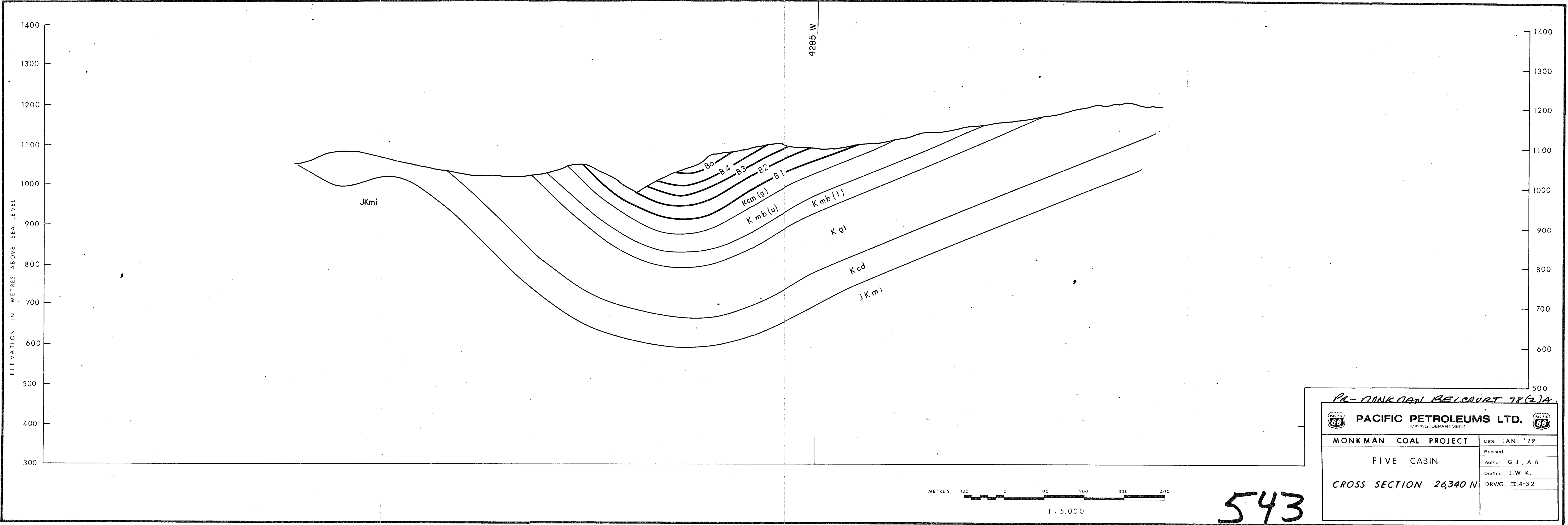
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
FIVE CABIN	
CROSS SECTION 28,340 N	
<small>Date</small> JAN. '79	<small>Revised</small>
<small>Author</small> G. J., A. B.	<small>Drafted</small> J. W. K.
<small>DRWG.</small> II.4-3.2	



543

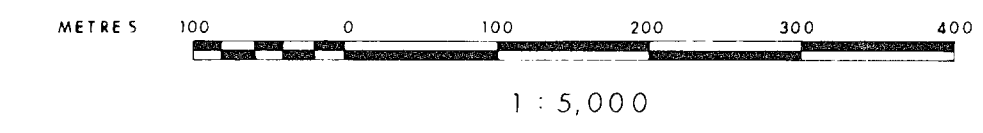
RE-DUNKAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
	Revised
FIVE CABIN	Author G J, A B.
	Drafted J.W.K.
CROSS SECTION 27,340 N	DRWG. II.4-32

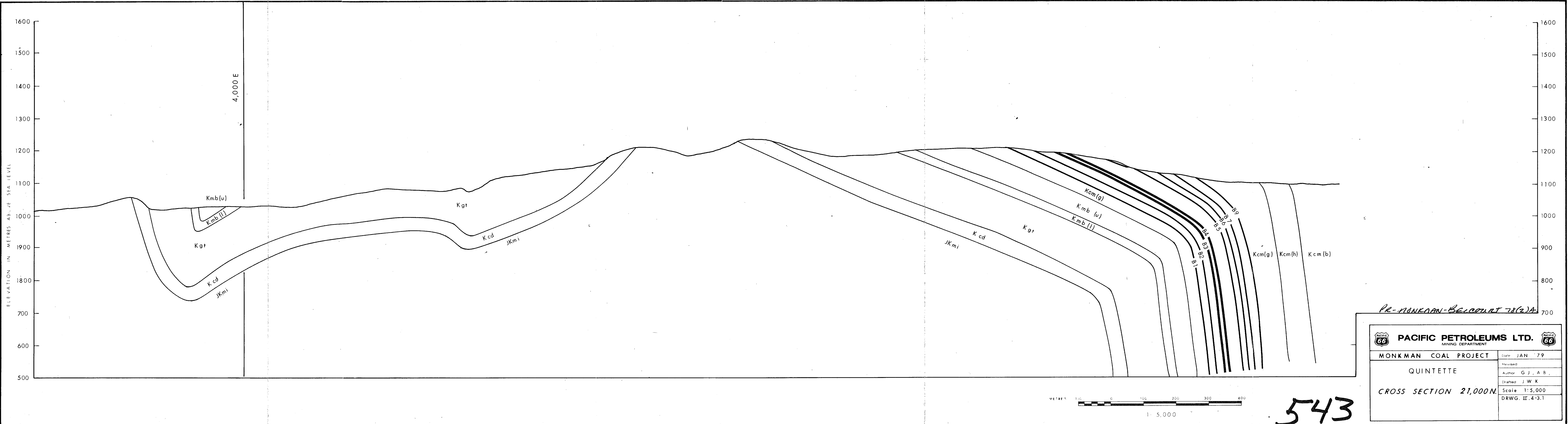


PR-MONKMAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
FIVE CABIN	Revised
CROSS SECTION 26,340 N	Author G J, A B
	Drafted J.W.K.
	DRWG. II.4-32

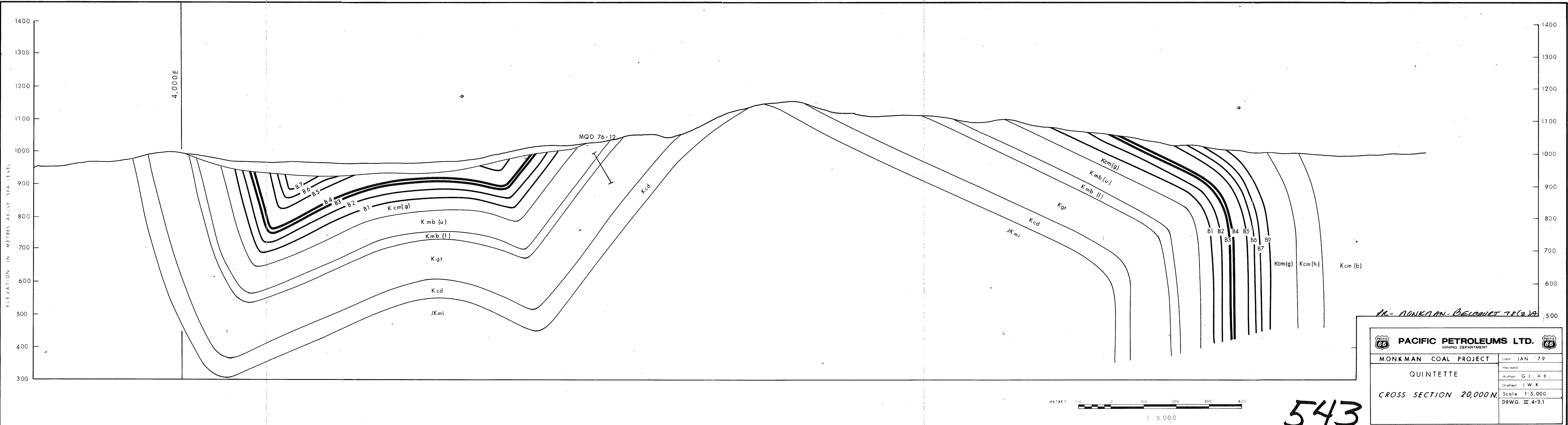


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PR-MONKMAN-BELMOUNT 78(2)A

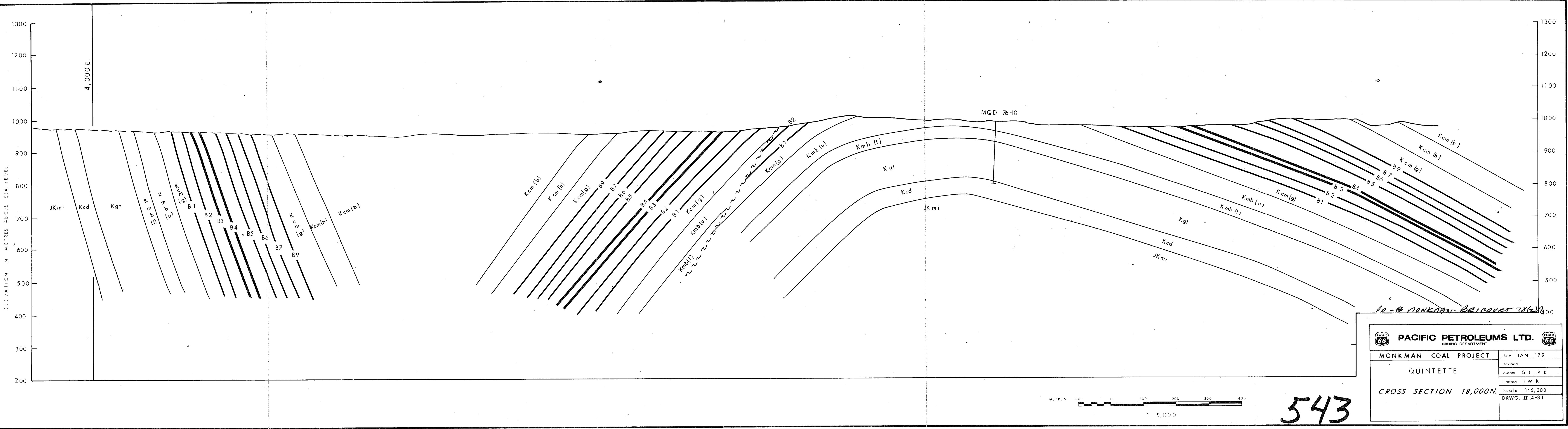
PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date: JAN 79
QUINTETTE	Revised:
	Author: G J, A B
	Drafted: J W K
	Scale: 1:5,000
	DRWG. II.4-3.1



PK-10NKAAN-BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
	Date JAN '79 Revised Author G J, A B, Drafted J W K Scale 1:5,000 DRWG. II.4-3.1
QUINTETTE CROSS SECTION 20,000 N.	

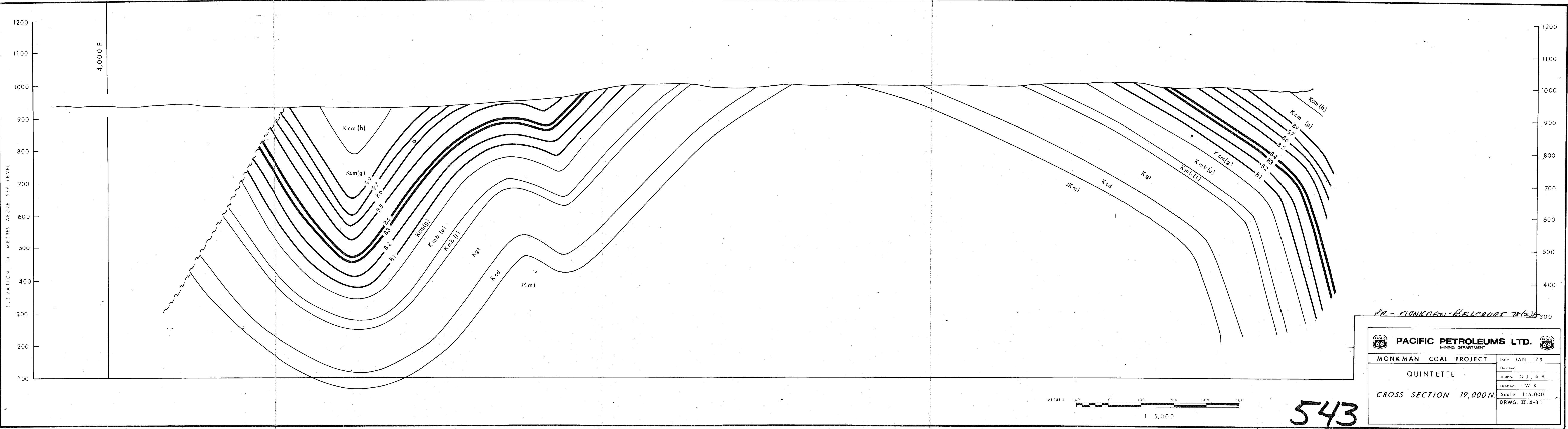
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12-@ MONKMAN-BELCOVER 78(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT QUINTETTE CROSS SECTION 18,000N.	Date JAN '79 Revised Author G J, A B Drafted J W K Scale 1:5,000 DRWG. II.4-31

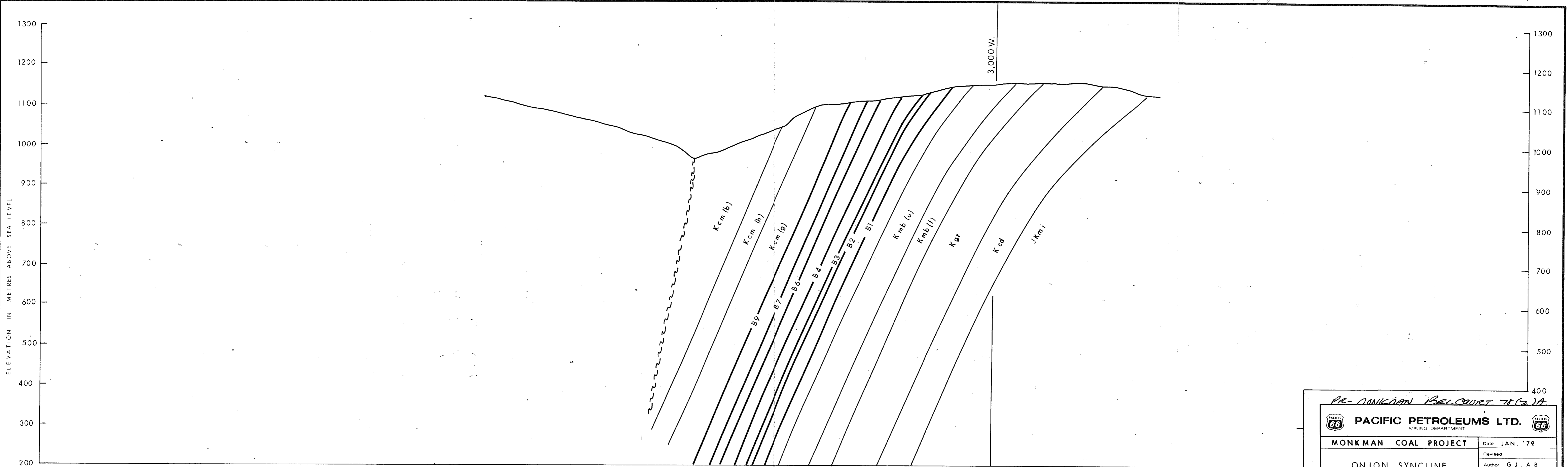
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PR - MONKMAN-BELCOURT 78(2)

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT QUINTETTE CROSS SECTION 19,000N.	Date: JAN '79 Revised Author: G J, A B Drafted: J W K Scale: 1:5,000 DRWG. II. 4-3.1

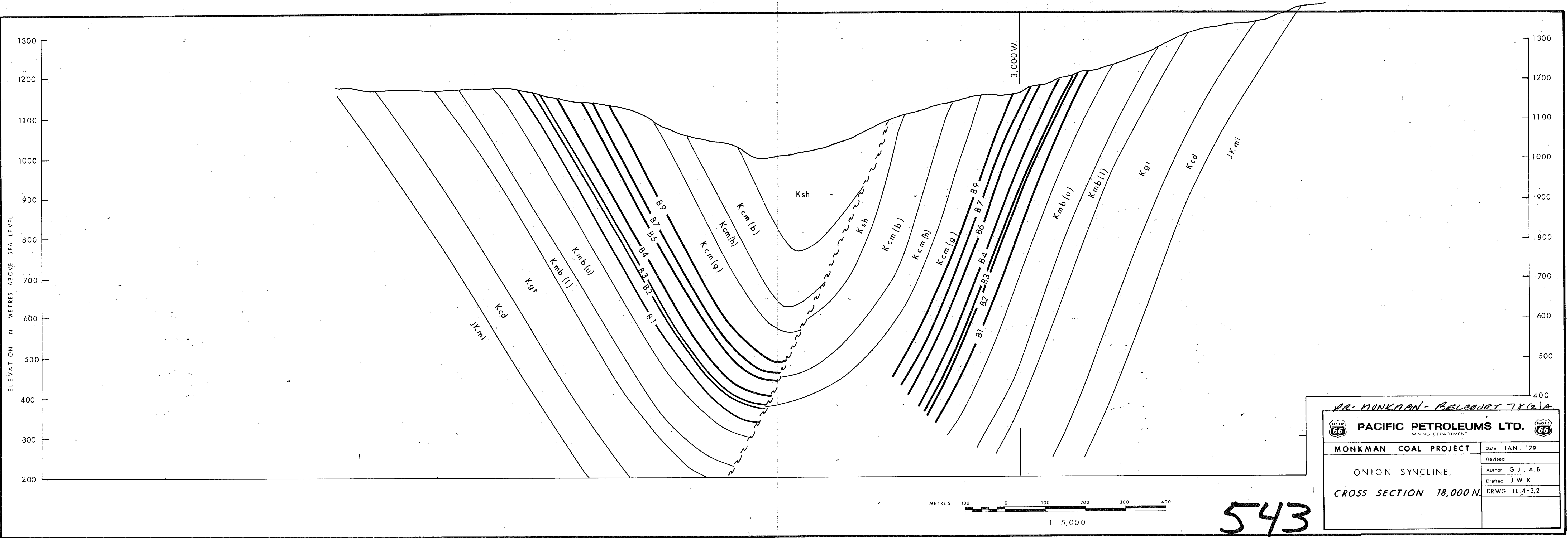
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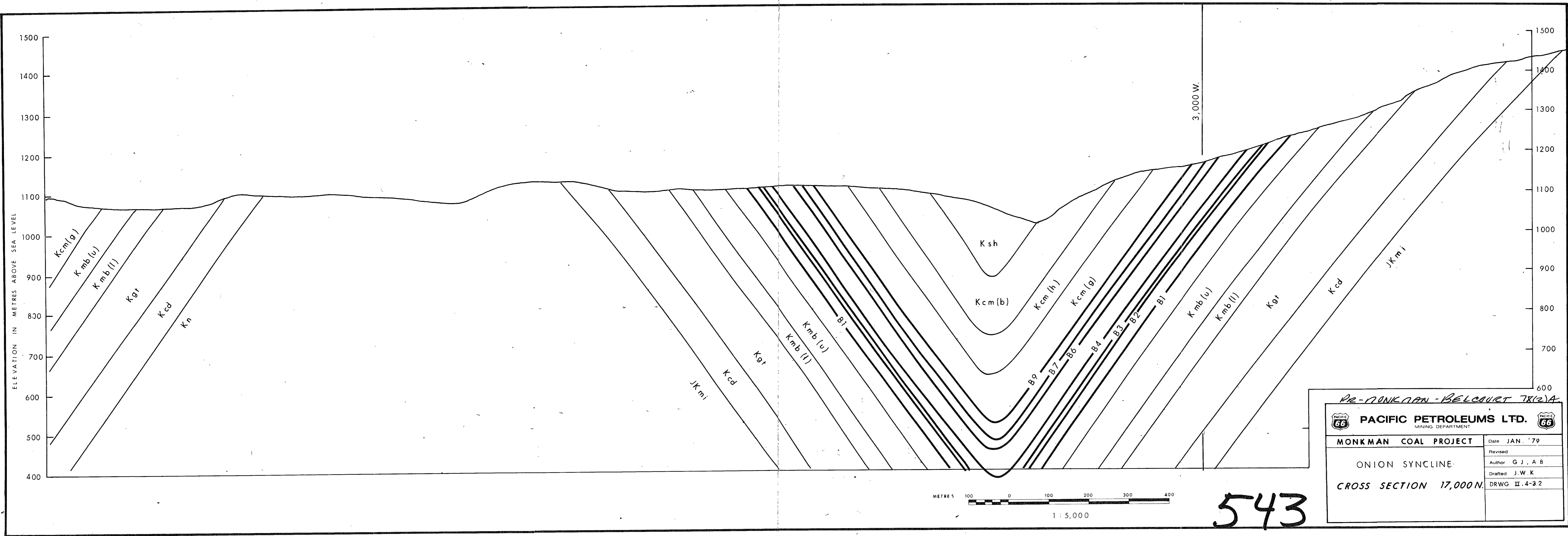


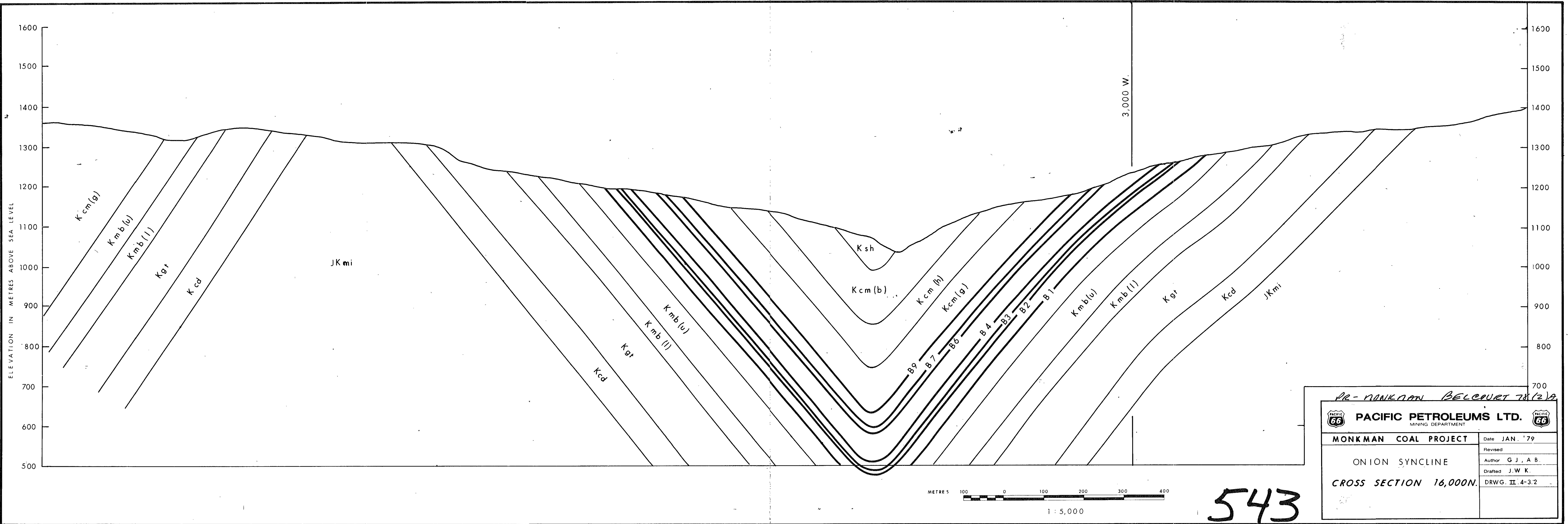
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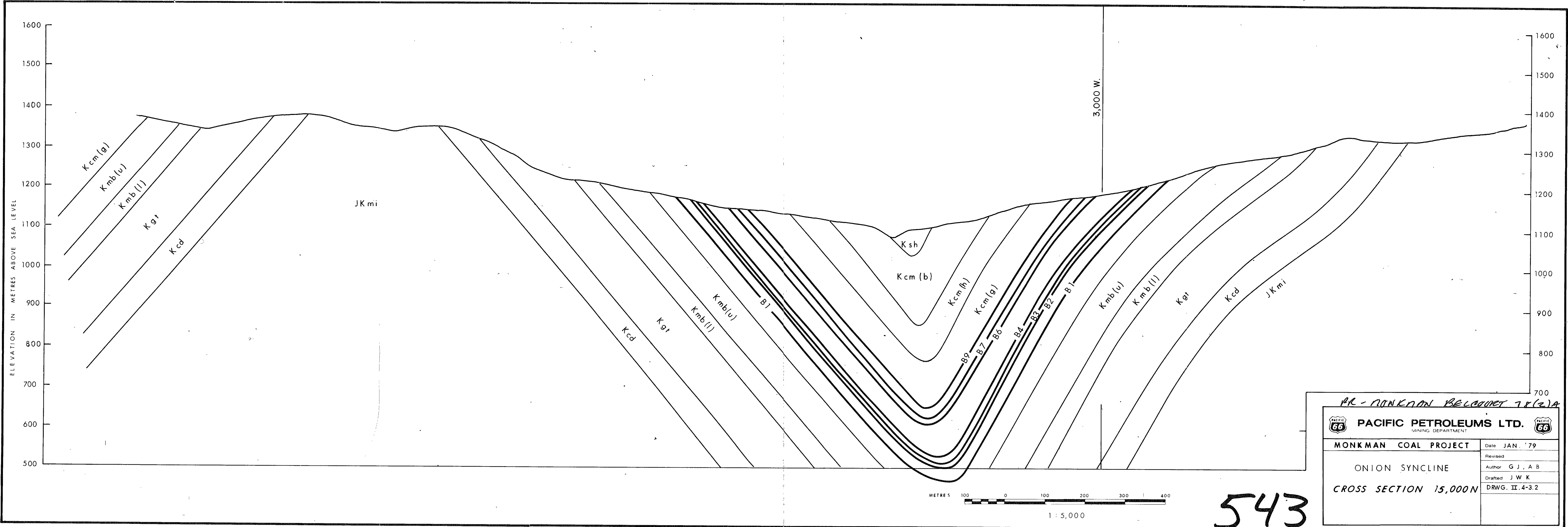
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
ONION SYNCLINE	
CROSS SECTION 19,000N	
Revised Author G J, A B Drafted J.W.K. DRWG. II.4-3.2	

543





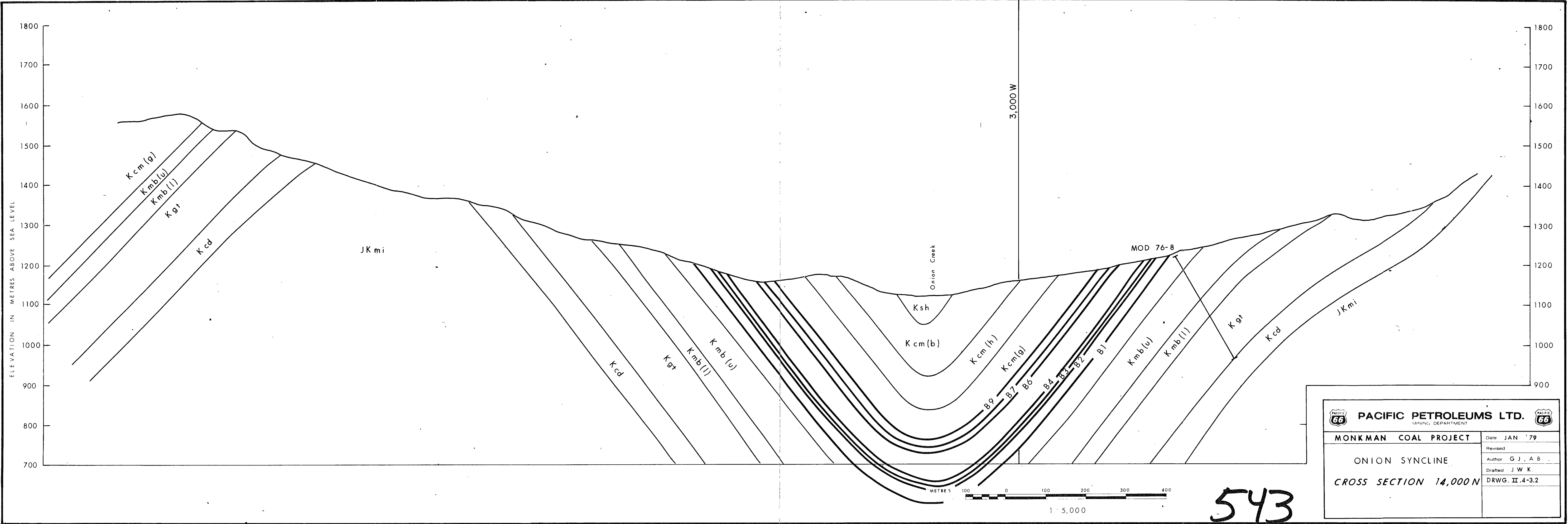




PR - RANKEON BELCOVET 18(2)A

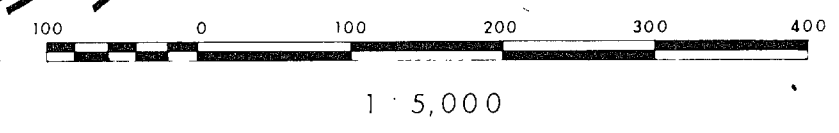
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
ONION SYNCLINE CROSS SECTION 15,000N	Revised
	Author G J, A B
	Drafted J W K
	DRWG. II.4-3.2

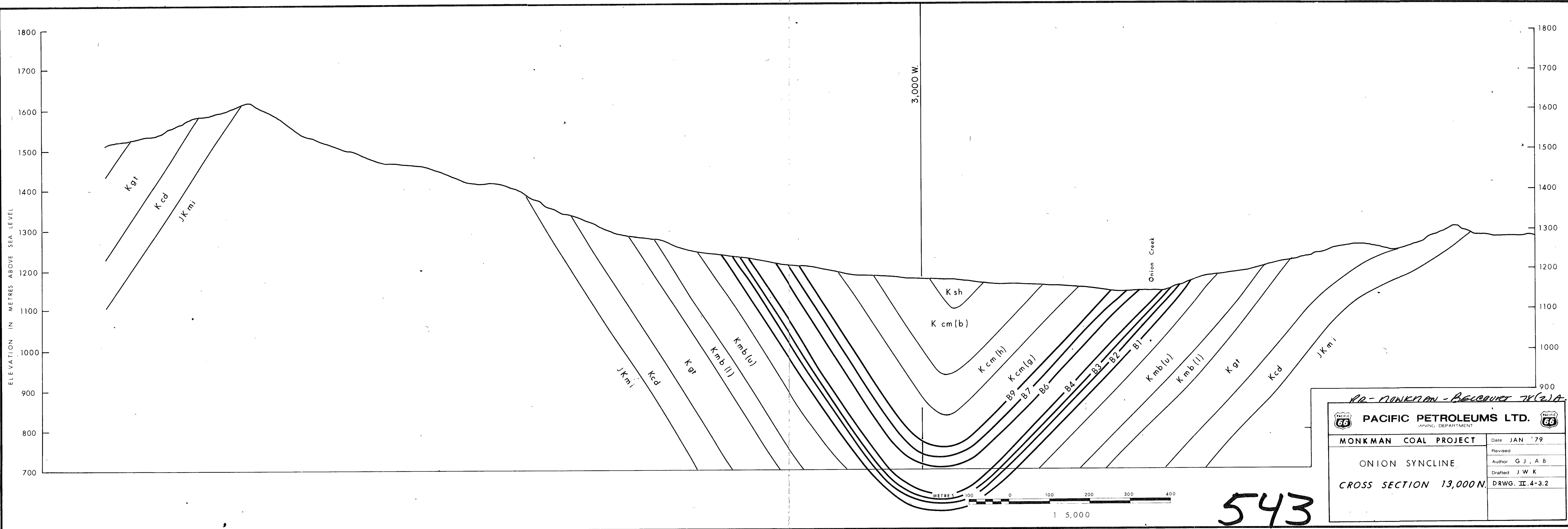
543



PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
ONION SYNCLINE	
CROSS SECTION 14,000 N	
Date	JAN '79
Revised	
Author	G J, A B
Drafted	J W K.
DRWG.	II.4-3.2

543

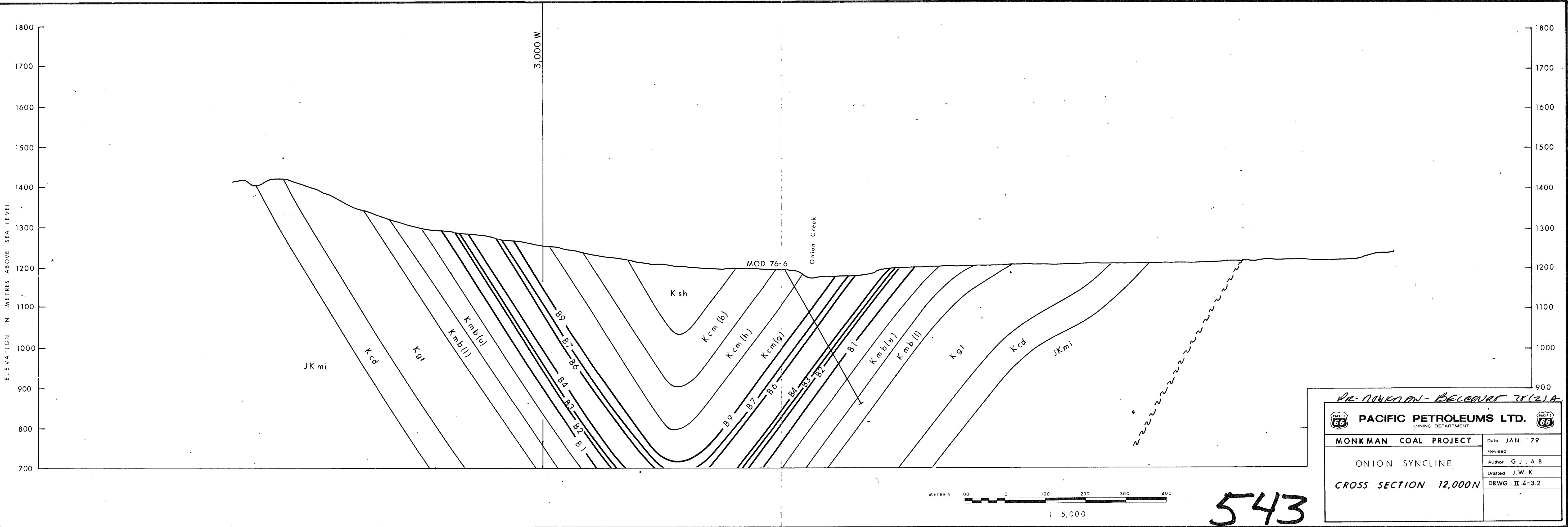






RR - DANKTON - BEAVER 7(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN '79
ONION SYNCLINE	Revised
CROSS SECTION 13,000 N.	Author G J, A B
	Drafted J W K
	DRWG. II.4-3.2

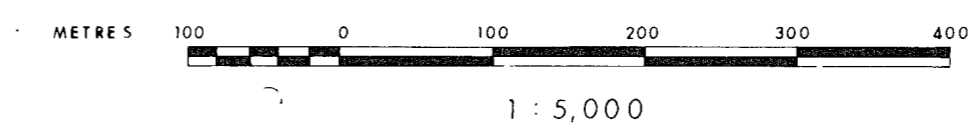
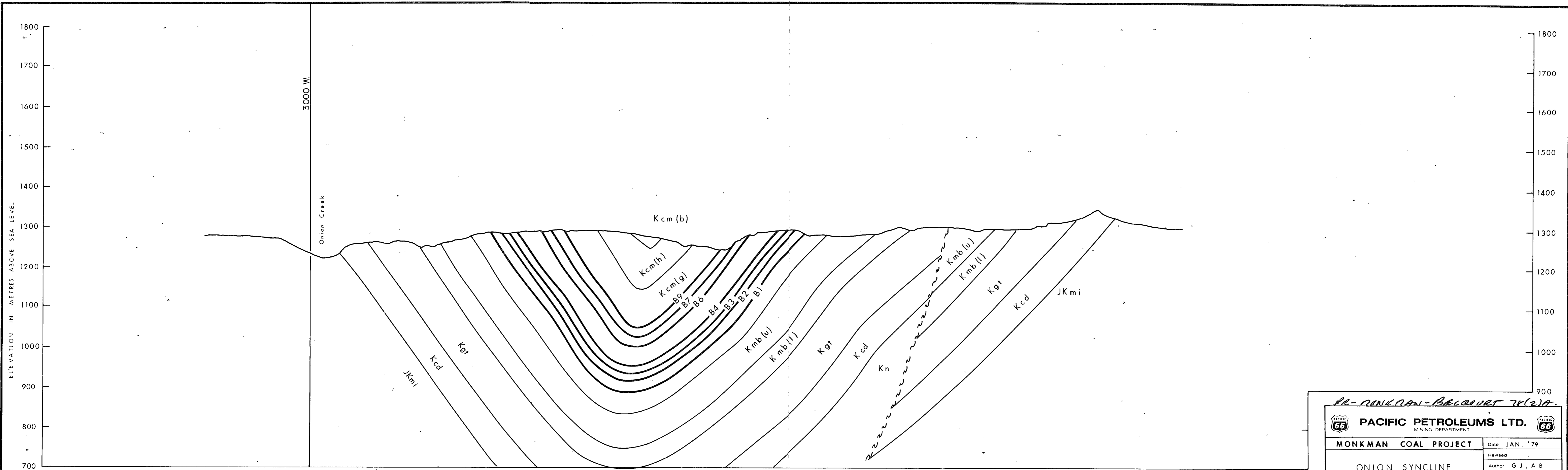


Pre-Northern-Bellevue 78(2)A

 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
Date	JAN. '79
Revised	
Author	G J, A B
Drafted	J.W.K.
DRWG.	II.4-3.2

ONION SYNCLINE
CROSS SECTION 12,000N

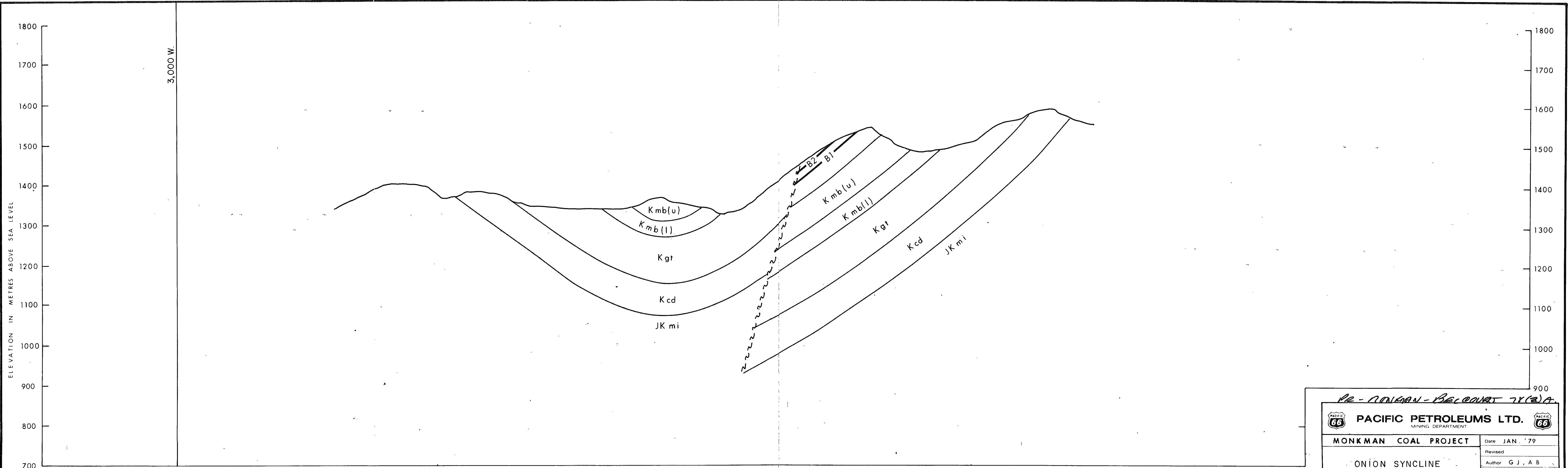
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543

PR-MONKMAN-BELLEVUE 78(2)A.

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
Date JAN. '79	Revised
Author G J, A B	Drafted J W K
ONION SYNCLINE	
CROSS SECTION 11,000N	
DRWG. II.4-3.2	



PR - RONKMAN - BELCOURT 7Y(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN. '79
	Revised
	Author G J, A B
	Drafted J W K
	DRWG. II.4-3.3

ONION SYNCLINE

CROSS SECTION 10000N

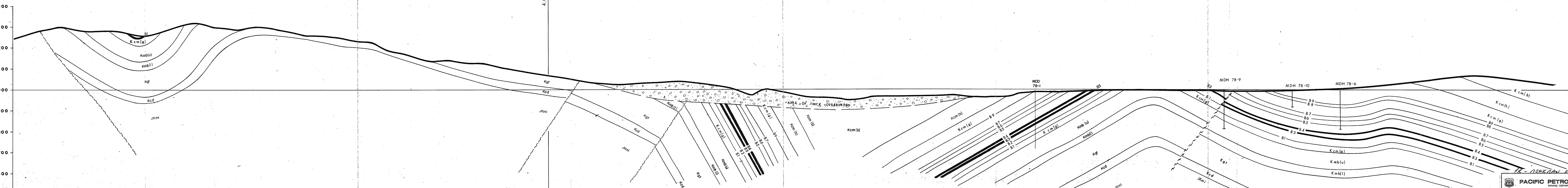
543

ELEVATION IN METRES ABOVE SEA LEVEL

1400
1300
1200
1100
1000
900
800
700
600
500
400

4,000 E

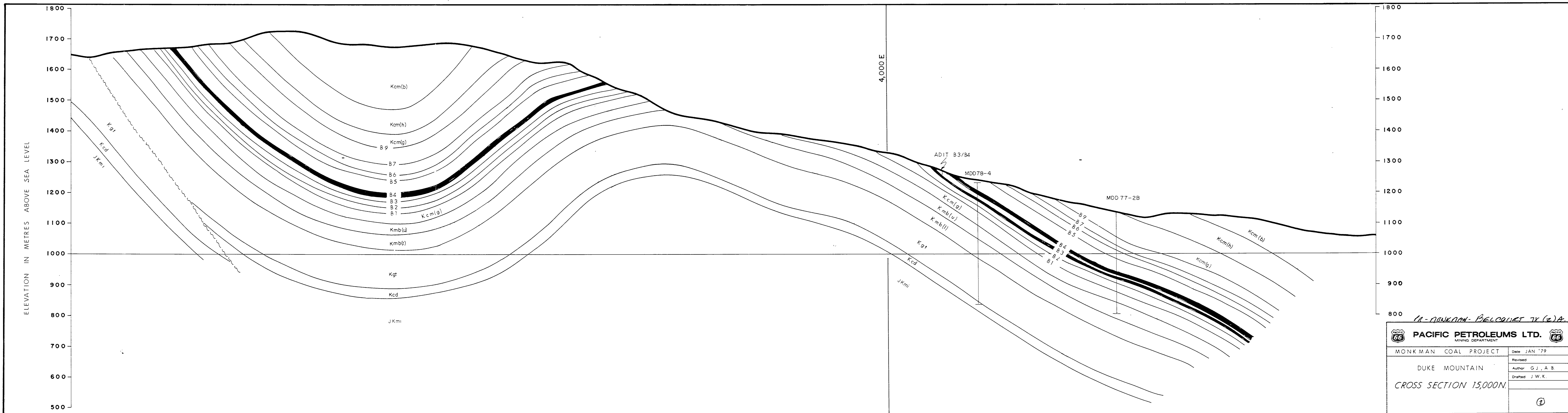
1400
1300
1200
1100
1000
900
800
700



PK - CONKAW BELLEVUE 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. '79
DUKE MOUNTAIN	Revised Author G.J., A.B.
CROSS SECTION 17,000N.	Drafted J.W.K.

543

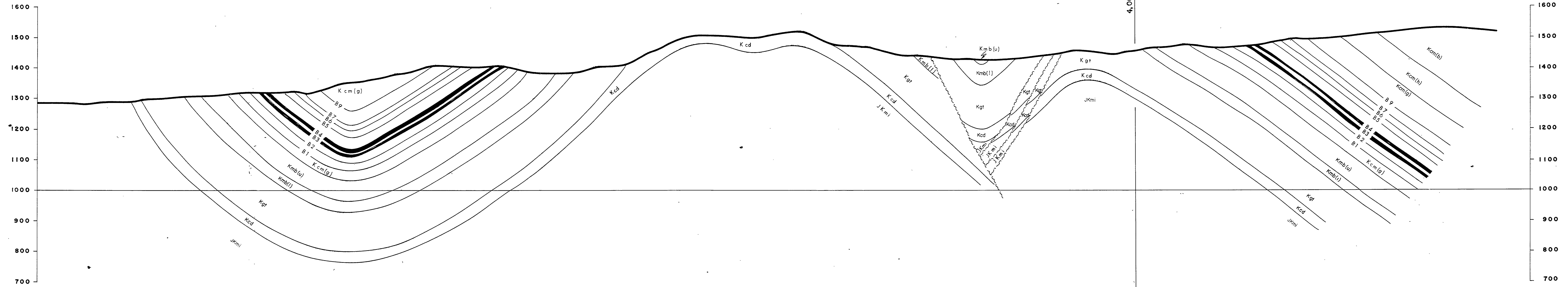


11-NANKOW-BELCOUET 7X (2) A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN '79
	Revised
DUKE MOUNTAIN	Author G. J., A. B.
CROSS SECTION 15,000N.	Drafted J. W. K.
	(2)

543

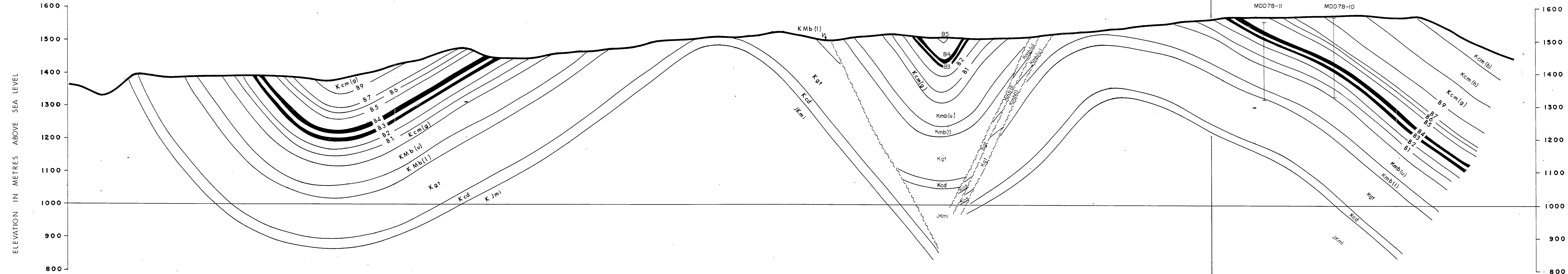
ELEVATION IN METRES ABOVE SEA LEVEL



543

PR-DONKON BELCOUET 78(2)A

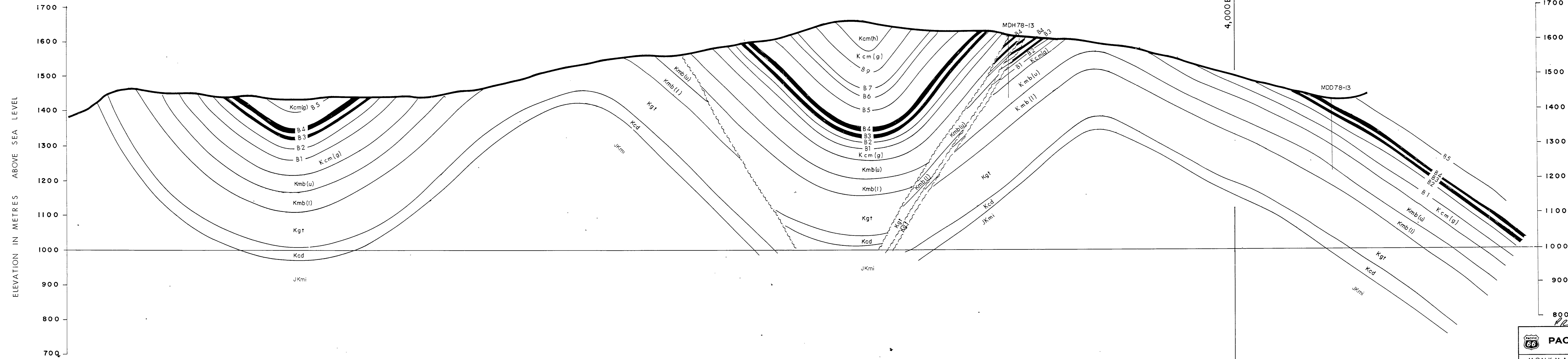
PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. '79
	Revised
DUKE MOUNTAIN	Author G.J., A. B.
CROSS SECTION 12,500N.	Drafted J.W.K.
	②



PR - MONKMAN BELCOUET 7121A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. '79
DUKE MOUNTAIN	Revised
CROSS SECTION 13,000N.	Author G.J., A. B.
	Drafted J.W.K.
	④

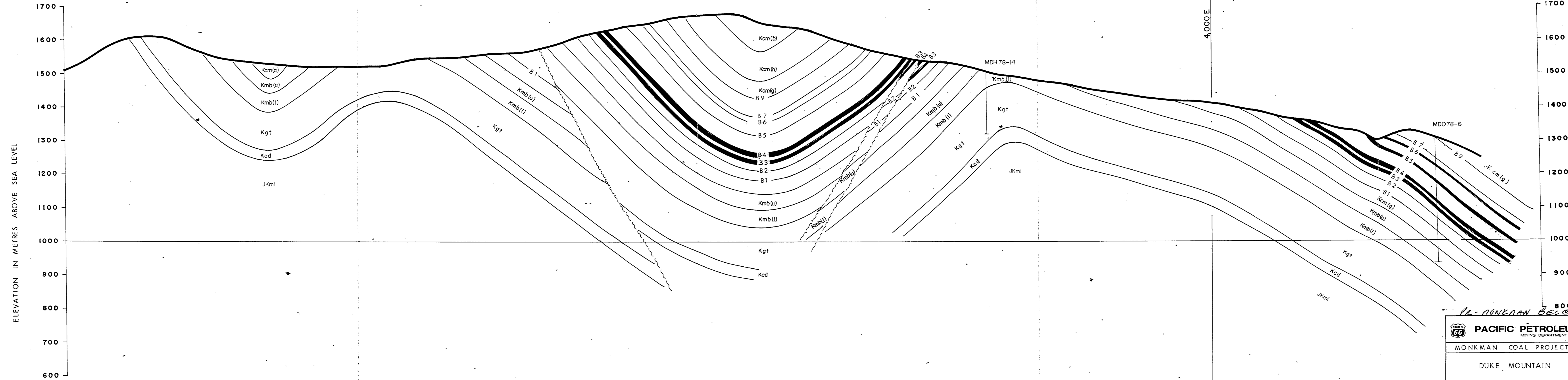
543



PR NONKMAN BELIEVER 7/12/79

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. 79
DUKE MOUNTAIN	Author G. J., A. B.
CROSS SECTION 13,500N.	Drafted J.W.K.
	(5)

543



800
10-1000000 BECCOURT 18(2)A

PACIFIC PETROLEUMS LTD.
 MINING DEPARTMENT

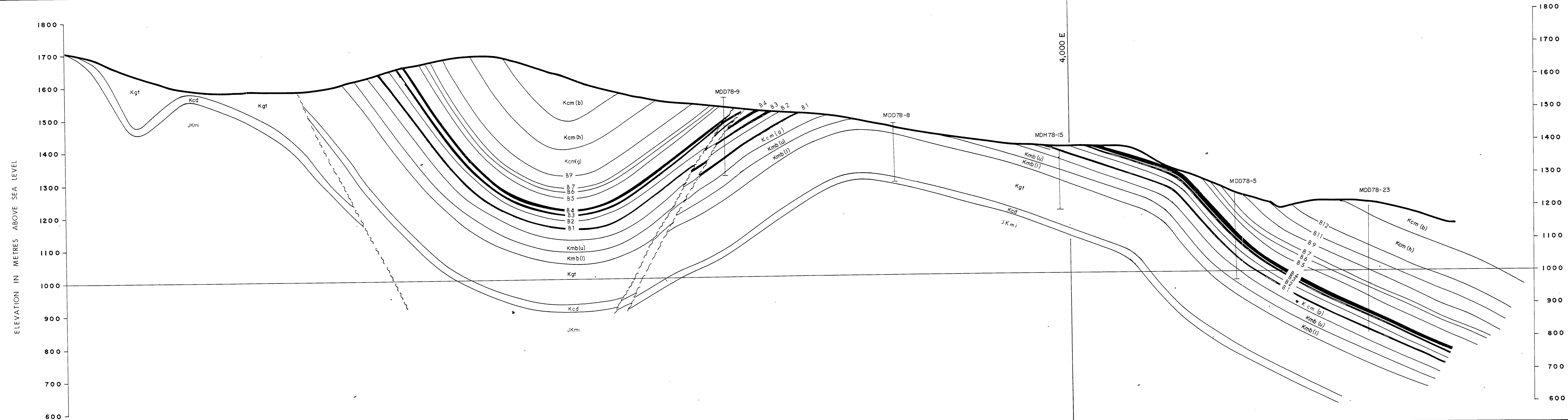
MONKMAN COAL PROJECT

DUKE MOUNTAIN
 CROSS SECTION 14,000N.

Date	JAN. '79
Revised	
Author	G.J., A.B.
Drafted	J.W.K.

6

543

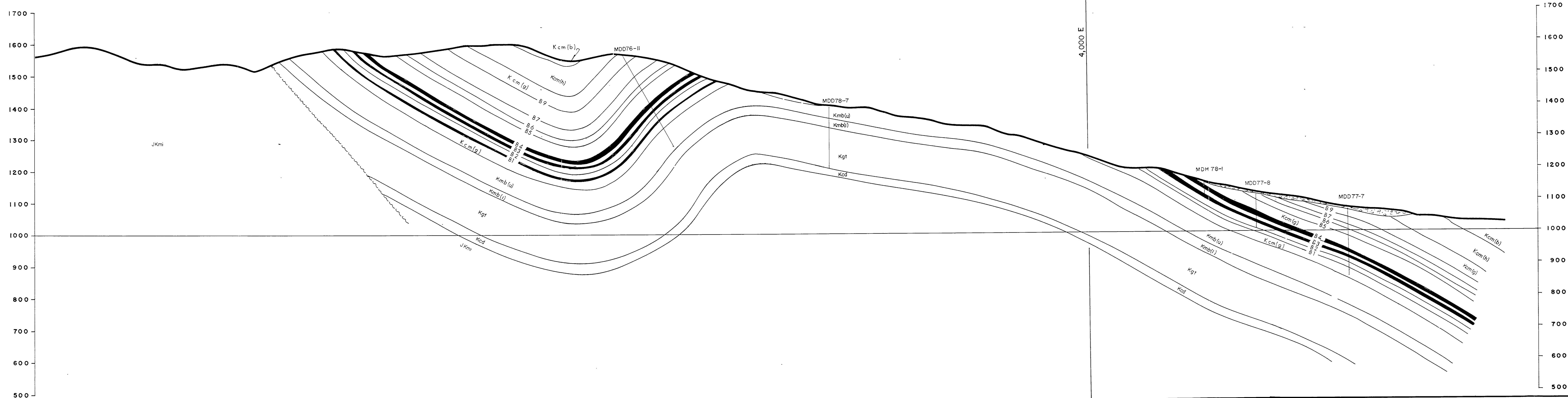


543

12- DONKMAN BELCOUET 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. '79
DUKE MOUNTAIN	Revised
CROSS SECTION 14,500N.	Author G. J. A. B.
	Drafted J. W. K.
	①

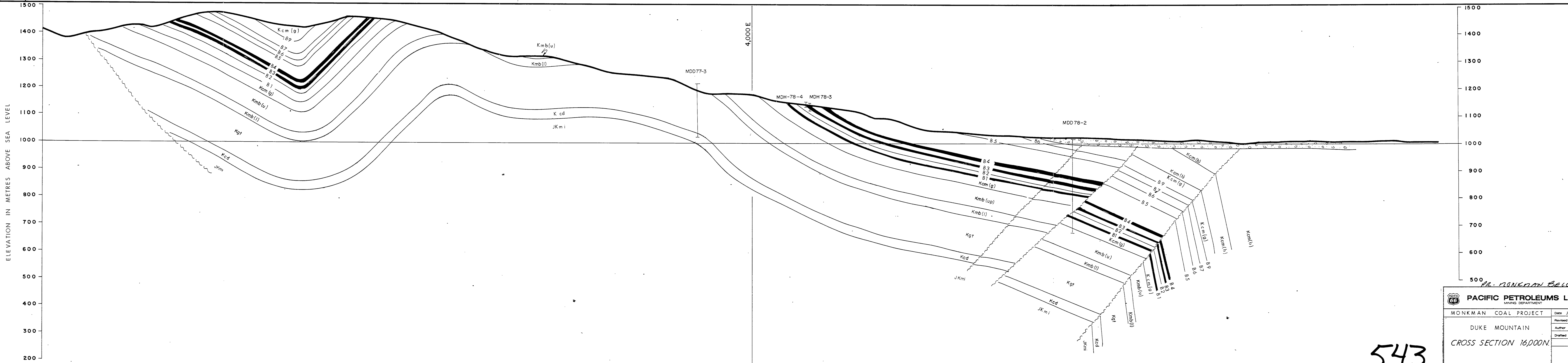
ELEVATION IN METRES ABOVE SEA LEVEL



543

PR - MONKMAN - BELLEVUE 78(2) A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. '79
DUKE MOUNTAIN	Revised
CROSS SECTION 15,500N.	Author G. J., A. B.
	Drafted J. W. K.



543

AL. MONKMAN BELCOURT

78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date JAN. '79	
Author G. J., A. B.	
Drafter J. W. K.	
DUKE MOUNTAIN	
CROSS SECTION 16,000N.	

ELEVATION IN METRES ABOVE SEA LEVEL



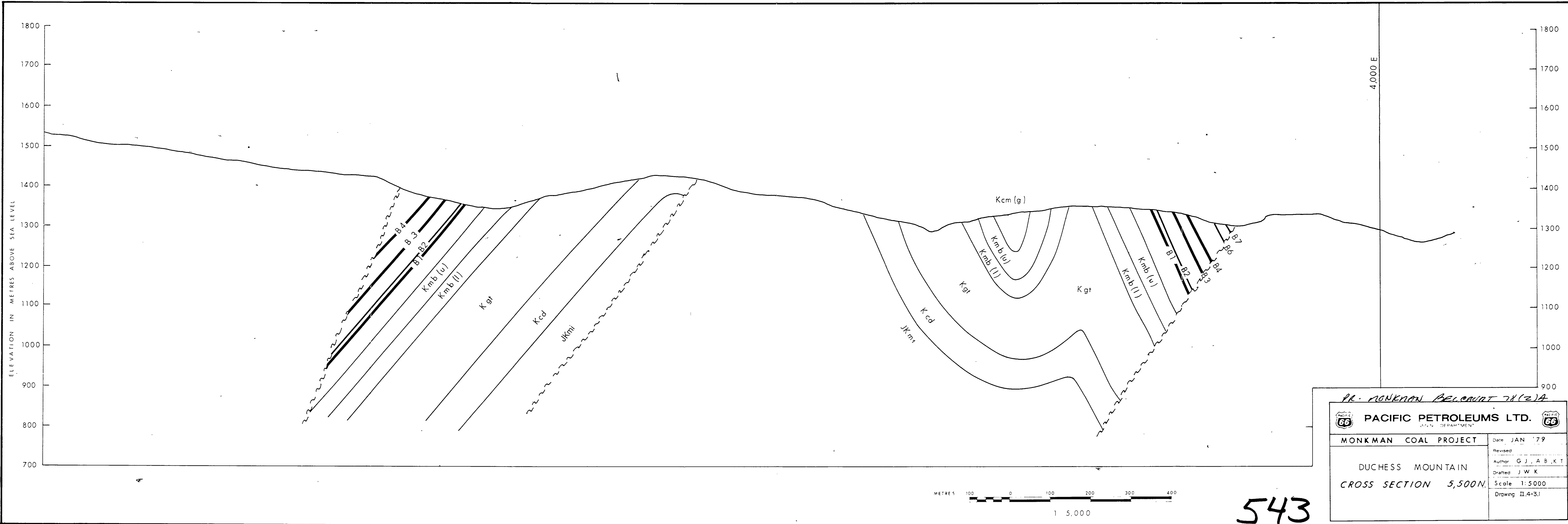
PR-DONKMAN BECCOYET
78(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN. '79
	Revised
DUKE MOUNTAIN	Author G.J., A.B.
CROSS SECTION 16,500N.	Drafted J.W.K.

(10)

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PR. MONKMAN BELCAVAT 78(2)A

PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date: JAN '79	Revised:
Author: G J, A B, K T	Drafted: J W K
Scale: 1:5000	Drawing: II.4-3.1

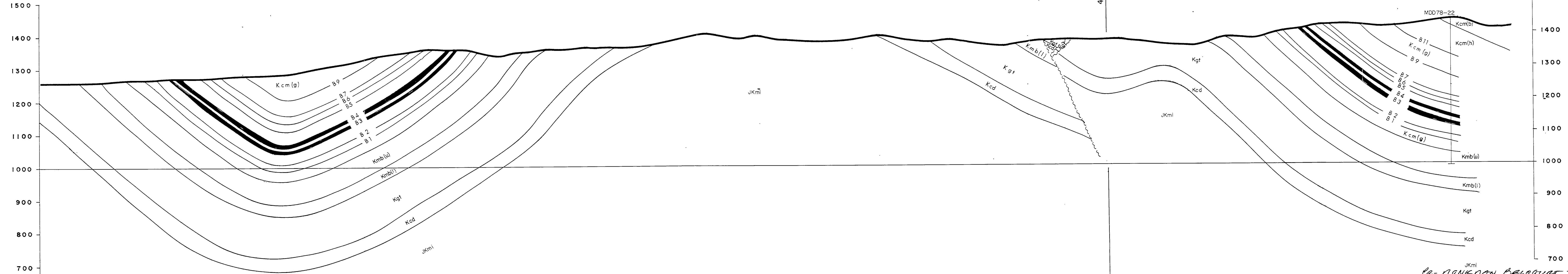
543

ELEVATION IN METRES ABOVE SEA LEVEL

1500
1400
1300
1200
1100
1000
900
800
700
600

4,000E

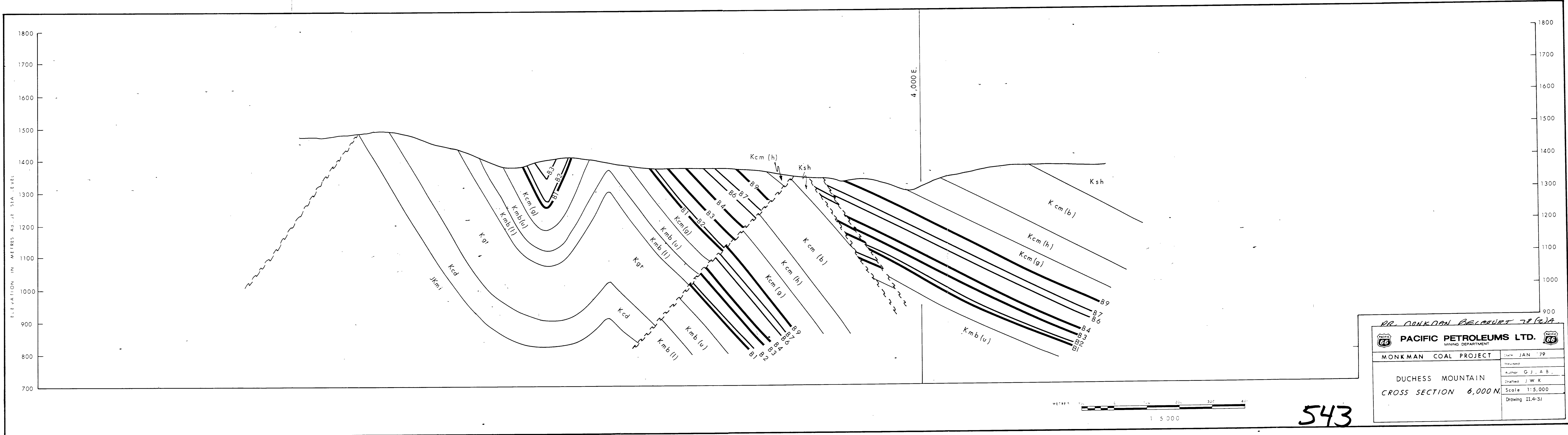
1500
1400
1300
1200
1100
1000
900
800
700



JKmi
PR- NONKMAN BELGIUM 78/22

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. 79
DUKE MOUNTAIN	Revised
CROSS SECTION 12,000N.	Author G. J., A. B.
	Drafted J. W. K.
	(1)

543

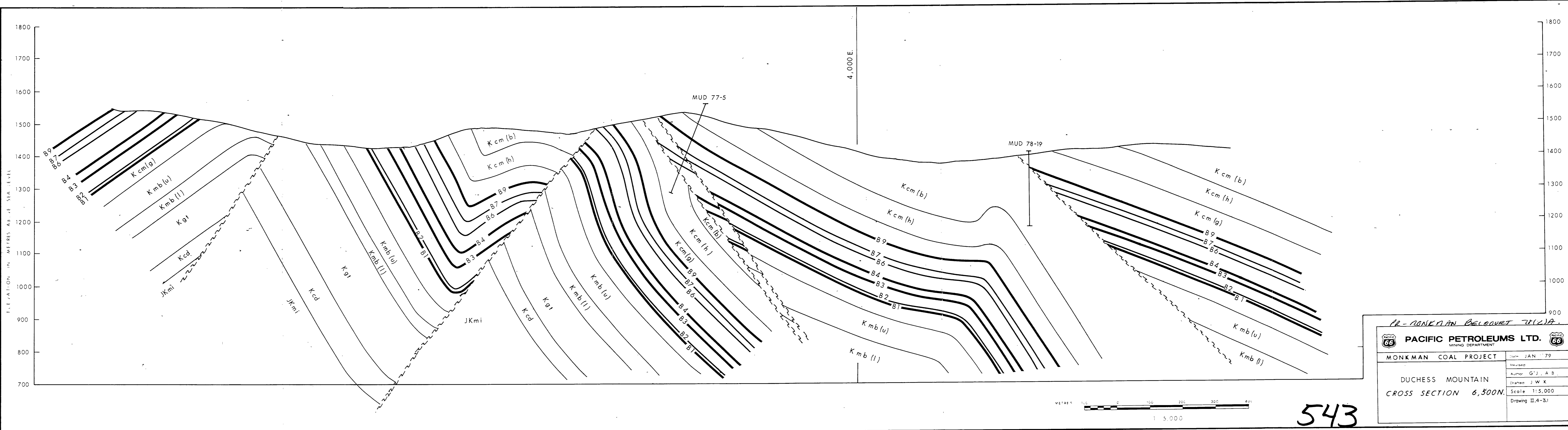


RR. DONKON BELCOURT 78 (2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date: JAN '79
	Revised:
	Author: G J, A B,
	Drafted: J W K
DUCHESS MOUNTAIN	Scale: 1:5,000
CROSS SECTION 6,000 N.	Drawing: II.4-31

543



PR-RONKLAN BELLEVILLE 28(2)A.

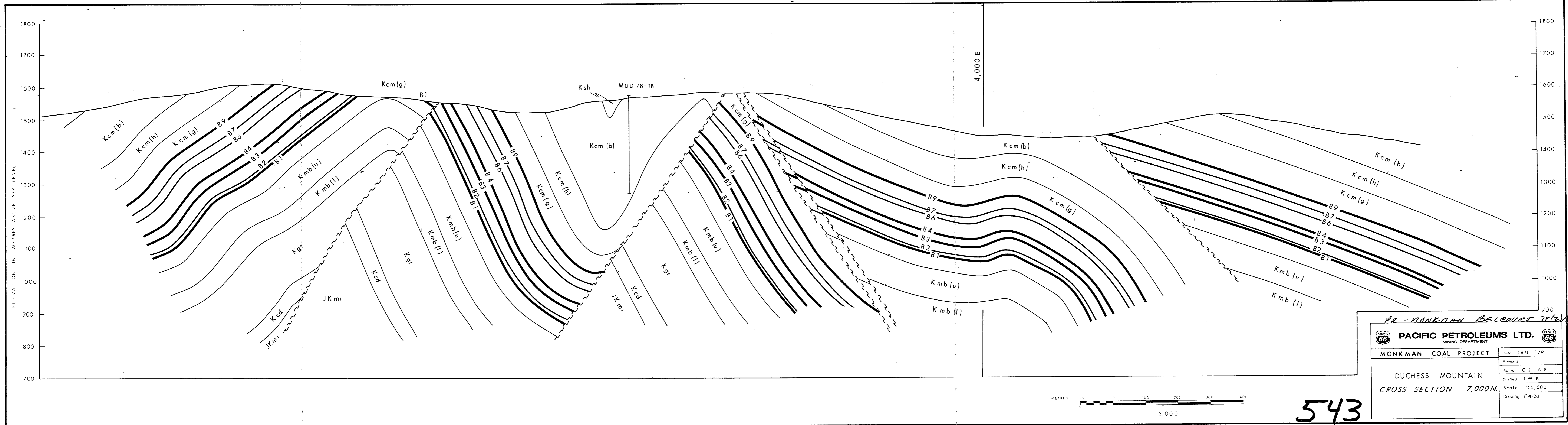
PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT

DUCHESS MOUNTAIN
CROSS SECTION 6,500N.

Date	JAN '79
Revised	
Author	G.J., A.B.
Drafted	J.W.K.
Scale	1:5,000
Drawing	II.4-3.1

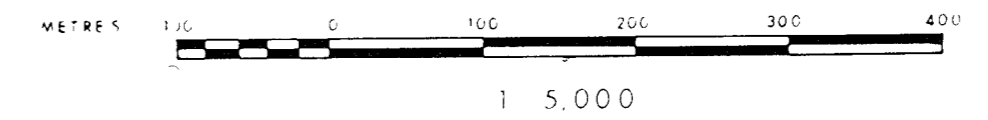
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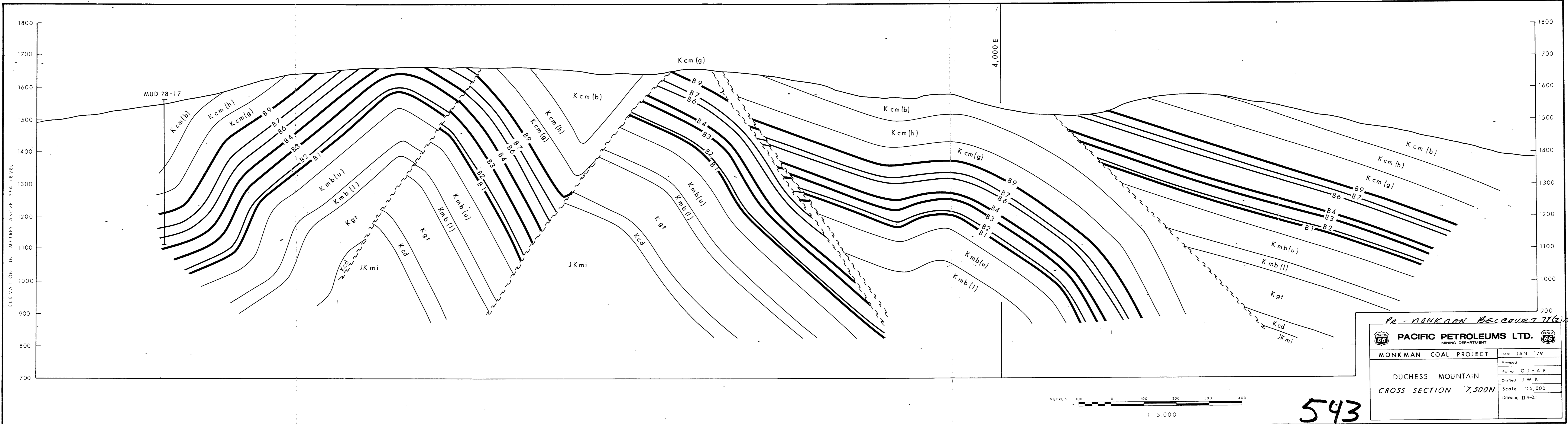


PA - NONKMAN BELCOURT 78(2)

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN '79
	Revised
	Author G J, A B
	Drafted J W K
	Scale 1:5,000
	Drawing II.4-3.I

543

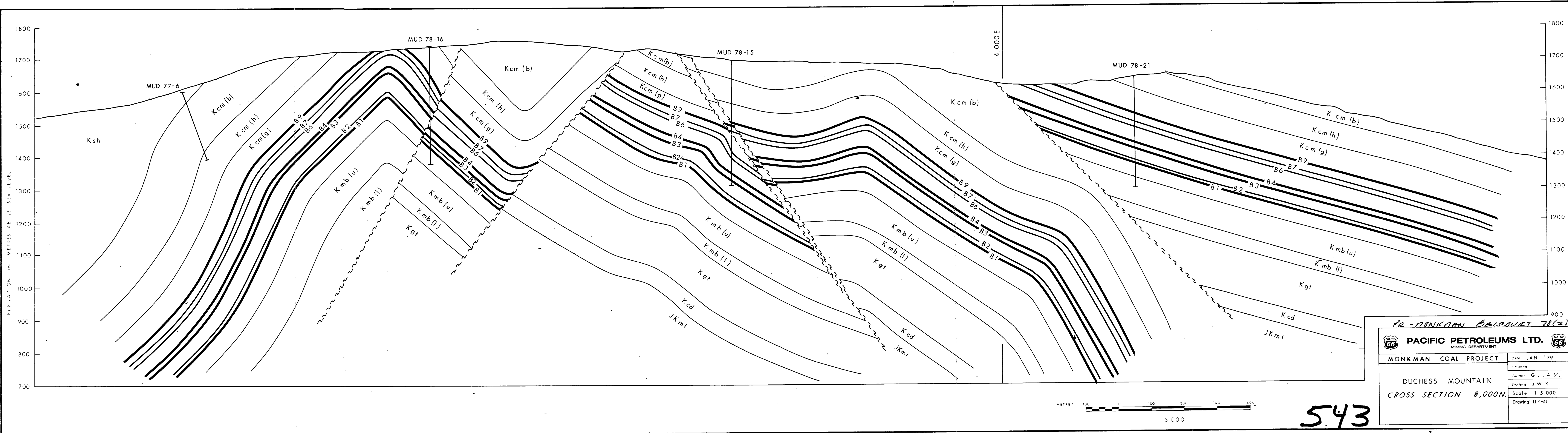




PR - NONKMAN BELCOURT 78(2)

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
Date: JAN '79	Revised
Author: G J ; A B .	Drafted: J W K
Scale: 1:5,000	Drawing: II.4-31
DUCHESS MOUNTAIN CROSS SECTION 7,500N.	

543

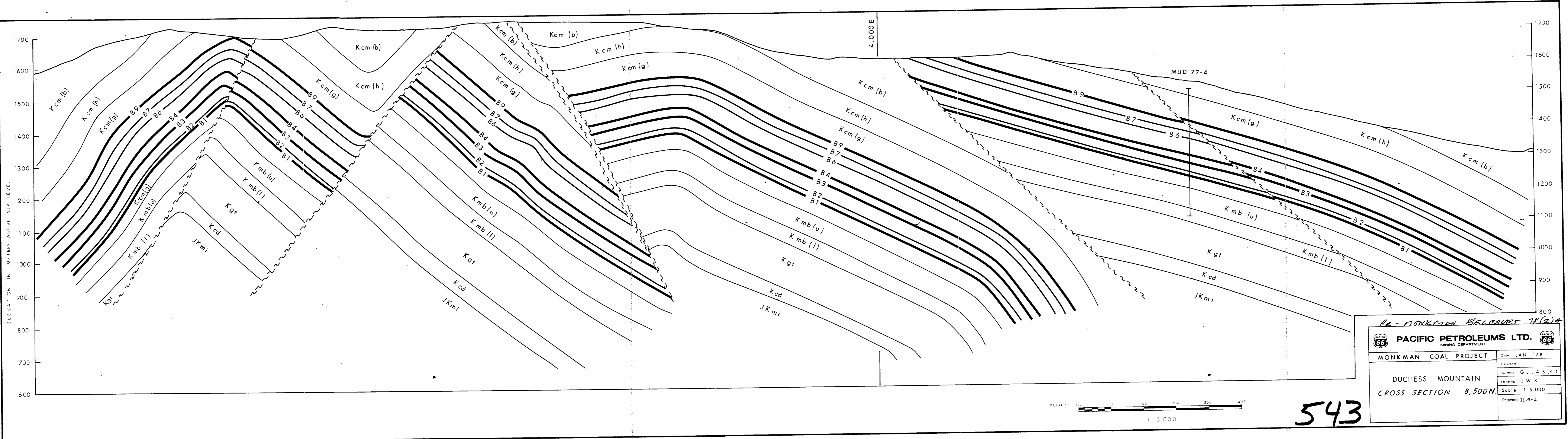


PR-MONKMAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN '79
	Revised
	Author G J, A B
	Drafted J W K
	Scale 1:5,000
	Drawing II.4-31

543

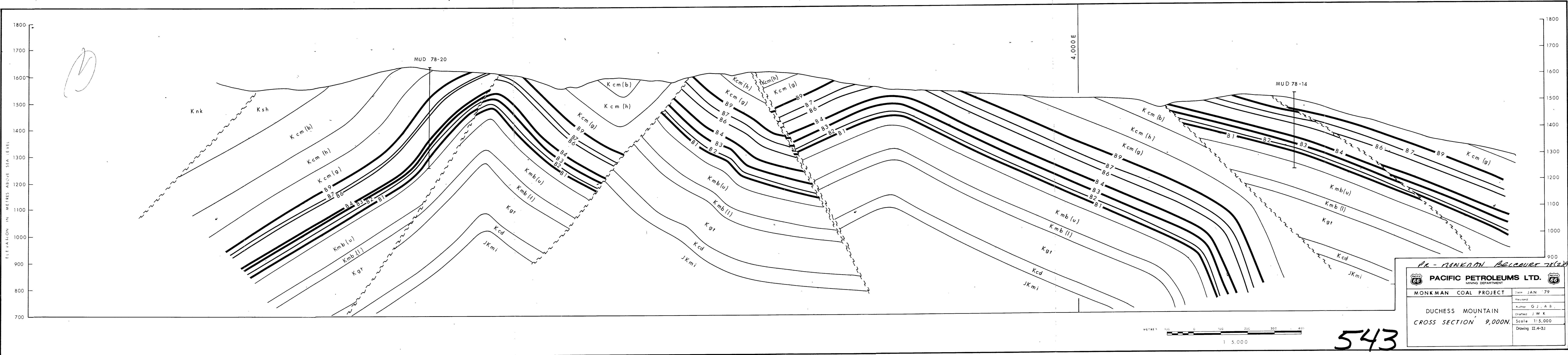


PR - MONKMAN BECCOURT 78(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT		Date JAN '78
DUCHESS MOUNTAIN		Revised
CROSS SECTION 8,500N.		Author G J , A B , K T
		Drafted J W K
		Scale 1:5,000
		Drawing II.4-31

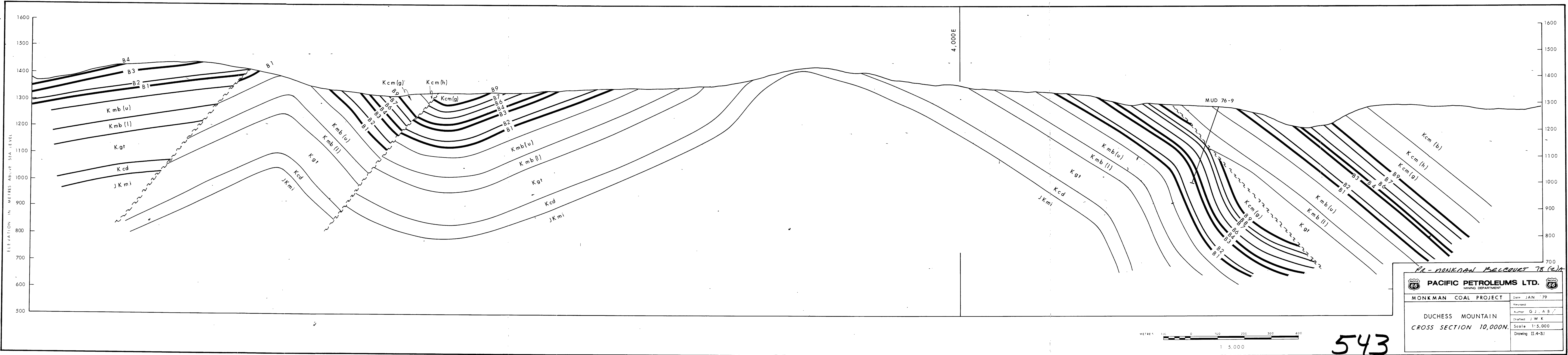
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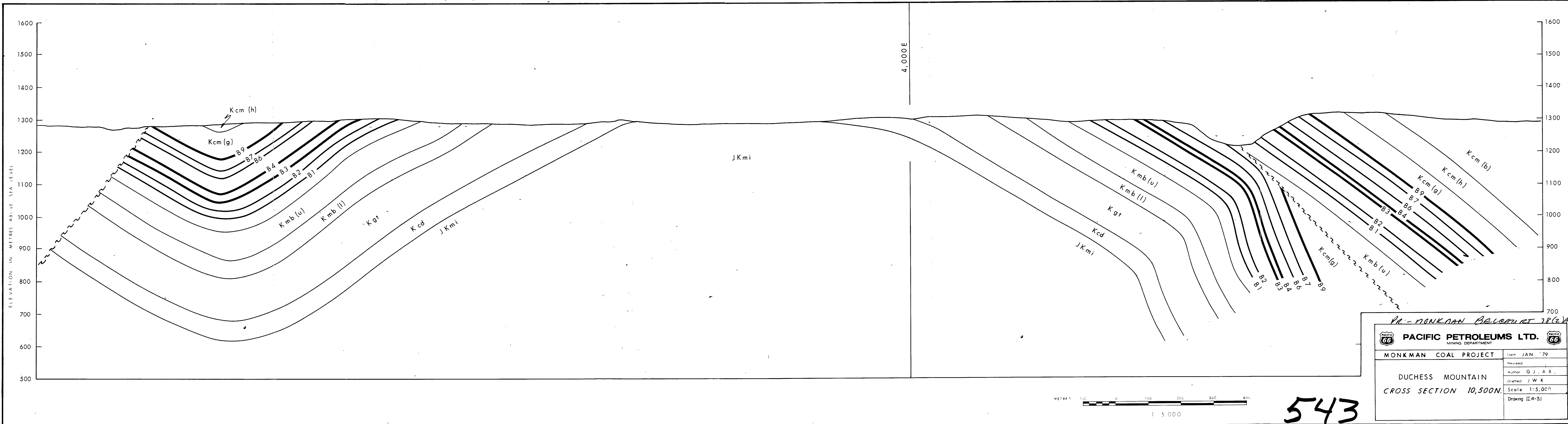


PR - MONKMAN BELCOURT 78(2)

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN '79
	Revised
	Author G J . A B .
	Drafted J W K
DUCHESS MOUNTAIN CROSS SECTION 9,000N.	Scale 1:5,000
	Drawing II.4-3.1

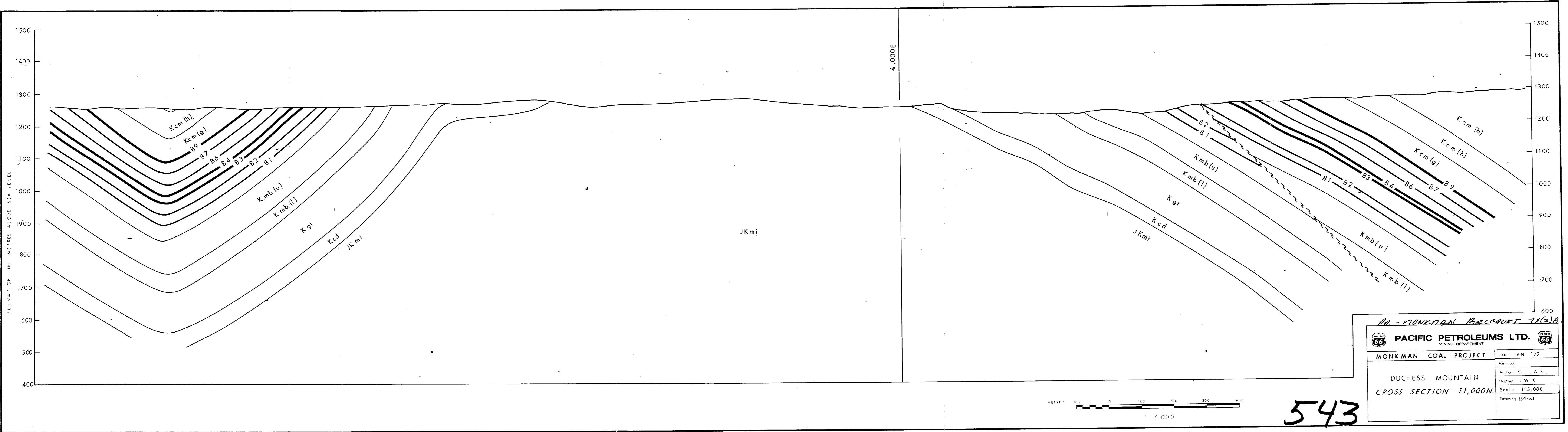
543





PA-MONKMAN BELMONT 28(2)A

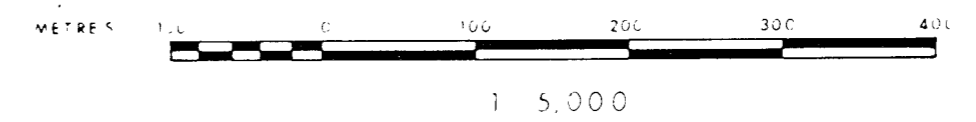
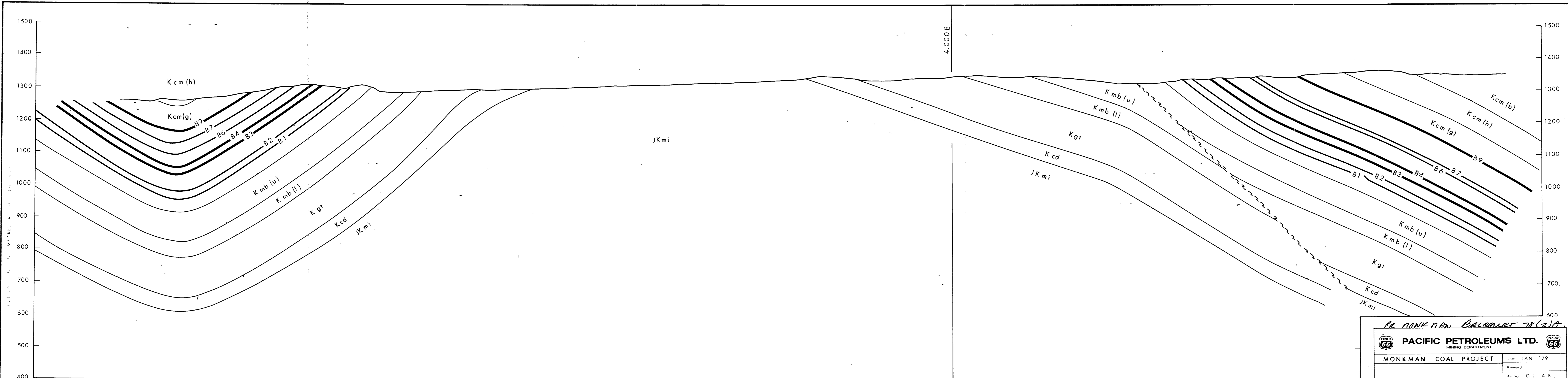
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN '79
	Revised
	Author G. J. A. B.
	Drafted J. W. K.
	Scale 1:5,000
	Drawing II.4-3.1



PA-MONKMAN BELCOURT 71(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date: JAN '79
	Revised
	Author: G. J. A. B.
	Drafted: J. W. K.
DUCHESS MOUNTAIN	Scale: 1:5,000
CROSS SECTION 11,000N.	Drawing: II-4-31

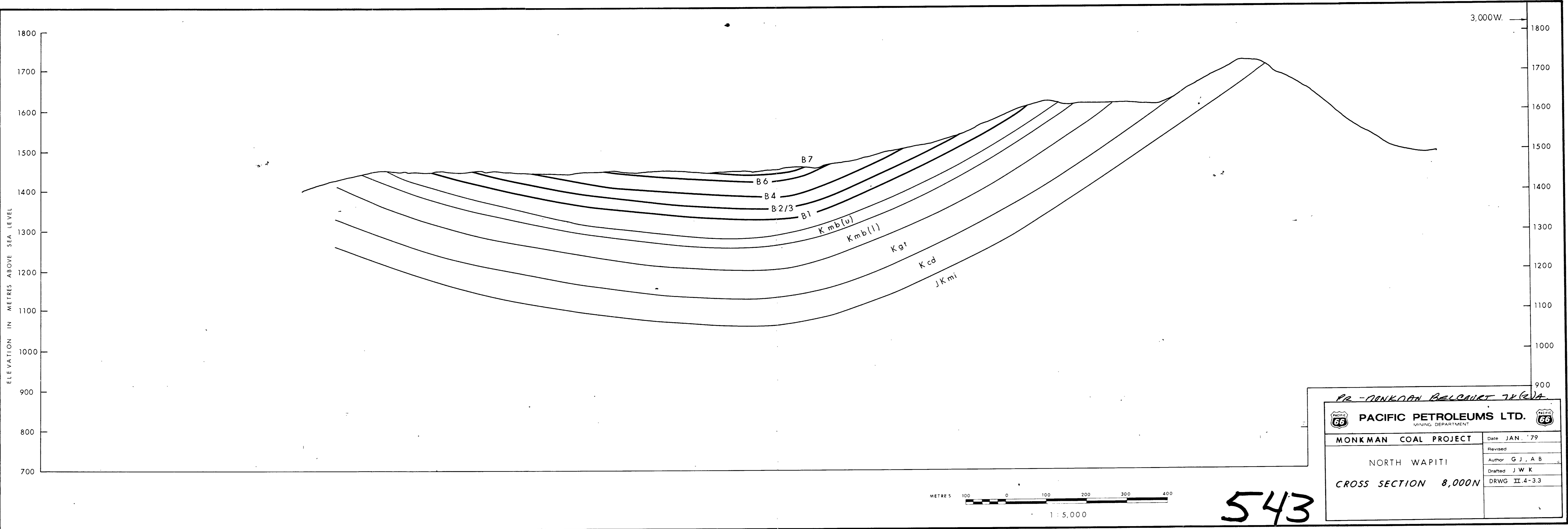
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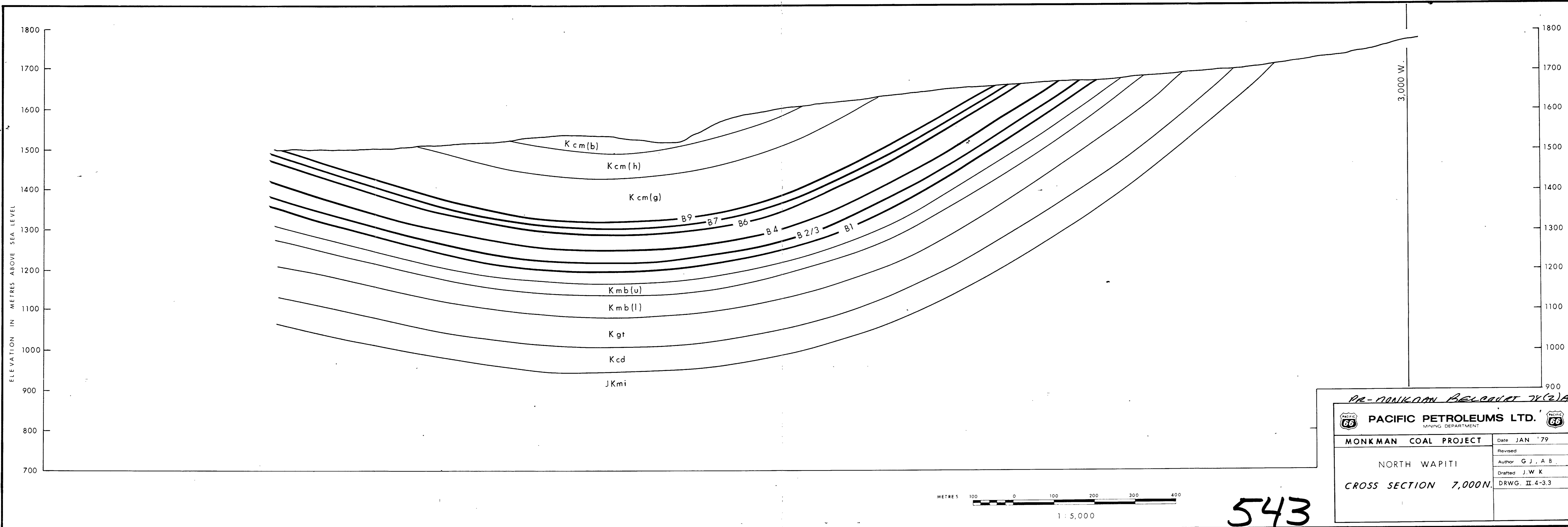


LA NONK DON BELEWER 11(2)A



PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	DATE JAN '79
	Revised
	Author G. J. A. B.
	Drafted J. W. K.
	Scale 1:5,000
	Drawing II-4-31

543





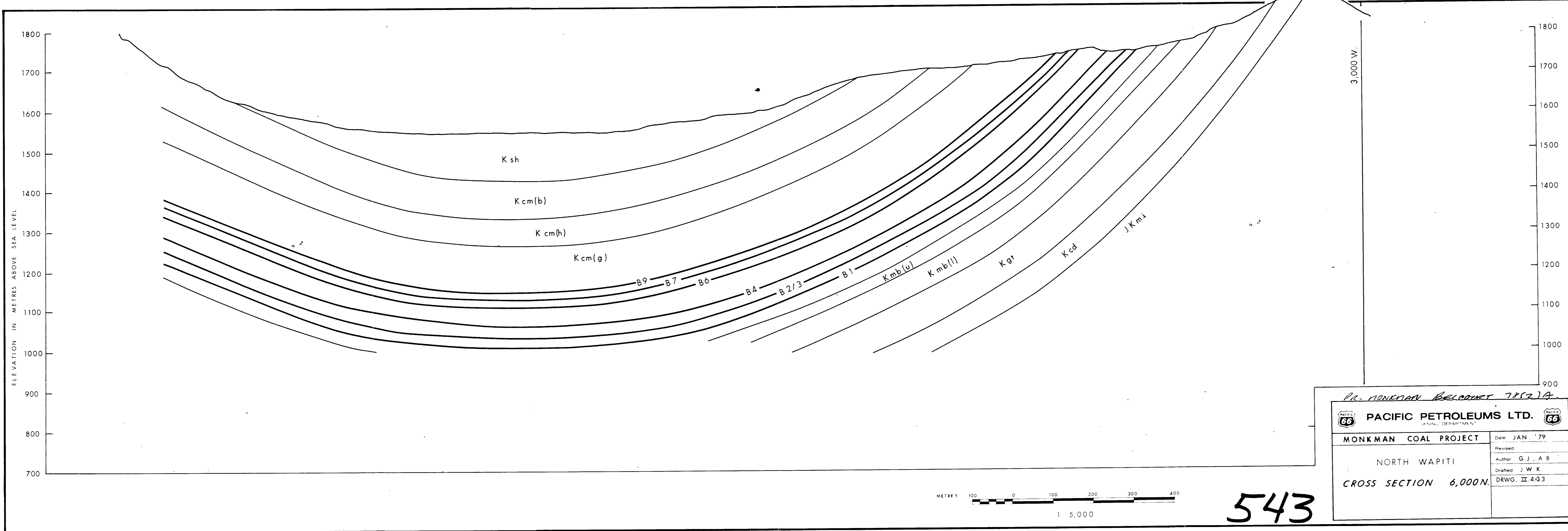
PR-MONKMAN BELCOURT 7K(2)A


PACIFIC PETROLEUMS LTD.

 MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN '79
	Revised
	Author G J, A B
	Drafted J.W.K
	DRWG. II.4-3.3

NORTH WAPITI
 CROSS SECTION 7,000N.

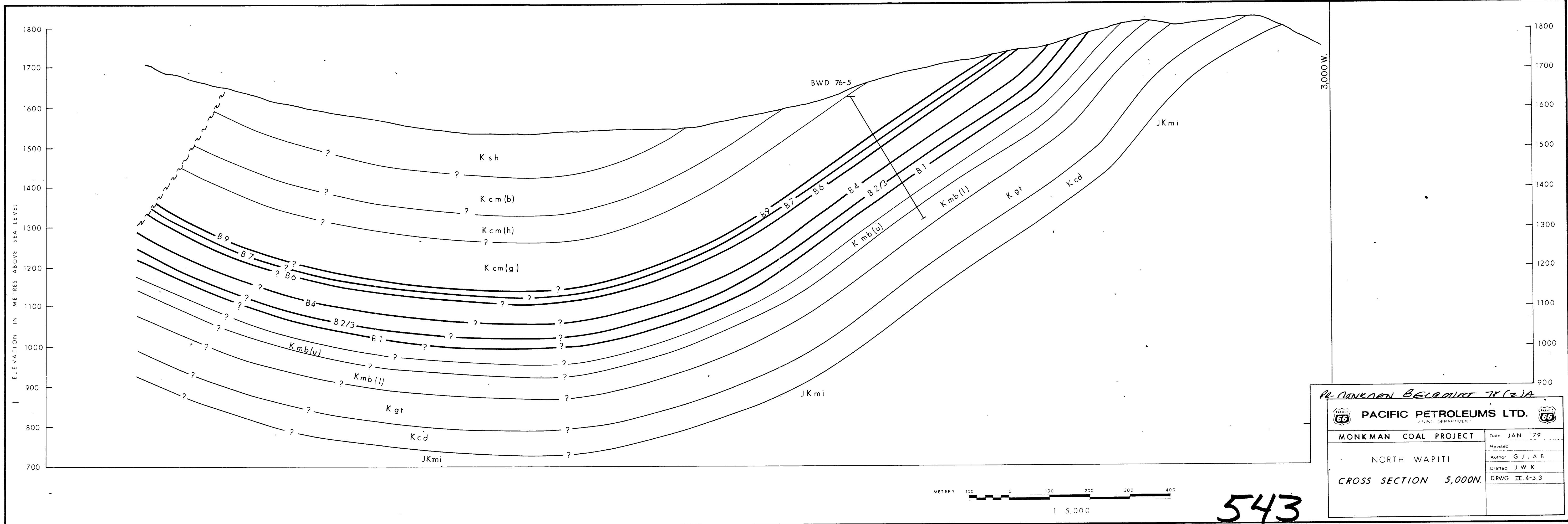
543



PL. NONNAN BELCOURT 78(2)A.

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
NORTH WAPITI	
CROSS SECTION 6,000N.	
Date JAN '79	
Revised	
Author G J, A B	
Drafted J W K	
DRWG. II.4-33	

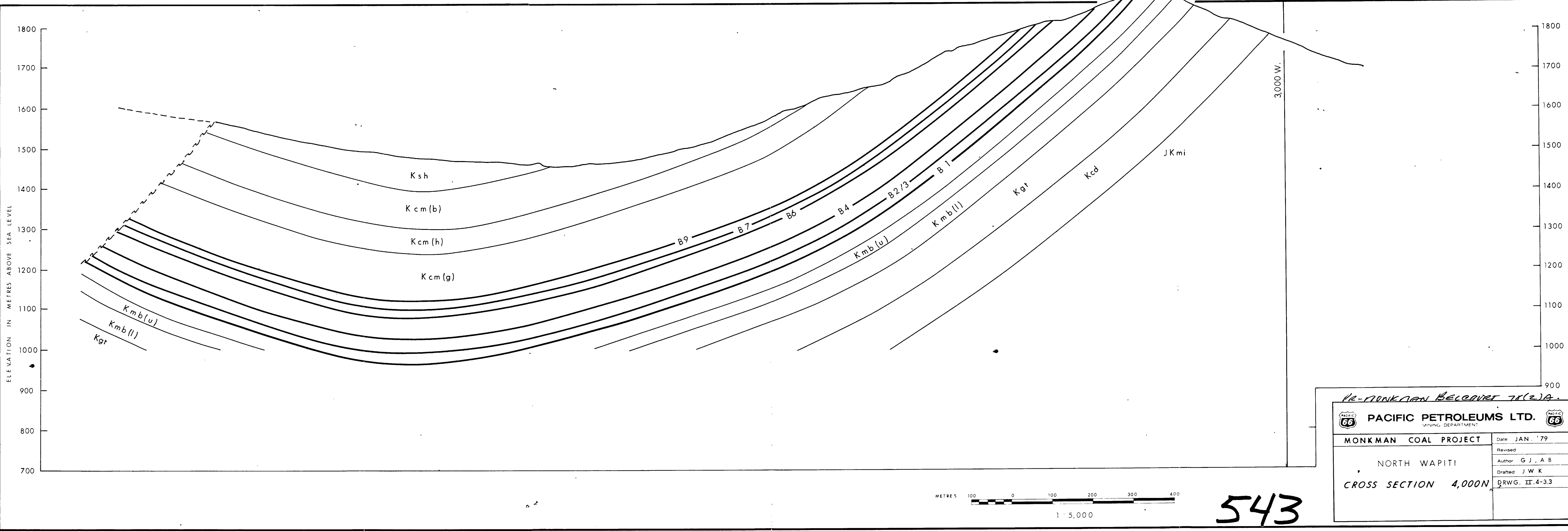
543



McMANNAN BELLEAIR TR (2) A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN '79
NORTH WAPITI	Revised
CROSS SECTION 5,000N.	Author G J, A B
	Drafted J W K
	DRWG. II.4-3.3

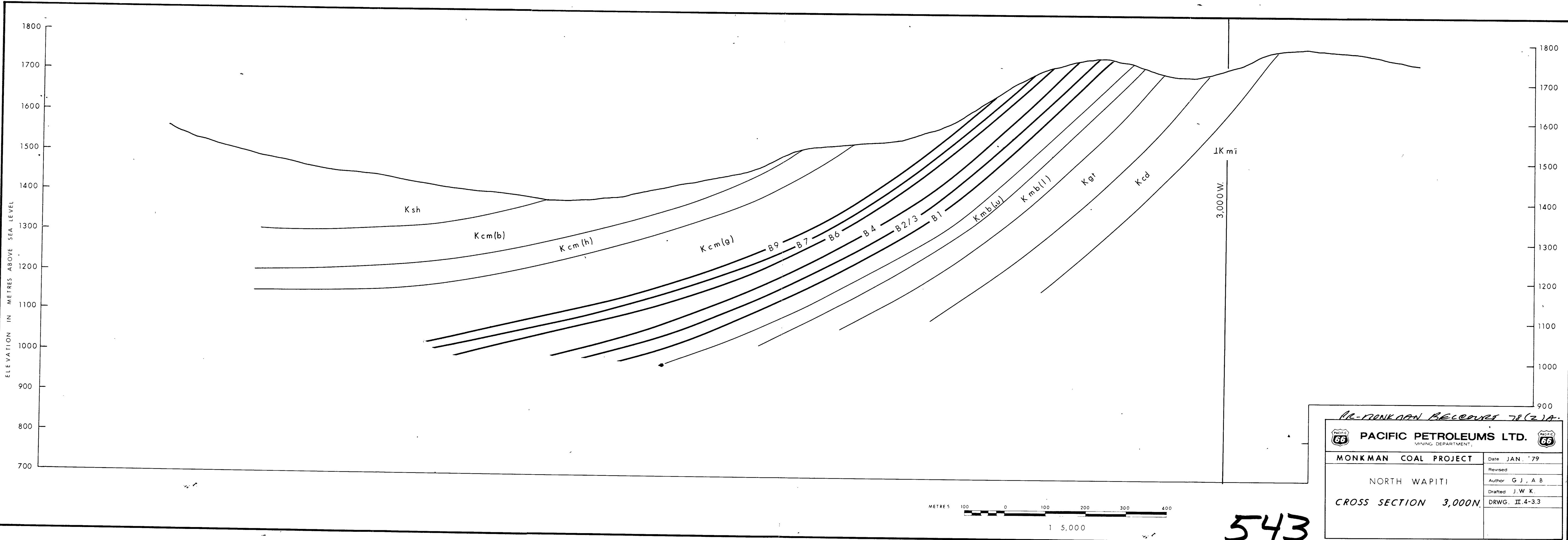
543



Pre-Monkman Belvedere 71(2)A.

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
NORTH WAPITI	
CROSS SECTION 4,000N	
Revised	
Author G J, A B	
Drafted J W K	
DRWG. II.4-3.3	

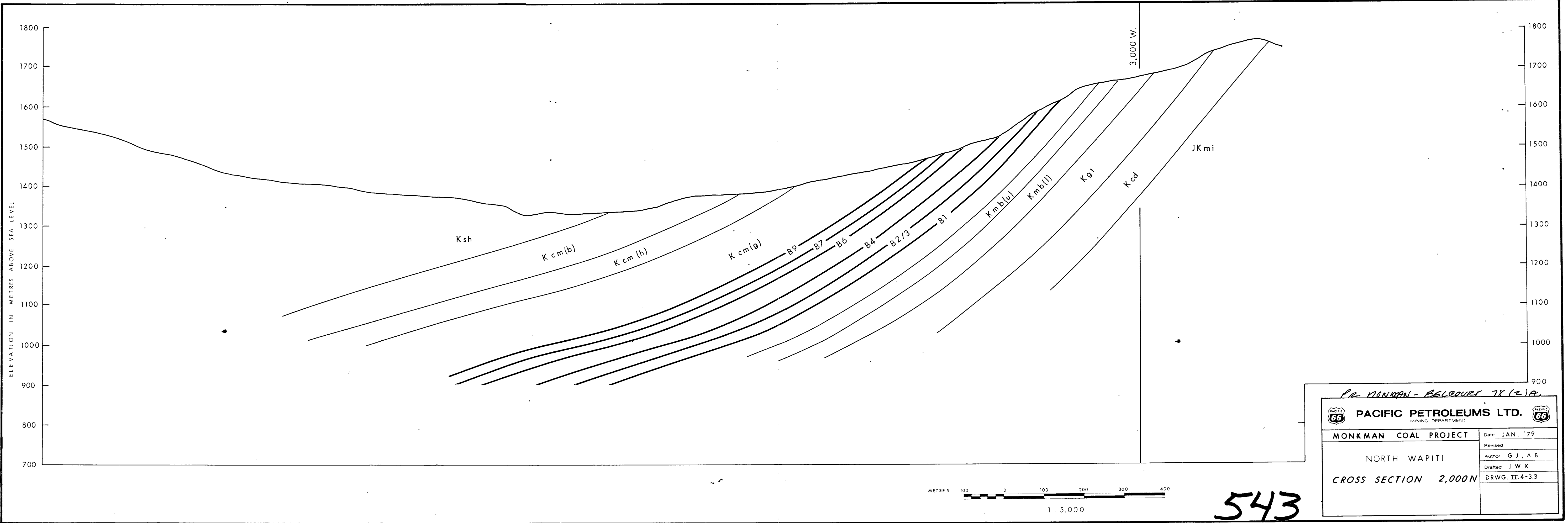
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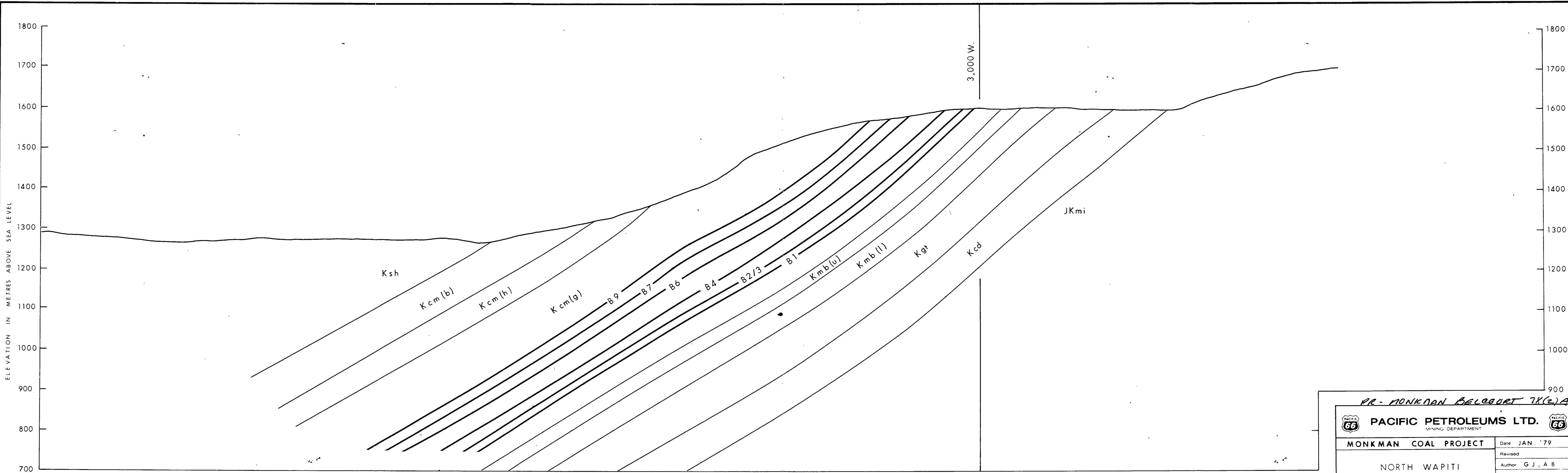
RR-DONKADAN BELCOURE 78(2)A.

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
	Date JAN. '79
	Revised
	Author G J, A B
	Drafted J.W.K.
	DRWG. II.4-3.3

543



543



PR - MONKMAN BELLEFORT 78(2)A

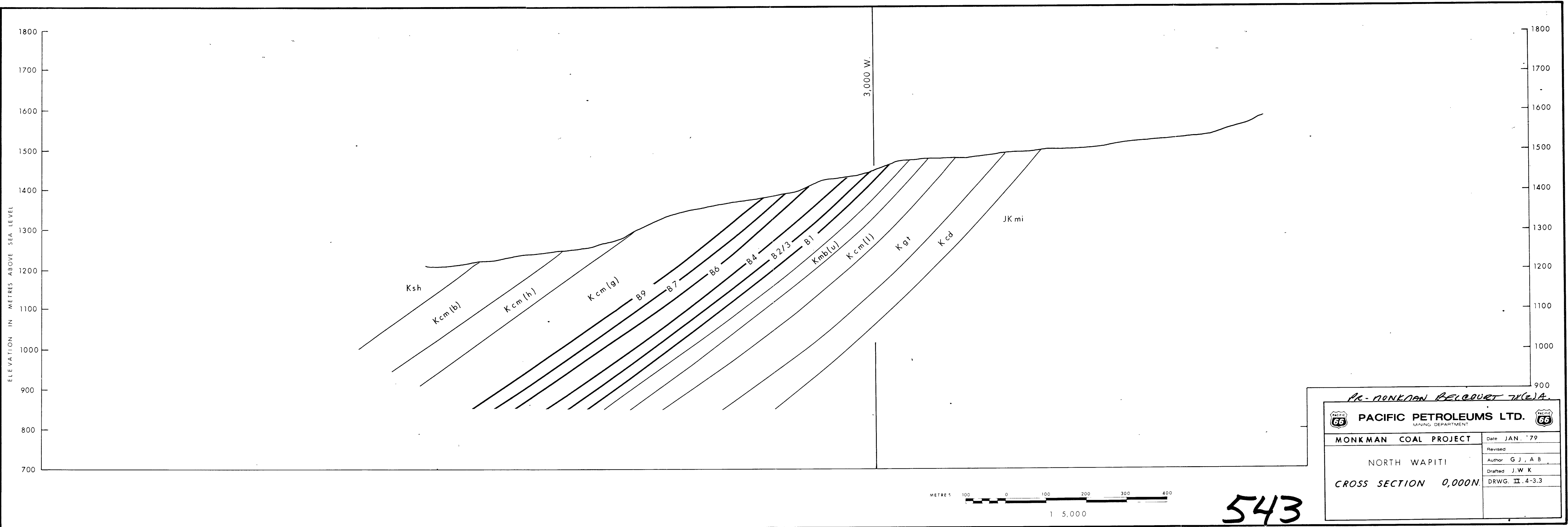
PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN. '79
	Revised
	Author G J, A B
	Drafted J.W.K
	DRWG. II.4-3.3

NORTH WAPITI

CROSS SECTION 1,000N

543



PR. NONKON BELCOURT 71(e)A.

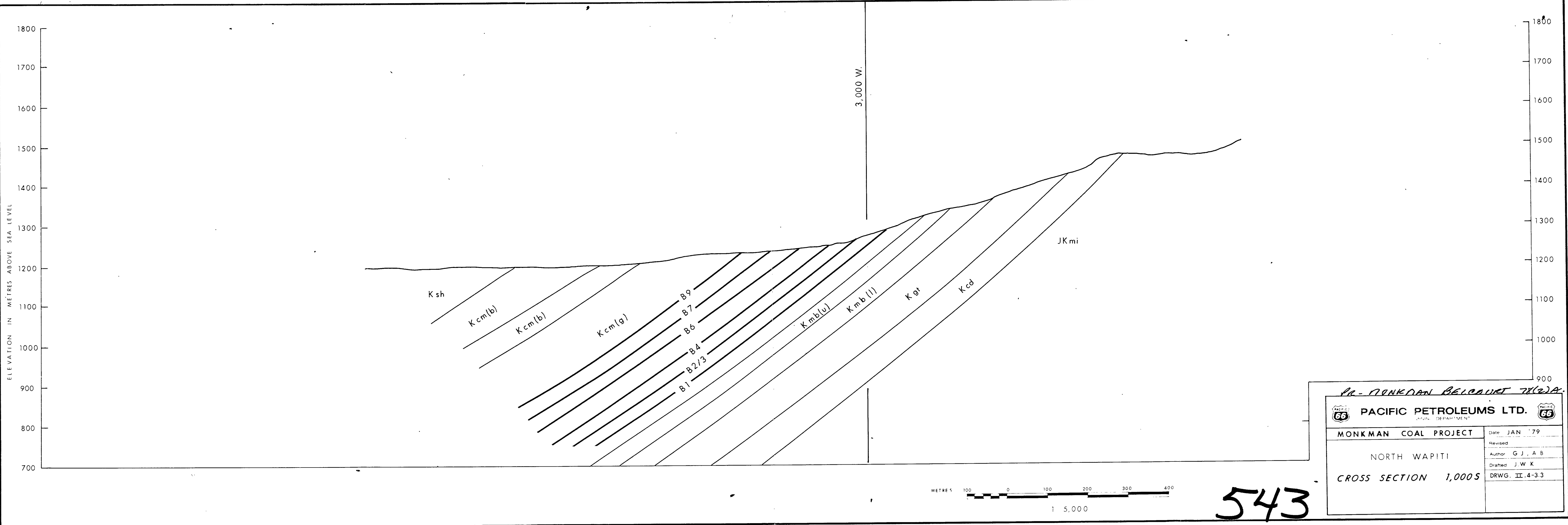
PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN. '79
	Revised
	Author G J, A B
	Drafted J.W K
	DRWG. II. 4-3.3

NORTH WAPITI

CROSS SECTION 0,000N.

543

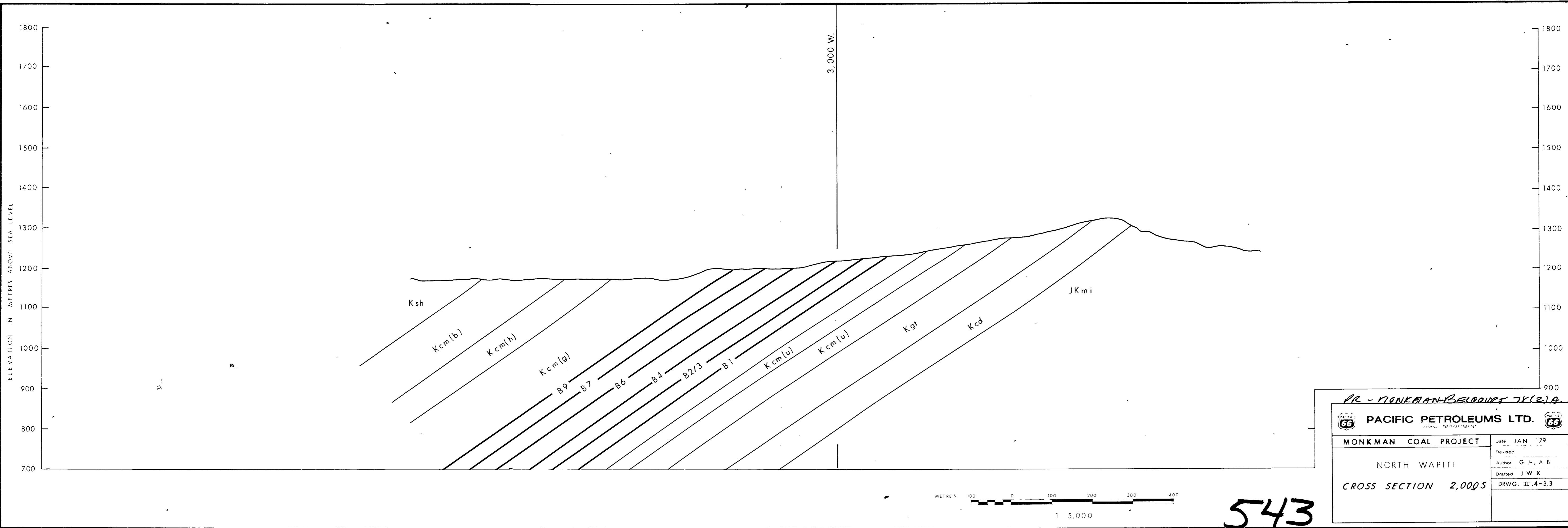


PR-NONKEDAN BELCAVET 78(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date: JAN '79
NORTH WAPITI	Revised
	Author: G J, A B
	Drafted: J, W K
CROSS SECTION 1,000S	DRWG. II.4-3.3

543

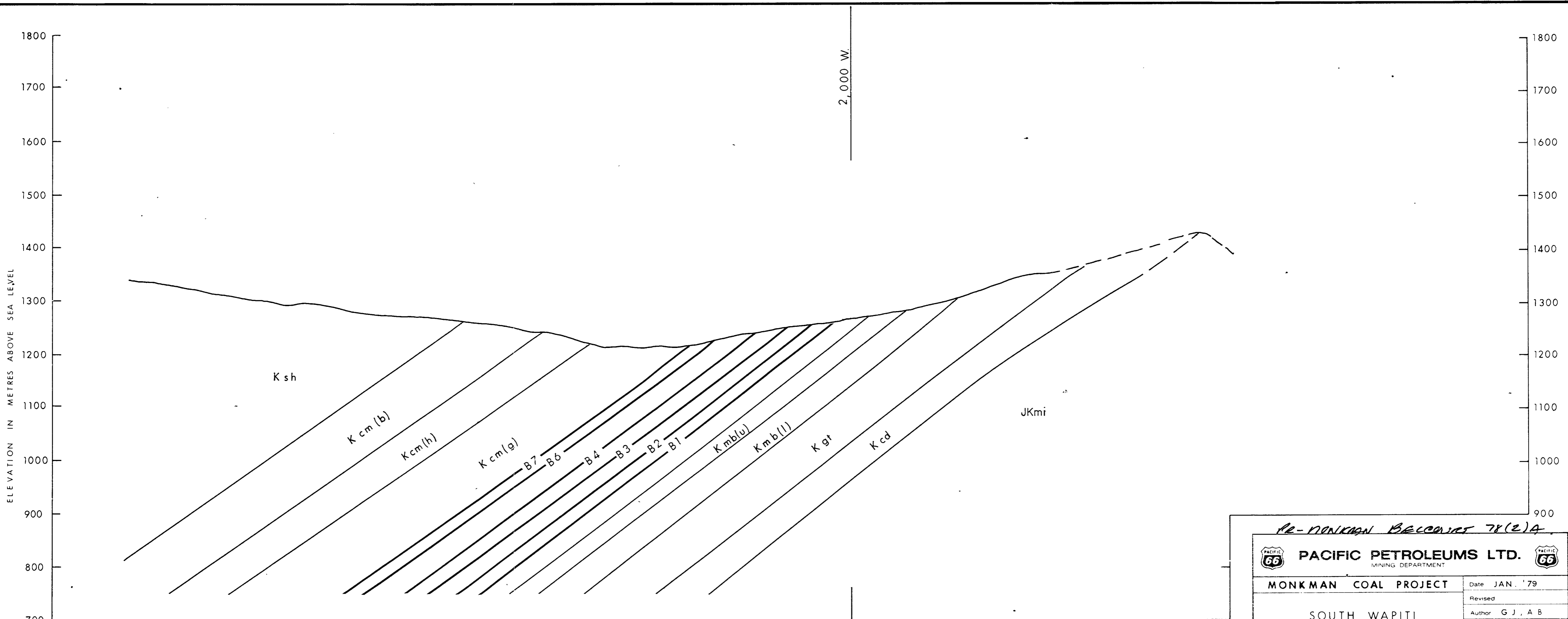


PR - MONKMAN-BELLEVUE JK(2)A

PACIFIC PETROLEUMS LTD.	
MONKMAN COAL PROJECT	
Date	JAN '79
Revised	
Author	G J., A B
Drafted	J W K
DRWG. II.4-3.3	



NORTH WAPITI
CROSS SECTION 2,000S

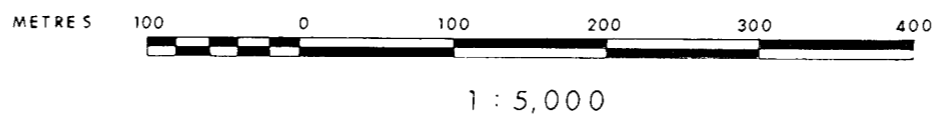
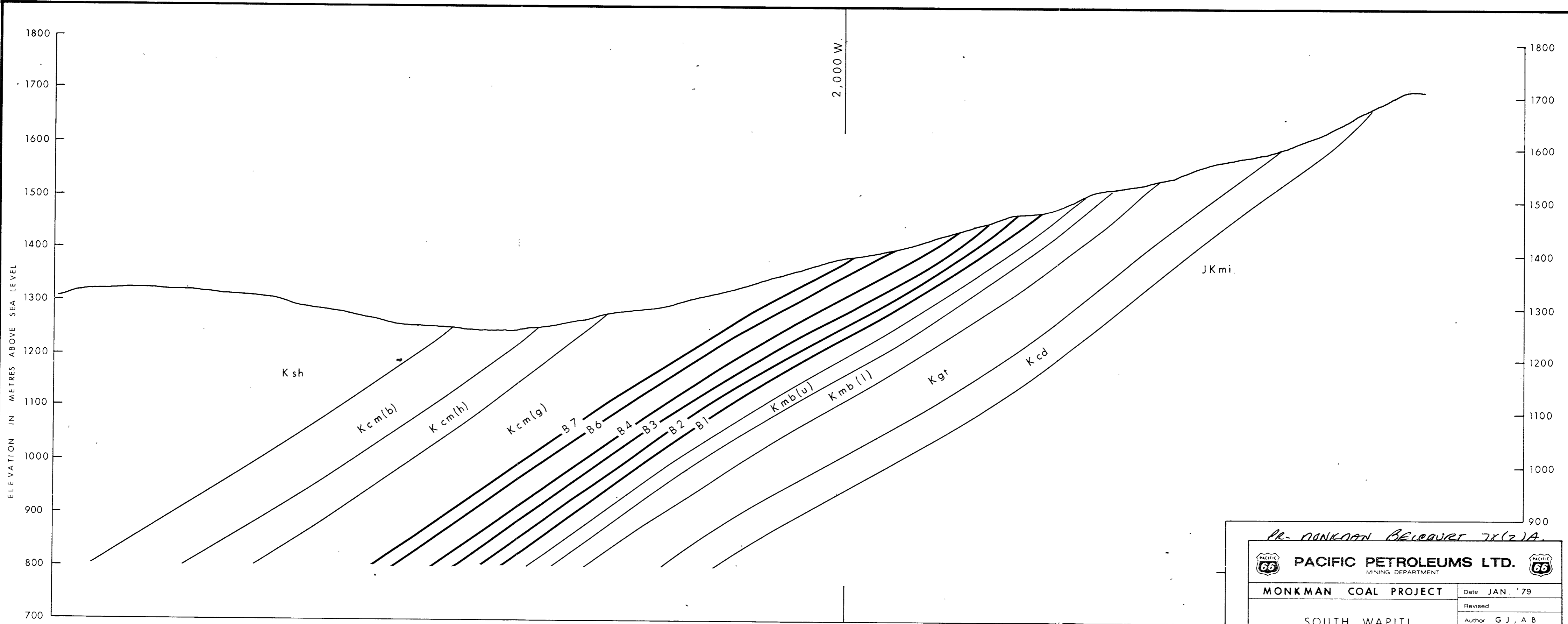
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543



Re-monkey Becomes 78(2)A

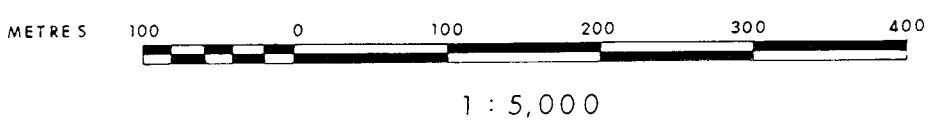
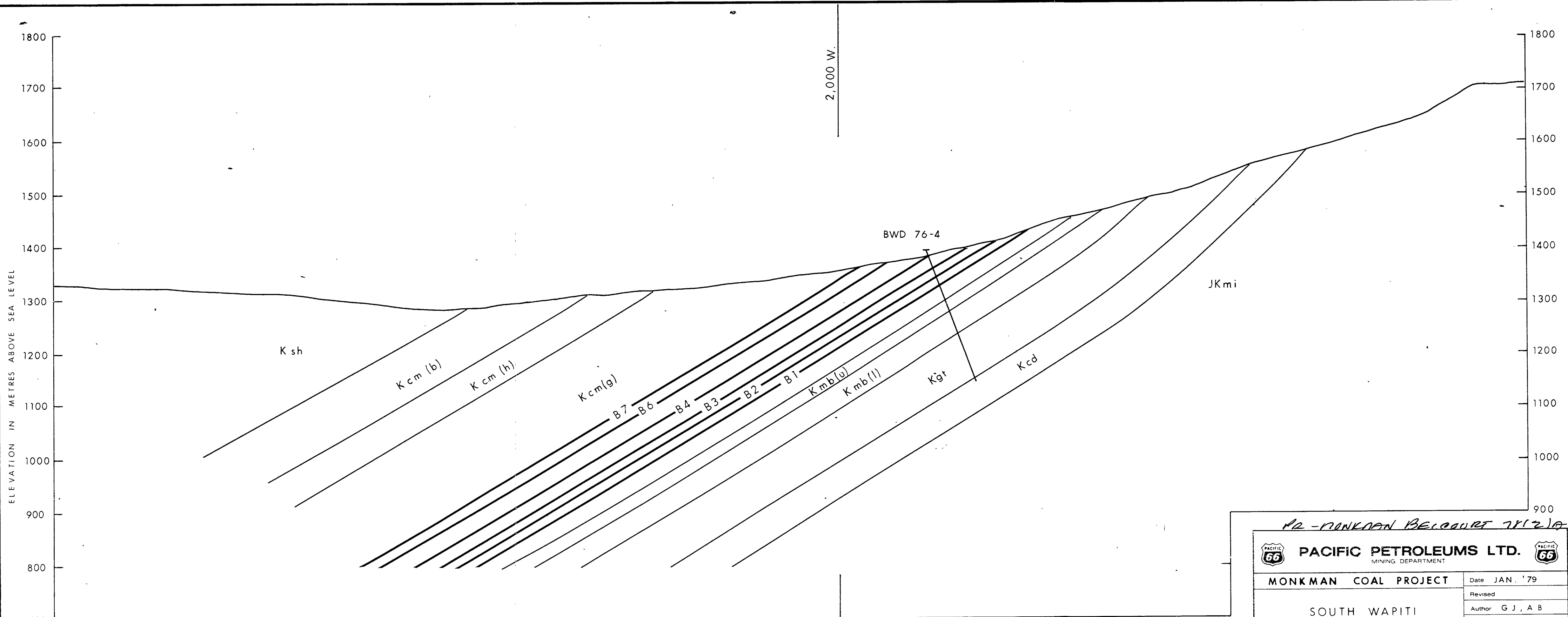
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		Date JAN. '79
SOUTH WAPITI		Revised
CROSS SECTION 5,000S		Author G J, A B
		Drafted J.W.K.
		①



543

PR- NONKONAN BELCAVER 7X(2)A.

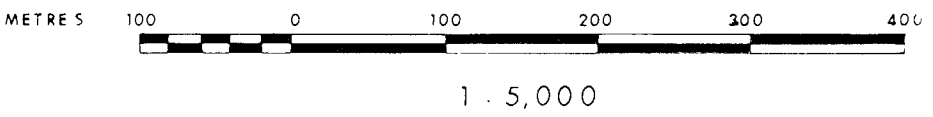
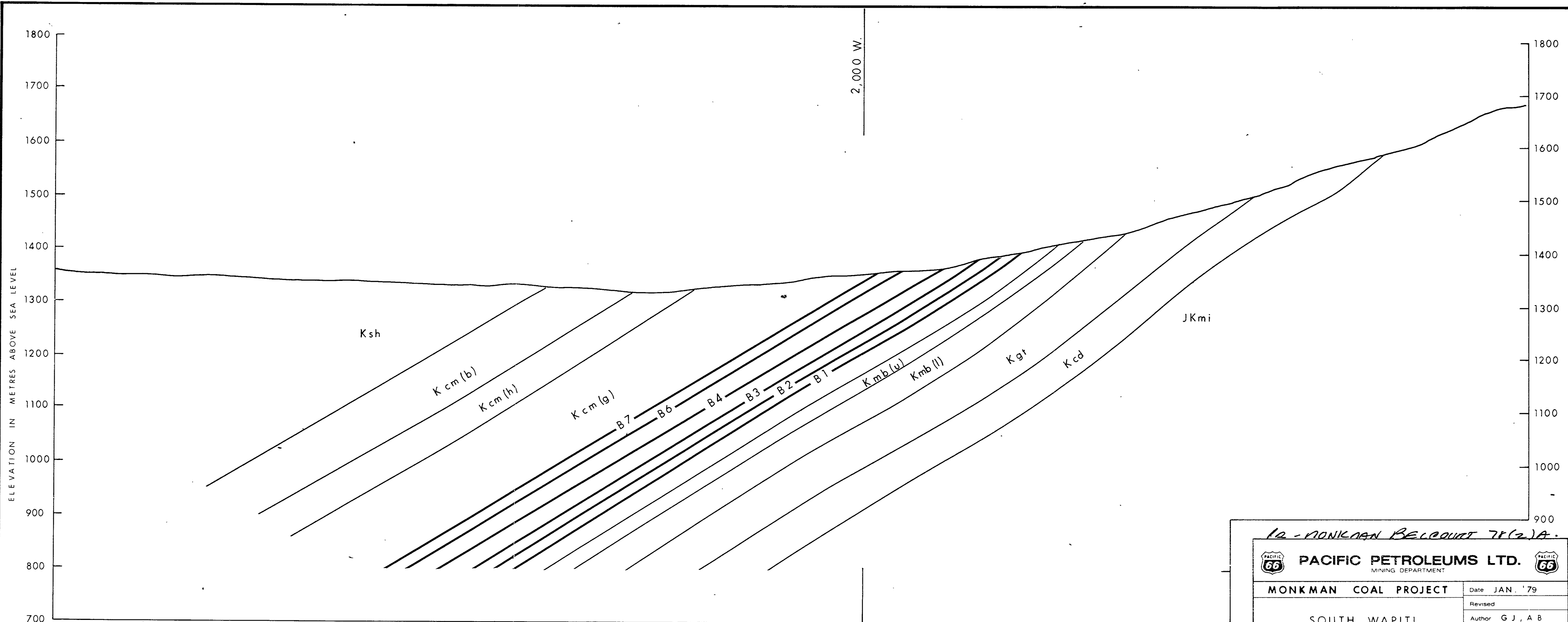
 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	Date JAN. '79
Revised	
Author G J , A B	
Drafted J.W K	
SOUTH WAPITI CROSS SECTION 6,000 S	
(2)	



543

12 - MONKMAN BELLAIR 71(2)A

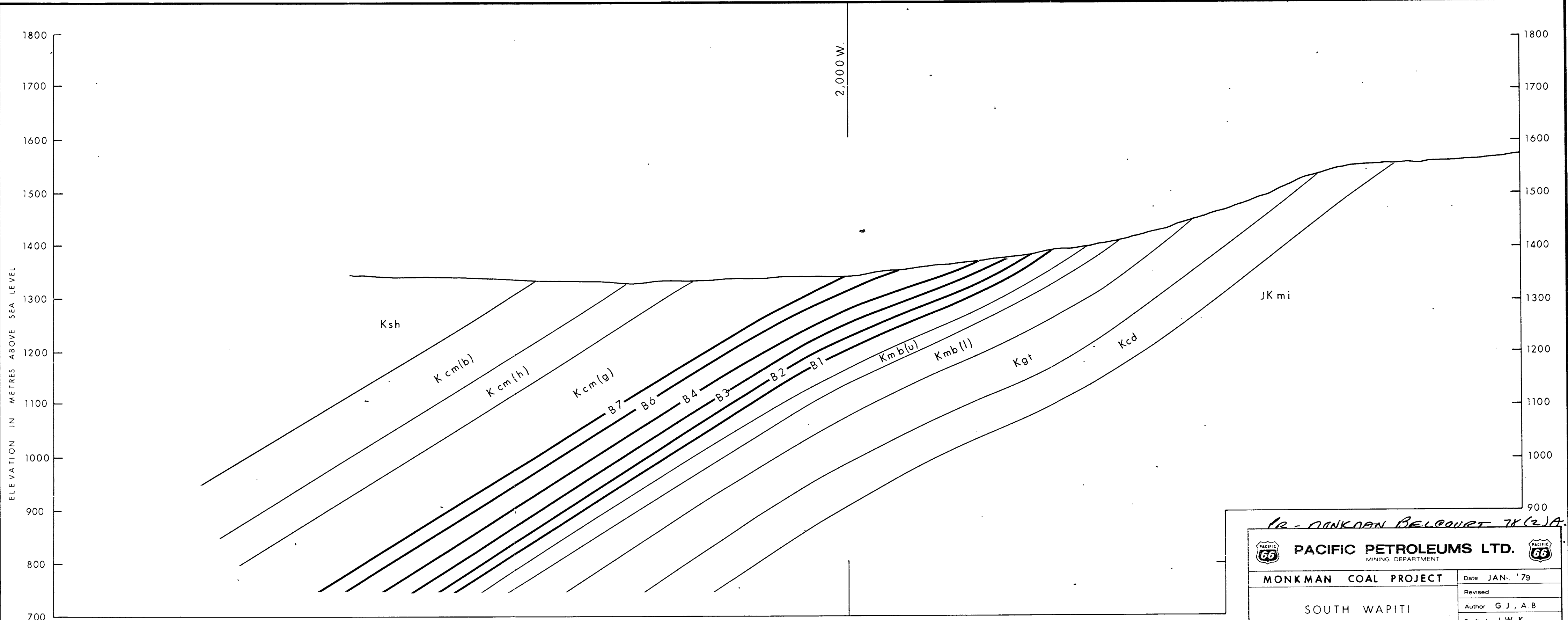
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
SOUTH WAPITI	Revised
CROSS SECTION 7,000S	Author G J, A B
	Drafted J.W.K
	③



543

12 - NONIKOAN BELCOURT 78(2)A.

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>		
MONKMAN COAL PROJECT		Date JAN. '79
SOUTH WAPITI		Revised
CROSS SECTION 8,000S		Author G J, A B
		Drafted J. W. K.
		④



12-DUNKAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT

MONKMAN COAL PROJECT

SOUTH WAPITI

CROSS SECTION 9,000S

Date JAN. '79

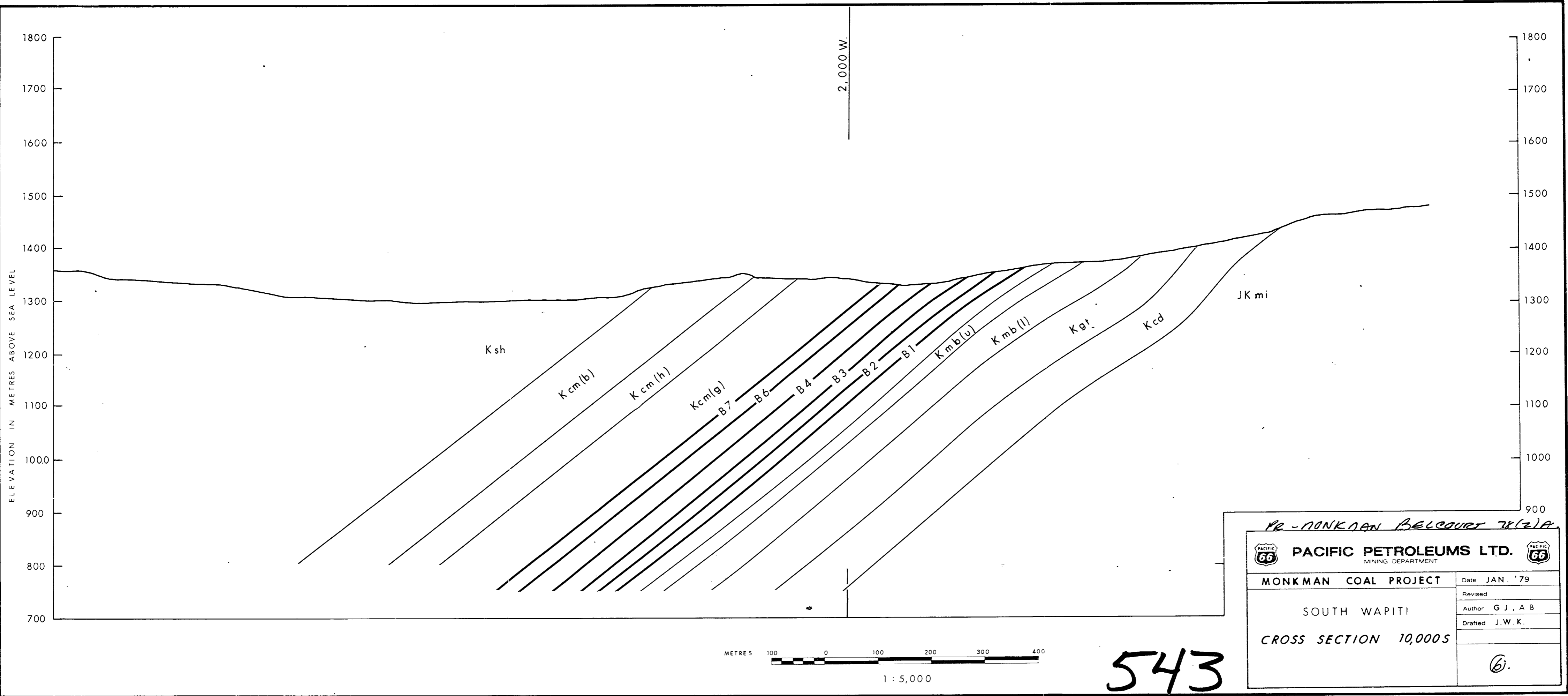
Revised

Author G. J., A. B.

Drafted J. W. K.

5

543



ELEVATION IN METRES ABOVE SEA LEVEL

1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700

1800
1700
1600
1500
1400
1300
1200
1100
1000
900

2000 W.

Ksh

Kcm(b)

Kcm(h)

Kcm(g)

B7

B6

B4

B3

B1

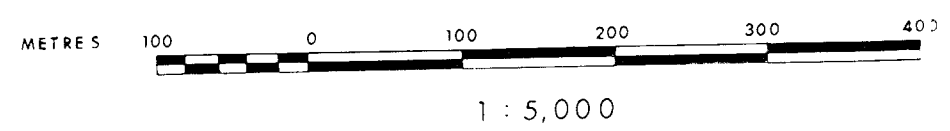
Kmb(u)

Kmb(l)

Kgt



Kcd

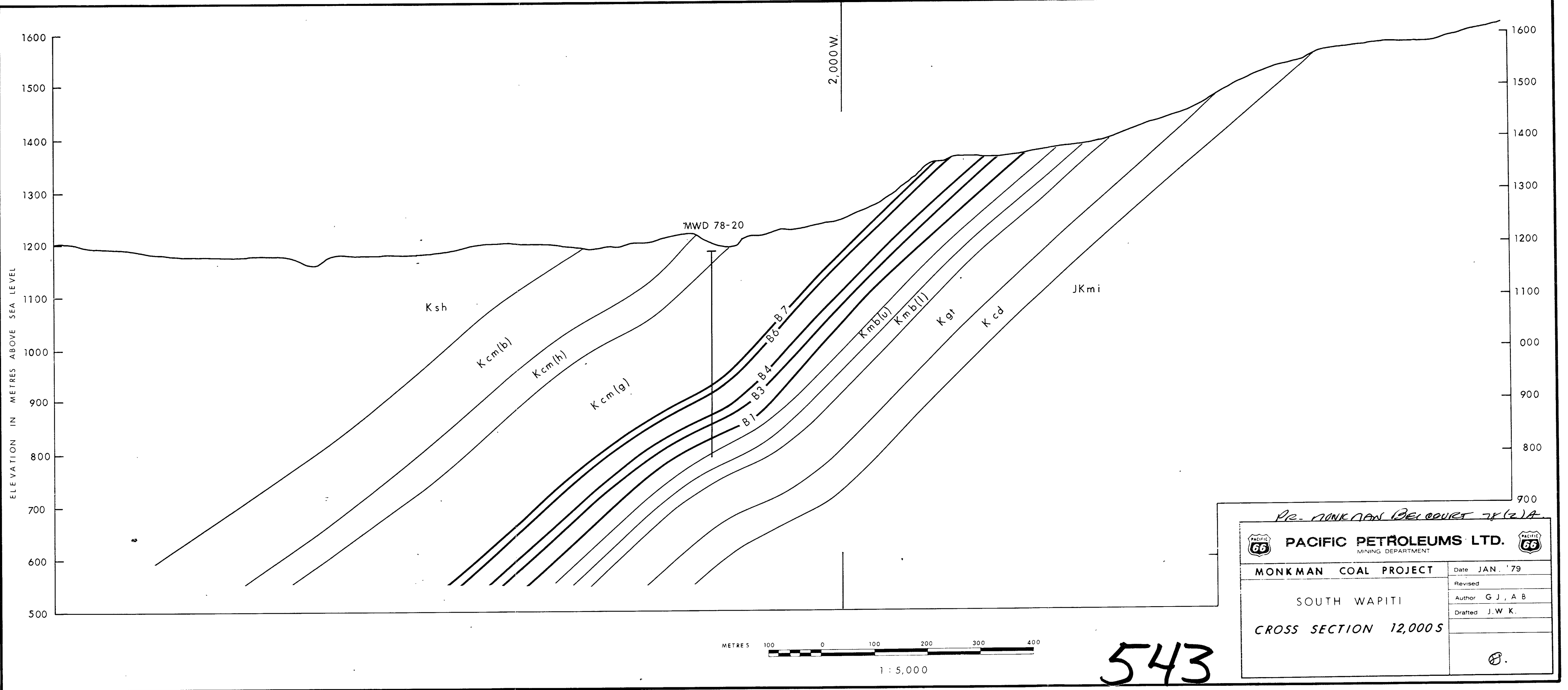
JKmi



543

PR - MONKMAN BELCOURT JK (2)A

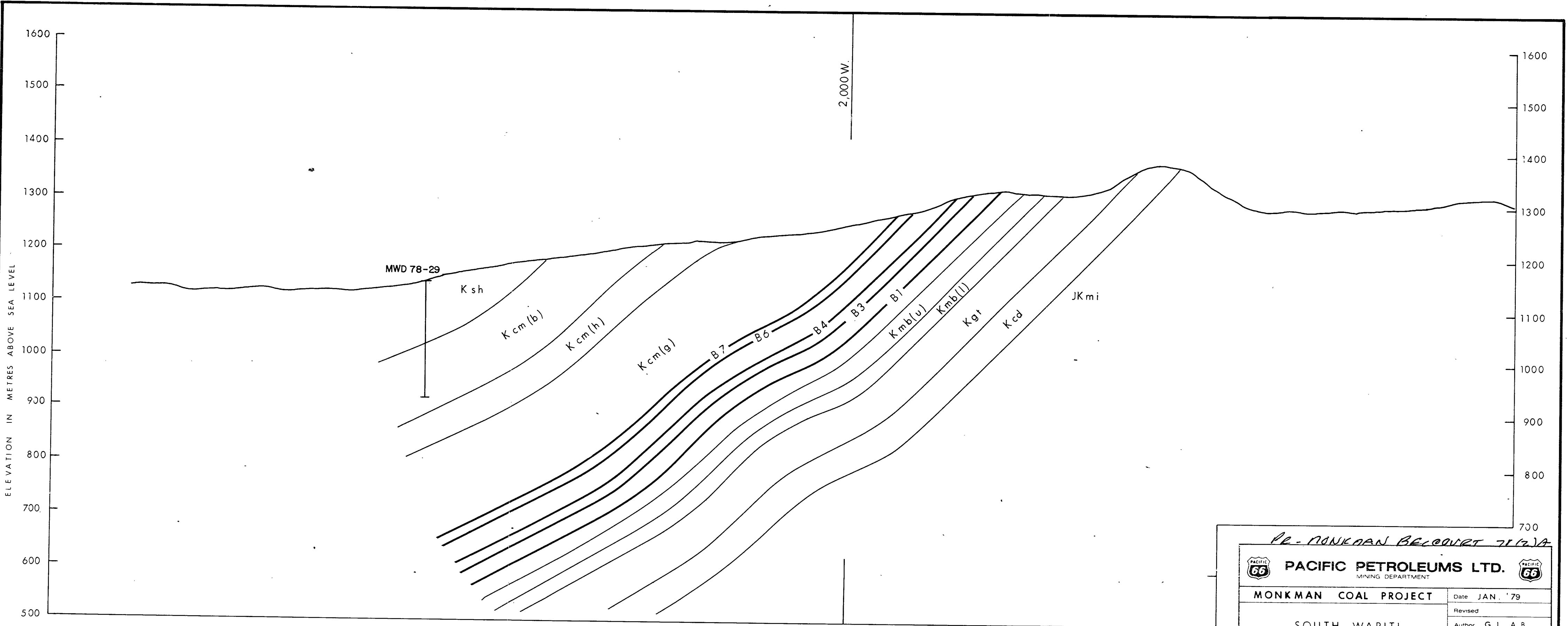
 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	Date JAN. '79
SOUTH WAPITI	Revised
	Author G J, A B.
	Drafted J.W.K.
CROSS SECTION 11,000S	(2)



Pr. MONKMAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
SOUTH WAPITI	Revised
<i>CROSS SECTION 12,000 S</i>	Author G J, A B
	Drafted J. W. K.
	Ⓢ.

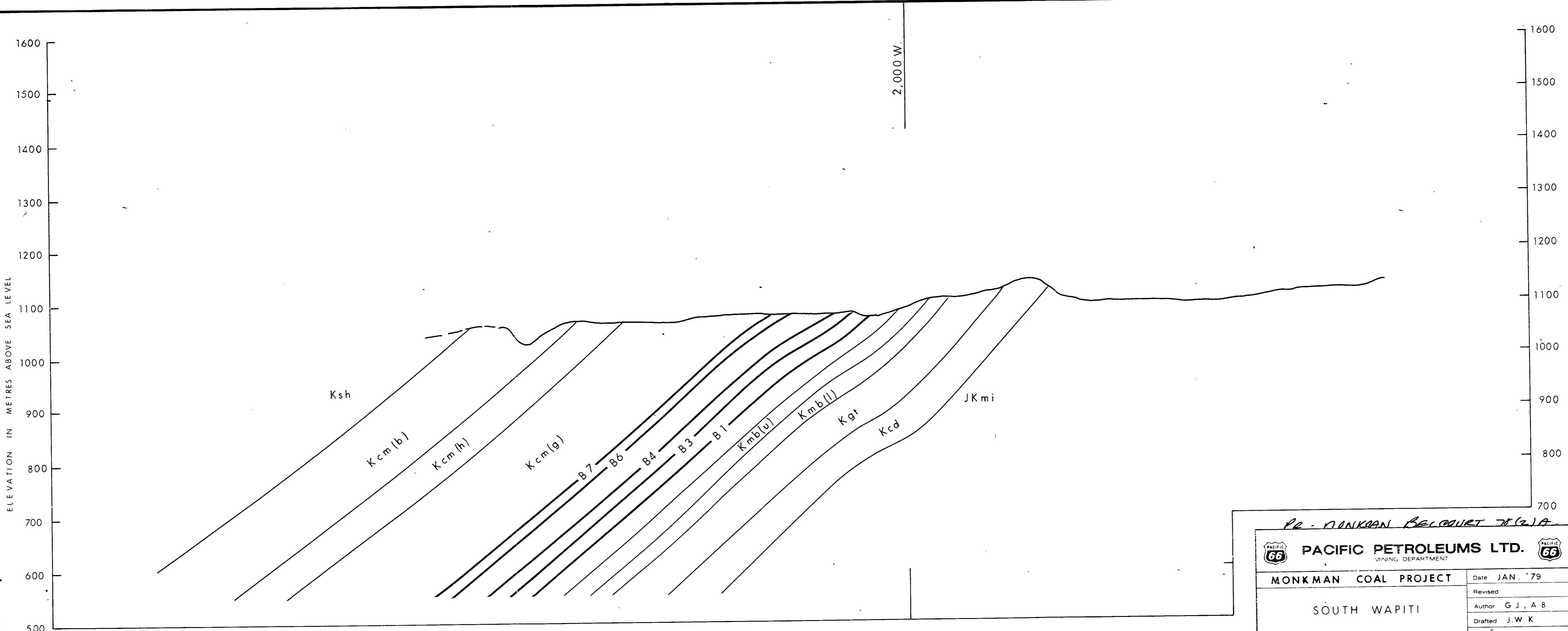
543



PR - NONKONAN BELCORET 71(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
SOUTH WAPITI	Revised
CROSS SECTION 13,000S	Author G J, A B
	Drafted J.W.K.
	(9)

543



543

PR - MONKMAN BELLAIR 78(2)A

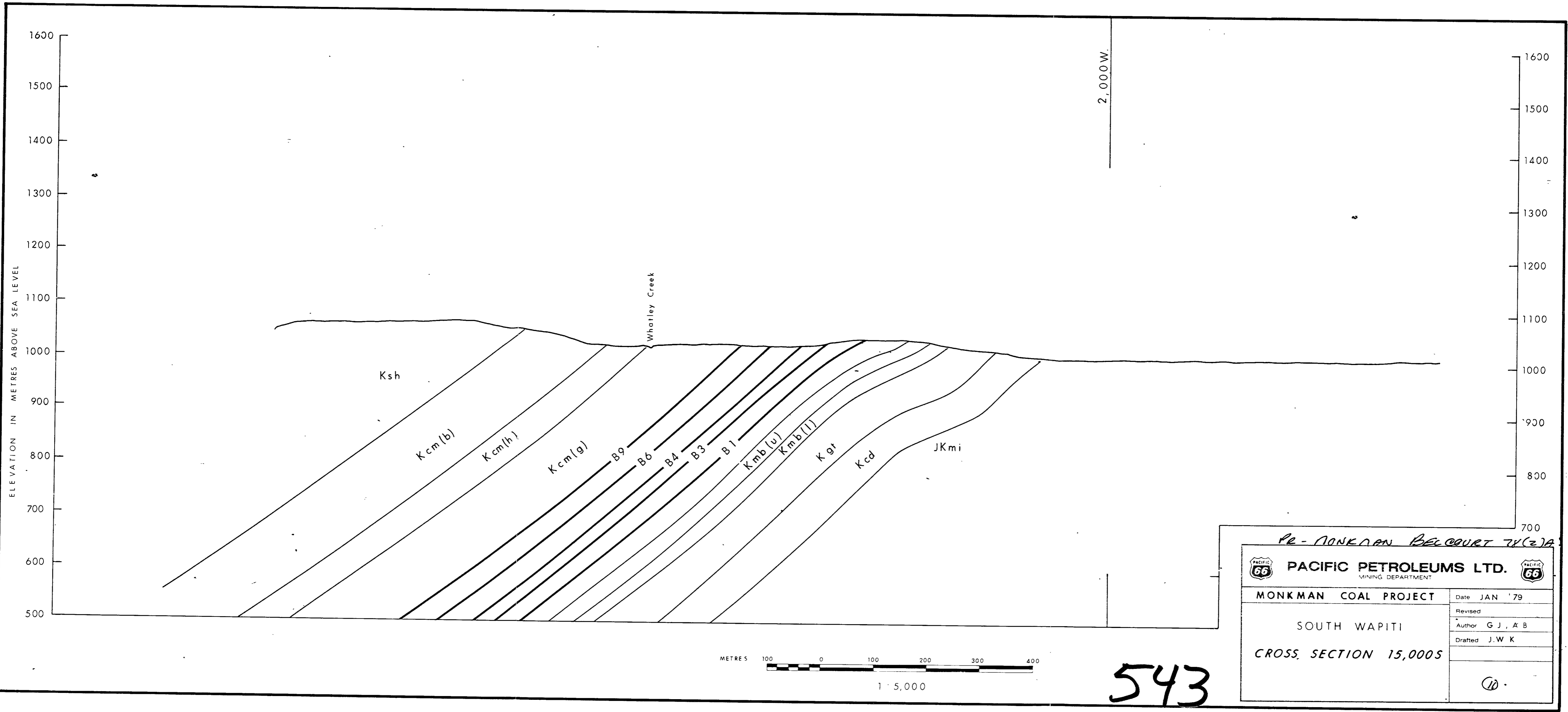
PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT



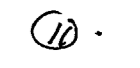
SOUTH WAPITI
CROSS SECTION 14,000S

Date	JAN. '79
Revised	
Author	G J, A B
Drafted	J.W.K

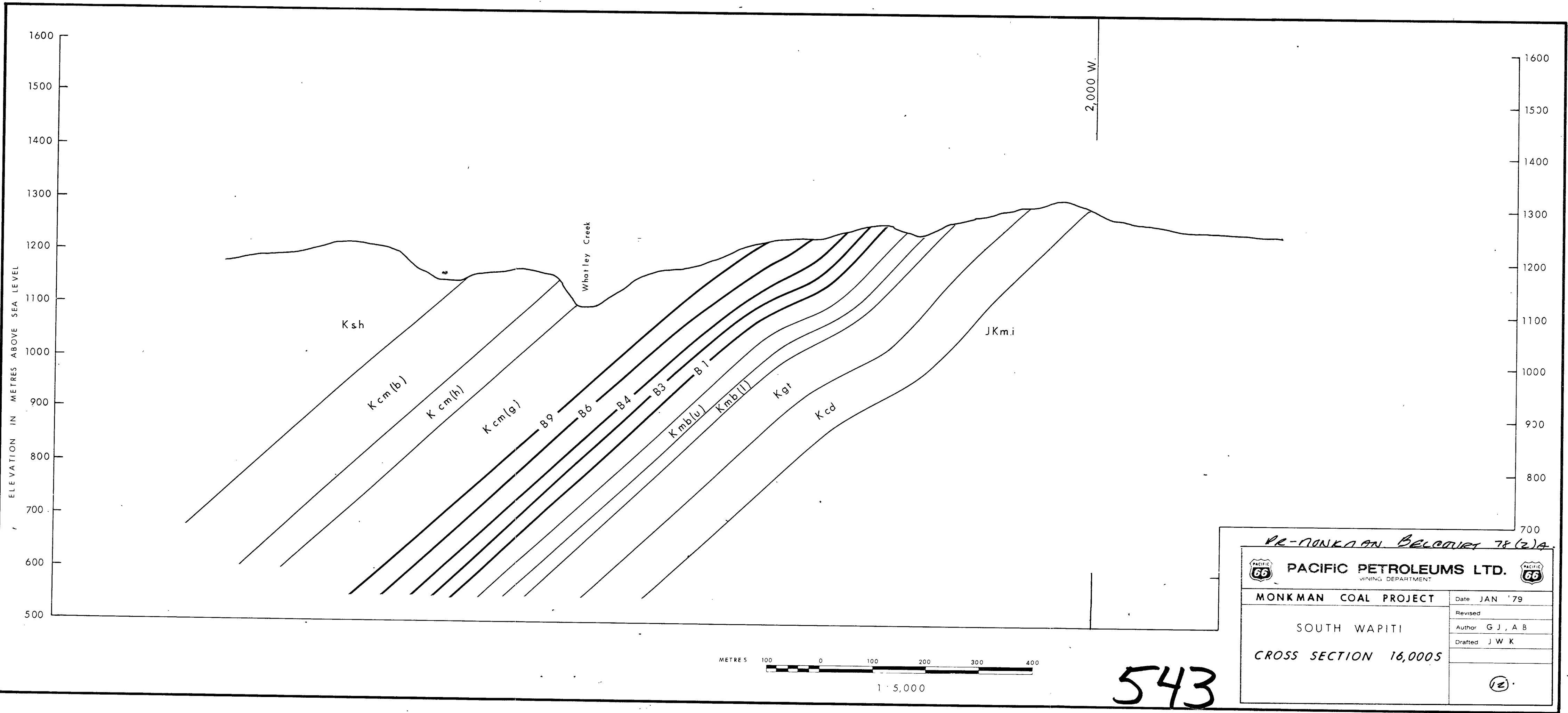
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Pre-MONKMAN BELCOURT 74(2)A

 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SOUTH WAPITI	
CROSS SECTION 15,000S	
	Date JAN '79 Revised Author G J, & B Drafted J.W K
	

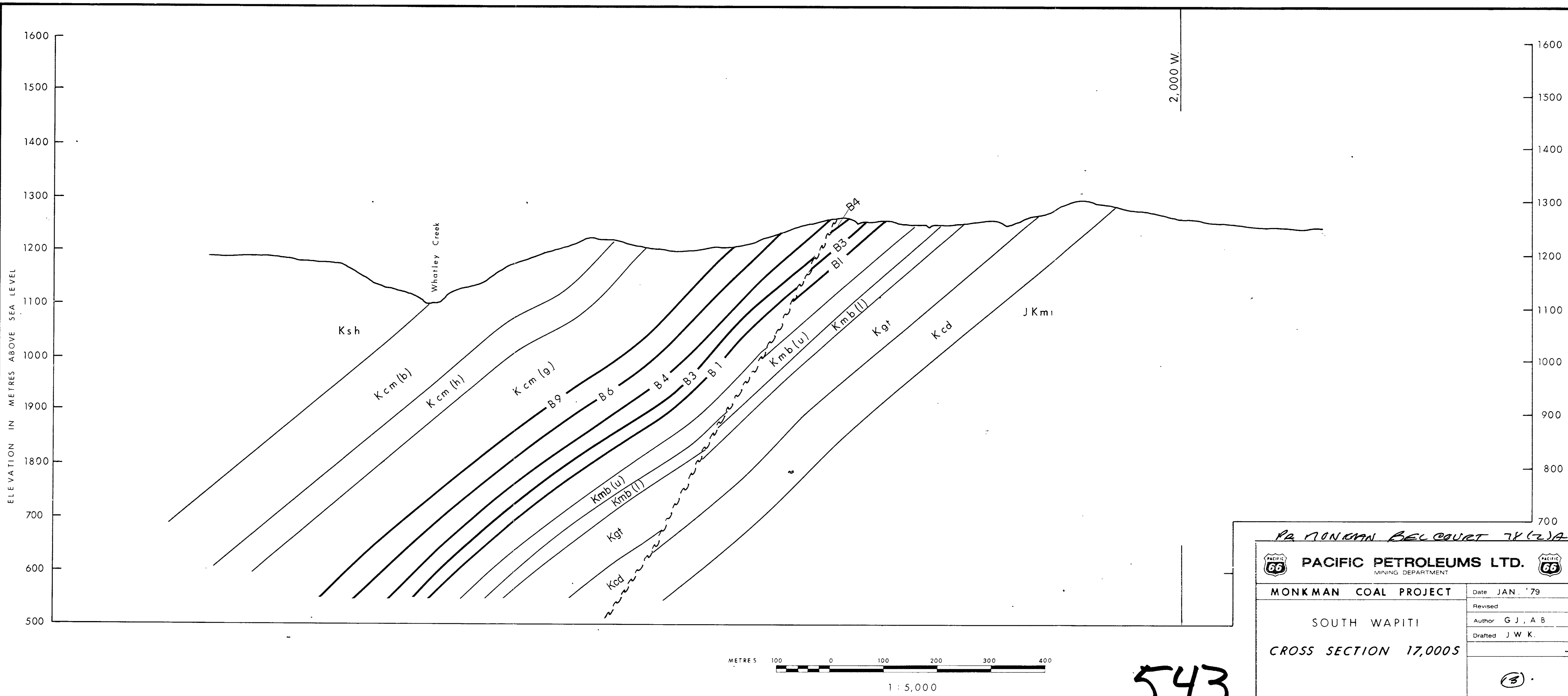
543



543

RE-NONKMAN BELCOVER 78(2)A

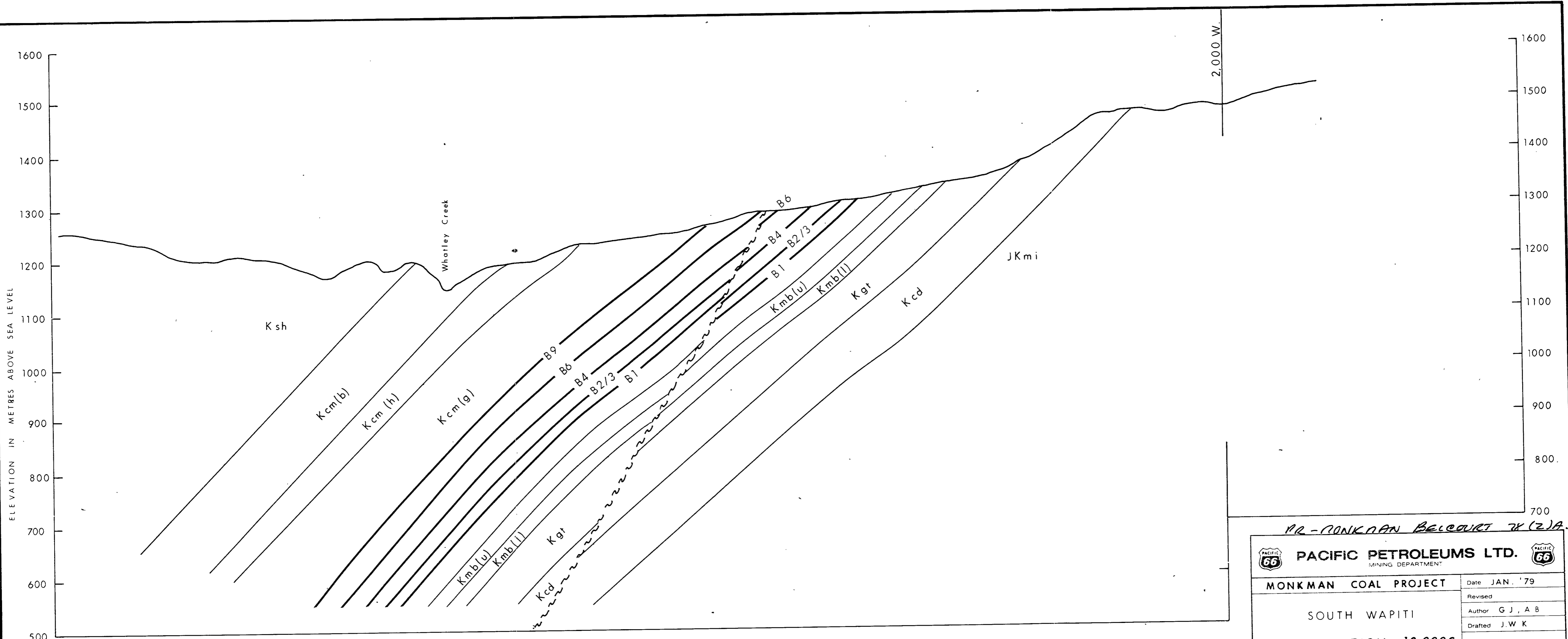
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN '79
Revised	
Author G J, A B	
Drafted J W K	
SOUTH WAPITI CROSS SECTION 16,000S	
(2)	



543

RR MONKMAN BELCOURT 7K(2)A

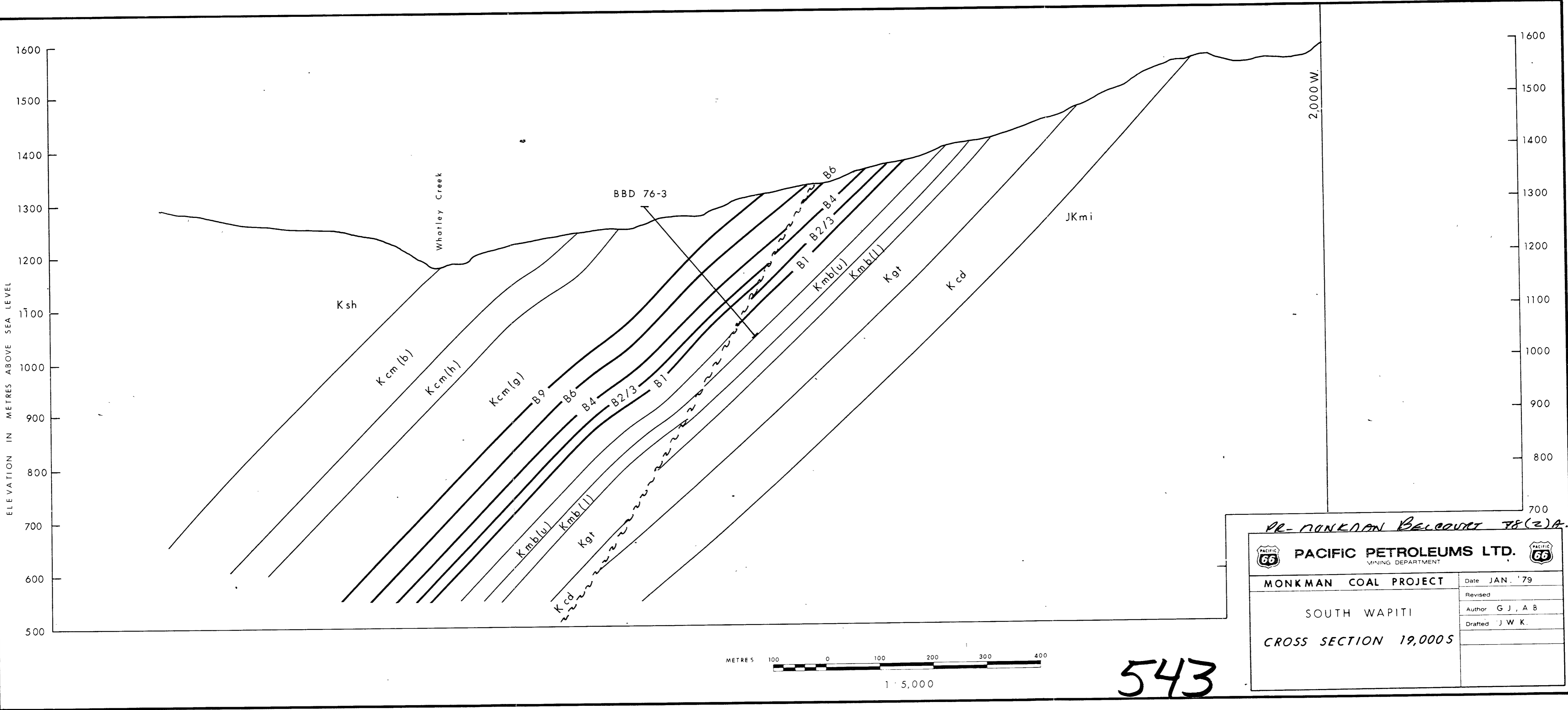
PACIFIC PETROLEUMS LTD.	MINING DEPARTMENT
MONKMAN COAL PROJECT	
SOUTH WAPITI	
<i>CROSS SECTION 17,000S</i>	
Date	JAN. '79
Revised	
Author	G J, A B
Drafted	J W K.
(3)	



543

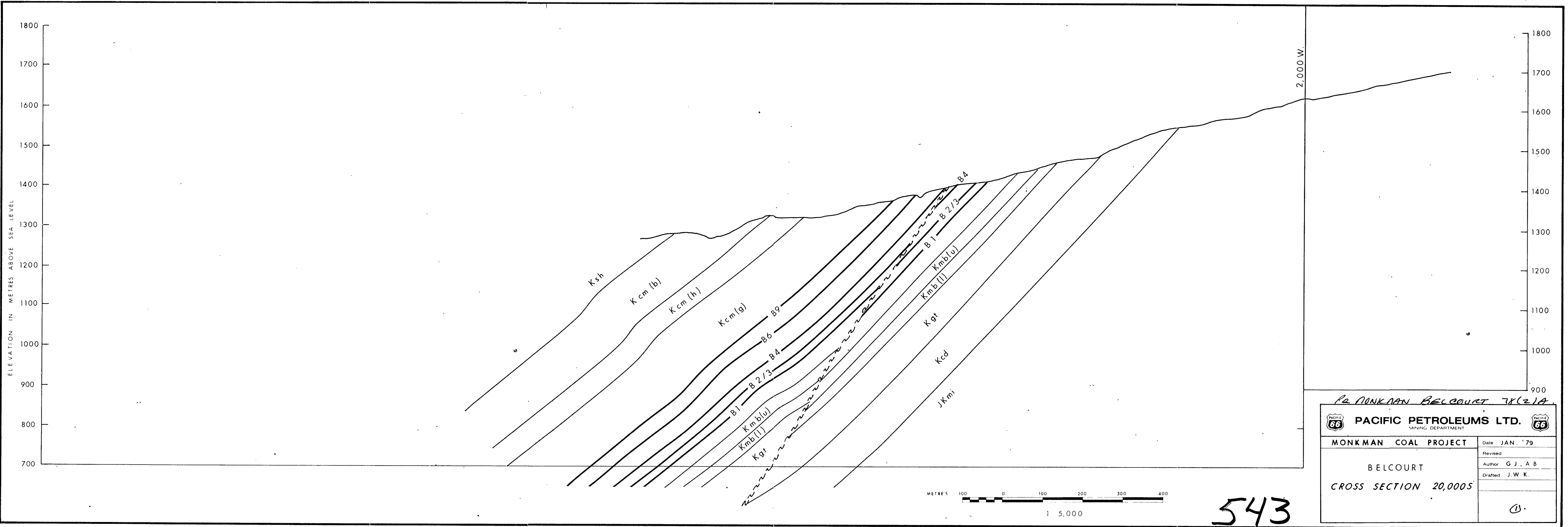
PR - CONKMAN BELCOURT 28 (2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
SOUTH WAPITI	Revised
CROSS SECTION 18,000S	Author G J, A B
	Drafted J.W.K
	(14)



PR-MONKMAN BELCOVET 78(2)A.

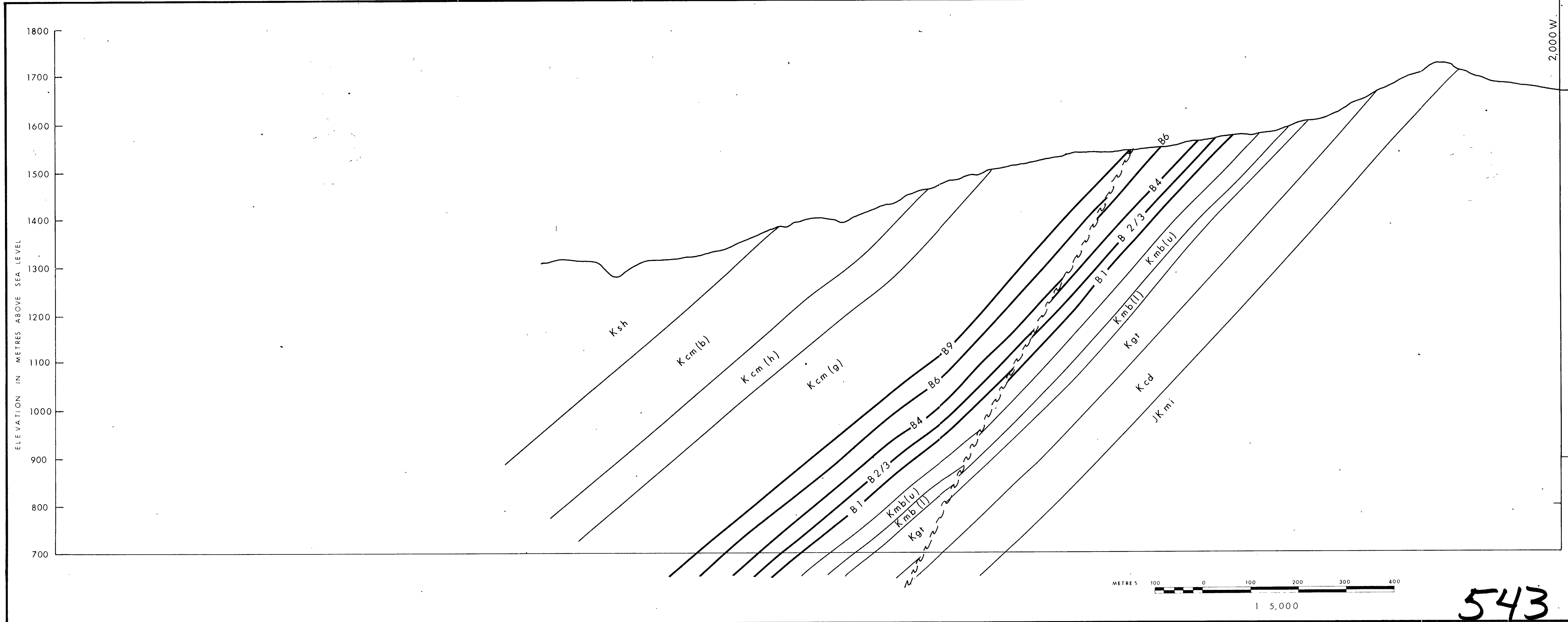
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SOUTH WAPITI	
CROSS SECTION 19,000 S	
	Date JAN. '79 Revised Author G J, A B Drafted J W K.



PA. DONKMAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN. '79
	Revised
	Author G J, A B
	Drafted J.W.K.
BELCOURT	
CROSS SECTION 20,000S	
①	



2,000 W.

ELEVATION IN METRES ABOVE SEA LEVEL

1800
1700
1600
1500
1400
1300
1200
1100
1000
900

1800
1700
1600
1500
1400
1300
1200
1100
1000
900

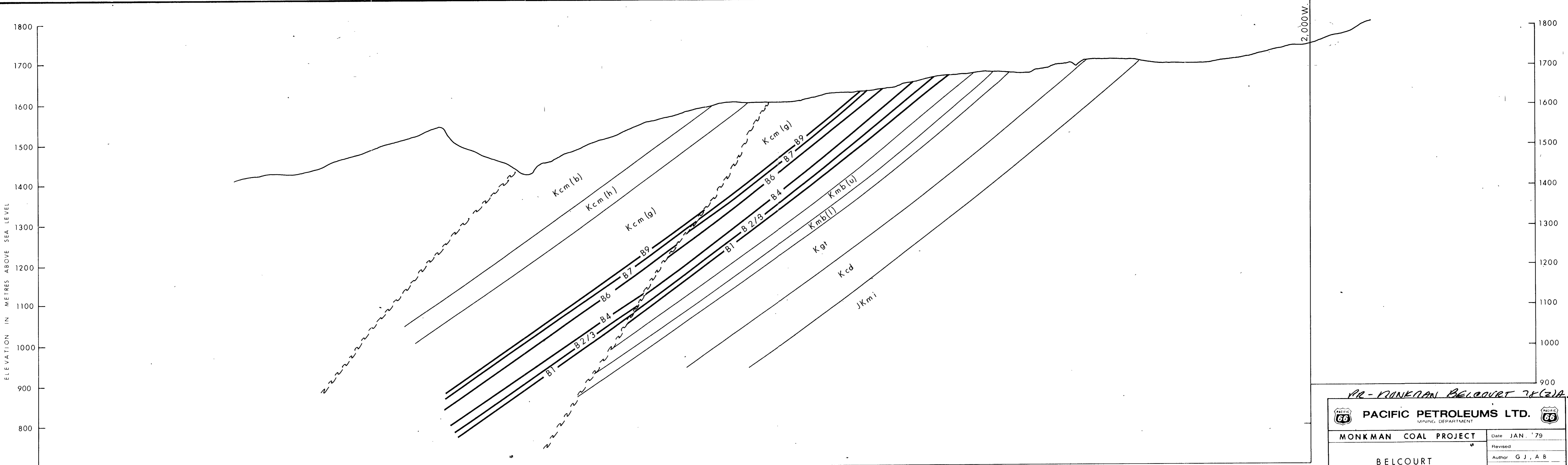
Ksh
Kcm(b)
Kcm(h)
Kcm(g)
B1
B2/3
B4
B6
B9
Kmb(u)
Kmb(l)
Kgt
Kcd
JKmi

METRES 100 0 100 200 300 400
1:5,000

543

Pre-Monkman Belcourt 78(2)A

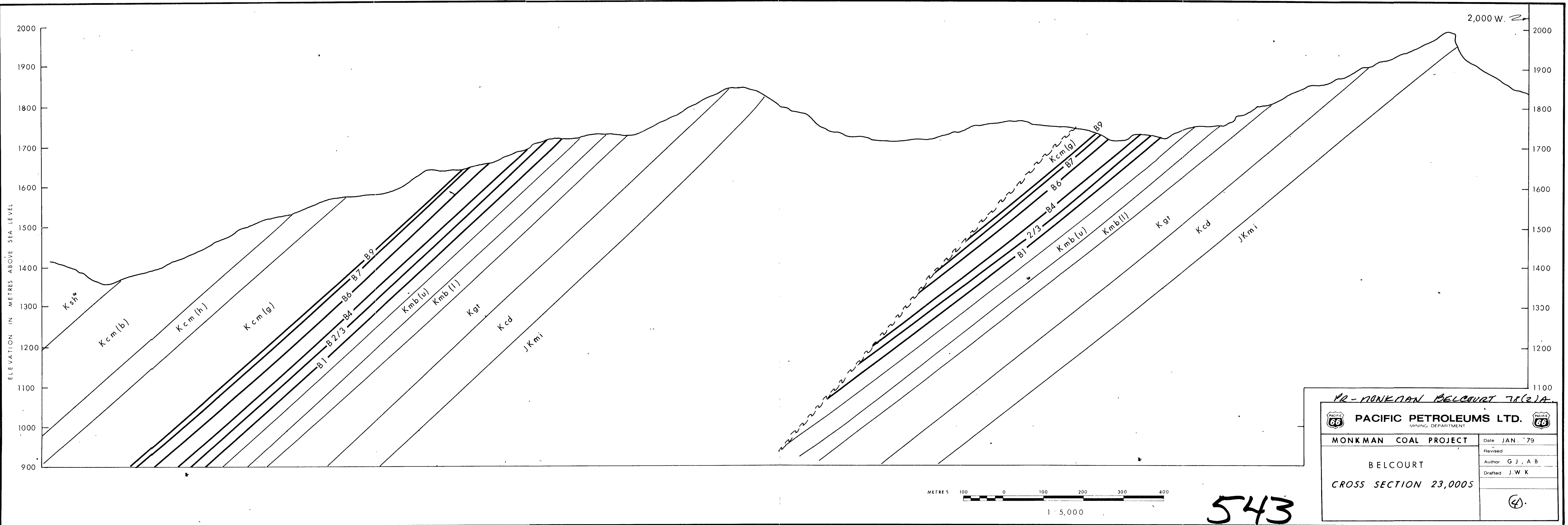
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
BELCOURT	
CROSS SECTION 21,000S	
Date JAN. '79	
Revised	
Author G. J., A. B.	
Drafted J. W. K.	
②	



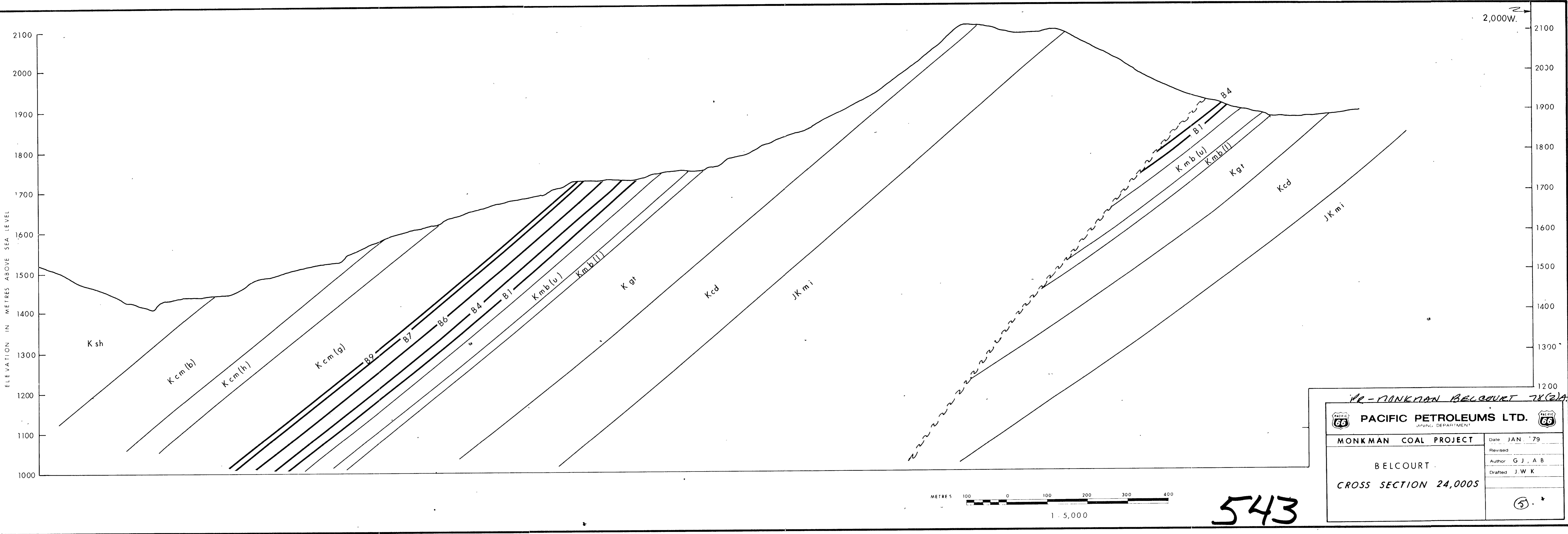
543

PR - MONKMAN BELCOURT 28(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
BELCOURT	
CROSS SECTION 22,000S	
Revised Author G J, A B Drafted J W K	
(3)	



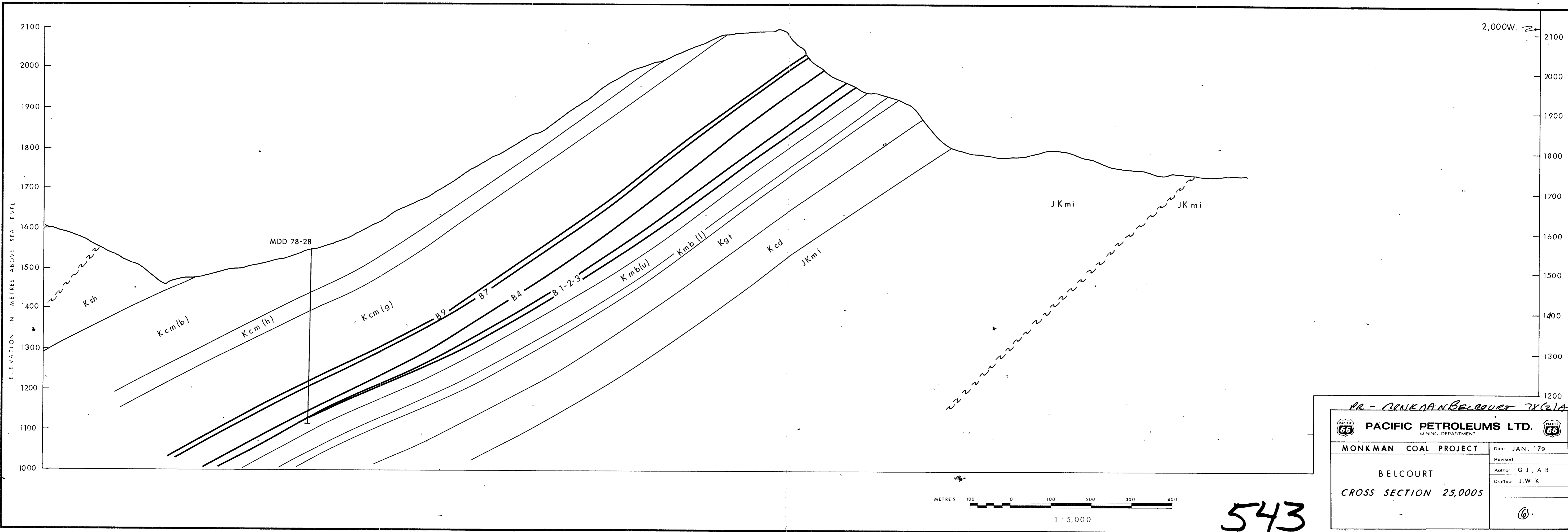
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PR-MONKMAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN '79
Revised	
Author G J, A B	
Drafted J. W. K.	
BELCOURT CROSS SECTION 24,000S	
(5)	

543

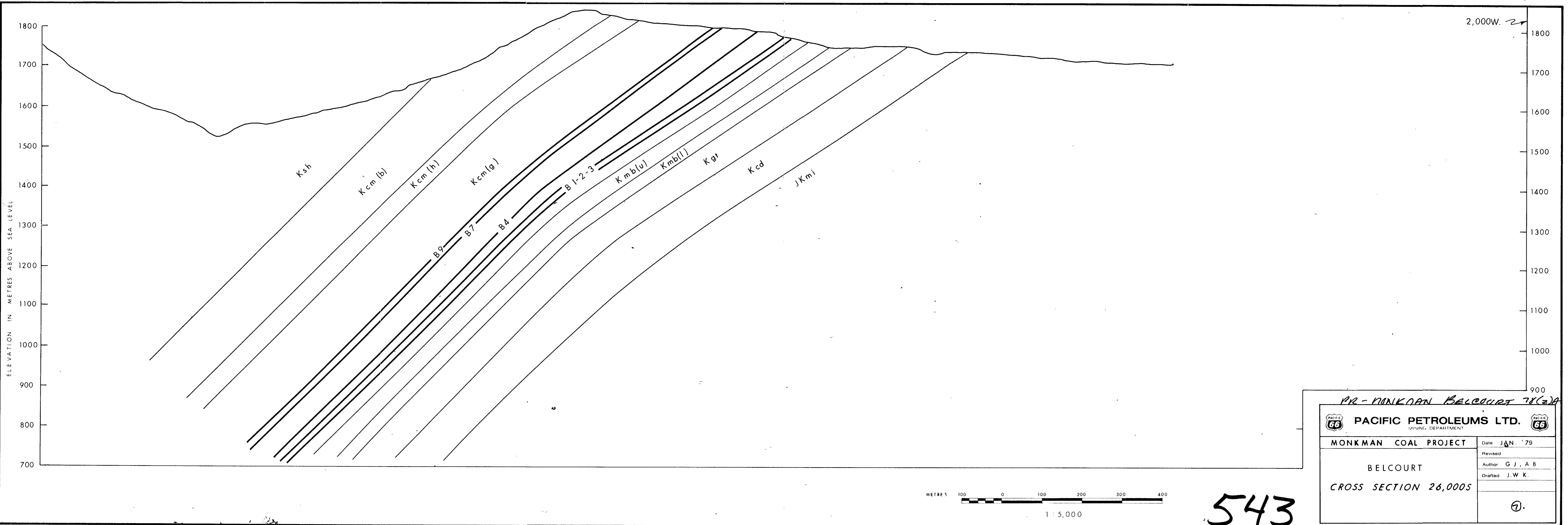


RR - CONKMAN BELCOURT 2X(2)A

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN. '79
BELCOURT CROSS SECTION 25,000S	Revised
	Author G J, A B
	Drafted J.W K
	(6)

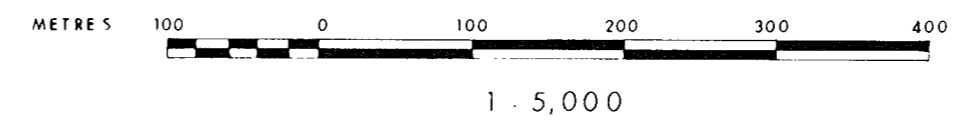
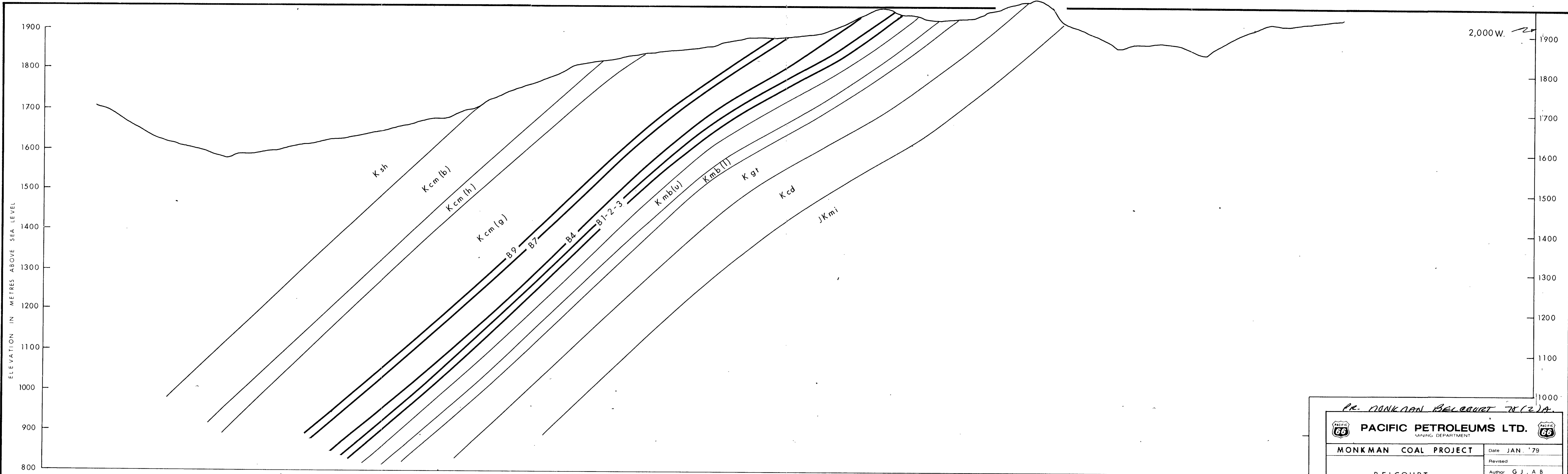
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PR - MONKMAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN '79
	Revised
	Author G J, A B
	Drafted J.W.K.
BELCOURT CROSS SECTION 26,000S	①

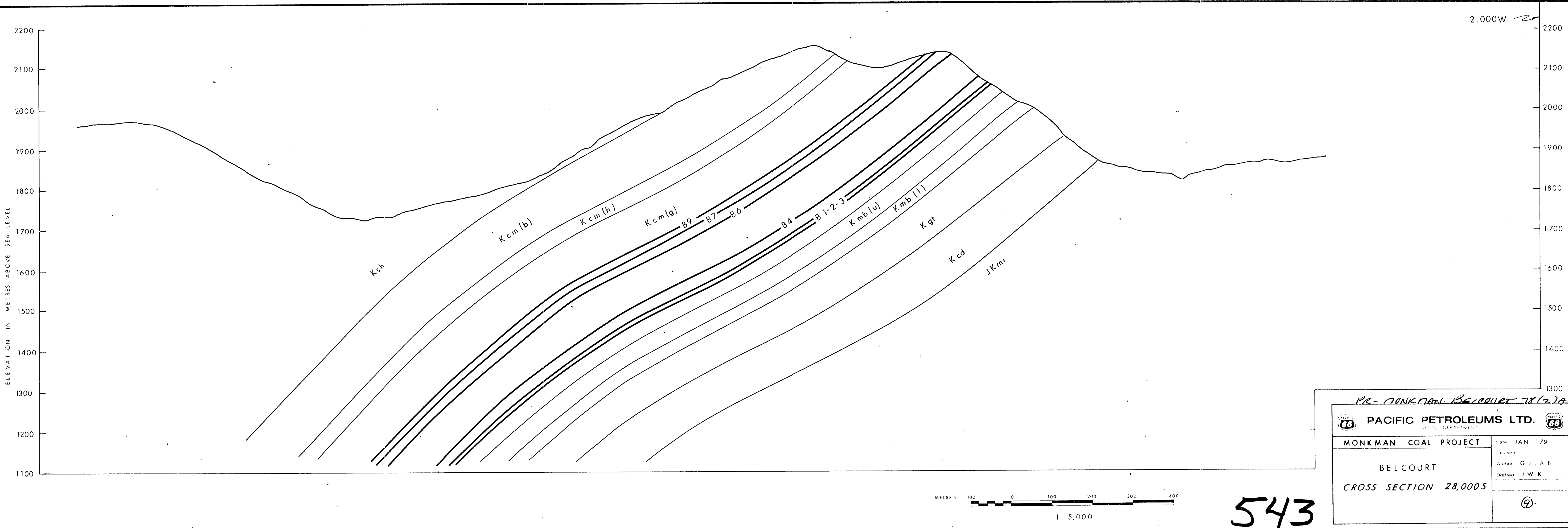
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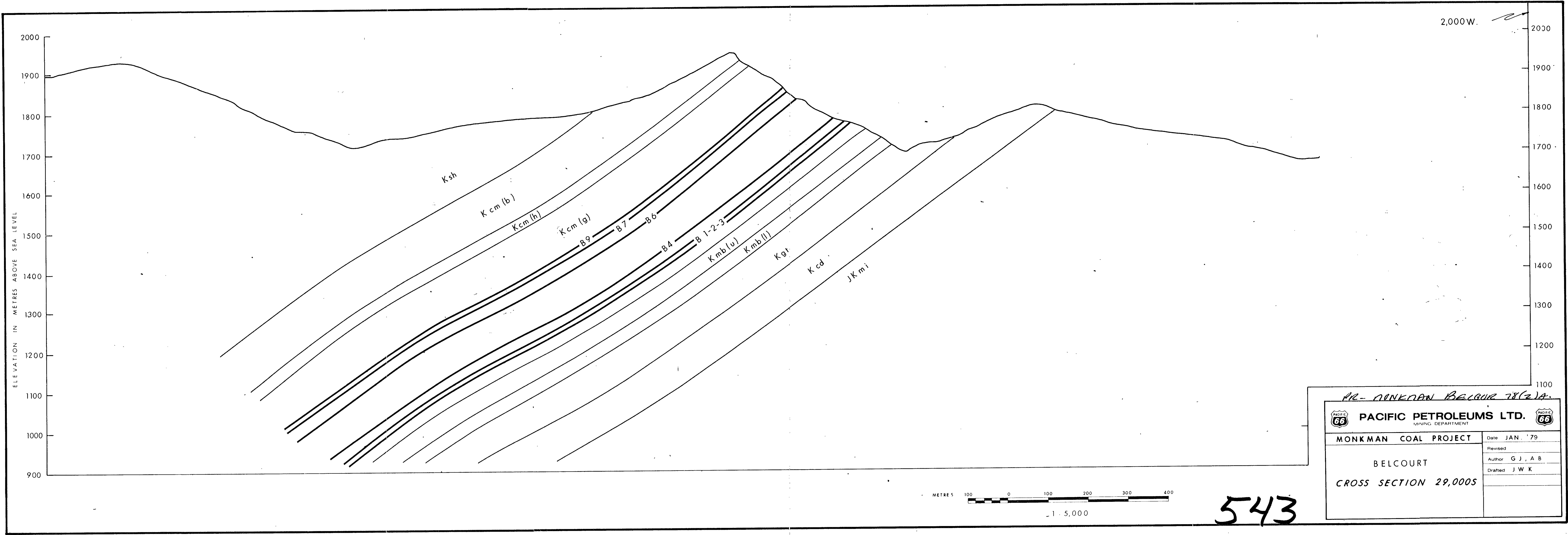
PR. DONKLAN BELCOURT 78(2)A.

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
	Revised
	Author G J, A B
	Drafted J W K.
BELCOURT CROSS SECTION 27,000S	



PR - MONKMAN BELCOURT 78(2)A

 PACIFIC PETROLEUMS LTD. 	
MONKMAN COAL PROJECT	
BELCOURT	
CROSS SECTION 28,000S	
Date: JAN '79 Revised: Author: G J, A B Drafted: J W K	



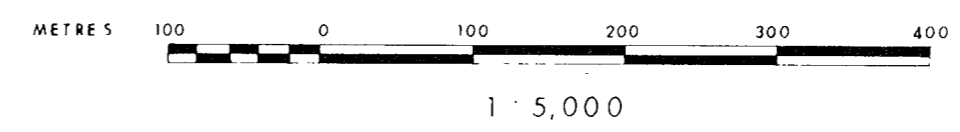
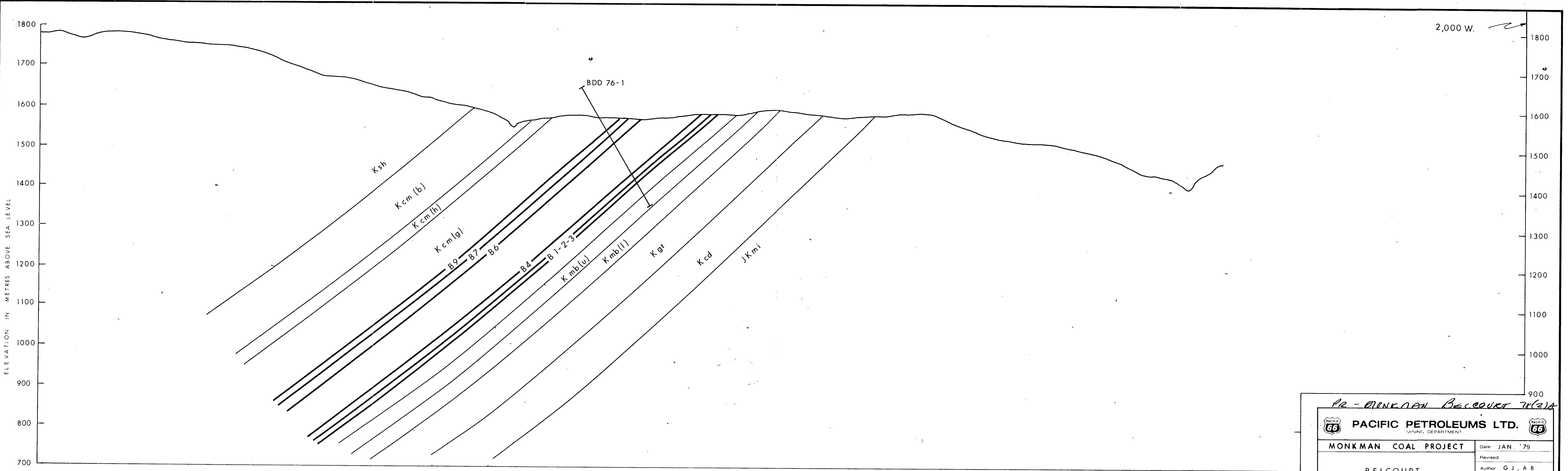
12- DUNKER BELCOUR 78(2)A.

PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT	Date JAN. '79
	Revised
	Author G J, A B
	Drafted J W K

BELCOUR
CROSS SECTION 29,000S

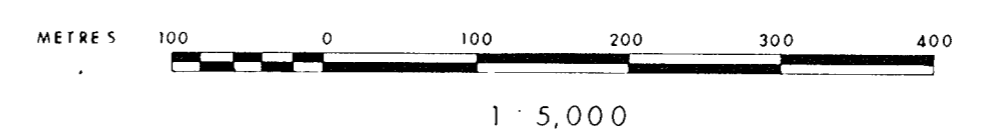
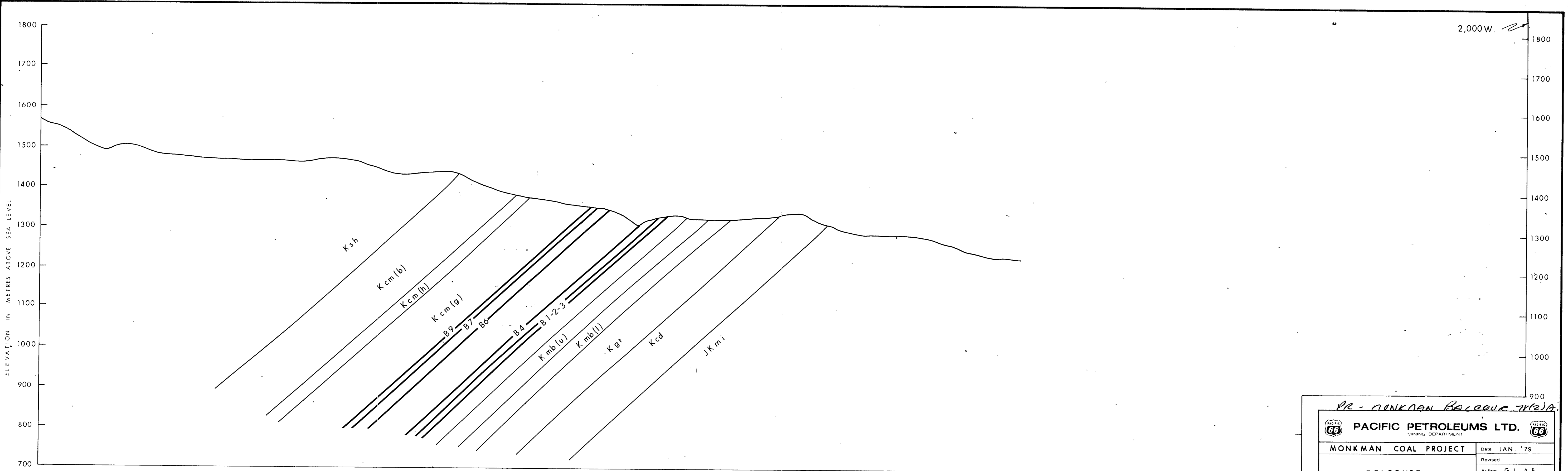
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543

12 - MONKMAN BELCOURT 78(2)A

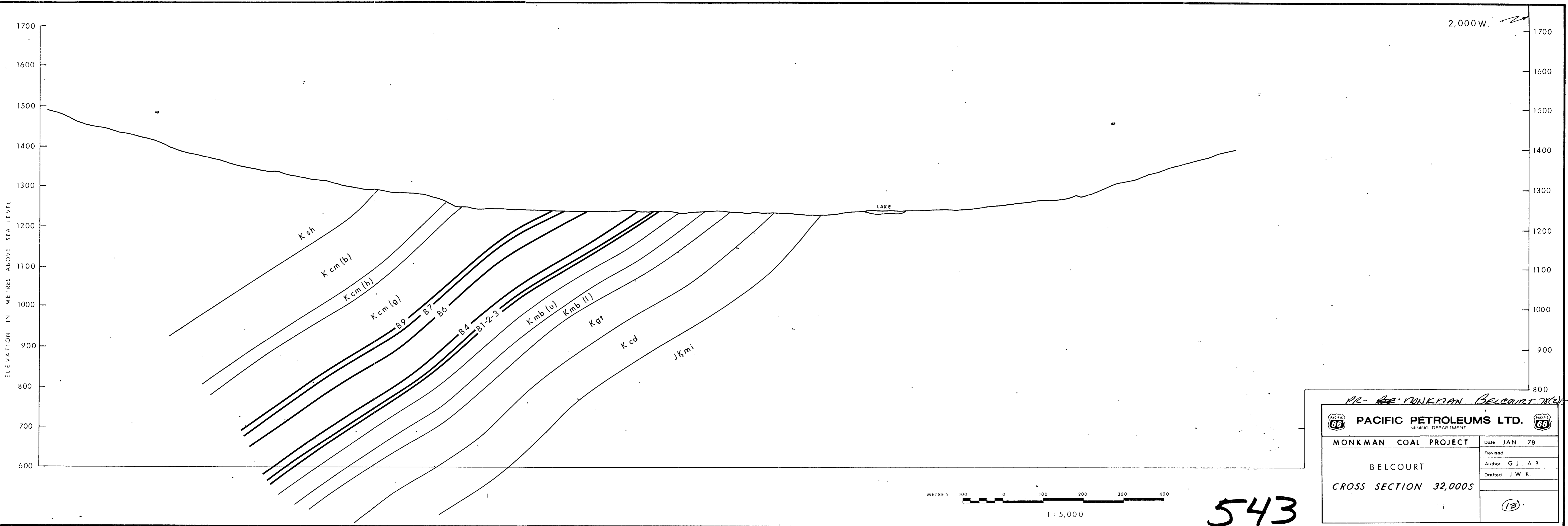
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
Revised	
Author G. J. A. B.	
Drafted J. W. K.	
BELCOURT CROSS SECTION 30,000S	



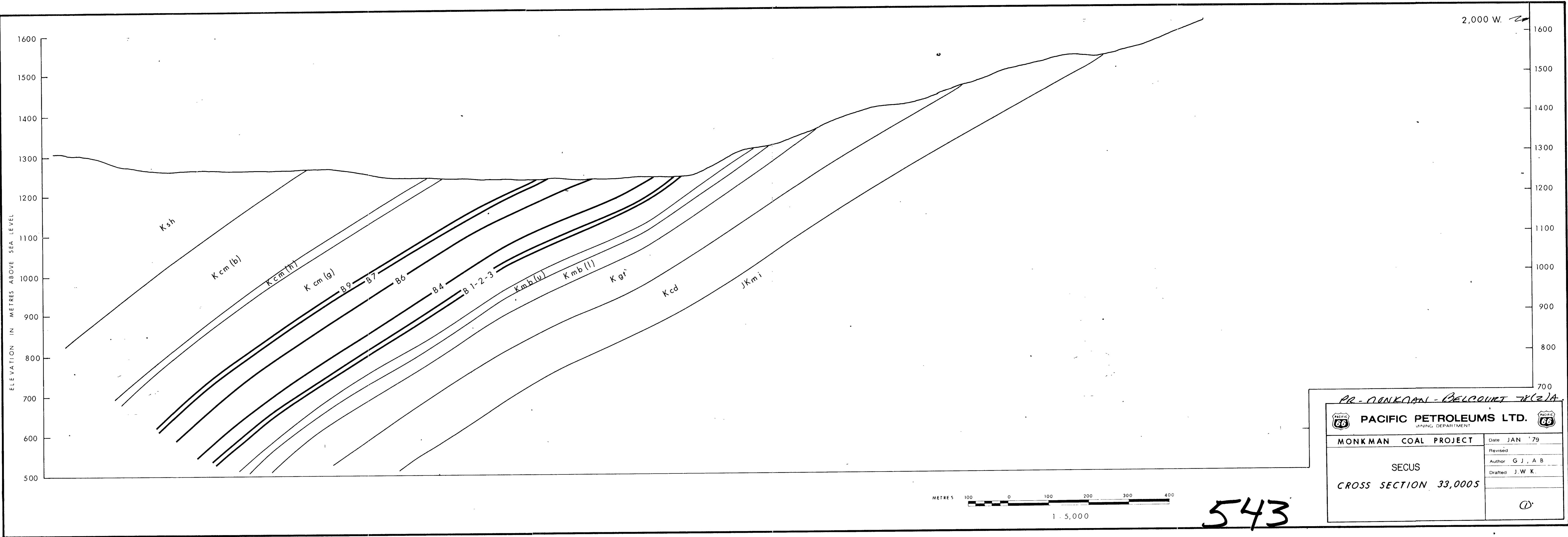
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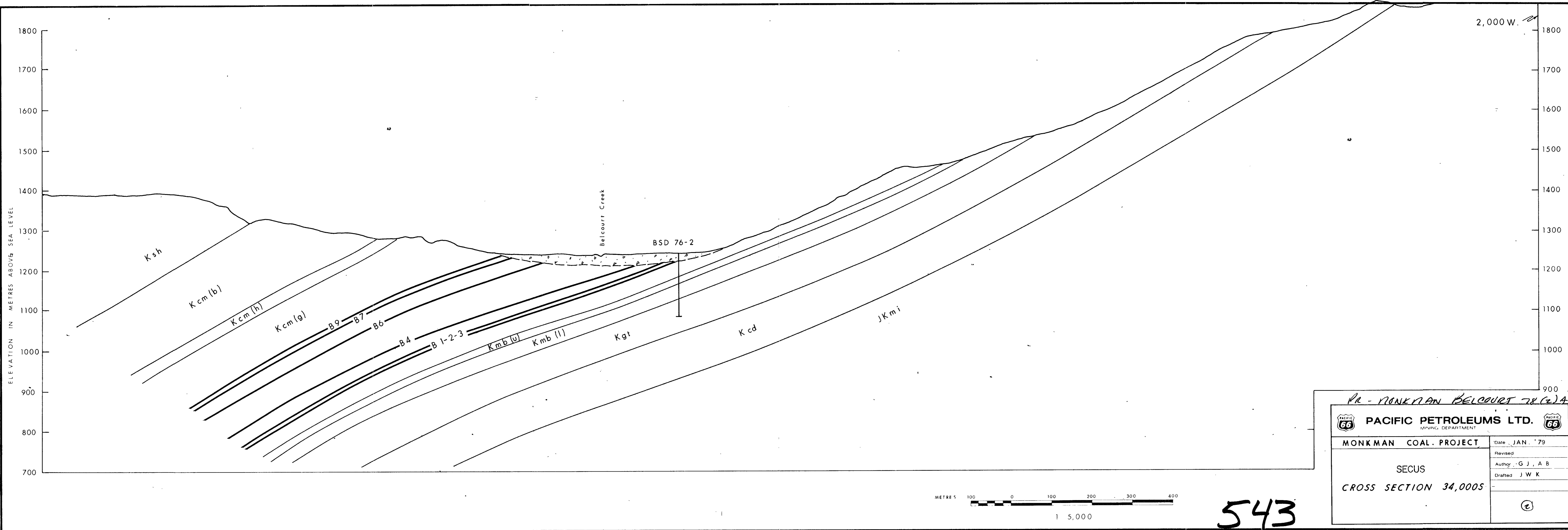
PR - MONKMAN BELCOURT (2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
BELCOURT	
CROSS SECTION 31,000S	
Revised _____ Author G J, A B Drafted J W K	
(Signature)	





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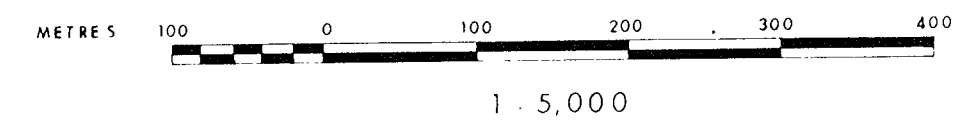
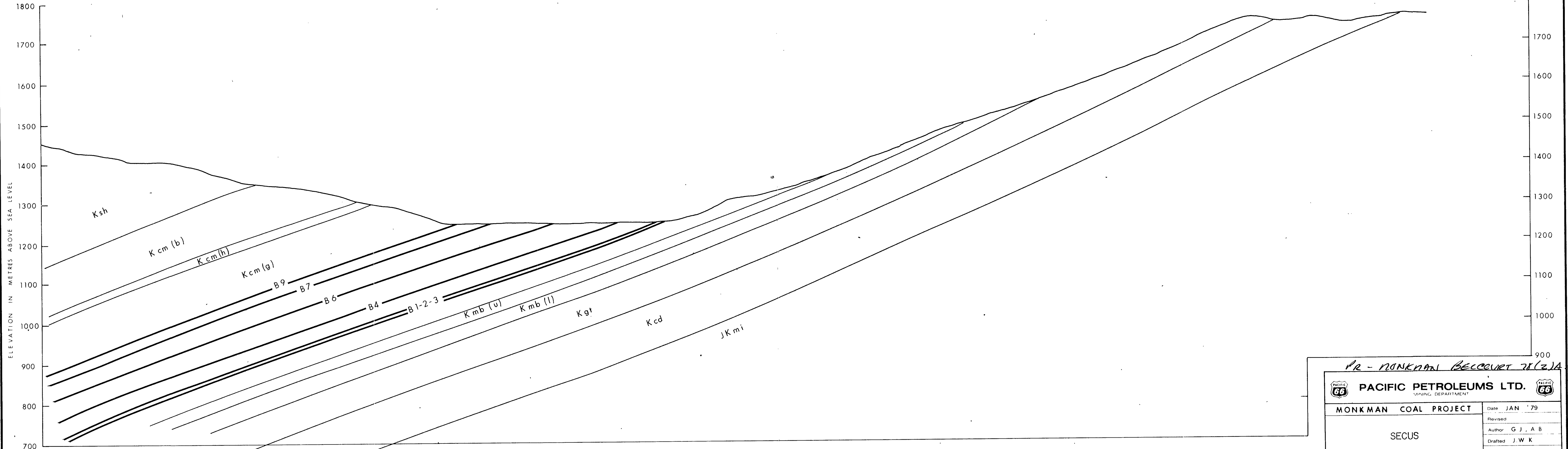


PR - MONKMAN BELCOURT 78 (2) A.

 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. '79
SECUS	Revised
CROSS SECTION 34,000S	Author G J, A B
	Drafted J W K
	




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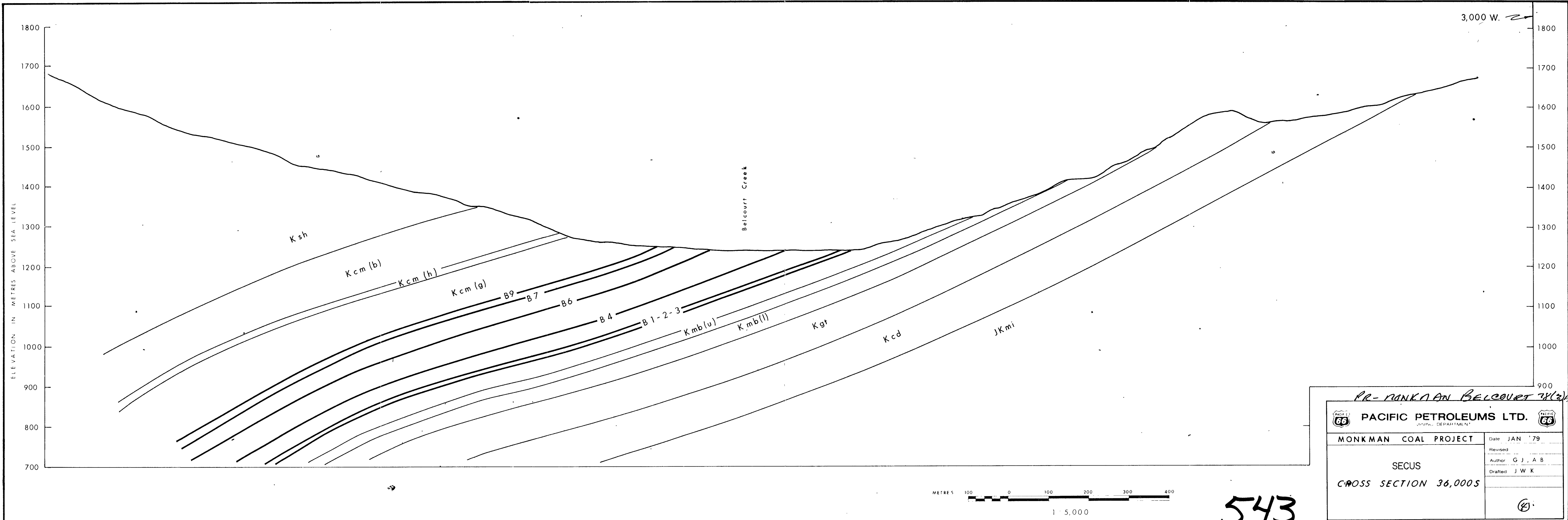
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543

PR - MONKMAN BELCOURT 28(2)A

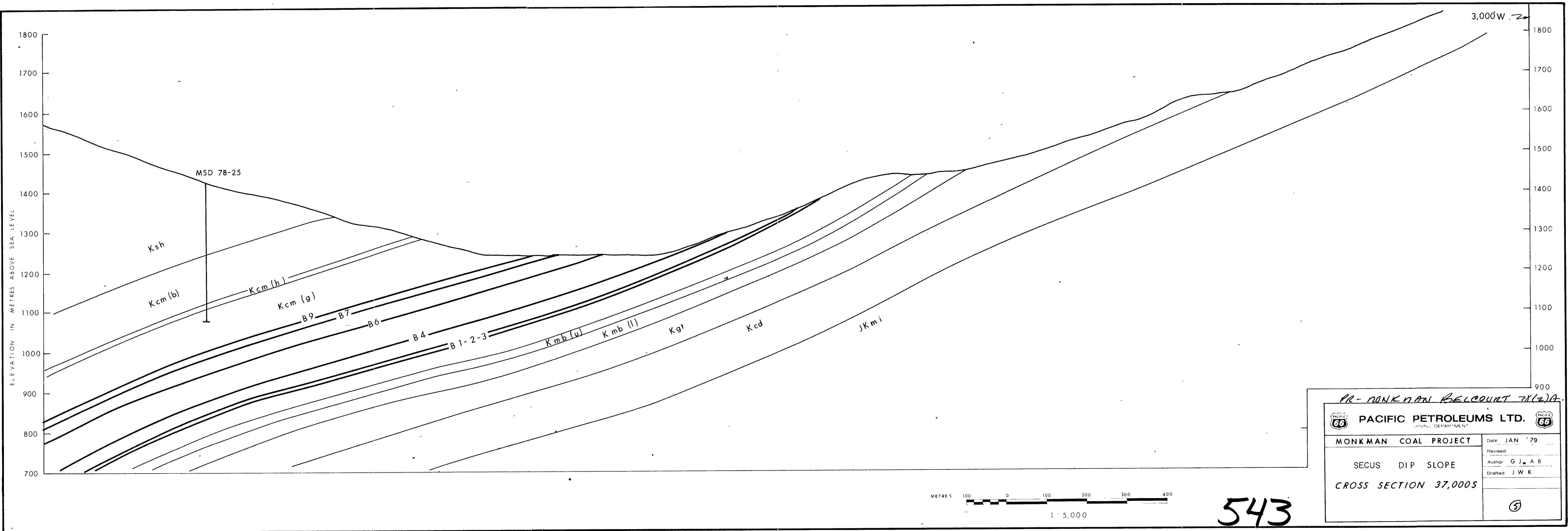
 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SECUS	
CROSS SECTION 35,000S	
	Date JAN '79 Revised Author G J, A B Drafted J W K
	



PR-MONKMAN BELCOURT 78(2)

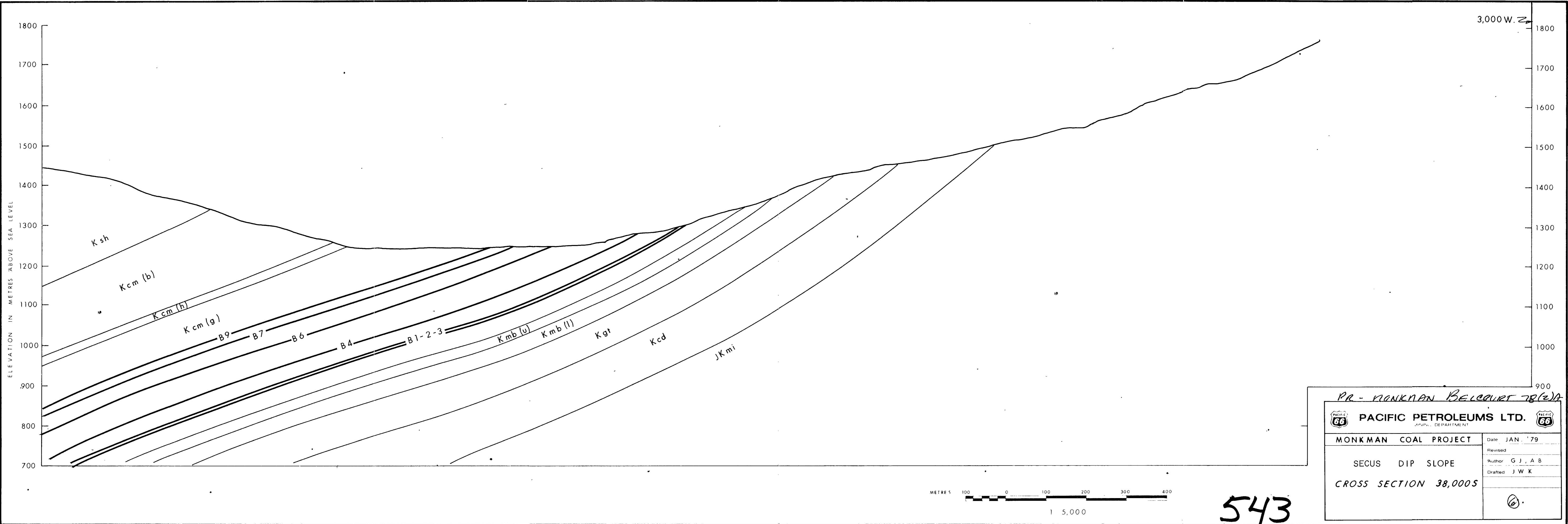
PACIFIC PETROLEUMS LTD.	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN '79
SECUS	Revised
CROSS SECTION 36,000S	Author G J, A B
	Drafted J W K

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PR - MONKMAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD.	
MONKMAN COAL PROJECT	
SECUS DIP SLOPE CROSS SECTION 37,000S	Date JAN '79 Revised Author G J A B Drafted J W K

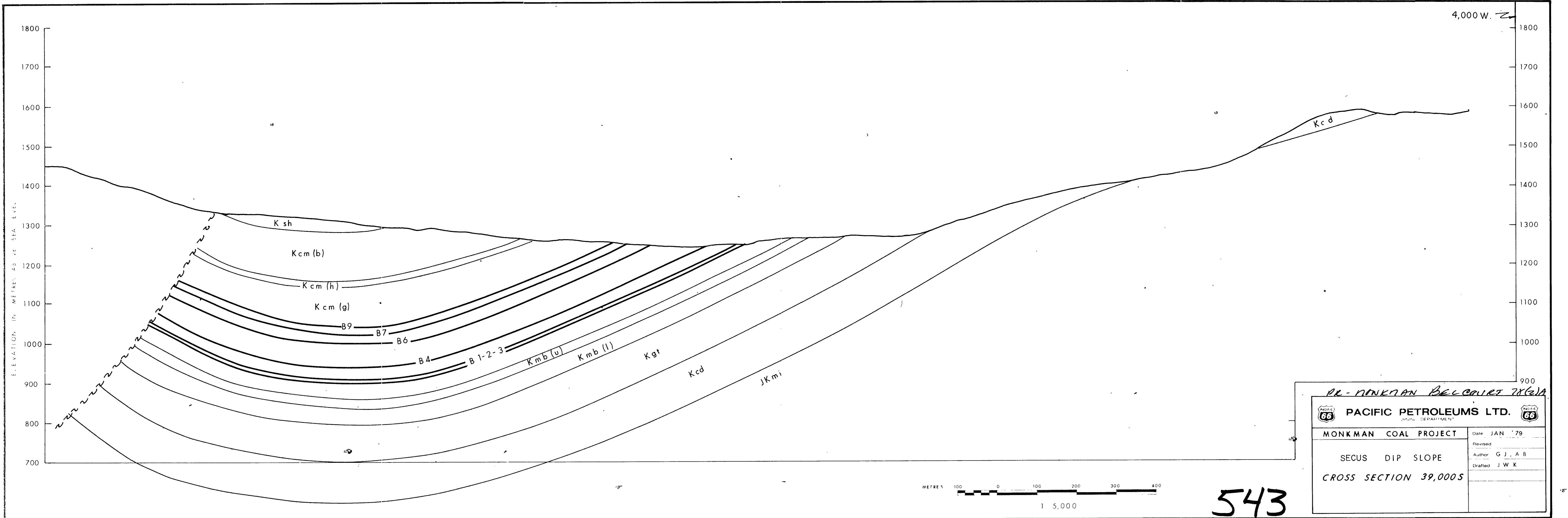


PR - MONKMAN BELCOURT 78(2)A



PACIFIC PETROLEUMS LTD.
SEISMIC DEPARTMENT

MONKMAN COAL PROJECT	Date JAN. '79
SECUS DIP SLOPE	Revised
CROSS SECTION 38,000S	Author G J, A B
	Drafted J W K

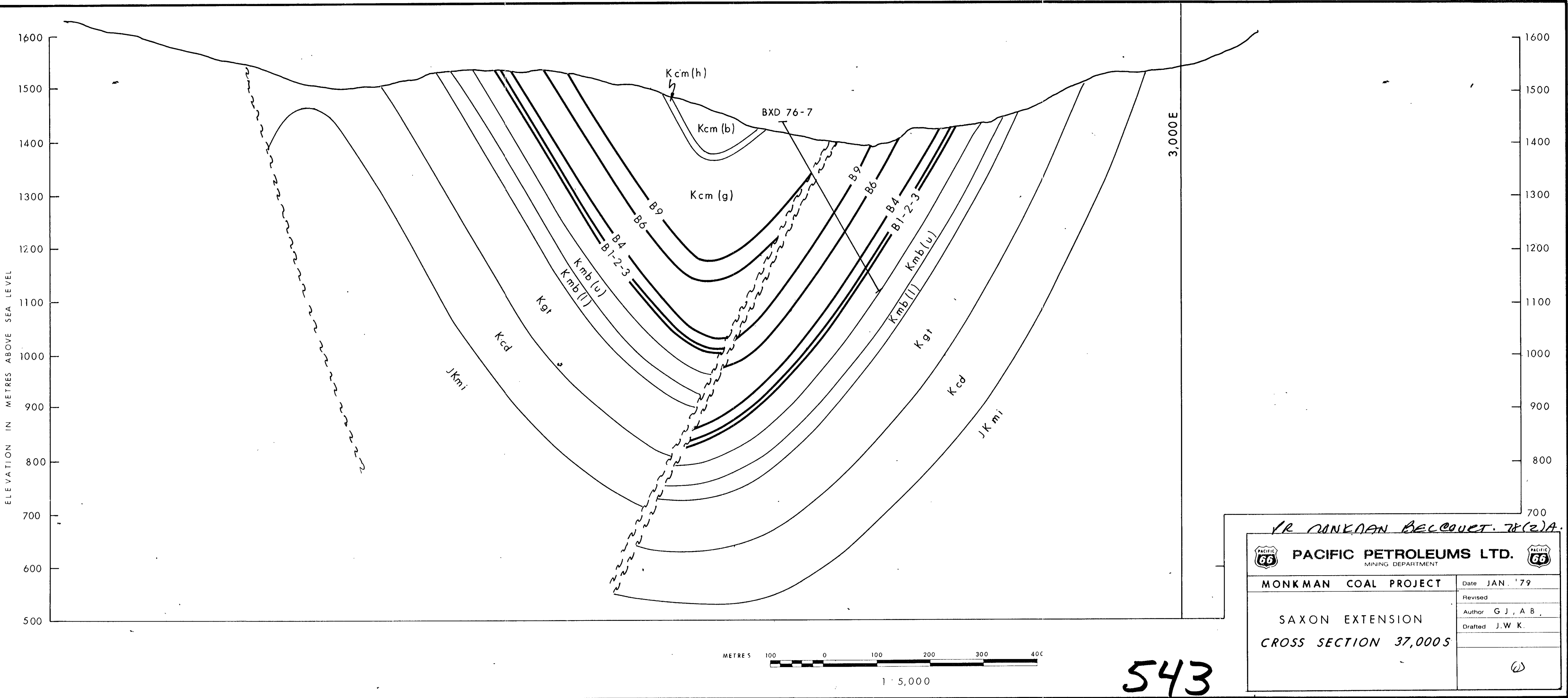
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PR-MONKMAN BELCOURT 78(2)A

 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN '79
	Revised
	Author G J, A B
	Drafted J W K
SECUS DIP SLOPE CROSS SECTION 39,000 S	

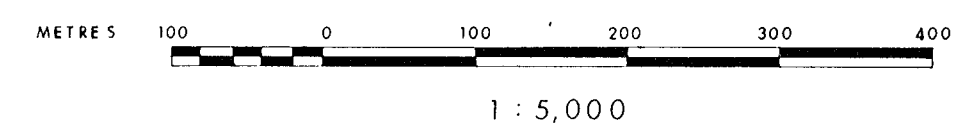
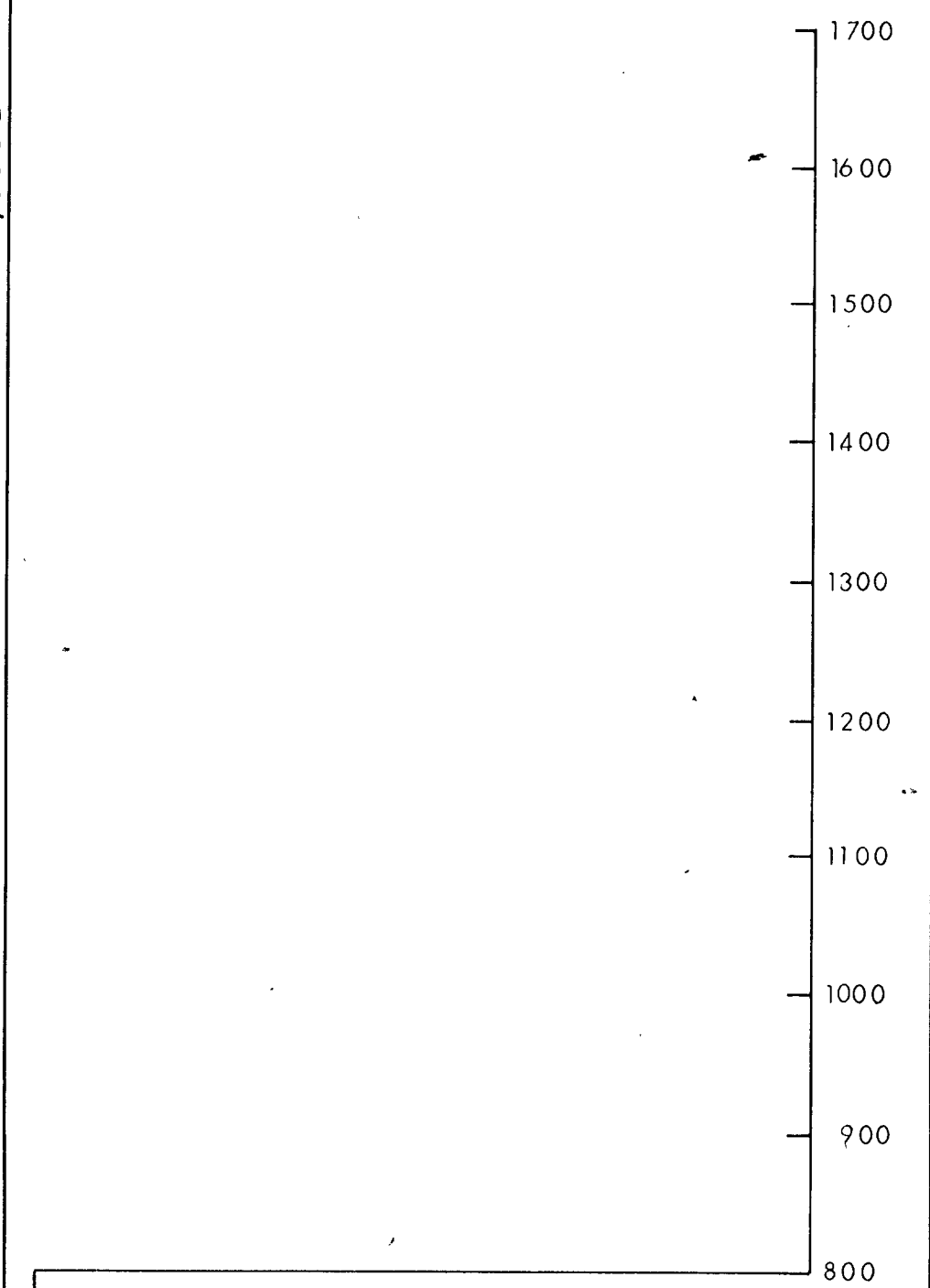
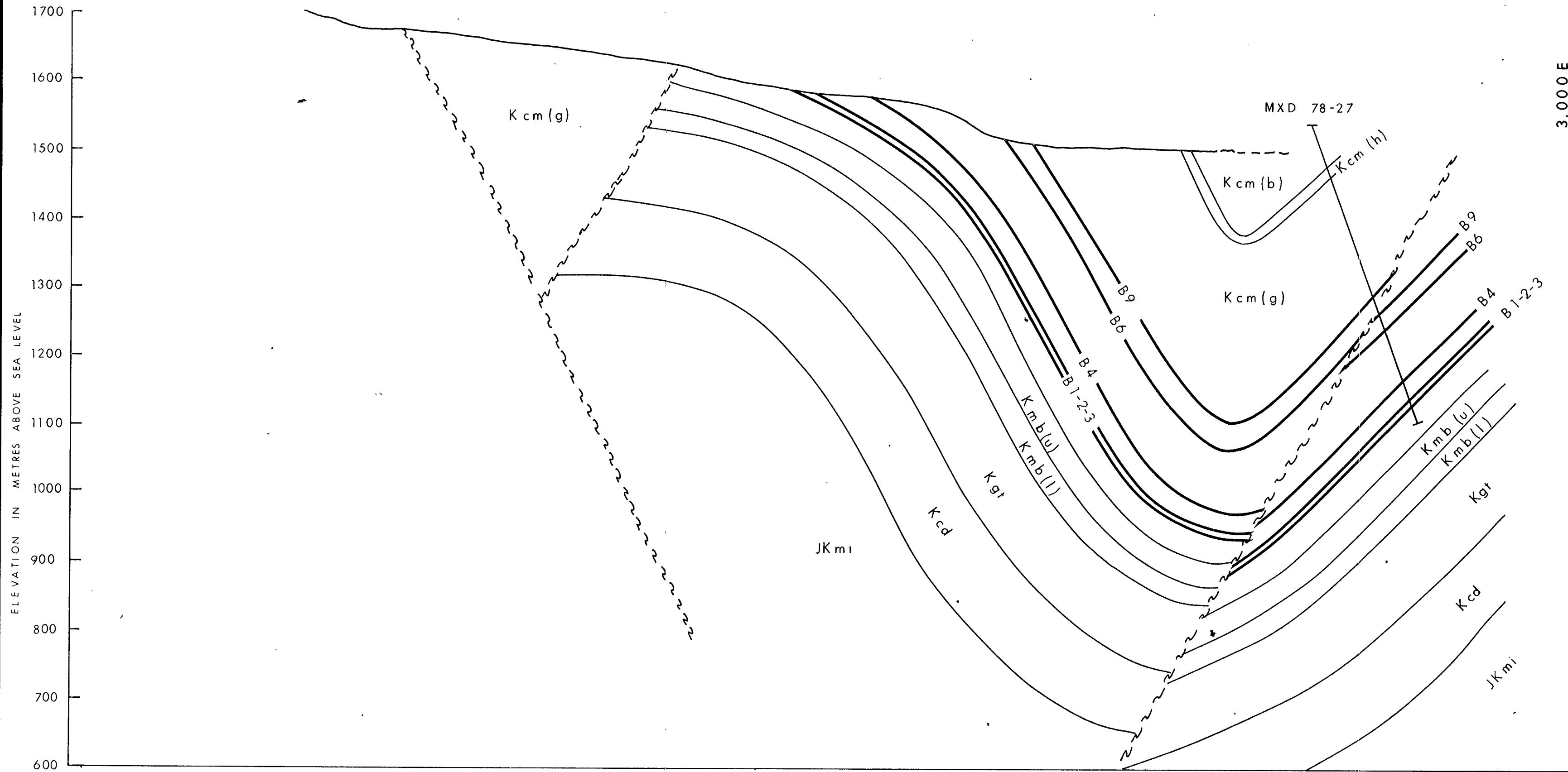
543



IR CANKAN BELCOUET. 78(2)A.

PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. '79
	Revised
	Author G. J., A. B.
	Drafted J. W. K.
SAXON EXTENSION CROSS SECTION 37,000S	

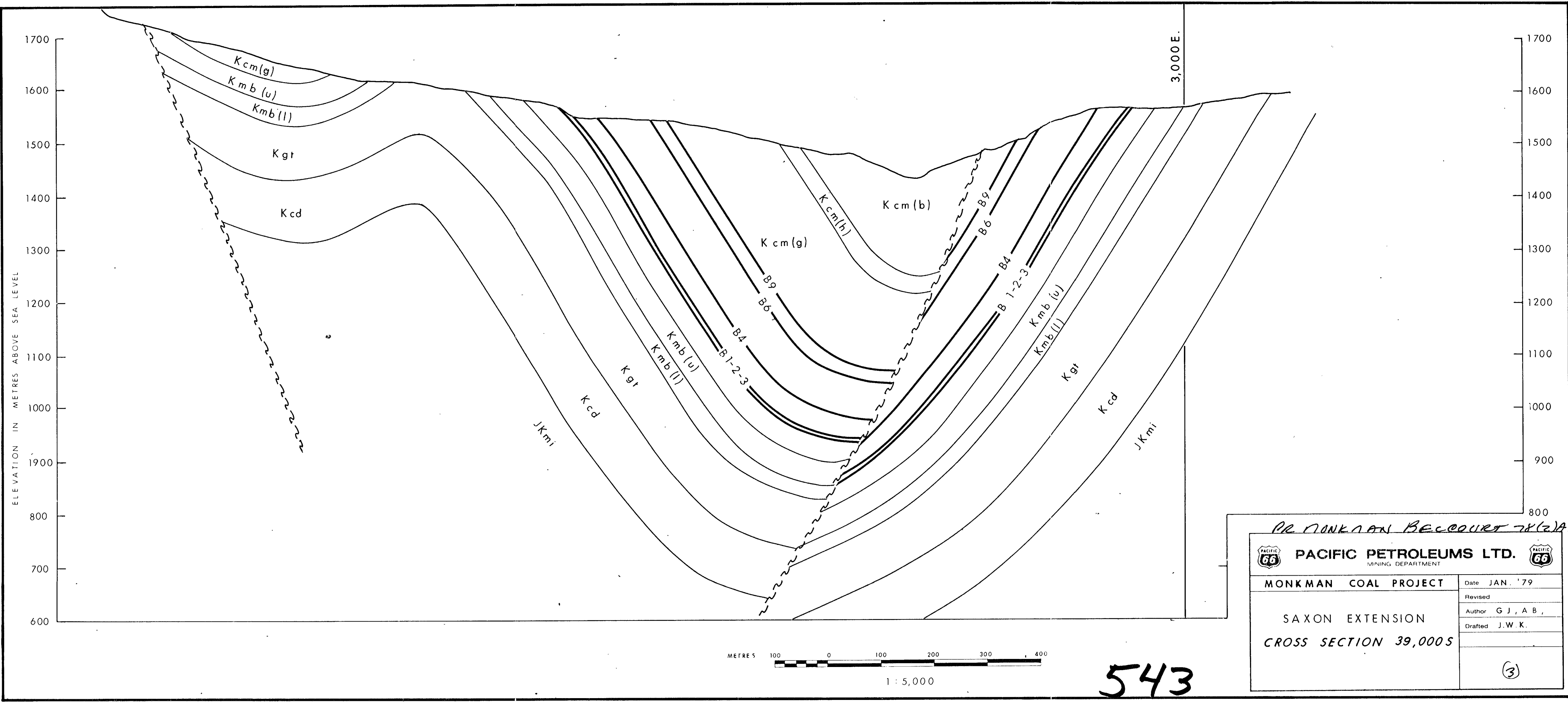
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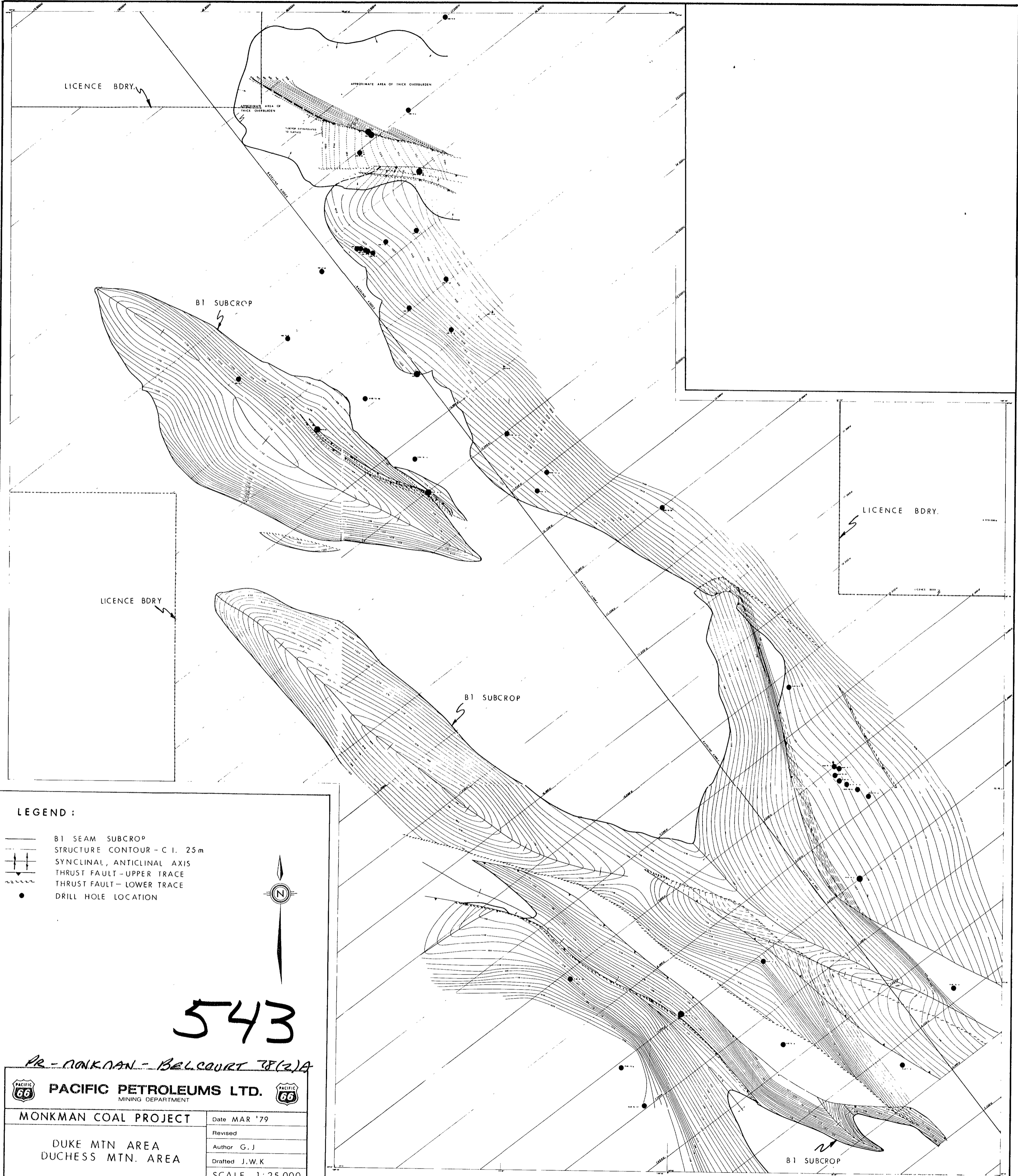


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PR-DONKMAN BELCOURT 78(2)P

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. '79
	Revised
	Author G J, A B
	Drafted J.W.K.
SAXON EXTENSION CROSS SECTION 38,000S	





LEGEND :

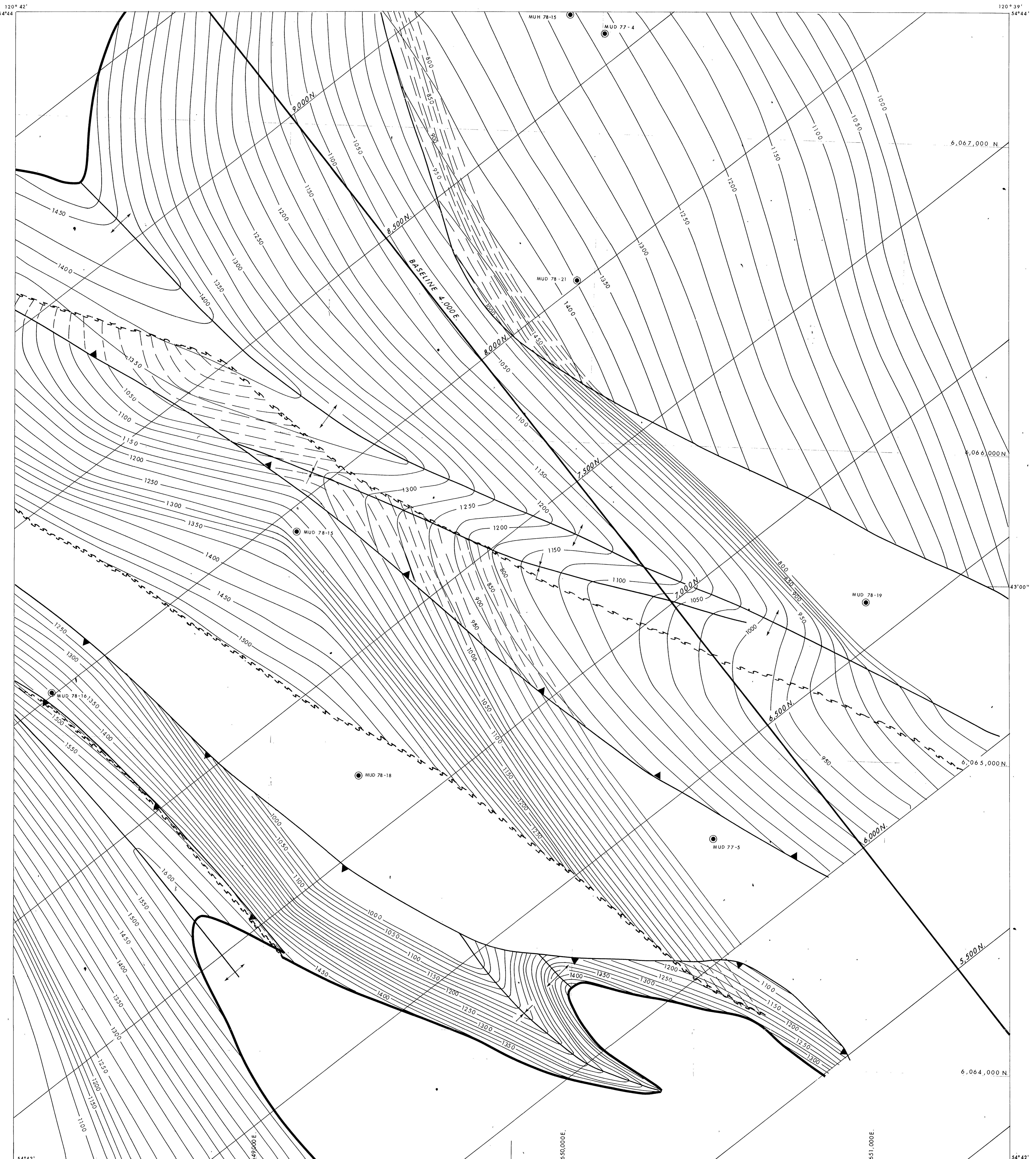
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- STRUCTURE CONTOUR - C I. 25m
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION



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PR - MONKMAN - BELCOURT 78(2)A

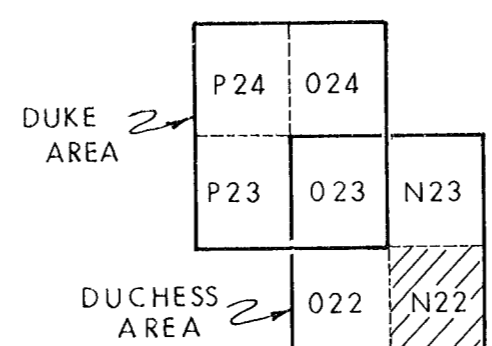
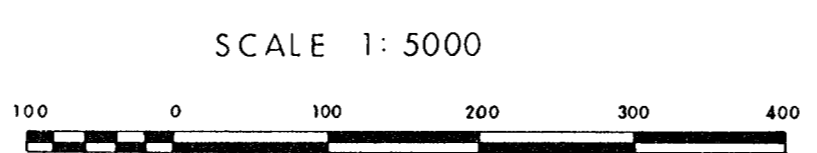
PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	Date MAR '79 Revised Author G. J. Drafted J. W. K. SCALE 1: 25,000 Drawing II.4-4.1
MONKMAN COAL PROJECT	
DUKE MTN AREA DUCHESS MTN. AREA	
B1 STRUCTURE CONTOURS	





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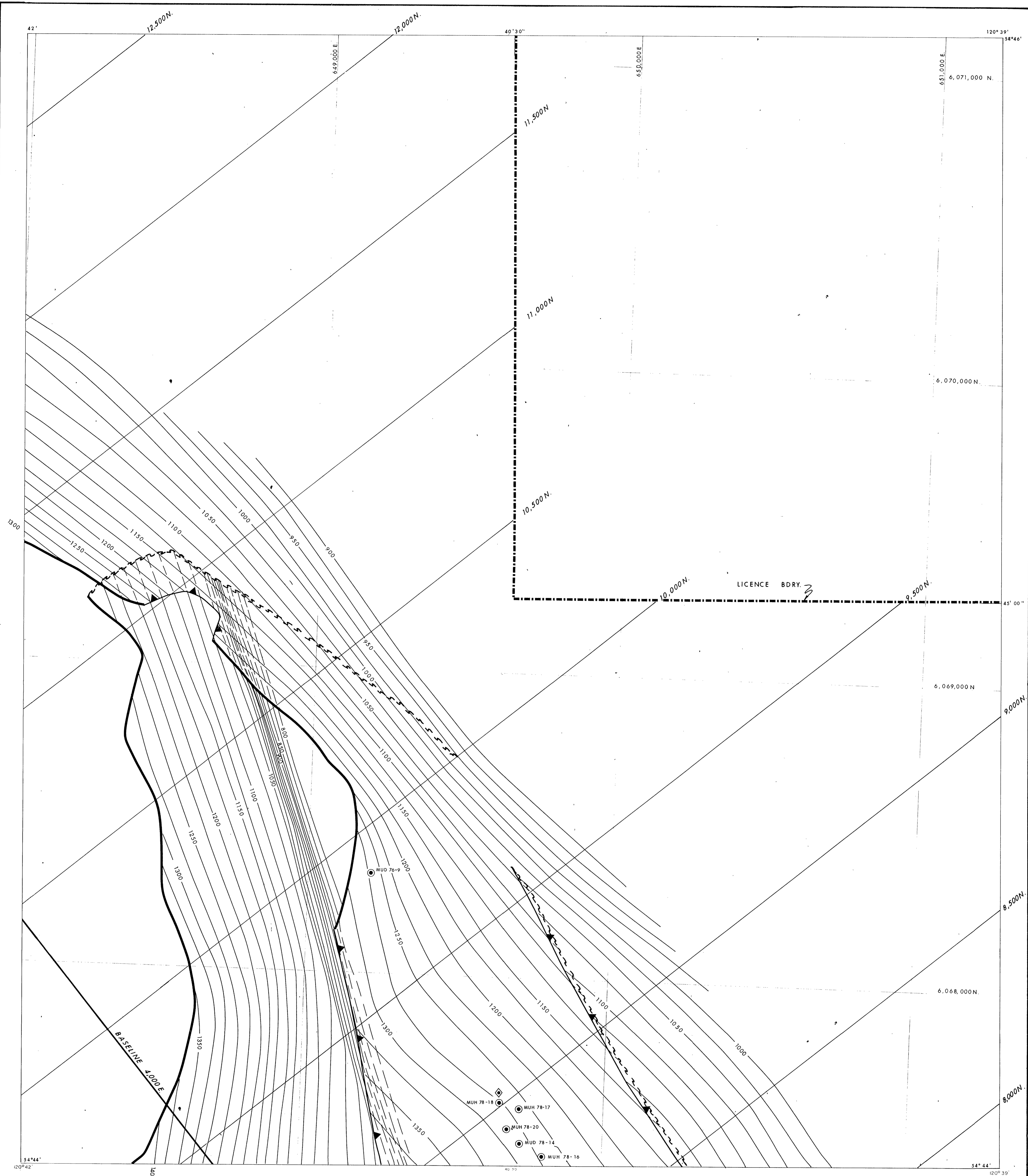
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-  SEAM SUBCROP
-  STRUCTURE CONTOUR - C.I. - 25 m.
-  SYNCLINAL, ANTICLINAL AXIS
-  THRUST FAULT - UPPER TRACE
-  THRUST FAULT - LOWER TRACE
-  DRILL HOLE LOCATION
-  ADIT LOCATION



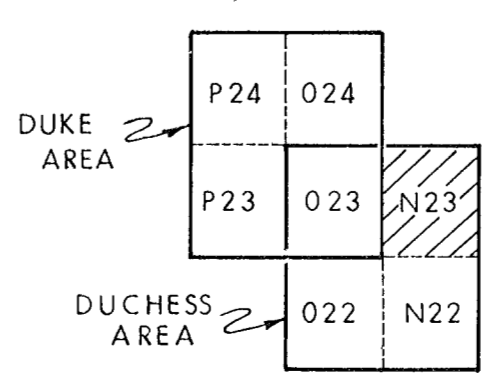
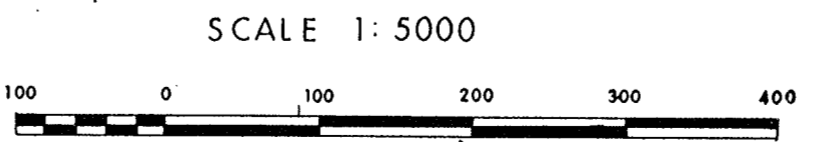
Re-monkman Becroft 74 (2)A.

 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	Date JAN. 7
MONKMAN COAL PROJECT	Revised
DUCHESS MTN. AREA	Author G.J.
STRUCTURE CONTOURS	Drafted J.W.K.
B1 SEAM	Scale 1:5,000
	Drawing II.4-4.2
	N 22



LEGEND:

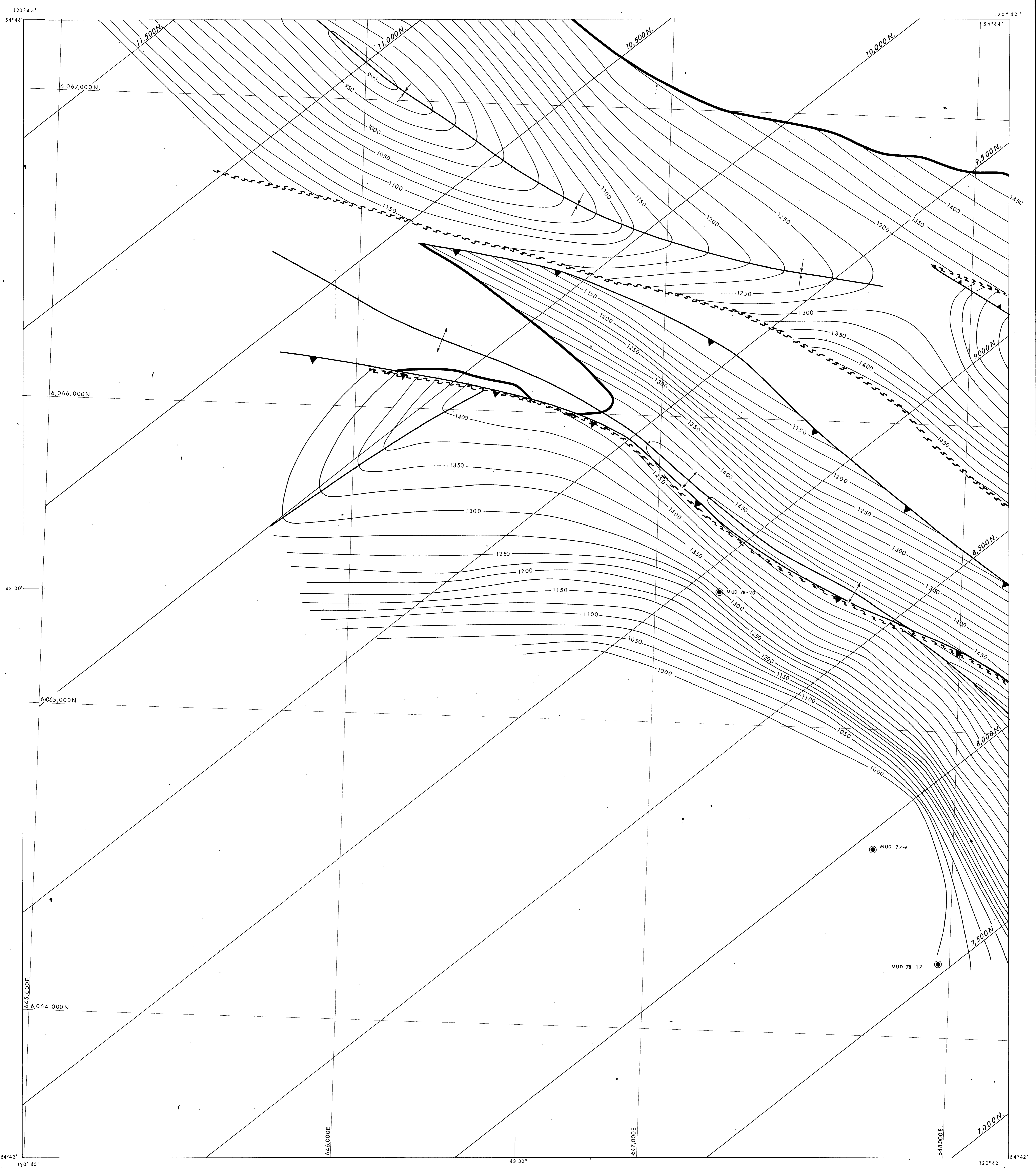
- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. - 25 m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



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PR - ANNEON BELLEVUE 78(2)A

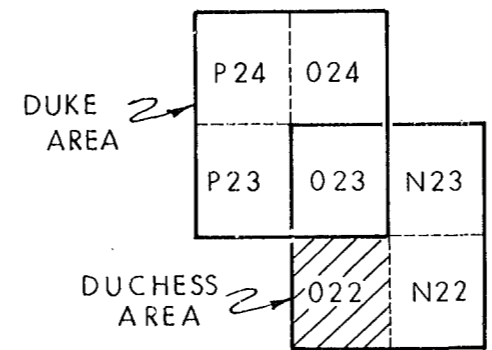
PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUCHESS MTN. AREA	
STRUCTURE CONTOURS B1 SEAM	
Date JAN. 7	Revised
Author G. J.	Drafted J.W.K.
Scale 1:5,000	Drawing II-4-42
N 23	



LEGEND:

- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. 25 m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION

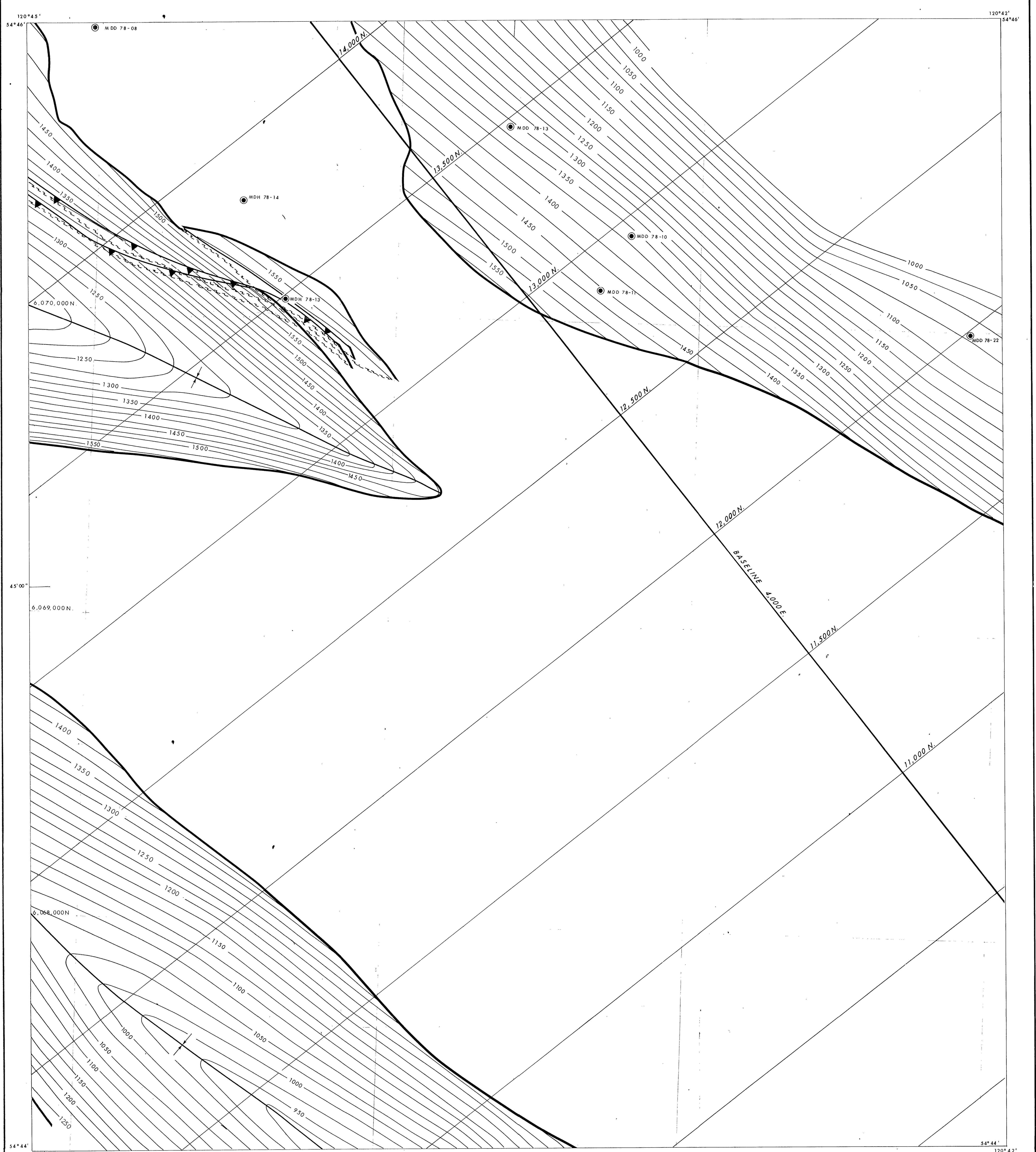
SCALE 1:5000



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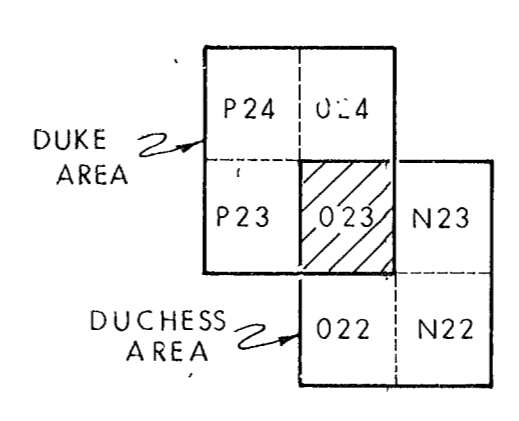
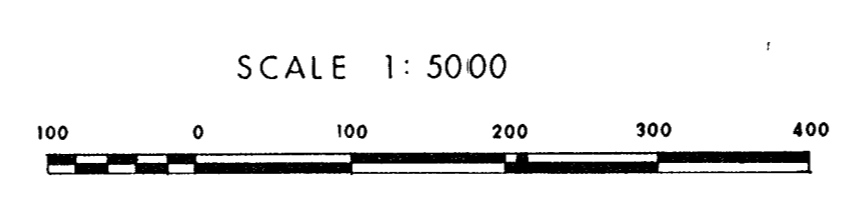
Mc-MONKMAN BELMONT TX (2)A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. 7
DUCHESS MTN. AREA	Revised
STRUCTURE CONTOURS	Author G. J.
B1 SEAM	Drafted J. W. K.
	Drawing II-4-4.2
	022



LEGEND:

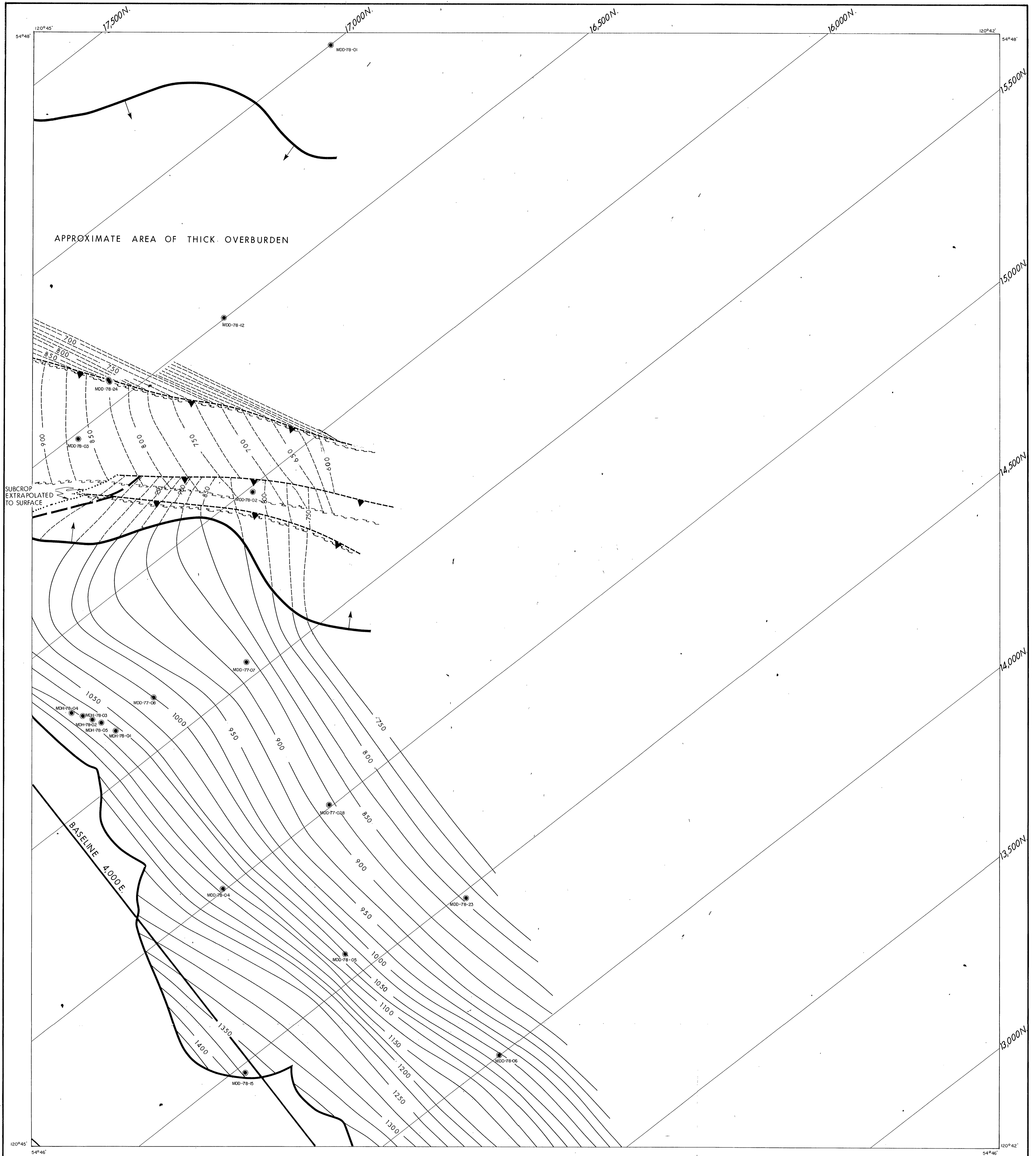
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- STRUCTURE CONTOUR - C.I. -25m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



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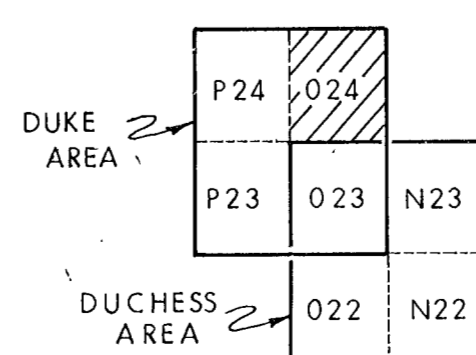
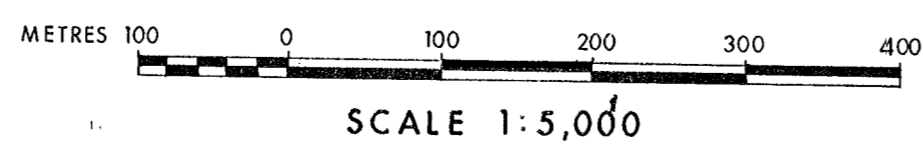
Re-work on Beccover 78 (2) A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA & DUCHESS MTN. AREA	
STRUCTURE CONTOURS B1 SEAM	
Date JAN. '79	Revised
Author G.J.	Drafted J.W.K.
Scale 1:5,000	Drawing II.4-4.2
O 23	



LEGEND:

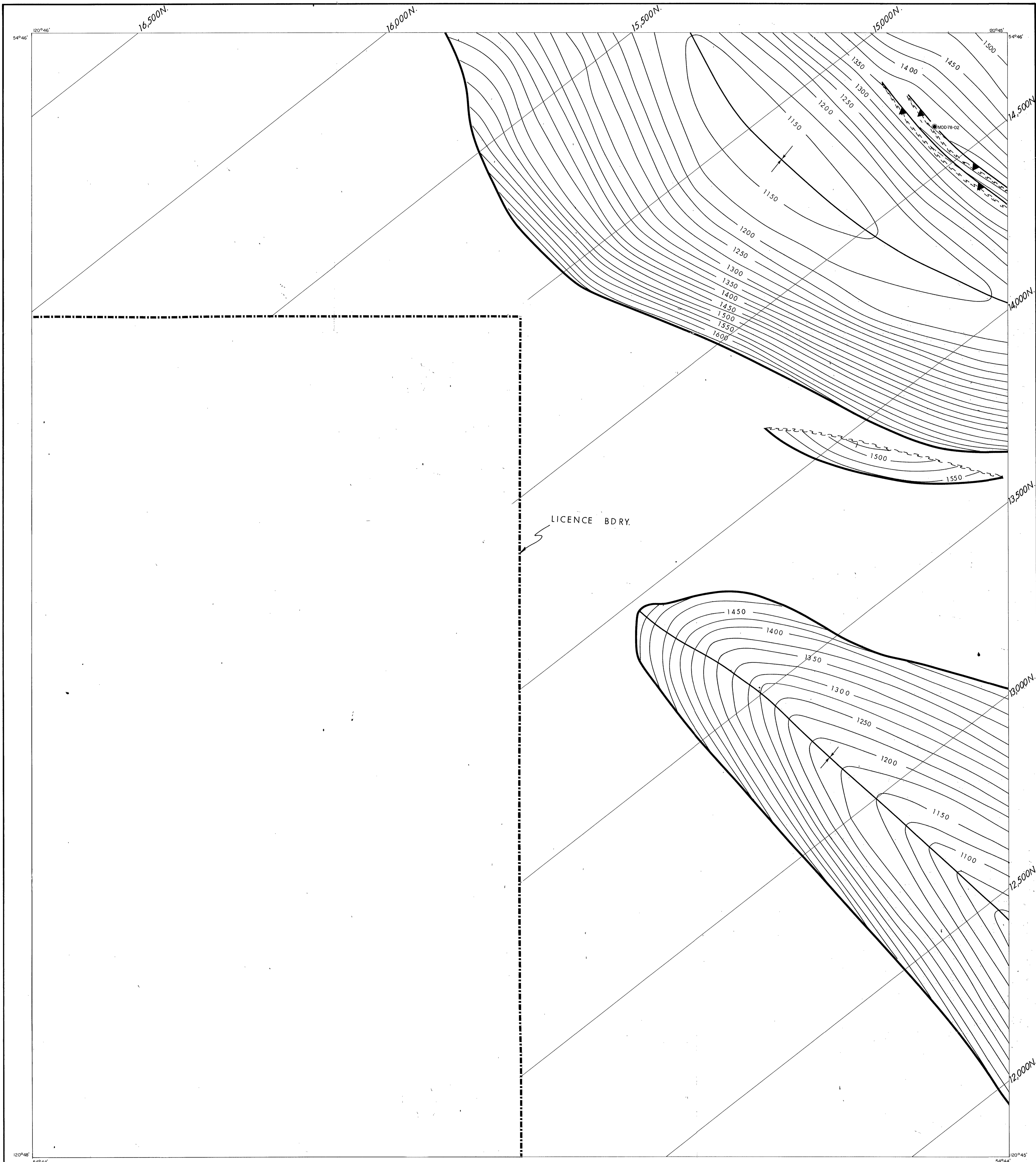
- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25m.
- ↑↓ SYNCLINAL, ANTICLINAL AXIS
- ↗↘ THRUST FAULT - UPPER TRACE
- ↖↙ THRUST FAULT - LOWER TRACE
- ⊙ DRILL HOLE LOCATION
- ↗↘ ADIT LOCATION



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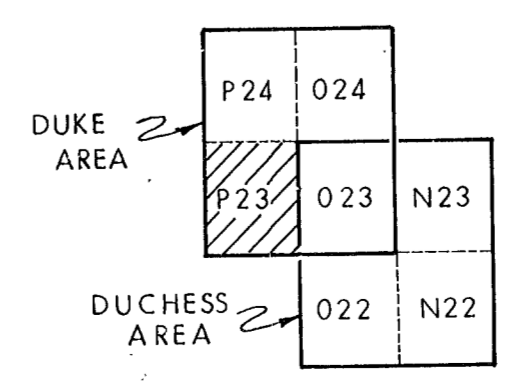
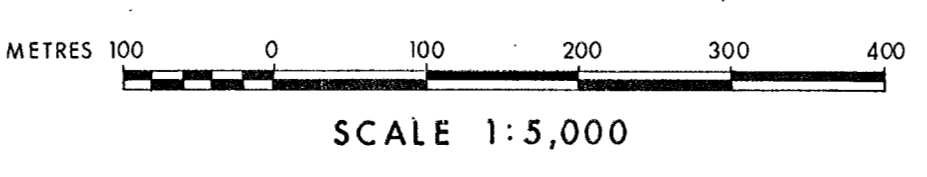
PR - MONKMAN (Belcourt 78(2)A)

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date FEB. '79
DUKE MTN. AREA	Revised
	Author G. J.
	Drafted J. W. K.
STRUCTURE CONTOURS B1 SEAM	Drawing II.4-4.2
	O24



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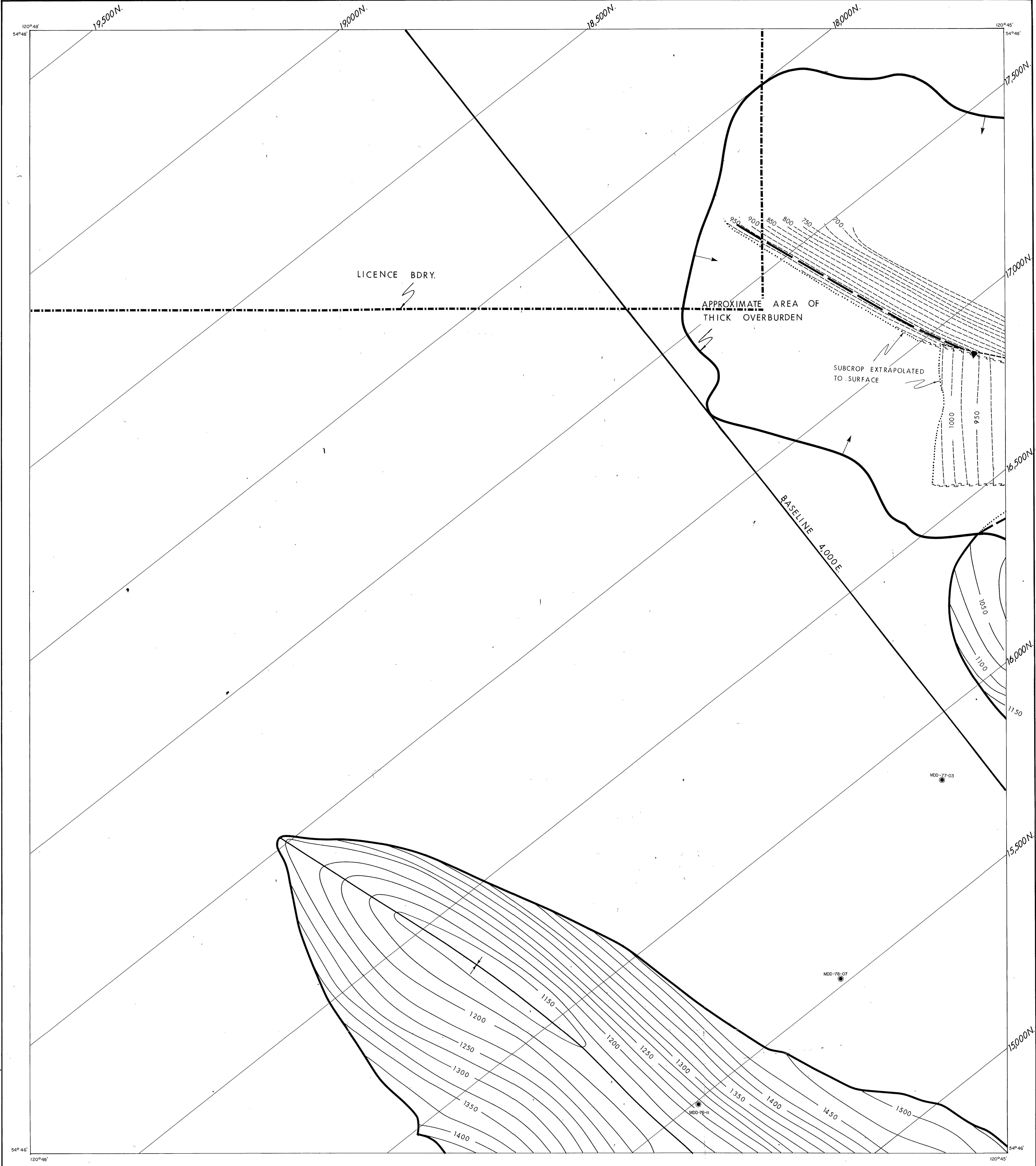
- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25m.
- ↑↓ SYNCLINAL, ANTICLINAL AXIS
- ▲— THRUST FAULT - UPPER TRACE
- ▼— THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- > ADIT LOCATION



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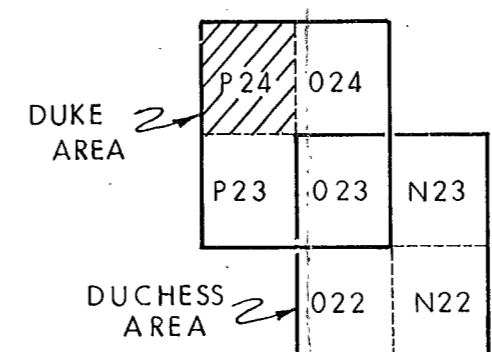
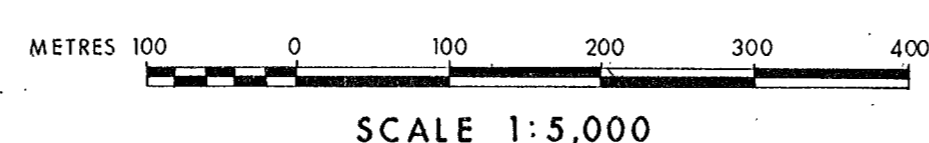
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PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	
STRUCTURE CONTOURS B1 SEAM	
Date FEB. '79	Revised
Author G. J.	Drafted J.W.K.
Drawing I14-42	
P23	



LEGEND:

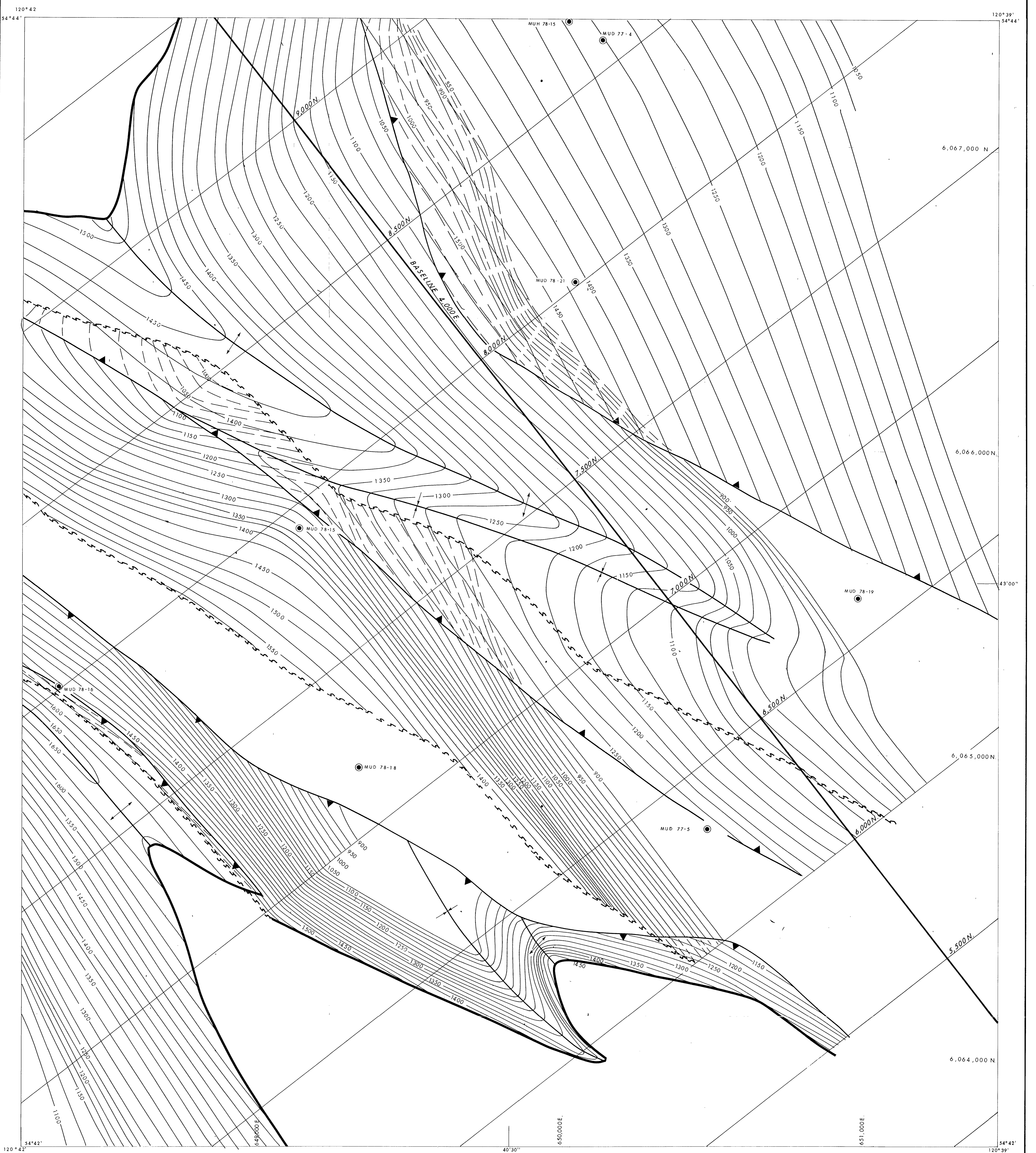
- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25m.
- ↑ ↓ SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



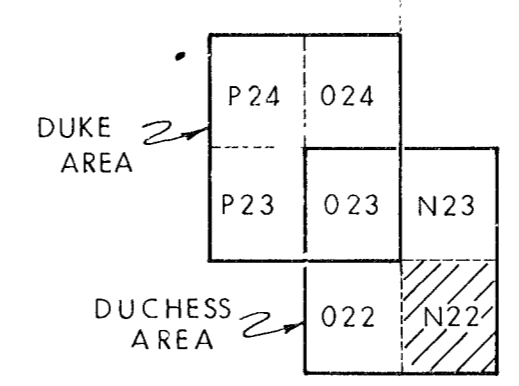
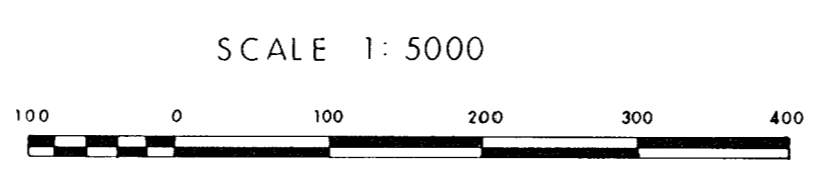
543

PR - DUNE CLAN BELLAIR 78 (2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date FEB. '79	Revised
Author G. J.	Drafted J. W. K.
STRUCTURE CONTOURS B1 SEAM	
Drawing II.4-4.2 P 24	



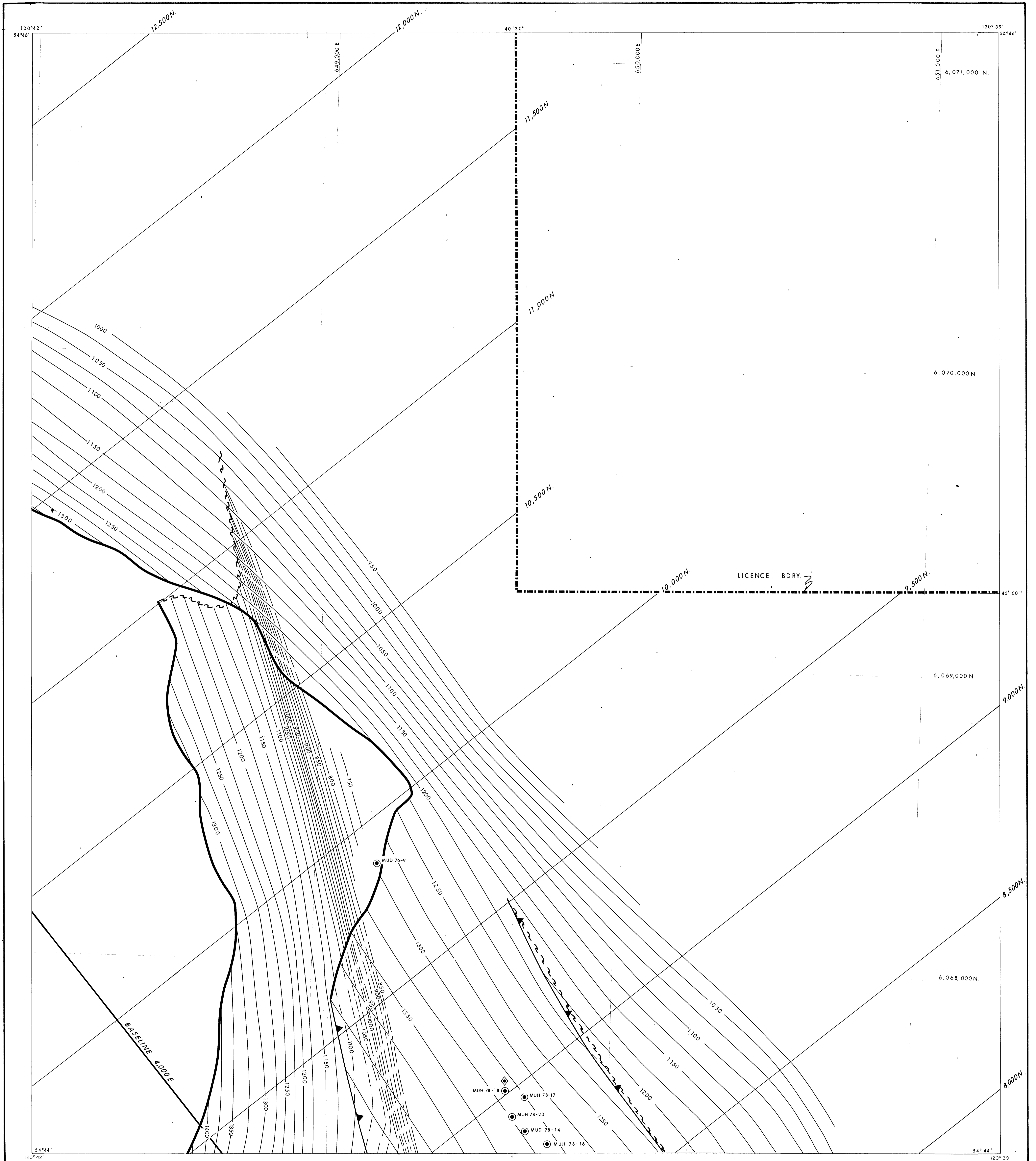
- LEGEND:**
- SEAM SUBCROP
 - STRUCTURE CONTOUR - C.I. - 25m.
 - SYNCLINAL, ANTICLINAL AXIS
 - THRUST FAULT - UPPER TRACE
 - THRUST FAULT - LOWER TRACE
 - DRILL HOLE LOCATION
 - ADIT LOCATION



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Re-nomenclature BECCORDT 71(2)A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date JAN. 7	Revised
Author G. J.	Drafted J.W.K.
Scale 1:5,000	Drawing II-4-42
STRUCTURE CONTOURS B3 SEAM	
N22	

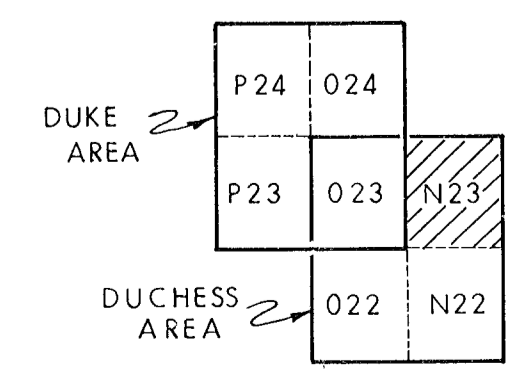
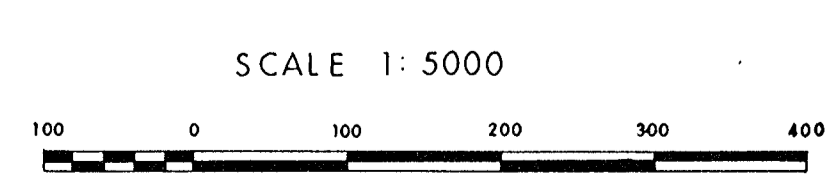


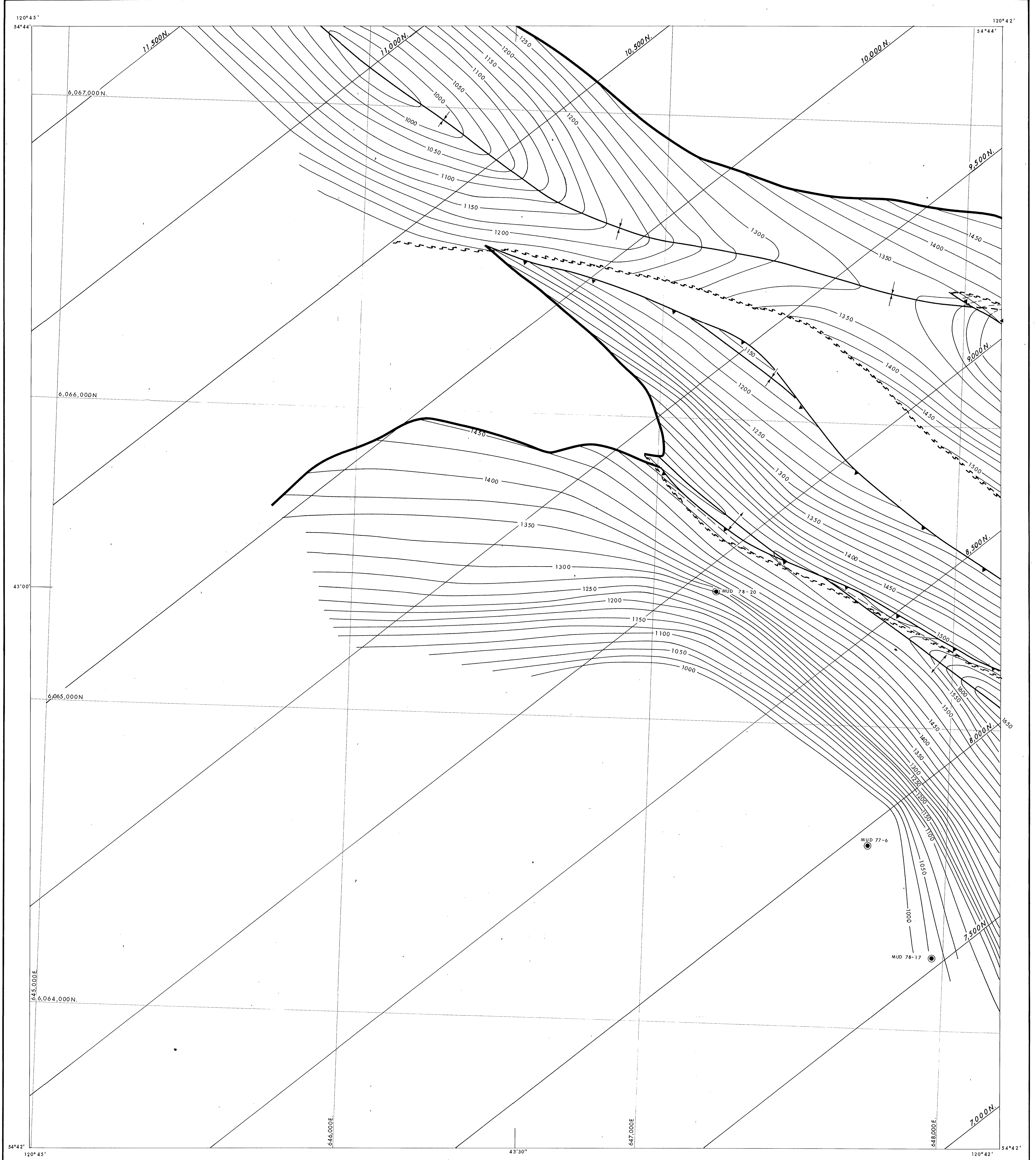
543

PK - DUNKERON BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date	JAN. 7
Revised	
Author	G. J.
Drafted	J.W.K.
Scale	1:5,000
Drawing	II-4-42
N 23	

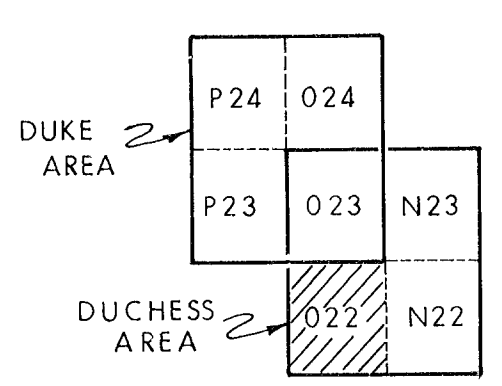
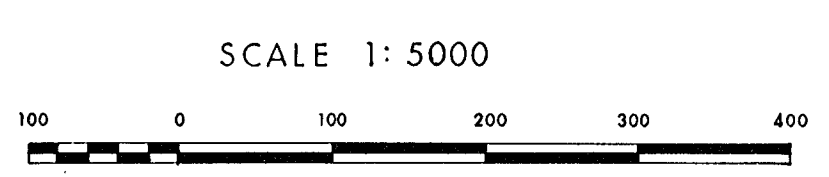
- LEGEND:**
- SEAM SUBCROP
 - STRUCTURE CONTOUR - C.I. - 25 m.
 - SYNCLINAL, ANTICLINAL AXIS
 - THRUST FAULT - UPPER TRACE
 - THRUST FAULT - LOWER TRACE
 - DRILL HOLE LOCATION
 - ADIT LOCATION





LEGEND:

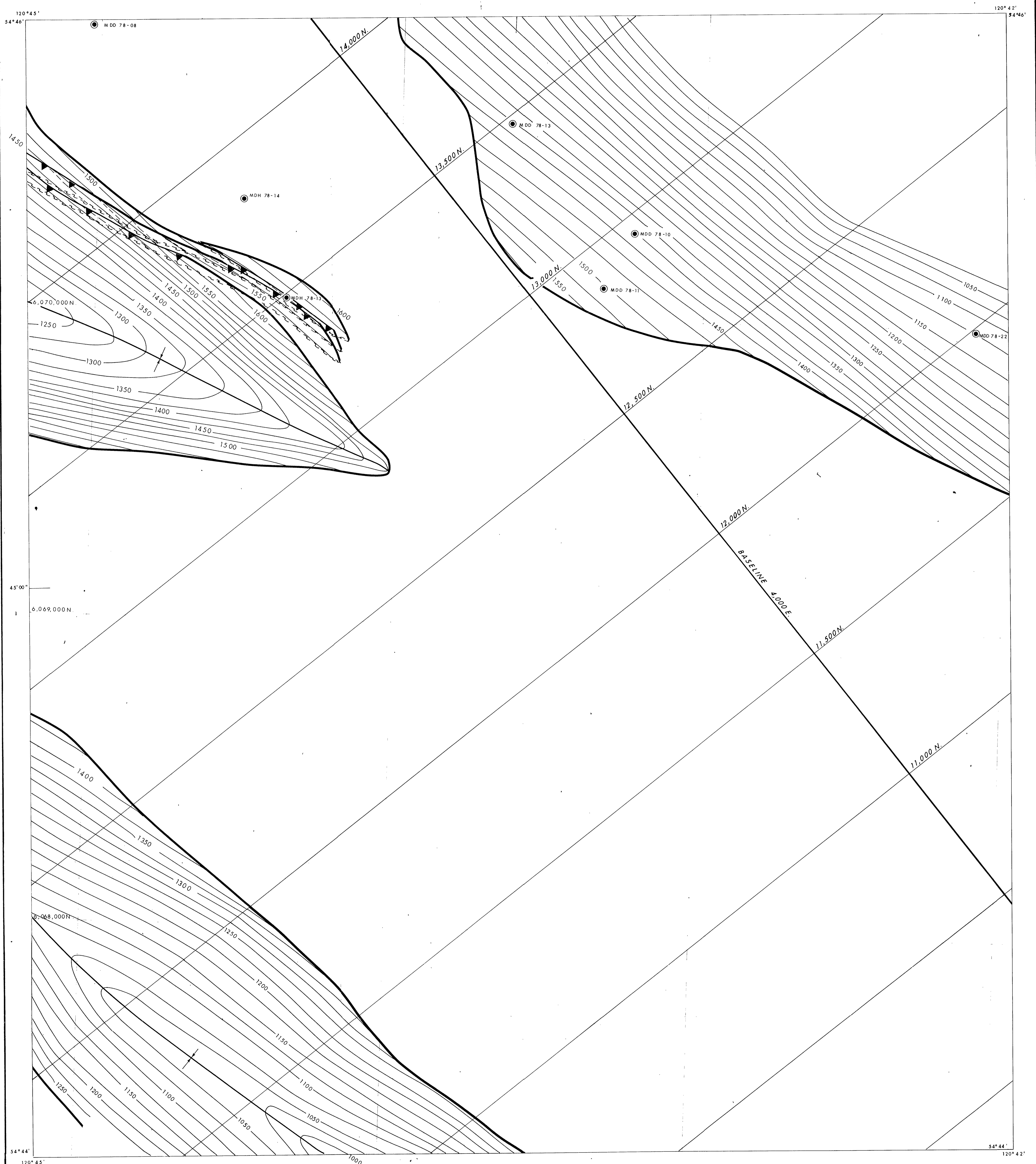
- SEAM SUBCROP
- STRUCTURE CONTOUR-C.I.25m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT-UPPER TRACE
- THRUST FAULT-LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



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PE-DUNKAN BELMONT 78(2)A

PACIFIC PETROLEUMS LTD.	<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date	JAN. 78
DUCHESS MTN. AREA	Revised	
STRUCTURE CONTOURS	Author	G. J.
B3 SEAM	Drafted	J. W. K.
	Drawing	II.4-42
		022

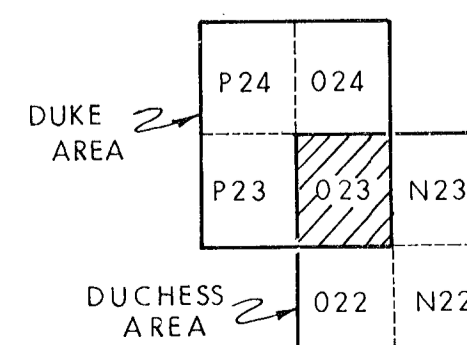


543

LEGEND:

- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. = 25m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION

SCALE: 1:5000'



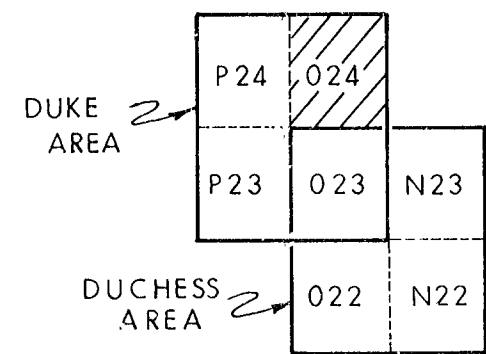
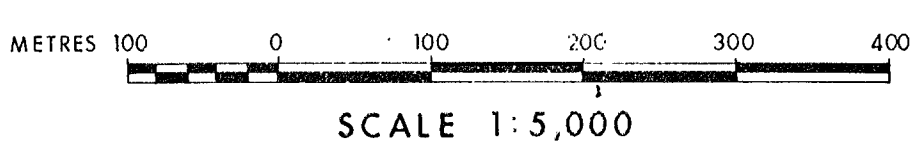
PR - DUKEDON BELMONT 78(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>		<small>Date JAN. '79</small>
MONKMAN COAL PROJECT		<small>Revised</small>
DUKE MTN. AREA & DUCHESS MTN. AREA		<small>Author G.J.</small>
STRUCTURE CONTOURS		<small>Drafted J.W.K.</small>
B3 SEAM		<small>Scale 1:5,000</small>
		<small>Drawing 114-42</small>
		<small>023</small>



LEGEND:

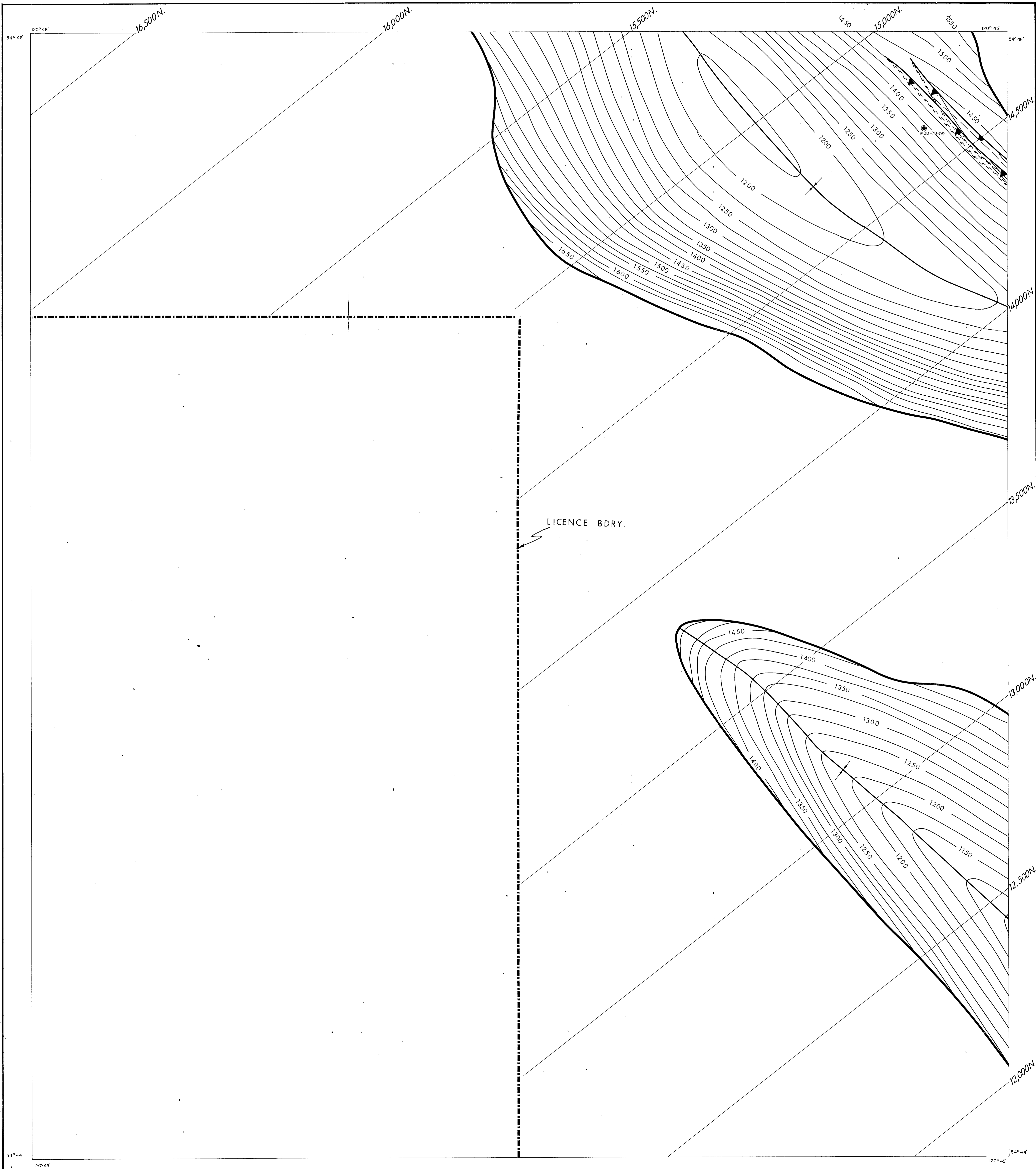
- SEAM SUBCROP
- - - - STRUCTURE CONTOUR - C.I. 2.5 m.
- ↑ ↓ SYNCLINAL, ANTICLINAL AXIS
- ▲— THRUST FAULT - UPPER TRACE
- ▼— THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



543

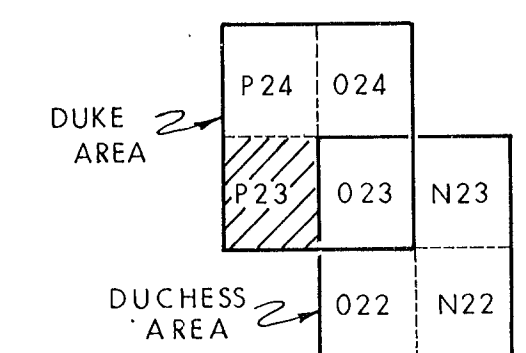
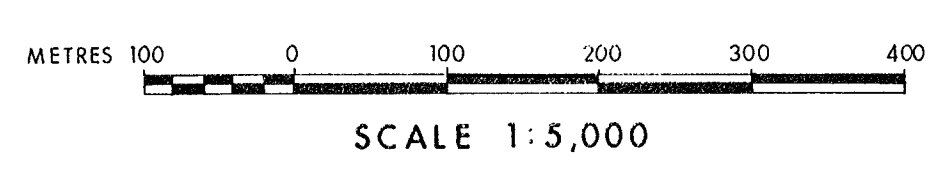
PR - MONKMAN BELGOUET 7(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	Date FEB. '79
	Revised
	Author G. J.
	Drafted J.W.K.
STRUCTURE CONTOURS B3 SEAM	
	Drawing II-4-2
	024



LEGEND:

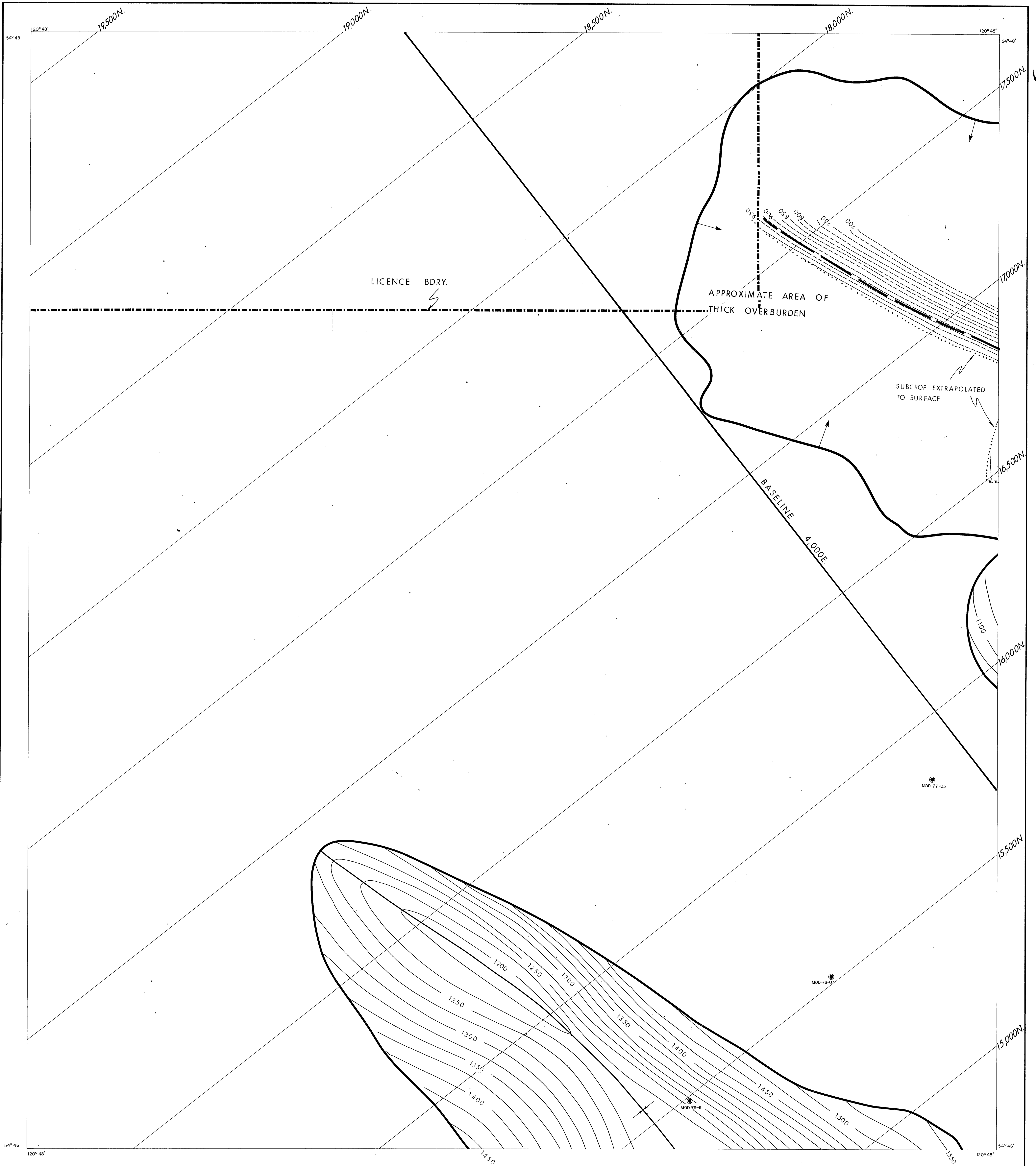
- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. 25 m
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



543

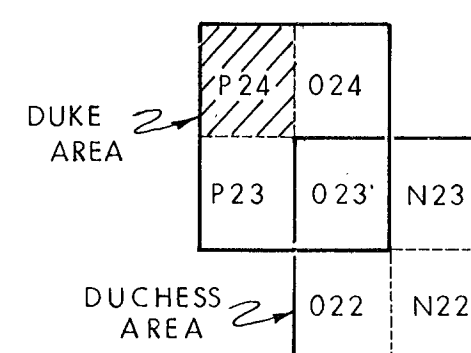
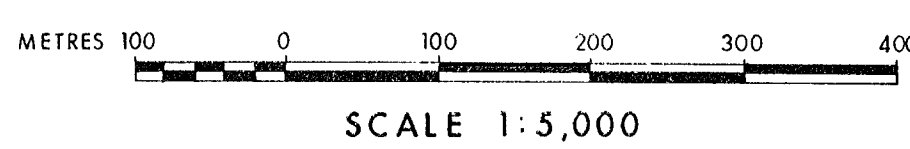
12-TUNKOON - BELLEVUE 7K (2) A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT.	
DUKE MTN. AREA	Date FEB. '79
STRUCTURE CONTOURS	Revised
B3 SEAM	Author G.J.
	Drafted J.W.K.
	Drawing II4-42
	P23



LEGEND:

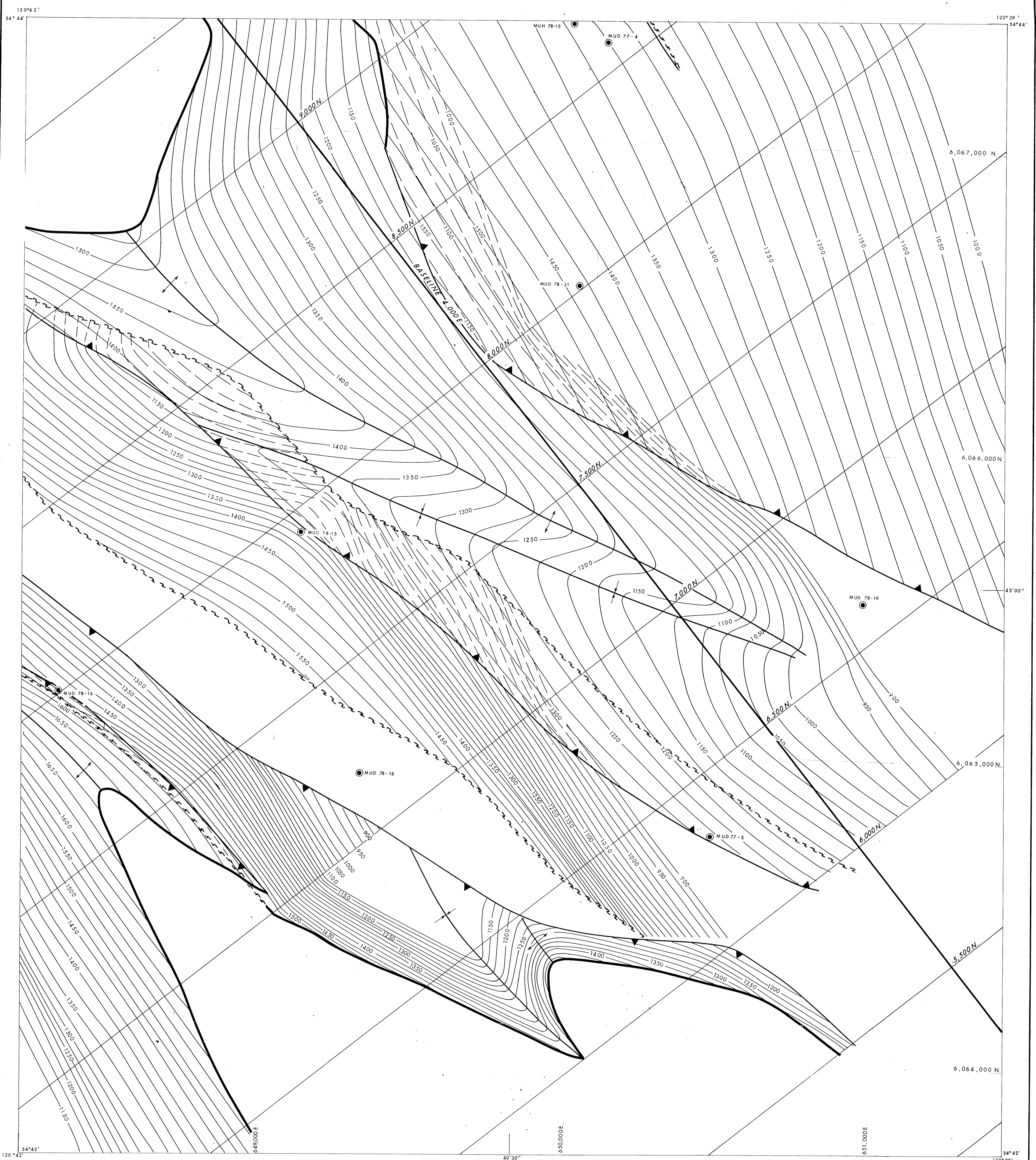
- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25 m.
- ↑↑↑ SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- ~~~~~ THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ↘ ADIT LOCATION




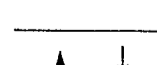
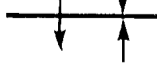




543

PR - UNKNOWN BECAUSE 74 (2) A

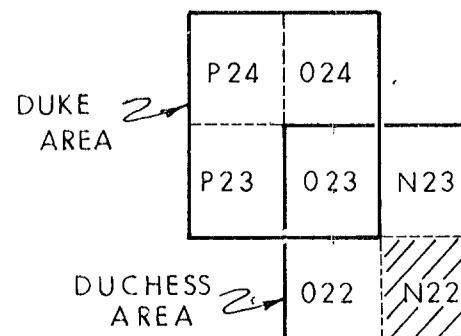
	PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT		Date FEB. '79
DUKE MTN. AREA		Revised
STRUCTURE CONTOURS		Author G. J.
B3 SEAM		Drafted J.W.K.
		Drawing IIA-42
		P 24



LEGEND:


-  SEAM SUBCROP
-  STRUCTURE CONTOUR—C.I.—25 m.
-  SYNCLINAL, ANTICLINAL AXIS
-  THRUST FAULT—UPPER TRACE
-  THRUST FAULT—LOWER TRACE
-  DRILL HOLE LOCATION
-  ADIT LOCATION

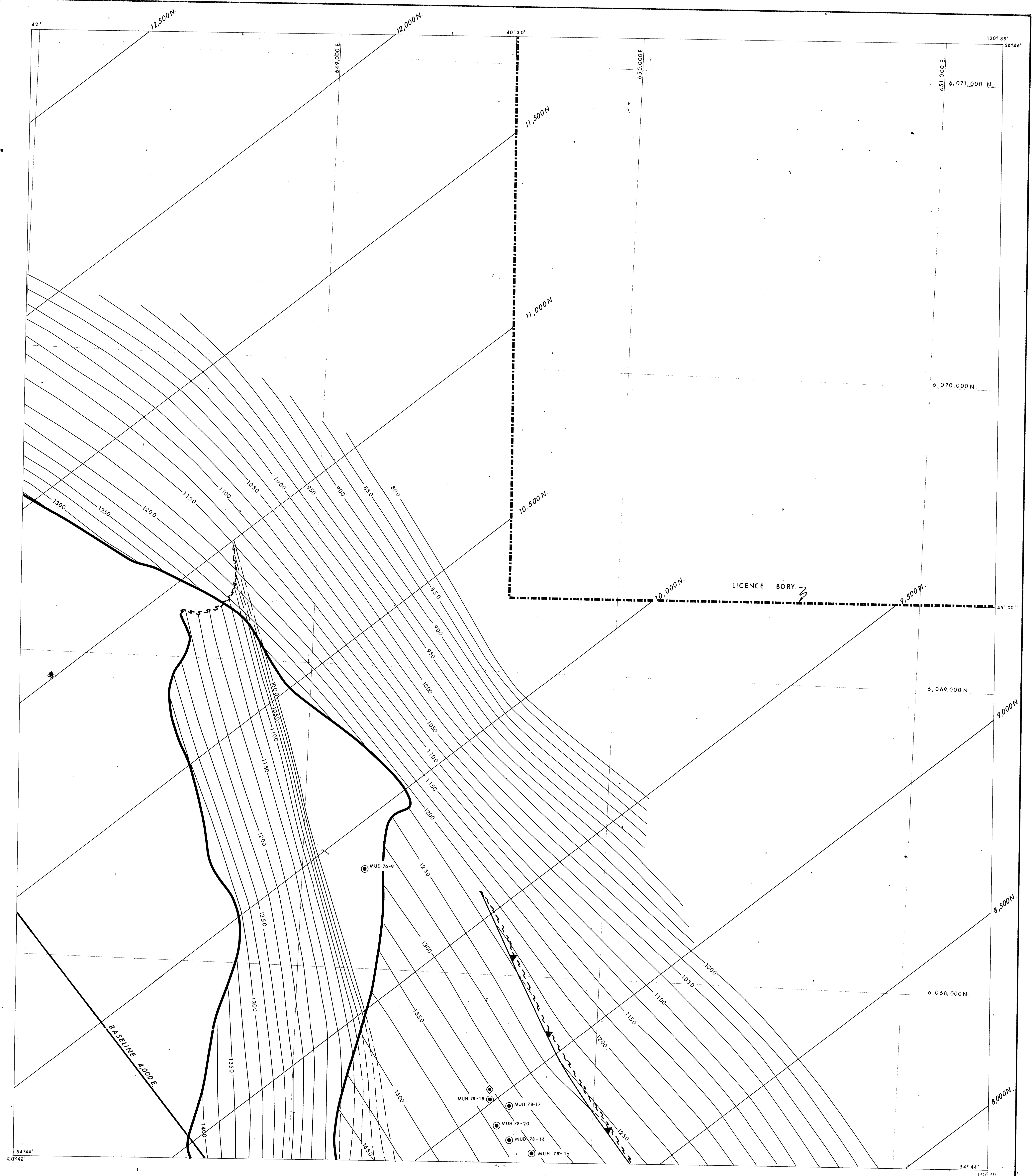
SCALE 1:5000



543

Mr. DONALD BELMONT JR. (2)A

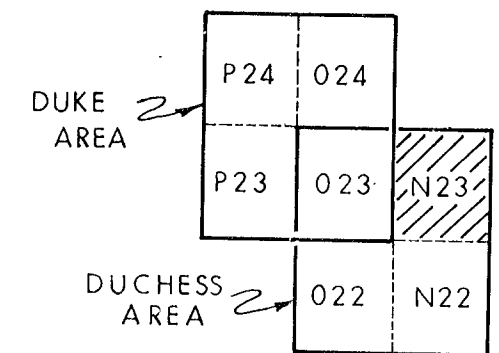
													
MONKMAN COAL PROJECT													
DUCHESS MTN. AREA STRUCTURE CONTOURS B4 SEAM	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Date</td> <td>JAN. 7</td> </tr> <tr> <td>Revised</td> <td></td> </tr> <tr> <td>Author</td> <td>G. J.</td> </tr> <tr> <td>Drafted</td> <td>J.W.K.</td> </tr> <tr> <td>Scale</td> <td>1:5,000</td> </tr> <tr> <td>Drawing</td> <td>114-42</td> </tr> </table>	Date	JAN. 7	Revised		Author	G. J.	Drafted	J.W.K.	Scale	1:5,000	Drawing	114-42
Date	JAN. 7												
Revised													
Author	G. J.												
Drafted	J.W.K.												
Scale	1:5,000												
Drawing	114-42												
N22													



LEGEND:

- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. - 25 m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION

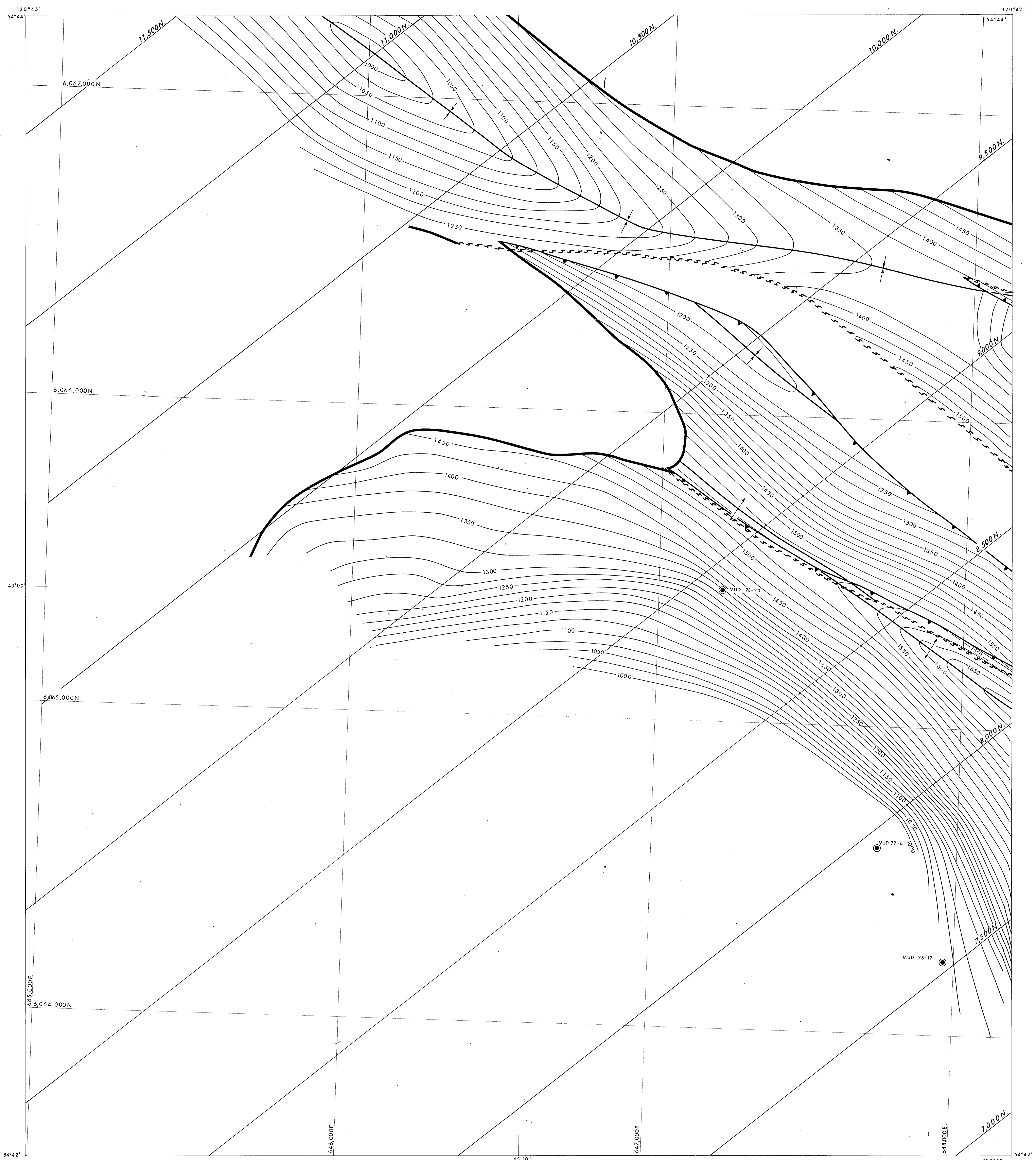
SCALE 1:5000



543

PR - DUNE on Belvedere St (2) 12

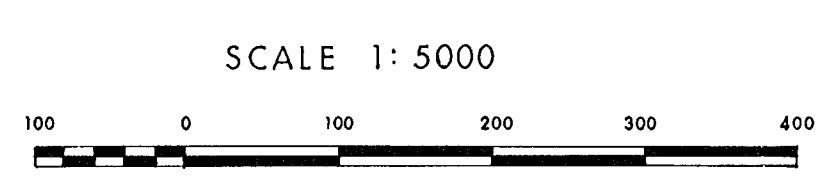
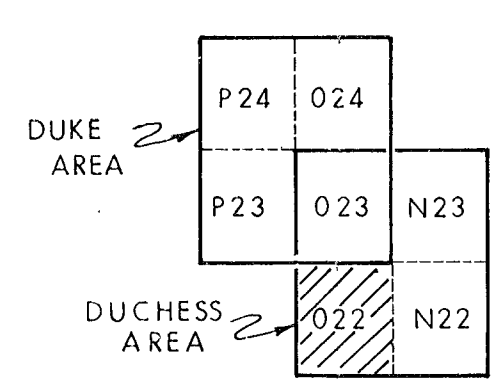
PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUCHESS MTN. AREA	
STRUCTURE CONTOURS B4 SEAM	
Date JAN. 7	Revised
Author G. J.	Drafted J.W.K.
Scale 1:5000	Drawing I14-42
N 23	



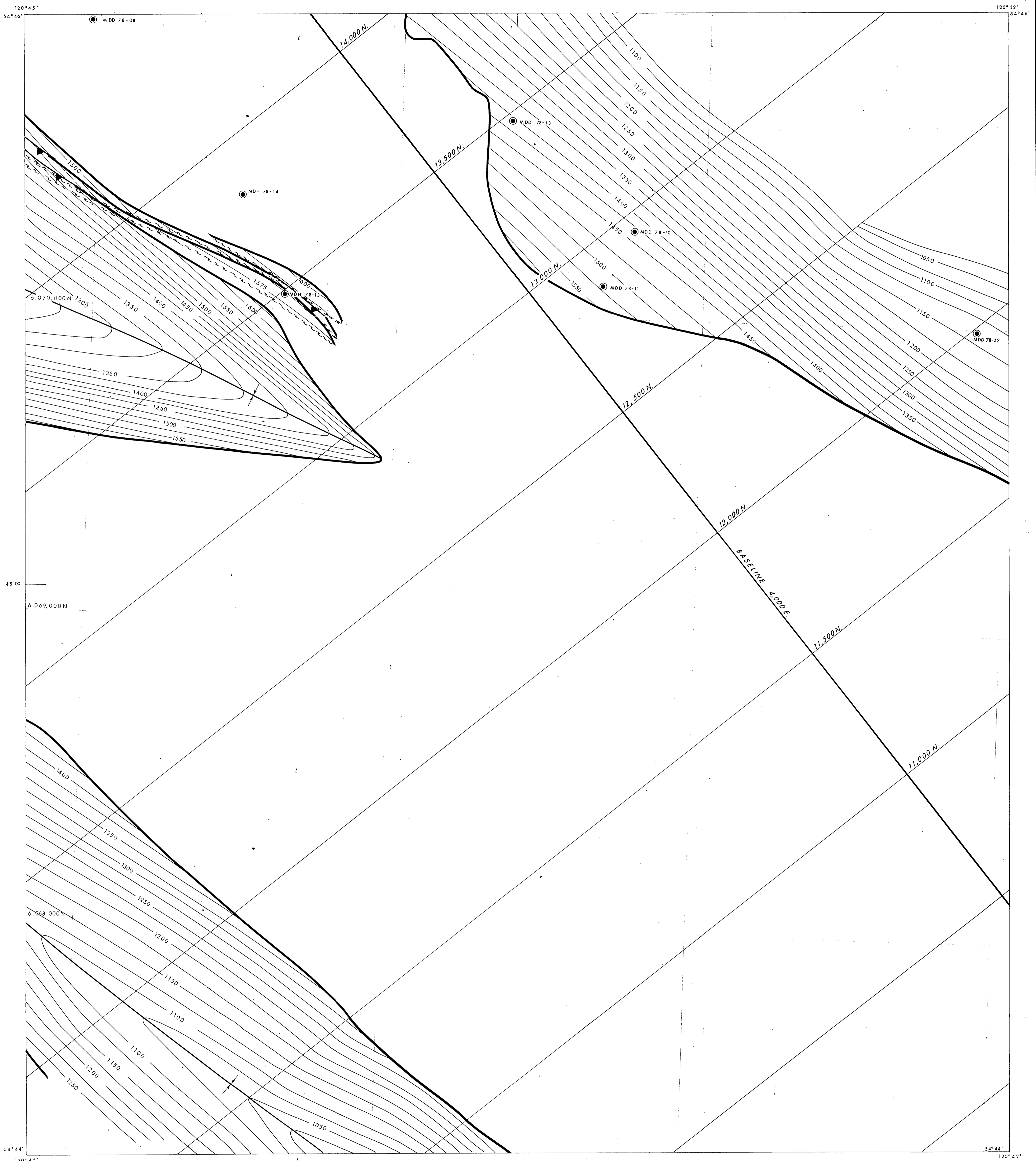
543

Mc-DONALD BELMONT & CO.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUCHESS MTN. AREA	
STRUCTURE CONTOURS B4 SEAM	
Date	JAN. 78
Revised	
Author	G. J.
Drafted	J. W. K.
Drawing	II-4-42
022	

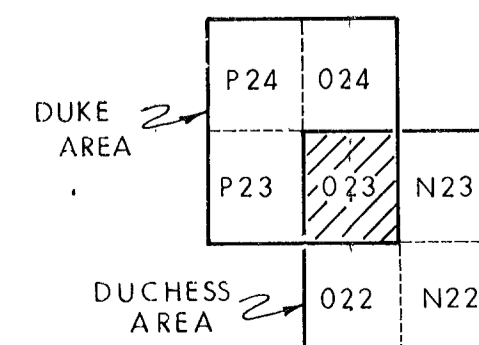
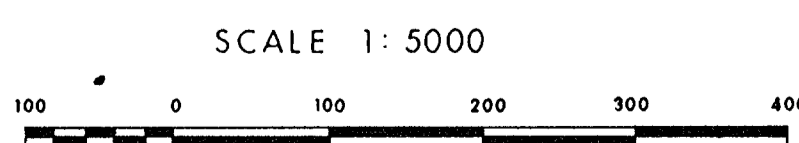


- LEGEND:**
- SEAM SUBCROP
 - STRUCTURE CONTOUR - C.I. - 25 m.
 - SYNCLINAL, ANTICLINAL AXIS
 - THRUST FAULT - UPPER TRACE
 - THRUST FAULT - LOWER TRACE
 - DRILL HOLE LOCATION
 - ADIT LOCATION



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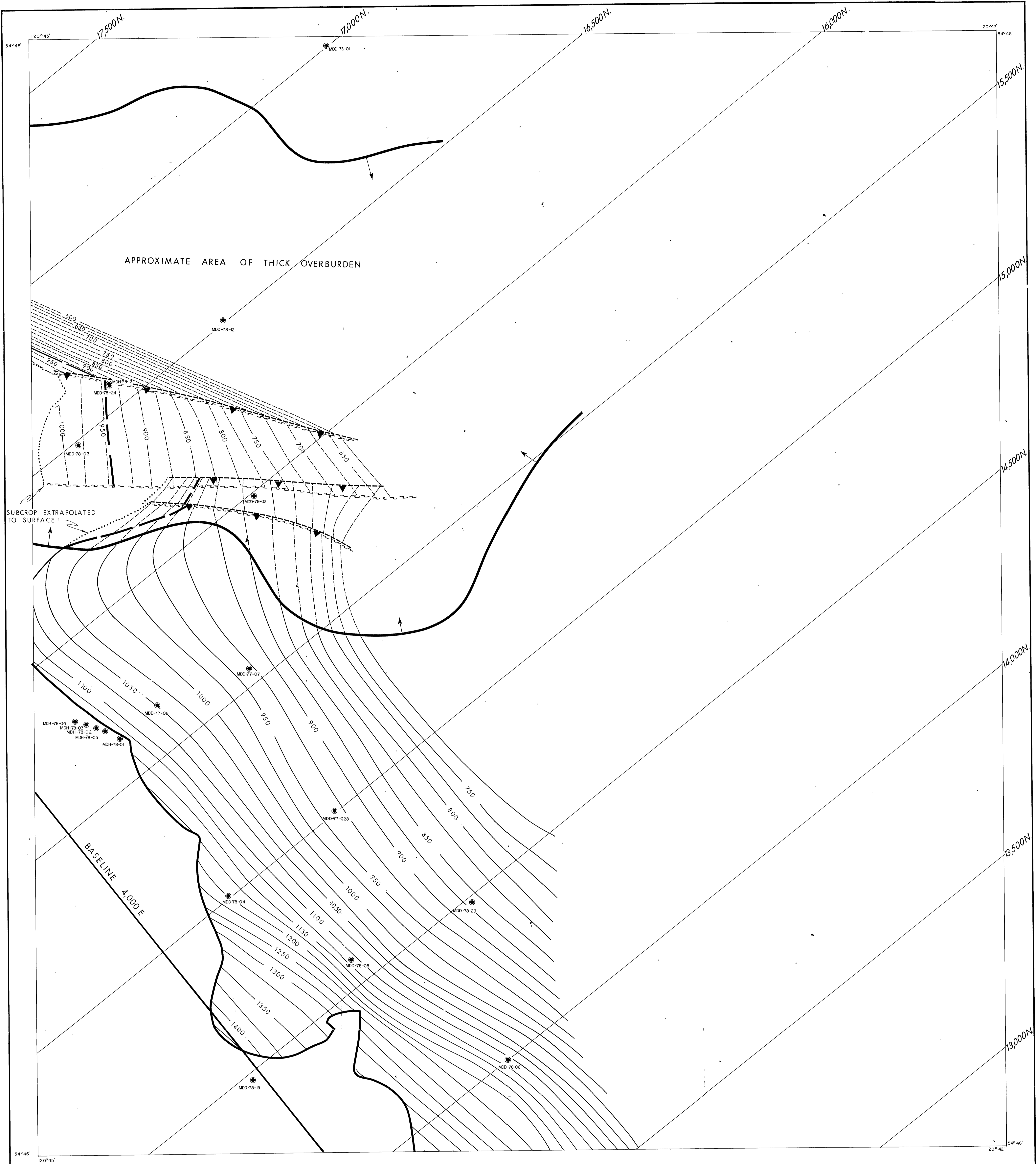
- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. - 25 m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



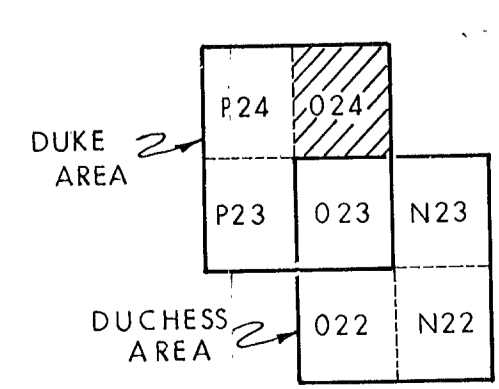
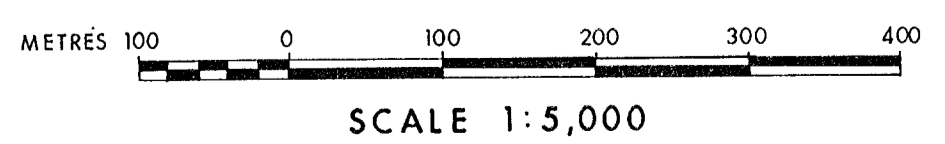
543

PA - DUNKLEMAN BELMONT X (2) 1/2

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date JAN. 79
DUKE MTN. AREA & DUCHESS MTN. AREA	Revised
STRUCTURE CONTOURS	Author G. J.
R4 SEAM	Drafted J. W. K.
	Scale 1:5,000
	Drawing II.4-4.2
	O 23



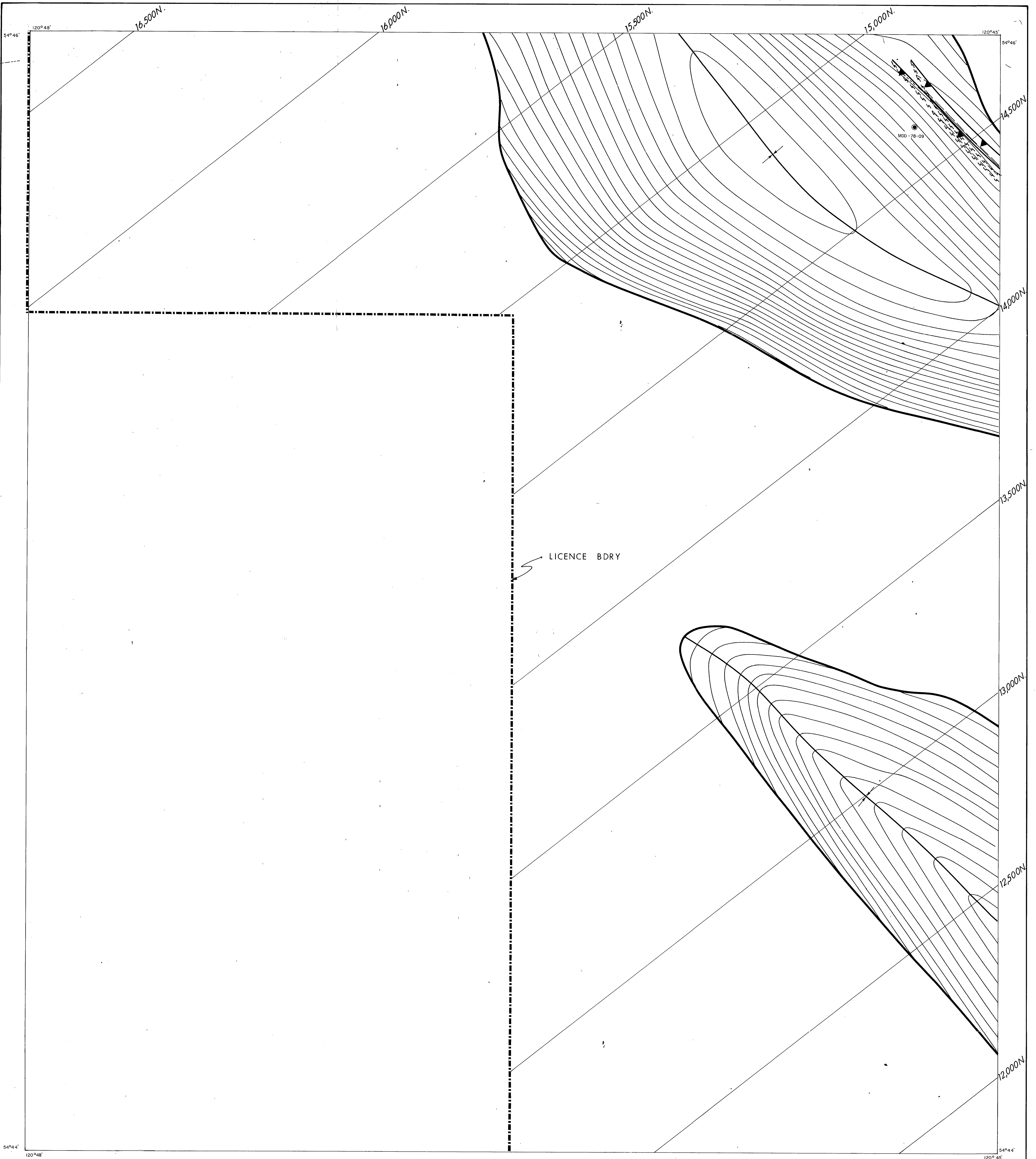
- LEGEND:**
- SEAM SUBCROP
 - 1550- STRUCTURE CONTOUR - C.I. 25 m.
 - ↑ SYNCLINAL, ANTICLINAL AXIS
 - ↓ THRUST FAULT - UPPER TRACE
 - ~ THRUST FAULT - LOWER TRACE
 - DRILL HOLE LOCATION
 - ADIT LOCATION



543

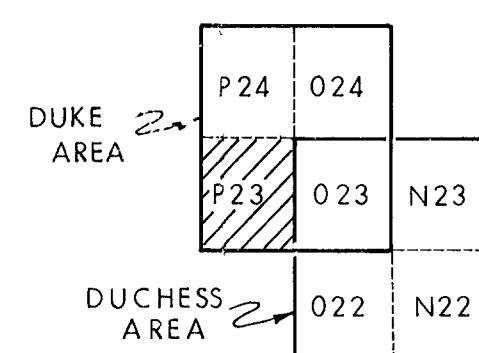
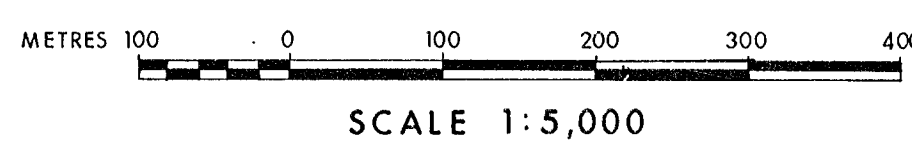
PR - DENKAM BELCOURT 21(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	
STRUCTURE CONTOURS B4 SEAM	
Date FEB. '79	Revised
Author G. J.	Drafted J. W. K.
Drawing II.4-42	
O24	



LEGEND:

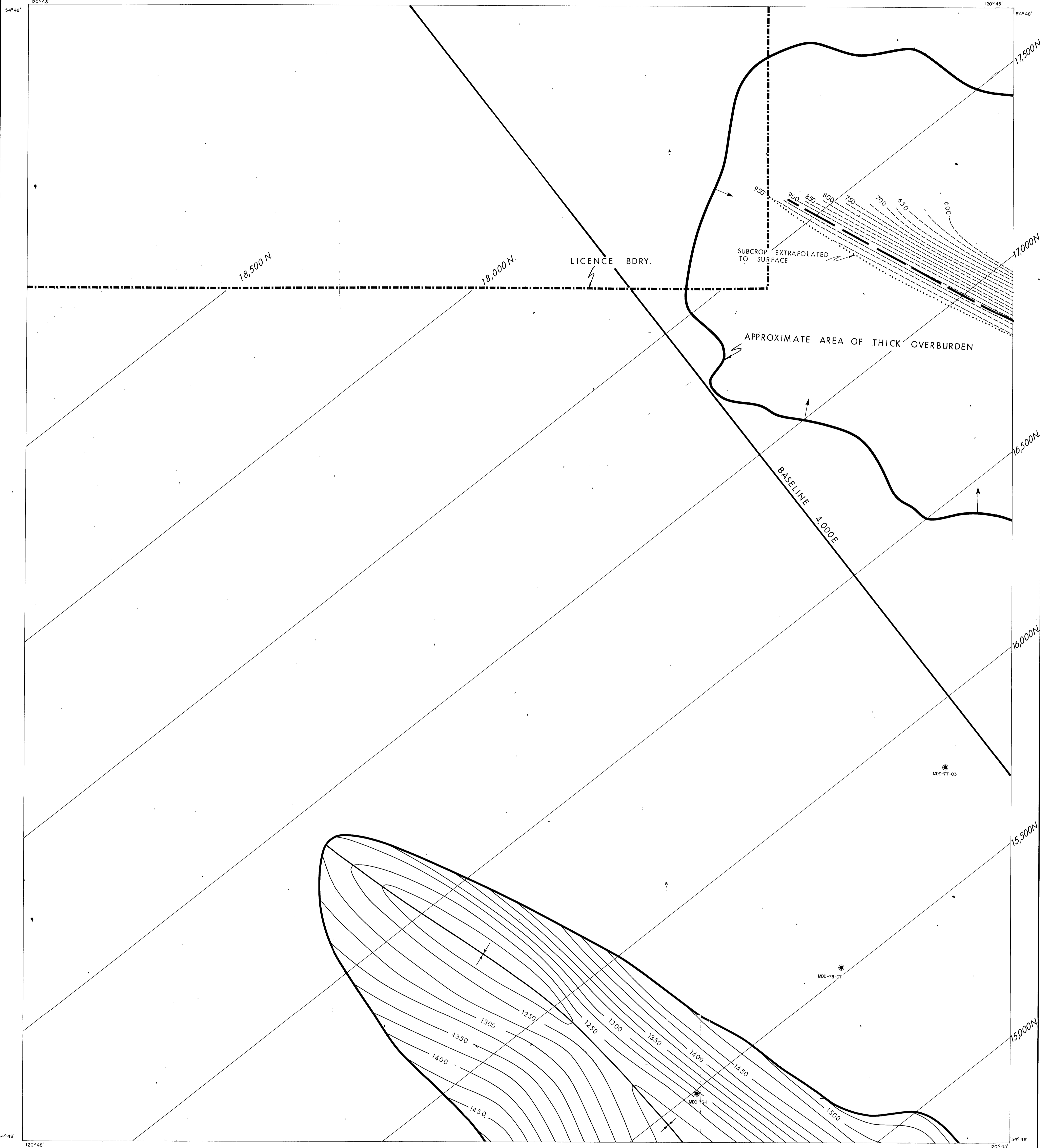
- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25m.
- ↑ ↓ SYNCLINAL, ANTICLINAL AXIS
- ↗ ↘ THRUST FAULT - UPPER TRACE
- ↖ ↙ THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



543

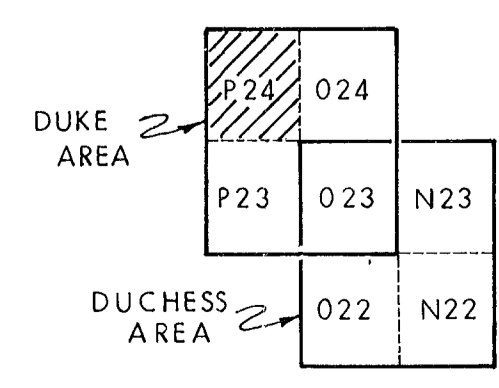
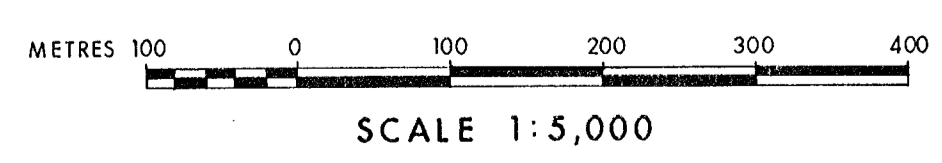
P. HANCOCK BELMONT 7/2/10

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	Date FEB. '79
STRUCTURE CONTOURS	Revised
B4 SEAM	Author G. J.
	Crafted J. W. K.
	Drawing II.4-42
	P23



LEGEND:

- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25m.
- ↑↓ SYNCLINAL, ANTICLINAL AXIS
- ↘ THRUST FAULT - UPPER TRACE
- ↙ THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ↗ ADIT LOCATION



543

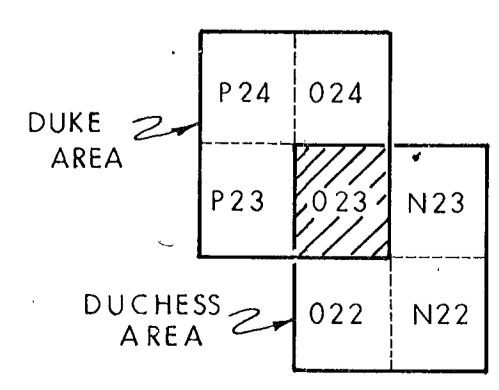
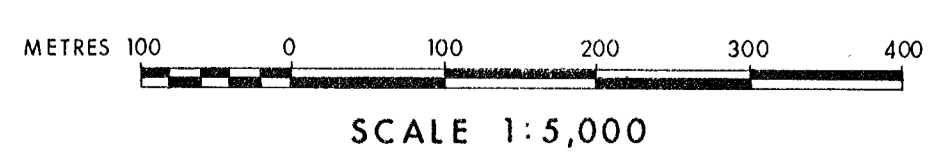
Mc DONALD Boreover 28/2/79

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	
STRUCTURE CONTOURS B4 SEAM	
Date FEB '79	Revised
Author G.J.	Drafted J.W.K.
Drawing II.4-4.2	P24



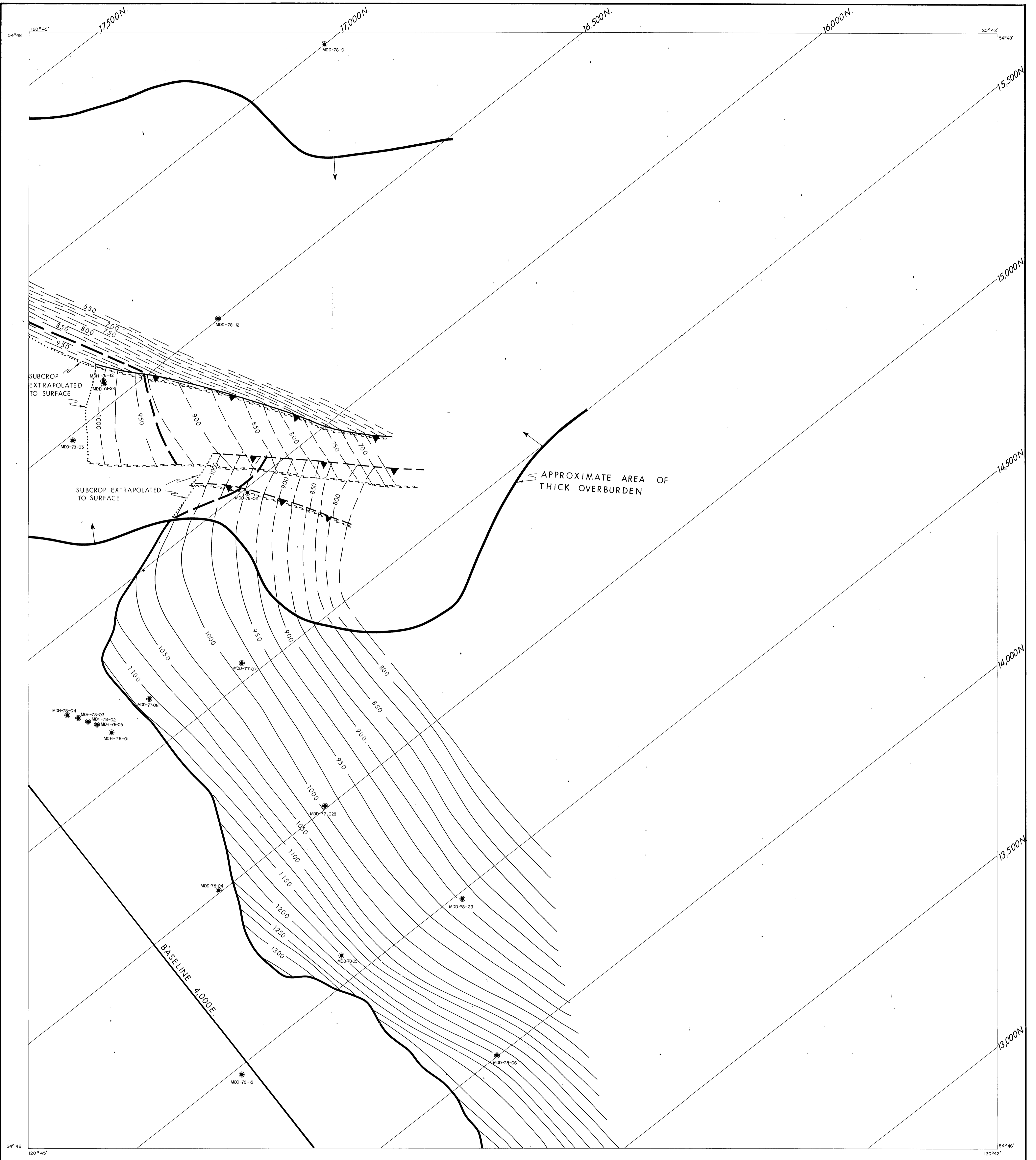
LEGEND:

- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 2.5m.
- ↑ ↓ SYNCLINAL, ANTICLINAL AXIS
- ↘ THRUST FAULT - UPPER TRACE
- ↙ THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ↔ ADIT LOCATION



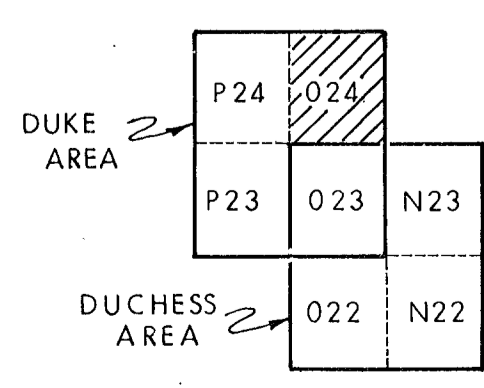
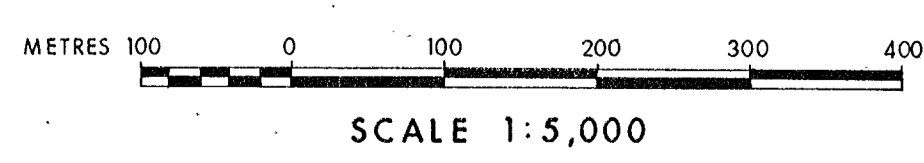
543

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
DUKE MTN. AREA & DUCHESS MTN. AREA	Date FEB. '79 Revised Author G. J. Drafted J. W. K. Drawing II-4-42
STRUCTURE CONTOURS B5 SEAM	
<small>023</small>	



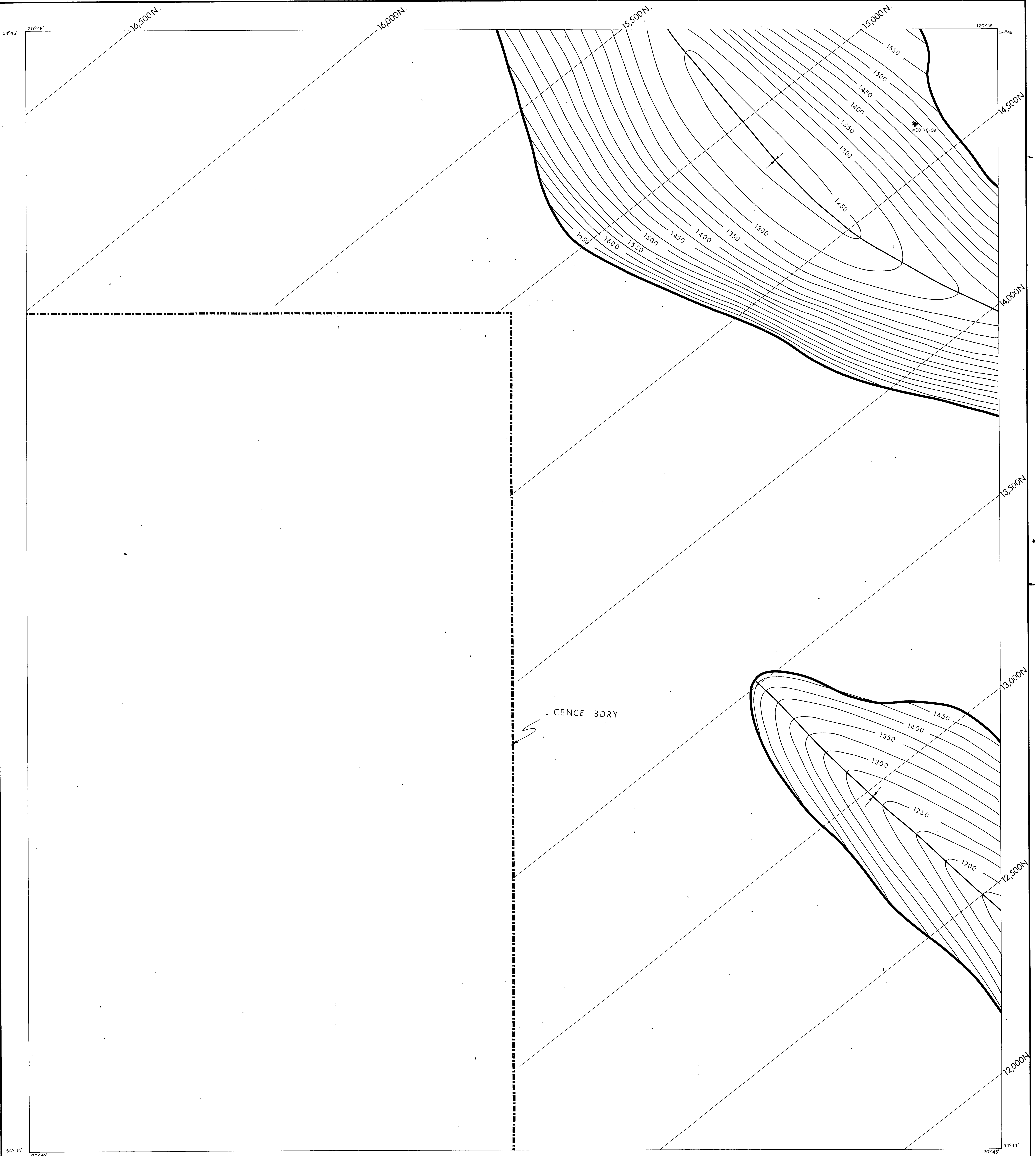
LEGEND:

- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25m.
- ↑↓ SYNCLINAL, ANTICLINAL AXIS
- ▲ THRUST FAULT - UPPER TRACE
- ▼ THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ⋈ ADIT LOCATION



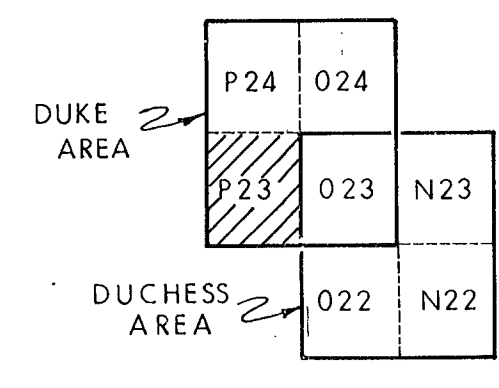
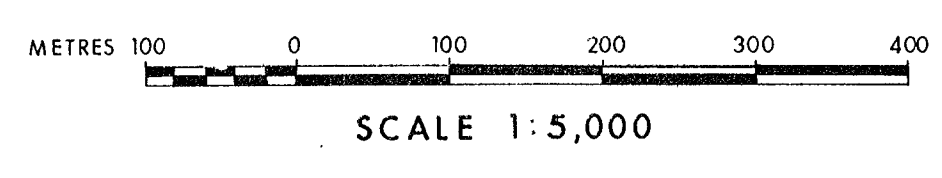
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PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	
STRUCTURE CONTOURS B5 SEAM	
Date FEB. '79 Revised Author G. J. Drafted J. W. K. Drawing II-4-42	O24



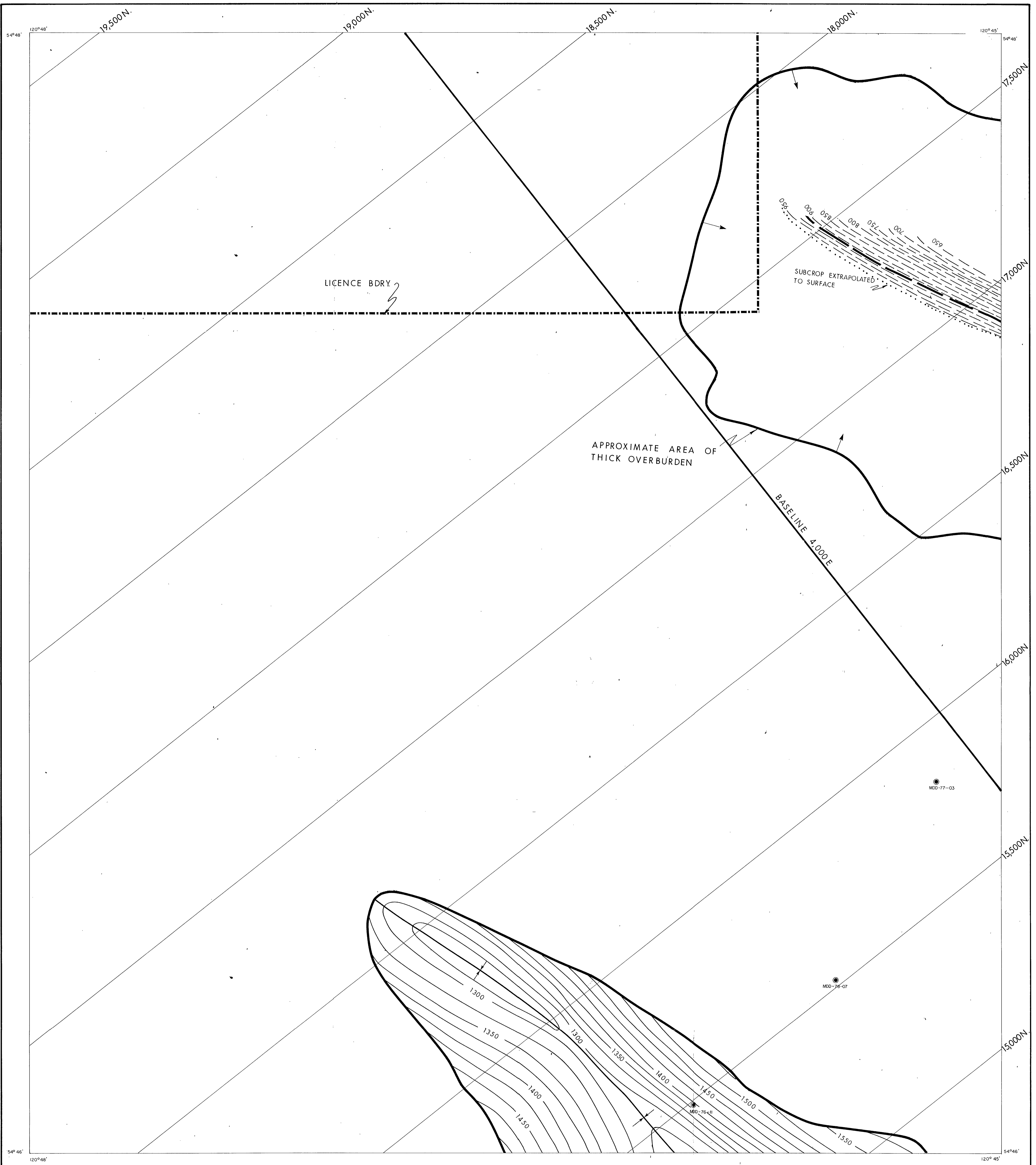
LEGEND:

- SEAM SUBCROP
- 1550— STRUCTURE CONTOUR - C.I. 25 m.
- ↑ ↓ SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- ~ ~ ~ THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



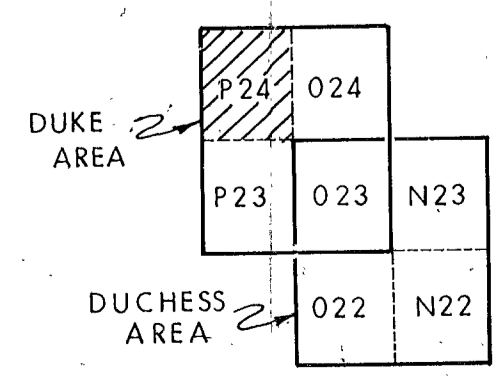
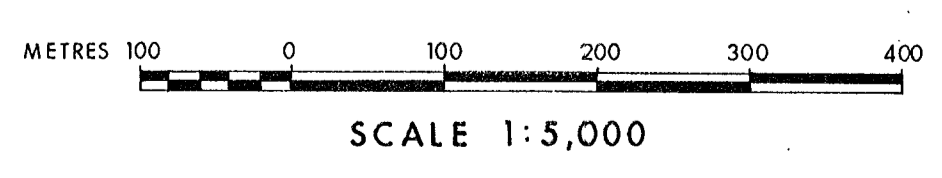
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PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	Date FEB. '79
STRUCTURE CONTOURS	
B5 SEAM	
Revised	Author G. J.
Drafted	J. W. K.
Drawing	11.4-4.2
P 23	



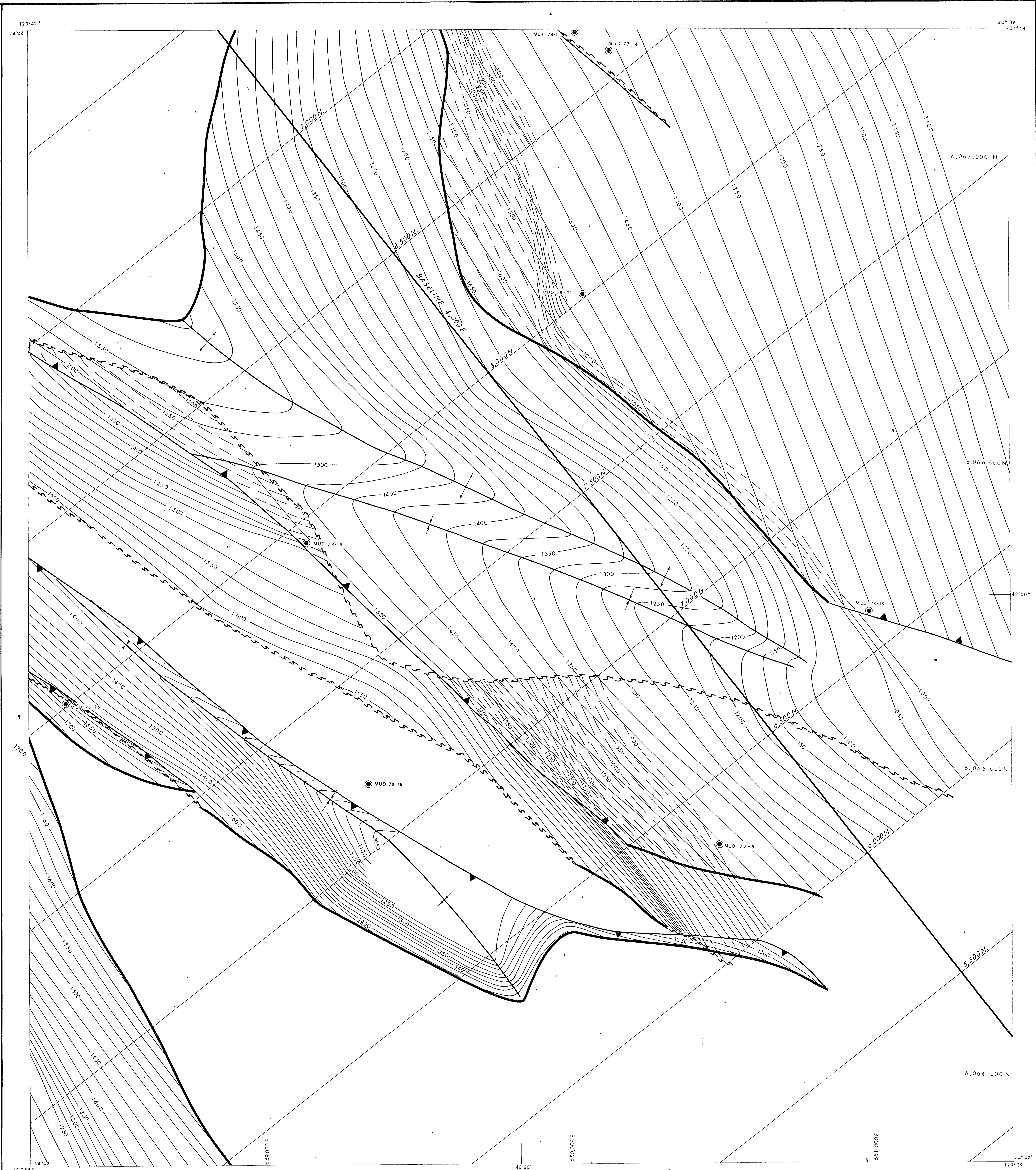
LEGEND:

- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25 m.
- ↑↓ SYNCLINAL, ANTICLINAL AXIS
- ↗ THRUST FAULT - UPPER TRACE
- ↘ THRUST FAULT - LOWER TRACE
- ⊙ DRILL HOLE LOCATION
- ↗ ADIT LOCATION



543

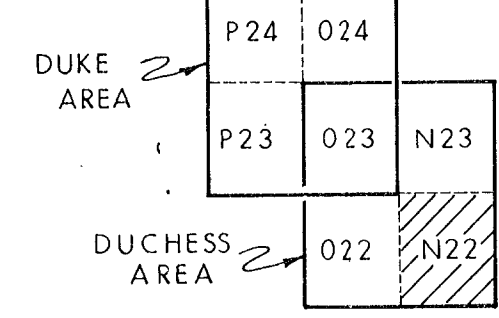
PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	
STRUCTURE CONTOURS B 5 SEAM	
Date FEB. '79	Revised
Author G. J.	Drafted J. W. K.
Drawing II-4-42	
P24	



LEGEND:

- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. 25 m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT-UPPER TRACE
- THRUST FAULT-LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION

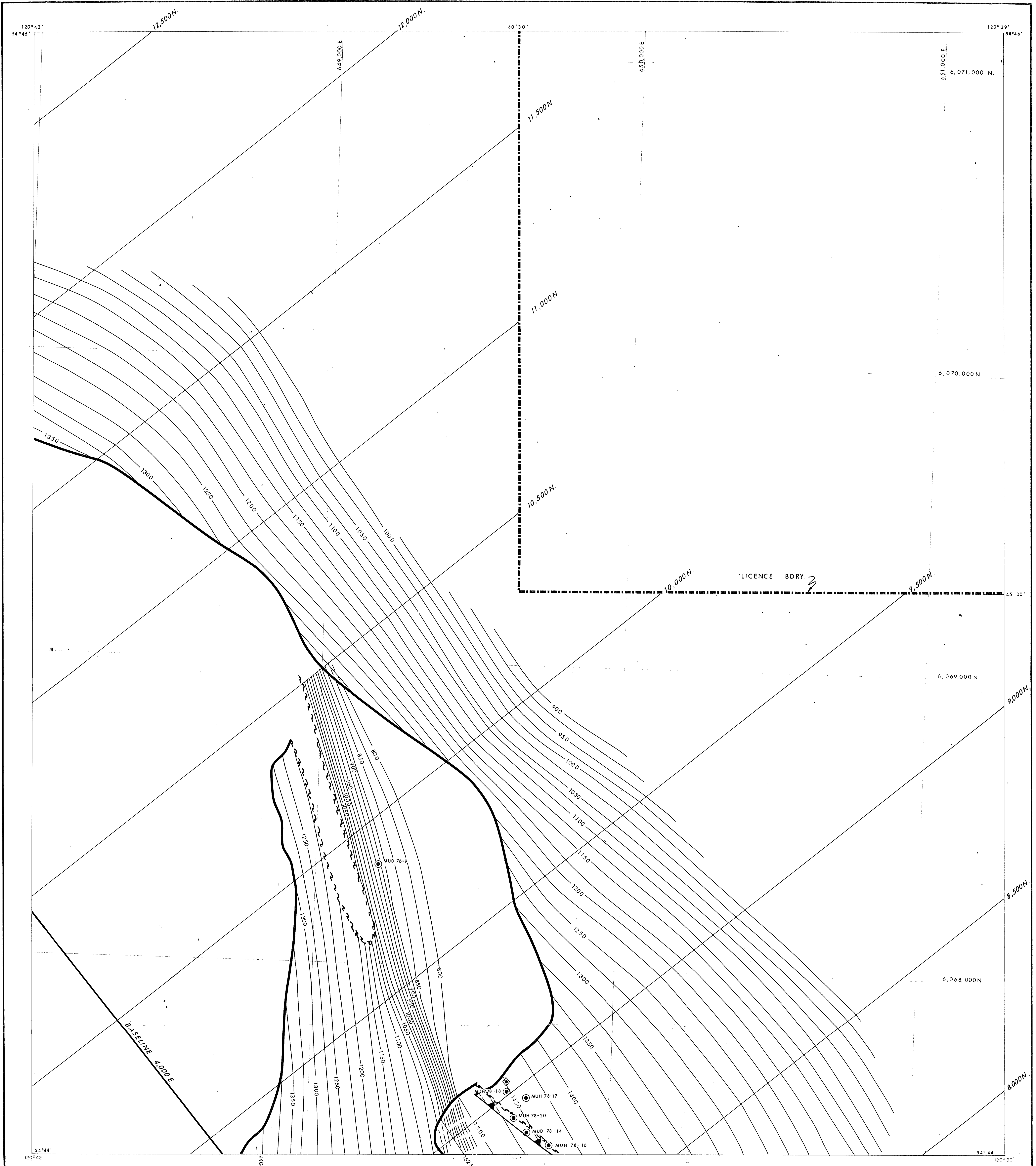
SCALE 1:5000



543

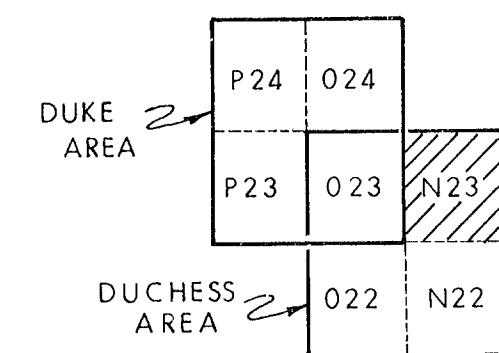
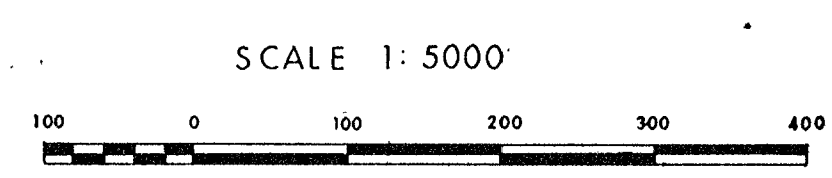
PR - ANKON BELCANT 78(2)A

PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	Date: JAN. 7
DUCHESS MTN. AREA	Revised
STRUCTURE CONTOURS	Author: G.J.
B9 SEAM	Drafted: J.W.K.
	Scale: 1:5000
	Drawing: I14-42
	N 22



LEGEND:

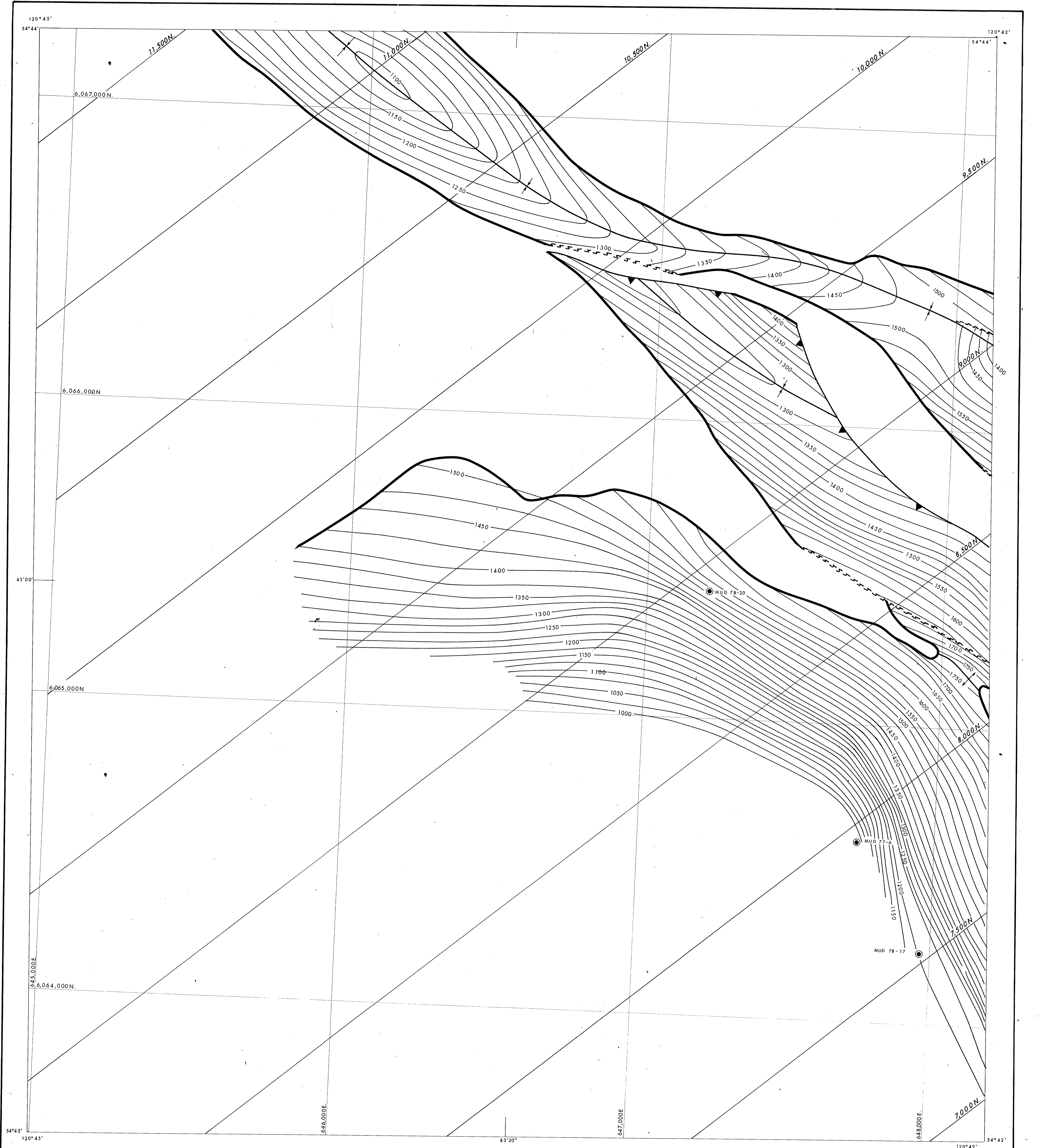
- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. - 25 m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



543

PK - DANKOAN BELCAVAT 78(2)A

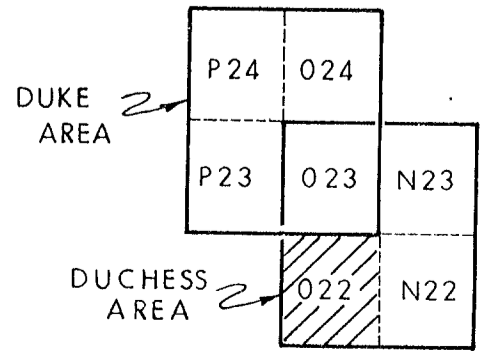
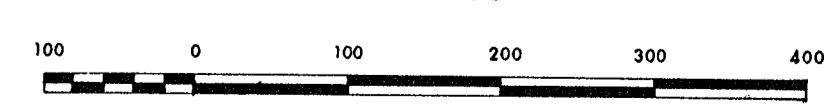
PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUCHESS MTN. AREA	
STRUCTURE CONTOURS B9 SEAM	
Date JAN. 7	Revised
Author G. J.	Drafted J.W.K.
Scale 1:5,000	Drawing II.4-4.2
N 23	



LEGEND:

- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. - 25 m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION

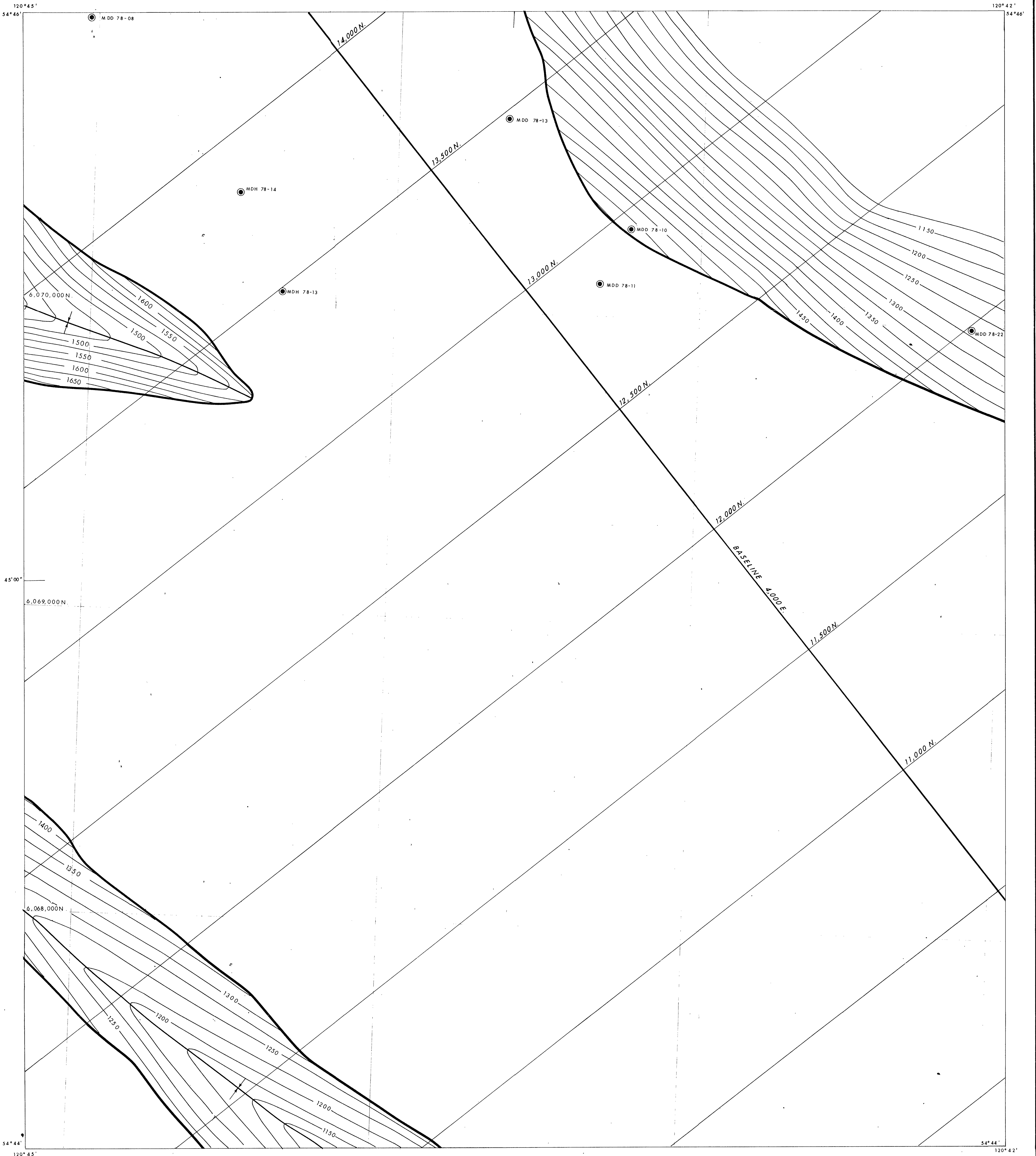
SCALE 1:5000



543

Re-DUNEDAN BECAUPT 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUCHESS MTN. AREA	
STRUCTURE CONTOURS B9 SEAM	
Date	JAN. 78
Revised	
Author	G. J.
Drafted	J. W. K.
Drawing	11.4-42
022	

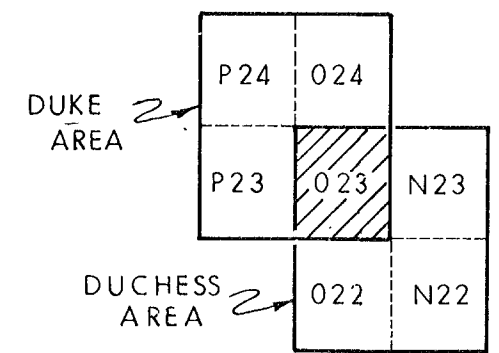
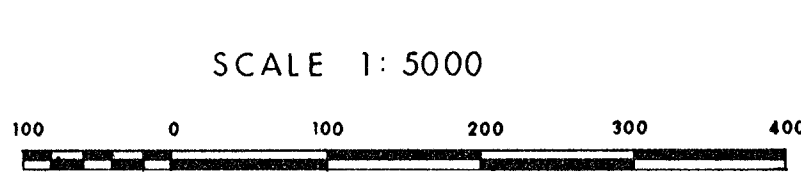


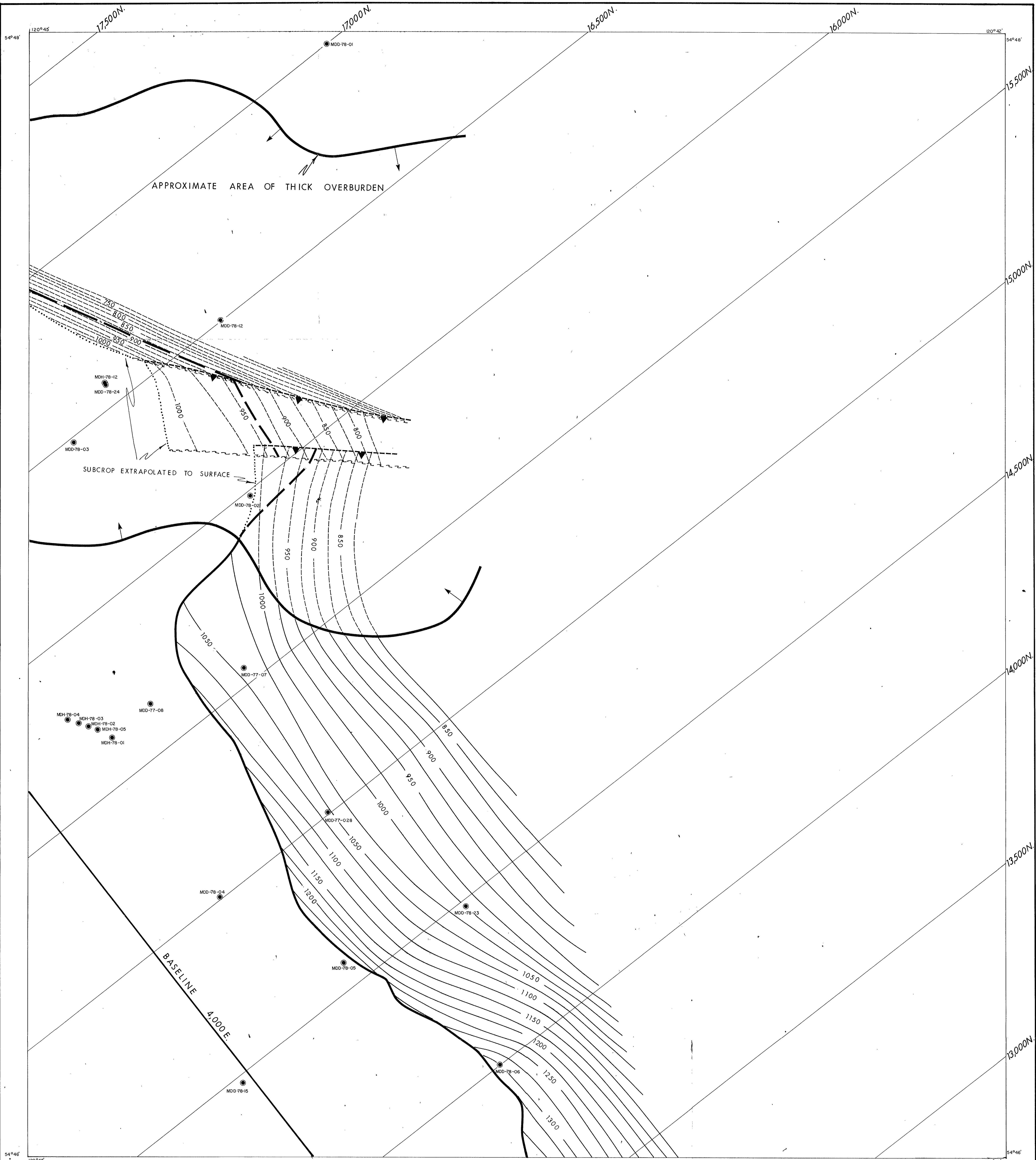
543

Pr. Monkman Belcourt 75 (2) A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date JAN '79	Revised
Author G.J.	Drafted J.W.K.
Scale 1:5,000	Drawing II.4-4.2
STRUCTURE CONTOURS B9 SEAM	
O 23	

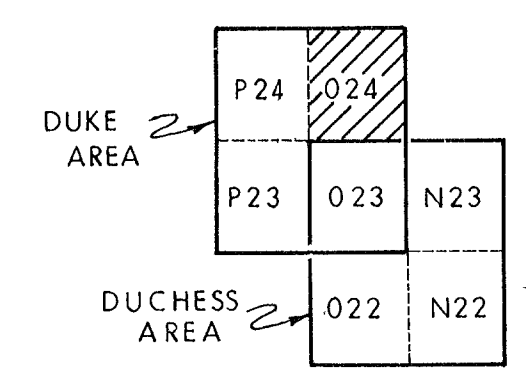
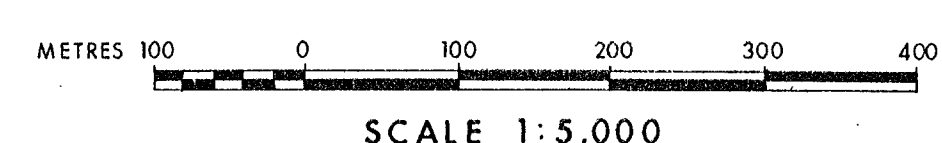
- LEGEND:**
- SEAM SUBCROP
 - STRUCTURE CONTOUR - C.I. - 25m.
 - SYNCLINAL, ANTICLINAL AXIS
 - THRUST FAULT - UPPER TRACE
 - THRUST FAULT - LOWER TRACE
 - DRILL HOLE LOCATION
 - ADIT LOCATION





LEGEND:

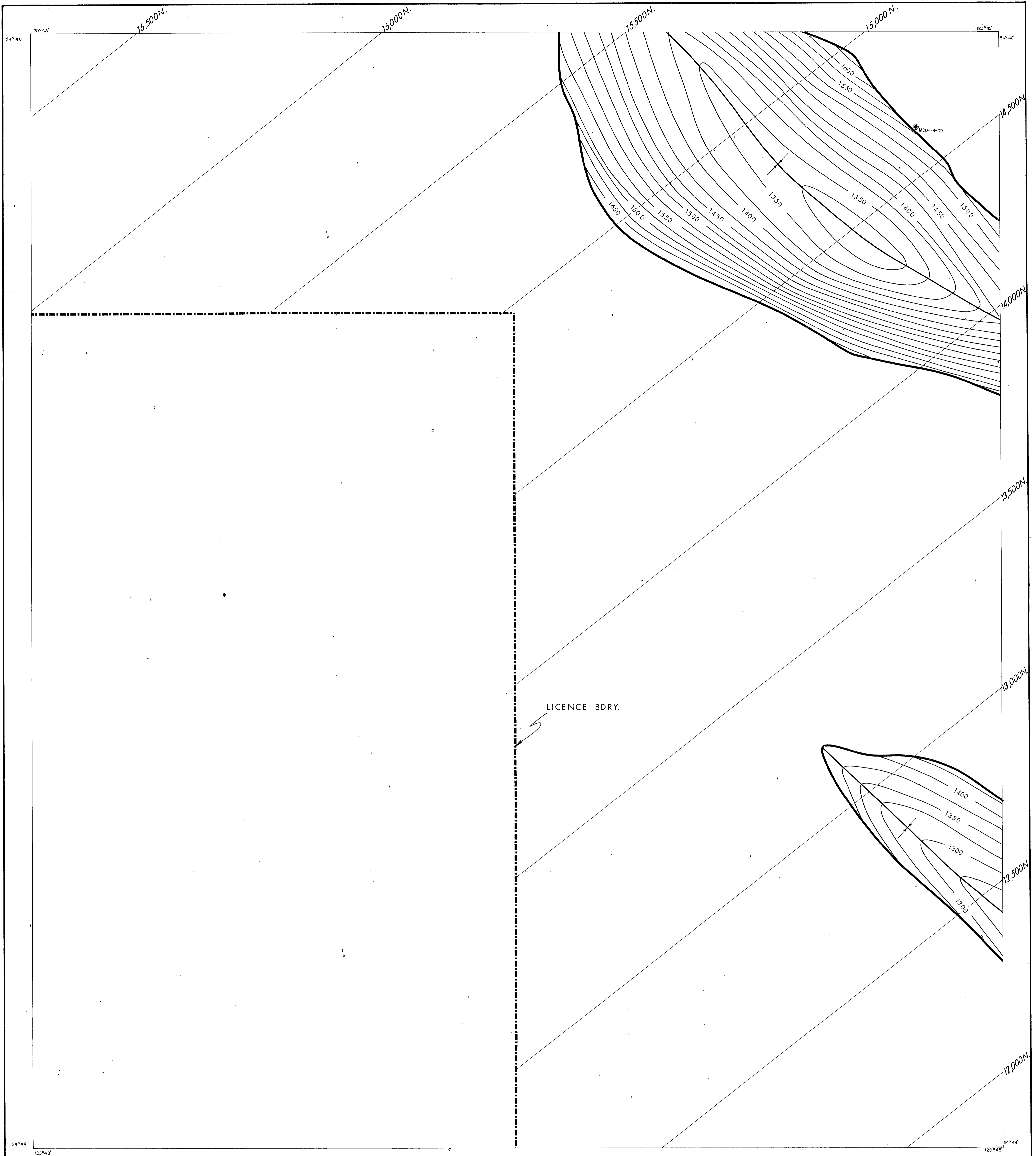
- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25 m.
- ↑↓ SYNCLINAL, ANTICLINAL AXIS
- ▲ THRUST FAULT - UPPER TRACE
- ▲ THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ↔ ADIT LOCATION



543

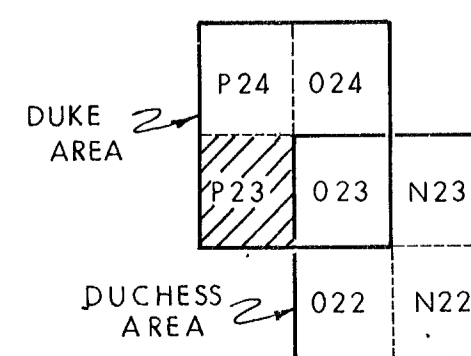
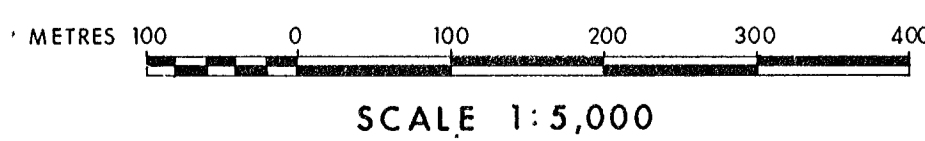
18- DUKESAN BELCOURT 71(2)12

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		Date FEB. '79
MONKMAN COAL PROJECT		Revised
DUKE MTN. AREA		Author G. J.
STRUCTURE CONTOURS B9 SEAM		Drafted J. W. K.
		Drawing II-4-42
		O24



LEGEND:

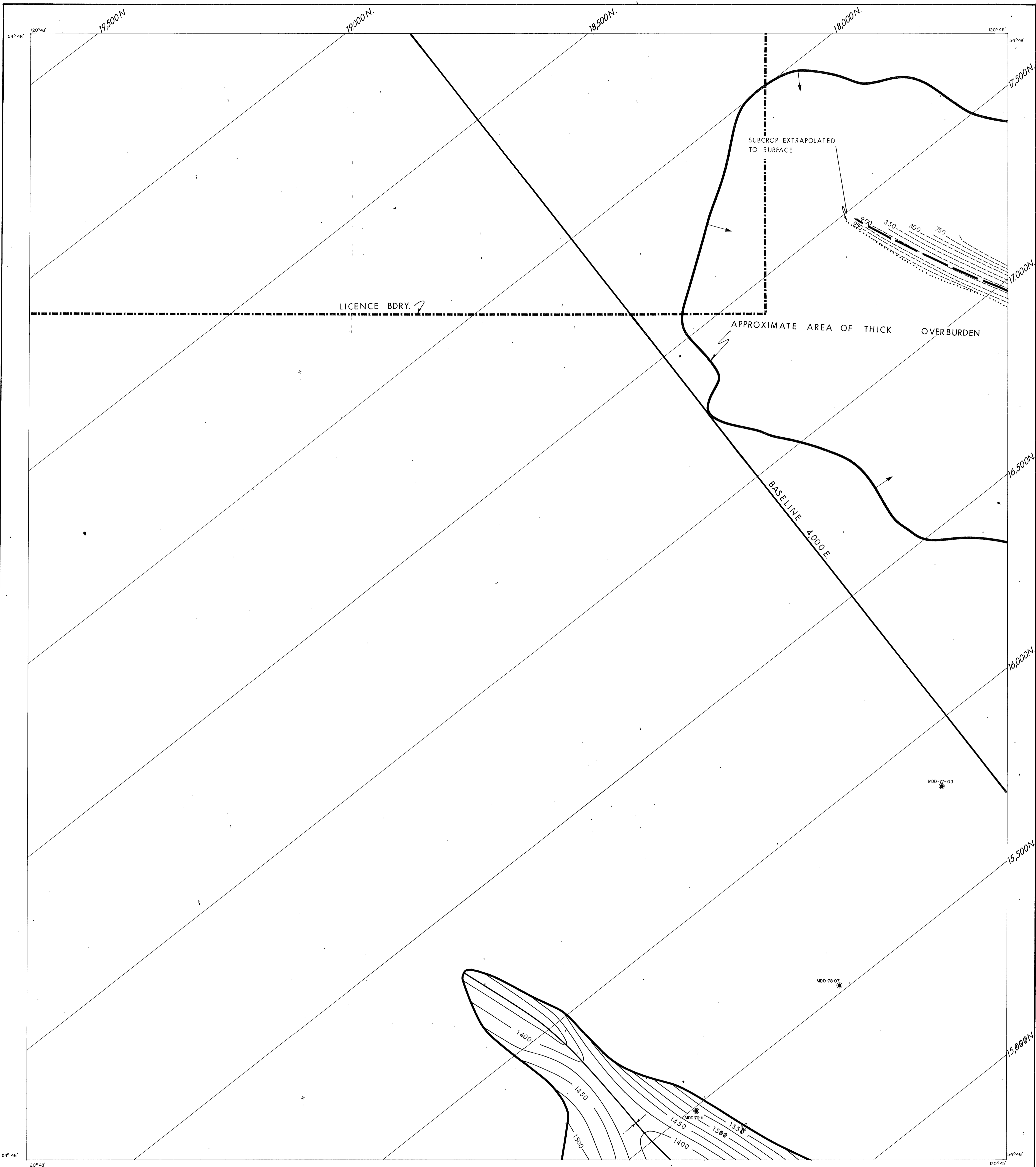
- SEAM SUBCROP
- STRUCTURE CONTOUR - C.I. 2.5m.
- SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



543

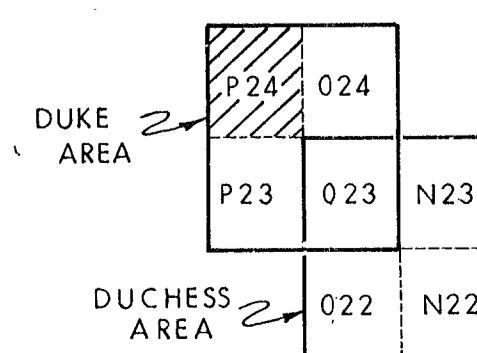
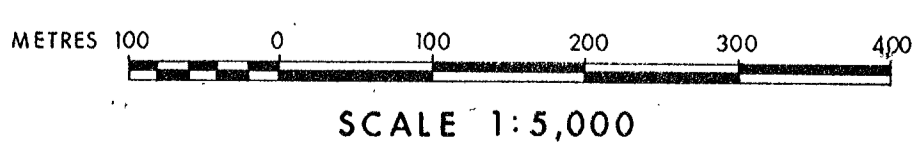
PA - DANEVAN BELLEVUE 7X(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	Date FEB. '79
MONKMAN COAL PROJECT	Revised
DUKE MTN. AREA	Author G. J.
STRUCTURE CONTOURS	Drafted J.W.K.
B9 SEAM	Drawing 11.4-42
	P23



LEGEND:

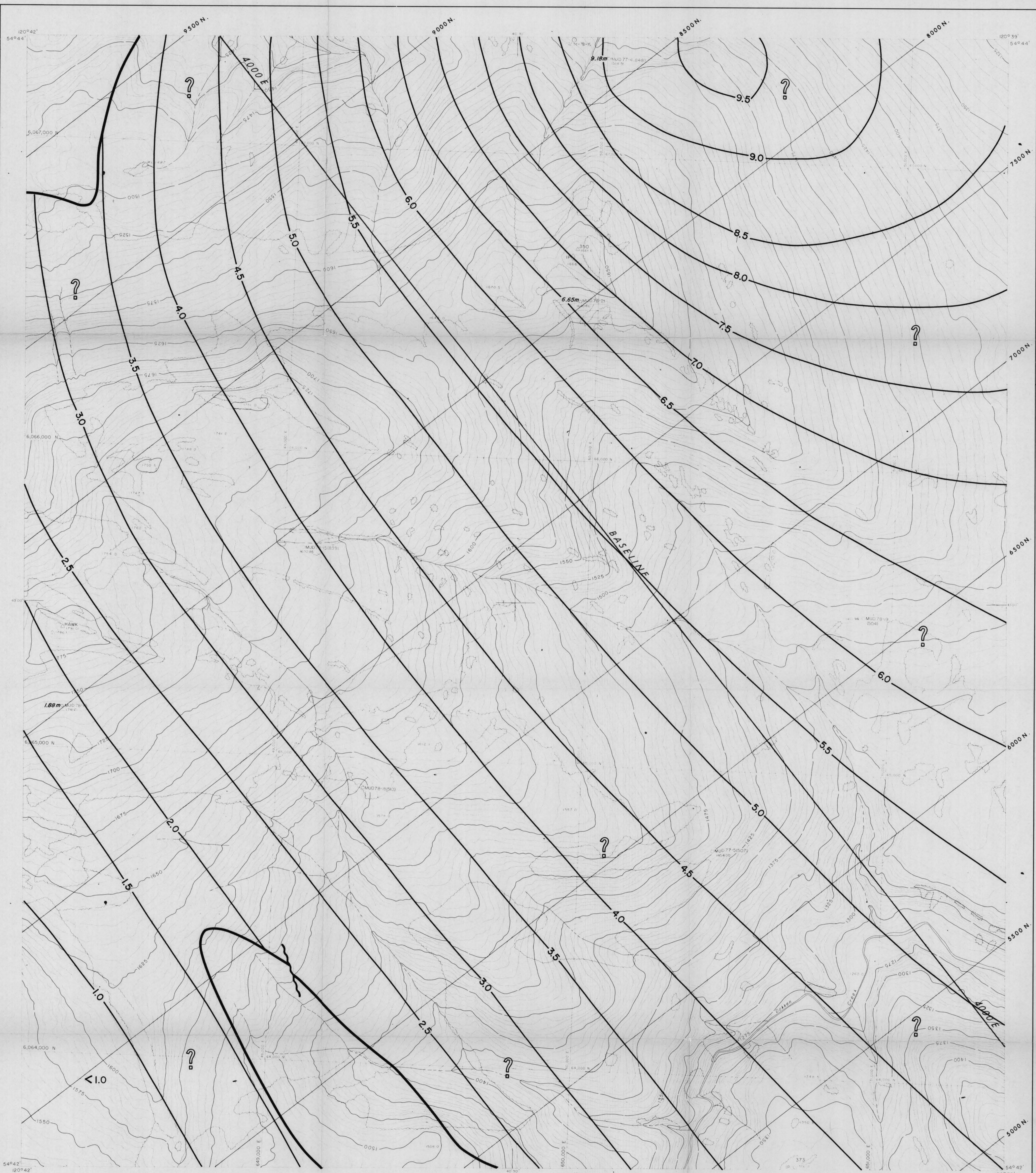
- SEAM SUBCROP
- 1550- STRUCTURE CONTOUR - C.I. 25m.
- ↑↓ SYNCLINAL, ANTICLINAL AXIS
- THRUST FAULT - UPPER TRACE
- THRUST FAULT - LOWER TRACE
- DRILL HOLE LOCATION
- ADIT LOCATION



543

Pe-nanegan Belcovert 71612

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
DUKE MTN. AREA	
STRUCTURE CONTOURS B9 SEAM	
Date FEB. '79	Revised
Author G.J.	Drafted J.W.K.
Drawing II-4-42	P24



LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

1500
 1390
 1279
 1168

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

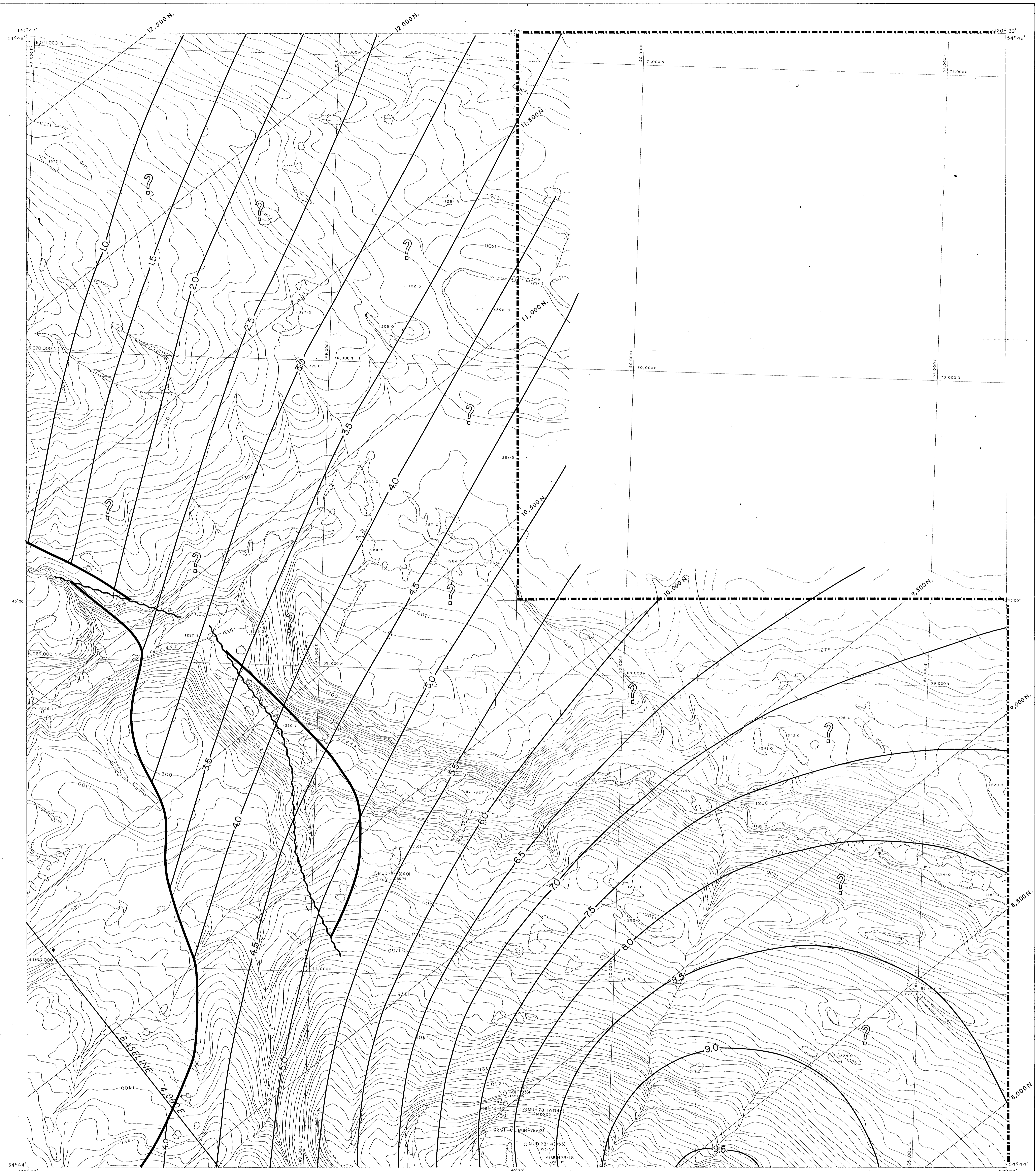
SURVEY NOTE
 The horizontal and vertical coordinates were established by D. W. Watson, B.C.S., using conventional and EDM survey equipment. Horizontal and vertical coordinates and elevations are derived from Trig Stations. Datum: F. Canadian S.W. Mean Sea Level. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level. Spot elevations were established by trig leveling, vertical angles, leveling, or at least one of each, as appropriate.



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12- DUNKERON BELCONET 71(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION	Date JAN. 1979
ISOPACH MAP	Revised
BI SEAM	Author P.J.P.
DUCHESS MTN.	Drafted edy
	Scale 1:5,000
	Drawing II.4-5
	N 22

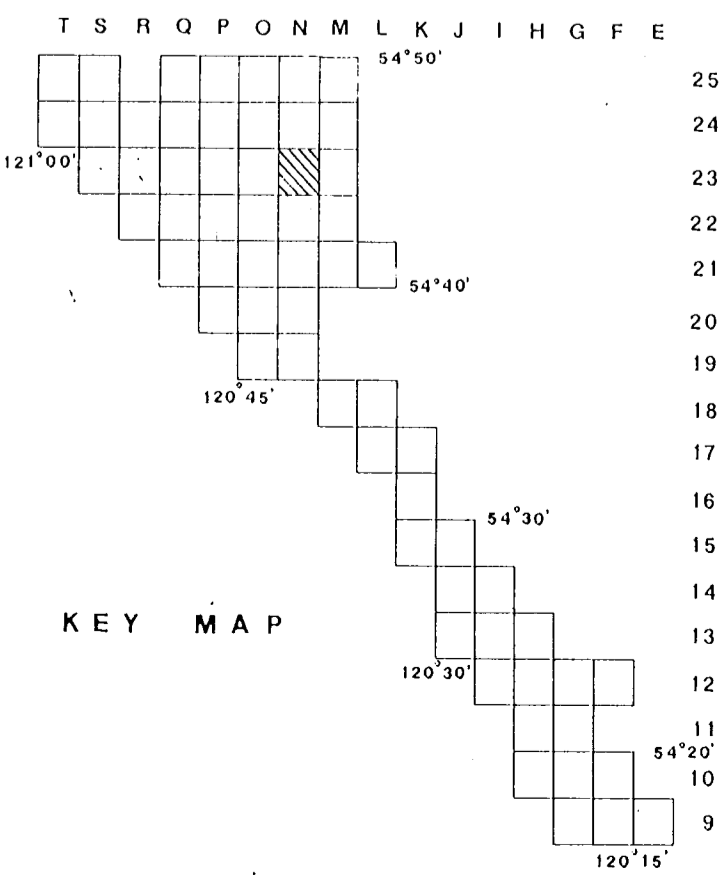


LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Frost area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

SURVEY NOTE
 The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S. using conventional and I.D.M. survey equipment. Horizontal and vertical co-ordinates and elevations are derived from Trig. Stations Dumfries E, Dumfries SW, Maina, Hpaak, Marica, Kahaipo. All co-ordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig levelling, vertical angles being read at both ends of each course simultaneously.



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PR - HUNGAN BECCOET 71(2)A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. 1979
MINING SECTION ISOPACH MAP BI SEAM DUCHESS MTN.	Revised Author P.J.P. Drafted edg Scale 1:5,000 Drawing II.4-5
N 23	



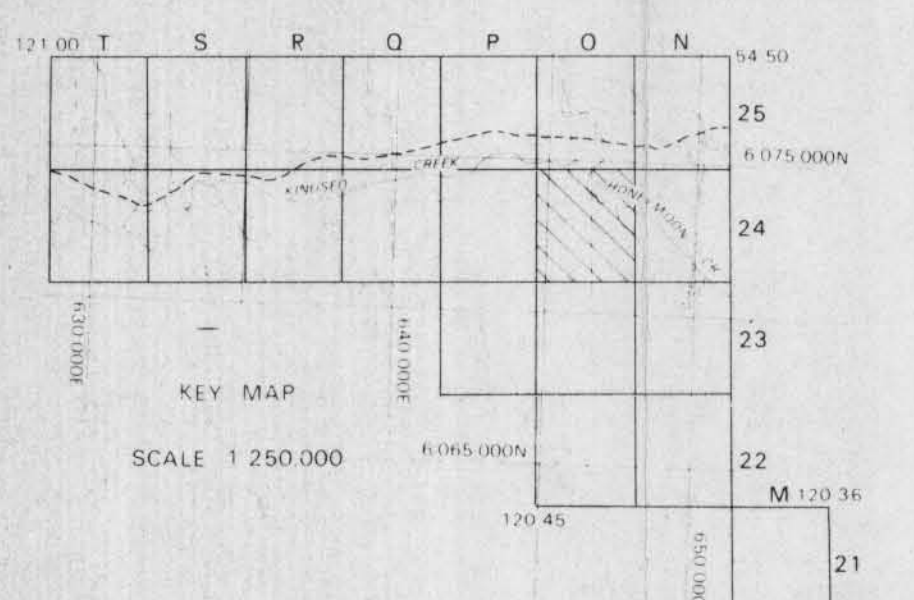
LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHY SEPTEMBER 1975

DATE OF SURVEY APRIL 1977
DATE OF MAPPING MAY 1977

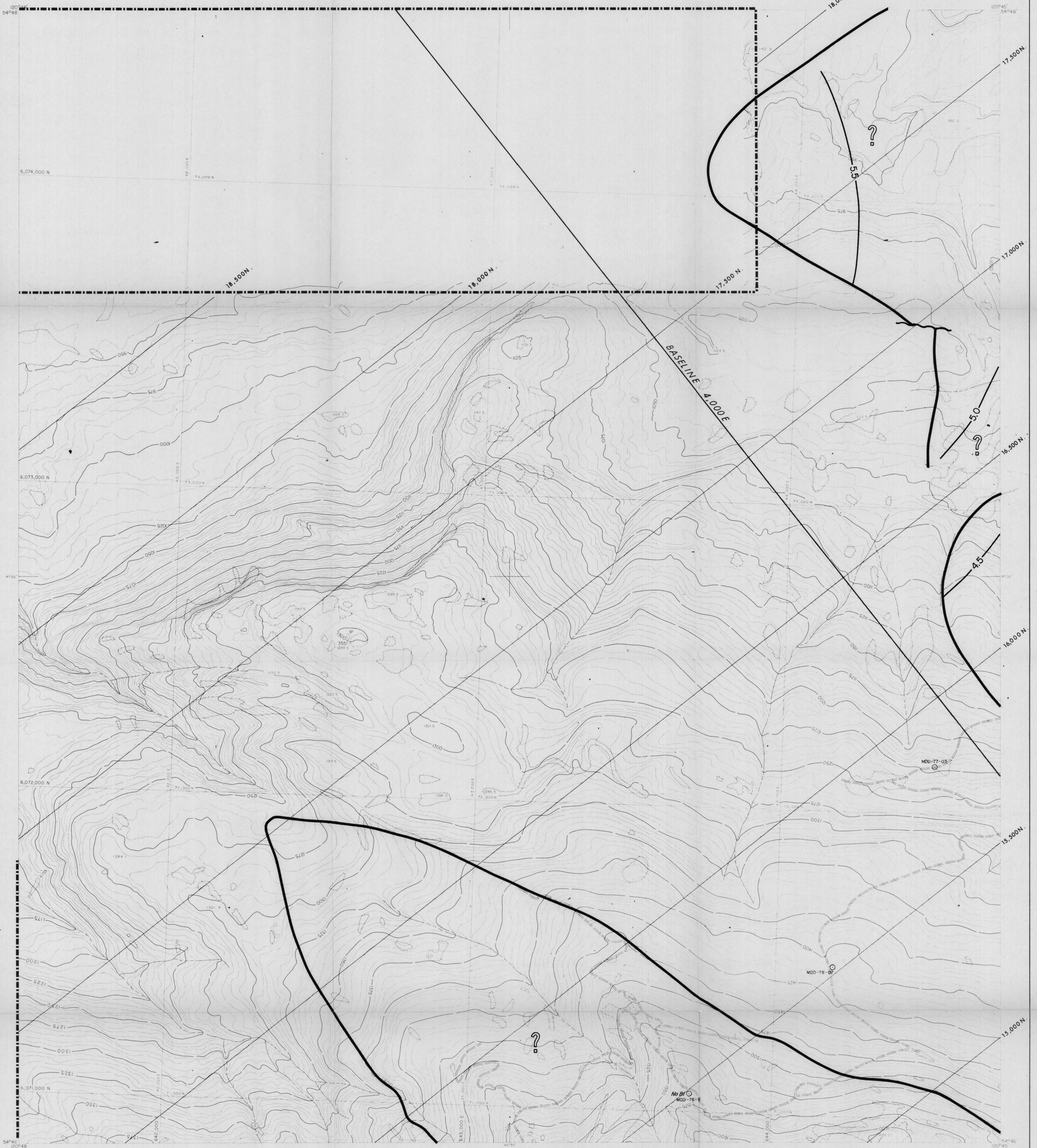
SURVEY NOTE
The Horizontal and Vertical Coordinates were established by D. W. Watson, B.C.L.S. using conventional and EDM surveying equipment. Horizontal and vertical coordinates and elevations are derived from the Station Quilley S.W. Main Hawk Marica Kinross. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling, vertical angles being read at both ends of each course simultaneously.



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PE - HANKOAN BALCONET 7X21A

PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date	JAN 1979
Revised	
Author	P.J.R.
Drafted	edj
Scale	1:5,000
Drawing	II.4-5
O 24	



LEGEND

- Improved road
- Secondary road
- Track or trail
- Ditch line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pit

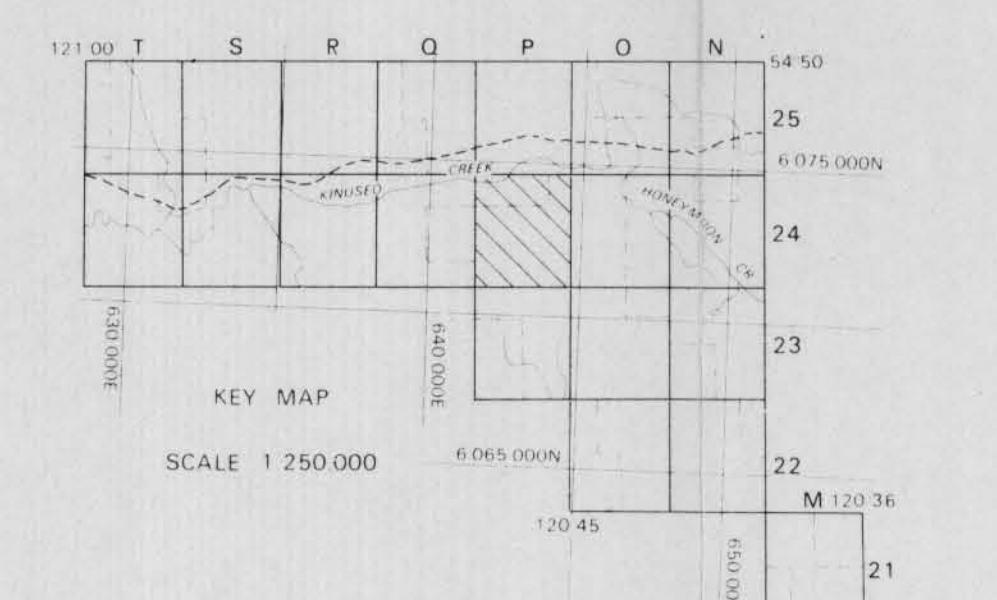
1300
 1350
 1400
 1450
 1500
 1550
 1600
 1650
 1700
 1750
 1800
 1850
 1900
 1950
 2000
 2050
 2100
 2150
 2200
 2250
 2300
 2350
 2400
 2450
 2500

N
 124° 5
 127° 5
 130° 5
 133° 5
 136° 5
 139° 5
 142° 5
 145° 5
 148° 5
 151° 5
 154° 5
 157° 5
 160° 5
 163° 5
 166° 5
 169° 5
 172° 5
 175° 5
 178° 5
 181° 5
 184° 5
 187° 5
 190° 5
 193° 5
 196° 5
 199° 5
 202° 5
 205° 5
 208° 5
 211° 5
 214° 5
 217° 5
 220° 5
 223° 5
 226° 5
 229° 5
 232° 5
 235° 5
 238° 5
 241° 5
 244° 5
 247° 5
 250° 5

DATE OF SURVEY APRIL 1977
 DATE OF PHOTOGRAPHY SEPTEMBER 1975
 DATE OF MAPPING MAY 1977

SURVEY NOTE

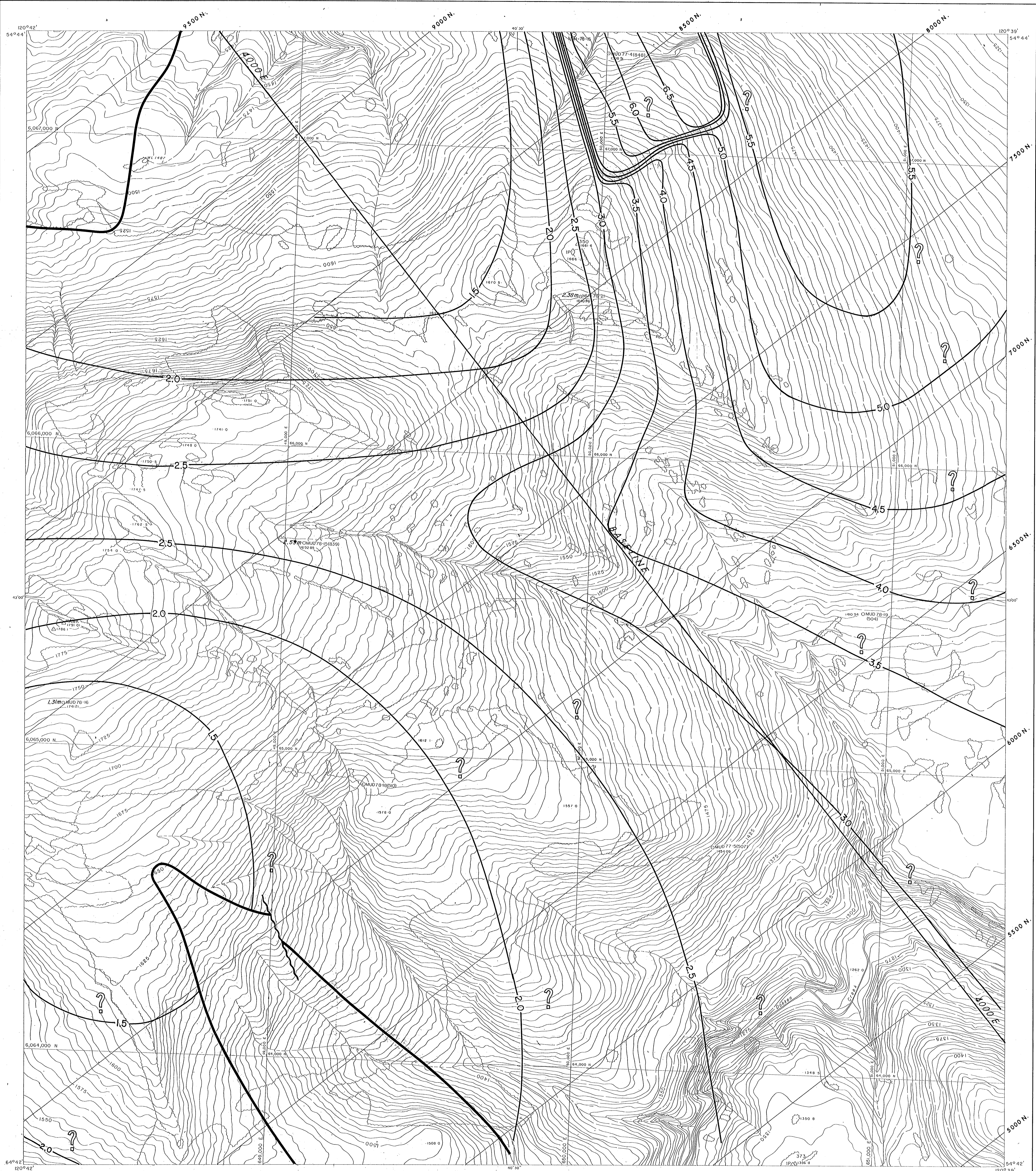
The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S. using conventional and I.D.M. surveying methods. Horizontal and vertical co-ordinates and elevations are derived from Trig Stations Quinette I, Quinette S.W., Mania, Haak, Mania, Kinross. All co-ordinates referred to Universal Traverse Meridian, Grid Zone 18. Elevation are above Mean Sea Level were established by trig leveling vertical angles being read at both ends of each course simultaneously.



543

PE - NONKMAN BELCOUET 7X(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP BI SEAM DUKE MTN.	Date JAN. 1979 Revised Author P.J.P. Drafted edy Scale 1:5,000 Drawing II.4-5
P 24	

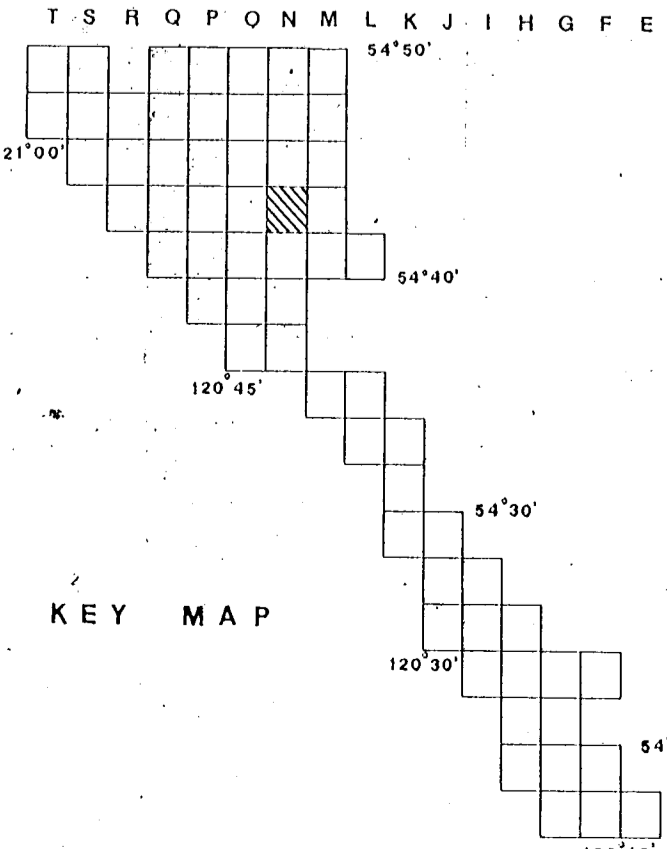


LEGEND

Improved road	
Secondary road	
Track or trail	
Cut line	
Tree area	
River	
Stream	
Intermittent stream	
Swamp	
Contours	
Horizontal control	
Vertical control	
Spot elevation	
Iron Pit	

CONTOUR INTERVAL: 5 METRES DATE OF SURVEY: 1977-1978
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975 DATE OF MAPPING: 1977-1978

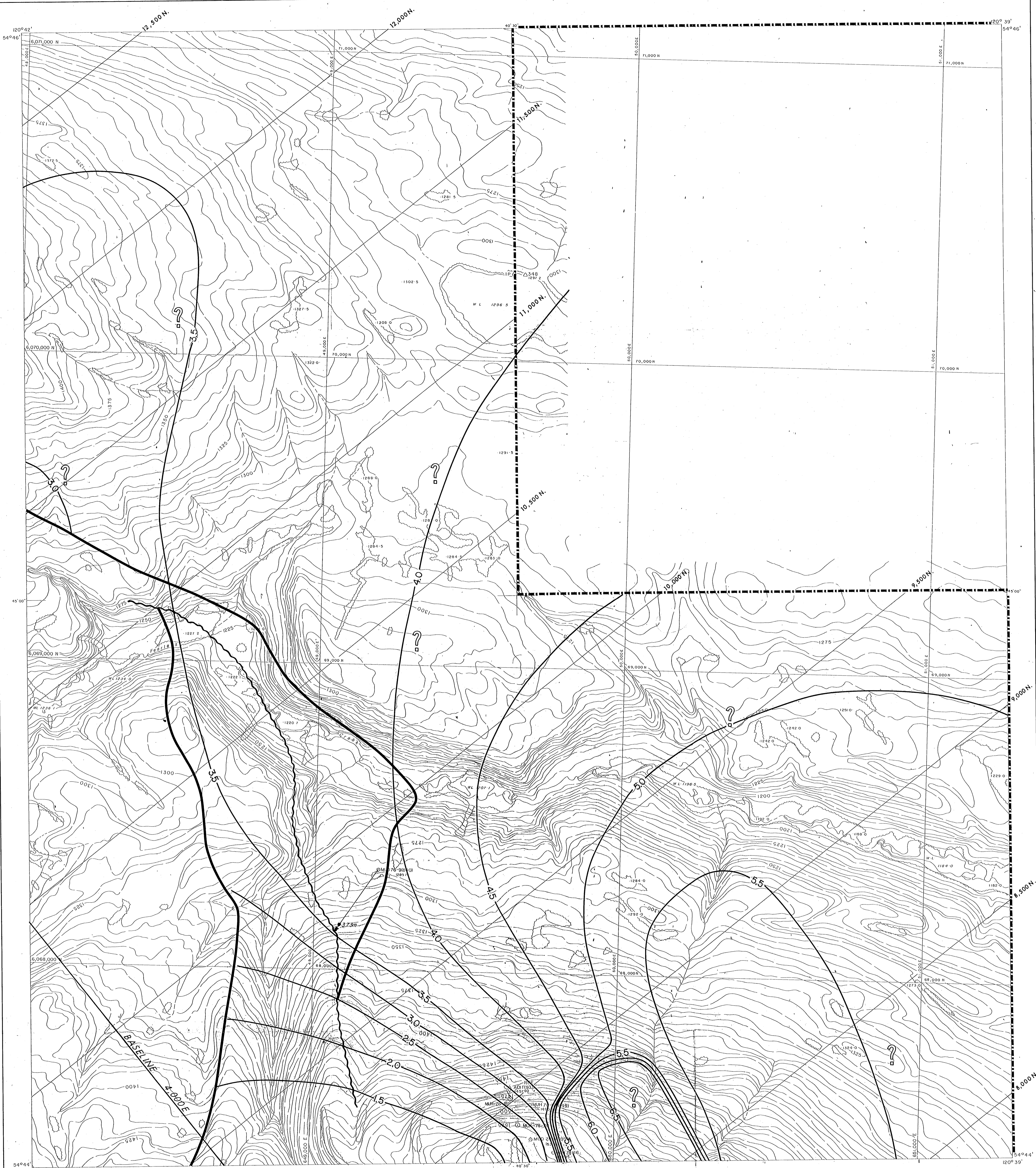
SURVEY NOTE
 The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S., using conventional and C.D.M. survey equipment. Horizontal and vertical co-ordinates and elevations are derived from Trig. Stations Quenneville E., Quenneville S.W., Marmie, Hawk, Marica, Kinnear. All co-ordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig. leveling, vertical angles being read at both ends of each course simultaneously.



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12-200000 BELLEVUE 7P(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN 1979
MINING SECTION ISOPACH MAP B3 SEAM DUCHESS MTN.	Revised Author P.J.P. Drafted edy Scale 1:5,000 Drawing II.4-5
N 22	



LEGEND

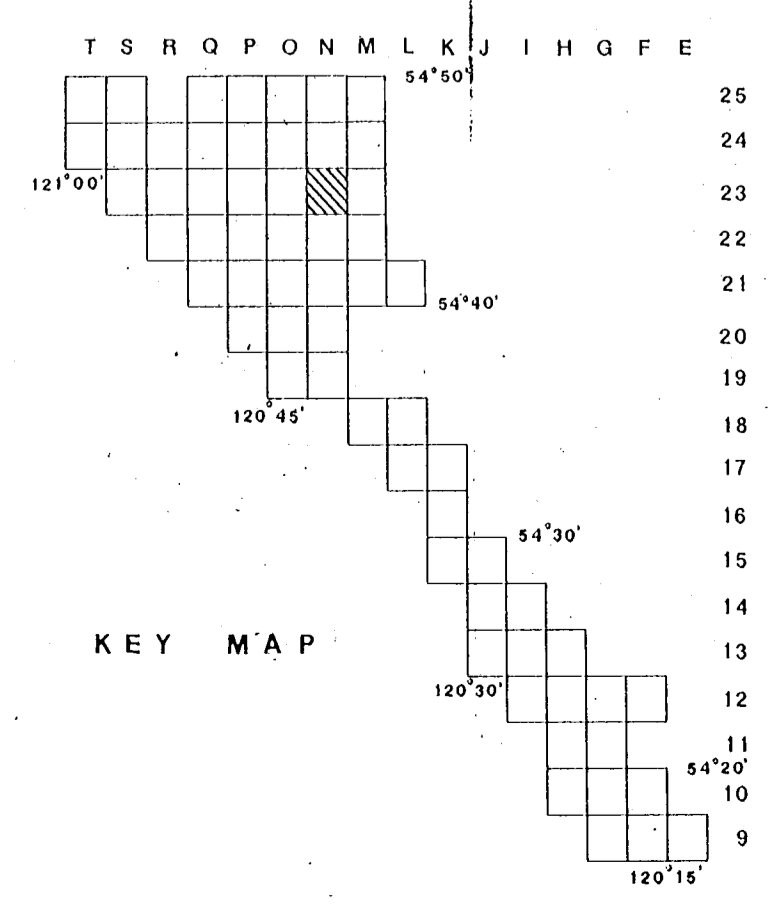
- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Sewage
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL: 5 METRES
DATE OF PHOTOGRAPHY: SEPTEMBER 1975

DATE OF SURVEY: 1977-1978
DATE OF MAPPING: 1977-1978

SURVEY NOTE

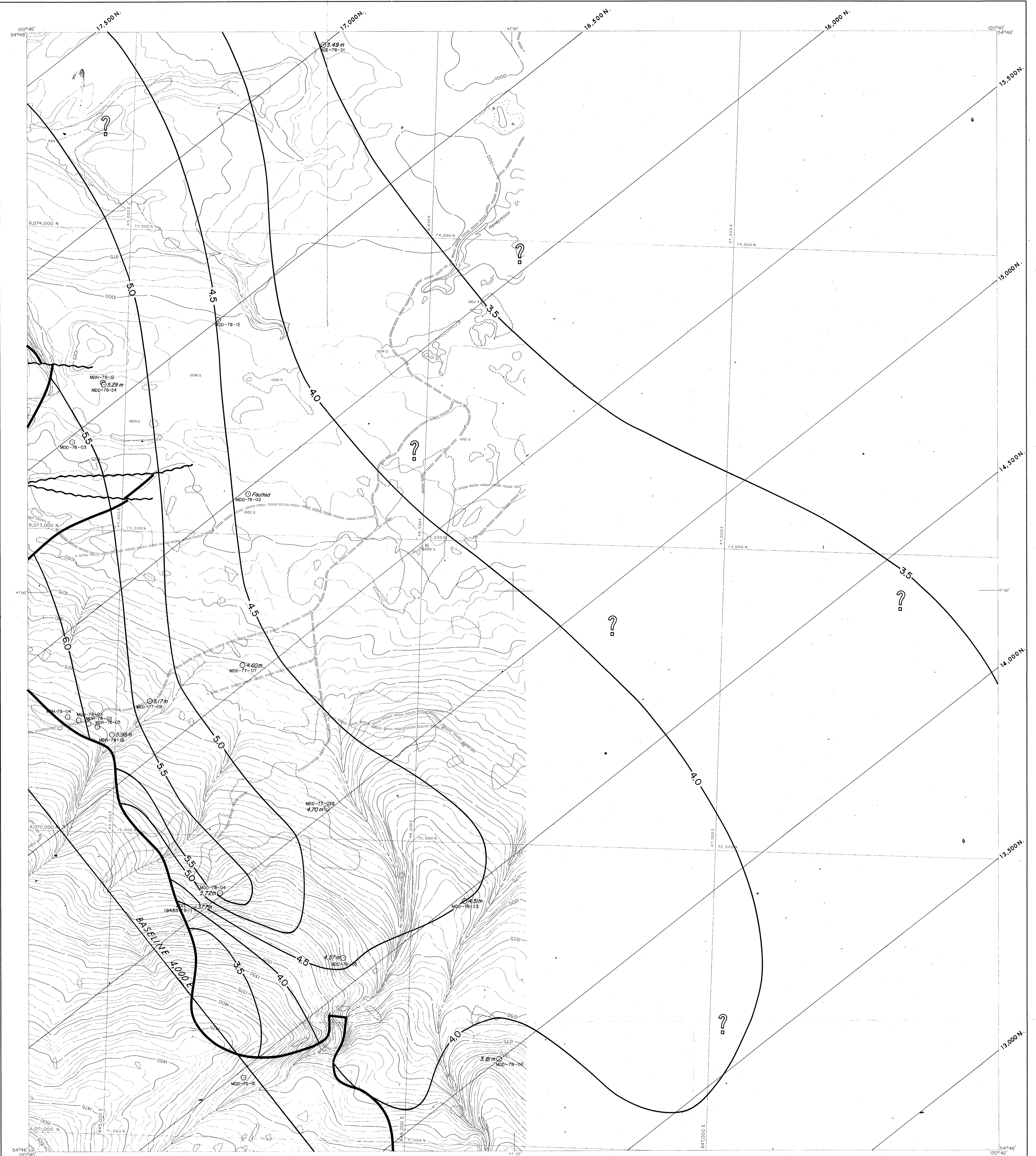
The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S., using conventional and E.D.M. survey equipment. Horizontal and vertical co-ordinates and elevations are derived from Trig. Station Quantine E. Quantine S.W. Mines, Hays-Marcus Schistes. All co-ordinates referred to Universal Transverse Mercator Grid Zone 10 Elevations are above Mean Sea Level were established by trig levelling; vertical angles being read at both ends of each course simultaneously.



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PR. JUNKMAN BELLEVUE TR (2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date JAN. 1979	Revised
Author P.J.P.	Drafted edy
Scale 1:5,000	Drawing II.4-5
MINING SECTION ISOPACH MAP B3 SEAM DUCHESS MTN.	
N 23	



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LEGEND

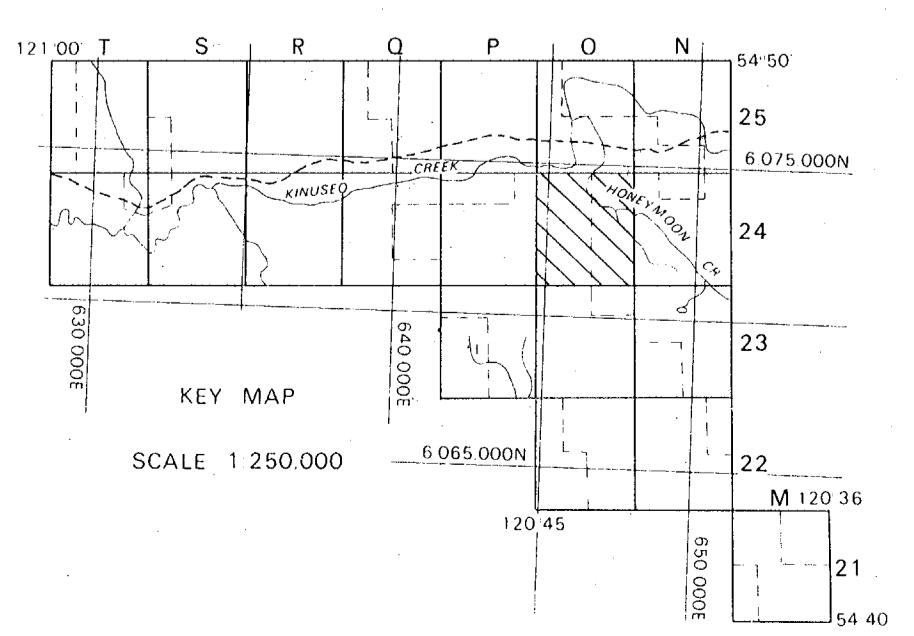
- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHY SEPTEMBER 1975

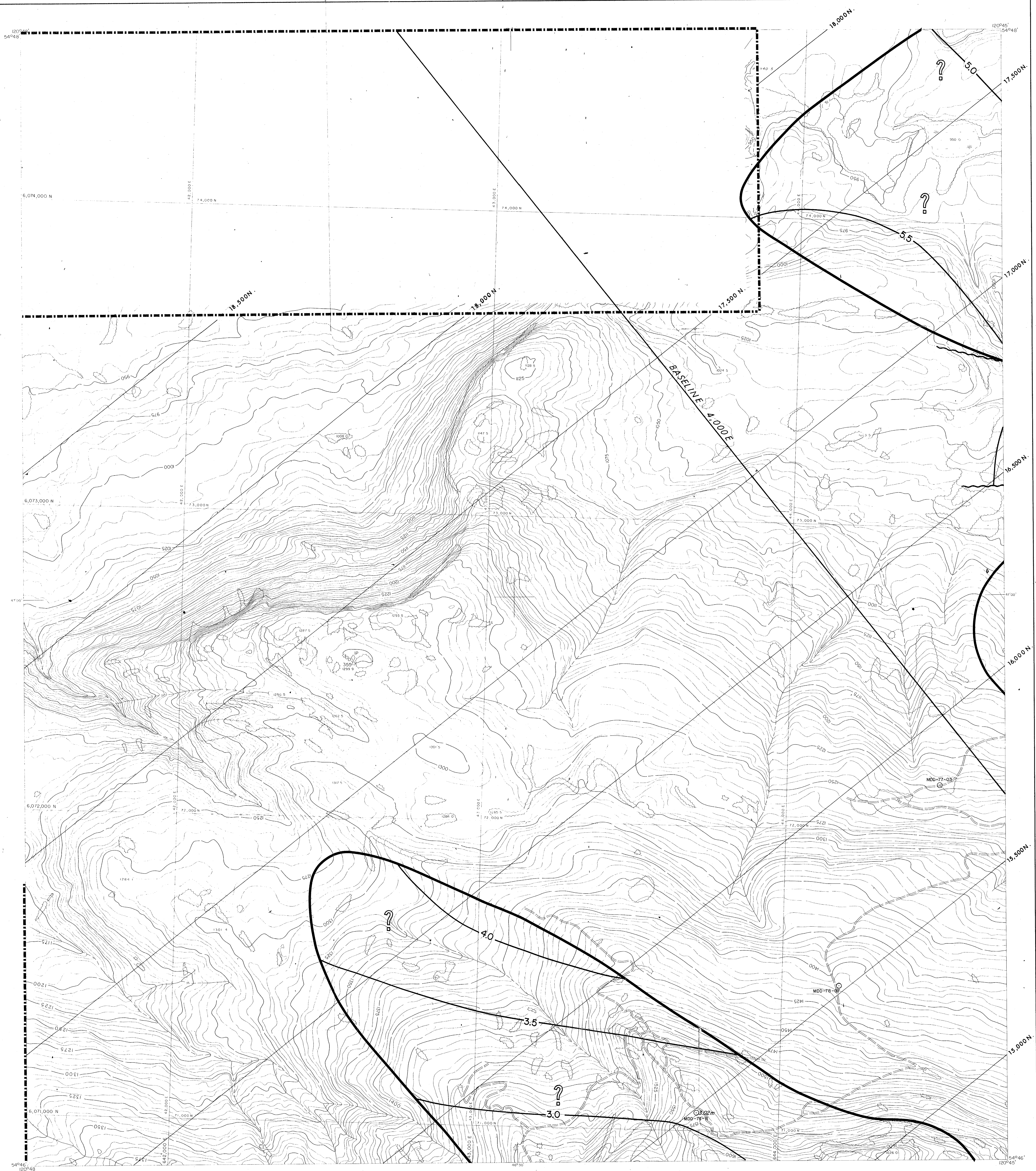
DATE OF SURVEY APRIL 1977
DATE OF MAPPING MAY 1977

SURVEY NOTE

The Horizontal and Vertical Co ordinates were established by D. W. Watson, B.C.L.S. using conventional and I.C.M. survey equipment. Horizontal and vertical co ordinates and elevations are derived from Trig Stations. Datum is E. Datum is S.W. Maine. Mark. Marco. Kinross. All co ordinates referred to Universal Traverse Mercator Grid Zone 18. Elevations are above Mean Sea Level were established by trig leveling. Vertical angles being read at both ends of each course simultaneously.



PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP B3 SEAM DUKE MTN.	
Date	JAN 1979
Revised	
Author	P.J.P.
Drafted	edy
Scale	1:5,000
Drawing	II.4-5
O 24	



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LEGEND

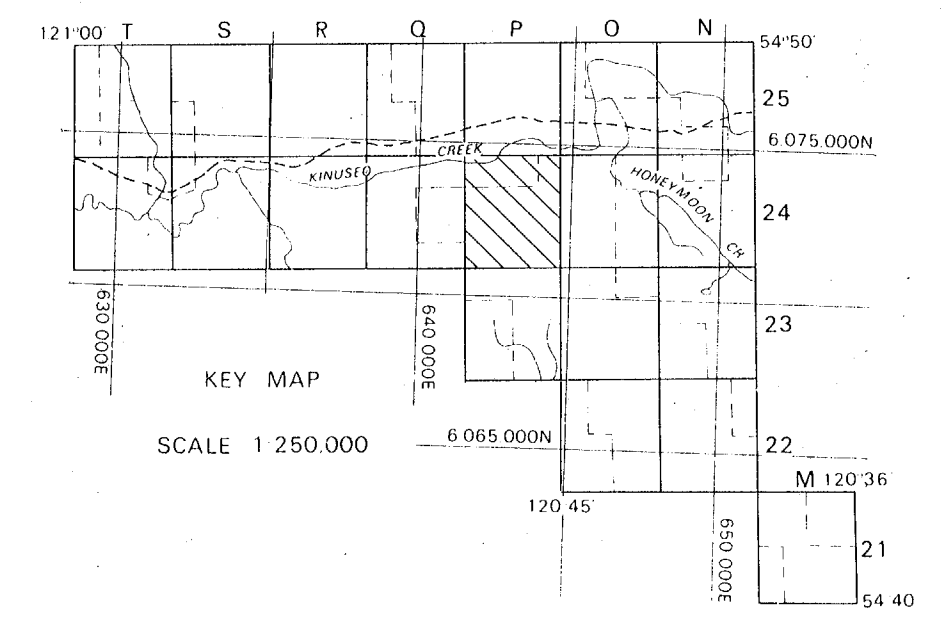
- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevations
- Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHY SEPTEMBER 1975

DATE OF SURVEY APRIL 1977
DATE OF MAPPING MAY 1977

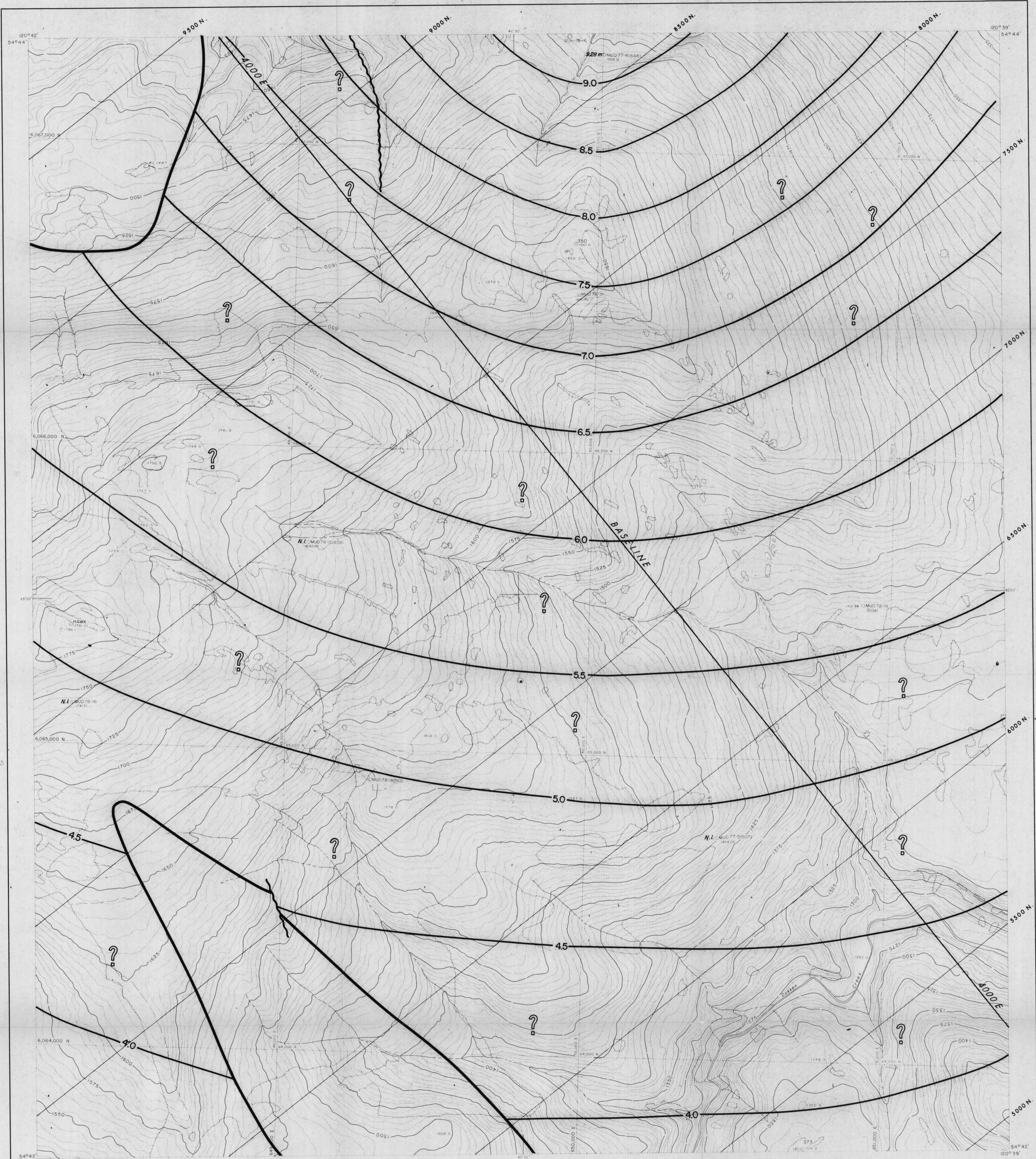
SURVEY NOTE

The Horizontal and Vertical Coordinates were established by D. W. Mason B.C.L.S. using conventional and I.D.M. survey equipment. Horizontal and vertical coordinates and elevations are derived from Trig Stations Quinette, E. Quinette S.W. Main, Hawk, Marco, Amosco. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling, vertical angles (twice) read at both ends of each course simultaneously.



PE - DUNKLETON BELMONT 74(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date JAN. 1979	Revised
Author P.J.R.	Drafted edy
Scale 1:5,000	Drawing II.4-5
MINING SECTION ISOPACH MAP B3 SEAM DUKE MTN.	
P 24	

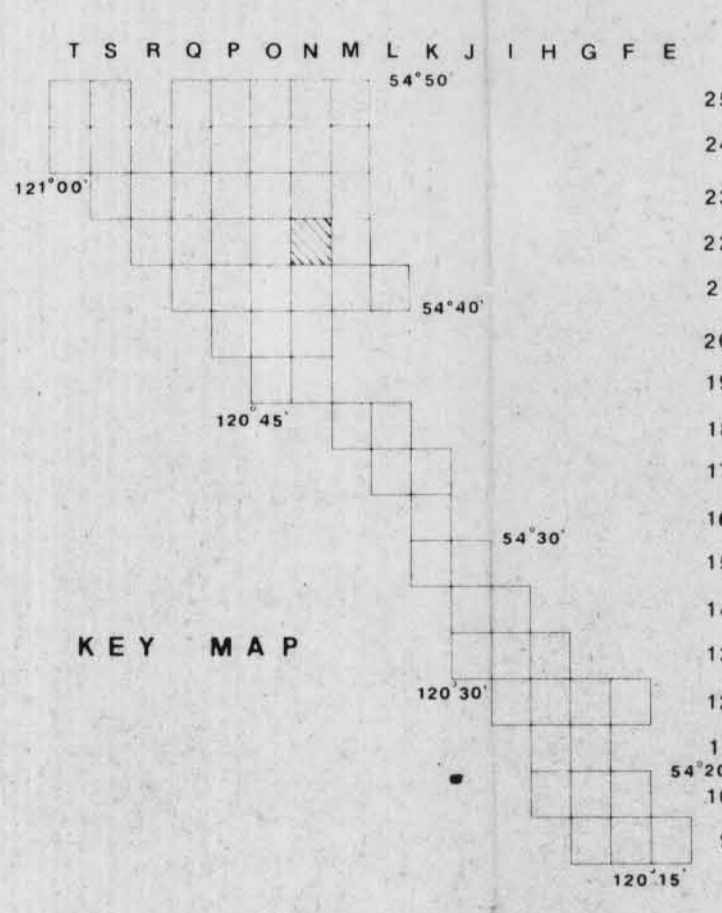


LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamps
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

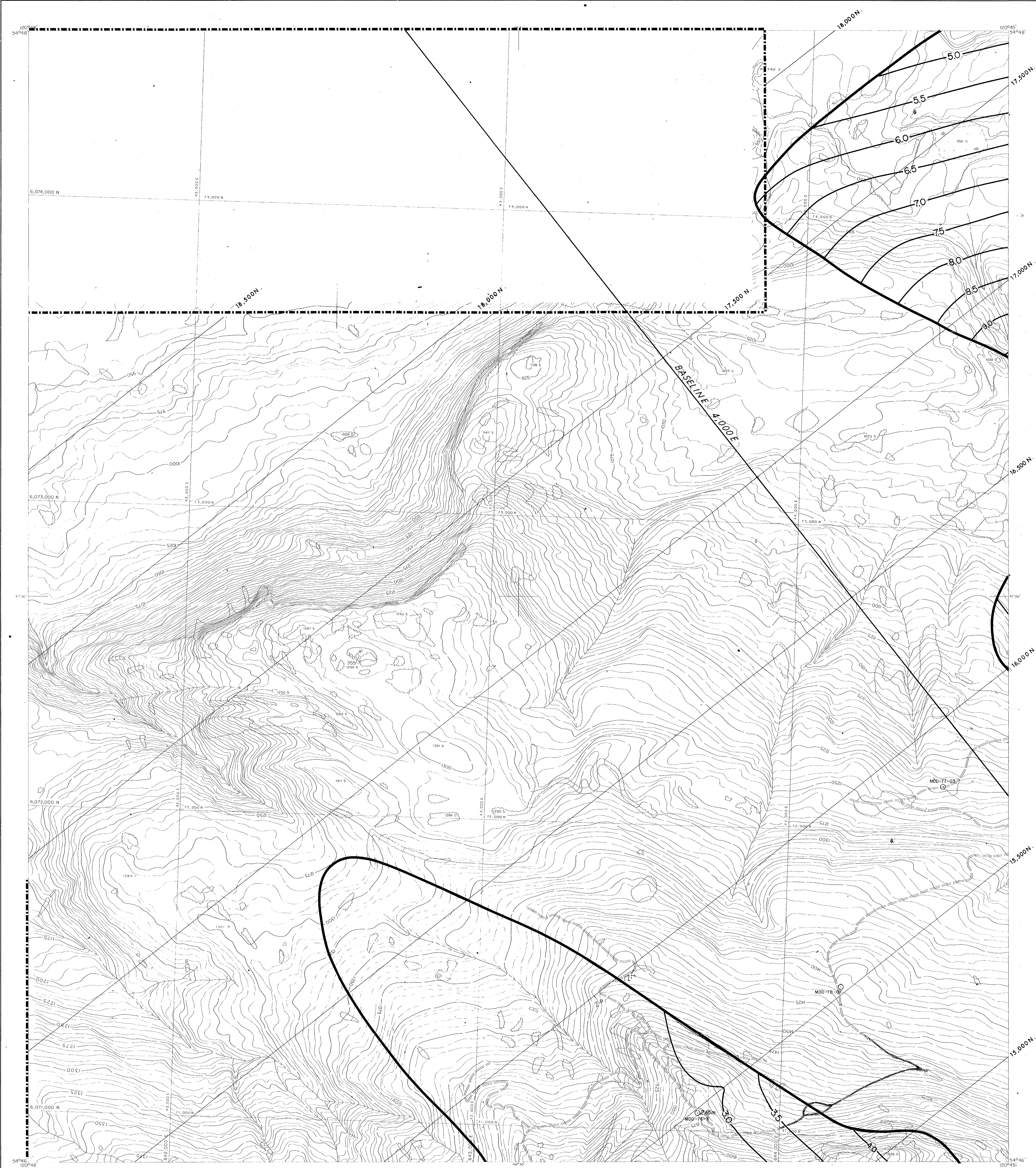
SURVEY NOTE
 The Horizontal and Vertical Co-ordinates were established by D.W. Watson B.C.L.S. using conventional and EDM surveying equipment. Horizontal and vertical co-ordinates and elevations are derived from Trig Stations. Distances E. Distance S.W. Mains Hawk Mains Kinross. All co-ordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling vertical angles being read at both ends of each course simultaneously.



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PR-ANNEGAN BELLEVUE JV (2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. 1979
MINING SECTION	Revised
ISOPACH MAP	Author J.R.
B4 SEAM	Drafted edg
DUCHESS MTN.	Scale 1:5,000
	Drawing II.4-5
	N 22

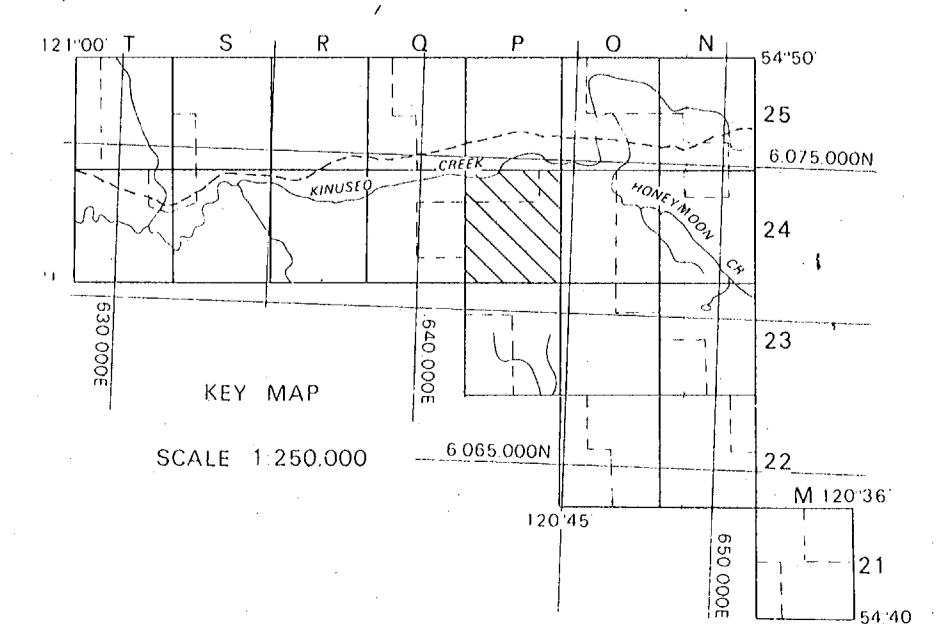


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- LEGEND**
- Improved road
 - Secondary road
 - Track or trail
 - Can. line
 - Free area
 - River
 - Stream
 - Intermittent stream
 - Swamp
 - Contours
 - Horizontal control
 - Vertical control
 - Spirit elevation
 - Iron Pin

CONTOUR INTERVAL 5 METRES DATE OF SURVEY APRIL 1977
 DATE OF PHOTOGRAPHY SEPTEMBER 1975 DATE OF MAPPING MAY 1977

SURVEY NOTE
 The Horizontal and Vertical Coordinates were established by G. W. Watson B.C.L.S. using conventional and I.D.M. survey equipment. Horizontal and vertical coordinates and elevations are derived from Trip Stations. Datum: I. Datum: S.W. Main. Base: Alaska. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling, vertical angles being read at both ends of each course simultaneously.



Pa - Monkman Belauver 79(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. 1979
MINING SECTION ISOPACH MAP B4 SEAM DUKE MTN.	Revised Author P.J.P. Drafted edy Scale 1:5,000 Drawing II.4-5
P 24	



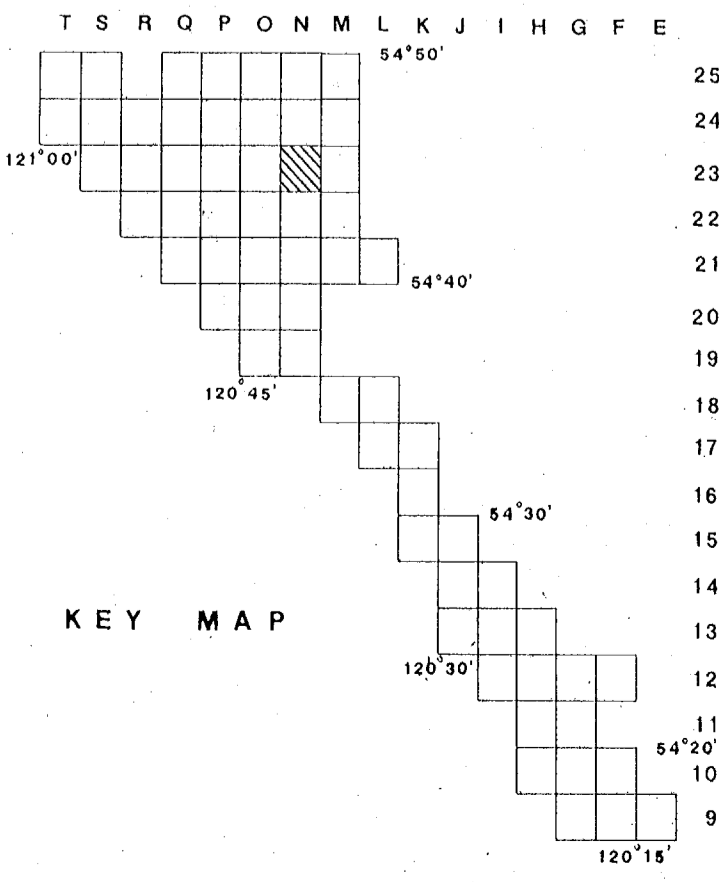
LEGEND

Improved road	
Secondary road	
Track or trail	
Cut line	
Tree area	
River	
Stream	
Intermittent stream	
Swamp	
Contours	
Horizontal control	
Vertical control	
Spot elevation	
Iron Pin	

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975

DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

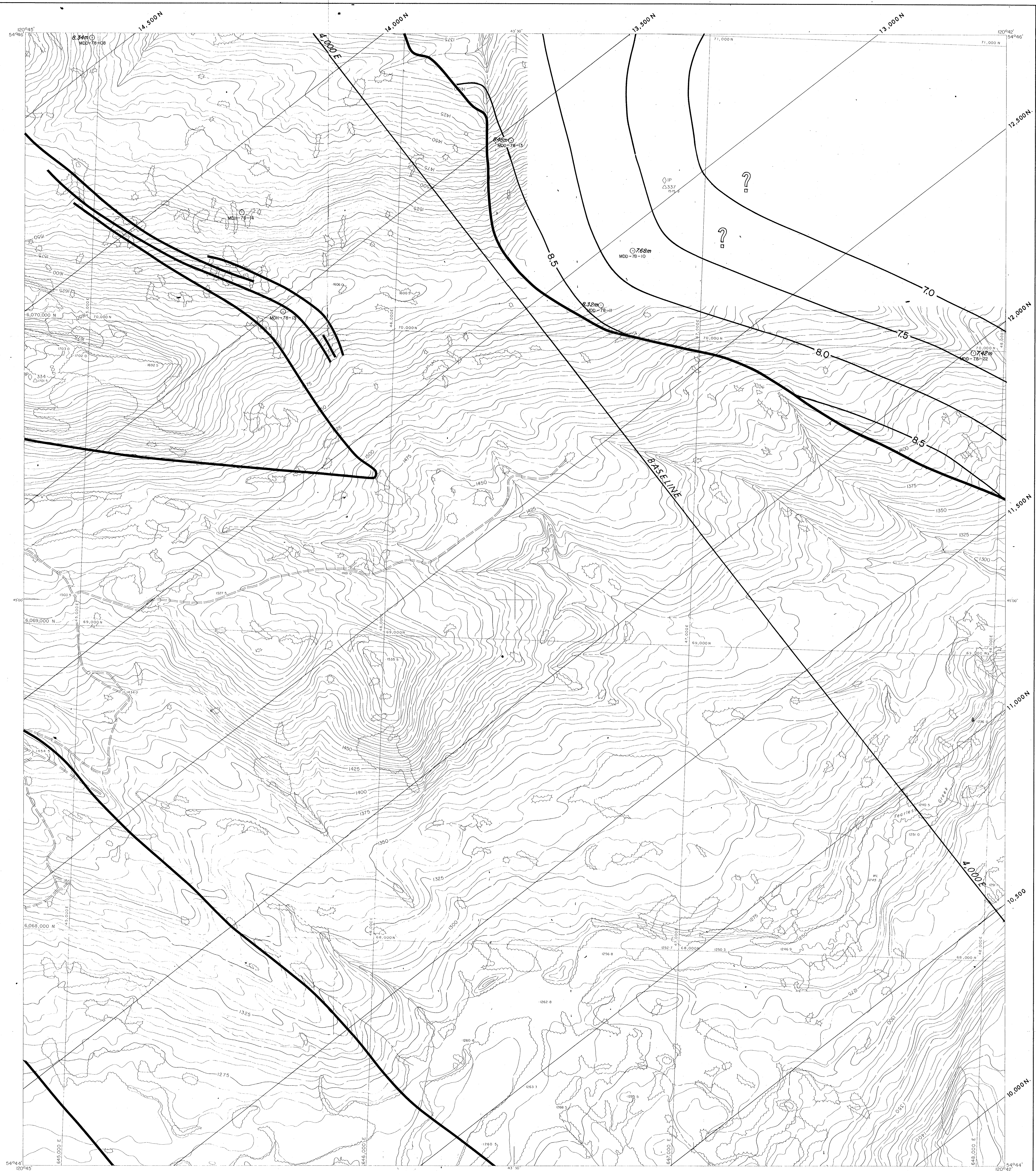
SURVEY NOTE
 The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S., using conventional and 1/2" M. survey equipment. Horizontal and vertical co-ordinates and elevations are derived from Trig Station Quonsetto E. Quonsetto S.W. Manana. Hawk. Marca. Kofusko. All co-ordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling, vertical angles being read in both ends of each course simultaneously.



543

Pr - DUNKERAN BELCOVET 71 (2) A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date JAN. 1979
MINING SECTION ISOPACH MAP B4 SEAM DUCHESS MTN.	Revised
	Author J. R.
	Drafted edy
	Scale 1:5,000
	Drawing II.4-5
	N 23

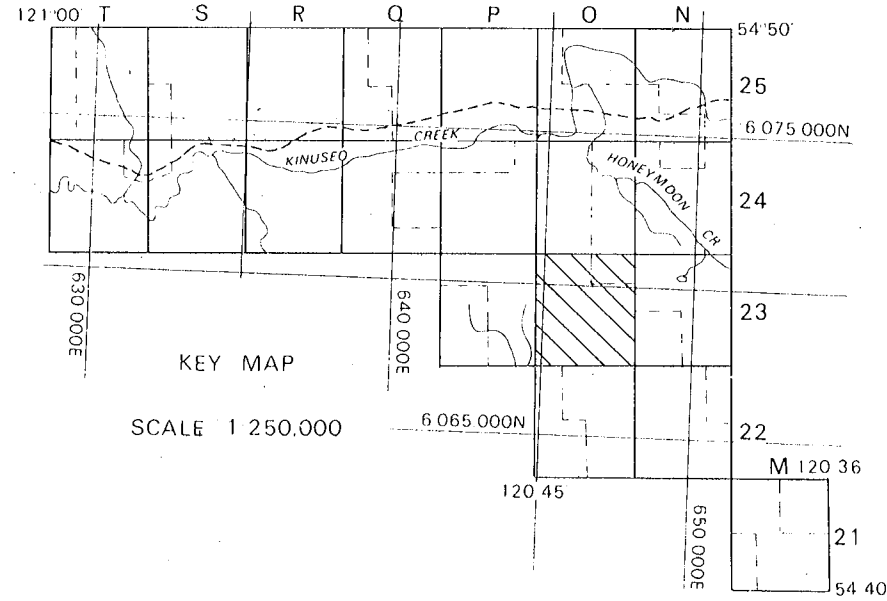


LEGEND

Improved road	
Secondary road	
Track or trail	
Cut line	
Tree area	
River	
Stream	
Intermittent stream	
Swamp	
Contours	
Horizontal control	
Vertical control	
Spot elevation	
Iron Pin	

CONTOUR INTERVAL 5 METRES DATE OF SURVEY APRIL 1977
 DATE OF PHOTOGRAPHY SEPTEMBER 1975 DATE OF MAPPING MAY 1977

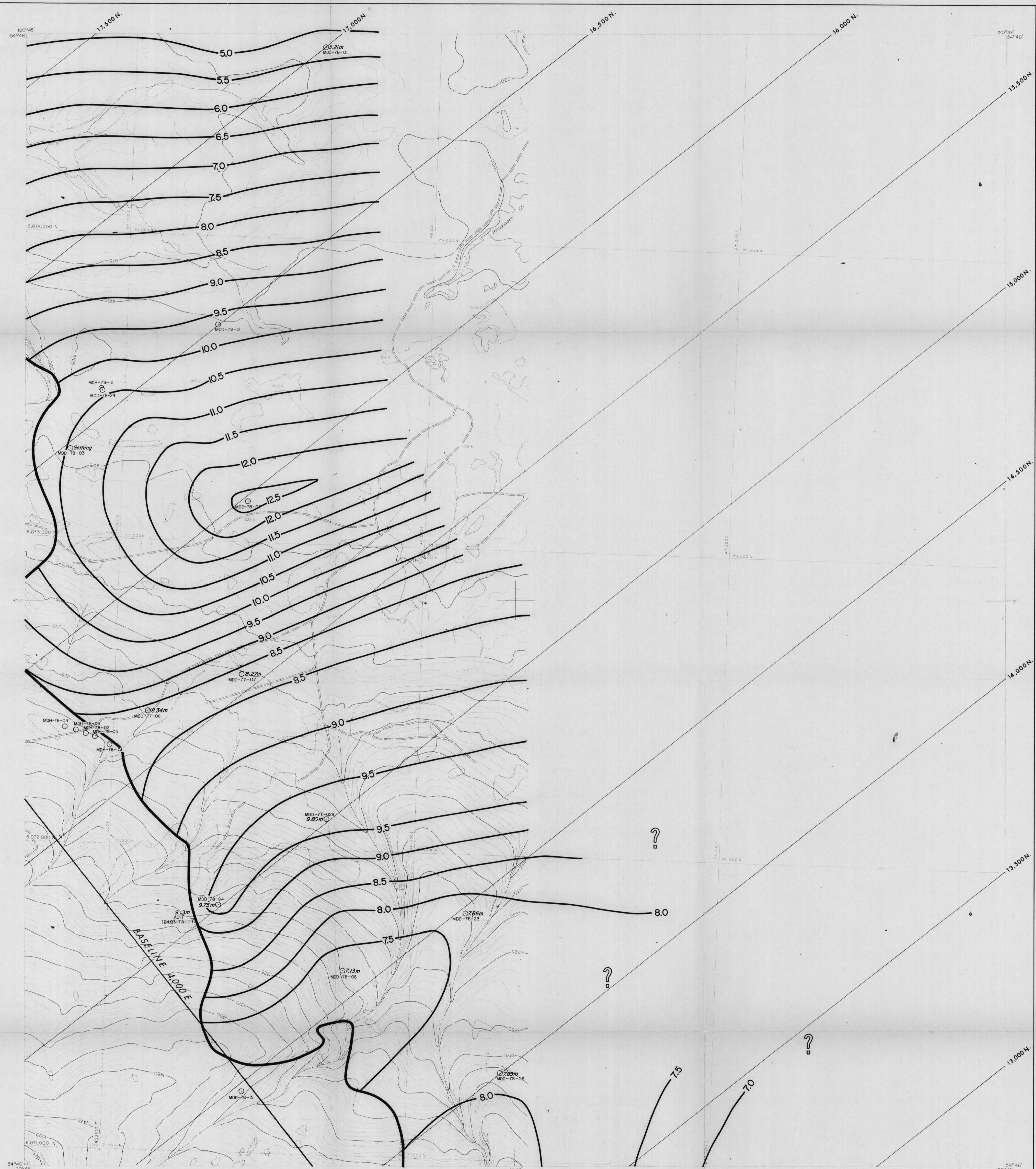
SURVEY NOTE
 The Horizontal and Vertical Co ordinates were established by D.W. Watson, B.C.L.S. using conventional and I.D.M. survey equipment. Horizontal and vertical co ordinates and elevations are derived from Trip Stations Quinette II, Dumiretto S.W. Maine, Hawk, Marica, Krusko. All co ordinates referred to Universal Transverse Mercator, Grid Zone 10. Elevation are above Mean Sea Level were established by trip leveling vertical angles from a level at both ends of each course simultaneously.



543

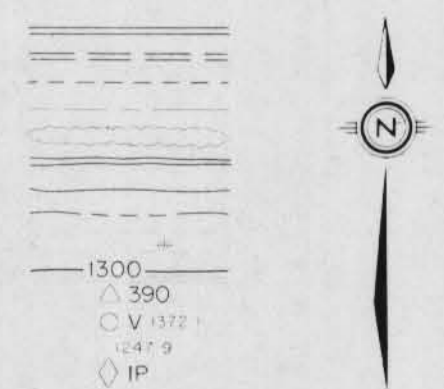
Pr-nankon Beladver 78(2)A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION	Date JAN. 1979
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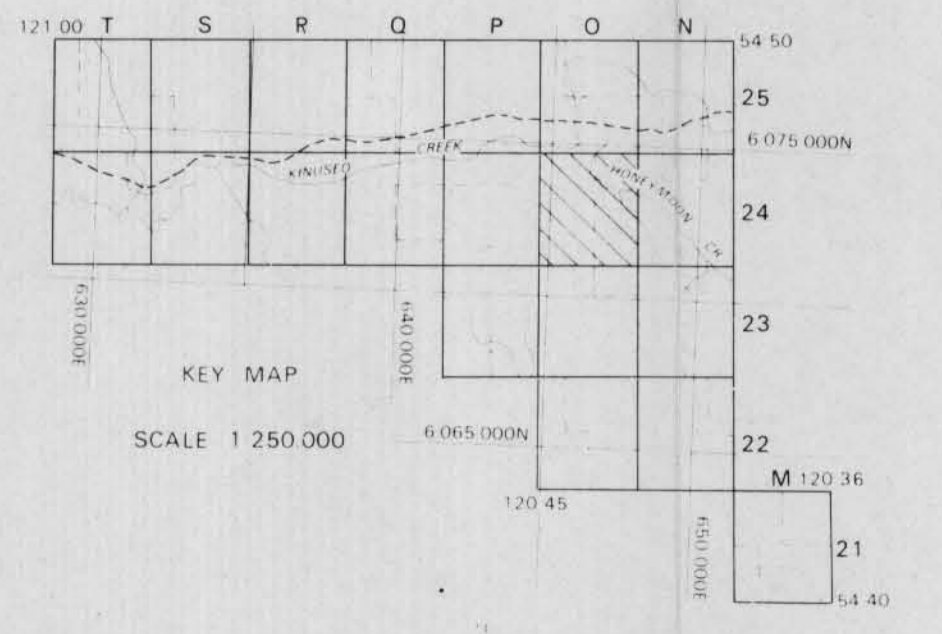
LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin



CONTOUR INTERVAL 5 METRES DATE OF SURVEY APRIL 1977
 DATE OF PHOTOGRAPHY SEPTEMBER 1975 DATE OF MAPPING MAY 1977

SURVEY NOTE
 The horizontal and vertical coordinates were established by D. W. Watson, B.C.L.S., using conventional and I.D.M. surveying methods. Horizontal and vertical coordinates and elevations are derived from Trig. Station Quintero E. Quintero S.W. Marker, Hana, Maricao, Knives. All coordinates referred to Universal Transverse Mercator Grid Zone 18 T. Elevations are above Mean Sea Level. Vertical control was established by trig leveling, vertical angles being read at both ends of each course simultaneously.



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PA. DANLEON - BELLEVUE - 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP B4 SEAM DUKE MTN.	Date JAN. 1979 Revised Author P.J.R. Drafted edy Scale 1:5,000 Drawing II.4-5
O 24	



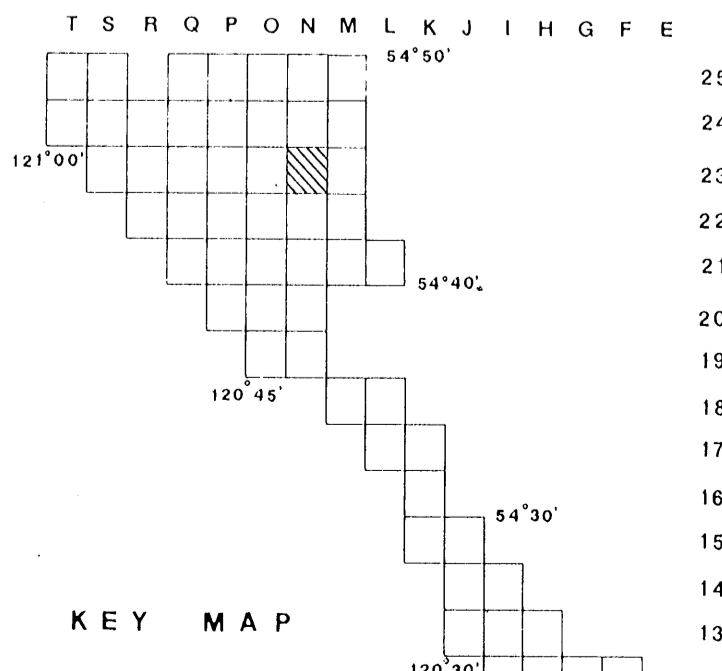
LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975

DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

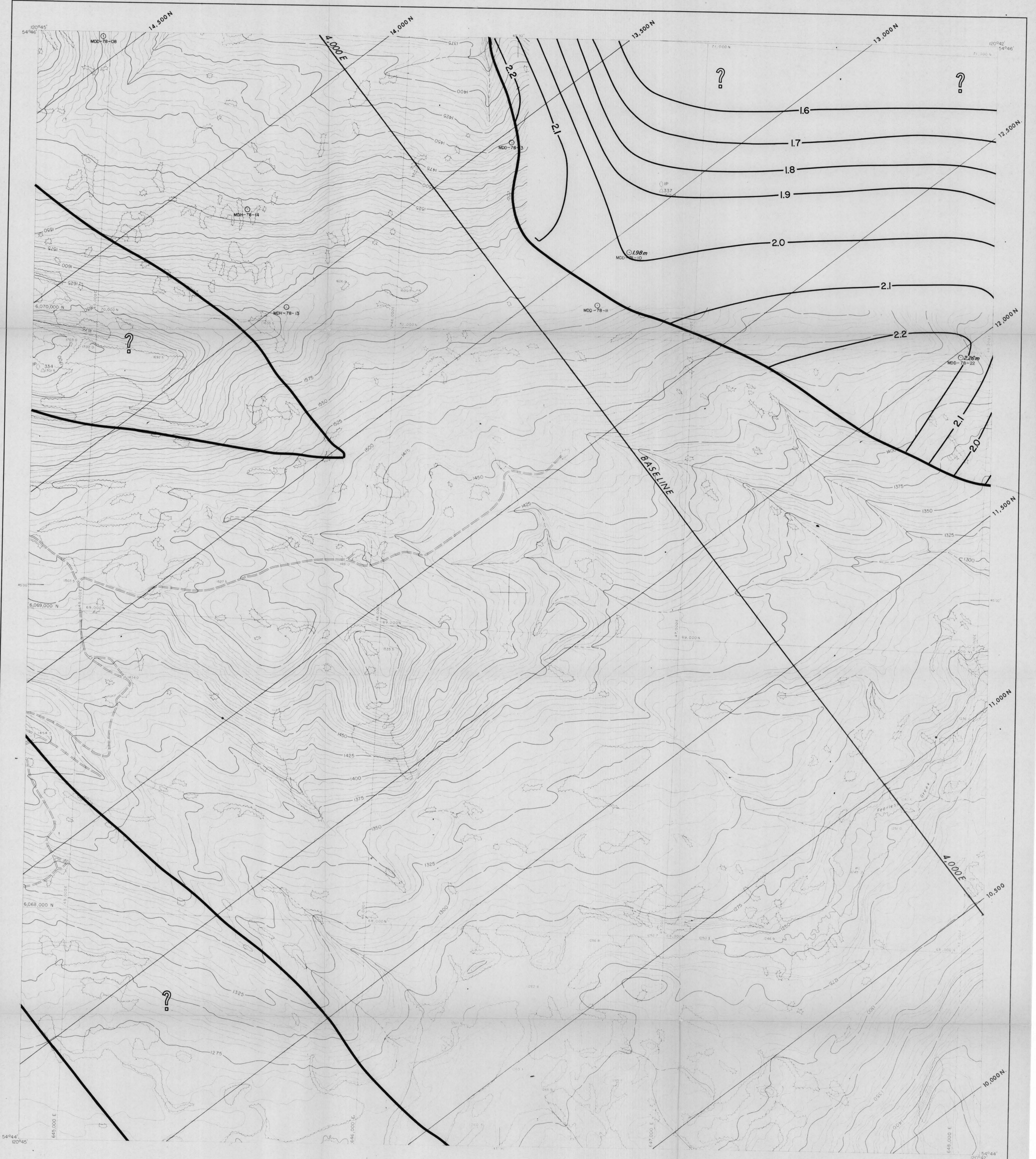
SURVEY NOTE
 The Horizontal and Vertical Co ordinates were established by D. W. Watson B.C.L.S. using conventional and E.M. surveying equipment. Horizontal and vertical co ordinates and elevations are derived from Trig. Stations Quinette E, Dumette SW, Mame, Hama, Macca, Kulusso. All co ordinates referred to Universal Traverse Mercator Grid Zone 18. Elevations are above Mean Sea Level were established by trig leveling, vertical angles being run at both ends of each course simultaneously.



543

PA - MONKMAN BELGARD 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP B5 SEAM DUCHESS MTN.	Date JAN 1979 Revised Author J. R. Drafted edy Scale 1:5,000 Drawing II.4-5
N 23	



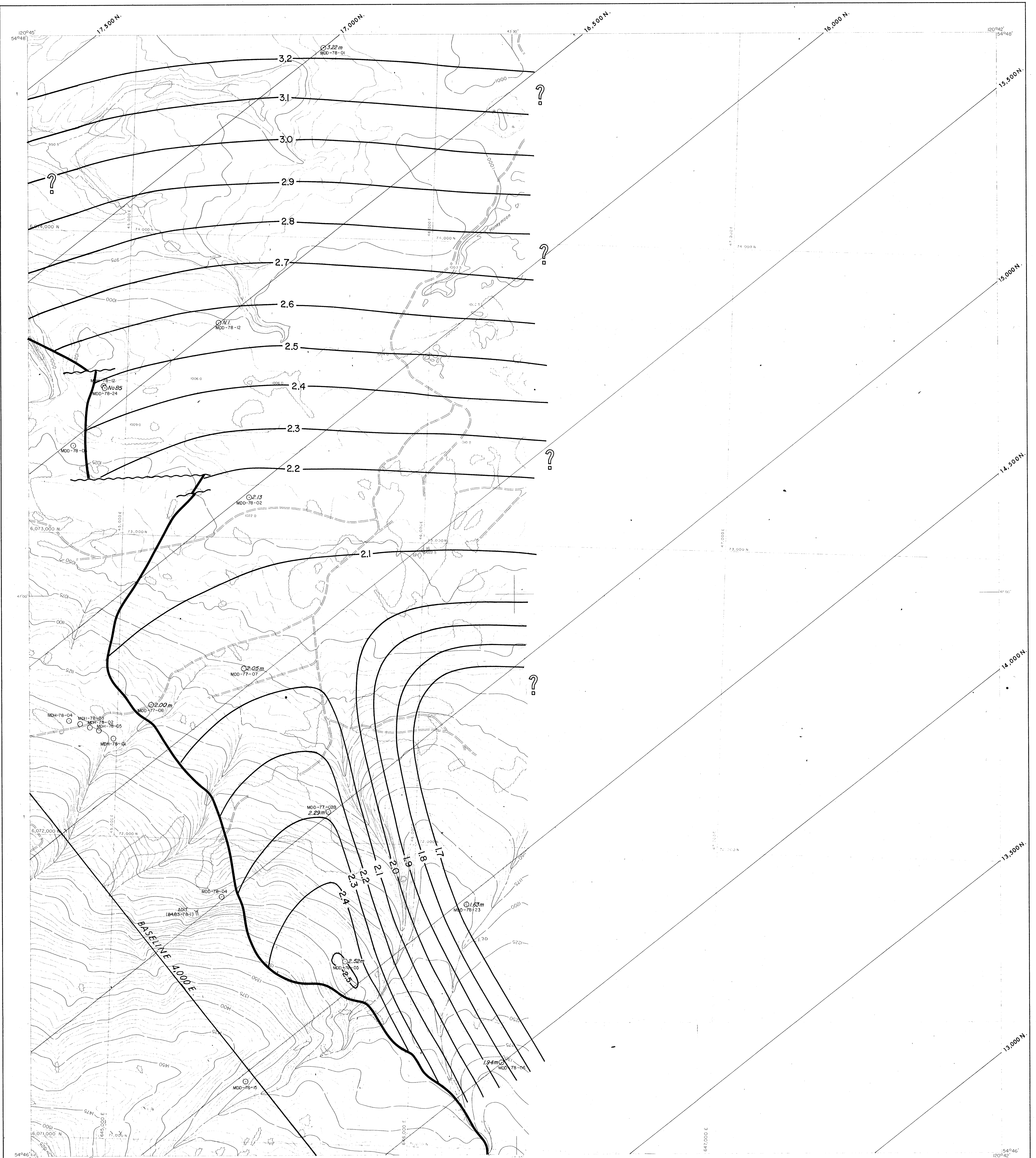
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PR - DUNDON BELCOURT 78 (2)A

LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

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LEGEND

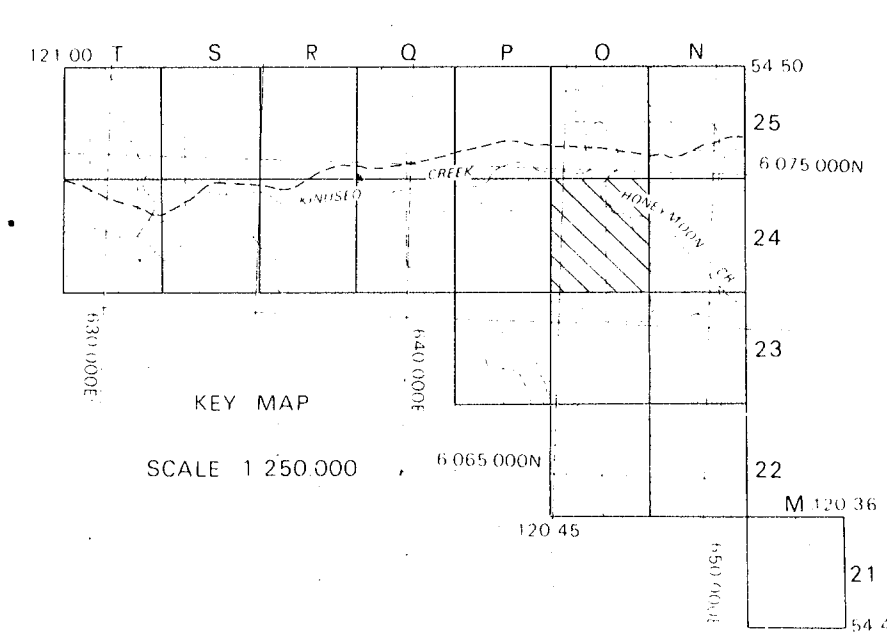
- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHY SEPTEMBER 1975

DATE OF SURVEY APRIL 1977
DATE OF MAPPING MAY 1977

SURVEY NOTE

The Horizontal and Vertical Coordinates were established by D. W. Watson B.C.L.S. using conventional and EDM survey equipment. Horizontal and vertical coordinates and elevations are derived from Trig Stations (Quinn's E., Quinn's S.W., Marine Head, Marlin, Kennerly). All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level. Level was established by trig levelling, vertical angles being read on both ends of each course simultaneously.

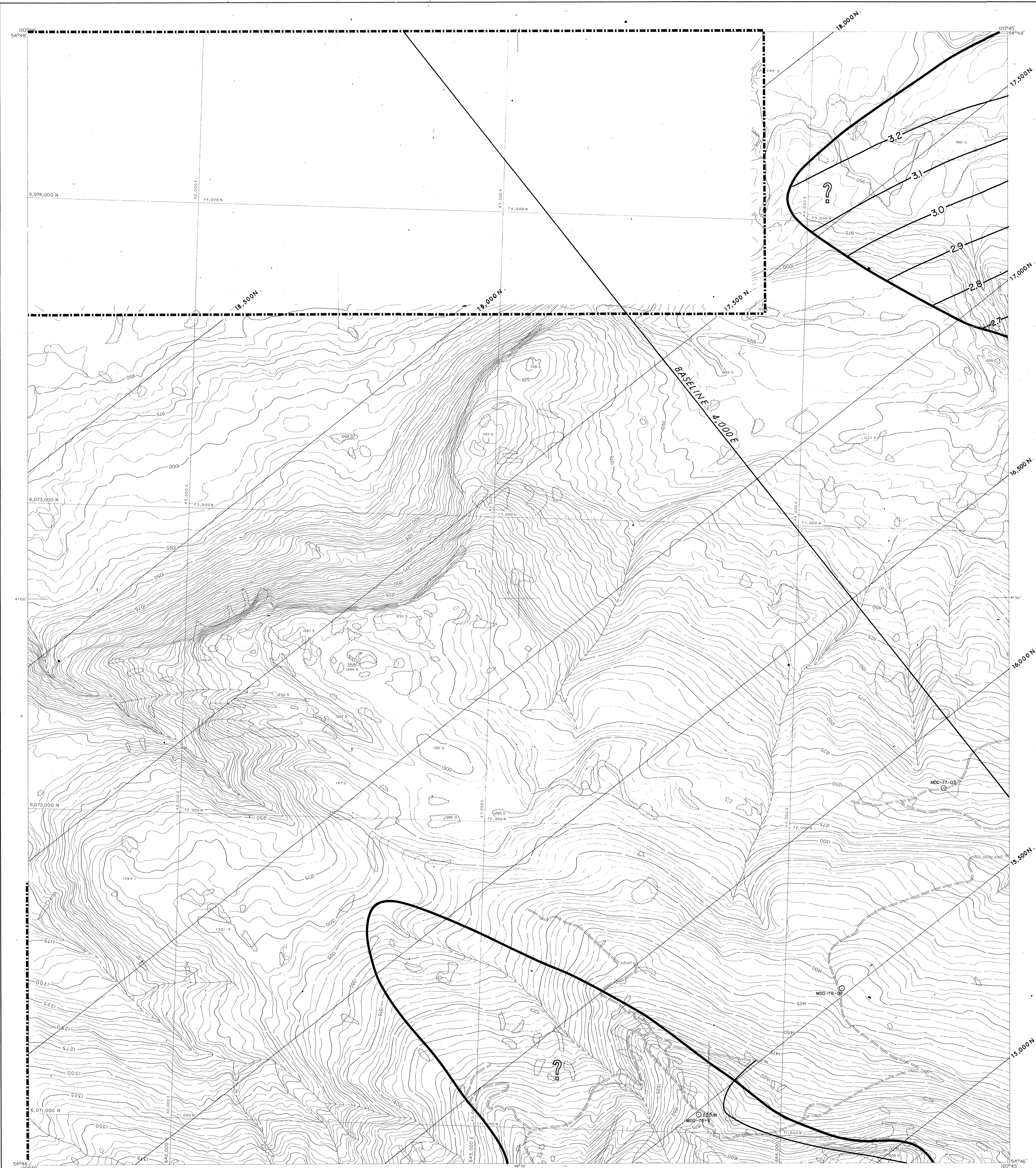


543

PA-DUNEDAN BELCOURT 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP B5 SEAM DUKE MTN.	Date JAN. 1979
	Revised
	Author J.R.
	Drafted edy
	Scale 1:5,000
	Drawing 11.4-5
	O 24

© 1979 PACIFIC PETROLEUMS LTD.



LEGEND

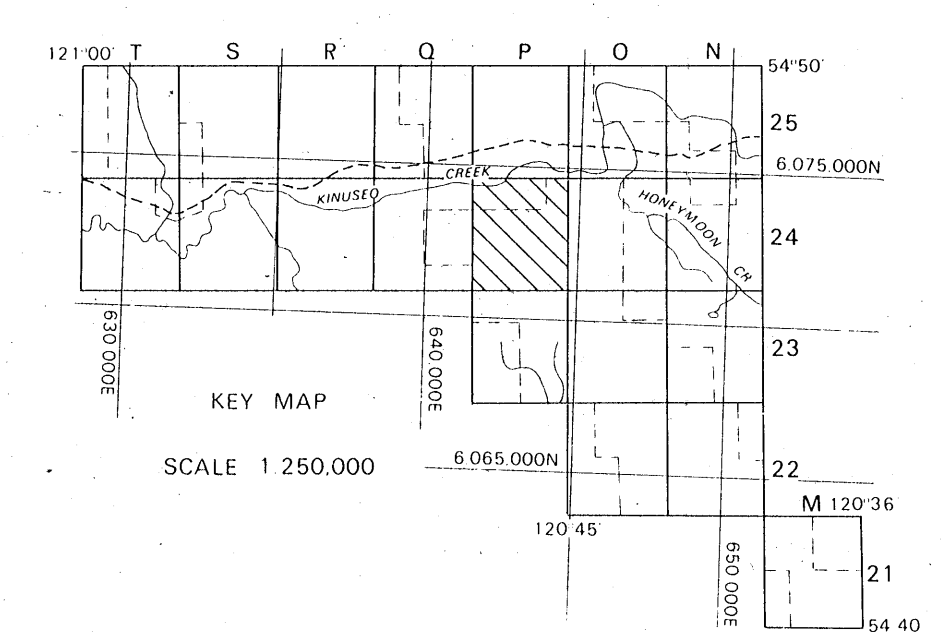
- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHY SEPTEMBER 1975

DATE OF SURVEY APRIL 1977
DATE OF MAPPING MAY 1977

SURVEY NOTE

The Horizontal and Vertical Co ordinates were established by D. W. Watson B.C.L.S. using conventional and EDM survey equipment. Horizontal and vertical co ordinates and elevations are derived from Trig. Stations Quintette E, Quintette S.W., Manna Hawk, Marook, Kinuso. All co ordinates referred to Universal Traverse Mercator Grid Zone 18. Elevations are above Mean Sea Level were established by trig leveling vertical angles being read at both ends of each course simultaneously.



543

12-20N120R120E Belcarra 71(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP B5 SEAM DUKE MTN.	
Date JAN. 1979	Revised
Author J.R.	Drafted edy
Scale 1:5,000	Drawing II.4-5
P 24	

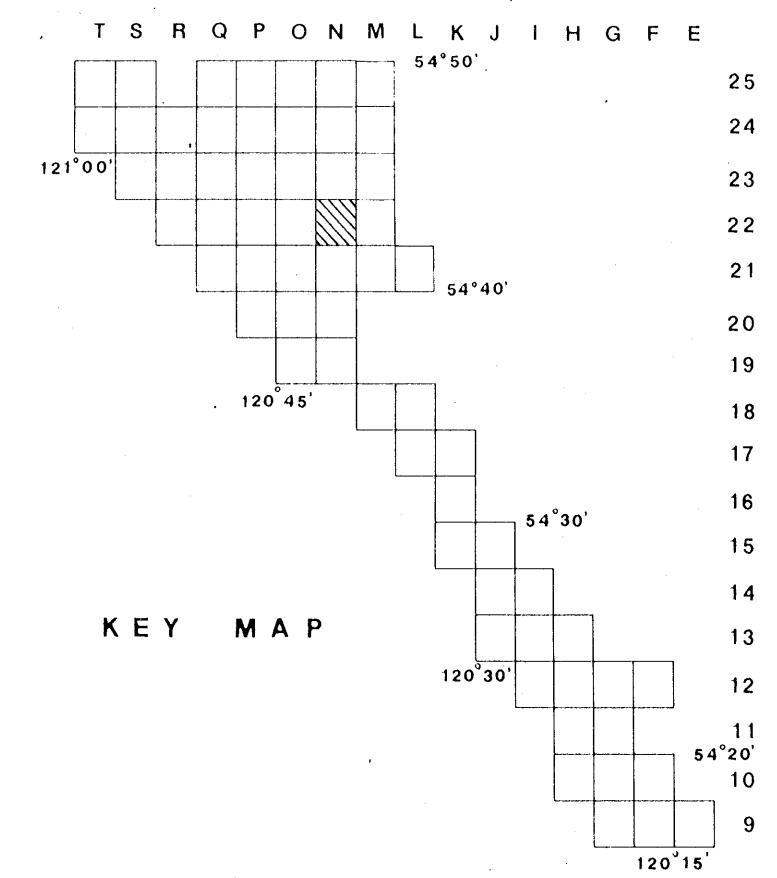


- LEGEND**
- Improved road
 - Secondary road
 - Track or trail
 - Cut line
 - Tree area
 - River
 - Stream
 - Intermittent stream
 - Swamp
 - Contours
 - Horizontal control
 - Vertical control
 - Spirit elevation
 - Iron Pin

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975

DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

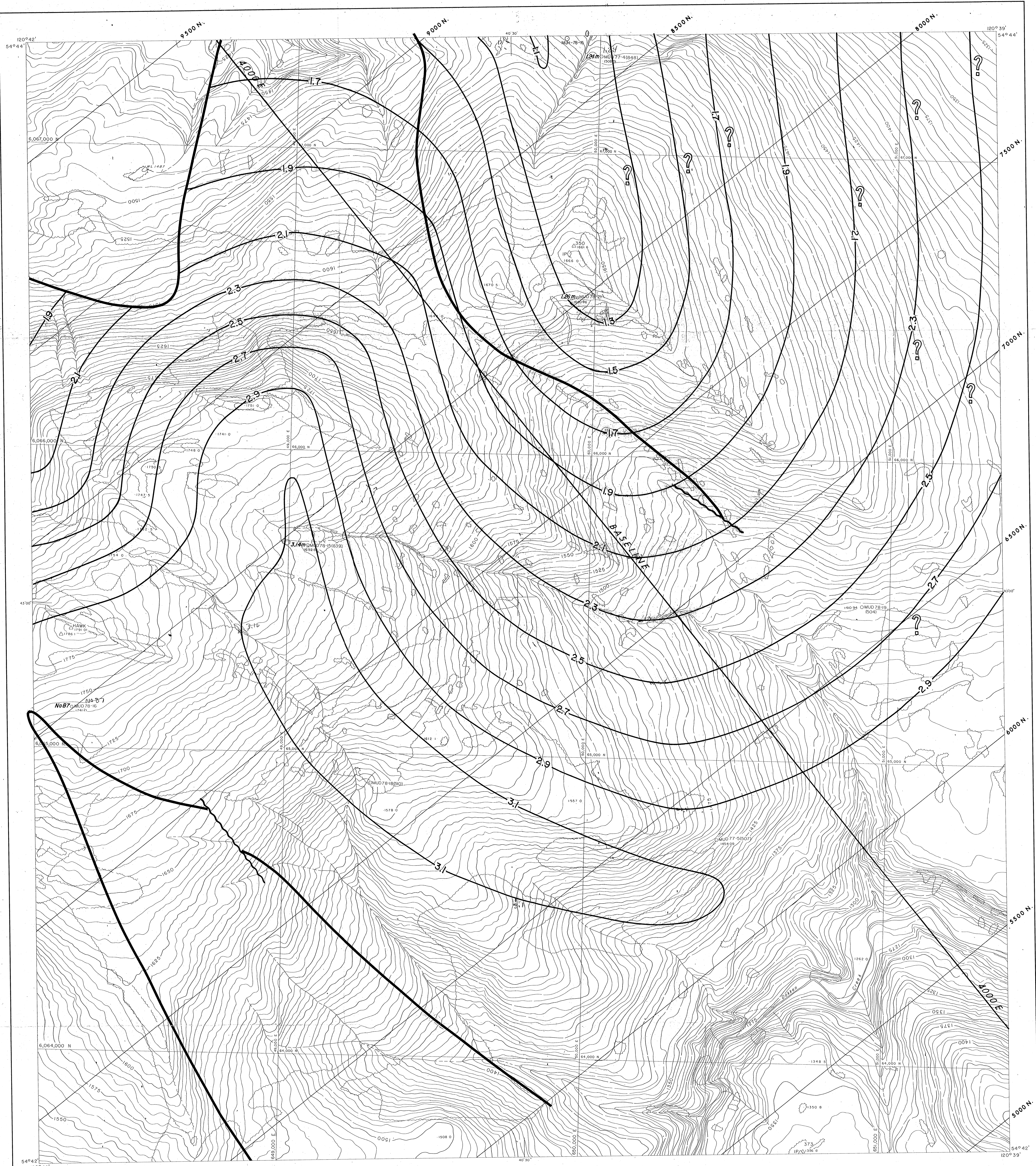
SURVEY NOTE
 The Horizontal and Vertical Co ordinates were established by D. W. Watson, B.C.L.S. using conventional and EDM survey equipment. Horizontal and vertical co ordinates and elevations are derived from Trig Stations 'Dumetree SW', 'Mama Hawk', 'Mama Kinnear'. All co ordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig levelling, vertical angles being read at both ends of each course simultaneously.



543

PR - DUNKAN BELMONT T.C. (A)

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date JAN. 1979	Revised
Author P.J.P.	Drafted edy
Scale 1:5,000	Drawing II.4-5
N 22	

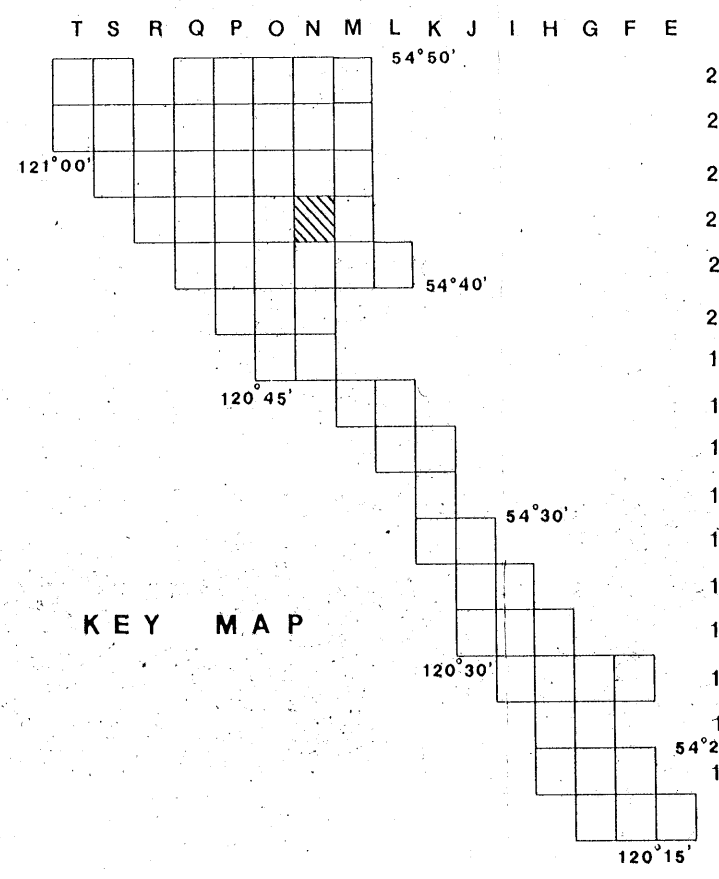


LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

SURVEY NOTE
 The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S., using conventional and EDM survey equipment. Horizontal and vertical co-ordinates are derived from Trip Station Quinette E. Quinette S.W. Main: Hawk, Marica, Kinuso. All co-ordinates referred to Universal Traverse Meridian Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling, vertical angles being read at both ends of each course simultaneously.



543

Mc. NANKMAN BELLEVUE 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date JAN. 1979	Revised
Author P.J.P.	Drafted edg
Scale 1:5,000	Drawing 11.4-5
N 22	

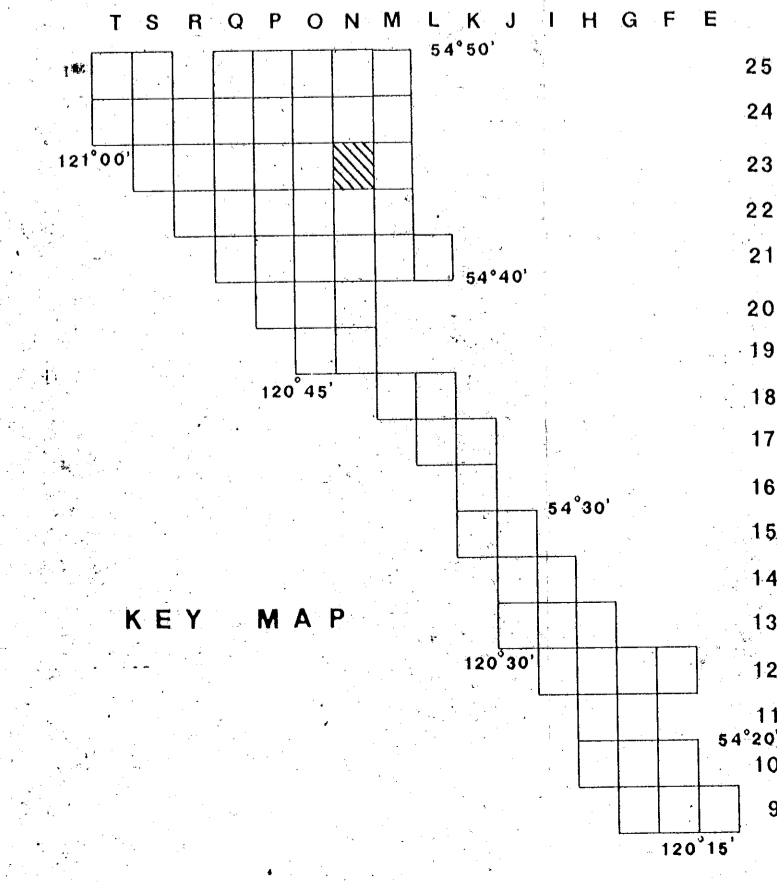
MINING SECTION
ISOPACH MAP
 B7 SEAM
 DUCHESS MTN.



- LEGEND**
- Improved road
 - Secondary road
 - Track or trail
 - Cut line
 - Tree area
 - River
 - Stream
 - Intermittent stream
 - Swamp
 - Contours
 - Horizontal control
 - Vertical control
 - Spot elevation
 - Iron Pin

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

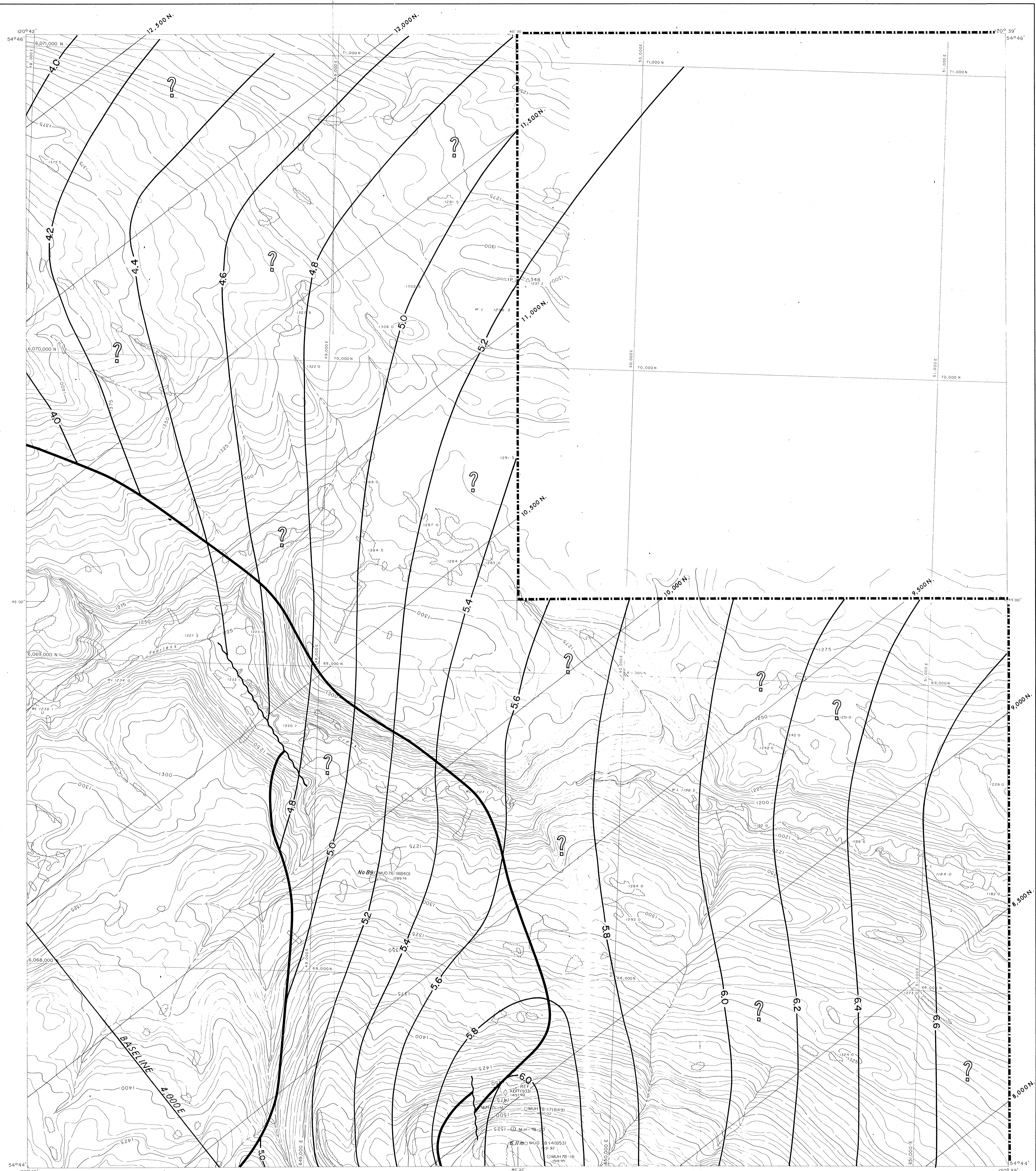
SURVEY NOTE
 The Horizontal and Vertical Co-ordinates were established by D. W. Watson, B.C.L.S. using conventional and C.I.M. survey equipment. Horizontal and vertical co-ordinates and elevations are derived from Trig Stations Queneau, E. Queneau S.W., Manna, Hawk, Manoa, Kufuseo. All co-ordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling, vertical angles being read at both ends of each course simultaneously.



543

12- DUKANAN BEACOURT TX (2) A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP B7 SEAM DUCHESS MTN.	
Date JAN. 1979	Revised
Author P.J.P.	Drafted edy
Scale 1:5,000	Drawing II.4-5
N 23	



LEGEND

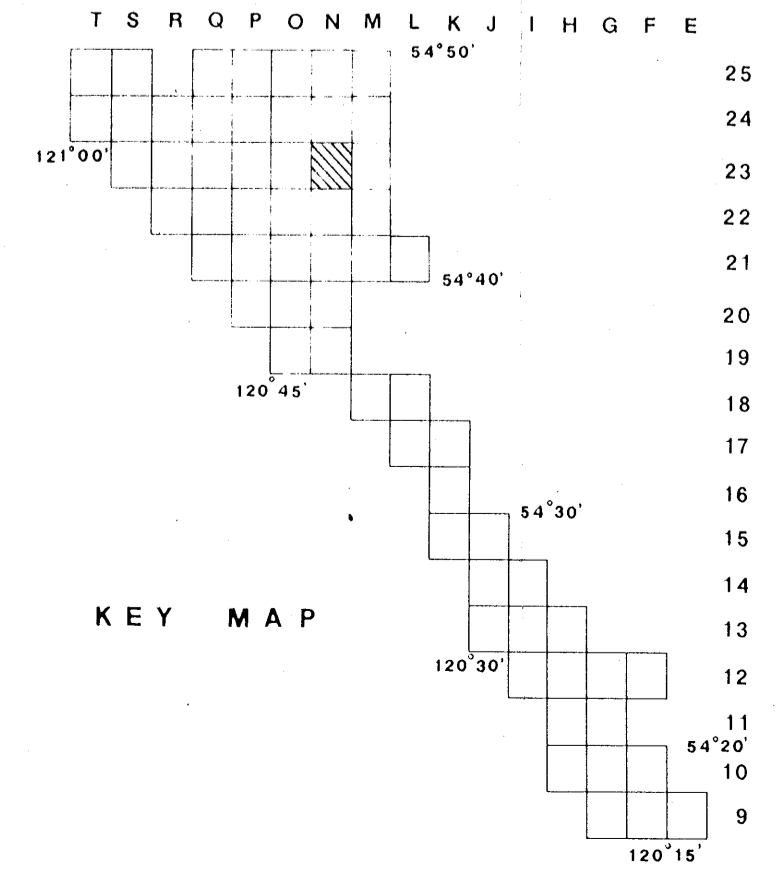
- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL: 5 METRES
DATE OF PHOTOGRAPHY: SEPTEMBER 1975

DATE OF SURVEY: 1977-1978
DATE OF MAPPING: 1977-1978

SURVEY NOTE

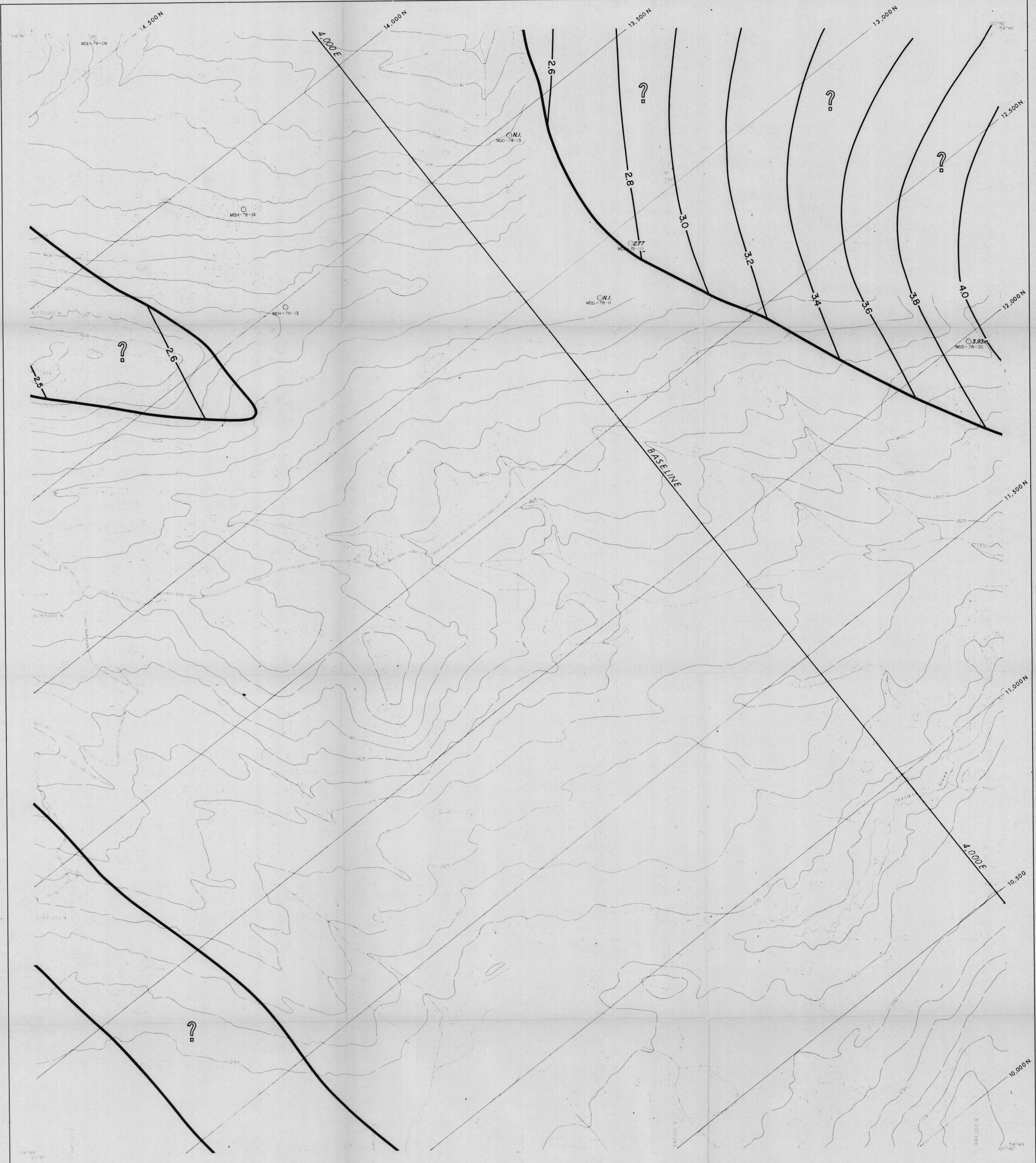
The Horizontal and Vertical Co ordinates were established by D. W. Watson, B.C.S., using conventional and E.T.M. surveying methods. Horizontal and vertical co ordinates and elevations are derived from Trig Stations: Quinette E, Quinette S.W., Manna, Hana, Marica, Kulusse. All co ordinates referred to Universal Traverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling, vertical angles being read at both ends of each course simultaneously.



543

PR - MONKMAN BELLOUET 78(2)A

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date JAN. 1979	Revised
Author P.J.P.	Drafted edy
Scale 1:5,000	Drawing II.4-5
MINING SECTION ISOPACH MAP B9 SEAM DUCHESS MTN.	
N 23	



LEGEND

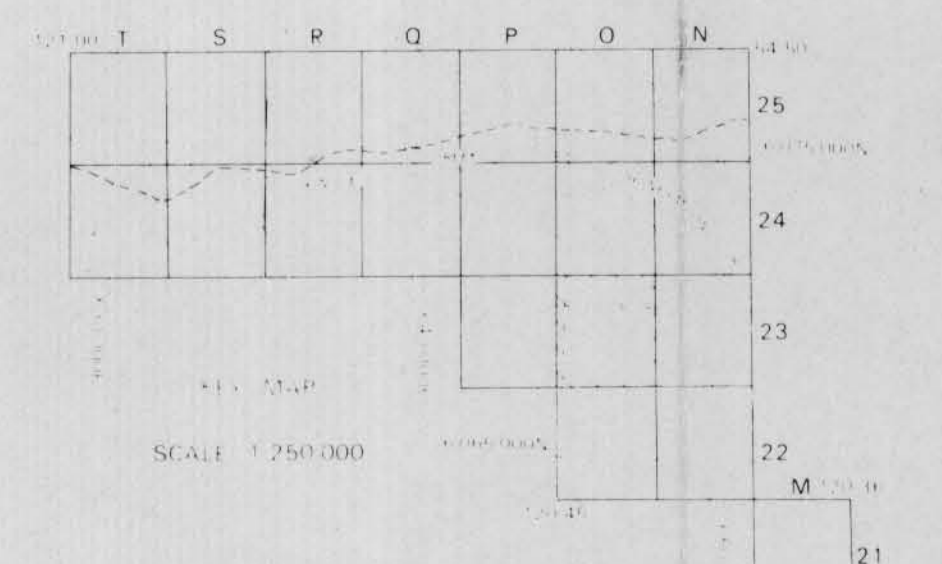
Imagined road
 National boundary
 Electric line
 Telephone line
 Boundary
 Stream
 Intermittent stream
 Snow line
 Contour
 Man-made contour
 Spot elevation
 Bench mark

5 METRES
 100
 200
 300

DATE OF SURVEY APRIL 1977
DATE OF PHOTOGRAPHY SEPTEMBER 1975
DATE OF MAPPING MAY 1977

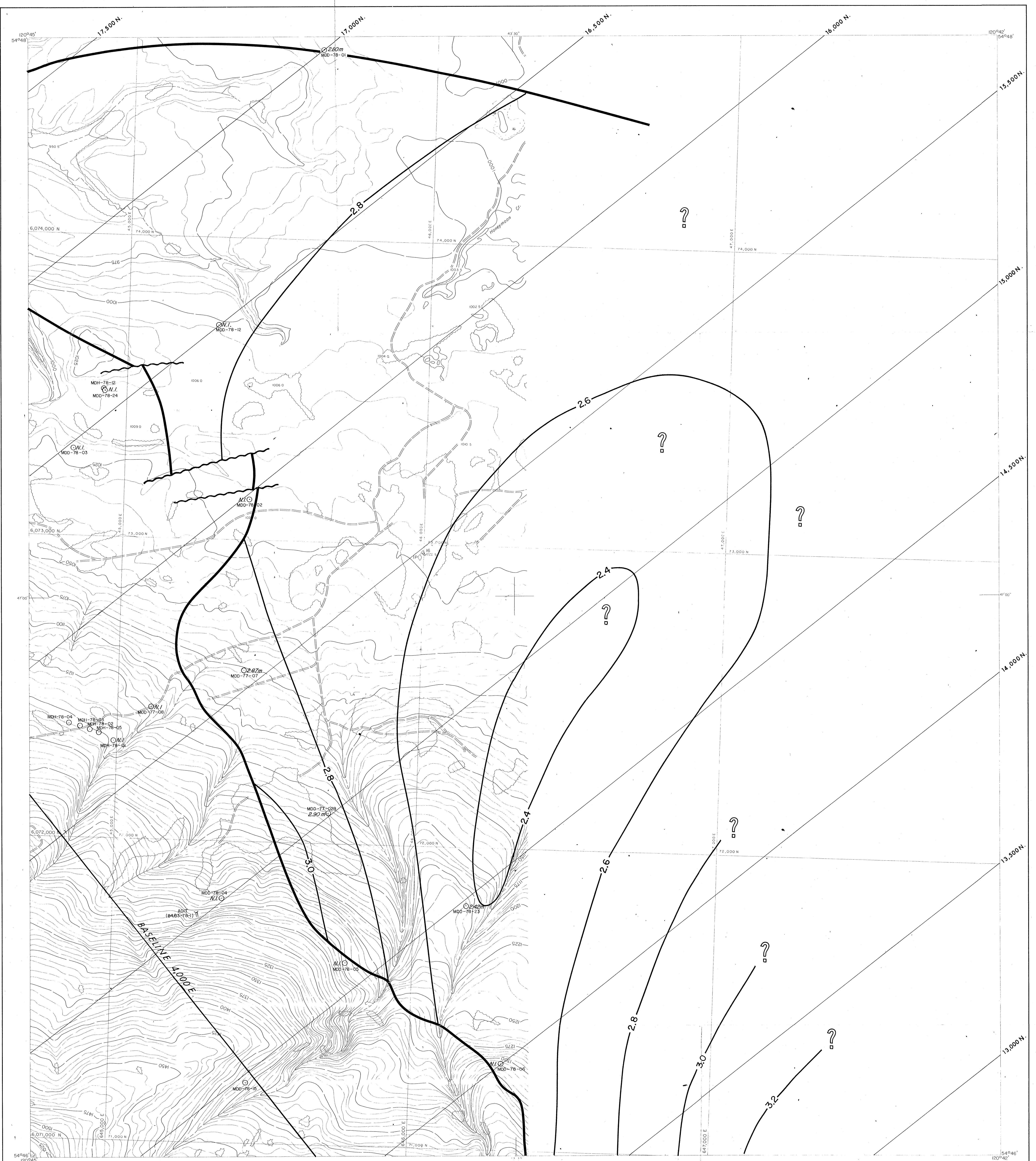
SURVEY NOTE

1. This map was prepared by D. A. Wilson, B.S., a registered surveyor, under the supervision of J. S. Macdonald, M.A., a registered geologist, in accordance with the provisions of the Survey Act, R.S.O. 1970, Chapter S. 1, and the Mining Act, R.S.O. 1970, Chapter M. 2.



12 - DANKOAN BELCOURT TICEA

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP B9 SEAM DUKE MTN.	
Date JAN. 1979 Revised Author P.J.P. Drafted edy Scale 1:5,000 Drawing II.4-5	O 23

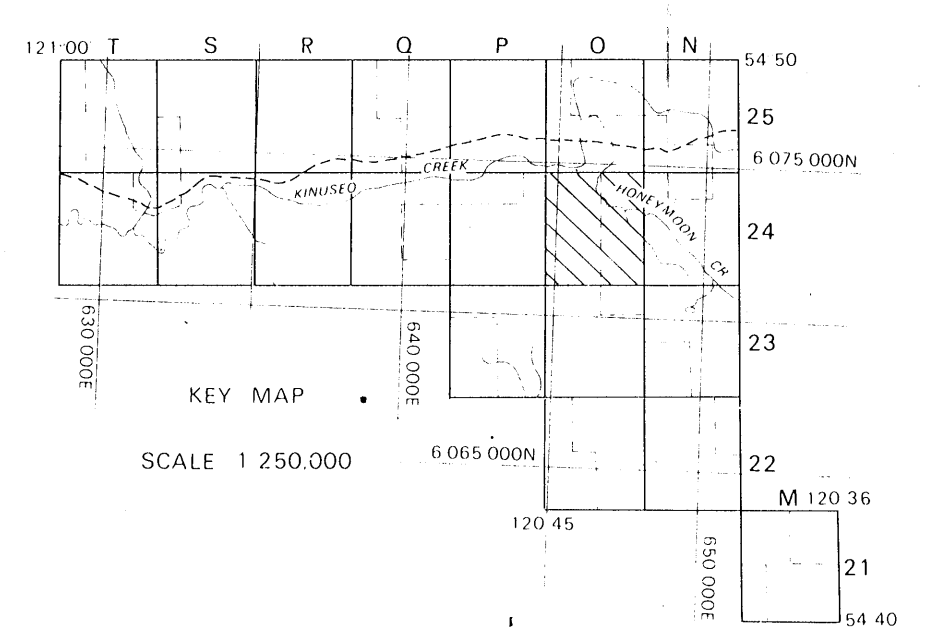


LEGEND

Improved road	
Secondary road	
Track or trail	
Cut line	
Tree area	
River	
Stream	
Intermittent stream	
Swamp	
Contours	
Horizontal control	
Vertical control	
Spot elevation	
Iron Pin	

CONTOUR INTERVAL 5 METRES
 DATE OF PHOTOGRAPHY SEPTEMBER 1975
 DATE OF SURVEY APRIL 1977
 DATE OF MAPPING MAY 1977

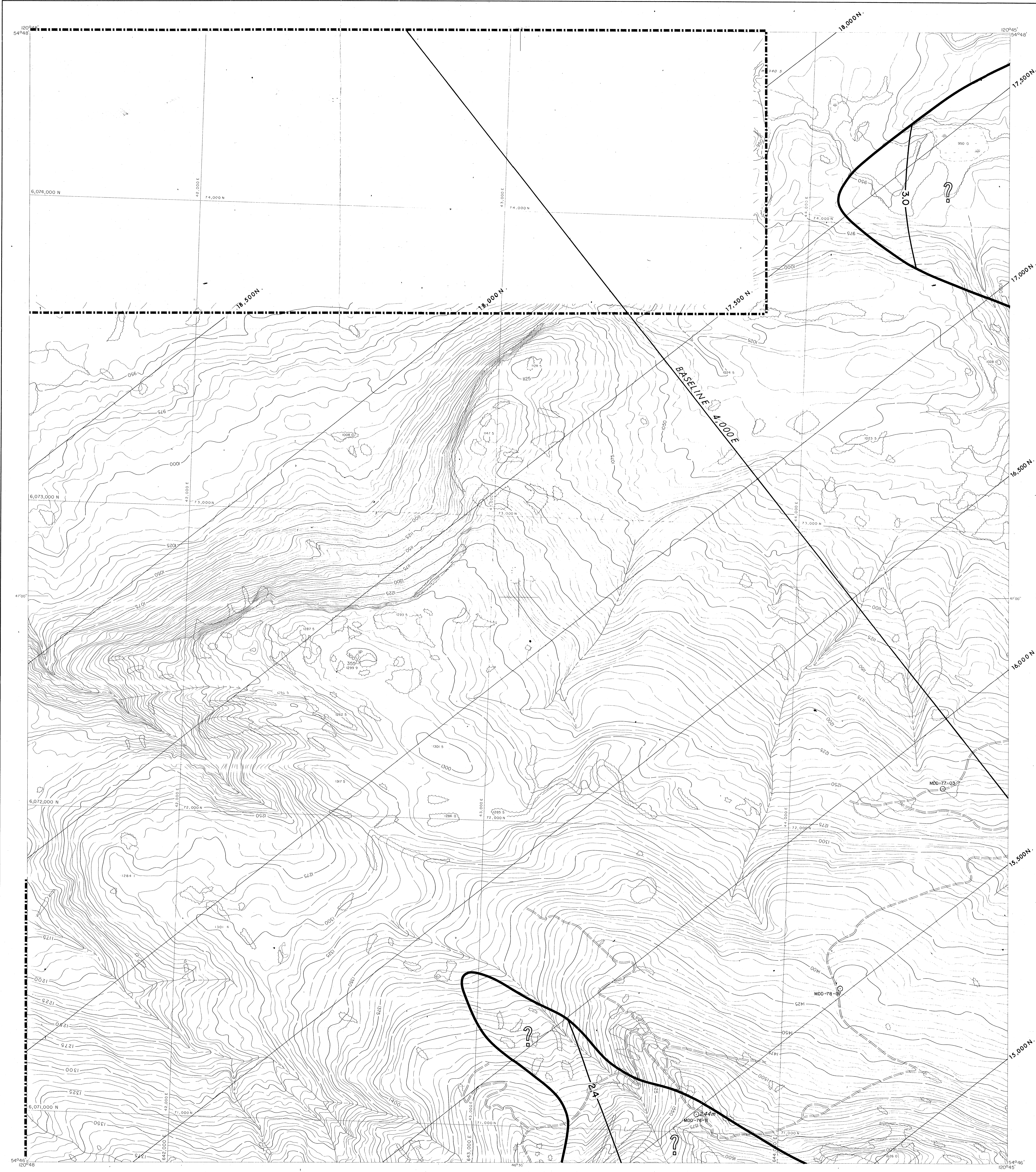
SURVEY NOTE
 The Horizontal and Vertical Co ordinates were established by D. W. Watson, B.C.L.S., using conventional and E.T.M. survey equipment. Horizontal and vertical co ordinates and elevations are derived from Trig Stations Quinlan, E. Quinlan, S.W. Manne, Hawk, Marica, Kinuso. All co ordinates referred to Universal Traverse Meridian Grid Zone 10. Elevations are above Mean Sea level were established by trig levelling vertical angles being read at both ends of each course simultaneously.



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PR - DUNKAN BELCOURT 78(2)A

	PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT		Date JAN. 1979
MINING SECTION ISOPACH MAP B9 SEAM DUKE MTN.		Revised
		Author R.J.P.
		Drafted edy
		Scale 1:5,000
		Drawing II.4-5
		O 24

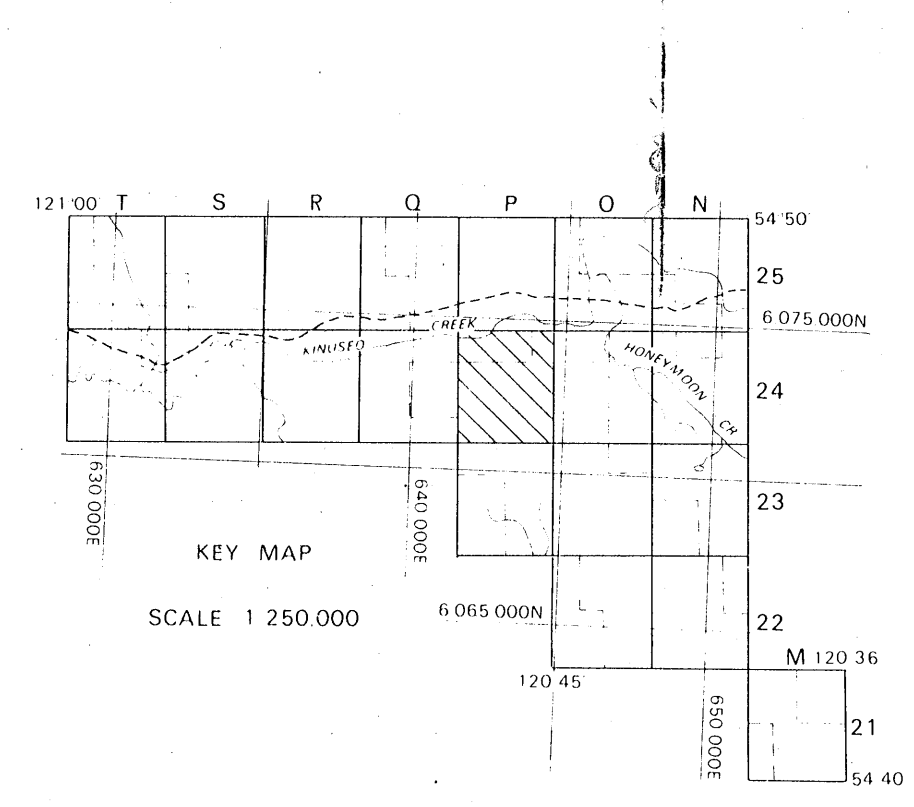


LEGEND

Improved road	
Secondary road	
Track or trail	
Cut line	
Tire area	
River	
Stream	
Intermittent stream	
Swamp	
Contours	
Horizontal control	
Vertical control	
Sight elevation	
Iron Pin	

CONTOUR INTERVAL 5 METRES DATE OF SURVEY APRIL 1977
 DATE OF PHOTOGRAPHY SEPTEMBER 1975 DATE OF MAPPING MAY 1977

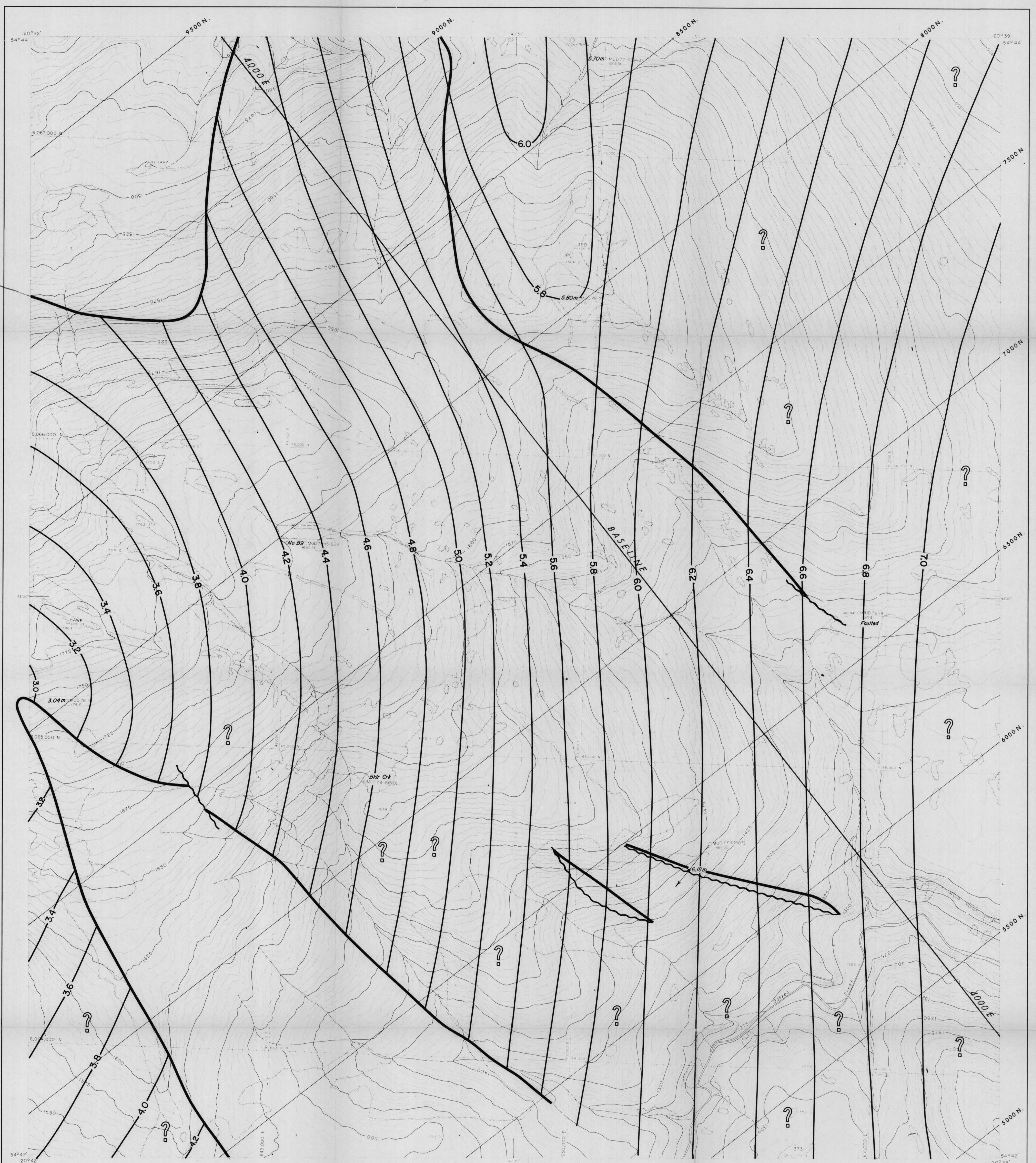
SURVEY NOTE
 The Horizontal and Vertical Coordinates were established by D. W. Watson, B.C.L.S., using conventional and EDM survey methods. Horizontal and vertical coordinates and elevations are derived from Trig Stations: Quintette E, Quintette S.W., Mame, Hana, Marco, Knusso. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevations are above Mean Sea Level were established by trig leveling vertical angles being read at both ends of each course simultaneously.



543

PR. DONK DAN BELARUET 78(2)A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
MINING SECTION ISOPACH MAP B9 SEAM DUKE MTN.	Date JAN. 1979 Revised Author P.J.P. Drafted edy Scale 1:5,000 Drawing II 4-5
P 24	

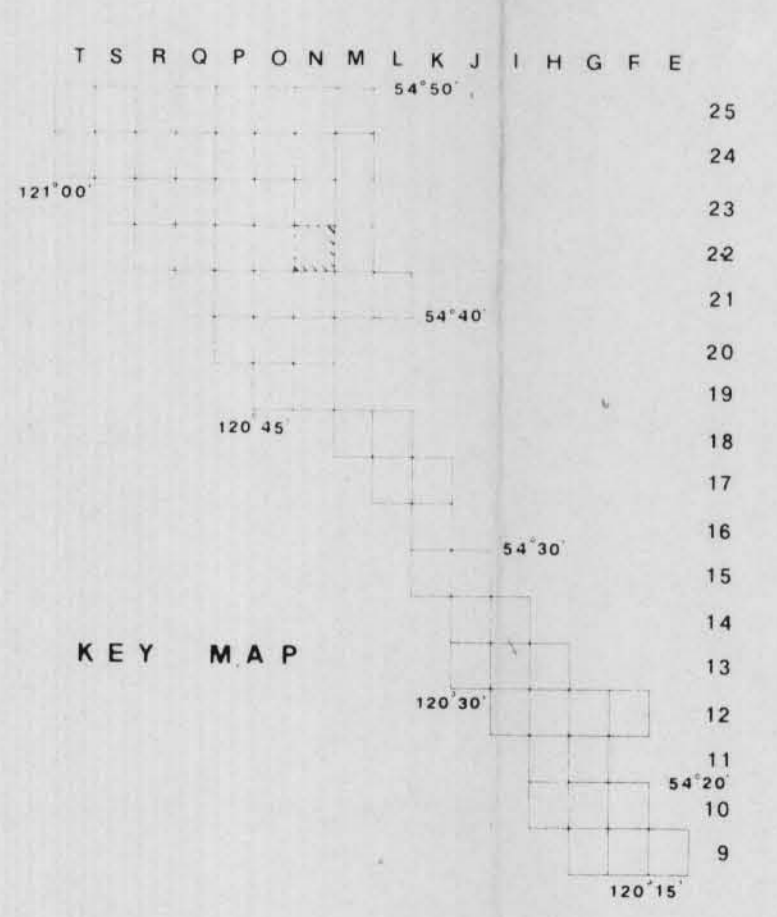


LEGEND

- Improved road
- Secondary road
- Track or trail
- Cut line
- Tree area
- River
- Stream
- Intermittent stream
- Swamp
- Contours
- Horizontal control
- Vertical control
- Spot elevation
- Iron Pin

CONTOUR INTERVAL: 5 METRES
 DATE OF PHOTOGRAPHY: SEPTEMBER 1975
 DATE OF SURVEY: 1977-1978
 DATE OF MAPPING: 1977-1978

SURVEY NOTE
 The horizontal and vertical coordinates were established by B. W. Wilson B.C.L.S. using conventional and EDM surveying equipment. Horizontal and vertical coordinates and elevations are derived from Trig Stations: Quinlan, E. Quinlan, S.W. Main, Hawk, Main, Kluwe. All coordinates referred to Universal Transverse Mercator Grid Zone 10. Elevation are above Mean Sea Level were established by trig leveling, vertical angles being read at both ends of each course simultaneously.



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PR - MONKMAN BELLOUET 71 (2) A.

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date	JAN 1979
Revised	
Author	P.J.P.
Drafted	edy
Scale	1:5,000
Drawing	II-4-5
N 22	



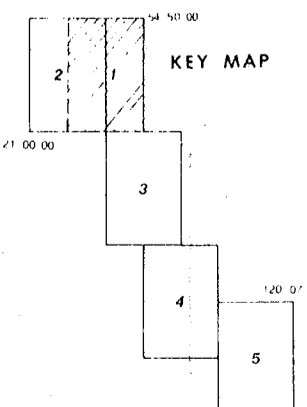
TOPOGRAPHIC LEGEND

- MAIN ACCESS ROAD — DRY WEATHER
- EXPLORATION ROAD
- EXPLORATION TRAIL
- AIR STRIP
- SEISMIC LINE, CUT LINE
- POWER TRANSMISSION LINE
- RIVER
- STREAM
- LAKE
- SWAMP
- CONTOURS
- DEPRESSION CONTOUR

MONKMAN RESERVES (Millions Tonnes)

AREA	PROVEN	INDICATED	INFERRED	TOTAL
DUKE PIT AREA	97.35			97.35
SOUTH DUKE		48.61		48.61
FEARLESS		195.00		195.00
QUINETTE			260.67	260.67
DUKE SYNCLINE			114.25	114.25
NORTH BOOMERANG			95.85	95.85
SOUTH BOOMERANG			126.34	126.34
EAST BOOMERANG			186.72	186.72
TOTAL	97.53	243.61	783.73	1124.87

Note: Total In place Reserves calculated to 500m cover.
Reserve Areas shown on map are diagrammatic only.



SURVEY NOTE

Control Survey was carried out for Photogrammetric Mapping to cover MONKMAN COAL PROJECT COAL LEASES. Mapping outside of the Coal Leases was taken from existing N.T.S. maps, and 25 metre contour intervals were interpolated.

CONTOUR INTERVAL 25m

R.M. HARDY & ASSOCIATES LTD.

1978

LEGEND

- PROVEN
- INDICATED
- INFERRED

543

RE- MONKMAN RESERVE 78(2)A

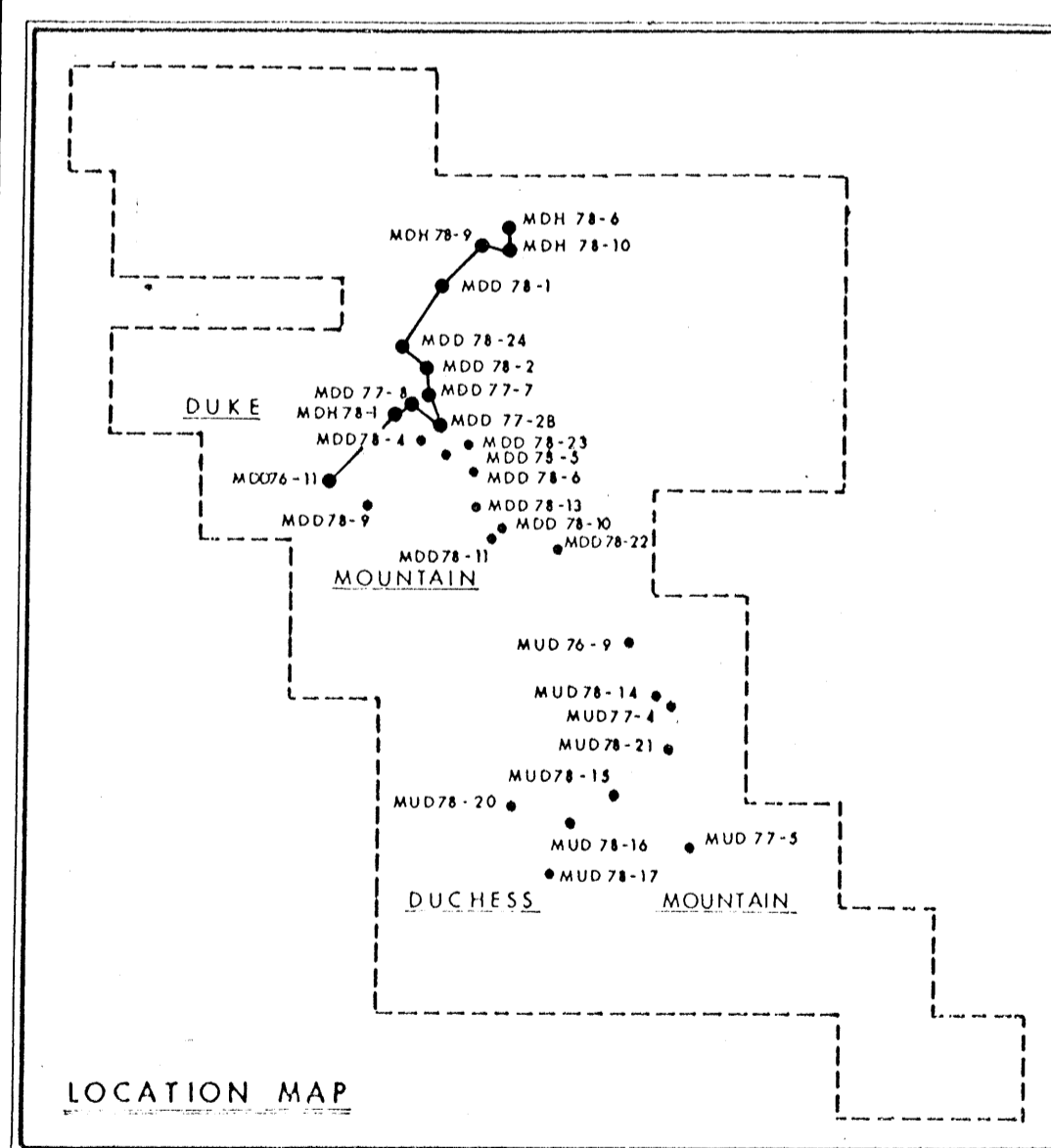
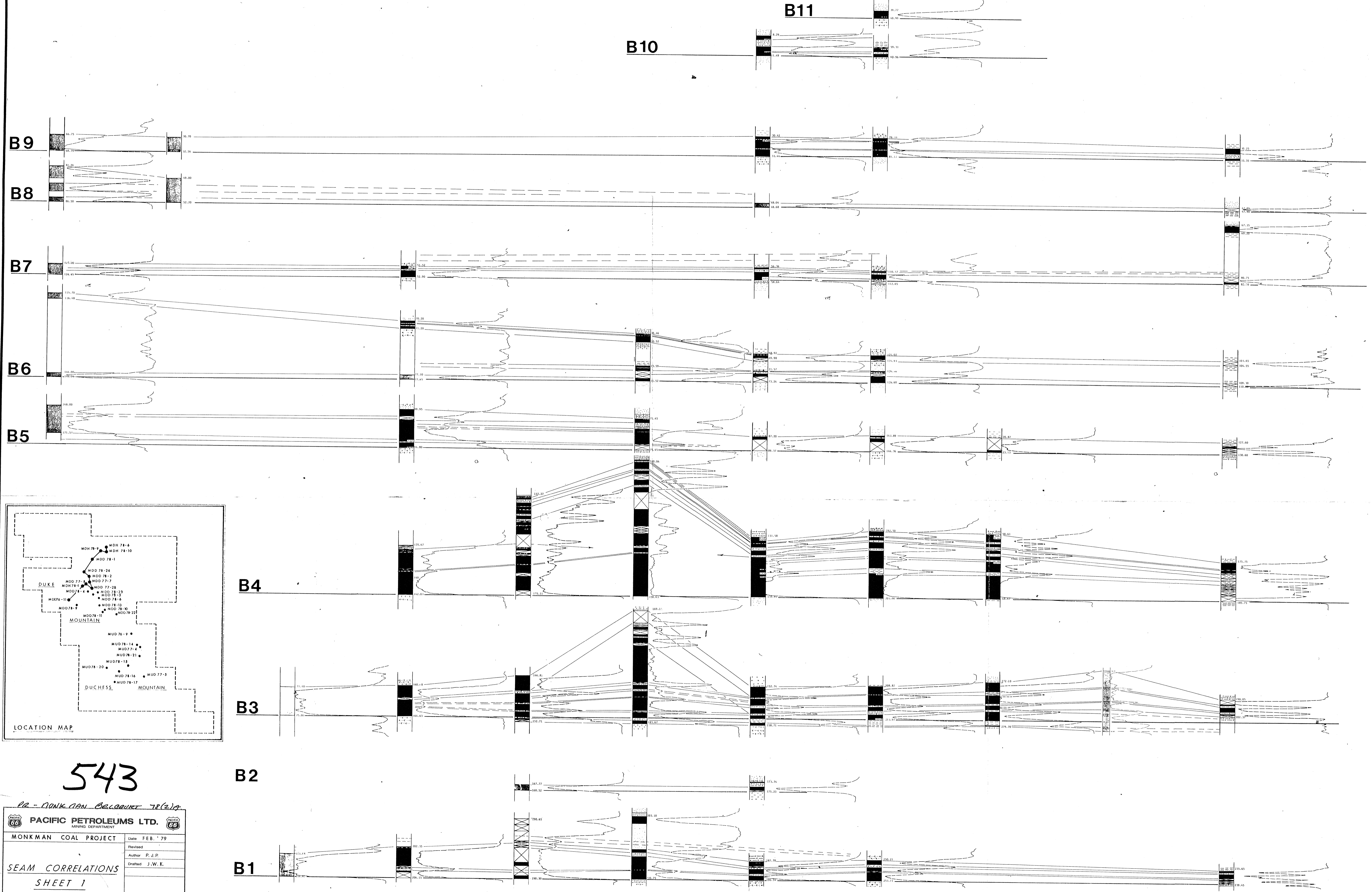
PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT

DUKE MOUNTAIN BLOCK RESERVE CATEGORY MAP

Date March 1979
Revised
Author A.E.B., G.J.
Drafted edy
Scale 1:25,000
Drawing II.4-7

MDH 78-6 MDH 78-10 MDH 78-9 MDD 78-1 MDD 78-24 MDD 78-2 MDD 77-7 MDD 77-2B MDD 77-8 MDH 78-1 MDD 76-11



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PR - BANK ON BELLEVUE 78(2)7

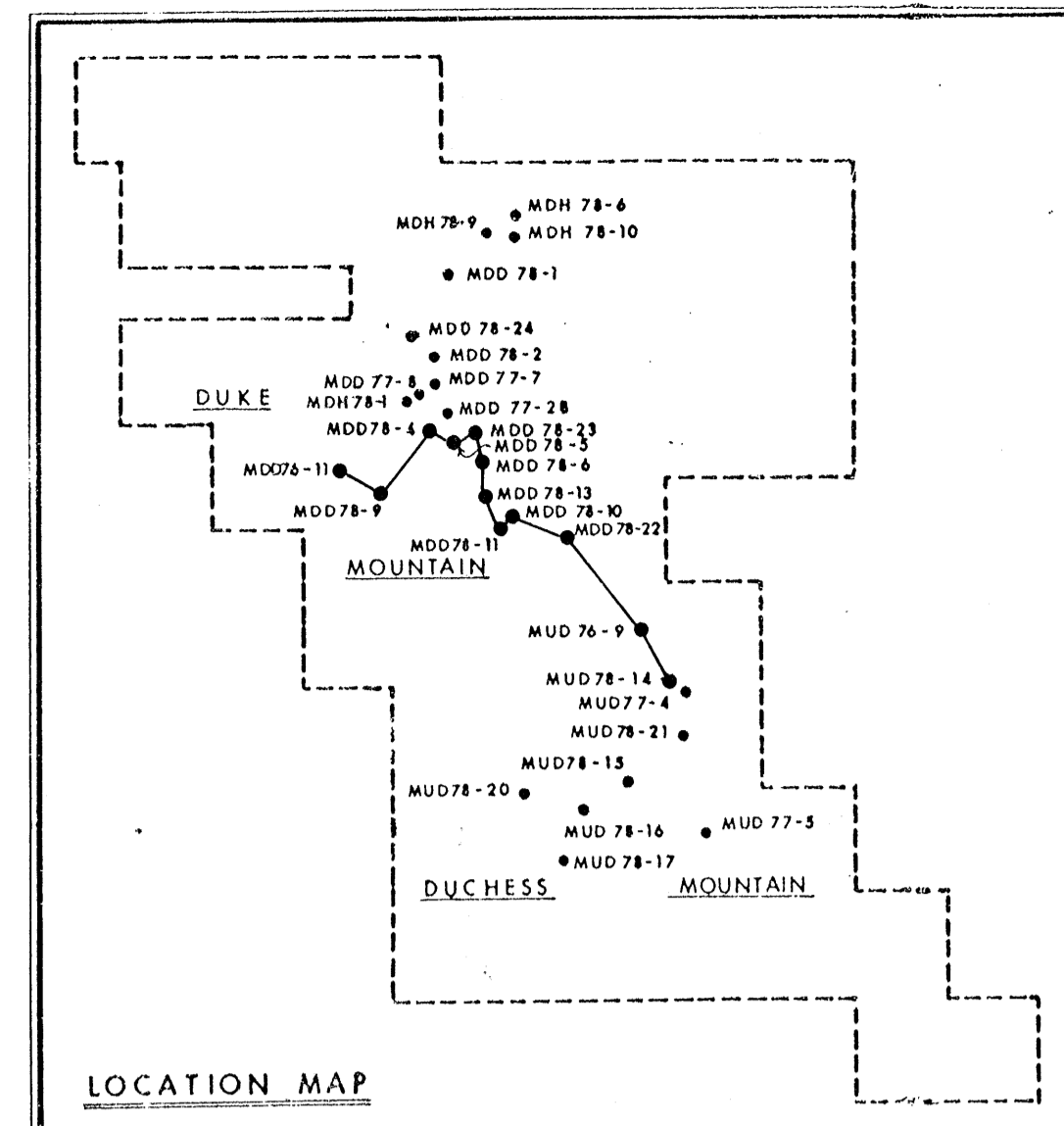
PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

MONKMAN COAL PROJECT Date FEB. '79

Revised
Author P.J.P.
Drafted J.W.K.

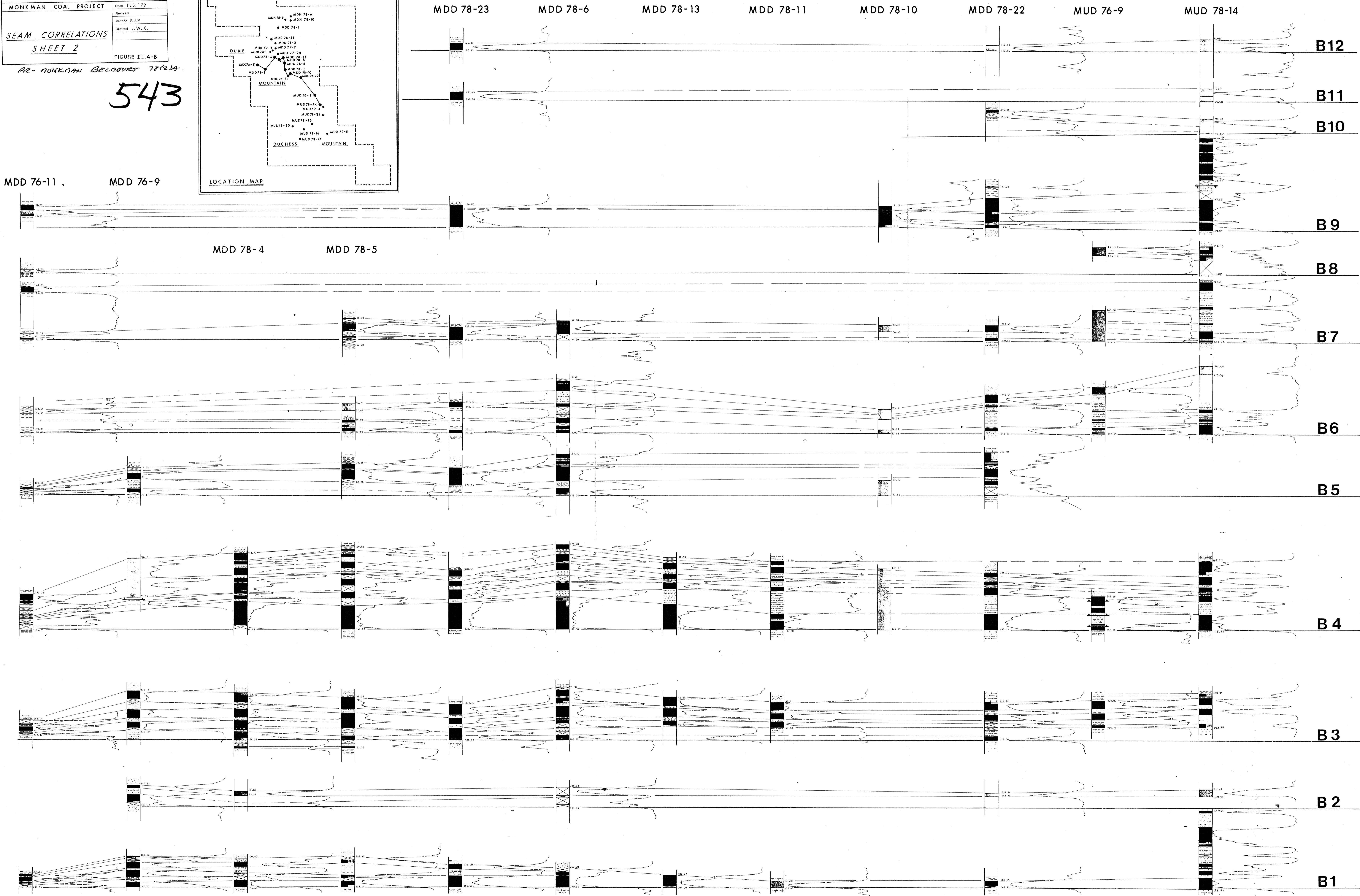
SEAM CORRELATIONS
SHEET 1

FIGURE II, 4-8



543

MDD 76-11, MDD 76-9



MDD 78-22

MUD 76-9

MUD 78-14

MUD 77-4

MUD 78-21

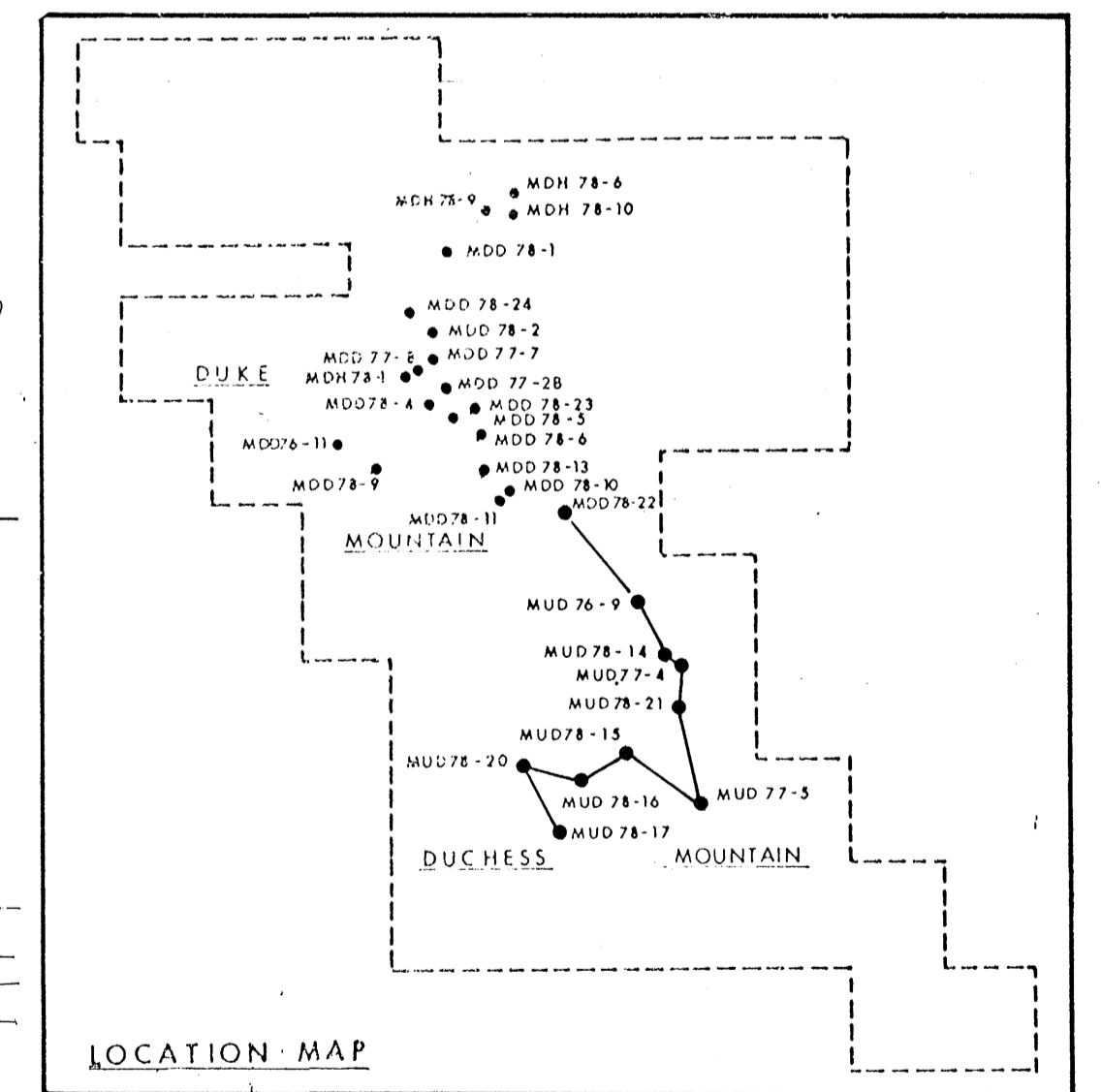
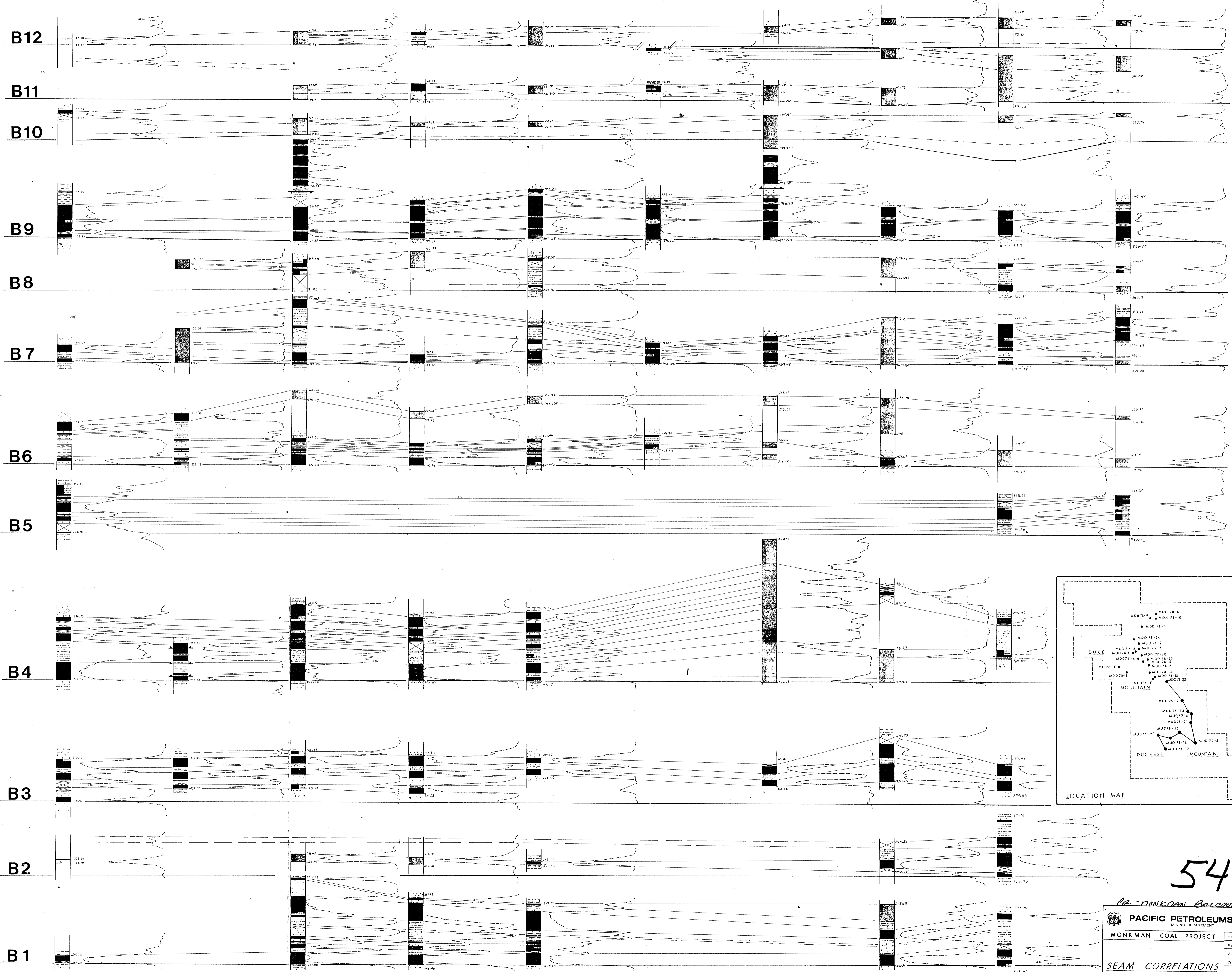
MUD 77-5

MUD 78-15

MUD 78-16

MUD 78-20

MUD 78-17




543

12 - DANKAN BALCOUER 78/219

PACIFIC PETROLEUMS LTD.	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
Date FEB. '79	Revised
Author P.J.P.	Drafted J.W.K.
SEAM CORRELATIONS	
SHEET 3	



PR-MONKMAN-BELCOUET 78(3)A
BORE HOLE DATA 1978



MONKMAN COAL PROJECT
1978 EXPLORATION REPORT
APPENDIX C - BOOK 1
GEOLOGICAL LOGS
PACIFIC PETROLEUMS LTD.

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PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Hammer Drill Log

OPEN FILE

HOLE NO: MDH 78-01

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, b-40-B
- (c) Drill Hole Co-ordinates: N 15638.98 - E 4334.60
- (d) Elevation: 1447.79m

AZIMUTH & INCLINATION: vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Site reclaimed, casing left open.

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B3 - B4
TOTAL DEPTH: 48.9m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, F.B.L., G.R.N., Dev

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

00 543

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-02

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, c-40-B
- (c) Drill Hole Co-ordinates: N 15714.10 - E 4291.82
- (d) Elevation: 1151.26m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₃
TOTAL DEPTH: 30.5m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, G.R.N.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-03

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, c-40-B
- (c) Drill Hole Co-ordinates: N 15746.18 - E 4277.68
- (d) Elevation: 1151.27m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₃
TOTAL DEPTH: 24.8m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, GRN

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-04

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, c-40-B
- (c) Drill Hole Co-ordinates: N 15775.89 - E 4256.58
- (d) Elevation: 1150.28m

AZIMUTH & INCLINATION: Vertical

CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates

COAL SEAMS INTERSECTED: B₃ at outcrop

TOTAL DEPTH: 12.2m

DATE DRILLED: July, 1978

DRILLED BY: Interior Water Wells Ltd.

LOGGED BY: N/A

GEOPHYSICAL LOGS: None

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer: Drill Log

HOLE NO: MDH 78-05

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, c-40-B
- (c) Drill Hole Co-ordinates: N 15689.78 - E 4310.50
- (d) Elevation: 1149.23m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B3
TOTAL DEPTH: 36.6m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, GRN

P A C I F I C P E T R O L E U M S L T D.

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-06

LOCATION:

- (a) Coal Licence: 3232
- (b) N.T.S. 93-I-15, d-68-B
- (c) Drill Hole Co-ordinates: N 17060.13 - E 7767.89
- (d) Elevation: 995.96m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B5, B7, B9
TOTAL DEPTH: 182.8m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, FBL, GRN, Dev

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-07

LOCATION:

- (a) Coal Licence: 3233
- (b) N.T.S. 93-I-15, c-80-B
- (c) Drill Hole Co-ordinates: N 17898.85 - E 6812.82
- (d) Elevation: 993.49m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gething
COAL SEAMS INTERSECTED:
TOTAL DEPTH: 183.0m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, FBL, GRN,

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-08

LOCATION:

- (a) Coal Licence: 3233
- (b) N.T.S. 93-I-15, 1-69-B
- (c) Drill Hole Co-ordinates: N 16954.01 - E 6827.19
- (d) Elevation: 996.28m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Overburden only
COAL SEAMS INTERSECTED: None
TOTAL DEPTH: No information

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: None

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-09

LOCATION:

- (a) Coal Licence: 3232
- (b) N.T.S. 93-I-15, c-68-B
- (c) Drill Hole Co-ordinates: N 17128.27 - E 7239.38
- (d) Elevation: 998.98m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₁, B₃
TOTAL DEPTH: 182.9m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, GRN

P A C I F I C P E T R O L E U M S L T D.

MONKMAN COAL PROJECT

HammerDrill Log

HOLE NO: MDH 78-10

LOCATION:

- (a) Coal Licence: 3232
- (b) N.T.S. 93-I-15, d-68-B
- (c) Drill Hole Co-ordinates: N 16776.92 - E 7552.08
- (d) Elevation: 997.40m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: Bg & Bg
TOTAL DEPTH: 79.2m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens (Missing), GRN

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer: Drill Log

HOLE NO: MDH 78-11

LOCATION:

- (a) Coal Licence: 3232
- (b) N.T.S. 94-I-15, b-67-B
- (c) Drill Hole Co-ordinates: N 16046.10 - E 7858.29
- (d) Elevation 1016.06m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gething
COAL SEAMS INTERSECTED: -
TOTAL DEPTH: 184.0m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, GRN

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer : Drill Log

HOLE NO: MDH 78-12

LOCATION:

- (a) Coal Licence: 3227
- (b) N.T.S. 93-I-15, c-50-B
- (c) Drill Hole Co-ordinates: N 16573.15 - E 5039.95
- (d) Elevation 1009.84m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: all overburden
COAL SEAMS INTERSECTED: None
TOTAL DEPTH: No information

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: None

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer . Drill Log

HOLE NO: MDH 78-13

LOCATION:

- (a) Coal Licence:3225
- (b) N.T.S. 93-I-15, c-9-B
- (c) Drill Hole Co-ordinates: N 13484.19 - E 3364.91
- (d) Elevation 1609.27m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₁, B₂, B₃, B₄
TOTAL DEPTH: 177.2m

DATE DRILLED: July, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, GRN

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-14

LOCATION:

- (a) Coal Licence: 3225
- (b) N.T.S. 92-I-15, a-20-B
- (c) Drill Hole Co-ordinates: N 13821.04 - E 3457.63
- (d) Elevation: 1508.26m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gething
COAL SEAMS INTERSECTED:
TOTAL DEPTH: 184.4m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, GRN

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-15

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, a-30-B
- (c) Drill Hole Co-ordinates: N 14475.81 - E 3970.40
- (d) Elevation 1372.82m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gething
COAL SEAMS INTERSECTED:
TOTAL DEPTH: 183.0m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, FBL, GRN

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MUH 78-15

LOCATION:

- (a) Coal Licence: 3199
- (b) N.T.S. 93-I-10, c-74-J
- (c) Drill Hole Co-ordinates: N 8697.27 - E 4905.44
- (d) Elevation 1512.88m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: Bg
TOTAL DEPTH: 103.6m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, FBL, GRN

P A C I F I C P E T R O L E U M S L T D.

MONKMAN COAL PROJECT

Hammer, Drill Log

HOLE NO: MUH 78-16

LOCATION:

- (a) Coal Licence: 3199
- (b) N.T.S. 93-I-10, c-74-J
- (c) Drill Hole Co-ordinates: N 8785.19 - E 4868.94
- (d) Elevation 1518.95m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₉
TOTAL DEPTH: 94.5m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A.

GEOPHYSICAL LOGS: Cal/Dens

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MUH 78-17

LOCATION:

- (a) Coal Licence: 3944
- (b) N.T.S. 93-I-10, b-84-J
- (c) Drill Hole Co-ordinates: N 8954.34 - E 4905.75
- (d) Elevation 1490.10m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₉
TOTAL DEPTH: 63.4m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MUH 78-18

LOCATION:

- (a) Coal Licence: 3203
- (b) N.T.S. 92-I-10, a-85-J
- (c) Drill Hole Co-ordinates: N 9010.52 - E 4872.73
- (d) Elevation 1476.17m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₉
TOTAL DEPTH: 39.6m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, GRN

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MUH 78-19

LOCATION:

- (a) Coal Licence: 3203
- (b) N.T.S. 92-I-10, a-85-J
- (c) Drill Hole Co-ordinates: not surveyed
- (d) Elevation 1445m± (not surveyed)

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₉
TOTAL DEPTH: 15.2m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MUH 78-20

LOCATION:

- (a) Coal Licence: 3203
- (b) N.T.S. 92-I-10, a-85-J
- (c) Drill Hole Co-ordinates: N 8927.48 - E 4834.42
- (d) Elevation 1522.02m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored -

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: B₉ Upper, B₉ Lower, B₁₀, B₁₁
TOTAL DEPTH: 79.2m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, FBL

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Hammer Drill Log

HOLE NO: MDH 78-21

LOCATION:

- (a) Coal Licence: 3227
- (b) N.T.S. 93-I-15, c-50-B
- (c) Drill Hole Co-ordinates:
- (d) Elevation: 1012.45m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gates
COAL SEAMS INTERSECTED: pre-collar for MDD 78-24
TOTAL DEPTH: 63.3m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal, Dev

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Hammer- . Drill Log

HOLE NO: MDH 78-22

LOCATION:

- (a) Coal Licence: 3246
- (b) N.T.S. 93-I-15, c-74-C
- (c) Drill Hole Co-ordinates: -
- (d) Elevation: 976.01m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: 152mm casing, not cored

ABANDONMENT PROCEDURE: Casing left in hole

FORMATION TESTED: Gething
COAL SEAMS INTERSECTED: -
TOTAL DEPTH: 112.8m

DATE DRILLED: August, 1978
DRILLED BY: Interior Water Wells Ltd.
LOGGED BY: N/A

GEOPHYSICAL LOGS: Cal/Dens, FBL, GRN

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-01

LOCATION:

- (a) Coal Licence: 3227
- (b) N.T.S. 93-I-15, c-59-B
- (c) Drill Hole Co-ordinates: N 17001.94 - E 6302.64
- (d) Elevation: 991.96m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 - B7
TOTAL DEPTH: 267.0m

DATE DRILLED: June 12 - 17, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Cal/Dens, GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 35.05	35.05	OVERBURDEN
<u>GATES MEMBER - COMMOTION FORMATION</u>		
35.05 - 37.70	2.65	Sandstone: fine to medium grained, medium grey, flow features, minor slickensides. BCA = 50°.
37.70 - 39.05	1.35	Sandstone: fine grained, medium to dark grey, carbonaceous specks and stringers. BCA = 45° - 50°.
39.05 - 40.15	1.10	Sandstone: fine to medium grained, medium grey, occasional carbonaceous specks and stringers, minor slickensides. BCA = 47°.
40.15 - 42.37	2.22	Sandstone: medium grained, occasional carbonaceous stringer, laminated. BCA = 32°.
42.37 - 43.44	1.07	Sandstone: medium grained, light to medium grey, minor laminations, occasional carbonaceous speck. BCA = 45°.
43.44 - 45.31	1.87	Sandstone: medium grained, light grey, occasional carbonaceous stringer, minor slickensides, occasional pebble.
45.31 - 47.19	1.88	Sandstone: coarse grained, some pebble bands with rounded pebbles up to 1 cm in diameter, vitreous coal stringers up to 3-4 mm in width. BCA = 52°.
47.19 - 47.57	0.38	Sandstone: medium grained, fractures filled with coal, minute stringers of coal up to 2 mm in width.
47.57 - 48.67	1.10	Sandstone: coarse grained, conglomerate or pebble bands, pebbles rounded and up to 1 cm in diameter, coal specks and bands up to 1 cm in width.
48.67 - 48.94	0.27	Siltstone: dark grey to black, minute coaly stringers, pyrite disseminations, core intact.

MDD 78-1 (cont'd.)

48.94 - 49.44	0.50	Sandstone: fine to medium grained, dark grey, some vitreous coal bands and stringers up to 1 cm in width. BCA = 55°.
49.44 - 49.97	0.53	Siltstone: carbonaceous, coaly stringers, minor slickensides, pyrite disseminations.
49.97 - 50.45	0.48	Siltstone: carbonaceous, vitreous coal stringers up to 1 cm in width.
50.45 - 50.90	0.45	Coal: carbonaceous siltstone, dirty coal, crushed and ground, (recovered 12 cm out of 45 cm).
50.90 - 51.80	0.90	Siltstone: very carbonaceous, plant fossils, vitreous coal stringers common, slickensides, pyrite disseminations, last 40 cm broken and crushed.
51.80 - 51.89	0.09	COAL SEAM B7
51.80 - 51.89	0.09	Coal: dirty, minor slickensides, pyrite disseminations; coal intermediate lustre with 20% vitreous bands.
51.89 - 52.09	0.20	Coal: clean, intermediate lustre with 30% vitreous bands, core intact. Recovery 100%.
52.09 - 52.29	0.20	Siltstone: carbonaceous, plant fossils abundant, small coaly stringers.
52.29 - 52.41	0.12	Coal: dull with up to 30% vitreous bands, clean, core intact, last 4 cm dirty coal band.
52.41 - 52.61	0.20	Coal: clean, vitreous, pyrite disseminations, recovery 100%.
52.61 - 52.82	0.21	Coal: clean, pyrite disseminations, intermediate lustre, core crushed and broken.
52.82 - 52.99	0.17	Coal: clean, vitreous, core intact, recovery 100%.
52.99 - 53.18	0.19	Coal: clean, intermediate lustre with 30% vitreous bands, core crushed and broken.

MDD 78-1 (cont'd.)

	Samples	Interval	Width	Dry Ash	F.S.I.
	0167	51.80 - 52.09	0.29	39.91	4
	0168	52.09 - 52.41	0.32		
	0169	52.41 - 53.18	0.79		
53.18 - 53.95		0.77			
				Siltstone: carbonaceous, vitreous coal stringers, plant fossils, BCA = 70°.	
53.95 - 57.00		3.05			
				Siltstone: dark grey to black, plant fossils, occasional carbonaceous stringer, minute fractures, flow features, brown mud bands.	
57.00 - 60.05		3.05			
				Siltstone: uniform, brown mud bands, rare plant fossil, minor slickensides.	
60.05 - 61.84		1.79			
				Siltstone: black, brown mud bands and pebbles (rip up clasts) common, rare plant fossil, minute fractures common.	
61.84 - 66.14		4.30			
				Siltstone: dark grey, interbedded with sandstone, flow features, carbonaceous specks and stringers. Worm burrows at 63.76 cm. BCA = 72°.	
66.14 - 68.62		2.48			
				Siltstone: with brown mud blebs and bands, flow features, minute fractures.	
68.62 - 70.04		1.42			
				Siltstone: dark grey to black, minute fractures, uniform, core intact. BCA = 62°.	
				COAL SEAM B6 (upper)	
70.04 - 70.32		0.28			
				Coal: fairly clean, crushed and broken, minor slickensides, 70% intermediate lustre with 30% vitreous bands.	
70.32 - 70.40		0.08			
				Siltstone: carbonaceous, coaly.	
70.40 - 70.55		0.15			
				Coal: fairly clean, 50% intermediate lustre, 30% dull coal, 20% vitreous.	
70.55 - 70.68		0.13			
				Siltstone: carbonaceous, plant fossils, some vitreous coal stringers 1 - 2 mm in width.	
70.68 - 71.21		0.53			
				Coal: fairly clean, dull coal with 30% vitreous bands, broken and crushed, (recovered 34 cm).	

MDD 78-1 (cont'd.)

	Samples	Interval	Width	Dry Ash	F.S.I.
	0170	70.04 - 70.32	0.28		
	0171	70.32 - 70.68	0.36	48.86	2
	0172	70.68 - 71.21	0.53		
71.21 - 71.63		0.42	Siltstone: carbonaceous, plant fossils, core broken.		
71.63 - 73.71		2.08	Siltstone: carbonaceous, plant fossils abundant, flow features, minute fractures filled with calcite, occasional coaly stringer. BCA = 52°.		
73.71 - 73.87		0.16	Sandstone: very fine grained, flow features, minute fractures.		
73.87 - 74.11		0.24	Siltstone: carbonaceous, core broken and crushed.		
74.11 - 75.85		1.74	Siltstone: plant fossils abundant, some carbonaceous blebs and stringers. BCA = 62°.		
75.85 - 76.12		0.27	Coal: dirty, vitreous bands up to 0.5 cm in width.		
76.12 - 76.93		0.81	Siltstone: carbonaceous, plant fossils abundant, minute vitreous stringers.		
			COAL SEAM B6 (lower)		
76.93 - 77.20		0.27	Coal: clean, intermediate lustre, 40% vitreous, coal crushed and ground.		
77.20 - 77.40		0.20	Siltstone parting: carbonaceous, coaly stringers and bands up to 1 cm in width.		
77.40 - 77.72		0.32	Coal: clean, 50% - 60% intermediate lustre, 30 - 50% vitreous, 10% dull, fibrous peaty coal, core crushed and ground.		
	Samples	Interval	Width	Dry Ash	F.S.I.
	0173	76.93 - 77.20	0.27		
	0174	77.20 - 77.40	0.20	43.40	4
	0175	77.40 - 77.72	0.32		
77.72 - 78.04		0.32	Siltstone: carbonaceous and coaly stringers, plant fossils.		

MDD 78-1 (cont'd.)

78.04 - 80.77	2.73	Sandstone: very fine grained, interbedded with 40% siltstone, carbonaceous blebs and stringers, occasional minute coal stringer, flow features. BCA = 67°.
80.77 - 82.79	2.02	Sandstone: fine grained, medium grey, minor flow features.
82.79 - 83.14	0.35	Siltstone: plant fossils, uniform.
83.14 - 83.52	0.38	Siltstone: carbonaceous, plant fossils, numerous coal stringers of 1 - 2 mm widths, minor slickensides; core broken.
83.52 - 83.82	0.30	Sandstone: fine grained, dark grey, carbonaceous stringers and partings, pyrite blebs and disseminations, flow features.
83.82 - 86.11	2.29	Sandstone: fine grained, medium grey, occasional plant fossil, minor flow features. BCA = 57°.
86.11 - 90.22	4.11	Sandstone: fine grained, medium grey, plant fossils, minute fractures filled with carbonaceous material, core intact. BCA = 62°.
90.22 - 90.52	0.30	Siltstone: carbonaceous, numerous vitreous stringers; core broken and crushed.
		COAL SEAM B5
90.52 - 90.82	0.30	Coal: fairly clean, hard, intermediate lustre, some slickensides, minor amounts of dirty coal (less than 10%), coal broken and crushed.
90.82 - 92.66	1.84	Coal: intermediate lustre, steely grey, hard, core ground and crushed, (recovered 147 cm).
92.66 - 93.28	0.62	Coal: intermediate lustre, vitreous bands up to 1 cm in width, minor slickensides, hard; core intact.
93.28 - 93.68	0.40	Coal: intermediate lustre, vitreous bands common; core intact.
93.68 - 93.99	0.31	Coal: silvery-steely grey, hard, core broken and crushed (recovered 20 cm).

MDD 78-1 (cont'd.)

93.99 - 94.55	0.56	Coal: clean, intermediate lustre, 30% vitreous bands, 10% dull peaty coal, core intact, carbonaceous mudstone band from 94.42 - 94.55.			
94.55 - 94.63	0.08	Coal: clean, intermediate lustre, 30% vitreous bands.			
94.63 - 94.67	0.04	Coal: clean, hard, intermediate lustre with 20% vitreous bands.			
94.67 - 94.71	0.04	Coal: vitreous, core broken and crushed.			
94.71 - 95.11	0.40	Coal: bone coal, hard, dull soft peaty coal 10%, 10% bright vitreous bands, plant fossils, minor slickensides.			
95.11 - 95.21	0.10	Coal: dirty, broken.			
		Samples	Interval	Width	Dry Ash F.S.I
		0187	90.52 - 92.66	2.14	46.55 2
		0188	92.66 - 93.68	1.02	10.82 4½
		0189	93.68 - 94.55	0.87	55.33 1
		0190	94.55 - 95.21	0.66	63.79 1
95.21 - 95.31	0.10	Siltstone: carbonaceous, coaly stringers up to 0.5 cm in width, plant fossils.			
95.31 - 95.71	0.40	Siltstone: dark grey, plant fossils, some slickensides, minute fractures filled with carbonaceous material.			
95.71 - 95.91	0.20	Mudstone: carbonaceous, core broken and crushed.			
95.91 - 97.29	1.38	Siltstone: medium grey, uniform, core solid. BCA = 67°.			
97.29 - 98.76	1.47	Siltstone: medium grey, rare carbonaceous parting, occasional brown mud band, uniform, core intact.			
98.76 - 101.80	3.04	Siltstone: medium grey, occasional vitreous stringer, uniform, core intact.			
101.80 - 102.30	0.50	Siltstone: vitreous blebs and stringers, uniform, BCA = 62°.			
102.30 - 105.16	2.86	Siltstone: medium grey, uniform, carbonaceous specks and stringers, plant fossils.			

MDD 78-1 (cont'd.)

105.16 - 108.20	3.04	Sandstone: very fine grained with 30% interbedded siltstone, carbonaceous specks and stringers, minor flow features.										
108.20 - 109.62	1.42	Siltstone: interbedded with sandstone, carbonaceous specks and stringers, minor flow features.										
109.62 - 111.25	1.63	Sandstone: very fine grained, some siltstone interbedded carbonaceous specks and stringers, flow features, rip up clasts, BCA = 67°.										
111.25 - 114.30	3.05	Sandstone: very fine grained, with siltstone interbeds, carbonaceous specks and stringers, flow features, rip up clasts.										
114.30 - 114.98	0.68	Sandstone: fine to medium grained, light to medium grey, carbonaceous specks and stringers, plant fossils. BCA = 58°.										
114.98 - 117.00	2.02	Sandstone: very fine grained, with siltstone interbeds, medium grey, minor flow features, uniform, core intact.										
117.00 - 117.65	0.65	Siltstone: dark grey, slickensides, uniform.										
117.65 - 118.25	0.60	Siltstone: carbonaceous, plant fossils abundant, minute coal filled fractures common, slickensides.										
118.25 - 121.42	3.17	Siltstone/mudstone: carbonaceous, vitreous, coal bands up to 2 cm in width, minute coal filled fractures, plant fossils abundant, minor slickensides.										
121.42 - 122.23	0.81	Coal: crushed and ground, bright coal with 10% carbonaceous siltstone. Recovery 40% (recovered 34 cm).										
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0191</td> <td>121.42 - 122.23</td> <td>0.81</td> <td>68.87</td> <td>½</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0191	121.42 - 122.23	0.81	68.87	½
Sample	Interval	Width	Dry Ash	F.S.I.								
0191	121.42 - 122.23	0.81	68.87	½								
122.23 - 123.95	1.72	Siltstone: carbonaceous, plant fossils abundant, vitreous stringers and blebs common, minute coal filled fractures. BCA = 58°.										
123.95 - 126.17	2.22	Siltstone: plant fossils, carbonaceous specks and stringers, flow features, some slickensides. BCA = 62°.										

MDD 78-1 (cont'd.)

126.17 - 128.15	1.98	Sandstone: very fine grained, carbonaceous specks and stringers, occasional plant fossil, minor flow features. BCA = 60°.
128.15 - 130.38	2.23	Sandstone: very fine grained, medium grey, occasional plant fossil, some carbonaceous specks and stringers, occasional minute fracture filled with calcite.
130.38 - 131.88	1.50	Sandstone: fine to medium grained, light to medium grey, quartz filled fractures, minor flow features.
131.88 - 133.70	1.82	Siltstone: carbonaceous stringers and partings, vitreous coal stringers 2 - 3 mm in width, rip up clasts. BCA = 62°.
133.70 - 136.15	2.45	Siltstone: carbonaceous, plant fossils, coaly stringers, minute fractures; core solid. BCA = 62°.
		COAL SEAM B4
136.15 - 136.22	0.07	Coal: vitreous, broken and crushed.
136.22 - 136.40	0.18	Siltstone/mudstone: carbonaceous, slicken-sides.
136.40 - 136.44	0.04	Coal: clean, vitreous.
136.44 - 136.50	0.06	Mudstone: carbonaceous, numerous coaly stringers.
136.50 - 137.26	0.76	Coal: clean, intermediate lustre, 10% vitreous bands, 10% dull peaty coal, core solid. Recovery 100%.
137.26 - 137.86	0.60	Coal: clean, intermediate lustre, core ground and crushed. Recovery 90% to 95%.
137.86 - 138.49	0.63	Coal: clean, intermediate lustre with 10% vitreous bands, core solid.
	0.06	138.43 - 138.49 dirty coal band. Recovery 100%.
138.49 - 138.72	0.23	Coal: clean, dull peaty coal 30%, vitreous bands 10%, core fairly solid. Recovery (recovered 19 cm).
138.72 - 139.25	0.53	Coal: clean, intermediate lustre with 25% vitreous bands, 15% dull peaty coal; core crushed and ground.

MDD 78-1 (cont'd.)

139.25 - 140.52	1.27	Coal: clean, hard, intermediate lustre with 20% - 25% dull peaty coal, 20% vitreous bands. Core solid. Recover 100%.																																								
140.52 - 142.34	1.82	Coal: clean, hard, intermediate lustre with 20% dull peaty coal, 20% vitreous bands. Core fairly solid. Recovery 95% (recovered 1.74 m).																																								
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0176</td> <td>136.15 - 136.50</td> <td>0.35</td> <td>56.41</td> <td>1</td> </tr> <tr> <td>0177</td> <td>136.50 - 137.26</td> <td>0.76</td> <td>12.56</td> <td>5½</td> </tr> <tr> <td>0178</td> <td>137.26 - 137.86</td> <td>0.60</td> <td>20.85</td> <td>4½</td> </tr> <tr> <td>0179</td> <td>137.87 - 138.49</td> <td>0.63</td> <td>10.93</td> <td>6½</td> </tr> <tr> <td>0180</td> <td>138.49 - 139.25</td> <td>0.76</td> <td>11.52</td> <td>6</td> </tr> <tr> <td>0181</td> <td>139.25 - 140.52</td> <td>1.27</td> <td>14.58</td> <td>4</td> </tr> <tr> <td>0182</td> <td>140.52 - 142.34</td> <td>1.82</td> <td>4.72</td> <td>7</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0176	136.15 - 136.50	0.35	56.41	1	0177	136.50 - 137.26	0.76	12.56	5½	0178	137.26 - 137.86	0.60	20.85	4½	0179	137.87 - 138.49	0.63	10.93	6½	0180	138.49 - 139.25	0.76	11.52	6	0181	139.25 - 140.52	1.27	14.58	4	0182	140.52 - 142.34	1.82	4.72	7
Samples	Interval	Width	Dry Ash	F.S.I.																																						
0176	136.15 - 136.50	0.35	56.41	1																																						
0177	136.50 - 137.26	0.76	12.56	5½																																						
0178	137.26 - 137.86	0.60	20.85	4½																																						
0179	137.87 - 138.49	0.63	10.93	6½																																						
0180	138.49 - 139.25	0.76	11.52	6																																						
0181	139.25 - 140.52	1.27	14.58	4																																						
0182	140.52 - 142.34	1.82	4.72	7																																						
142.34 - 143.22	0.88	Siltstone: carbonaceous, plant fossils, coaly stringers, minute fractures filled with calcite and carbonaceous material, core solid. BCA = 60°.																																								
143.22 - 145.39	2.17	Siltstone: carbonaceous stringers, plant fossils, uniform, core solid. BCA = 65°.																																								
145.39 - 147.64	2.25	Siltstone: carbonaceous stringers and partings, minute fractures, uniform, core solid.																																								
147.64 - 149.86	2.22	Sandstone: very fine grained, with 30% siltstone interbeds, occasional carbonaceous partings and stringers, core solid. BCA = 62°.																																								
149.86 - 153.84	3.98	Sandstone: fine grained, medium to light grey, clean, well sorted, some carbonaceous partings, less than 10% siltstone bands. Core solid. BCA = 62°.																																								
153.84 - 156.04	2.20	Sandstone: fine grained, medium grey, cross-bedded, flow features.																																								
156.04 - 157.38	1.34	Sandstone: very fine grained, medium grey, carbonaceous specks and stringers, minor slickensides. BCA = 56°.																																								
157.38 - 159.80	2.42	Siltstone: carbonaceous, plant fossils, coaly stringers up to 2 mm in width, flow features, brown mud blebs.																																								

MDD 78-1 (cont'd.)

159.80 - 160.65	0.85	Siltstone: carbonaceous, plant fossils, coaly blebs and stringers, minute fractures filled with calcite.
		COAL SEAM B3
160.65 - 160.78	0.13	Coal: fairly clean, broken, intermediate lustre 60%, dull peaty coal 40%, minute vitreous bands up to 2 mm in width.
160.78 - 160.86	0.08	Coal: clean, vitreous, fairly hard, core fairly solid. Recover 100%.
160.86 - 161.28	0.42	Coal: clean, 50% intermediate lustre, 30% dull peaty coal, 10% vitreous bands. Recovery 100%.
161.28 - 161.48	0.20	Coal: clean, dull, 30% intermediate lustre, core fairly solid. Recovery 100%.
161.48 - 161.66	0.18	Coal: clean, hard, intermediate lustre, 10% dull peaty coal, 30% vitreous bands. Recovery 100%.
161.66 - 162.16	0.50	Coal: clean, 60% intermediate lustre, 30% vitreous bands, 10% dull peaty coal, hard, core solid. Recovery 100%.
162.16 - 162.33	0.17	Coal: clean, fairly soft, intermediate lustre, 20% dull peaty coal, 15% vitreous bands, minor specks of white ash.
162.33 - 163.68	1.35	Coal: clean, intermediate lustre, granular, 10% dull peaty coal, specks of white ash common.
163.38 - 163.68	0.30	Coal: clean, hard, as above with up to 20% vitreous bands. Recovery 94% (recovered 1.27 m)
163.68 - 163.85	0.17	Coal: intermediate lustre, broken and crushed.
163.85 - 164.15	0.30	Coal: clean, hard, intermediate lustre with 10% dull soft peaty coal.
164.15 - 164.87	0.72	Coal: clean, intermediate lustre, 20% vitreous bands, specks of white ash common. Recovery 100%
164.87 - 165.04	0.17	Coal: intermediate lustre, crushed and ground. Recovery 80%.

MDD 78-1 (cont'd.)

	Samples	Interval	Width	Dry Ash	F.S.I.
	0183	160.65 - 161.28	0.63	37.00	5
	0184	161.28 - 162.33	1.05	14.17	7
	0185	162.33 - 163.68	1.35	8.86	7½
	0186	163.68 - 165.04	1.36	9.41	8
165.04 - 166.24		1.20	Siltstone: carbonaceous, plant fossils, coaly stringers, core solid. BCA = 62°.		
166.24 - 169.77		3.53	Siltstone: black, occasional plant fossil, minute fractures, core solid.		
169.77 - 170.29		0.52	Sandstone: fine grained, medium grey, occasional carbonaceous specks and partings, core solid.		
170.29 - 172.82		2.53	Sandstone: fine grained, light grey, interbedded with 10% siltstone bands, carbonaceous specks and stringers, minor flow features. BCA = 60°.		
172.82 - 177.69		4.87	Sandstone: fine grained, light grey, 10% siltstone interbeds, flow features, mud clasts, carbonaceous partings and stringers, plant fossils.		
177.69 - 178.92		1.23	Sandstone: very fine grained, medium grey, occasional brown mud band, occasional plant fossil.		
178.92 - 181.07		2.15	Siltstone: dark grey, uniform. BCA = 64°.		
181.07 - 181.97		0.90	Siltstone: interbedded with sandstone, occasional plant fossil.		
181.97 - 183.13		1.16	Sandstone: medium grained, clean, well sorted, core solid.		
183.13 - 183.33		0.20	Sandstone: fine grained, carbonaceous stringers and partings.		
183.33 - 185.11		1.78	Sandstone: medium grained, clean, well sorted, occasional pebble, minute fractures filled with carbonaceous material.		
185.11 - 185.27		0.16	Sandstone: medium grained, vitreous coal stringers up to 0.5 cm in width.		

MDD 78-1 (cont'd.)

185.27 - 189.68	4.41	Sandstone: medium grained, light grey, clean, well sorted, occasional carbonaceous parting. BCA = 64°.
189.68 - 190.20	0.52	Sandstone: coarse grained, light grey, clean, well sorted.
190.20 - 197.68	7.48	Sandstone: medium grained, light grey, occasional carbonaceous partings, fairly clean, well sorted. BCA = 66°.
197.68 - 203.30	5.62	Sandstone: medium grained, medium grey, carbonaceous specks and partings, uniform. BCA = 67°.
203.30 - 2-3.42	0.12	Sandstone: fine grained, carbonaceous specks and partings, vitreous stringers 2 - 3 mm in width, core solid.
		COAL SEAM B1
203.42 - 203.51	0.09	Coal: intermediate brightness with 10% vitreous bands, core fairly solid.
203.51 - 203.50	0.09	Mudstone: carbonaceous
203.60 - 203.92	0.32	Coal: intermediate lustre, 10% vitreous bands, 20% dull peaty coal.
203.92 - 203.60	0.30	Coal: clean, hard, intermediate lustre, 30% soft peaty coal, 5% vitreous stringers.
204.22 - 204.42	0.20	Coal: clean, soft peaty.
204.42 - 204.66	0.24	Coal: clean, intermediate lustre, with 10% soft dull peaty coal, specks white ash, core fairly solid.
204.66 - 205.41	0.75	Coal: clean, intermediate lustre, 20% dull peaty coal, 5% vitreous bands; core solid.
205.41 - 206.25	0.84	Coal: clean, crushed and ground (recovered 42 cm).
206.25 - 206.35	0.10	Mudstone: carbonaceous, slickensides.

Samples	Interval	Width	Dry Ash	F.S.I.
0192	203.42 - 203.92	0.50	30.64	4
0193	203.92 - 204.66	0.74	6.99	7
0194	204.66 - 205.41	0.75	7.81	7
0195	205.41 - 206.35	0.94	43.20	5½

MDD 78-1 (cont'd.)

206.35 - 206.58	0.23	Sandstone: fine grained, carbonaceous specks and stringers, vitreous stringers 1 mm in width common. BCA = 62 ^o .
206.58 - 206.74	0.16	Coal: intermediate lustre, ground and crushed. Recovery 80%.
206.74 - 207.21	0.47	Sandstone: fine grained, medium grey, plant fossils.
207.21 - 209.40	2.19	Sandstone: very fine to fine grained, some carbonaceous partings, minor flow features.
209.40 - 211.60	2.20	Sandstone: medium grained, light grey, carbonaceous specks, stringers and partings, some rip up clasts, rare slickensides, occasional 1 cm bands of coarse grained sandstone.
211.60 - 212.45	0.85	Sandstone: fine grained, some carbonaceous specks and stringers.
212.45 - 213.50	1.05	Sandstone: fine grained, dark grey with 20% vitreous interbeds, some carbonaceous specks and stringers.
213.50 - 213.72	0.22	Siltstone/mudstone: carbonaceous, plant fossils, coaly stringers 1 - 2 mm in width.
213.72 - 218.94	5.22	Sandstone: medium grained, light grey, occasional carbonaceous parting, clean, well sorted, core solid. BCA = 65 ^o .
218.94 - 223.48	4.54	Sandstone: fine grained, light grey, minor crossbedding, occasional carbonaceous specks and partings. BCA = 62 ^o .
223.48 - 223.70	0.22	Sandstone: medium grained, light grey, worm burrowed interval.
223.70 - 225.36	1.66	Sandstone: medium grained, light grey, some crossbedding, occasional carbonaceous partings, clean.
		224.64 - 225.36: worm burrowed interval.
225.36 - 228.75	3.39	Sandstone: medium grained, light grey, occasional carbonaceous parting, clean, well sorted. BCA = 62 ^o .
228.75 - 232.31	3.56	Sandstone: medium grained, light grey, well sorted, clean.

MDD 78-1 (cont'd.)

232.31 - 238.14	5.83	Sandstone: fine to medium grained, occasional rip up clast, clean, well sorted, core solid. BCA = 64 ^o .
238.14 - 240.79	2.65	Sandstone: fine grained, some carbonaceous partings, occasional siltstone bands 1 - 2 cm in width.
240.79 - 243.84	3.05	Sandstone: fine to medium grained, interbedded with 10% siltstone, occasional carbonaceous partings, some plant fossils.

MOOSEBAR FORMATION (upper)

243.84 - 262.74	18.90	Sandstone: fine grained, with 30% siltstone interbeds, carbonaceous partings, rip up clasts, minor flow features, minute fractures filled with calcite. BCA = 66 ^o .
262.74 - 267.00	4.26	Sandstone: fine grained, interbedded with 30 - 40% siltstone, carbonaceous specks and partings, flow features. BCA = 64 ^o .

E.O.H.

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-02

LOCATION:

- (a) Coal Licence: 3227
- (b) N.T.S. 93-I-15, a-50-B
- (c) Drill Hole Co-ordinates: N 15987.31 - E 5184.35
- (d) Elevation: 1021.43m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped, hole plugged

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B₁ - B₆
TOTAL DEPTH: 356.5

DATE DRILLED: June 18 - 26, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Cal/Dens, Dev., GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>										
0 - 32.00	32.00	OVERBURDEN										
		<u>GATES MEMBER - COMMOTION FORMATION</u>										
32.00 - 32.61	0.61	Sandstone: fine grained, light grey										
32.61 - 33.17	0.56	Sandstone: fine grained, light grey, broken, occasional unconsolidated gravel and mud bands.										
33.17 - 35.66	2.49	Sandstone: fine grained, some siltstone intervals, broken, carbonaceous stringers and bands. BCA = 72°										
35.66 - 35.87	0.21	Mudstone: carbonaceous, slickensides, broken and crushed.										
35.87 - 36.74	0.87	Siltstone: occasional carbonaceous specks and stringers.										
36.74 - 38.71	1.97	Sandstone: fine grained, 30% siltstone bands, flow features, some carbonaceous stringers and partings, calcite filled fractures.										
38.71 - 40.48	1.77	Mudstone: carbonaceous specks, some plant fossils, core broken.										
		COAL SEAM B6 (Upper)										
40.48 - 40.58	0.10	Coal: dirty, broken and crushed.										
40.58 - 40.64	0.06	Coal: hard, intermediate lustre, core solid.										
40.64 - 40.71	0.07	Coal: clean, vitreous.										
40.71 - 40.77	0.06	Mudstone: carbonaceous, 10% vitreous stringers, core intact.										
40.77 - 40.96	0.19	Coal: clean, intermediate lustre, 20% dull peaty coal, 20% vitreous bands, core fairly solid.										
40.96 - 41.76	0.80	Coal: dull to intermediate lustre, broken and crushed, occasional mudstone chips (recovered 64 cm).										
		<table border="1"> <thead> <tr> <th><u>Sample</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0216</td> <td>40.48-41.76</td> <td>1.28</td> <td>45.34</td> <td>3 1/2</td> </tr> </tbody> </table>	<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0216	40.48-41.76	1.28	45.34	3 1/2
<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>								
0216	40.48-41.76	1.28	45.34	3 1/2								
41.76 - 42.16	0.40	Mudstone: carbonaceous, plant fossils, minor slickensides, core solid. BCA = 70°										
42.16 - 43.50	1.34	Siltstone: occasional carbonaceous specks or stringer, core solid.										
43.50 - 44.20	0.70	Siltstone: carbonaceous, plant fossils										
44.20 - 45.46	1.26	Siltstone: carbonaceous, plant fossils, pyrite disseminations, core broken BCA = 68°										

<u>Interval</u>	<u>Width</u>	<u>Description</u>										
45.46 - 45.60	0.14	Mudstone: carbonaceous COAL SEAM B6 (Lower)										
45.60 - 45.78	0.18	Coal: fairly clean, dull, soft, platy.										
45.78 - 45.90	0.12	Mudstone parting: carbonaceous.										
45.90 - 46.84	0.94	Coal: clean, intermediate lustre, core broken and crushed (recovered 64 cm).										
		<table border="1"> <thead> <tr> <th><u>Sample</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0217</td> <td>45.60-46.84</td> <td>1.24</td> <td>59.66</td> <td>2 1/2</td> </tr> </tbody> </table>	<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0217	45.60-46.84	1.24	59.66	2 1/2
<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>								
0217	45.60-46.84	1.24	59.66	2 1/2								
46.84 - 47.31	0.47	Siltstone: carbonaceous, slickensides, plant fossils, core broken.										
47.31 - 47.85	0.54	Siltstone: occasional carbonaceous specks or stringer.										
47.85 - 50.29	2.44	Fault Zone Sandstone: very fine to fine grained, broken, slickensides with calcite along slickensided surfaces, numerous fractures filled with calcite, carbonaceous stringers and partings, vitreous bands 2 - 3 mm in width. BCA = 45°										
50.29 - 50.77	0.48	Mudstone: carbonaceous, slickensides, calcite along slickenside surfaces, core ground and crushed.										
50.77 - 53.88	3.11	Sandstone: very fine grained, calcite filled fractures common, slickensides, carbonaceous stringers and partings. BCA = 42°										
53.88 - 54.58	0.70	Sandstone: very fine grained, carbonaceous stringers and partings, core broken. BCA = 40°										
54.58 - 54.70	0.12	Mudstone: carbonaceous, plant fossils, slickensides.										
54.70 - 55.78	1.08	Coal: intermediate lustre, core crushed and ground 10 - 15% mudstone chips (recovered 65 cm).										
55.78 - 55.91	0.13	Mudstone: carbonaceous.										
55.91 - 56.15	0.24	Coal: fairly dirty, intermediate lustre, core broken and crushed.										
		<table border="1"> <thead> <tr> <th><u>Sample</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0218</td> <td>54.70-56.15</td> <td>1.45</td> <td>80.47</td> <td>NA</td> </tr> </tbody> </table>	<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0218	54.70-56.15	1.45	80.47	NA
<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>								
0218	54.70-56.15	1.45	80.47	NA								
56.15 - 56.45	0.30	Mudstone: carbonaceous										
56.45 - 57.00	0.55	Siltstone/Mudstone: minute calcite filled fractures. BCA = 52°										
57.00 - 58.19	1.19	Siltstone: carbonaceous, plant fossils, slickensides, calcite filled fractures, core solid.										
58.19 - 60.05	1.86	Sandstone: interbedded with siltstone, flow features, minute fractures filled with calcite and vitreous coal.										

<u>Interval</u>	<u>Width</u>	<u>Description</u>															
60.05 - 62.15	2.10	Siltstone: carbonaceous specks and stringers, core solid. BCA = 47°															
62.15 - 63.09	0.94	Mudstone/Siltstone: carbonaceous, calcite along slickensides and filling fractures, some plant fossils. BCA = 50°															
63.09 - 70.41	7.32	Mudstone/Siltstone: carbonaceous, plant fossils, minute calcite filled fractures, minor slickensides, minor flow features. BCA = 45°															
70.41 - 72.00	1.59	Sandstone: very fine grained, minor flow features, calcite filled fractures, minor slickensides.															
72.00 - 72.62	0.62	Mudstone: carbonaceous, plant fossils, slickensides, core broken and crushed.															
		COAL SEAM B5															
72.62 - 72.69	0.07	Coal: dirty															
72.69 - 73.10	0.41	Coal: clean, intermediate lustre, 30% dull peaty coal, core broken.															
73.10 - 73.62	0.52	Mudstone parting: carbonaceous															
73.62 - 73.92	0.30	Coal: clean, vitreous, crushed and ground.															
73.92 - 74.02	0.10	Mudstone: carbonaceous															
74.02 - 74.68	0.66	Coal: crushed and ground (recovered 6 cm).															
74.68 - 76.50	1.82	Coal: appears clean, intermediate and vitreous lustre, core broken and ground (recovered 1.48 m)															
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0219</td> <td>72.62-74.68</td> <td>2.06</td> <td>68.26</td> <td>1 1/2</td> </tr> <tr> <td>0220</td> <td>74.68-76.50</td> <td>1.82</td> <td>11.48</td> <td>7 1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0219	72.62-74.68	2.06	68.26	1 1/2	0220	74.68-76.50	1.82	11.48	7 1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>													
0219	72.62-74.68	2.06	68.26	1 1/2													
0220	74.68-76.50	1.82	11.48	7 1/2													
76.50 - 79.45	2.95	Mudstone: carbonaceous, slickensides, plant fossils, vitreous coal stringers common - up to 0.5 cm in width, some fractures filled with calcite, core solid.															
79.45 - 87.67	8.22	Siltstone: carbonaceous with some mudstone intervals plant fossils, slickensides, vitreous coal stringers, occasional fracture filled with calcite, last 2 m broken otherwise core intact. BCA = 52°															
87.67 - 91.84	4.17	Siltstone: slickensides, occasional brown mud band, carbonaceous stringers and partings, calcite filled fractures and along slickensides.															
91.84 - 96.91	5.07	Siltstone: occasional carbonaceous speck or stringer, minor slickensides, some flow features, minute calcite filled fractures.															

<u>Interval</u>	<u>Width</u>	<u>Description</u>
96.91 - 97.66	0.75	Siltstone: slickensides, carbonaceous stringers and partings. NOTE: 1.30 m marker error
97.66 - 99.88	2.22	Siltstone/Mudstone: some slickensides, carbonaceous specks and stringers, core solid. BCA = 58°
99.88 - 101.88	2.00	Siltstone/Mudstone: numerous slickensides, core broken.
101.88 - 106.04	4.16	Siltstone: minor slickensides, carbonaceous stringers and partings.
106.04 - 111.86	5.82	Siltstone: occasional carbonaceous speck, core solid.
111.86 - 120.57	8.71	Siltstone: interbedded with sandstone intervals, occasional carbonaceous specks and stringers, minor flow features.
120.57 - 127.10	6.53	Siltstone: interbedded with very fine grained sandstone intervals, some carbonaceous specks, and stringers, minor flow features, rare slickenside, occasional fracture filled with calcite.
127.10 - 134.93	7.83	Siltstone/Mudstone: carbonaceous, minor slickensides, plant fossils, specks of white ash (weathered pyrite), core fairly solid. BCA = 60°
134.93 - 139.40	4.47	Sandstone: very fine grained, medium grey, occasional carbonaceous parting, minor flow features, calcite filled fractures, core solid. BCA = 64°
139.40 - 140.85	1.45	Sandstone: very fine grained, carbonaceous specks and stringers, core solid. BCA = 65°
140.85 - 142.04	1.19	Mudstone: carbonaceous, plant fossils, coaly stringers 2 - 3 mm in width common. COAL SEAM B4
142.04 - 142.28	0.24	Coal: and coaly mudstone, slickensides.
142.28 - 142.69	0.41	Coal: clean, hard, intermediate lustre, 30% dull coal, 10% vitreous bands, core broken.
142.69 - 143.00	0.31	Coal: clean, intermediate lustre, 20% dull, soft, peaty coal, 20% vitreous bands, core fairly solid.
143.00 - 143.15	0.15	Coal: clean, vitreous, crushed and ground.
143.15 - 143.43	0.28	Mudstone: carbonaceous, plant fossils, slickensides, vitreous bands.
143.43 - 143.46	0.03	Coal: clean, vitreous, ground and crushed.

<u>Interval</u>	<u>Width</u>	<u>Description</u>
143.46 - 143.77	0.31	Coal: clean, intermediate lustre, 30% vitreous bands, core solid.
143.77 - 143.82	0.05	Coal: vitreous, broken and crushed.
143.82 - 144.04	0.22	Mudstone: carbonaceous
144.04 - 145.00	0.96	Coal: crushed and ground, 70% clean coal, 30% dirty coal (recovered 43 cm).
145.00 - 145.13	0.13	Coal: clean, intermediate lustre, 10% vitreous bands, core solid.
145.13 - 145.22	0.09	Coal: soft and platy, crushed and ground.
145.22 - 145.54	0.32	Mudstone: carbonaceous, plant fossils, core broken.
145.54 - 145.88	0.34	Coal: core broken and ground, 70% clean vitreous coal, 30% mudstone chips.
145.88 - 146.06	0.18	Coal: clean, intermediate lustre with 30% vitreous bands, core solid.
146.06 - 146.21	0.15	Coal: ground and crushed.
146.21 - 148.30	2.09	Core missing
148.30 - 148.44		Coal: core ground and crushed.
148.44 - 148.93	0.49	Coal: fairly clean, dull coal with 20% intermediate lustre, core ground and crushed.
148.93 - 150.36	1.43	Coal: clean, hard, intermediate lustre, 10% vitreous bands, 20% dull peaty coal, core broken.
150.36 - 150.62	0.26	Coal: intermediate lustre, core broken and crushed.
150.62 - 151.49	0.87	Core missing
151.49 - 153.62	2.13	Coal: appears clean, intermediate lustre, ground and crushed (recovered 1.52 m).
153.62 - 153.66	0.04	Coal: dirty
153.66 - 154.29	0.63	Coal: clean, broken, intermediate lustre, 30% vitreous bands.
154.17 - 154.29	0.12	Coal: dirty
154.29 - 154.53	0.24	Coal: clean, intermediate lustre, 20% vitreous bands, 20% soft dull, peaty coal, core broken.
154.53 - 155.41	0.88	Coal: clean, intermediate lustre, 20% vitreous, broken and crushed.
155.41 - 156.06	0.65	Coal: appears clean, intermediate lustre, 10% vitreous, 20% dull, core ground and crushed.
156.06 - 157.08	1.02	Coal: fairly clean, minor slickensides, 20% dull peaty coal, 5% vitreous bands, core broken.
157.08 - 157.58	0.50	Coal: clean, intermediate lustre, 30% dull peaty coal, core broken.

<u>Interval</u>	<u>Width</u>	<u>Description</u>																																																							
157.58 - 159.00	1.42	Coal: clean, core intact, metallic lustre, 40% vitreous bands, 20% dull peaty coal, recovery 100%.																																																							
159.00 - 159.27	0.27	Coal: clean, intermediate lustre, 40% dull, fairly hard; recovery 100%																																																							
159.27 - 159.84	0.57	Coal: clean, 40% intermediate lustre, 60% vitreous, ground and crushed core.																																																							
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0221</td> <td>142.04-143.15</td> <td>1.11</td> <td>47.88</td> <td>3</td> </tr> <tr> <td>0222</td> <td>143.15-145.00</td> <td>1.85</td> <td>58.64</td> <td>1 1/2</td> </tr> <tr> <td>0223</td> <td>145.00-146.35 (146.35-148.44)</td> <td>1.35</td> <td>59.33</td> <td>2</td> </tr> <tr> <td>0224</td> <td>148.44-150.62</td> <td>2.18</td> <td>13.06</td> <td>5 1/2</td> </tr> <tr> <td>0225</td> <td>150.62-153.62</td> <td>3.00</td> <td>17.21</td> <td>3</td> </tr> <tr> <td>0226</td> <td>153.62-154.53</td> <td>0.91</td> <td>10.93</td> <td>6</td> </tr> <tr> <td>0227</td> <td>154.53-155.41</td> <td>0.88</td> <td>5.03</td> <td>7 1/2</td> </tr> <tr> <td>0228</td> <td>155.41-157.08</td> <td>1.67</td> <td>4.82</td> <td>7 1/2</td> </tr> <tr> <td>0229</td> <td>157.08-159.00</td> <td>1.92</td> <td>5.13</td> <td>8</td> </tr> <tr> <td>0230</td> <td>159.00-159.84</td> <td>0.84</td> <td>5.76</td> <td>9</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0221	142.04-143.15	1.11	47.88	3	0222	143.15-145.00	1.85	58.64	1 1/2	0223	145.00-146.35 (146.35-148.44)	1.35	59.33	2	0224	148.44-150.62	2.18	13.06	5 1/2	0225	150.62-153.62	3.00	17.21	3	0226	153.62-154.53	0.91	10.93	6	0227	154.53-155.41	0.88	5.03	7 1/2	0228	155.41-157.08	1.67	4.82	7 1/2	0229	157.08-159.00	1.92	5.13	8	0230	159.00-159.84	0.84	5.76	9
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																																																					
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159.84 - 160.90	1.06	Siltstone: occasional carbonaceous speck or stringer, core solid. BCA = 65°																																																							
160.90 - 165.43	4.53	Sandstone: fine grained with 20% siltstone interbeds, slickensides, calcite vianlets and along fractures, minor flow features. BCA = 72°																																																							
165.43 - 167.15	1.72	Sandstone: as above BCA = 62°																																																							
167.15 - 172.82	5.67	Siltstone: carbonaceous, plant fossils, slickensides, bright coal bands (0.5 cm) common. COAL SEAM B3																																																							
172.82 - 173.14	0.32	Coal: 30% vitreous, 10% dull peaty coal, core solid.																																																							
173.14 - 173.25	0.11	Mudstone: coaly																																																							
173.25 - 173.46	0.21	Coal: 30% vitreous																																																							
173.46 - 173.61	0.15	Mudstone: carbonaceous, plant fossils, sheared.																																																							
173.61 - 173.79	0.18	Coal: 80% vitreous, core fairly solid																																																							
173.79 - 174.35	0.56	Coal: 30% vitreous																																																							
174.25 - 174.29	0.04	Coal: dirty, high specific gravity.																																																							
174.35 - 175.87	1.52	Coal: 20% vitreous, coal broken in large pieces.																																																							
174.44 - 174.51	0.07	Coaly mudstone, high specific gravity.																																																							

<u>Interval</u>	<u>Width</u>	<u>Description</u>
175.87 - 175.97	0.10	Coal: 80% vitreous, core pulverized.
175.97 - 176.72	0.75	Coal: 40% vitreous, metallic lustre, core fairly solid.
176.72 - 177.06	0.34	Coal: dull coal, banded, 30% vitreous coal, core pulverized.
177.06 - 177.80	0.74	Coal: 10% vitreous, metallic lustre, core fairly solid.
177.80 - 178.92	1.12	Coal: 20% vitreous, metallic lustre, fairly solid (recovered 92 cm).
178.92 - 179.23	0.31	Coal: 80% vitreous, metallic lustre, core fairly solid.
179.23 - 179.48	0.25	Mudstone: carbonaceous
179.48 - 180.41	0.93	Coal: metallic lustre, 30% vitreous (recovered 53 cm) core pulverized.
180.41 - 180.61	0.20	Mudstone: interbedded with coal, high specific gravity.
180.61 - 181.97	1.36	Coal: 30% vitreous, metallic lustre, core fairly solid. (181.31 - 181.37 mudstone band)
181.97 - 182.97	1.00	Coal: 10% vitreous, earthy lustre, core broken in large pieces.
182.97 - 183.49	0.52	Coal: 30% vitreous, metallic lustre, 183.39 - 183.49 mudstone, carbonaceous, core pulverized.
183.49 - 184.17	0.68	Coal: 30% vitreous, metallic lustre, core fairly solid.
184.17 - 184.52	0.35	Mudstone: carbonaceous, bright coal bands.
184.52 - 184.64	0.12	Coal: 80% vitreous, core pulverized (recovered 9 cm)
184.64 - 184.94	0.30	Coal: 80% vitreous, core solid.

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0231	172.82-173.79	0.97	39.10	5
0232	173.79-175.87	2.08	22.44	7 1/2
0233	175.87-177.80	1.93	3.22	8 1/2
0234	177.80-179.23	1.43	6.49	8 1/2
0235	179.23-180.61	1.38	49.40	2
0236	180.61-182.97	2.36	16.43	8
0237	182.97-184.17	1.20	28.64	7
0238	184.17-184.94	0.77	64.22	1 1/2

184.94 - 186.89 1.95

Siltstone: carbonaceous, core solid

186.89 - 191.73 4.84

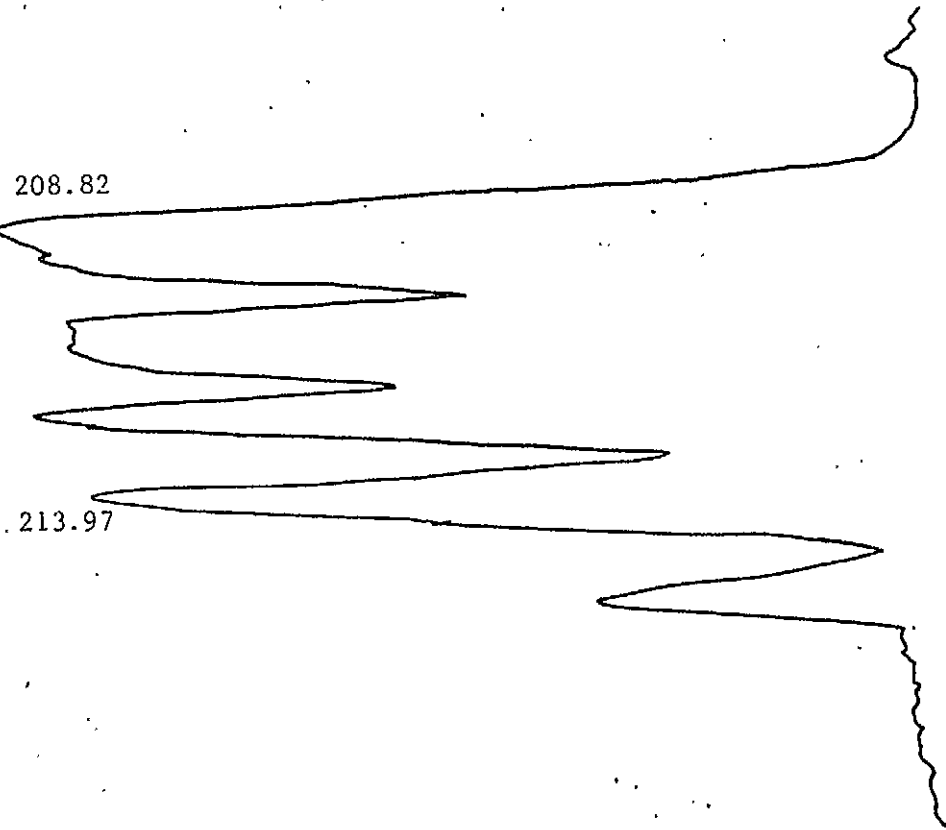
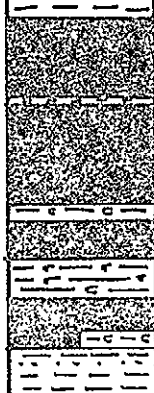
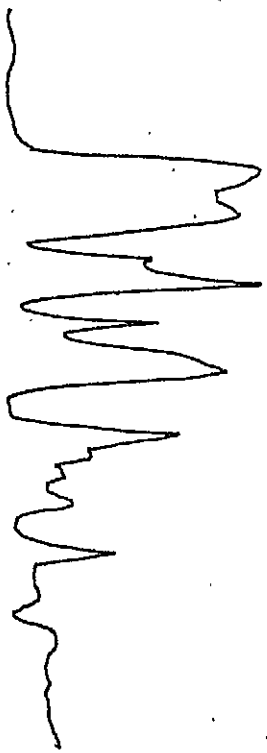
Sandstone: very fine grained, interbedded with 30% siltstone, carbonaceous specks and partings, minor flow features, core solid.
BCA = 72°

RESISTIVITY
(OHM METERS)

2500
5000
7500

BULK DENSITY
(GRAMS/CC)

1.30
1.40
1.50
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
2.40
2.50
2.60
2.70
2.80
2.90
3.00
3.10
3.20
3.30



208.82

213.97



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B 3

HOLE
MDD 77-2B
DIP 24

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-22

LOCATION:

- (a) Coal Licence: 3224
- (b) N.T.S. 93-I-15, d-7-B
- (c) Drill Hole Co-ordinates: N 11981.58 - E 5063.65
- (d) Elevation: 1437.12m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B12
TOTAL DEPTH: 439.5m

DATE DRILLED: Sept. 8 - 15, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: G. Jordan

GEOPHYSICAL LOGS: . Dev., Dens/Cal, GRN, FBL

<u>Interval</u>	<u>Width</u>	<u>Description</u>																									
272.06 - 282.55	10.49	Sandstone: fine grained, with 20 - 30% siltstone interbeds, plant fossils, carbonaceous partings, minor bioturbation. BCA = 70°																									
282.55 - 291.48	8.93	Sandstone: medium grained, light grey, some worm burrowed (large, white) intervals, occasional rip-up clasts.																									
291.48 - 291.96	0.48	Mudstone: carbonaceous, core solid.																									
		COAL SEAM B1																									
291.96 - 292.88	0.92	Coal: 40% vitreous, metallic lustre, hard, core pulverized.																									
292.88 - 296.18	3.30	Sandstone: medium grained, some siltstone phases, vitreous bands up to 1 cm in width, coaly rootlets.																									
296.18 - 296.34	0.16	Coal: 20% vitreous, metallic lustre, hard, high specific gravity, core fairly solid.																									
296.34 - 296.48	0.14	Coal: 80% vitreous																									
296.48 - 296.74	0.26	Coal: 80% vitreous, core pulverized.																									
296.74 - 297.02	0.28	Mudstone: carbonaceous, bright coal bands.																									
297.02 - 297.24	0.22	Mudstone: interbedded with coal, sheared.																									
297.24 - 297.72	0.48	Coal: 20% vitreous, metallic lustre, hard, core solid.																									
297.72 - 297.76	0.04	Coal: 30% vitreous																									
297.76 - 298.21	0.45	Coal: 80% vitreous, core solid.																									
298.21 - 298.33	0.13	Coal: 80% vitreous, core pulverized.																									
298.33 - 298.67	0.34	Coal: 90% vitreous, core solid.																									
298.67 - 298.97	0.30	Coal: 80% vitreous, core pulverized.																									
298.97 - 299.01	0.04	Mudstone: carbonaceous.																									
299.01 - 299.27	0.26	Coal: 30% vitreous, metallic lustre, hard, core solid.																									
299.27 - 300.18	0.91	Coal: 30% vitreous, metallic lustre.																									
300.18 - 300.48	0.30	Coal: 40% vitreous, core pulverized (recovered 20 cm).																									
300.48 - 300.73	0.25	Coal: core pulverized, dull coal and carbonaceous mudstone.																									
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0250</td> <td>291.96-292.88</td> <td>0.92</td> <td>18.67</td> <td>7</td> </tr> <tr> <td>0251</td> <td>296.18-297.02</td> <td>0.84</td> <td>54.22</td> <td>1</td> </tr> <tr> <td>0252</td> <td>297.02-298.67</td> <td>1.65</td> <td>19.12</td> <td>5 1/2</td> </tr> <tr> <td>0253</td> <td>298.67-300.73</td> <td>2.06</td> <td>25.80</td> <td>7 1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0250	291.96-292.88	0.92	18.67	7	0251	296.18-297.02	0.84	54.22	1	0252	297.02-298.67	1.65	19.12	5 1/2	0253	298.67-300.73	2.06	25.80	7 1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																							
0250	291.96-292.88	0.92	18.67	7																							
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0252	297.02-298.67	1.65	19.12	5 1/2																							
0253	298.67-300.73	2.06	25.80	7 1/2																							
300.73 - 301.10	0.37	Mudstone: carbonaceous, bright coal stringers, core solid.																									

<u>Interval</u>	<u>Width</u>	<u>Description</u>
301.10 - 306.20	5.10	Siltstone: some carbonaceous intervals, plant fossils, mildly bioturbated. BCA = 68°
306.20 - 318.00	11.80	Sandstone: medium grained, clean, cross-bedded.
318.00 - 331.40	13.40	Sandstone: fine grained, occasional coaly rootlet, minor calcite filled fractures and shears.
331.40 - 342.00	10.60	Sandstone: fine grained, 30% siltstone interbeds, some plant fossils, carbonaceous partings and coaly rootlets, mildly bioturbated.
342.00 - 356.60	14.60	Sandstone: fine grained, 40 - 60% siltstone interbeds, mildly bioturbated, core solid.

E. O. H.

P A C I F I C P E T R O L E U M S L T D.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-03

LOCATION:

- (a) Coal Licence: 3227
- (b) N.T.S. 93-I-15, c-50-B
- (c) Drill Hole Co-ordinates: N 16478.01 - E 4838.92
- (d) Elevation: 1022.37m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gething Formation
COAL SEAMS INTERSECTED: -
TOTAL DEPTH: 332.3m

DATE DRILLED: June 26 - July 3, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: G. Jordan

GEOPHYSICAL LOGS: Dev., FBL, GRN, Dens/Cal

<u>INTERVAL</u>	<u>WIDTH</u>	<u>DESCRIPTION</u>
0 - 21.34	21.34	CASING
		<u>GATES MEMBER-COMMOTION FORMATION</u>
21.34 - 21.64	0.30	Sandstone: fine grained, light grey, sharp basal contact, core broken.
		<u>MOOSEBAR FORMATION (upper)</u>
21.64 - 25.53	3.89	Siltstone: grey with frequent interbeds of light grey, fine grained sandstone, interbed ratio of silt/sand = 1/1, moderate bioturbation, core breaks on bedding, moderately competent. BCA=81°
25.53 - 57.28	31.75	Siltstone: as above, silt/sand ratio = 2/1, very heavily bioturbated by small dark coloured worm burrows. BCA=60°
57.28 - 65.12	7.84	Siltstone: as above, silt/sand ratio = 4/1, sharp basal contact. BCA=70°
		<u>MOOSEBAR FORMATION (lower)</u>
65.12 - 65.15	0.03	Claystone: white, soft, Bentonitic.
65.15 - 67.98	2.83	Mudstone: dark grey, very heavily bioturb- ated by small dark coloured worm burrows very few silt interbeds, low competency core intact.
67.98 - 68.08	0.10	Claystone: white as above.
68.08 - 72.84	4.76	Mudstone: dark grey, as above.
72.84 - 73.48	0.64	Breccia: very heavily sheared, mudstone with calcite veins and slickensides.
		<u>FAULT PLANE</u>
73.48 - 74.90	1.42	Mudstone: dark grey, as above.
74.90 - 84.70	9.80	Siltstone: dark grey with light grey fine grained sandstone interbeds ratio = 1/1, frequent irregular calcite filled fractures with slickensides, bedding varies: 74.90 BCA=40° 77.0m BCA=0° 81.0m BCA=25°
84.70 - 84.94	0.24	Breccia: as above.

FAULT PLANE

84.94 - 88.19	3.25	Siltstone: as above. BCA=60°
88.19 - 89.05	0.86	Breccia: as above.

FAULT PLANEMOOSEBAR FORMATION (upper)

89.05 - 92.30	3.25	Sandstone: light grey, medium grained, massive, core broken with calcite filled fractures, small scale faulting, core broken.
92.30 - 97.43	5.13	Sandstone: interbedded with mudstone, minor bioturbation, few calcite veins, very minor faulting, core broken.
97.43 - 101.17	3.74	Siltstone: interbedded with dark grey mudstone, strongly bioturbated, calcite veins and slickensides, faulting minor, core broken.
101.17 - 101.94	0.77	Sandstone: light grey, medium grained, massive. BCA=73°

TRANSITION ZONE

101.94 - 106.95	5.01	Siltstone: grey with frequent interbeds of light grey fine grained sandstone, interbed ratio silt/sand = 1/1. BCA=74°
106.95 - 133.61	26.66	Siltstone: as above, silt/sand = 2/1, very heavily bioturbated by small dark coloured worm burrows. BCA=72°
133.61 - 152.84	19.23	Siltstone: as above, silt/sand ratio = 3/1, sharp basal contact. BCA=72°

MOOSEBAR FORMATION (lower)

152.84 - 152.92	0.08	Claystone: white, soft, bentonitic.
152.92 - 155.63	2.71	Mudstone: dark grey, very heavily bioturbated by small dark colored worm burrows, very few silt interbeds, low competency, core intact.
155.63 - 155.70	0.07	Claystone: white, soft, bentonitic.

155.70 - 190.71	35.01	Mudstone: dark grey, as above, occasional pyritic concretions and pyrite filled worm burrows, sharp basal contact.
<u>GETHING FORMATION</u>		
190.71 - 190.98	0.27	Conglomerate: dark grey, glauconitic, pebble, clasts average 0.02m, large matrix content, competent, core intact.
190.98 - 193.23	2.25	Sandstone: interbedded with conglomerate, light grey medium grained sandstone and grey granule to pebble conglomerate, sandstone is very clean, near massive, very competent, cross bedded, conglomerate medium grey, pebbles rounded to sub-rounded, pebbles white, black, and grey chert and argillite, large irregular coaly rootlets, core intact.
193.23 - 194.40	1.17	Sandstone: interbedded with conglomerate, as above, slickensides and calcite veins, minor faulting, core broken.
194.40 - 198.79	4.39	Sandstone: interbedded with conglomerate. as above, sharp basal contact.
198.79 - 199.74	0.95	Mudstone: dark grey, abundant plant fossils.
199.74 - 199.79	0.05	Shale: carbonaceous, fissile, black, plant fossil fragments.
199.79 - 199.84	0.05	Coal: 30% vitreous, hard, core intact.
199.84 - 199.86	0.02	Shale: carbonaceous, fissile, black.
199.86 - 199.92	0.06	Mudstone: dark grey.
199.92 - 199.96	0.04	Coal: 50% vitreous, core intact.
199.96 - 200.02	0.06	Coal and claystone: carbonaceous, black, coal bands.
200.02 - 200.08	0.06	Coal: 20% vitreous, core intact.
200.08 - 200.28	0.20	Mudstone: dark grey, as above.
200.28 - 200.34	0.06	Coal: 30% vitreous, lightly sheared, core broken.
200.34 - 200.54	0.20	Mudstone: carbonaceous, black.

MDD-78-3 cont'd

200.54 - 200.95	0.41	Mudstone: as above, heavily sheared.
		<u>COAL SEAM</u>
200.95 - 201.37	0.42	Coal: 10% vitreous, very heavily sheared core broken.
201.37 - 201.40	0.03	Mudstone: dark grey, heavily sheared, core broken.
201.40 - 201.42	0.02	Coal: heavily sheared, core pulverized
201.42 - 201.67	0.25	Coal: heavily sheared, core broken to small pieces.
201.67 - 201.85	0.18	Coal: heavily sheared, core pulverized.
201.85 - 202.45	0.60	Core missing.
202.45 - 202.51	0.06	Coal: dull, sheared, core intact.
202.51 - 202.61	0.10	Coal: Boney, core intact.
202.61 - 202.76	0.15	Coal: 50% vitreous, core pulverized.
202.76 - 202.88	0.12	Coal: 50% vitreous, core intact.
202.88 - 203.03	0.15	Coal: sheared and pulverized.
203.03 - 203.21	0.18	Coal: 70% vitreous, core intact.
203.21 - 203.23	0.02	Coal: pulverized.
203.23 - 203.29	0.06	Core missing.
		Samples: <u>Interval</u> <u>Width</u> <u>Dry Ash</u> <u>F.S.I.</u>
		0257: 200.95-201.37 0.42 29.3 3-1/2
		0258: 201.37-201.40 0.03 77.8 1/2
		0259: 201.40-201.85 0.45 15.4 1
		0260: 201.85-203.23 1.38 20.0 6-1/2
203.29 - 210.45	7.16	Siltstone: grey carbonaceous mudstone at top, interbedded with dark grey mudstone in lower half, competent. BCA=80°
210.45 - 212.20	1.75	Sandstone: light grey, fine grained, with interbeds of grey siltstone.
212.20 - 222.96	10.76	Sandstone: light grey, coarse grained, clean, very competent, cross-bedded, large coaly rootlets at base.

MDD-78-3 cont'd

222.96 - 223.97	1.01	Conglomerate: grey pebble, 30% matrix, grains of white, black and grey chert and argillite, bright coal bands, core intact.
223.97 - 228.17	4.20	Sandstone: light grey, medium to coarse grained, frequent pebble bands and conglomerate phases, sharp basal contact, core intact.
228.17 - 228.38	0.21	Mudstone: dark grey, gradational basal contact, low competency, frequent stress relief fractures.
228.38 - 230.62	2.24	Siltstone: grey, interbedded with light grey fine grained sandstone, bedding extremely irregular, slump features, core intact.
230.62 - 231.08	0.46	Sandstone: medium grained, light grey, clean, cross bedded, fine carbonaceous partings on bedding, core intact, competent. BCA=73
231.08 - 233.99	2.91	Conglomerate: grey, pebble with granule phases, grains of black, white and grey chert and argillite, small percent matrix, large coaly rootlets at base, sharp basal contact, core competent and intact.
<u>COAL SEAM</u>		
233.99 - 234.07	0.08	Coal: vitreous 40% core intact.
234.07 - 234.77	0.70	Coal: 10% vitreous, hard, core intact.
234.77 - 234.80	0.03	Claystone: carbonaceous, dark brown, bright coal bands.
234.80 - 236.20	1.40	Coal: 10% vitreous, core hard, intact.
236.20 - 236.45	0.25	Coal: 30% vitreous, lightly sheared, core intact.
236.45 - 236.51	0.06	Coal: bright, core intact.
236.51 - 236.80	0.29	Mudstone: dark grey, carbonaceous of top, bright coal bands at base, core intact.
236.80 - 236.92	0.12	Coal: Boney, hard, core intact.

MDD-78-3 cont'd

236.92 - 236.99	0.07	Coal: vitreous, core intact.
236.99 - 237.07	0.08	Coal: dull, core intact.
237.07 - 237.31	0.24	Coal: 70% vitreous, core intact.
237.31 - 237.85	0.54	Coal: 40% vitreous, core sheared, broken and pulverized.
237.85 - 237.99	0.14	Claystone: dark grey, core intact.
237.99 - 238.39	0.40	Coal: 40% vitreous, core sheared, broken.
238.39 - 238.47	0.08	Coal: 20% vitreous, core intact, sharp basal contact.
238.47 - 238.64	0.17	Core missing.
Samples: <u>Interval</u> <u>Width</u> <u>Dry Ash</u> <u>F.S.I.</u>		
	0261: 233.99-234.79	0.78 14.8 1-1/2
	0262: 234.77-234.80	0.03 67.9 1/2
	0263: 234.80-236.51	1.71 8.9 2
	0264: 236.51-236.80	0.29 90.6 N/A
	0265: 236.80-237.85	1.05 12.2 7
	0266: 237.85-237.99	0.14 83.2 N/A
	0267: 237.99-238.47	0.48 26.7 4-1/2
238.64 - 243.21	4.57	Sandstone: light grey, medium grained, massive, clean, competent. BCA=72 ^o
243.21 - 243.46	0.25	Sandstone: as above, interbedded with dark grey mudstone.
243.46 - 252.41	8.95	Sandstone: as above, clean, competent. core solid.
252.41 - 255.83	3.42	Siltstone and Mudstone: interbedded, dark grey mudstone and grey siltstone forming thin graded units, minor bioturbation by small light colored worm burrows core intact. BCA=65 ^o
255.83 - 261.28	5.45	Sandstone: light grey, medium grained, fine carbonaceous partings on bedding, coaly rootlets at base, competent, core intact.
261.28 - 262.42	1.14	Sandstone: grey, fine grained, with large interbeds of grey siltstone, bedding disturbed by slumping, grades to a carbonaceous mudstone at base.

COAL SEAL

262.42 - 262.67	0.25	Coal: 10% vitreous, hard, core intact.										
262.67 - 262.75	0.08	Coal: 100% vitreous, hard, core intact.										
262.75 - 263.08	0.33	Coal: 50% vitreous, core broken in large pieces.										
		<table border="1"> <thead> <tr> <th><u>Sample:</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Day Ash</u></th> <th><u>FSI</u></th> </tr> </thead> <tbody> <tr> <td>0268:</td> <td>262.42-263.08</td> <td>0.66</td> <td>16.4</td> <td>7-1/2</td> </tr> </tbody> </table>	<u>Sample:</u>	<u>Interval</u>	<u>Width</u>	<u>Day Ash</u>	<u>FSI</u>	0268:	262.42-263.08	0.66	16.4	7-1/2
<u>Sample:</u>	<u>Interval</u>	<u>Width</u>	<u>Day Ash</u>	<u>FSI</u>								
0268:	262.42-263.08	0.66	16.4	7-1/2								
263.08 - 264.27	1.19	Siltstone: grey, interbedded with dark grey mudstone, some phases of fine grained sandstone, laminated. BCA=52 ^o										
264.27 - 264.40	0.13	Claystone: carbonaceous, bright coal bands, sheared, core broken.										
264.40 - 266.62	2.22	Siltstone and Mudstone: interbedded as above, minor floral bioturbation.										
266.62 - 271.20	4.58	Sandstone: light grey, fine grained, small scale cross bedding, slumping at top, grades to a siltstone at base. BCA=68 ^o										
271.20 - 272.55	1.35	Mudstone: carbonaceous, black, massive, competent, core broken at base.										
272.55 - 273.52	0.97	Sandstone: light grey, medium grained, with interbeds of carbonaceous mudstone, bedding disturbed by rootlets.										
273.52 - 275.90	2.38	Siltstone: sandy, grey, coalified plant rootlets at top, grades to unit at base.										
275.90 - 277.01	1.11	Sandstone: fine grained, light grey, with phases of medium grained sandstone throughout, sharp basal contact.										
277.01 - 277.60	0.59	Mudstone: dark grey, silty at base.										
277.60 - 282.55	4.95	Sandstone: medium grained, light grey, abundant carbonaceous partings on bedding and occasional carbonaceous mudstone phase, strongly cross bedded. BCA=71 ^o										

MDD-78-3 cont'd

282.55 - 284.18	1.63	Mudstone: dark grey with occasional interbeds of grey siltstone at top, irregular sharp basal contact.
284.18 - 292.90	8.72	Sandstone: medium grained, light grey, clean, few thin carbonaceous partings, sharp basal contact. BCA=71°
292.90 - 293.39	0.49	Mudstone: dark grey, carbonaceous at top, silty at base, gradational basal contact.
293.39 - 294.60	1.21	Sandstone: light grey, silty at top, massive, plant rootlets.
294.60 - 297.68	3.08	Siltstone: interbedded with dark grey mudstone; grades to a carbonaceous mudstone at base.
297.68 - 299.56	1.88	Mudstone: carbonaceous, coal inclusions at base.
299.56 - 304.03	4.47	Sandstone: light grey, medium to coarse grained, silty at top, abundant large coaly rootlets towards base, sharp irregular basal contact.
304.03 - 304.32	0.29	Mudstone: dark grey, carbonaceous towards base.
304.32 - 304.48	0.16	Coal: 20% vitreous, sheared, core intact.
304.48 - 304.62	0.14	Coal: 40% vitreous, heavily sheared, core broken into small pieces.
304.62 - 304.89	0.27	Mudstone: carbonaceous, black, bright coal bands, core broken.
304.89 - 306.80	1.91	Siltstone: sandy, grey, sandstone phases towards base.
306.80 - 309.02	2.22	Sandstone: interbedded with siltstone, heavily bioturbated by large, dark coloured worm burrows.
309.02 - 311.77	2.75	Sandstone: medium to coarse grained, light grey, abundant large coaly rootlets throughout, cross bedded, carbonaceous partings on bedding.
311.77 - 312.19	0.42	Conglomerate: dark grey, angular pebbles of siltstone within a coarse grained sandstone matrix.
312.19 - 313.36	1.17	Sandstone: as above.

MDD-78-3 cont'd

313.36 - 314.75	1.39	Conglomerate: dark grey, granule to pebble, poorly sorted, high percent matrix, clasts at base.
314.75 - 318.70	3.95	Mudstone: dark grey, silty at top and fine siltstone interbeds towards base. BCA=64 ⁰
318.70 - 319.00	0.30	Claystone: light grey, bentonitic, soft and fissile towards base, sharp basal contact.
319.00 - 319.34	0.34	Mudstone: dark grey, as above.
319.34 - 319.51	0.17	Conglomerate: medium grey, granule, very well sorted, little matrix.
319.51 - 319.90	0.39	Mudstone: as above.
319.90 - 320.25	0.35	Conglomerate: as above.
320.25 - 321.45	1.20	Siltstone: light grey, sandy at top.
321.45 - 328.41	6.96	Mudstone: as above, carbonaceous phases, some siltstone interbeds, BCA=62 ⁰
328.41 - 328.94	0.53	Claystone: white, gradational upper contact, sharp basal contact.
<u>CADOMIN FORMATION</u>		
328.94 - 332.32	3.38	Conglomerate: pebble to boulder, poorly sorted, high percent matrix.

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-04

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, d-30-B
- (c) Drill Hole Co-ordinates: N 14995.37 - E 4286.94
- (d) Elevation: 1238.60m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped, hole plugged

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 - B4
TOTAL DEPTH: 401.0m

DATE DRILLED: June 16 - 26, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia and G. Jordan

GEOPHYSICAL LOGS: Dev., Dens/Cal, FBL, GRN

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 3.35	3.35	OVERBURDEN
		<u>GATES MEMBER - COMMOTION FORMATION</u>
3.35 - 5.62	2.27	Sandstone: fine grained, medium grey, carbonaceous stringers and partings, minor flow features; core fairly solid. BCA = 56°
5.62 - 7.62	2.00	Sandstone: very fine grained, medium grey, carbonaceous stringers and partings, some vitreous coal bands, minor ferruginous staining, core broken.
7.62 - 8.95	1.33	Sandstone: very fine to fine grained, medium grey, ferruginous staining common, carbonaceous stringers and partings, flow features, vitreous coal bands 2 - 3 cm in width.
8.95 -10.82	1.87	Sandstone: fine to medium grained, ferruginous staining throughout, flow features, rip-up clasts, carbonaceous stringers and partings, occasional pyrite speck, core fairly solid. BCA = 60°
10.82-15.28	4.46	Sandstone: medium grained, carbonaceous partings and stringers, numerous fractures filled with carbonaceous material, vitreous coal bands 3 - 4 mm in width, pyrite specks and disseminations, minor slickensides. BCA = 63°
15.28-17.85	2.57	Sandstone: fine grained, flow features, minute fractures filled with calcite, occasional carbonaceous speck or stringer, core solid. BCA = 68°
17.85-21.25	3.40	Sandstone: very fine grained, with 20% siltstone interbeds, minute fractures filled with calcite, occasional carbonaceous speck and stringer, core solid.
21.25-24.81	3.56	Sandstone: very fine grained, flow features, some vitreous stringers, core solid.
24.81-25.54	0.73	Siltstone: carbonaceous specks and stringers, pyrite disseminations, minor slickensides, core broken.
25.54-29.06	3.52	Siltstone with some fine grained Sandstone Bands: carbonaceous, plant fossils, flow features, pyrite specks and stringers.
29.06-29.43	0.37	Siltstone: some vitreous bands, slickensides, core broken and crushed.

MDD 78-4 (Cont'd.)

29.43 - 30.35	0.92	Siltstone: carbonaceous bands and partings, plant fossils, minute vitreous filled fractures.
30.35 - 32.57	2.22	Siltstone: carbonaceous specks and stringers, numerous fractures filled with carbonaceous material and calcite.
32.57 - 33.30	0.73	Siltstone: carbonaceous, plant fossils, vitreous specks and stringers.
33.30 - 34.77	1.47	Siltstone: carbonaceous, plant fossils, coaly bands up to 1 cm in width, minute fractures filled with calcite, core solid.
34.77 - 34.90	0.13	Mudstone: carbonaceous, slickensides.
		COAL SEAM B4
34.90 - 34.99	0.09	Coal: bone coal, slickensides, core broken.
34.99 - 35.18	0.19	Coal: dirty, vitreous bands up to 1 cm in width, slickensides, core broken.
35.18 - 35.37	0.19	Coal: fairly clean, dull coal, with 40% vitreous bands, specks of white ash, core broken; Recovery 100%.
35.37 - 35.45	0.08	Coal: fairly dirty, hard, steely grey with 10% minute vitreous bands, minor slickensides.
35.45 - 35.55	0.10	Coal: clean, dull with 15% vitreous bands, core broken and crushed.
35.55 - 36.07	0.52	Coal: clean, hard, steely grey with minute vitreous bands (10%) 2 cm bone coal at 35.62 m.
		35.76 - 36.07 m coal clean, intermediate lustre, 30% vitreous bands, 5-10% dull peaty coal, core solid.
36.07 - 36.22	0.15	Coal: hard, fairly clean, steely grey, intermediate lustre with 15% vitreous bands, core broken and crushed.
36.22 - 36.42	0.20	Mudstone parting: carbonaceous, vitreous stringers, minor slickensides.
36.42 - 36.76	0.34	Coal: clean, intermediate luster with 40% vitreous bands, core broken. Recovery 100%
36.76 - 36.80	0.04	Coal: clean, vitreous.
36.80 - 37.34	0.54	Mudstone parting: carbonaceous, plant fossils, minor vitreous bands.
37.34 - 37.55	0.21	Coal: clean, steely grey with 20% vitreous bands, core broken and crushed.
37.55 - 38.11	0.56	Coal: clean, hard, steely grey with 20% vitreous bands, core intact. Recover 100%

MDD 78-4 (Cont'd.)

38.11 - 38.26	0.15	Coal: clean, intermediate lustre with 20% vitreous bands, core broken.
38.26 - 38.38	0.12	Coal: dirty.
38.38 - 38.82	0.44	Mudstone parting: carbonaceous, plant fossils, minor vitreous stringers, core intact.
38.82 - 39.02	0.20	Coal: broken and crushed, minor slickensides, intermediate luster with 5% vitreous bands.
39.02 - 39.48	0.46	Coal: clean, fairly soft, intermediate luster, 20% vitreous bands, core intact.
39.48 - 39.52	0.04	Coal: intermediate luster; Recovery 50%
39.52 - 39.94	0.42	Coal: 20% dull peaty coal, 20% vitreous bands, minor slickensides, coal ground and crushed.
39.94 - 40.34	0.40	Coal: clean, steely grey, intermediate luster, core broken and crushed.
40.34 - 40.74	0.40	Coal: clean, intermediate luster with 10% vitreous bands, core fairly intact. Recovery 100%.
40.74 - 41.08	0.34	Coal: fairly dirty, (last 16 cm), intermediate luster with 20% vitreous bands.
41.08 - 41.39	0.31	Coal: minor slickensides, fairly dirty 41.31 - 41.39 carbonaceous mudstone parting.
41.39 - 41.61	0.22	Coal: clean, intermediate luster, 20% vitreous bands, broken and crushed.
41.61 - 41.65	0.04	Coal: dull, soft and platy.
41.65 - 41.80	0.15	Coal: clean, intermediate luster, hard, core intact; Recovery 100%
41.80 - 42.16	0.36	Mudstone parting: carbonaceous with vitreous bands up to 1 cm in width.
42.16 - 42.42	0.26	Coal: clean, intermediate luster, minor slickensides; Recovery 100%
42.42 - 43.12	0.70	Coal: clean, intermediate luster, vitreous bands 20%, dull soft peaty coal 10%, fairly hard, core intact; Recovery 100%
43.12 - 43.83	0.71	Coal: clean, intermediate luster, 20% vitreous bands, core intact.
43.83 - 44.33	0.51	Coal: clean, hard, intermediate luster, 10% vitreous bands, core intact.
44.33 - 44.56	0.50	Coal: clean, hard, intermediate luster, 10% vitreous bands, minor slickensides, core intact.
44.56 - 45.06	0.50	Coal: clean, intermediate luster, core broken and crushed.

MDD 78-4 (Cont'd.)

45.06 - 45.30	0.24	Coal: clean, vitreous, broken and crushed; Recovery 95%																																																							
45.30 - 45.35	0.05	Coal: dirty, broken and crushed; Recovery 80%																																																							
45.35 - 45.48	0.13	Coal: clean, intermediate luster.																																																							
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0196</td> <td>34.90-35.45</td> <td>0.55</td> <td>73.4</td> <td>1/2</td> </tr> <tr> <td>0197</td> <td>25.45-36.22</td> <td>0.77</td> <td>34.3</td> <td>4</td> </tr> <tr> <td>0198</td> <td>36.22-37.34</td> <td>1.12</td> <td>69.6</td> <td>1/2</td> </tr> <tr> <td>0199</td> <td>37.34-38.11</td> <td>0.77</td> <td>22.7</td> <td>5 1/2</td> </tr> <tr> <td>0200</td> <td>38.11-38.82</td> <td>0.71</td> <td>79.5</td> <td>NA</td> </tr> <tr> <td>0202</td> <td>38.82-39.94</td> <td>1.12</td> <td>23.9</td> <td>3 1/2</td> </tr> <tr> <td>0203</td> <td>39.94-41.80</td> <td>1.86</td> <td>25.8</td> <td>4 1/2</td> </tr> <tr> <td>0204</td> <td>41.80-42.42</td> <td>0.62</td> <td>53.8</td> <td>1</td> </tr> <tr> <td>0205</td> <td>42.42-43.83</td> <td>1.41</td> <td>9.3</td> <td>4 1/2</td> </tr> <tr> <td>0206</td> <td>43.83-45.48</td> <td>1.65</td> <td>4.2</td> <td>8</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0196	34.90-35.45	0.55	73.4	1/2	0197	25.45-36.22	0.77	34.3	4	0198	36.22-37.34	1.12	69.6	1/2	0199	37.34-38.11	0.77	22.7	5 1/2	0200	38.11-38.82	0.71	79.5	NA	0202	38.82-39.94	1.12	23.9	3 1/2	0203	39.94-41.80	1.86	25.8	4 1/2	0204	41.80-42.42	0.62	53.8	1	0205	42.42-43.83	1.41	9.3	4 1/2	0206	43.83-45.48	1.65	4.2	8
Samples	Interval	Width	Dry Ash	F.S.I.																																																					
0196	34.90-35.45	0.55	73.4	1/2																																																					
0197	25.45-36.22	0.77	34.3	4																																																					
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0199	37.34-38.11	0.77	22.7	5 1/2																																																					
0200	38.11-38.82	0.71	79.5	NA																																																					
0202	38.82-39.94	1.12	23.9	3 1/2																																																					
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45.48 - 47.32	1.84	Siltstone: carbonaceous, plant fossils, carbonaceous specks and stringers. BCA = 64°																																																							
47.32 - 51.72	4.40	Siltstone: plant fossils abundant, carbonaceous specks and stringers, flow features, minute fractures.																																																							
51.72 - 53.92	2.20	Siltstone: plant fossils, carbonaceous specks and stringers, calcite filled fractures, occasional slickensides.																																																							
53.92 - 56.18	2.26	Siltstone: plant fossils common, flow features, carbonaceous specks and stringers, minute vitreous stringers, minute fractures filled with calcite and coal, core solid. BCA = 63°																																																							
56.18 - 56.53	0.35	Mudstone: carbonaceous, core broken and crushed.																																																							
56.53 - 58.53	2.00	Siltstone/Mudstone: carbonaceous, plant fossils abundant, minute fractures filled with carbonaceous material and calcite, minor slickensides, core solid.																																																							
		COAL SEAM B3																																																							
58.53 - 58.92	0.39	Coal: 80% clean vitreous coal, 20% dirty coal and carbonaceous mudstone, slickensides, specks white ash, core crushed.																																																							
58.92 - 59.30	0.38	Coal: clean, 70% vitreous, 30% intermediate luster, core broken; Recovery 95%																																																							
59.30 - 60.40	1.10	Coal: appears clean, 60% vitreous, 40% intermediate luster, core broken and crushed; Recovered 0.58 m																																																							

MDD 78-4 (Cont'd.)

60.40 - 61.56	1.16	Coal: clean, 70% vitreous, 10% soft, dull, peaty coal, core intact; Recovery 100%
61.56 - 61.70	0.14	Mudstone parting: carbonaceous
61.70 - 61.76	0.06	Coal: clean, vitreous, broken and crushed.
61.76 - 62.09	0.33	Mudstone parting: carbonaceous
62.09 - 62.73	0.64	Coal: clean, intermediate luster with 20% vitreous bands, 20% soft, dull peaty coal, core fairly solid; Recovery 100%
62.73 - 63.46	0.73	Coal: clean, 80% vitreous. 63.22 - 63.26 dirty coal band, slickensides, core solid; Recovery 100%
63.46 - 63.60	0.14	Mudstone parting: carbonaceous, slickensides.
63.60 - 64.05	0.45	Coal: clean, 80% vitreous, 20% intermediate luster, core broken; Recovery 100%
64.05 - 64.26	0.21	Coal: clean, vitreous coal with 10% soft peaty coal, core solid; Recovery 100%
64.26 - 64.39	0.13	Mudstone parting: carbonaceous, vitreous stringers 1 - 3 mm in width.
64.39 - 64.55	0.16	Coal: clean, 60% intermediate luster, 40% vitreous, core broken and crushed; Recovery 80%
64.55 - 64.86	0.31	Coal: dirty and carbonaceous mudstone, vitreous bands up to 1 cm in width, slickensides, cor broken and crushed; Recovery 85%

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0207	58.53-60.40	1.87	27.1	4
0208	60.40-61.56	1.16	8.8	7.5
0209	61.56-62.09	0.53	79.9	0
0210	62.09-63.46	1.37	22.1	4
0211	63.46-64.26	0.80	23.6	7.5
0212	64.26-64.86	0.60	76.5	0

64.86 - 65.33	0.47	Mudstone: carbonaceous
65.33 - 65.56	0.23	Coal: dirty, core broken and crushed.
65.56 - 66.07	0.51	Sandstone: fine grained, with 30% siltstone interbeds, carbonaceous partings and stringers, slickensides.
66.07 - 66.30	0.23	Coal: ground and crushed (recovered 13 cm)
66.30 - 67.71	1.41	Siltstone: carbonaceous, plant fossils, coaly stringers and bands up to 0.5 cm in width, slickensides. BCA = 64°

MDD 78-4 (Cont'd.)

67.71 - 72.92	5.21	Sandstone: medium grained, occasional pebble, light grey, clean sandstone well sorted, core intact.
72.92 - 74.82	1.90	Sandstone: medium to coarse grained, light grey, occasional pebble. BCA = 54°
74.82 - 75.06	0.24	Conglomerate: pebbles well rounded.
75.06 - 75.48	0.42	Sandstone: medium grained, carbonaceous specks and stringers.
75.48 - 75.79	0.31	Conglomerate: pebble
75.79 - 78.90	3.11	Sandstone: medium grained, light grey, clean, well sorted, rare slickensides with calcite along slickensides. BCA = 58°
78.90 - 80.17	1.27	Mudstone: carbonaceous, plant fossils, vitreous stringers up to 0.5 cm in width.
80.17 - 80.37	0.20	Coal: broken and crushed; recovered 10 cm
80.37 - 83.18	2.81	Siltstone: some carbonaceous specks and stringers, minor flow features. BCA = 60°
83.18 - 84.00	0.82	Coal: dirty, core broken and crushed, approximately 30% mudstone chips; Recovered 32 cm
84.00 - 84.16	0.16	Mudstone: crushed and ground.
84.16 - 85.36	1.20	Sandstone: fine grained, carbonaceous stringers and partings, vitreous coal bands 2 - 3 cm in width, numerous fractures filled with coal, last 30 cm slickensides.
85.36 - 85.69	0.33	Mudstone: carbonaceous, dirty coal bands, slickensides, core broken and crushed.
85.69 - 88.12	2.43	Sandstone: fine grained, light grey, some carbonaceous stringers, minor flow features. BCA = 64°
88.12 - 89.37	1.25	Siltstone/Mudstone: plant fossils, carbonaceous, occasional slickensides, minute fractures filled with coal and calcite, dirty coal bands 3 - 4 cm in width.
89.37 - 89.54	0.17	Coal: fairly clean, intermediate luster.
89.54 - 91.66	2.12	Siltstone/Mudstone: carbonaceous, minute calcite filled fractures, minor slickensides, coaly bands 3 - 4 cm in width.

MDD 78-4 (Cont'd.)

91.66 - 93.09	1.43	Siltstone/Mudstone: carbonaceous, plant fossils, rare coaly band 2 - 3 cm in width.																				
93.09 - 98.16	5.07	Sandstone: very fine to fine grained, minor carbonaceous specks and stringers, calcite along slickensides and filling fractures. BCA = 64°																				
98.16 - 100.41	2.25	Sandstone: very fine grained, some carbonaceous siltstone intervals, flow features, minor fractures filled with calcite.																				
100.41 - 101.38	0.97	Sandstone: very fine to fine grained, rare slickensides, calcite filled fractures. BCA = 65°																				
101.38 - 101.99	0.61	Mudstone: carbonaceous, core solid.																				
COAL SEAM B1																						
101.99 - 102.59	0.60	Coal: 101.99 - 102.08 vitreous coal 102.08 - 102.59 coal, clean, hard, intermediate luster with 10% vitreous bands and 20% dull peaty coal, core solid.																				
102.59 - 103.47	0.88	Mudstone: carbonaceous, plant fossils, coaly bands up to 1 cm in width, minor slickensides.																				
103.47 - 103.55	0.08	Coal: dirty																				
103.55 - 104.15	0.06	Coal: clean, intermediate luster, 20% soft, dull, peaty coal, core fairly solid.																				
104.15 - 104.91	0.76	Coal: clean, 60 - 70% vitreous, 20% intermediate luster, 10% dull, peaty coal, core intact; Recovery 100%																				
104.91 - 105.05	0.14	Coal: vitreous																				
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0213</td> <td>101.99-102.59</td> <td>0.60</td> <td>13.59</td> <td>5.5</td> </tr> <tr> <td>0214</td> <td>102.59-103.47</td> <td>0.88</td> <td>88.28</td> <td>NA</td> </tr> <tr> <td>0215</td> <td>103.47-105.05</td> <td>1.58</td> <td>21.56</td> <td>6.5</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0213	101.99-102.59	0.60	13.59	5.5	0214	102.59-103.47	0.88	88.28	NA	0215	103.47-105.05	1.58	21.56	6.5
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																		
0213	101.99-102.59	0.60	13.59	5.5																		
0214	102.59-103.47	0.88	88.28	NA																		
0215	103.47-105.05	1.58	21.56	6.5																		
105.05 - 105.70	0.65	Mudstone: carbonaceous, core broken and crushed. (recovered 30 cm)																				
105.70 - 107.14	1.14	Mudstone: carbonaceous, plant fossils, slickensides, occasional 3 - 4 cm band of vitreous coal. BCA = 63°																				
107.14 - 107.47	0.33	Sandstone: fine grained, soft, carbonaceous and coaly stringers.																				

107.47 - 111.86	4.39	Sandstone: medium grained, light grey, clean, well sorted, rare carbonaceous stringers.
111.86 - 121.01	9.15	Sandstone: medium grained, light grey, clean, well sorted, rare carbonaceous parting, core intact. BCA = 65°
121.01 - 128.72	7.71	Sandstone: medium grained, light grey, clean, core intact. BCA = 65°
128.72 - 130.69	1.97	Sandstone: medium grained, light grey, some 4 - 6 cm siltstone intervals, occasional up clasts, some carbonaceous stringers and partings associated with the siltstone. BCA = 66°
130.69 - 135.12	4.43	Sandstone: fine to medium grained, light grey, some cross bedding.
135.12 - 139.38	4.26	Sandstone: fine to medium grained, light grey, occasional silt interval, some cross bedding, minor flow features.
139.38 - 143.18	3.80	Sandstone: fine grained, occasional siltstone interval, cross bedding, minor flow features. BCA = 62°
MOOSEBAR FORMATION (UPPER)		
143.18 - 145.84	2.66	Sandstone: fine grained, interbedded with 10% siltstone, minor flow features, occasional slickenside with calcite along slickenside surfaces.
145.84 - 148.03	2.19	Sandstone: fine grained, rare siltstone band, flow features, minor slickensides with calcite along slickenside surfaces.
148.03 - 150.16	2.13	Sandstone: fine grained, rare siltstone band, minor flow features. BCA = 60°
150.16 - 151.49	1.33	Sandstone: fine grained, with 20% siltstone, flow features, occasional carbonaceous speck or stringer.
151.49 - 152.22	0.73	Sandstone: medium grained, well sorted, minor cross bedding, carbonaceous partings.
152.22 - 152.92	0.70	Sandstone: fine grained, 30% siltstone interbeds, flow features, some carbonaceous stringers and partings.

MDD 78-4 (Cont'd.)

152.92 - 156.23	3.31	Sandstone: medium to fine grained, occasional siltstone interval, some carbonaceous specks and partings, rare rip-up clasts. BCA = 62°
156.23 - 156.73	0.50	Sandstone: medium grained.
156.73 - 158.00	1.27	Sandstone: fine grained, 10 - 15% siltstone interbeds, minor flow features, carbonaceous partings and stringers, slickensides with calcite common. BCA = 55°
158.00 - 160.63	2.63	Sandstone: fine grained, 10% siltstone intervals, carbonaceous partings, slickensides with calcite along slickenside surfaces. BCA = 50°
		FAULT ZONE
160.63 - 161.33	0.70	Sandstone: fine grained, slickensides, common, calcite along slickensides. BCA = 8°
161.33 - 162.66	1.33	Sandstone: fine grained, minor siltstone intervals, slickensides common with calcite along slickenside surfaces. BCA = 50°
162.66 - 164.62	1.96	Sandstone: medium grained, light grey, carbonaceous stringers and partings, minor slickensides, minor flow features. BCA = 68°
164.62 - 166.73	2.11	Sandstone: fine grained, with siltstone interbeds (20%) flow features, cross bedding, carbonaceous specks and stringers, slickensides.
166.73 - 172.82	6.09	Sandstone: medium grained, some cross bedding, rare siltstone band 2 - 3 cm wide, occasional rip-up clasts and slickensides. BCA = 62°
172.82 - 181.63	8.81	Sandstone: fine grained, with 20% siltstone interbeds, flow features, carbonaceous specks and stringer, core solid. BCA = 63°
181.63 - 185.76	4.13	Sandstone: fine grained, with 40% siltstone interbeds, flow features. BCA = 64°
185.76 - 194.26	8.50	Sandstone: fine grained, with 50% siltstone interbeds, carbonaceous stringers and partings, minute fractures filled with coal, flow features.

MOOSEBAR FORMATION (LOWER)		
194.26 - 198.52	4.26	Siltstone: with 20 - 30% fine grained sandstone interbeds, minor flow features, carbonaceous specks and stringers, pyrite modules up to 1.5 cm in diameter.
198.52 - 204.48	5.96	Siltstone: with less than 10% sandstone, calcite stringers, minor flow features, core solid.
204.48 - 211.02	6.54	Siltstone: minor flow features, pyrite blibs (0.5 cm) and disseminations. BCA = 64°
211.02 - 217.68	6.66	Siltstone: minor flow features, pyrite blibs and stringers up to 1 cm, occasional slickensides, core solid.
217.68 - 217.78	0.10	Kaolinite band
217.78 - 222.52	4.74	Siltstone: uniform, core solid.
222.52 - 222.60	0.08	Kaolinite band
222.60 - 228.01	5.41	Siltstone: uniform. BCA = 68°
228.01 - 232.24	4.23	Siltstone: pyrite disseminations, minute specks and vienlets of calcite, some slickensides.
232.24 - 239.48	7.24	Siltstone: pyrite disseminations and stringers, some calcite specks, rare slickensides.
239.48 - 243.23	3.74	Siltstone: pyrite and calcite specks common, rare slickensides. BCA = 68°
243.23 - 247.42	4.2	Siltstone: minor flow features.
247.42 - 249.34	1.92	Siltstone: occasional carbonaceous parting and stringers, some minute vitreous stringers.
249.34 - 254.98	5.64	Siltstone: uniform, core solid. BCA = 66° - 68°
GETHING FORMATION		
254.98 - 255.67	0.69	Conglomerate: pebble, pebbles 1 - 2 cm in diameter.
255.67 - 265.22	9.55	Conglomerate: medium grained, sand matrix, black chert and rare green chert pebbles, occasional coaly and calcite filled stringers.
265.22 - 265.50	0.28	Mudstone: carbonaceous, minor slickensides, vitreous stringers 2 - 3 mm in width.
265.50 - 266.02	0.52	Coal: clean, hard, intermediate luster with 40% vitreous bands, core solid; Recovery 100%
266.02 - 266.10	0.08	Mudstone: carbonaceous

		COAL SEAM			
266.10 - 266.14	0.04	Coal: dirty			
266.14 - 266.28	0.14	Mudstone: carbonaceous			
266.28 - 266.61	0.33	Coal: clean, 30% vitreous, 10% dull, core fairly solid.			
266.61 - 267.08	0.47	Coal: clean, vitreous 60%, intermediate luster 40%, core broken and crushed. Recovery 100%			
267.08 - 267.60	0.52	Siltstone parting: some slickensides, vitreous bands 2 - 3 mm in width.			
267.60 - 267.97	0.37	Coal: hard, clean, intermediate luster, with 10% vitreous bands, core broken; Recovery 80%.			
267.97 - 268.05	0.08	Coal: bone			
268.05 - 268.58	0.53	Coal: clean, intermediate luster, 40% vitreous bands, core fairly solid except for last 18 cm which is crushed. Recovery 85%			
268.58 - 269.30	0.72	Coal:			
		268.58 - 268.63 - carbonaceous mudstone			
		268.63 - 269.30 - clean coal, intermediate luster with 10% vitreous bands, core crushed. (recovered 35 cm)			
		<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>
		0244	265.50-267.08	1.58	51.40
		0245	267.08-267.60	0.52	92.44
		0246	267.60-269.30	1.70	26.17
					<u>F.S.I.</u>
					3.5
					NA
					6.5
269.30 - 270.36	1.06	Siltstone: some carbonaceous specks and stringers, core solid. BCA = 65°			
270.36 - 273.96	3.60	Siltstone: rare slickensides and carbonaceous interval, core solid.			
273.96 - 274.46	0.50	Sandstone: fine grained, with 20% siltstone interbeds.			
274.46 - 276.68	2.22	Sandstone: fine grained, light, grey, siltstone 10%, cross bedded. BCA = 66°			
276.68 - 278.88	2.20	Sandstone: medium grained, (salt and pepper) carbonaceous and coaly stringers up to 3 mm in width, minor slickensides.			
278.88 - 280.88	2.00	Sandstone: medium to coarse grained, carbonaceous specks and stringers, occasional vitreous band 0.5 cm in width.			

MDD 78-4 (Cont'd.)

280.88 - 286.45	5.57	Sandstone: coarse grained, light grey, (salt and pepper), carbonaceous stringers and partings, vitreous bands up to 0.5 cm in width. BCA = 70°															
286.45 - 291.69	5.24	Conglomerate: pebble, pebbles rounded, 0.5 cm average pebble diameter, numerous fractures filled with calcite and/or coal.															
291.69 - 292.60	0.91	Sandstone: coarse grained, occasional pebble, fractures filled with vitreous coal, core solid.															
292.60 - 296.12	3.52	Conglomerate: (pebble) with c.g. sandstone intervals, average pebble diameter 1 cm, fractures filled with calcite and coal															
296.12 - 300.40	4.28	Sandstone: coarse grained, occasional pebble or pebble band, minor slickensides, fractures filled with vitreous coal and calcite.															
300.40 - 303.15	2.75	Conglomerate: average pebble diameter 1 cm, minute fractures filled with calcite.															
303.15 - 303.67	0.52	Mudstone: carbonaceous, vitreous stringers, calcite along slickensides.															
COAL SEAM																	
303.67 - 303.89	0.22	Coal: fairly clean, core broken and crushed. Recovery 100%															
303.89 - 304.50	0.61	Coal: clean, hard, steely grey, 15% vitreous bands, core broken.															
304.50 - 306.93	2.43	Coal: clean, hard, steely grey, core broken and crushed. (recovered 1.43 m)															
306.93 - 307.33	0.40	Coal: clean, 60% vitreous, 20% intermediate luster, 20% dull peaty coal, core solid. Recovery 100%															
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<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>													
0247	303.67-304.50	0.83	22.31	2 1/2													
0248	304.50-307.33	2.83	15.04	2 1/2													
307.33 - 309.00	1.67	Mudstone: carbonaceous, plant fossils, slickensides, calcite along slickensides, vitreous coal stringers.															
309.00 - 316.08	7.08	Sandstone: medium grained, light grey, clean, occasional carbonaceous parting, core intact.															
316.08 - 326.85	10.77	Sandstone: fine grained, light grey, core solid.															
326.85 - 328.04	1.19	Siltstone: with 10% sandstone interbeds, flow fractures. BCA = 68°															

MDD 78-4 (Cont'd.)

328.04 - 329.87	1.74	Mudstone: core solid.
		COAL SEAM
329.78 - 329.87	0.09	Coal: bone
329.87 - 330.09	0.22	Coal: hard, clean, intermediate luster with 30% vitreous bands; Recovery 100%
330.09 - 331.32	1.13	Coal: clean, hard, 50% vitreous, 30% dull, 20% intermediate luster, fairly solid. Recovery 100%
331.32 - 332.04	0.72	Mudstone: carbonaceous and coaly, numerous slickensides, vitreous bands and stringers, occasional 4 cm band of crushed coal.
332.04 - 334.37	2.23	Siltstone: occasional carbonaceous parting, core solid.

<u>Interval</u>	<u>Width</u>	<u>Descriptions</u>
		<p><u>NOTE:</u> The following core boxes to T.D. were dropped from transporter during shipment to camp. The core logged below represents all the recoverable intact core. The depths of boxes have been lost in much of the upper portion of the core thus some sections lack depth control. These sections are logged as individual boxes.</p> <p style="text-align: center;">G.J.</p>
Box No. 156		All Core Missing
Box No. 157		All Core Missing
Box No. 158		Missing: 1.25m at top of box
	0.25	Siltstone: dark grey, sandy, thin interbeds of dark grey mudstone, sequence of graded units with unit thickness av. 0.02 m unfractured, medium competency. BCA = 61°
		Missing: 0.76 m at base of box
Box No. 159		Missing: All Core
Box No. 160		Missing: All Core
Box No. 161		Missing: All Core
Box No. 162		Missing: All Core
Box No. 163		Missing: All Core
Box No. 164		Missing: 0.36 m at top of box
	0.51	Sandstone: very fine grained, silty, medium grey becoming dark grey at base, very heavily bioturbated - all bedding obliterated, abundant small coalified plant fragments throughout, very competent.
		Missing: 0.64 m
		Sandstone: as above, probable continuation of above Unit.
Box No, 165		Missing: All Core
Box No. 166		
	0.02	Mudstone: dark grey, listric surface on bedding plane at top, grades to unit below, competent BCA = 55°
	0.63	Siltstone: grey, becomes sandy towards base, sandy phases towards base with moderate bioturbation, competent, slickensides. calcite filled fracture on bedding at base.
		- Missing: 0.09 m

0.24

Sandstone: fine grained, mid grey, frequent interbeds of dark grey siltstone, bedding disturbed by floral bioturbation, small coaly inclusions (rootlets), very competent, calcite filled slickensided fractures at top and base.

Sandstone: medium grained, light grey, bedding is regular, fine partings of carbonaceous material on bedding throughout, very competent.
BCA = 75°

Missing: 0.42 m

Box No. 167

358.68 - 358.75	0.07	Sandstone: as above, coalified plant rootlets at base, abrupt basal contact.
358.75 - 359.26	0.51	Mudstone: dark grey, listric surfaces on fractures throughout, calcite filled tension gashes in centre, abrupt basal contact, low competence.
COAL SEAM		
359.26 - 359.29	0.03	Coal: heavily sheared and slickensided, core badly broken.
359.29 - 359.42	0.13	Coal: 20% vitreous, core intact but strongly sheared.
359.42 - 359.56	0.14	Coal: 70% vitreous, core intact but strongly sheared.
359.56 - 359.58	0.02	Carbonaceous Claystone: black
359.58 - 359.62	0.04	Mudstone: light brown, possibly Kaolinitic
359.62 - 359.93	0.31	Carbonaceous Claystone: black, frequent large bright coal bands throughout and prominent at base, listric surfaces on bedding plane fractures, abrupt basal contact, low competency, core broken to 0.04 m units.
359.93 - 360.01	0.08	Coal: 40% vitreous, core mostly intact but heavily sheared.
360.01 - 360.08	0.07	Carbonaceous Claystone: black with numerous large bright coal bands, calcite filled bedding plane fractures, grades to unit at base, low competency.
360.08 - 360.69	0.61	Mudstone: grey, becoming silty at base, occasional interbeds of dark grey claystone in lower half core intact, moderately competent. BCA = 68°

Box No. 168

Missing: All Core

Box No. 169

2.01

Siltstone: mid grey with frequent thin interbeds of fine grained light grey sandstone and large gradational phases of dark grey mudstone, bedding slightly disturbed by floral bioturbation in top half, coalified plant rootlets, core intact.
BCA = 70°

Box No. 170

- Missing: 0.37 m
- 0.35 Sandstone: fine grained, light grey with thin grey siltstone interbeds, bedding moderately disturbed by bioturbation, core intact, very competent.
- 0.33 Missing:
- 0.43 Sandstone: very fine grained, mid grey, grading to dark grey silty mudstone at top, core intact, very competent.
BCA = 61°
- Missing: 0.25 m
- 0.51 Sandstone: as above, with interbeds of medium grained light grey sandstone.

Box No. 171

- 0.54 Sandstone: As above.
- Missing: 0.22 m
- 0.21 Sandstone: as above, graded to unit below.
- 0.27 Mudstone: dark grey to black, carbonaceous, numerous bright coal bands, fine calcite filled fractures on bedding, core intact, few bedding breaks, low competency.
BCA = 67°
- Missing: 0.29 m
- 0.450 Sandstone: medium grained, light grey with phases and interbeds of dark grey mudstone, small scale sedimentary structures disturbs bedding at base, very sharp, irregular basal contact, core intact, competent.
- 0.13 Mudstone: dark grey with few interbeds of grey siltstone, regular bedding, core intact, competent.
BCA = 67°
- Missing: 0.16 m

Box No. 172

- 0.280 Carbonaceous Claystone: bright coal bands, silty laminations in lower half, core solid, competent.
- COAL SEAM
- 0.02 Coal: very heavily sheared, core badly broken.
- 0.20 Coal: dully, high specific gravity.
- 0.48 Siltstone: sandy, carbonaceous, black, strongly bioturbated coal bands and inclusions, competent, core intact.

MDD 78-4 (Cont'd.)

	0.04	Coal: 30% vitreous
	0.03	Siltstone: as above.
	0.26	Coal: 10% vitreous, hard, high specific gravity, lightly sheared, core with few breaks.
	0.06	Carbonaceous Claystone: black, very sharp basal contact, core intact.
	0.02	Coal: 60% vitreous, core pulverized.
	0.02	Carbonaceous Claystone: as above.
	0.67	Sandstone: light grey, fine grained, massive, large coalified plant rootlets, core intact, competent.
Box No. 173		
		Missing: 0.54
	0.22	Sandstone: as above.
		Missing: 0.42
	0.33	Sandstone: light grey, fine to medium grained with phases of medium grained sandstone, very competent, core intact. BCA = 54 ⁰
		Missing: 0.17 m
372.39 - 373.85	1.46	Sandstone: as above.
373.85 - 374.41	0.56	Sandstone: medium grained, light grey, coalified plant rootlets, granule conglomerate pebble band near base, sharp basal contact, core intact, competent.
374.41 - 376.52	2.11	Conglomerate: granule to pebble with phases of coarse grained sandstone throughout, large coalified rootlets at top and base, core intact, very competent.
376.52 - 376.82	0.30	Sandstone: as above with large dark grey siltstone, sedimentary breccia fragments.
376.82 - 379.31	2.49	Sandstone: light grey, coarse grained with phases of granule conglomerate throughout, coalified plant rootlets throughout, very competent, core intact.
379.31 - 379.61	0.30	Conglomerate: granule, well sorted, very little matrix, competent, core intact, very sharp basal contact.
379.61 - 379.91	0.30	Carbonaceous Claystone: black, bright coal bands.
379.91 - 379.94	0.03	Coal: vitreous
379.94 - 380.13	0.19	Carbonaceous Claystone: as above.
380.13 - 380.30	0.17	Claystone: light grey, with a distinct burrow mottling by large black worm burrows, competent.

MDD 78-4 (Cont'd.)

380.30 - 380.49	0.19	Carbonaceous Claystone: black, coal inclusions.																				
		COAL SEAM																				
380.49 - 380.54	0.05	Coal: dull, high specific gravity, core intact.																				
380.54 - 380.65	0.11	Coal: 10% vitreous, core intact.																				
380.65 - 380.69	0.04	Coal: dull, high specific gravity, core intact.																				
380.69 - 380.72	0.03	Carbonaceous Claystone: dark brown, core intact.																				
380.72 - 380.82	0.10	Coal: dull, high specific gravity, core intact.																				
380.82 - 381.08	0.26	Coal: 20% vitreous, core intact.																				
381.08 - 381.11	0.03	Coal: bright, core intact.																				
381.11 - 382.76	1.65	Mudstone: dark grey, silty, carbonaceous near top, core intact, competent.																				
		Missing: 1.82 m																				
Box No. 179																						
382.73 - 385.16	2.43	Siltstone: grey with thin sandy interbeds near top and grading to carbonaceous mudstone at base, core intact, competent. BCA = 70°																				
		COAL SEAM																				
385.16 - 385.29	0.13	Coal: 40% vitreous, core badly broken.																				
385.29 - 385.68	0.39	Mudstone: dark grey, carbonaceous at top, core intact, competent.																				
385.68 - 385.95	0.27	Coal: dull, high specific gravity, core broken in lower half.																				
385.95 - 386.02	0.07	Claystone: dark grey, silty.																				
386.02 - 386.27	0.25	Coal: dull, high specific gravity, core broken at top.																				
386.27 - 386.47	0.20	Coal: vitreous, 40% lightly sheared.																				
		<table border="0"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0254</td> <td>385.68-385.95</td> <td>0.27</td> <td>24.6</td> <td>1 1/2</td> </tr> <tr> <td>0255</td> <td>385.95-386.02</td> <td>0.07</td> <td>87.1</td> <td>NA</td> </tr> <tr> <td>0256</td> <td>386.02-386.47</td> <td>0.45</td> <td>19.6</td> <td>1 1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0254	385.68-385.95	0.27	24.6	1 1/2	0255	385.95-386.02	0.07	87.1	NA	0256	386.02-386.47	0.45	19.6	1 1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																		
0254	385.68-385.95	0.27	24.6	1 1/2																		
0255	385.95-386.02	0.07	87.1	NA																		
0256	386.02-386.47	0.45	19.6	1 1/2																		
386.47 - 396.61	0.14	Sandstone: fine to medium grained, light grey, with frequent large phases of grey siltstone and mudstone, carbonaceous at top, core intact, competent. BCA = 70°																				
396.61 - 397.78	1.17	Sandstone: as above but characterized by mudstone sedimentary breccia of the mudstone phases.																				
397.78 - 398.85	0.07	Siltstone: dark grey with thin fine grained sandstone interbeds, strongly bioturbated, core solid and competent.																				

MDD 78-4 (Cont'd.)

			Missing: 0.16 m
	1.30		Siltstone: as above.
Box No. 186			
			Missing: All Core
Box No. 187			
			Missing: All Core
Box No. 188			
403.55 - 404.61	1.06		Conglomerate: pebble to boulder, rounded to sub-rounded, chert and angilite, white and grey tones, matrix 30% at top reducing to 15% - Cadomin Formation?
Box No. 189			
			Missing: All Core to T.D.

NOTE: - Errors in markers above. Upset core is not corrected in this section. The incomplete sequence of blocks does not allow for determination of compounding or correcting the error.

P A C I F I C P E T R O L E U M S L T D.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-05

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, c-29-B
- (c) Drill Hole Co-ordinates: N 14580.93 - E 4476.62
- (d) Elevation: 1245.94m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 - B7
TOTAL DEPTH: 268.0m

DATE DRILLED: June 27 - July 3, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: G. Jordan

GEOPHYSICAL LOGS: Dev., Dens/Cal, FBL, GRN

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 26.52	26.52	CASING
<u>GATES MEMBER - COMMOTION FORMATION</u>		
26.52 - 28.97	2.45	Siltstone: sandy, medium grey with thin sandstone interbeds, one phase of dark grey mudstone, iron staining, core broken, sharp irregular basal contact.
28.97 - 32.89	3.92	Mudstone: dark grey, silty at top, coalified plant fragments near the top, gradational basal contact, iron staining, core broken.
32.89 - 34.52	1.63	Siltstone: medium grey, with thin interbeds of dark grey mudstone, bedding disturbed by floral bioturbation; unit characterized by abundant fine irregular coalified rootlets, iron staining.
34.52 - 34.97	0.45	Siltstone: as above, core badly broken with intermixed coal spoil.
34.97 - 35.86	0.89	Siltstone: as above, core intact.
35.86 - 36.47	0.61	Mudstone: dark grey, with occasional interbeds of grey fossiliferous sandstone, core broken at top, occasional bright coal bands.
36.47 - 36.68	0.21	Mudstone: as above, core broken.
36.68 - 37.47	0.79	Core Loss.
37.47 - 38.30	0.83	Mudstone: as above, core intact.
38.30 - 39.30	1.00	Siltstone and Mudstone: interbedded; dark grey mudstone with frequent thin interbeds of grey siltstone unit characterized by coalified rootlets, with penetration marks disturbing bedding. BCA = 38 ⁰
COAL SEAM B7		
39.30 - 39.35	0.05	Coal and Claystone: interbedded, black carbonaceous claystone with frequent bright coal bands, high S.G., core intact.

MDD 78-5 (Cont'd.)

39.35 - 39.62	0.27	Core Loss.
39.62 - 39.71	0.09	Claystone carbonaceous: dark brown, core intact, very heavily sheared.
39.71 - 39.76	0.05	Coal: 50% vitreous, sheared, core broken and pulverized.
39.76 - 39.79	0.03	Coal: 20% vitreous, sheared, core intact.
39.79 - 39.86	0.07	Coal: 10% vitreous, core badly broken, sheared.
39.86 - 39.89	0.03	Coal: Dull, core intact, sheared.
38.89 - 39.92	0.03	Clay: carbonaceous, brown, soft.
39.92 - 39.95	0.03	Coal: Boney, core intact.
39.95 - 40.12	0.17	Coal: 50% vitreous, core broken and pulverized.
40.12 - 40.26	0.14	Coal: 30% vitreous, core broken and pulverized.
40.26 - 40.29	0.03	Coal: 10% vitreous, core intact.
40.29 - 40.38	0.09	Coal: 70% vitreous, core intact.
40.38 - 40.41	0.03	Coal: 20% vitreous, core intact.
40.41 - 40.45	0.04	Coal: Bright, core intact.
40.45 - 40.62	0.17	Coal and claystone: interbedded, black carbonaceous claystone with coal bands, core pulverized and mixed in box.
40.62 - 40.72	0.10	Coal: 10% vitreous, core broken and pulverized, mixed in box.
40.72 - 40.84	0.12	Claystone: carbonaceous, core broken and pulverized, mixed in box.
40.84 - 41.76	0.92	Core missing.
41.76 - 41.91	0.15	Claystone: carbonaceous with bright bands.
41.91 - 41.95	0.04	Coal: 50% vitreous, core intact.
41.95 - 41.98	0.03	Coal: 70% vitreous, core intact.
41.98 - 42.02	0.04	Coal: Bright, core intact.
42.02 - 42.07	0.05	Coal: 30% vitreous, core intact.
42.07 - 42.10	0.03	Claystone: carbonaceous, black, coal bands.

MDD 78-5 (Cont'd.)

Interval	Thickness	Description	Samples	Interval	Width	Dry Ash	F.S.I.
42.10 - 42.14	0.04	Coal: 30% vitreous, core intact.					
			0269	39.30 - 40.45	1.15	26.0	4½
			0270	40.45 - 40.84	0.39	23.5	7
			0271	40.84 - 41.91	1.07	83.7	N/A
			0272	41.91 - 42.14	0.23	33.0	6
42.14 - 42.97	0.83	Claystone: dark grey, low competency, iron stained.					
42.97 - 46.77	3.80	Siltstone and Mudstone: interbedded, dark grey mudstone with thin grey siltstone interbeds, some fine grained sandstone phases, iron stained, core intact. BCA = 43°					
46.77 - 47.06	0.29	Sandstone: white, strongly cross-bedded, medium grained with abundant carbonaceous partings on bedding.					
47.06 - 51.81	4.75	Mudstone: dark grey, low competency, iron staining, very occasional sandstone phases, as above.					
51.81 - 52.03	0.22	Sandstone: very light grey, strongly cross-bedded, thin grey siltstone laminations in lower half.					
52.03 - 55.90	3.87	Mudstone: dark grey, siltstone interbeds at the top, iron staining on fractures.					
55.90 - 57.03	1.13	Siltstone: medium grained, with irregularly bedded sandstone interbeds and inclusions.					
57.03 - 57.64	0.61	Mudstone: dark grey, carbonaceous at the base with bright coal bands.					

MDD 78-5 (Cont'd.)

COAL, SEAM B6

57.64 - 57.70	0.06	Coal: boney.
57.70 - 57.74	0.04	Claystone: carbonaceous, bright coal bands.
57.74 - 57.78	0.04	Coal: boney.
57.78 - 57.86	0.08	Claystone: carbonaceous.
57.86 - 57.94	0.08	Coal: 10% vitreous, core intact.
57.94 - 58.00	0.06	Coal: 70% vitreous, core intact.
58.00 - 58.03	0.03	Coal: Bright, core intact.
58.03 - 58.08	0.05	Coal: 10% vitreous, core intact.
58.08 - 58.12	0.04	Coal: 70% vitreous, core intact.
58.12 - 58.20	0.08	Coal: 50% vitreous, core intact.
58.20 - 58.27	0.07	Coal: 70% vitreous, core intact.
58.27 - 58.29	0.02	Coal: 10% vitreous, core intact.
58.29 - 58.33	0.04	Claystone: dark grey, core broken, low competency.
58.33 - 59.80	1.47	Siltstone: grey, with dark grey mudstone, interbeds, iron staining on fractures carbonaceous at the base.
59.80 - 59.84	0.04	Coal: 30% vitreous, core intact.
59.84 - 59.87	0.03	Coal: Bright, core intact.
59.87 - 59.94	0.07	Coal: 50% vitreous, core intact.
59.94 - 60.02	0.08	Coal: 30% vitreous, core intact.
60.02 - 60.39	0.37	Mudstone: dark grey, iron staining on vertical joints, BCA = 60°.
60.39 - 60.62	0.23	Coal and claystone: interbedded.
60.62 - 60.74	0.12	Claystone: carbonaceous, sub-fissile.

MDD 78-5 (Cont'd.)

60.74 - 60.77	0.03	Coal: 70% vitreous, core intact.
60.77 - 60.88	0.11	Coal: 50% vitreous, core intact.
60.88 - 60.93	0.05	Coal: 50% vitreous, sheared, core intact.
60.93 - 60.97	0.04	Coal: 30% vitreous, core intact.
60.97 - 61.02	0.05	Coal: Bright, core intact.
61.02 - 61.06	0.04	Coal: 30% vitreous, core intact.
61.06 - 61.20	0.14	Coal: Bright, core intact.
61.20 - 61.41	0.21	Claystone: carbonaceous.
61.41 - 62.56	1.15	Siltstone: grey, with interbeds of dark grey mudstone bedding disturbed by bioturbation, iron staining on fractures, occasional large bright coal bands.
62.56 - 62.60	0.04	Coal: bright.
62.60 - 63.45	0.85	Siltstone: as above.
63.45 - 66.02	2.57	Sandstone: grey, strongly cross-bedded, some phases with slump structures, frequent interbeds of grey siltstone, very sharp basal contact, iron staining.
66.02 - 66.72	0.70	Mudstone: dark grey with bright coal bands, core broken and slickensided on coal partings.
66.72 - 76.04	9.32	Mudstone: dark grey with frequent siltstone phases. BCA = 55°.
76.04 - 77.35	1.31	Siltstone: grey with interbeds of fine grained sandstone bedding slumped and disturbed by abundant coalified rootlets, large coaly inclusions towards the base, gradational basal contact.
77.35 - 79.92	2.57	Mudstone: dark grey, bright coal bands towards the base.

MDD 78-5 (Cont'd.)

COAL SEAM B5

79.92 - 79.95	0.03	Coal: 30% vitreous, core solid.
79.95 - 80.12	0.17	Mudstone: as above.
80.12 - 80.19	0.07	Coal: Dull.
80.19 - 80.24	0.05	Coal: 10% vitreous.
80.24 - 80.29	0.05	Coal: 30% vitreous.
80.29 - 80.31	0.02	Coal and Claystone: interbedded.
80.31 - 80.35	0.04	Coal: Bright.
80.35 - 80.39	0.04	Coal: 10% vitreous.
80.39 - 80.42	0.03	Coal: stoney.
80.42 - 80.46	0.04	Coal: 50% vitreous.
80.46 - 80.54	0.08	Coal: 70% vitreous.
80.54 - 80.60	0.06	Coal: 50% vitreous.
80.60 - 80.64	0.04	Coal: 50% vitreous, moderately sheared.
80.64 - 80.67	0.03	Coal: Bright, core broken.
80.67 - 80.70	0.03	Coal: Dull.
80.70 - 80.86	0.16	Coal: 30% vitreous.
80.86 - 81.38	0.52	Core Missing: probable additional core loss 0.3m.
81.38 - 81.46	0.08	Coal: 50% vitreous.
81.46 - 81.49	0.03	Coal: 30% vitreous.
81.49 - 81.55	0.06	Coal: dull, hard.
81.55 - 81.70	0.15	Coal: 10% vitreous.
81.70 - 81.81	0.11	Coal: dull, hard.
81.81 - 81.86	0.05	Coal: bright.
81.86 - 81.99	0.13	Coal: dull, sheared, core broken.

MDD 78-5 (Cont'd.)

81.99 - 82.03	0.04	Coal: 10% vitreous.																									
82.03 - 82.09	0.06	Coal: dull, hard.																									
82.09 - 82.16	0.07	Claystone: dark grey.																									
82.16 - 82.59	0.43	Coal: 30% - 70% vitreous.																									
82.59 - 82.61	0.02	Coal: 10% vitreous.																									
82.61 - 82.65	0.04	Coal: bright.																									
82.65 - 82.71	0.06	Coal: 50% vitreous.																									
82.71 - 82.72	0.01	Coal: dull abundant Fusaine.																									
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0273</td> <td>80.12 - 80.86</td> <td>0.74</td> <td>16.3</td> <td>7½</td> </tr> <tr> <td>0274</td> <td>81.38 - 82.09</td> <td>0.71</td> <td>11.7</td> <td>3</td> </tr> <tr> <td>0275</td> <td>82.09 - 82.16</td> <td>0.07</td> <td>93.2</td> <td>N/A</td> </tr> <tr> <td>0276</td> <td>82.16 - 82.72</td> <td>0.56</td> <td>12.0</td> <td>5½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0273	80.12 - 80.86	0.74	16.3	7½	0274	81.38 - 82.09	0.71	11.7	3	0275	82.09 - 82.16	0.07	93.2	N/A	0276	82.16 - 82.72	0.56	12.0	5½
Samples	Interval	Width	Dry Ash	F.S.I.																							
0273	80.12 - 80.86	0.74	16.3	7½																							
0274	81.38 - 82.09	0.71	11.7	3																							
0275	82.09 - 82.16	0.07	93.2	N/A																							
0276	82.16 - 82.72	0.56	12.0	5½																							
82.72 - 99.67	16.95	Mudstone: dark grey with occasional phases of grey siltstone, massive, some carbonaceous phases, low competency.																									
99.67 - 111.04	11.37	Siltstone: grey with phases and interbeds of dark grey mudstone, bedding slumped in places. BCA = 59°.																									
111.04 - 115.90	4.86	Sandstone: interbedded with mudstone, sandstone light grey, fine grained, with frequent interbeds of dark grey mudstone, bedding disturbed by small scale sedimentary structures, slumped towards the base.																									
115.90 - 120.28	4.38	Mudstone: dark grey, carbonaceous at base, with bright coal bands, occasional grey siltstone phases.																									
120.28 - 121.44	1.16	Sandstone: fine grained, light grey, small scale cross bedding, thin carbonaceous partings on bedding surfaces.																									
121.44 - 123.82	2.38	Siltstone and mudstone: interbedded, grey siltstone and dark grey mudstone interbedded forming thin graded units, laminated. BCA = 43°.																									
123.82 - 130.20	6.38	Mudstone: dark grey, phases of grey siltstone, towards the top, carbonaceous at the base, some bright coal bands.																									

MDD 78-5 (Cont'd.)

COAL SEAM B4

130.20 - 130.23	0.03	Coal: Dull.
130.23 - 130.27	0.04	Coal: 30% vitreous.
130.27 - 130.31	0.04	Coal: carbonaceous claystone and frequent bright coal bands.
130.31 - 130.36	0.05	Coal: 25% vitreous.
130.36 - 130.56	0.20	Claystone: carbonaceous, black, with bright coal bands.
130.56 - 130.64	0.08	Coal: 50% vitreous.
130.64 - 130.83	0.19	Siltstone: carbonaceous, bright coal bands.
130.83 - 130.89	0.06	Coal: 30% vitreous.
130.89 - 130.94	0.05	Coal: 70% vitreous.
130.94 - 130.98	0.04	Coal: bright.
130.98 - 131.04	0.06	Coal: 70% vitreous.
131.04 - 131.10	0.06	Coal: 40% vitreous.
131.10 - 131.13	0.03	Coal: 10% vitreous.
131.13 - 131.16	0.03	Coal: bright.
131.16 - 131.19	0.03	Coal: dull.
131.19 - 131.94	0.75	Siltstone: dark grey, large coaly inclusions.
131.94 - 131.97	0.03	Coal: 10% vitreous.
131.97 - 131.99	0.02	Claystone: carbonaceous, bright coal bands.
131.99 - 132.05	0.06	Coal: 50% vitreous.
132.05 - 132.12	0.07	Coal: boney.
132.12 - 132.18	0.06	Coal: 50% vitreous.
132.18 - 132.23	0.05	Claystone: carbonaceous.
132.23 - 132.28	0.05	Coal: 50% vitreous.
132.28 - 132.32	0.04	Coal: boney.

MDD 78-5 (Cont'd.)

132.32 - 132.39	0.07	Coal: 70% vitreous.
132.39 - 132.43	0.04	Coal: 50% vitreous.
132.43 - 132.47	0.04	Coal: 30% vitreous.
132.47 - 132.50	0.03	Coal: Dull.
132.50 - 132.53	0.03	Coal: 50% vitreous, sheared.
132.53 - 132.56	0.03	Coal: bright.
132.56 - 132.58	0.02	Coal: boney.
132.58 - 132.63	0.05	Coal: dull.
132.63 - 132.69	0.06	Coal: 50% vitreous.
132.69 - 132.74	0.05	Coal: 70% vitreous.
132.74 - 132.78	0.04	Coal: boney.
132.78 - 133.20	0.42	Core loss.
133.20 - 133.25	0.05	Coal: dull, high specific gravity.
133.25 - 133.29	0.04	Coal: dull, sheared.
133.29 - 133.56	0.27	Siltstone/Mudstone: interbedded, dark grey mudstone with thin interbeds of light grey siltstone. BCA = 48°.
133.56 - 133.60	0.04	Claystone: carbonaceous, heavily sheared.
133.60 - 133.70	0.10	Coal: dull, sheared.
133.70 - 134.70	1.00	Core missing.
134.70 - 134.79	0.09	Coal: 30% vitreous, core broken.
134.79 - 134.92	0.13	Claystone: carbonaceous, sheared listric surfaces, core broken.
134.92 - 135.00	0.08	Coal: dull.
135.00 - 135.04	0.04	Coal: dull, sheared, core broken.
135.04 - 135.09	0.05	Mudstone: grey, core badly broken.
135.09 - 135.24	0.15	Coal: dull, core badly broken.

MDD 78-5 (Cont'd.)

135.24 - 135.30	0.06	Coal: 30% vitreous.
135.30 - 135.41	0.11	Coal: 50% vitreous, core pulverized.
135.41 - 135.45	0.04	Coal: 30% vitreous.
135.45 - 135.56	0.11	Coal: 50% vitreous.
135.56 - 135.63	0.07	Coal: 30% vitreous.
135.63 - 136.25	0.62	Core missing.
136.25 - 136.33	0.08	Coal: bright, sheared.
136.33 - 136.45	0.12	Mudstone: dark grey, carbonaceous bands.
136.45 - 136.50	0.05	Claystone: carbonaceous.
136.50 - 136.57	0.07	Coal: 50% vitreous.
136.57 - 136.65	0.08	Coal: bright.
136.65 - 136.74	0.09	Mudstone: carbonaceous, dark grey, bright coal bands.
136.74 - 136.79	0.05	Coal: 50% vitreous, very heavily sheared.
136.79 - 136.82	0.03	Coal: 30% vitreous, very heavily sheared, core broken.
136.82 - 136.87	0.05	Mudstone: dark grey, carbonaceous.
136.87 - 136.92	0.05	Coal: dull, very heavily sheared.
136.92 - 136.96	0.04	Mudstone: dark grey, heavily sheared, core broken.
136.96 - 137.01	0.05	Coal: stoney, bright coal bands.
137.01 - 137.46	0.45	Mudstone: carbonaceous, frequent bright coal bands.
137.46 - 138.07	0.61	Core missing.
138.07 - 138.24	0.17	Coal: 50% vitreous.
138.24 - 138.59	0.35	Coal: dull, high specific gravity.
138.59 - 138.71	0.12	Coal: 25% vitreous.
138.71 - 138.75	0.04	Coal: Dull.

MDD 78-5 (Cont'd.)

138.75 - 138.81	0.06	Coal: 30% vitreous.
138.81 - 138.86	0.05	Coal: 50% vitreous.
138.86 - 138.90	0.04	Coal: 70% vitreous.
138.90 - 139.00	0.10	Coal: Dull.
139.00 - 139.06	0.06	Coal: 20% vitreous.
139.06 - 139.10	0.04	Coal: Bright.
139.10 - 139.29	0.19	Core missing.
139.29 - 139.34	0.05	Coal: 40% vitreous.
139.34 - 139.38	0.04	Coal: 70% vitreous.
139.38 - 139.43	0.05	Coal: 50% vitreous.
139.43 - 139.52	0.09	Coal: Dull.
139.52 - 139.61	0.09	Coal: 10% vitreous.
139.61 - 139.66	0.05	Coal: Bright
139.66 - 139.85	0.19	Coal: 20% vitreous.
139.85 - 139.91	0.06	Coal: Bright, core broken.
139.91 - 139.96	0.05	Coal: 50% vitreous.
139.96 - 140.01	0.05	Coal: 10% vitreous.
140.01 - 140.12	0.11	Coal: 40% vitreous.
140.12 - 140.18	0.06	Coal: 70% vitreous.
140.18 - 140.23	0.05	Coal: 50% vitreous.
140.23 - 140.26	0.03	Coal: 70% vitreous.
140.26 - 140.33	0.07	Coal: 50% vitreous.
140.33 - 140.37	0.04	Coal: 30% vitreous.
140.37 - 140.43	0.06	Coal: 50% vitreous.

MDD 78-5 (Cont'd.)

140.43 - 140.52	0.09	Coal: 30% vitreous, core broken.
140.52 - 140.63	0.11	Coal: 50% vitreous, core broken.
140.63 - 140.67	0.04	Coal: 70% vitreous.
140.67 - 140.77	0.10	Coal: 30% vitreous.
140.77 - 140.85	0.08	Coal: 70% vitreous.
140.85 - 140.88	0.03	Coal: 20% vitreous.
140.88 - 141.01	0.13	Coal: 50% vitreous.
141.01 - 141.18	0.17	Coal: 10% vitreous.
141.18 - 141.29	0.11	Coal: 25% vitreous.
141.29 - 141.37	0.08	Coal: 70% vitreous.
141.37 - 141.47	0.10	Coal: 30% vitreous.
141.47 - 141.53	0.06	Coal: 50% vitreous.
141.53 - 141.61	0.08	Coal: 30% vitreous.
141.61 - 141.64	0.03	Coal: 10% vitreous.
141.64 - 141.68	0.04	Coal: 70% vitreous.
141.68 - 141.76	0.08	Coal: 50% vitreous, core broken

Samples	Interval	Width	Dry Ash	F.S.I.
0277	130.20 - 130.64	0.44	38.2	2
0278	130.64 - 130.83	0.19	80.6	N/A
0279	130.83 - 131.19	0.36	15.8	7
0280	131.19 - 131.94	0.75	86.5	N/A
0281	131.94 - 133.29	1.35	20.8	3½
0282	133.29 - 133.60	0.31	86.6	N/A
0283	133.60 - 134.79	1.19	21.4	5
0284	134.79 - 134.92	0.13	81.7	N/A
0285	134.92 - 136.33	1.41	31.8	2½
0286	136.33 - 136.50	0.17	50.9	½
0287	136.50 - 136.79	0.29	10.8	7½
0288	136.79 - 138.07	1.28	56.7	1
0289	138.07 - 141.76	3.69	8.1	7½

MDD 78-5 (Cont'd.)

141.76 - 148.06	6.30	Siltstone and Mudstone: interbedded, dark grey mudstone and grey siltstone forming thin graded units, regular bedding, laminated, medium to low competency. BCA = 48°.
148.06 - 148.48	0.42	Claystone: carbonaceous dark grey, frequent bright coal bands.
		COAL SEAM B3
148.48 - 148.55	0.07	Coal: 50% vitreous, core intact.
148.55 - 148.59	0.04	Coal: 90% vitreous, core intact.
148.59 - 148.63	0.04	Coal: 20% vitreous, core intact.
148.63 - 148.77	0.14	Coal: 40% vitreous, core intact.
148.77 - 148.83	0.06	Coal: bright, core intact.
148.83 - 148.89	0.06	Coal: 10% vitreous, core intact.
148.89 - 149.00	0.11	Coal: 30% vitreous, core intact.
149.00 - 149.08	0.08	Coal: 10% vitreous, core intact.
149.08 - 149.13	0.05	Coal: 30% vitreous, core intact.
149.13 - 149.21	0.08	Coal: 10% vitreous, core intact.
149.21 - 149.25	0.04	Coal: 50% vitreous, core intact.
149.25 - 149.33	0.08	Coal: 30% vitreous, core intact.
149.33 - 149.37	0.04	Coal: dull, vitreous, core intact.
149.37 - 149.41	0.04	Coal: bright, vitreous, core intact.
149.41 - 149.49	0.08	Coal: 10% vitreous, core intact.
149.49 - 149.53	0.04	Coal: 30% vitreous, core intact.
149.53 - 149.58	0.05	Coal: 50% vitreous, core intact.
149.58 - 149.69	0.11	Coal: 30% vitreous, core intact.
149.69 - 149.72	0.03	Coal: 50% vitreous, core intact.
149.72 - 149.77	0.05	Coal: dull, sheared.
149.77 - 149.82	0.05	Coal: 30% vitreous, sheared.

MDD 78-5 (Cont'd.)

149.82 - 149.86	0.04	Coal: dull, sheared.
149.86 - 149.93	0.07	Coal: 30% vitreous, sheared.
149.93 - 149.99	0.06	Coal: 50% vitreous, sheared.
149.99 - 150.63	0.64	Claystone: carbonaceous, black, bright coal bands with grey siltstone interbeds towards the base.
150.63 - 150.71	0.08	Coal: 10% vitreous, core solid.
150.71 - 150.80	0.09	Coal: 30% vitreous.
150.80 - 150.87	0.07	Coal: 50% vitreous.
150.87 - 150.89	0.02	Coal: dull.
150.89 - 150.96	0.07	Coal: bright.
150.96 - 151.02	0.06	Coal: dull.
151.02 - 151.22	0.20	Coal: 30% vitreous.
151.22 - 151.28	0.06	Coal: dull.
151.28 - 151.32	0.04	Coal: boney.
151.32 - 151.38	0.06	Coal: 30% vitreous.
151.38 - 151.46	0.08	Coal: 30% vitreous, core broken.
151.46 - 151.48	0.02	Coal: bright.
151.48 - 151.57	0.09	Coal: dull.
151.57 - 151.64	0.07	Coal: 50% vitreous.
151.64 - 151.66	0.02	Coal: stoney.
151.66 - 151.68	0.02	Coal: 70% vitreous.
151.68 - 151.72	0.04	Coal: 10% vitreous.
151.72 - 151.94	0.22	Claystone: carbonaceous, slickensides and listric surfaces on fractures.
151.94 - 152.06	0.12	Coal: dull, core broken, high S.G., sheared.

MDD 78-5 (Cont'd.)

152.06 - 152.17	0.11	Coal: dull, sheared.
152.17 - 152.23	0.06	Coal: 30% vitreous, sheared.
152.23 - 152.47	0.24	Coal: dull, sheared.
152.47 - 152.59	0.12	Coal: 10% vitreous sheared.
152.59 - 152.65	0.06	Coal: 30% vitreous sheared.
152.65 - 152.70	0.05	Coal: dull sheared.
152.70 - 152.73	0.03	Coal: dull, fusain sheared.
152.73 - 152.79	0.06	Coal: bright sheared.
152.79 - 152.83	0.04	Coal: 50% vitreous sheared.
152.83 - 152.87	0.04	Coal: 70% vitreous sheared.
152.87 - 152.90	0.03	Coal: 50% vitreous sheared.
152.90 - 152.96	0.06	Coal: 70% vitreous sheared.
152.96 - 153.57	0.61	Mudstone: dark grey, carbonaceous, bright coal bands.
153.57 - 153.61	0.04	Coal: 50% vitreous, core pulverized.
153.61 - 153.65	0.04	Mudstone: carbonaceous, as above.
153.65 - 153.69	0.04	Coal: Bright, pulverized.
153.69 - 153.82	0.13	Mudstone: carbonaceous, as above.
153.82 - 153.88	0.06	Coal: dull, core pulverized, powdered.
153.88 - 153.92	0.04	Coal: 70% vitreous.
153.92 - 154.01	0.09	Coal: 30% vitreous, core broken.
154.01 - 154.04	0.03	Coal: 50% vitreous, core broken.
154.04 - 154.53	0.49	Core missing.
154.53 - 154.64	0.11	Coal: 50% vitreous, core broken.
154.64 - 154.71	0.07	Claystone: carbanceous, black.
154.71 - 154.74	0.03	Coal: 50% vitreous.

MDD 78-5 (Cont'd.)

154.74 - 155.09	0.35	Sandstone and Mudstone: interbedded, dark grey mudstone with thin interbeds of fine grained light grey sandstone. BCA = 60°.
154.09 - 155.12	0.03	Coal: 50% vitreous.
155.12 - 155.15	0.03	Mudstone: dark grey, carbonaceous.
155.15 - 155.24	0.09	Coal: 50% vitreous.
155.24 - 155.32	0.08	Mudstone: dark grey, carbonaceous at top, occasional interbeds of grey siltstone, competent.
155.32 - 155.39	0.07	Coal: dull.

Samples	Interval	Width	Dry Ash	F.S.I.
0290	148.48 - 149.99	1.51	4.94	7½
0291	149.99 - 150.63	0.64	53.42	2
0292	150.63 - 151.72	1.09	67.16	1½
0293	151.72 - 152.06	0.34	12.70	4½
0294	152.06 - 152.96	0.90	7.37	9
0295	152.96 - 153.57	0.61	84.17	N/A
0296	153.57 - 153.82	0.25	68.15	1
0297	153.82 - 154.64	0.82	7.85	8
0298	154.64 - 154.74	0.10	70.41	1½
0299	154.74 - 155.09	0.35	90.48	N/A
0300	155.09 - 155.24	0.15	29.10	6

155.39 - 156.95	1.56	Mudstone and Sandstone: interbedded, as above.
156.95 - 170.89	13.94	Sandstone: medium to coarse grained, light grey with frequent pebble and granular conglomerate phases, a few phases of dark grey mudstone, very competent.
170.89 - 171.95	1.06	Mudstone: dark grey, sandy, sandstone phases towards base.
171.95 - 174.20	2.25	Sandstone: medium grained, light grey, coaly inclusions, occasional phases of thin carbonaceous partings on bedding.
174.20 - 174.29	0.09	Mudstone: dark grey.
174.29 - 178.74	4.45	Breccia: sedimentary, composed of angular fragments of interbedded siltstone and mudstone contained in a medium grained, light grey, clean sandstone, phases of clean sandstone without clasts, prominent marker bed.

MDD 78-5 (Cont'd.)

178.74 - 181.75	3.01	Claystone: light grey, Kaolinitic with thin well-bedded laminations of plant debris. BCA = 45°.
181.75 - 183.01	1.26	Sandstone: grey, very heavily bioturbated, with large light coloured worm burrow.
183.01 - 183.52	0.51	Sandstone: white, medium to coarse grained, massive.
183.52 - 184.14	0.62	Mudstone: dark grey with grey siltstone interbeds, very abrupt upper and lower contacts.
184.14 - 184.37	0.23	Conglomerate: granule, very well sorted, very little matrix, carbonate cement, angular grains.
184.37 - 204.80	20.43	Siltstone and Mudstone: grey siltstone with dark grey mudstone interbeds, mudstone at top, frequent phases containing plant rootlets. BCA = 40°.
204.80 - 204.84	0.04	Claystone: carbonaceous, bright coal bands.
204.84 - 204.91	0.07	Coal: 40% vitreous, core intact.
204.91 - 204.95	0.04	Claystone: carbonaceous, as above.
204.95 - 204.99	0.04	Coal: 50% vitreous.
204.99 - 205.04	0.05	Claystone: carbonaceous as above.
205.04 - 205.27	0.23	Coal and bands: carbonaceous claystone with very frequent bright coal bands.
205.27 - 206.97	1.70	Mudstone: dark grey, siltstone phases and interbeds, carbonaceous claystone at base.
		COAL - SEAM B1
206.97 - 207.01	0.04	Coal: 10% vitreous, core broken.
207.01 - 207.08	0.07	Coal: 30% vitreous.
207.08 - 207.13	0.05	Coal: 50% vitreous.
207.13 - 207.17	0.04	Coal: dull, sheared, core broken.

MDD 78-5 (Cont'd.)

207.17 - 207.21	0.04	Claystone: carbonaceous.
207.21 - 207.24	0.03	Coal: 50% vitreous.
207.24 - 207.30	0.06	Claystone: carbonaceous.
207.30 - 207.34	0.04	Coal: dull, core broken.
207.34 - 207.39	0.05	Coal: bright.
207.39 - 207.45	0.06	Coal: dull, core broken.
207.45 - 207.54	0.09	Coal: 50% vitreous, core broken.
207.54 - 207.58	0.04	Coal: bright, core broken.
207.58 - 207.65	0.07	Coal: dull.
207.65 - 207.68	0.03	Coal: bright.
207.68 - 207.86	0.18	Coal: 50% vitreous.
207.86 - 207.90	0.04	Coal: 30% vitreous.
207.90 - 208.18	0.28	Coal and claystone: fragments mixed in box.
208.18 - 208.34	0.16	Core missing.

Samples	Interval	Width	Dry Ash	F.S.I
0301	206.97 - 207.17	0.20	13.68	7
0302	207.17 - 207.30	0.13	57.56	2½
0303	270.30 - 207.90	0.69	6.18	7½
0304	207.90 - 208.18	0.28	35.96	4½

208.34 - 211.02	2.68	Mudstone: dark grey, a few thin grey siltstone interbeds. BCA = 56°.
211.02 - 242.25	31.23	Sandstone: medium grained, light grey, massive, very few phases of grey siltstone and mudstone, becoming more frequent at base. BCA = 60°.
242.25 - 268.03	25.78	Sandstone and mudstone: interbedded, light grey, medium grained sandstone, clean with scattered interbeds of dark grey mudstone, very minor bioturbation. BCA = 65°.

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-06

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, a-29-B
- (c) Drill Hole Co-ordinates: N 13997.53 - E 4677.31
- (d) Elevation: 1301.76m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 - B7
TOTAL DEPTH: 366.9m

DATE DRILLED: July 4 - 10, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, FBL, GRN

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 3.71	3.71	CASING
		<u>GATES MEMBER - COMMOTION FORMATION</u>
3.71 - 8.38	4.67	Mudstone: dark grey, oxidized, core broken.
8.38 - 11.92	3.54	Siltstone: with large irregular beds of dark grey mudstone, bedding indistinct but strongly slumped.
11.92 - 15.78	3.86	Mudstone: as above.
15.78 - 30.22	14.44	Sandstone: medium grained, coarse grained at base, large phases of fine grained sandstone at top, characterized by fine carbonaceous partings on bedding, large scale cross bedding, pebbles at base, gradational BCA = 30° very few coaly rootlets at the base, salt and pepper.
30.22 - 42.12	11.90	Sandstone: interbedded with conglomerate. <ul style="list-style-type: none"> - Coarse grained, light grey sandstone with large scale crossbedding, strongly developed salt and pepper appearance, caused by carbonaceous mudstone grains, large phases of granule conglomerate throughout. - The conglomerate is usually very well sorted with very little matrix. Very numerous large, irregular coal bands and inclusions (rootlets) towards the base. Sharp basal contact.
42.12 - 48.70	6.58	Sandstone: Interbedded with siltstone Sandstone, fine grained, medium grey, bedding irregular, mildly bioturbated, some black very fine coaly inclusions (plant fragments or rootlets) throughout. Calcite filled fractures and slickensides (minor faulting) at 42.82 m. BCA = variable 20° - 40°. <ul style="list-style-type: none"> - gradational basal contact. Occasional calcite filled fractures on bedding.
48.70 - 52.73	4.03	Mudstone: dark grey, occasional carbonaceous phases with bright coal bands.
52.73 - 52.78	0.05	Mudstone.

MDD 78-6 (Cont'd.)

COAL SEAM B7

52.78 - 52.96	0.18	Coal: 30% vitreous, lightly sheared, core broken to large pieces.
52.96 - 53.10	0.14	Coal: 10% vitreous, lightly sheared, core broken.
53.10 - 53.14	0.04	Claystone: carbonaceous, black prite coal bands.
53.14 - 53.20	0.06	Coal: 30% vitreous.
53.20 - 53.25	0.05	Coal: 50% vitreous, core broken.
53.25 - 53.30	0.05	Coal: 50% vitreous, core intact.
53.30 - 53.48	0.18	Coal: 10% vitreous.
53.48 - 53.58	0.10	Coal: 30% vitreous, sheared, large pieces.
53.58 - 53.78	0.20	Coal: Dull, hard, high S.G. metallic luster.
53.78 - 53.87	0.09	Coal: Dull, hard.
53.87 - 53.95	0.08	Coal: 10% vitreous.
53.95 - 54.02	0.07	Coal: Stony, earthy luster.
54.02 - 54.24	0.22	Coal: Dull, metallic luster, core intact.
54.24 - 54.31	0.07	Coal: 70% vitreous.
54.31 - 54.36	0.05	Coal: Dull, metallic luster.
54.36 - 54.40	0.04	Coal: 50% vitreous.
54.40 - 54.47	0.07	Coal: 30% vitreous, core pulverized.
54.47 - 54.54	0.07	Coal: 70% vitreous, core pulverized.
		Sample Interval Width Dry Ash F.S.I.
		0305 52.78 - 54.54 1.76 21.29 4½
54.54 - 59.05	4.51	Claystone: carbonaceous at top, bright coal bands, with occasional siltstone intervals, frequent bright coal bands, gradational basal contact.

MDD 78-6 (Cont'd.)

59.05 - 64.64	5.59	Siltstone: Grey, with occasional interbeds of fine grained sandstone, mildly bioturbated, grades to mudstone at base. BCA = 40°.
64.64 - 65.93	1.29	Sandstone: interbedded with mudstone, white sandstone interbedded with very dark grey mudstones. Bedding is strongly contorted, floral bioturbation.
65.93 - 69.32	3.39	Mudstone: dark grey, silty at top, blocky fracture.
69.32 - 70.16	0.84	Sandstone: interbedded with mudstone, as above. strong floral bioturbation, abundant, fine, irregular, coalified rootlets throughout.
70.16 - 71.31	1.15	Mudstone: dark grey, carbonaceous intervals, bright coal bands near base fractures at right angle to BCA. BCA = 40°.
		COAL SEAM B6
71.31 - 71.40	0.09	Coal: 70% vitreous, core broken to large pieces, metallic luster.
71.40 - 71.46	0.06	Coal: 50% vitreous, earthy luster.
71.46 - 71.52	0.06	Coal: 70% vitreous, metallic luster, core intact.
71.52 - 71.62	0.10	Mudstone: bright coal bands interbedded, high S.G. core intact.
71.62 - 71.72	0.10	Coal: 80% vitreous, metallic luster. Core pulverized.
71.72 - 71.80	0.08	Coal: 30% vitreous, core pulverized.
71.80 - 71.87	0.07	Coal: 30% vitreous, metallic luster, hard, core intact..
71.87 - 71.98	0.11	Coal: 70% vitreous, core pulverized.
71.98 - 72.16	0.18	Coal: 30% vitreous, metallic luster hard, S.G. high, core intact.
72.16 - 72.27	0.11	Coal: 70% vitreous, metallic luster, core intact.
72.27 - 72.30	0.03	Mudstone: carbonaceous.

MDD 78-6 (Cont'd.)

72.30 - 72.32	0.02	Coal: Dull
72.32 - 72.41	0.09	Coal: 70% vitreous, earthy luster, core intact.
72.41 - 72.54	0.13	Coal: 70% vitreous, metallic luster.
72.54 - 72.59	0.05	Coal: 30% vitreous, core pulverized.
72.59 - 72.62	0.03	Mudstone: interbedded with coal, bright coal bands, hard, core intact (Marker 73.16)
73.16 - 74.99	1.83	Mudstone: carbonaceous, tiny plant rootlets throughout.
74.99 - 75.06	0.07	Coal: 30% vitreous, core broken in large pieces.
75.06 - 75.14	0.08	Coal: 70% vitreous, metallic luster, core intact.
75.14 - 75.23	0.09	Coal: 30% vitreous, earthy luster.
75.23 - 76.05	0.82	Coal: 70% vitreous, metallic luster, core pulverized. Marker 76.05
76.05 - 77.32	0.27	Mudstone: with some siltstone interbeds, occasional carbonaceous interval, mildly bioturbated, core intact.
77.32 - 77.40	0.08	Coal: 40% vitreous, hard, shearing, metallic luster, fairly high S.G..
77.40 - 77.50	0.10	Coal: 60% vitreous.
77.50 - 77.67	0.17	Coal: 30% vitreous, hard, earthy luster, core solid.
77.67 - 78.01	0.68	Coal: 30% vitreous, dull hard, core intact, S.G. fairly high.
78.01 - 78.19	0.18	Mudstone: carbonaceous, brite coal bands, solid.
78.19 - 78.31	0.12	Coal: 70% vitreous, metallic luster, core pulverized.
78.31 - 78.34	0.03	Mudstone: interbedded with bright coal bands.

MDD 78-6 (Cont'd.)

78.34 - 78.55	0.21	Coal: 70% vitreous, metallic luster, core solid.																																			
78.55 - 78.62	0.07	Coal: 40% vitreous, core broken in large pieces. Marker 78.63																																			
78.63 - 78.68	0.05	Coal: 30% vitreous, metallic luster, core intact.																																			
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0306</td> <td>71.31 - 72.59</td> <td>1.28</td> <td>33.64</td> <td>3½</td> </tr> <tr> <td>2246</td> <td>72.59 - 74.99</td> <td>2.40</td> <td>83.7</td> <td>N/A</td> </tr> <tr> <td>0307</td> <td>74.99 - 76.05</td> <td>1.06</td> <td>12.77</td> <td>5½</td> </tr> <tr> <td>2247</td> <td>76.05 - 77.32</td> <td>1.27</td> <td>85.7</td> <td>N/A</td> </tr> <tr> <td>0308</td> <td>77.32 - 78.19</td> <td>0.87</td> <td>68.66</td> <td>1</td> </tr> <tr> <td>0309</td> <td>78.19 - 78.68</td> <td>0.49</td> <td>15.61</td> <td>5½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0306	71.31 - 72.59	1.28	33.64	3½	2246	72.59 - 74.99	2.40	83.7	N/A	0307	74.99 - 76.05	1.06	12.77	5½	2247	76.05 - 77.32	1.27	85.7	N/A	0308	77.32 - 78.19	0.87	68.66	1	0309	78.19 - 78.68	0.49	15.61	5½
Samples	Interval	Width	Dry Ash	F.S.I.																																	
0306	71.31 - 72.59	1.28	33.64	3½																																	
2246	72.59 - 74.99	2.40	83.7	N/A																																	
0307	74.99 - 76.05	1.06	12.77	5½																																	
2247	76.05 - 77.32	1.27	85.7	N/A																																	
0308	77.32 - 78.19	0.87	68.66	1																																	
0309	78.19 - 78.68	0.49	15.61	5½																																	
78.68 - 87.26	8.58	Sandstone: interbedded with siltstone fine grained, medium grey, highly floral bioturbated. Numerous irregular rootlets throughout, occasional worm burrow, rare calcite filled fracture, calcite on bedding BCA = 20°.																																			
87.26 - 87.81	0.55	As above																																			
87.81 - 88.31	0.50	As above, bright coal bands, core broken.																																			
88.31 - 91.25	2.94	Sandstone: interbedded with siltstone, medium grained sandstone, bedding bioturbated, numerous coaly bands and rootlets throughout moderately bioturbated.																																			
91.25 - 93.45	2.20	Sandstone: minor siltstone interbeds (20%). medium grained, occasional coaly rootlet, mildly bioturbated BCA = 22°.																																			
93.45 - 95.45	2.00	Mudstone: carbonaceous, coaly bands and rootlets, slickensides, coaly bands, shearing, core highly broken.																																			
95.45 - 99.17	3.72	Siltstone: sandstone interbedded sheared, calcite along shears, coaly rootlets, BCA = 38°.																																			
99.17 - 102.32	3.15	Mudstone: uniform, black, coaly rootlets, minor coal bands, carbonaceous, core intact.																																			
102.32 - 103.34	1.02	Mudstone: carbonaceous, coal bands, sheared, listric surfaces common, core broken.																																			
103.34 - 103.51	0.17	Coal: and mudstone, core pulverized.																																			

MDD 78-6 (Cont'd.)

103.51 - 114.03	10.52	Mudstone: very carbonaceous, plant fossils, coal partings, minor rootlets, core solid, bedding not visible.
114.03 - 114.47	0.44	Mudstone: interbedded with coal, carbonaceous, bright coal bands, core solid.
114.47 - 116.84	2.37	Mudstone: carbonaceous, as above (sheared). COAL SEAM B5
116.84 - 116.96	0.12	Coal: dull, 30% vitreous bands.
116.96 - 117.03	0.07	Mudstone: carbonaceous, bright coal bands.
117.03 - 117.23	0.20	Coal: 70% vitreous, metallic lustre, core quite solid.
117.23 - 117.32	0.09	Coal: 40% vitreous, earthy lustre, sheared.
117.32 - 117.57	0.25	Mudstone: sheared, carbonaceous - coally, bright coal bands.
117.57 - 117.63	0.06	Coal: 70% vitreous, core pulverized.
117.63 - 117.76	0.13	Mudstone: carbonaceous.
117.76 - 117.84	0.08	Coal: 80% vitreous.
117.84 - 117.94	0.10	Coal: 30% vitreous, core pulverized.
117.94 - 118.03	0.09	Coal: 30% vitreous, metallic lustre, core broken.
118.03 - 118.17	0.14	Coal: 30% vitreous, metallic lustre, core broken in large pieces.
118.17 - 118.28	0.11	Mudstone: interbedded bright coal bands, sheared.
118.28 - 118.42	0.14	Coal: 60% vitreous, metallic lustre.
118.42 - 118.48	0.06	Mudstone: interbedded with coal, high S.G.
118.48 - 118.55	0.07	Coal: 20% vitreous, earthy lustre, sheared, core pulverized.
118.55 - 118.70	0.15	Coal: 70% vitreous, metallic lustre, core intact.
118.70 - 118.76	0.06	Coal: 30% vitreous, metallic lustre.

MDD 78-6 (Cont'd.)

118.76 - 118.99	0.23	Coal: 70% vitreous, core intact.
118.99 - 119.14	0.15	Coal: 60% vitreous, metallic lustre.
119.14 - 119.34	0.20	Coal: 30% vitreous, metallic lustre.
119.34 - 119.52	0.18	Coal: 60% vitreous, metallic lustre, core intact.
119.52 - 119.68	0.16	Coal: 70% vitreous, core intact.
119.68 - 119.87	0.19	Coal: 30% vitreous, metallic lustre, core intact.
119.87 - 120.07	0.20	Coal: 70% vitreous, core intact.
120.07 - 120.23	0.16	Coal: 70% - 80% vitreous, metallic lustre.
120.23 - 120.34	0.11	Coal: 40% vitreous, core intact, metallic lustre.
120.34 - 120.44	0.10	Coal: 70% vitreous, core intact.
120.44 - 120.54	0.10	Coal: 50% vitreous, metallic lustre, minor shearing, core broken in large pieces.
120.54 - 120.96	0.42	Mudstone: interbedded with 30% metallic lustre, coal bands.
120.96 - 121.42	0.54	Mudstone: sheared, coal bands, core broken.
121.42 - 121.58	0.16	Coal: 30% vitreous, core pulverized.
121.58 - 121.78	0.20	Coal: 70% vitreous, core quite solid, metallic lustre.
121.78 - 121.93	0.15	Coal: 40% vitreous, metallic lustre, core solid.
121.93 - 122.00	0.07	Coal: 20% vitreous, earthy lustre.
122.00 - 122.06	0.06	Coal: 70% vitreous, core pulverized.
122.06 - 122.20	0.14	Coal: 30% vitreous bands, earthy lustre, high specific gravity.
122.20 - 122.33	0.13	Coal: 70% vitreous, core pulverized.

Samples	Interval	Width	Dry Ash	F.S.I.
0310	116.84 - 118.28	1.44	51.91	2½
0311	118.28 - 118.99	0.71	25.55	5
0312	118.99 - 120.54	1.55	11.69	4
2248	120.54 - 121.42	0.88	72.8	N/A
0313	121.42 - 122.33	0.91	45.17	2

MDD 78-6 (Cont'd.)

122.33 - 122.53	0.20	Core pulverized, mud, 20% coal.
122.53 - 122.81	0.28	Mudstone: carbonaceous, partings.
122.81 - 127.10	0.29	Mudstone: carbonaceous shears, calcite along shear plane (minor) vitreous coal bands 1 - 2 cm. in width.
127.10 - 128.77	0.67	Siltstone: carbonaceous, minor shears, coal and coal partings, rare mud clast.
128.77 - 137.29	0.52	Siltstone: interbedded with very fine grain sandstone; bioturbated (mildly), minor coally bands and calcite along bedding planes B.C.A. - 40°, dark grey.
137.29 - 157.58	0.29	Siltstone: interbedded with very fine sandstone, medium grey, occasional rare coal phase (3 - 6 cm. in width) pyrite nodules, moderately bioturbated, irregular coal rootlets, traces of calcite along bedding plane.
157.58 - 166.96	9.38	Siltstone: with interbedded fine sandstone, mild bioturbation, coally partings along bedding plane, minor coally rootlets, B.C.A. - 45°.
166.96 - 175.18	8.22	Siltstone: carbonaceous, brown mud clasts, minor calcite, minor shears, coally bands and small irregular rootlets, core solid.
175.18 - 176.88	1.70	Mudstone: carbonaceous, numerous small irregular rootlets, occasional bright coal band, 2 - 3 cm. in width
COAL SEAM B7		
176.79 - 177.20	0.41	Coal: clean, solid, metallic lustre. 20% vitreous bands,
177.20 - 177.32	0.12	Coal: 80% vitreous.
177.32 - 177.44	0.12	Coal: 30% vitreous bands, metallic lustre.
177.44 - 177.56	0.12	Coal: 80% vitreous
177.56 - 177.64	0.08	Coal: 30% vitreous, metallic lustre, core solid.
177.64 - 177.77	0.13	Coal: 80% vitreous, core pulverized.

MDD 78-6 (Cont'd.)

177.77 - 177.98	0.21	Coal: 30% vitreous, earthy lustre, core pulverized.
177.98 - 178.36	0.38	Mudstone: carbonaceous, core solid
178.36 - 178.64	0.28	Coal: 30% vitreous, metallic lustre, core pulverized.
178.36 - 178.80	0.44	Coal: 30% vitreous, metallic lustre, core solid.
178.80 - 178.97	0.17	Coal: 70% vitreous, metallic lustre, core broken in large pieces.
178.97 - 179.07	0.10	Coal: 20% vitreous, earthy lustre.
179.07 - 179.26	0.19	Coal: 30% vitreous, metallic lustre, 20% carbonaceous mudstone, core pulverized.
179.26 - 179.41	0.15	Mudstone: carbonaceous.
179.41 - 179.53	0.12	Coal: 30% vitreous, core pulverized (core loss).
179.53 - 179.76	0.23	Coal: 70% vitreous, core broken in large pieces.
179.76 - 180.21	0.45	Coal: 30% vitreous, core pulverized, .
180.21 - 180.44	0.23	Core missing.
180.44 - 180.52	0.08	Coal: dull
180.52 - 181.42	0.90	Mudstone: carbonaceous.
181.42 - 181.74	0.32	Coal: 30% vitreous, metallic lustre, core broken in small pieces.
181.42 - 182.16	0.74	Coal: 30% vitreous, earthy lustre, core pulverized.
182.16 - 182.35	0.19	Coal: carbonaceous mudstone, inter-bedded with coal.
182.35 - 182.98	0.63	Coal: carbonaceous mudstone, sheared.
182.98 - 183.02	0.04	Coal: 80% vitreous.
183.02 - 183.13	0.11	Coal: carbonaceous mudstone.
183.13 - 183.29	0.16	Coal: core pulverized, 70% mudstone, 30% bright coal.

MDD 78-6 (Cont'd.)

183.29 - 183.38	0.09	Coal: carbonaceous mudstone.
183.38 - 185.02	1.64	Coal: recovered .88, 30% vitreous, metallic lustre, 30% mudstone, core pulverized.
185.02 - 185.26	0.24	Coal: 70% vitreous, metallic lustre, core solid.
185.26 - 185.51	0.25	Coal: 70% vitreous, metallic lustre, core solid.
185.51 - 185.61	0.10	Coal: 30% vitreous, core solid.
185.61 - 185.65	0.04	Coal: 70% vitreous, earthy lustre.
185.65 - 185.85	0.20	Coal: 30% vitreous, metallic lustre.
185.65 - 185.84	0.19	Coal: 70% vitreous.
185.84 - 186.13	0.29	Coal: 30% vitreous.
186.13 - 186.37	0.24	Coal: 80% vitreous, core pulverized,
186.54 - 186.74	0.20	Coal: 70% vitreous, metallic lustre, core solid.
186.74 - 186.95	0.21	Coal: 40% vitreous, core pulverized.
186.74 - 187.11	0.37	Coal: 80% vitreous, core fairly solid.
187.11 - 187.40	0.29	Coal: 90% vitreous, core broken.
187.40 - 187.61	0.21	Coal: 40% vitreous, metallic lustre, core pulverized.
187.61 - 187.67	0.06	Coal: 80% vitreous.
187.61 - 187.77	0.16	Coal: 60% vitreous, core pulverized.

Samples	Interval	Width	Dry Ash	F.S.I
0314	176.79 - 177.98	1.19	20.05	4½
0315	177.98 - 178.36	0.38	83.01	N.A.
0316	178.36 - 179.26	1.05	23.13	5
0317	179.26 - 181.42	2.01	46.13	2½
0318	181.42 - 182.16	0.74	25.16	4½
0319	182.16 - 183.38	1.22	70.54	1
0320	183.38 - 185.02	1.64	27.41	2½
0321	185.02 - 186.54	1.35	6.14	6
0322	186.54 - 187.77	1.23	4.74	7½

MDD 78-6 (Cont'd.)

187.77 - 188.31		Mudstone: carbonaceous, core solid.
188.31 - 196.92		Siltstone: carbonaceous, laminated, occasional mudstone phase, occasional small irregular rootlet, mildly bioturbated towards base. B.C.A. = 42°.
196.92 - 197.20		Mudstone: carbonaceous, bright coal bands. COAL SEAM B3
197.20 - 197.28	0.08	Coal: 40% vitreous, metallic lustre, hard, solid.
197.28 - 197.68	0.40	Coal: 70% vitreous, metallic lustre, coal hard, solid.
197.68 - 197.78	0.10	Coal: 60% vitreous, as above.
197.78 - 197.82	0.04	Coal: 40% vitreous, hard, solid, metallic lustre.
197.87 - 198.12	0.30	Coal: 70% vitreous, metallic lustre.
198.12 - 198.20	0.08	Coal: 40% vitreous.
198.20 - 198.60	0.40	Coal: 80% vitreous, metallic lustre, solid.
198.60 - 198.81	0.21	Mudstone: inter-bedded with coal.
198.81 - 199.21	0.40	Coal: carbonaceous mudstone, with bright coal bands.
199.21 - 199.69	0.48	Coal: 80% vitreous, metallic lustre, core solid.
199.69 - 199.81	0.12	Coal: 30% vitreous, earthy lustre.
199.81 - 199.98	0.17	Coal: 60% vitreous, metallic lustre, core solid.
199.98 - 200.10	0.12	Coal: 10% vitreous, metallic lustre.
200.10 - 200.25	0.15	Core missing.
200.25 - 200.35	0.10	Coal: 70% vitreous.
200.35 - 200.74	0.39	Coal: 70% vitreous, metallic lustre, hard, core solid.
200.74 - 200.86	0.12	Coal: carbonaceous mudstone, sheared.

MDD 78-6 (Cont'd.)

200.86 - 201.03	0.17	Coal: 70% vitreous, core broken.		
201.03 - 201.09	0.06	Coal: carbonaceous mudstone.		
201.09 - 201.55	0.46	Coal: 30% vitreous, core pulverized, Marker 202.08		
201.55 - 202.08	0.53	Core missing		
202.08 - 202.19	0.11	Coal: 70% vitreous, core solid.		
202.19 - 203.61	0.42	Coal: carbonaceous mudstone, sheared, broken bright coal bands throughout.		
203.61 - 203.70	0.09	Coal: 70% vitreous, core solid, metallic lustre.		
203.70 - 204.00	0.30	Coal: 80% vitreous, core solid, metallic lustre.		
204.00 - 204.07	0.07	Coal: 30% vitreous, high S.G., earthy lustre, sheared.		
204.07 - 204.38	0.31	Coal: 70% vitreous, core pulverized.		
Samples	Interval	Width	Dry Ash	F.S.I
0323	197.20 - 198.60	1.40	5.26	6½
0324	198.60 - 199.21	0.61	74.17	1
0325	199.21 - 200.74	1.53	11.62	5
0326	200.74 - 202.19	1.45	39.77	5
0327	202.19 - 203.61	1.42	82.19	N.A.
0328	203.61 - 204.38	0.77	33.41	5
204.38 - 206.35		Sandstone: interbedded siltstone, mildly bioturbated, small irregular plant rootlet.		
206.35 - 206.78		Sandstone: as above, core broken, sheared.		
206.78 - 213.00		Sandstone: coarse grained, light grey, minor small black grains throughout.		
213.00 - 215.12		Sandstone: coarse grained, clean, core solid, light grey, very fine pebble phases (12 cm in width throughout).		
215.12 - 218.14		Sandstone: medium grained, light grey, with pebble conglomerate phases 6 - 7 cm in width, minor shearing, calcite and coal along shear planes.		
218.14 - 221.93		Sandstone: coarse grained, as above with occasional pebble (1-2 cm dia.), near base of interval.		

MDD 78-6 (Cont'd.)

- 221.93 - 222.16 Sandstone: fine grained.
- 222.16 - 226.52 Conglomerate: pebble fairly unsorted, green chert pebbles and occasional pink chert, numerous coaly rootlets throughout, occasional coarse grained sandstone phase 8 - 12 cm in width.
- 226.52 - 227.38 Mudstone: carbonaceous.
- 227.38 - 230.30 Sandstone: fine grained, interbedded with siltstone, cross-bedded, occasional small coaly rootlet.
- 230.30 - 230.61 Sandstone: medium grained.
- 230.61 - 231.71 Mudstone: carbonaceous, numerous coaly bands and rootlets, sheared listric surfaces, core broken.
- 231.71 - 231.95 Mudstone: 30% vitreous coal, core pulverized.
- 231.95 - 233.68 Sandstone: medium grained, dark grey, small irregular coaly rootlets throughout.
- 233.68 - 242.98 Sandstone: medium grained, light grey, core solid, occasional small coaly rootlet, minor carbonaceous parting along bedding. B.C.A. = 48°.
- 242.98 - 245.51 Sandstone: coarse grained, salt & pepper appearance, light grey, occasional coaly band, cross-bedded. B.C.A. = 45°.
- 245.51 - 248.85 Sandstone: coarse grained, as above with minor pebble bands, numerous coal rootlets mildly bioturbated.
- 248.85 - 253.94 Sandstone: coarse grained, core broken, coaly plant rootlets, rare pebble.
- 253.94 - 261.21 Sandstone: medium grained, medium grey, cross-bedded, occasional rootlet.
- 261.21 - 261.53 Conglomerate band: coaly rootlets.
- 261.53 - 264.57 Sandstone: medium grained, minor cross bedding numerous coaly rootlets throughout.
- 264.57 - 269.20 Conglomerate: well sorted, 1 cm dia., interbedded with coarse grained sandstone phases, core solid, occasional green and pink chert.

MDD 78-6 (Cont'd.)

269.20 - 269.46 Sandstone: fine grained, interbedded with
bright coal bands, core broken.

COAL SEAM B1

269.46 - 269.52 0.06 Coal: 30% vitreous, earthy lustre

269.46 - 270.02 0.56 Coal: 30% vitreous, earthy lustre, soft,
core broken in large pieces.

270.02 - 270.37 0.35 Coal: 30% vitreous, metallic lustre, core
broken in large pieces.

270.37 - 270.73 0.36 Coal: 30% vitreous, soft earthy lustre.

270.73 - 271.00 0.27 Coal: 70% vitreous, metallic lustre, core
broken in large pieces.

271.00 - 271.28 0.28 Coal: 60% vitreous, metallic lustre, core
broken in large pieces.

271.28 - 271.40 0.12 Coal: 80% vitreous, core pulverized.

Samples	Interval	Width	Dry Ash	F.S.I
0329	269.46 - 270.37	0.91	8.18	6½
0330	270.37 - 271.40	1.03	10.00	8

271.40 - 271.61 Mudstone: carbonaceous, core solid.

271.61 - 274.63 Mudstone: carbonaceous, broken

274.63 - 280.35 Sandstone: medium grained, light grey,
minor cross bedding. B.C.A. = 62.

280.35 - 281.92 Sandstone: medium grained, light grey, cross-
bedded, sheared, calcite veinlets along
fractures.

281.92 - 286.50 Sandstone: medium grained, medium grey.

286.50 - 303.65 Sandstone: fine grained, clean, laminated,
large white worm burrowed intervals
from 293.00 to 295.80, core solid.

303.65 - 307.68 Sandstone: fine grained, minor crossbeds,
occasional 3 - 8 cm mudstone phase.

307.68 - 312.10 Sandstone: fine grained, mudstone phases,
sheared, listric surfaces, minute
fractures filled with calcite. B.C.A. = 52
brecciated toward end of interval.

312.10 - 316.61 Sandstone: fine grained, brecciated zone at
312.49, core solid.

MDD 78-6 (Cont'd.)

MOOSEBAR FORMATION (UPPER)

316.61 - 318.24

Sandstone: fine grained, interbedded with 20% siltstone, core solid.

318.24 - 357.59

Sandstone: fine grained, medium grey, interbedded with 20% siltstone, minor cross bedding, mildly bioturbated, occasional large white worm burrow, minor pyrite nodules and stringers sheared at 354.80 with calcite filled fractures. B.C.A. = 48°. Occasional coally parting.

357.59 - 367.90

Siltstone: with 30% fine grain sandstone interbeds, coally rootlets throughout, moderately bioturbated.

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-07

LOCATION:

- (a) Coal Licence: 3239
- (b) N.T.S. 93-I-15, c-21-C
- (c) Drill Hole Co-ordinates: N 15,513.75 - E 3183.60
- (d) Elevation: 1404.12m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gething Formation
COAL SEAMS INTERSECTED: —
TOTAL DEPTH: 208.2m

DATE DRILLED: July 4 - 8, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 9.14	9.14	CASING
		<u>MOOSEBAR FORMATION</u>
9.14 - 11.28	2.14	Siltstone: with minor sandstone interbeds, minor flow features, core intact.
11.28 - 17.23	5.95	Siltstone: minor interbeds of fine grained sandstone, occasional coaly rootlet, flow features. BCA=78°
17.23 - 27.72	10.49	Siltstone: some mudstone phases, plant fossil fragments, flow features, pyrite specks, stringers and nodules (up to 1 cm in diameter). BCA=78°
27.72 - 28.47	0.75	Mudstone:
28.47 - 31.89	3.42	Siltstone: with interbeds of very fine grained sandstone. BCA=77°
31.89 - 35.97	4.08	Siltstone: with 10% fine grained sandstone interbeds, small black worm burrows throughout, pyrite stringers and nodules.
35.97 - 40.58	4.61	Siltstone: minor sandstone interbeds, small black worm burrows throughout, minor fractures with ferruginous staining.
40.58 - 41.28	0.70	Mudstone: minor fractures with ferruginous staining, core broken.
41.28 - 41.32	0.04	Claystone: white, soft, bentonitic.
41.32 - 43.24	1.92	Siltstone: as above
43.24 - 43.28	0.04	Claystone: soft, white, bentonitic.
43.28 - 72.85	29.57	Mudstone: occasional siltstone phases, occasional small black worm burrows, uniform, core intact.
		<u>GETHING FORMATION</u>
72.85 - 81.00	8.15	Conglomerate: glauconitic, pebbles 1 - 2 cm in diameter, fairly well sorted occasional phases of medium grained sandstone, some coaly rootlets.

81.00 - 88.96	7.96	Conglomerate: pebbles 0.5 - 6 cm in diameter, some coaly rootlets, minute fractures filled with calcite.				
88.96 - 89.13	0.17	Mudstone: carbonaceous.				
89.13 - 89.61	0.48	Coal: 30% vitreous, hard, metallic lustre.				
89.61 - 89.84	0.23	Mudstone: carbonaceous				
89.84 - 90.18	0.34	Coal: 30% vitreous				
90.18 - 90.30	0.12	Mudstone: carbonaceous				
<u>COAL SEAM</u>						
90.30 - 90.45	0.15	Coal: 30% vitreous, metallic lustre, core intact.				
90.45 - 90.52	0.07	Coal: 30% vitreous, core intact.				
90.52 - 90.70	0.18	Mudstone: carbonaceous.				
90.70 - 90.92	0.22	Coal: 60% vitreous, metallic lustre, core broken in large pieces.				
90.92 - 91.08	0.16	Coal: 70% vitreous, core pulverized.				
91.08 - 91.14	0.06	Coal: 30% vitreous, core pulverized.				
		<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
		0331:	90.30-90.52	0.22	28.50	1-1½
		0332:	90.52-90.70	0.18	78.54	1
		0333:	90.70-91.14	0.44	14.93	6
91.14 - 96.00	4.86	Sandstone: fine grained, interbedded with 20% siltstone, occasional carbonaceous parting, plant fossils, mildly bioturbated. BCA=76 ^o				
96.00 - 97.23	1.23	Mudstone: carbonaceous, numerous small coaly rootlets, floral bioturbation, core broken.				

MDD-78-7 - cont'd

97.23 - 108.81	11.58	Sandstone: fine grained, interbedded with siltstone, small irregular plant rootlets throughout, minor cross-bedding, occasional carbonaceous mudstone phase.
108.81 - 109.09	0.28	Sandstone: fine to medium grained, medium grey, numerous coaly rootlets.
109.09 - 112.00	2.91	Mudstone: carbonaceous, occasional fine grained sandstone phase, mildly bioturbated, numerous coaly rootlets throughout BCA-78 ^o
<u>COAL SEAM</u>		
112.00 - 112.51	0.51	Coal: 20% vitreous, metallic lustre, core intact.
112.51 - 112.69	0.18	Coal: 60% vitreous, metallic lustre, core intact.
112.69 - 112.93	0.24	Coal: 40% vitreous, metallic lustre.
112.93 - 113.14	0.21	Coal: 10% vitreous, metallic lustre.
113.14 - 113.29	0.15	Coal: 40% vitreous, metallic lustre.
113.29 - 113.39	0.10	Coal: 20% vitreous, earthy lustre, core intact.
113.39 - 113.71	0.32	Coal: 30% vitreous, metallic lustre, hard, core intact.
113.71 - 114.02	0.31	Coal: 80% vitreous, core intact.
114.02 - 114.10	0.08	Coal: 80% vitreous, core pulverized.
114.10 - 114.20	0.10	Coal: 30% vitreous, earthy lustre.
114.20 - 114.38	0.18	Coal: dull, soft, peaty.
114.38 - 114.82	0.44	Coal: 80% vitreous, core intact.
114.82 - 114.88	0.06	Coal: 80% vitreous, core intact.

114.88 - 114.98	0.10	Coal: 70% vitreous, hard, core intact.															
		<table border="1"> <thead> <tr> <th><u>Samples:</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0334:</td> <td>112.00-113.39</td> <td>1.39</td> <td>12.06</td> <td>2</td> </tr> <tr> <td>0335:</td> <td>113.39-114.98</td> <td>1.59</td> <td>8.70</td> <td>7</td> </tr> </tbody> </table>	<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0334:	112.00-113.39	1.39	12.06	2	0335:	113.39-114.98	1.59	8.70	7
<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>													
0334:	112.00-113.39	1.39	12.06	2													
0335:	113.39-114.98	1.59	8.70	7													
114.98 - 115.53	0.55	Sandstone: very fine grained, medium grey core intact.															
115.53 - 117.88	2.35	Mudstone: carbonaceous, plant fossils, vitreous coal bands 1 cm in width common, core intact.															
117.88 - 121.86	3.98	Sandstone: medium grained, medium grey, clean, minor cross bedding.															
121.86 - 133.20	11.34	Sandstone: fine grained, light grey, large white worm burrows near top of interval, minor shears.															
133.20 - 136.39	3.19	Sandstone: fine grained, sheared, calcite filled fractures and calcite along sheared surfaces, numerous small, irregular coaly rootlets throughout, core broken.															
136.39 - 138.11	1.72	Siltstone: interbedded with fine grained sandstone, minor cross bedding, mildly bioturbated, small coaly rootlets throughout.															
138.11 - 138.82	0.71	Sandstone: fine grained, light grey.															
138.82 - 138.91	0.09	Chert Band.															
138.91 - 145.36	6.45	Sandstone: fine grained, medium grey, mildly bioturbated, occasional large white worm burrows, coaly rootlets, minor cross bedding, brecciated at base of interval.															
145.36 - 147.94	2.58	Sandstone: medium grained, light grey, occasional small, bright, coal band. BCA=70															
147.94 - 151.10	3.16	Conglomerate: fine pebbles, numerous coaly rootlets at base, some coarse grained sandstone phases.															

MDD-78-7 - Cont'd

151.10 - 153.56	2.46	Sandstone: medium grained, light grey, occasional pebble band, numerous coaly rootlets.
153.56 - 159.20	5.64	Siltstone: interbedded with fine grained sandstone, some carbonaceous mudstone phases, mildly bioturbated.
159.20 - 163.25	4.05	Mudstone: some carbonaceous phases.
163.25 - 177.89	14.64	Sandstone: very fine grained, interbedded with siltstone, cross bedded, heavily bioturbated, small irregular coaly rootlets throughout, some carbonaceous mudstone phases, bright coal bands 1 - 4 cm in width, brecciated at 166 M.
177.89 - 178.64	0.75	Mudstone: carbonaceous, plant fossil fragments, vitreous coal bands up to 4 cm in width.
178.64 - 180.46	1.82	Sandstone: fine grained, interbedded with carbonaceous mudstone.
180.46 - 181.96	1.50	Mudstone: carbonaceous, coaly stringers and rootlets throughout, core broken.
181.96 - 182.53	0.57	Claystone: core intact
182.53 - 188.48	5.95	Sandstone: fine grained, interbedded with carbonaceous mudstone, bright coal bands 1 cm in width, mildly bioturbated, small rootlets throughout.
188.48 - 191.27	2.79	Sandstone: medium grained, light grey, occasional coaly rootlet.
191.27 - 191.36	0.09	Ash Band.
191.36 - 191.68	0.32	Sandstone: fine grained, worm burrowed, core intact.
191.68 - 192.11	0.43	Coal: bright, core intact.
192.11 - 193.15	1.04	Siltstone: core intact.

MDD-78-7 - Cont'd

193.15 - 197.80	4.65	Sandstone: fine grained, interbedded with siltstone, minor cross bedding, occasional coaly rootlet. $BCA=72^{\circ}$
197.80 - 202.25	4.45	Sandstone: medium grained, some carbonaceous siltstone phases, minor shears, pyrite, minor cross bedding, numerous coaly rootlets towards base of interval.
202.25 - 203.67	1.42	Sandstone: medium grained, some pebble bands, pebbles poorly sorted, numerous coaly rootlets and stringers.
203.67 - 205.79	2.12	Sandstone: fine grained, light grey, mildly bioturbated.
<u>CADOMIN FORMATION</u>		
205.79 - 208.15	2.36	Conglomerate: pebbles 1 - 6 cm in diameter, green, pink, white and black chert pebbles.

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-08

LOCATION:

- (a) Coal Licence: 3225
- (b) N.T.S. 93-I-15, c-20-B
- (c) Drill Hole Co-ordinates: N 14580.94 - E 3425.76
- (d) Elevation: 1466.01m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gething Formation
COAL SEAMS INTERSECTED: —
TOTAL DEPTH: 175.9m

DATE DRILLED: July 9 - 12, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dens/Cal, GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 4.57	4.57	CASING
		<u>MOOSEBAR FORMATION</u>
4.57 - 5.24	0.67	Siltstone: core solid.
5.24 - 5.30	0.06	Ashband.
5.30 - 37.16	31.86	Siltstone and Mudstone: minor shearing throughout, small black worm burrows common, occasional calcite filled fracture, core fairly broken. BCA = 72°.
		<u>GETHING FORMATION</u>
37.16 - 47.85	10.69	Conglomerate: pebbles poorly sorted, from 0.3cm to 8cm in diameter, minute calcite filled fractures throughout, occasional sandstone phase, coaly rootlets at base of interval.
47.85 - 53.70	5.85	Sandstone: coarse grained, occasional large pebble or pebble band, cross bedded, vitreous bands up to 1cm in width. BCA = 70°
53.70 - 53.91	0.21	COAL BAND.
53.91 - 56.13	2.22	Siltstone: grading to a carbonaceous mudstone at base of interval, bright coal bands throughout, core solid.
		COAL SEAM
56.13 - 56.18	0.05	Coal: 30% vitreous, fairly high specific gravity, core intact.
56.18 - 56.59	0.41	Coal: 70% vitreous, core intact.
		Sample: Interval Width Dry Ash F.S.I.
		0336 56.13 - 56.59 0.46 29.9 7
56.59 - 68.37	11.78	Sandstone: very fine grained, interbedded with siltstone, cross bedded, mildly bioturbated. BCA = 64°.

MDD 78-8 (Cont'd.)

68.37 - 74.50	6.13	Sandstone: medium grained, medium grey, cross bedded, occasional calcite filled fractures.															
74.50 - 76.40	1.90	Sandstone: medium grained, some pebble conglomerate phases, numerous coaly bands and rootlets.															
76.40 - 80.90	4.50	Sandstone: medium grained, medium grey, minor cross bedding, small coaly rootlets.															
80.90 - 82.48	1.58	Conglomerate: fine pebbles with phases of medium grained sandstone, vitreous coal bands up to 6cm in width.															
COAL SEAM																	
82.48 - 82.78	0.30	Coal: 70% vitreous, metallic lustre, core intact.															
82.78 - 83.18	0.40	Coal: 30% vitreous, hard, metallic lustre, core intact.															
83.18 - 83.43	0.25	Coal: 80% vitreous, metallic lustre, core intact.															
83.43 - 83.76	0.33	Coal: 40% vitreous, metallic lustre, core broken in large pieces.															
83.76 - 83.96	0.20	Coal: 80% vitreous, core intact.															
83.96 - 84.06	0.10	Coal: 30% vitreous, core pulverized.															
84.06 - 84.20	0.14	Coal: 30% vitreous, core intact.															
84.20 - 84.31	0.11	Coal: 80% vitreous.															
		<table border="1"> <thead> <tr> <th>Samples:</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0337</td> <td>82.48 - 83.43</td> <td>0.95</td> <td>15.2</td> <td>1½</td> </tr> <tr> <td>0338</td> <td>83.43 - 84.31</td> <td>0.88</td> <td>15.7</td> <td>1½</td> </tr> </tbody> </table>	Samples:	Interval	Width	Dry Ash	F.S.I.	0337	82.48 - 83.43	0.95	15.2	1½	0338	83.43 - 84.31	0.88	15.7	1½
Samples:	Interval	Width	Dry Ash	F.S.I.													
0337	82.48 - 83.43	0.95	15.2	1½													
0338	83.43 - 84.31	0.88	15.7	1½													
84.31 - 87.94	3.63	Siltstone: interbedded with mudstone, mildly bioturbated, vitreous coal bands up to 10 cm in width throughout.															
87.94 - 93.14	5.20	Sandstone: medium grained, medium grey, occasional calcite filled fracture and coaly rootlet.															
93.14 - 103.28	10.14	Sandstone: fine grained, light grey, core intact.															

MDD 78-8 (Cont'd.)

103.28 - 110.12	6.84	Sandstone: fine grained, interbedded with siltstone, carbonaceous partings throughout, numerous small irregular coaly rootlets, occasional mud clast.
110.12 - 125.90	15.78	Sandstone: medium grained, occasional pebble conglomerate phase, some intervals containing numerous coaly rootlets and bands, minor calcite filled fractures.
125.90 - 127.73	1.83	Conglomerate: pebbles well rounded and sorted, pebbles 1-2 cm. in diameter.
127.73 - 128.49	0.76	Sandstone: fine grained, cross bedded.
128.49 - 139.29	10.80	Siltstone: occasional mudstone phase, siltstone interbedded with some sandstone, mildly bioturbated, occasional carbonaceous parting or coaly band. BCA = 72°.
139.29 - 140.31	1.02	Sandstone: fine grained, mildly bioturbated, small coalified rootlets throughout.
140.31 - 140.66	0.35	Mudstone: bright coal bands, sheared.
140.66 - 148.77	8.11	Sandstone: medium grained, cross bedded, occasional calcite filled fractures, rare pebble, coaly rootlets towards base of interval.
148.77 - 153.70	4.93	Sandstone: fine grained, interbedded with siltstone, mildly bioturbated, small coaly rootlets throughout, occasional carbonaceous mudstone phase.
153.70 - 157.58	3.88	Mudstone: carbonaceous, occasional coal band up to 10 cm. in width.
157.58 - 159.92	2.34	Siltstone: interbedded with fine grained sandstone, carbonaceous, sheared, core intact.
159.92 - 160.33	0.41	COAL BAND.
160.33 - 165.30	4.97	Sandstone: fine grained, interbedded with siltstone, occasional calcite filled fracture, minor shearing. BCA = 70°.
165.30 - 171.98	6.68	Sandstone: fine grained, numerous calcite filled fractures, minor shearing, occasional coalified rootlet.

CADOMIN FORMATION

171.98 - 175.57	3.59	Conglomerate: hard, green and pink chert pebbles.
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P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-09

LOCATION:

- (a) Coal Licence: 3235
- (b) N.T.S. 93-I-15, d-11-C
- (c) Drill Hole Co-ordinates: N 15645.89 - E 2847.89
- (d) Elevation: 1552.96m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 - B6
TOTAL DEPTH: 239.9m

DATE DRILLED: July 13 - 16, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MDD 78-9

<u>Interval</u>	<u>Width</u>	<u>Description</u>																				
0 - 3.98	3.98	CASING																				
<u>GATES MEMBER COMMOTION FORMATION</u>																						
3.98 - 4.31	0.33	Mudstone: core pulverized																				
4.31 - 4.52	0.21	Coal: soft, core pulverized																				
4.52 - 5.28	0.76	Mudstone: core pulverized																				
COAL SEAM B6																						
5.28 - 5.53	0.25	Coal: 30% vitreous, earthy lustre, soft, core broken in large pieces.																				
5.53 - 5.93	0.40	Coal: 50% vitreous, core solid.																				
5.93 - 6.21	0.28	Coal: 30% vitreous, soft, core broken in large pieces.																				
6.21 - 6.42	0.21	Coal: soft, dull, peaty																				
6.42 - 7.02	0.60	Coal: 30% vitreous, soft, core pulverized																				
7.02 - 7.05	0.03	Coal: dirty, 20% bright bands, high specific gravity.																				
7.05 - 7.21	0.16	Coal: 20% vitreous, dull earthy lustre, core broken.																				
7.21 - 7.25	0.04	Mudstone: coaly																				
7.25 - 7.35	0.10	Coal: dull, soft, peaty																				
7.35 - 7.48	0.13	Coal: hard, dull, 20% bright bands.																				
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0351</td> <td>5.28-6.21</td> <td>0.93</td> <td>4.9</td> <td>4</td> </tr> <tr> <td>0352</td> <td>6.21-7.02</td> <td>0.81</td> <td>19.3</td> <td>7 1/2</td> </tr> <tr> <td>0.353</td> <td>7.02-7.48</td> <td>0.46</td> <td>60.6</td> <td>1 1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0351	5.28-6.21	0.93	4.9	4	0352	6.21-7.02	0.81	19.3	7 1/2	0.353	7.02-7.48	0.46	60.6	1 1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																		
0351	5.28-6.21	0.93	4.9	4																		
0352	6.21-7.02	0.81	19.3	7 1/2																		
0.353	7.02-7.48	0.46	60.6	1 1/2																		
7.48 - 8.75	1.27	Mudstone: carbonaceous, plant fossil fragments, soft, breaks easily.																				
8.75 - 11.28	2.53	Mudstone: core pulverized																				
11.28 - 12.48	1.20	Sandstone: fine grained, interbedded with siltstone, minute coaly rootlets, calcite filled fractures BCA = 52°																				
12.48 - 16.50	4.02	Mudstone: core highly broken																				
16.50 - 17.48		Sandstone: fine grained, as above.																				
17.48 - 20.32		Mudstone: core broken, occasional coaly band																				
COAL SEAM B5																						
20.32 - 20.42	0.10	Coal: soft, dull, peaty, core pulverized																				
20.42 - 20.61	0.19	Coal: 40% vitreous, metallic lustre, core broken.																				

MDD 78-9 (Cont'd.)

20.61 - 20.91	0.23	Coal: soft, peaty, sheared, core pulverized															
20.91 - 21.14	0.23	Coal: 30% vitreous, earthy lustre, core broken.															
21.14 - 22.47	1.33	Mudstone: carbonaceous, core solid.															
22.47 - 22.77	0.30	Coal: 20% vitreous, earthy lustre, 10% mudstone chips, core pulverized.															
22.77 - 22.99	0.22	Coal: very soft, dull, core pulverized.															
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0354</td> <td>20.32-21.14</td> <td>0.82</td> <td>12.4</td> <td>7 1/2</td> </tr> <tr> <td>0355</td> <td>21.14-22.99</td> <td>1.85</td> <td>29.2</td> <td>1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0354	20.32-21.14	0.82	12.4	7 1/2	0355	21.14-22.99	1.85	29.2	1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>													
0354	20.32-21.14	0.82	12.4	7 1/2													
0355	21.14-22.99	1.85	29.2	1/2													
22.99 - 23.20	0.21	Mudstone: carbonaceous															
23.20 - 35.66	12.46	Sandstone: fine grained, interbedded with siltstone, occasional mudstone phase, moderately bioturbated, small irregular coaly rootlets throughout, calcite filled fractures. BCA = 48°															
35.66 - 42.45	6.77	Sandstone: fine grained, light grey, small coaly rootlets throughout, minute calcite filled fractures.															
		FAULT ZONE															
42.45 - 47.44	4.99	Sandstone: fine grained with carbonaceous mudstone phases, numerous large coaly rootlets, numerous calcite veins and calcite filled fractures, core sheared and broken. BCA = 18°															
47.44 - 53.41	5.97	Sandstone: medium grained with occasional mudstone phase, numerous coaly rootlets throughout, numerous calcite filled fractures, core broken. BCA = 42°															
53.41 - 57.85	4.44	Siltstone/Mudstone: some carbonaceous phases, minor shearing, calcite filled fractures.															
57.85 - 68.02	10.17	Siltstone: interbedded with 20% very fine grained sandstone, minor shearing, core broken in large pieces. BCA = 48°															
68.02 - 69.00	0.98	Mudstone: carbonaceous, plant fossil fragments, coaly rootlets throughout, core intact,															
69.00 - 69.19	0.19	Coal: sheared, core pulverized.															
69.19 - 69.37	0.18	Mudstone: carbonaceous, bright coal bands, sheared.															

MDD 78-9 (Cont'd.)

COAL SEAM B4 (repeat)

69.37 - 69.54	0.17	Coal: 20% vitreous, earthy lustre, core intact
69.54 - 69.85	0.31	Coal: 30% vitreous, metallic lustre, core broken in large pieces.
69.85 - 69.92	0.07	Coal: soft, dull, fairly high specific gravity.
69.92 - 70.04	0.12	Coal: dull, 20% vitreous bands, sheared, core broken.
70.04 - 70.50	0.46	Coal: 30% vitreous, metallic lustre, core intact.
70.50 - 71.02	0.52	Coal: 30% vitreous, earthy lustre, core pulverized (recovered 42 cm)
71.02 - 71.44	0.42	Coal: 30% vitreous, metallic lustre, core broken in large pieces. (recovered 33 cm)
71.44 - 71.98	0.54	Coal: 70% vitreous, metallic lustre, core intact.
71.98 - 72.13	0.15	Coal: 20% vitreous, metallic lustre, hard, core intact.
72.13 - 72.48	0.35	Mudstone: carbonaceous, core intact.
72.48 - 72.71	0.23	Coal: 30% vitreous, metallic lustre, core intact.
72.71 - 72.97	0.26	Coal: 40% vitreous, earthy lustre, core intact.
72.97 - 73.17	0.20	Coal: 60% vitreous, metallic lustre, core broken in large pieces.
73.17 - 73.38	0.21	Coal: dull, soft, core broken.
73.38 - 73.50	0.12	Coal: boney
73.50 - 73.54	0.04	Coal: dull, hard, 20% vitreous bands
73.54 - 73.60	0.06	Coal: core pulverized
73.60 - 73.80	0.20	Coal: 30% vitreous, metallic lustre, hard, core intact.
73.80 - 74.20	0.40	Coal: soft, dull, sheared, core broken and crushed.
74.20 - 74.46	0.26	Mudstone: carbonaceous, bright coal bands, core intact.
74.46 - 74.97	0.51	Coal: 60% vitreous, earthy lustre, core broken in large pieces.
74.97 - 75.15	0.18	Coal: 70% vitreous, metallic lustre, core intact.
75.15 - 75.90	0.75	Coal: 30% vitreous, metallic lustre, core broken (recovered 20 cm)
75.90 - 77.18	1.28	Mudstone: carbonaceous, minor shearing, numerous coaly rootlets, core intact. BCA = 64°
77.18 - 77.46	0.28	Coal: 80% vitreous, metallic lustre, core intact.
77.46 - 77.50	0.04	Mudstone: carbonaceous

MDD 78-9 (Cont'd.)

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0366	84.45-86.56	2.11	12.5	7
86.56 - 87.25	0.69	Mudstone: carbonaceous, sheared, 4 - 5 cm bands of coal common.		
87.25 - 90.13	2.88	Mudstone: carbonaceous, sheared, minute coaly bands throughout, occasional calcite filled fractures, core intact.		
90.13 - 90.60	0.47	Coal: 30% vitreous, metallic lustre, some small (1 cm) mudstone bands.		
90.60 - 92.14	1.54	Mudstone: carbonaceous, as above.		
COAL SEAM B3 (repeat)				
92.14 - 92.26	0.12	Coal: dull, 20% minute vitreous bands.		
92.26 - 92.33	0.07	Coal: boney		
92.33 - 92.37	0.04	Coal: 20% vitreous, earthy lustre, core intact.		
92.37 - 92.67	0.30	Coal: 30% vitreous, earthy lustre, sheared, hard, core intact.		
92.67 - 92.77	0.10	Coal: hard, high specific gravity, sheared.		
92.77 - 93.19	0.42	Coal: 50% vitreous, soft, core pulverized.		
93.19 - 93.33	0.14	Coal: dull, hard, core pulverized.		
93.33 - 93.57	0.24	Mudstone: carbonaceous, core broken.		
93.57 - 93.77	0.20	Coal:		
93.77 - 95.33	1.56	Mudstone: carbonaceous, small coaly bands throughout. BCA = 62°		
95.33 - 96.69	1.36	Coal: soft, dull, 30% vitreous, core pulverized (recovered 87 cm)		
96.69 - 98.50	1.81	Mudstone: carbonaceous, sheared, small coaly rootlets throughout.		
98.50 - 98.76	0.26	Coal: dirty, core broken		
98.76 - 98.81	0.05	Mudstone: carbonaceous		
98.81 - 99.39	0.58	Coal: 20% vitreous, dull, hard		
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0367	92.14-92.77	0.63	46.7	1
0368	92.77-93.33	0.56	16.6	7
0369	95.33-96.69	1.36	27.8	4 1/2
0370	98.50-99.39	0.89	61.3	1
99.39 - 99.67	0.28	Mudstone: carbonaceous, bright coal bands, core pulverized.		

MDD 78-9 (Cont'd.)

99.67 - 100.01	0.34	Mudstone: carbonaceous, bright coal bands, core intact.															
100.01 - 102.32	2.31	Mudstone/Siltstone: carbonaceous, plant fossil fragments, minor shearing, occasional coal band up to 10 cm in width.															
102.32 - 102.72	0.40	Coal and Mudstone: core pulverized and mixed in box.															
102.72 - 109.02	6.30	Mudstone: carbonaceous, coal bands 3-4 cm in width common, sheared, occasional calcite filled fractures, core broken.															
COAL SEAM B4 (Lower)																	
109.02 - 109.34	0.32	Coal: 40% vitreous, metallic lustre, core pulverized.															
109.34 - 110.06	0.72	Coal: 70% vitreous, metallic lustre, sheared, soft, core broken in large pieces.															
110.06 - 110.61	0.55	Coal: 50% vitreous, soft, core pulverized.															
110.61 - 111.03	0.42	Coal: 20% vitreous, dull, soft, core pulverized.															
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0371</td> <td>109.02-109.34</td> <td>0.32</td> <td>13.5</td> <td>2 1/2</td> </tr> <tr> <td>0372</td> <td>109.34-111.03</td> <td>1.69</td> <td>15.1</td> <td>7 1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0371	109.02-109.34	0.32	13.5	2 1/2	0372	109.34-111.03	1.69	15.1	7 1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>													
0371	109.02-109.34	0.32	13.5	2 1/2													
0372	109.34-111.03	1.69	15.1	7 1/2													
111.03 - 123.95	12.92	Siltstone: interbedded with mudstone, carbonaceous, minute fractures filled with calcite, minor shearing, occasional fine grained sandstone phase.															
COAL SEAM B3																	
123.95 - 124.18	0.23	Mudstone: carbonaceous, sheared, core broken.															
124.18 - 124.58	0.40	Coal: 30% vitreous, metallic lustre, core pulverized.															
124.58 - 125.04	0.46	Coal: 70% vitreous, metallic lustre, soft, core broken in large pieces.															
125.04 - 126.11	1.07	Mudstone: carbonaceous, core intact.															
126.11 - 126.62	0.51	Coal: 70% vitreous, metallic lustre, core pulverized.															
126.62 - 126.82	0.20	Coal: 20% vitreous, metallic lustre, core broken in large pieces.															
126.82 - 127.32	0.50	Coal: 20% vitreous, as above.															
127.32 - 127.84	0.52	Mudstone: carbonaceous, core intact.															

MDD 78-9 (Cont'd.)

127.84 - 128.09	0.25	Coal: soft, dull, earthy lustre.
128.09 - 128.40	0.31	Coal: 30% vitreous, metallic lustre, core pulverized.
128.40 - 128.66	0.26	Coal: dull, core pulverized.

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0373	123.95-125.04	1.09	6.76	7 1/2
0374	125.04-127.32	2.28	12.87	7
2251	127.32-127.84	0.52	89.4	NA
0375	127.84-128.66	0.82	24.44	7 1/2

128.66 - 129.64	0.98	Mudstone: carbonaceous, small coaly rootlets throughout, core intact.
129.64 - 137.28	7.64	Siltstone: carbonaceous, plant fossil fragments, sheared, calcite filled fractures and along shears, core intact.
137.28 - 138.27	0.99	Mudstone: carbonaceous, sheared, bright coal bands throughout.
138.27 - 138.85	0.58	Mudstone: coaly, interbedded with coal.
138.85 - 139.65	0.79	Siltstone: carbonaceous, small coaly rootlets.
139.64 - 144.97	5.33	Sandstone: fine grained, interbedded with siltstone; plant fossils, minor shearing. BCA = 52 ^o
144.97 - 145.40	0.43	Coal: hard, dirty, sheared, core pulverized.
145.40 - 146.28	0.88	Mudstone: carbonaceous, bright coal bands throughout, sheared, core intact.

COAL SEAM B2

146.28 - 146.47	0.19	Coal: 70% vitreous, metallic lustre, core crushed and broken.
146.47 - 146.67	0.20	Coal: 70% vitreous, core intact.
146.67 - 147.15	0.48	Coal: 60% vitreous, metallic lustre, core pulverized.
147.15 - 147.29	0.14	Coal: 40% vitreous coal and 60% mudstone, core crushed and mixed in box.

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0377	146.28-147.29	1.01	14.35	5 1/2

147.29 - 151.49	4.20	Sandstone: medium grained, numerous coaly bands and rootlets throughout minor shearing, core broken.
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MDD 78-9 (Cont'd.)

151.49 - 156.47	4.98	Sandstone: fine grained, occasional plant fossil, occasional coaly rootlets or stringers, core intact.
156.47 - 179.64	23.17	Sandstone: medium grained, light grey, numerous coaly rootlets throughout, calcite filled fractures, sheared, occasional pebble band 2 - 3 cm in width towards base of interval, cross bedded towards base of interval. BCA = 56 ⁰
179.64 - 183.00	3.36	Siltstone/Mudstone: carbonaceous, plant fossils, coaly rootlets throughout, floral bioturbation, sheared, core intact.
183.00 - 184.04	1.04	Siltstone: interbedded with fine grained sandstone, coaly rootlets common, core intact.
COAL SEAM B1		
184.04 - 184.18	0.14	Coal: fairly solid, 70% vitreous, metallic lustre.
184.18 - 184.25	0.07	Coaly Mudstone: 30% vitreous bands, dull, high specific gravity.
184.25 - 185.01	0.76	Coal: dull, peaty, soft, 30% vitreous, sheared, core pulverized. (recovered 53 cm)
185.01 - 185.30	0.29	Coal: 70% vitreous, metallic lustre, hard, core broken in large pieces.
185.30 - 186.23	0.93	Coal: core pulverized, sheared, soft dull peaty coal.
186.13 - 186.23 - high specific gravity		
186.23 - 186.77	0.54	Coal: 60% vitreous, metallic lustre, core intact.
186.77 - 186.91	0.14	Coal: 30% vitreous bands, hard, dull-earthy lustre, higher specific gravity, sheared.
186.91 - 187.28	0.37	Mudstone: carbonaceous, core intact.
187.28 - 187.67	0.39	Coal: 60% vitreous, metallic lustre, core broken and crushed.
187.67 - 187.85	0.18	Coal: soft, dull, 20% minute vitreous bands, sheared, last 4 cm fairly high specific gravity, core broken and crushed.

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0378	184.04-185.01	0.97	37.52	7
0379	185.01-186.23	1.22	42.31	7
0380	186.23-186.91	0.68	24.47	7

MDD 78-9 (Cont'd.)

		<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
		2252	186.91-187.28	0.37	85.6	NA
		0381	187.28-187.85	0.57	14.41	8 1/2
187.85 - 189.48	1.63					Mudstone: carbonaceous, core intact.
189.48 - 201.98	12.5					Sandstone: medium grained, light grey, small coaly rootlets throughout, calcite filled fractures, minor cross bedding.
						194.03 - 195.63 - Core heavily sheared and broken. BCA = 56°
201.98 - 215.49	13.51					Sandstone: fine grained, light grey, cross bedded, occasional calcite filled fracture.
215.49 - 225.39	9.90					Sandstone: fine grained, as above with numerous calcite filled fractures, sheared.
225.39 - 239.88	14.49					Sandstone: fine grained, light grey, interbedded with 20% siltstone, cross bedded, shearing. BCA = 46°

E.O.H.

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-10

LOCATION:

- (a) Coal Licence: 3946
- (b) N.T.S. 93-I-15, a-18-B
- (c) Drill Hole Co-ordinates: N 12934.71 - E 4389.78
- (d) Elevation: 1575.50m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 - B9
TOTAL DEPTH: 239.9m

DATE DRILLED: July 17 - 20, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dens/Cal, GRN, FBL

<u>Interval (metres)</u>	<u>Width (metres)</u>	<u>Description</u>
0 - 4.59	4.59	Overburden
		<u>GATES MEMBER - COMMOTION FORMATION</u>
4.59 - 6.40	1.81	Mudstone: carbonaceous, soft, small coaly bands throughout.
6.40 - 6.70	0.30	Coal: 40% vitreous, metallic lustre, core broken in large pieces.
6.70 - 6.98	0.28	Coal: 40% vitreous, earthy lustre, core solid.
6.98 - 7.26	0.28	Coal: 70% vitreous, metallic lustre, core broken in large pieces.
7.26 - 9.16	1.90	Claystone: carbonaceous
9.16 - 11.68	2.52	Sandstone: very fine grained with carbonaceous mudstone phases, plant fossils, small coaly rootlets throughout, minor bioturbation. BCA = 61°.
		COAL SEAM B9
11.68 - 12.06	0.38	Coal: 60% vitreous, metallic lustre, hard, core intact.
12.06 - 12.16	0.10	Coal: 30% vitreous, earthy lustre, core intact.
12.16 - 12.23	0.07	Coal: dirty, 50% coal, 50% mudstone.
12.23 - 12.32	0.09	Coal: 30% vitreous, earthy lustre, core intact.
12.32 - 12.56	0.24	Coal: 30% vitreous, earthy lustre, fairly high specific gravity, core intact.
12.56 - 12.97	0.41	Coal: 70% vitreous, metallic lustre, core intact
12.97 - 13.35	0.38	Coal: 70% vitreous, metallic lustre, core broken
13.35 - 13.67	0.32	Coal: 40% vitreous, metallic lustre, core intact.
13.67 - 13.79	0.12	Coal: 80% vitreous, core intact.

MDD-78-10 (cont'd)

13.79 - 14.33	0.54	Coal: 70% vitreous, earthy lustre, core pulverized.
14.33 - 14.69	0.36	Coal: 50% coal, 50% carbonaceous mudstone, core pulverized and mixed in box.

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
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0382	6.40-7.26	0.86	10.53	1½
0383	11.68-12.16	0.48	15.12	NA
0384	12.16-12.56	0.40	38.85	NA
0385	12.56-13.79	1.23	3.84	NA
0386	13.79-14.33	0.54	23.56	NA
0387	14.33-14.69	0.36	50.13	NA

14.69 - 19.37	4.68	Sandstone: fine grained, small coaly rootlets throughout, sheared, occasional small coaly band.
19.37 - 19.79	0.42	Mudstone: carbonaceous.
19.79 - 20.42	0.63	Mudstone: numerous vitreous bands throughout.
20.42 - 26.52	6.10	Sandstone: interbedded with siltstone, plant fossils, minor shearing, occasional vitreous band up to 10cm in width.
26.52 - 27.08	0.56	Mudstone: carbonaceous, sheared.
27.08 - 27.23	0.15	Coal: dirty.
27.23 - 27.57	0.34	Mudstone: carbonaceous.
27.52 - 41.62	14.05	Sandstone: very fine grained, plant fossil fragments and small coaly rootlets, minor shearing.
41.62 - 47.35	5.73	Sandstone: medium grained, light grey, cross-bedded, occasional carbonaceous parting. BCA = 56°.
47.35 - 58.32	10.97	Sandstone: coarse grained, fine pebble conglomerate phases, cross-bedded, numerous coaly rootlets throughout, sheared at base of interval.
58.32 - 64.57	6.25	Siltstone: interbedded with fine grained sandstone, occasional brown mud band, coaly rootlets throughout, pyrite specks and stringers. BCA = 56°.
64.57 - 65.47	0.90	Sandstone: very fine grained, medium grey, core intact.

MDD-78-10 (cont'd)

65.47 - 65.54	0.07	Mudstone: carbonaceous COAL SEAM B7										
65.54 - 65.71	0.17	Coal: 70% vitreous, metallic lustre, pyrite specks common, core intact.										
65.71 - 65.83	0.10	Coal: 30% vitreous, metallic lustre, core intact.										
65.83 - 66.14	0.31	Coal: 70% vitreous, earthy lustre, core intact										
66.14 - 66.53	0.39	Coal: 40% vitreous, earthy lustre, numerous specks of pyrite, core intact.										
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0388</td> <td>65.54-66.53</td> <td>0.99</td> <td>7.75</td> <td>7</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0388	65.54-66.53	0.99	7.75	7
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>								
0388	65.54-66.53	0.99	7.75	7								
65.53 - 66.71	1.18	Mudstone: carbonaceous, minute coal bands throughout, core intact.										
66.71 - 77.80	11.09	Siltstone: interbedded with fine grained sandstone, occasional carbonaceous mudstone phase, plant fossils, small irregular. Coaly rootlets throughout. BCA = 56°.										
77.80 - 79.10	1.30	Mudstone; carbonaceous, small coaly rootlets and minute vitreous bands throughout, minor shearing. COAL SEAM B6										
79.10 - 79.25	0.15	Coal: 60% vitreous, earthy lustre, 2 small bands (1 cm each) of dirty coal, core intact.										
79.25 - 79.65	0.40	Coal: 60% vitreous, core intact.										
79.65 - 79.73	0.08	Mudstone: carbonaceous, pyrite specks, slickensides, core intact.										
79.73 - 79.88	0.15	Coal: 60% vitreous, earthy lustre, pyrite common, core intact.										
79.88 - 80.16	0.28	Mudstone: carbonaceous, core intact.										
80.16 - 80.36	0.20	Coal: 40% vitreous, metallic lustre, pyrite core intact.										
80.36 - 80.54	0.18	Coal: 30% vitreous, earthy lustre, soft, pyrite, core broken.										

MDD-78-10 (cont'd)

80.54 - 82.09	1.55	Mudstone: carbonaceous, small coaly bands throughout, core broken.				
82.09 - 82.68	0.59	Coal: 40% vitreous, metallic lustre, core pulverized.				
		<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
		0389	79.10-79.65	0.55	8.61	7
		0390	79.65-80.16	0.51	67.24	1½
		0391	80.16-80.54	0.38	6.40	7½
		2253	80.54-82.09	1.55	80.3	NA
		0392	82.09-82.68	0.59	17.21	7
82.68 - 85.57	2.89	Sandstone: fine grained with 20% siltstone, small irregular coaly rootlets throughout, mildly bioturbated.				
85.57 - 91.76	6.19	Sandstone: very fine grained, interbedded with siltstone, moderately bioturbated.				
91.76 - 95.30	3.54	Mudstone: carbonaceous, grades to a coaly mudstone at base, sheared, at base of interval vitreous bands up to 3 cm in width.				
		COAL SEAM B5				
95.30 - 95.46	0.16	Coal: 40% vitreous, earthy lustre, core intact.				
95.46 - 95.70	0.24	Mudstone: carbonaceous, small coal bands, core intact.				
95.70 - 96.00	0.30	Coal: 30% vitreous, metallic lustre, hard, pyrite specks common, core broken.				
96.00 - 96.10	0.10	Coal: dull, soft, peaty, sheared				
96.10 - 96.33	0.23	Coal: 30% vitreous, earthy lustre, hard, fairly high specific gravity, core broken.				
96.33 - 96.39	0.06	Mudstone: carbonaceous.				
96.39 - 96.62	0.23	Coal: 30% vitreous, earthy lustre, core pulverized.				
96.62 - 96.80	0.18	Coal: 40% vitreous, metallic lustre, core intact.				
96.80 - 96.84	0.04	Mudstone: carbonaceous.				
96.84 - 97.54	0.70	Coal: 30% vitreous, metallic lustre, core intact.				
		<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
		0393	95.30-96.62	1.32	48.00	2½
		0394	96.62-97.54	0.92	15.54	3

MDD-78-10 (cont'd)

97.54 - 108.76	11.22	Mudstone: carbonaceous, small coaly rootlets and minute vitreous bands throughout, core intact.
108.76 - 134.63	25.87	Siltstone: dark grey, uniform, minute fractures throughout, occasional coal band up to 1 cm in width, slump features and brown mud bands, core intact. BCA = 56° - 62°.
134.63 - 135.47	0.84	Mudstone: carbonaceous, core intact. COAL SEAM B4(u)
135.47 - 136.07	0.60	Coal: 30% vitreous, metallic lustre, coal very hard, core intact.
136.07 - 136.25	0.18	Coal: 30% vitreous, metallic lustre, core broken.
136.25 - 136.35	0.10	Coal: 40% vitreous, earthy lustre.
136.35 - 136.81	0.46	Mudstone: carbonaceous, core intact.
136.81 - 136.89	0.08	Coal: hard, fairly dirty, 10% vitreous bands.
137.32 - 137.58	0.26	Coal: 40% vitreous, earthy lustre, core broken.
137.58 - 137.71	0.13	Mudstone: carbonaceous.
137.71 - 137.98	0.27	Coal: 30% vitreous, metallic lustre, core intact.
137.98 - 138.20	0.22	Coal: 50% vitreous, metallic lustre, core intact.
138.20 - 138.38	0.18	Coal: 30% vitreous, metallic lustre, core intact.
138.38 - 138.50	0.12	Mudstone: carbonaceous.
138.50 - 138.60	0.10	Coal: 70% vitreous, metallic lustre, core intact.
138.60 - 139.00	0.40	Coal: 60% vitreous, metallic lustre, core intact.
139.00 - 139.14	0.14	Coal: 10% vitreous, earthy lustre, sheared, fairly high specific gravity.

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0395	135.47-136.35	0.88	21.57	3½
2254	136.35-136.81	0.46	88.10	NA
0396	136.81-137.58	0.77	13.23	5½
0397	137.58-138.50	0.92	34.52	2½
0398	138.50-139.14	0.64	51.10	1½

139.14 - 141.64	2.50	Mudstone: carbonaceous, sheared; numerous vitreous coal bands up to 10 cm in width. COAL SEAM B4(1)
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MDD-78-10 (cont'd)

141.64 - 142.14	0.50	Coal: soft, dull peaty, sheared, core pulverized.
142.14 - 142.34	0.20	Coal: 30% vitreous, dull earthy lustre, core broken.
142.34 - 142.69	0.35	Coal: 10% vitreous metallic lustre, core broken
142.69 - 143.04	0.35	Coal: 40% vitreous, metallic lustre, core intact.
143.04 - 143.40	0.36	Coal: 70% vitreous, metallic lustre, core broken in large pieces.
143.40 - 143.68	0.28	Coal: 40% vitreous, earthy lustre, minor shears, core broken in large pieces.
143.68 - 144.17	0.49	Coal: 20% vitreous, dull earthy lustre, core pulverized.

	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
	0399	141.64-142.34	0.70	28.63	3½
	0400	142.34-143.40	1.06	13.39	5½
	0401	143.40-144.17	0.77	5.26	7
144.17 - 147.27	3.10	Siltstone: carbonaceous, BCA = 66°.			
147.27 - 153.57	6.30	Sandstone: very fine grained, interbedded with siltstone, plant fossils, small irregular coaly rootlets throughout, mildly bioturbated.			
153.57 - 156.30	2.73	Mudstone: carbonaceous, minor shearing			
156.30 - 156.40	0.10	Mudstone: coaly			
		COAL SEAM B3			
156.40 - 156.70	0.30	Coal: 40% vitreous, metallic lustre, core intact.			
156.70 - 157.74	0.46	Coal: 80% vitreous, earthy lustre, core intact.			
157.28 - 157.24	0.46	Coal: 60% vitreous, metallic lustre, core intact.			
157.24 - 158.04	0.30	Mudstone: carbonaceous.			
158.04 - 158.40	0.36	Coal: 60% vitreous, earthy lustre, core intact.			
158.40 - 158.98	0.58	Coal: 40% vitreous, metallic lustre, core intact.			
158.98 - 159.14	0.16	Coal: 20% vitreous, dull, core intact.			
159.14 - 159.53	0.39	Mudstone: carbonaceous			

MDD-78-10 (Cont'd)

159.53 - 159.65	0.10	Coal: soft, dull, peaty
159.65 - 160.06	0.41	Coal: 30% vitreous, earthy lustre, core broken
160.06 - 160.40	0.34	Coal: 80% vitreous, earthy lustre, core pulverized.

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0402	156.30-157.24	1.44	6.21	7
0403	157.74-158.04	0.30	81.85	NA
0404	158.04-159.14	1.10	15.78	4
0405	159.14-159.53	0.39	83.41	NA
0406	159.53-160.40	0.89	10.17	6½
160.40 - 160.64	0.24	Mudstone: numerous small vitreous band, carbonaceous.		
160.64 - 161.61	0.97	Siltstone: core solid		
161.61 - 162.53	0.92	Mudstone: vitreous bands, 1 cm in width common		
162.53 - 162.79	0.26	Coal band: 70% vitreous, earthy lustre		
162.79 - 163.19	0.40	Mudstone: carbonaceous		
163.19 - 169.98	6.79	Mudstone: medium grained, light grey, cross-bedded. Small coaly rootlets throughout.		
169.98 - 170.75	0.77	Sandstone: fine grained, occasional coaly rootlets brecciated.		
170.75 - 174.87	4.12	Mudstone: sheared, core broken, carbonaceous.		
174.87 - 181.97	7.10	Sandstone: fine grained, occasional coaly rootlet, brecciated toward base of interval		
181.97 - 186.70	4.73	Sandstone: medium grained, coaly rootlets throughout, fine pebble conglomerate towards base of interval.		
186.70 - 186.97	0.27	Coal and: 40% vitreous, earthy lustre, core broken.		
186.97 - 188.16	1.19	Mudstone: coaly and carbonaceous, core broken.		
186.16 - 189.74	1.58	Siltstone: carbonaceous, small coaly rootlets throughout.		
189.74 - 191.11	1.37	Mudstone: carbonaceous, vitreous coal bands up to 6 cm in width.		

MDD-78-10 (Cont'd)

191.11 - 194.46	3.35	Siltstone: carbonaceous: as above										
194.46 - 205.68	11.22	Sandstone: very fine grained, interbedded with siltstone, minor cross bedding, small irregular coaly rootlets throughout.										
205.68 - 209.68	4.00	Sandstone: medium grained, cross bedded BCA = 58°										
209.68 - 210.55	0.87	Mudstone: carbonaceous, with occasional coal band 3-4 cm in width, sheared core broken.										
		COAL SEAM B1										
210.55 - 211.05	0.50	Coal: 20% vitreous, metallic lustre, hard, core broken and crushed.										
211.05 - 211.49	0.44	Coal: 40% vitreous, metallic lustre, core intact.										
		<table border="1"> <thead> <tr> <th><u>Sample</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0407</td> <td>210.55-211.49</td> <td>0.94</td> <td>8.60</td> <td>5½</td> </tr> </tbody> </table>	<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0407	210.55-211.49	0.94	8.60	5½
<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>								
0407	210.55-211.49	0.94	8.60	5½								
211.49 - 212.90	1.41	Mudstone: carbonaceous, core intact, occasional small vitreous band.										
212.90 - 215.49	2.59	Sandstone; very fine grained, siltstone interbeds, small coaly rootlets throughout.										
215.49 - 215.79	0.30	Mudstone: carbonaceous.										
215.79 - 227.18	11.39	Sandstone: medium grained. cross-bedded, occasional interval of large white worm burrows. Occasional coaly rootlet. BCA = 62°.										
222.18 - 239.88	12.20	Sandstone: medium grained, cross bedded, occasional silt band towards base of interval.										
		E.O.H.										

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-11

LOCATION:

- (a) Coal Licence: 3946
- (b) N.T.S. 93-I-15, b-18-B
- (c) Drill Hole Co-ordinates: N 12858.15 - E 4200.84
- (d) Elevation: 1558.82m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B4
TOTAL DEPTH: 227.7m

DATE DRILLED: July 11 - 16, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MDD 78-11

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 5.70	5.70	CASING
		<u>GATES MEMBER - COMMOTION FORMATION</u>
5.70 - 6.14	0.44	Mudstone: carbonaceous, core broken.
6.14 - 21.75	15.61	Siltstone: interbedded with mudstone, carbonaceous, occasional coal band 1 to 2 cm. in width, small coaly rootlets throughout, mildly bioturbated. BCA = 72°
21.75 - 21.95	0.20	Coal band: 30% vitreous, earthy lustre, core pulverized.
21.95 - 24.82	2.87	Mudstone: carbonaceous, plant fossil fragments, coaly bands 2 - 3 cm. in width.
		COAL SEAM B-4
24.82 - 24.92	0.10	Coal: 70% dirty coal and mudstone, 30% bright coal, core pulverized.
24.92 - 25.11	0.19	Coal: 30% vitreous, metallic lustre, core solid.
25.11 - 25.16	0.05	Coal: 70% vitreous, metallic lustre.
25.16 - 25.24	0.08	Coal: 30% vitreous, earthy lustre.
25.24 - 25.62	0.38	Coal: 70% vitreous, metallic lustre, core solid.
25.62 - 26.21	0.59	Mudstone: carbonaceous, core solid.
26.21 - 26.30	0.09	Coal: 50% vitreous, metallic lustre, core broken in large pieces
26.30 - 26.37	0.07	Mudstone: carbonaceous.
26.37 - 26.75	0.38	Coal: 70% vitreous, metallic lustre, core solid.
26.75 - 26.99	0.24	Mudstone: carbonaceous, core solid.
26.99 - 27.14	0.15	Coal: 30% vitreous, earthy lustre, fairly high specific gravity.
27.14 - 27.50	0.36	Coal: 30% vitreous, earthy lustre, minor dirty coal bands less than 1 cm. in width.
27.50 - 27.76	0.26	Coal: 60% vitreous, 40% dull, core solid.

MDD 78-11 (cont'd)

27.76 - 28.20	0.44	Coal: 40% vitreous, metallic lustre, core solid.				
		<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
		0339	24.82 - 25.62	0.80	25.3	5½
		2255	25.62 - 26.21	0.59	90.0	N.A.
		0340	26.21 - 26.75	0.54	25.7	6
		0341	26.75 - 26.99	0.24	85.0	N.A.
		0342	26.99 - 28.20	1.21	23.3	6½
28.20 - 31.17	2.97	Mudstone: carbonaceous, coal bands up to 6 cm. in width.				
31.17 - 31.74	0.57	Coal: 30% vitreous, dull earthy lustre some (20%) dirty coal - core pulverized.				
31.74 - 32.24	0.50	Coal: 30% vitreous, metallic lustre, core broken and crushed.				
32.24 - 32.76	0.52	Coal: 70% vitreous, metallic lustre, core solid.				
32.76 - 32.96	0.20	Coal: soft, dull, peaty coal, sheared, core broken into flakes.				
32.96 - 33.18	0.22	Coal: 30% vitreous, earthy lustre, core broken in large pieces.				
33.18 - 33.29	0.11	Coal: 80% vitreous.				
		<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
		0343	31.17 - 32.24	1.07	25.1	4½
		0344	32.24 - 33.29	1.05	5.7	7½
33.29 - 34.54	1.25	Mudstone: carbonaceous, core solid.				
34.54 - 44.61	10.07	Siltstone: interbedded with very fine grained sandstone, plant fossil fragments, small irregular coaly rootlets throughout, occasional carbonaceous parting. BCA = 72°				
44.61 - 45.12	0.51	Mudstone: carbonaceous, plant fossils, vitreous coal bands throughout.				
COAL SEAM B-3						
45.12 - 45.52	0.40	Coal: 70% vitreous, metallic lustre, core solid.				
45.52 - 45.81	0.29	Coal: 50% vitreous, earthy lustre.				
45.81 - 45.99	0.18	Coal: 40% vitreous, metallic lustre, core solid.				
45.99 - 46.49	0.50	Coal: 80% vitreous, core solid.				
46.49 - 46.75	0.26	Mudstone: carbonaceous, core solid.				

MDD 78-11 (cont'd)

46.75 - 47.11	0.36	Coal: 70% vitreous, core solid.																														
47.11 - 47.28	0.17	Coal: 20% vitreous, metallic lustre, core solid.																														
47.28 - 47.79	0.51	Coal: 30% bitreous, metallic lustre, core solid.																														
		<table border="1"> <thead> <tr> <th>Samples:</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0345</td> <td>45.12 - 46.49</td> <td>1.37</td> <td>4.5</td> <td>7½</td> </tr> <tr> <td>0346</td> <td>46.49 - 46.75</td> <td>0.26</td> <td>74.5</td> <td>½</td> </tr> <tr> <td>0347</td> <td>46.75 - 47.79</td> <td>1.04</td> <td>10.7</td> <td>5</td> </tr> <tr> <td>0348</td> <td>47.79 - 48.12</td> <td>0.33</td> <td>72.7</td> <td>½</td> </tr> <tr> <td>0349</td> <td>48.12 - 48.69</td> <td>0.57</td> <td>6.6</td> <td>8½</td> </tr> </tbody> </table>	Samples:	Interval	Width	Dry Ash	F.S.I.	0345	45.12 - 46.49	1.37	4.5	7½	0346	46.49 - 46.75	0.26	74.5	½	0347	46.75 - 47.79	1.04	10.7	5	0348	47.79 - 48.12	0.33	72.7	½	0349	48.12 - 48.69	0.57	6.6	8½
Samples:	Interval	Width	Dry Ash	F.S.I.																												
0345	45.12 - 46.49	1.37	4.5	7½																												
0346	46.49 - 46.75	0.26	74.5	½																												
0347	46.75 - 47.79	1.04	10.7	5																												
0348	47.79 - 48.12	0.33	72.7	½																												
0349	48.12 - 48.69	0.57	6.6	8½																												
48.69 - 60.05	11.36	Mudstone: carbonaceous, plant fossils, vitreous coal bands up to 10 cm. in width.																														
60.05 - 69.29	9.24	Sandstone: fine grained, interbedded with siltstone, plant fossils, occasional small coaly rootlet, mildly bioturbated. BCA = 72°																														
69.29 - 76.97	7.68	Sandstone: medium grained, light grey, occasional coaly rootlet, small cross bedded intervals, brecciated intervals throughout.																														
76.97 - 84.77	7.80	Sandstone: coarse grained, occasional fine pebbles conglomerate band, numerous vitreous bands and coaly rootlets throughout.																														
84.77 - 87.21	2.44	Sandstone: fine grained, numerous coaly rootlets throughout, moderately bioturbated.																														
87.21 - 94.06	6.85	Sandstone: fine grained, interbedded with siltstone, occasional carbonaceous parting, mildly bioturbated.																														
94.06 - 98.53	4.47	Sandstone: medium grained, light grey, cross bedded, occasional carbonaceous parting. BCA = 62°																														
98.53 - 99.42	0.89	Sandstone: fine grained, interbedded with siltstone, small irregular coaly rootlets throughout, moderately boiturbated.																														
99.42 - 102.80	3.38	Mudstone: carbonaceous with minute vitreous bands.																														
		COAL SEAM B-1																														
102.80 - 102.85	0.05	Coal: 30% vitreous, metallic lustre.																														
102.85 - 102.98	0.13	Coal: dirty, soft, dull, sheared.																														

MDD 78-11 (cont'd)

102.98 - 103.56	0.58	Coal: 40% vitreous, metallic lustre, core solid.
103.56 - 103.71	0.15	Coal: dirty, 20% vitreous-bands, sheared, core pulverized.
		Sample: Interval Width Dry Ash F.S.I.
		0350 102.80 - 103.71 0.91 28.3 6½
103.71 - 104.25	0.54	Mudstone: carbonaceous.
104.25 - 104.40	0.15	Coal band.
104.40 - 107.75	3.35	Mudstone: carbonaceous with occasional fine grained sandstone intervals.
107.75 - 122.92	15.17	Sandstone: medium grained, light grey, cross bedded, worm burrowed (large, white) intervals throughout. BCA = 70°
122.92 - 133.70	10.78	Sandstone: fine grained, minor cross bedding, occasional carbonaceous parting.
133.70 - 163.64	29.94	Sandstone: fine grained, interbedded with 20% siltstone, minor cross bedding, occasional carbonaceous parting, some plant fossil fragments, rare worm burrow, occasional rip-up clasts.
<u>MOOSEBAR FORMATION</u>		
163.64 - 181.97	18.33	Sandstone: fine grained, interbedded with 40% siltstone, mildly bioturbated, small coaly rootlets throughout.
181.97 - 204.57	22.60	Siltstone: interbedded with 20% sandstone, mildly bioturbated, occasional pyrite and calcite nodules.
204.57 - 204.69	0.12	Clay band: greyish green in color.
204.69 - 214.05	9.36	Siltstone: with less than 10% sandstone interbeds, minute fractures throughout, occasional calcite crystal, minor plant fossil fragments.
214.05 - 227.69	13.64	Siltstone: uniform, core solid.

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-12

LOCATION:

- (a) Coal Licence: 3227
- (b) N.T.S. 93-I-15, d-50-B
- (c) Drill Hole Co-ordinates: N 16499.58 - E 5458.20
- (d) Elevation: 1003.56m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: 80m casing pulled, 2.7m left in hole

FORMATION TESTED: Boulder Creek and Hulcross Members
COAL SEAMS INTERSECTED: None
TOTAL DEPTH: 257.5m

DATE DRILLED: July 17 - 26, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 83.52	83.52	CASING
<u>BOULDER CREEK MEMBER-COMMOTION FORMATION</u>		
83.52 - 86.56	3.04	Sandstone: fine grained, small coaly rootlets and calcite filled fractures, mildly bioturbated, core intact. BCA=40°
86.56 - 90.53	3.97	Sandstone: fine grained, as above with occasional siltstone phase, core highly broken.
90.53 - 106.55	16.02	Sandstone: fine grained, mildly bioturbated, small irregular coaly rootlets throughout, sheared, calcite along sheared surfaces.
106.55 - 110.56	4.01	Sandstone: fine grained, interbedded with siltstone, minor shearing, coaly rootlets throughout. BCA=30°
110.56 - 126.44	15.88	Sandstone: fine to medium grained, minor shearing, numerous vitreous bands and coaly rootlets, bioturbated. core broken. BCA=38°
126.44 - 130.97	4.53	Sandstone: medium grained, numerous minute vitreous bands and coaly rootlets, highly sheared, numerous calcite filled fractures, pyrite stringers and nodules, core highly broken. BCA=30°
130.97 - 138.42	7.45	Sandstone: fine grained, minor shearing, numerous calcite filled fractures, small coaly rootlets throughout, slump features. BCA=30°
138.42 - 146.31	7.89	Sandstone: fine grained, highly bioturbated, numerous calcite filled fractures and coaly rootlets, minor shearing. BCA=22°

MDD-78-12 - cont'd

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
146.31 - 153.90	7.59	Sandstone: very fine grained, numerous calcite filled fractures, small irregular coaly rootlets, uniform, bedding indistinct, core intact.
153.90 - 154.40	0.50	Mudstone: carbonaceous, sheared, core broken and crushed.
154.40 - 157.10	2.70	Sandstone: fine grained, light grey, heavily bioturbated, numerous calcite filled fractures and coaly rootlets, sheared. BCA=8 ^o -20 ^o
157.10 - 158.42	1.32	Siltstone: carbonaceous, small coaly rootlets throughout, core broken.
158.42 - 162.40	3.98	Claystone: light grey, numerous small coaly rootlets, core intact.
162.40 - 172.18	9.78	Siltstone: occasional calcite filled fracture and small coaly rootlet, grades to a dark grey uniform mudstone at base, core broken.
172.18 - 172.54	0.36	Coal band: metallic lustre, core broken and crushed.
172.54 - 172.98	0.44	Siltstone: carbonaceous, sheared, core broken.
172.98 - 173.38	0.40	Coal: metallic lustre, sheared, core pulverized.
173.38 - 173.74	0.36	Core missing.
173.74 - 174.32	0.58	Coal: metallic lustre, sheared, core broken in large pieces.
174.32 - 175.87	1.55	Coal and Siltstone: core pulverized and mixed in box.
175.87 - 176.57	0.70	Coal: earthy lustre, sheared, core pulverized.
176.57 - 176.70	0.13	Siltstone: core intact.

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
176.70 - 177.39	0.69	Coal: earthy lustre, soft, sheared, core broken in large pieces.
177.39 - 180.04	2.65	Mudstone: carbonaceous, sheared, calcite filled fractures, core intact. BCA=28°
180.04 - 180.64	0.60	Coal: earthy lustre, soft, core pulverized.
180.64 - 182.00	1.36	Mudstone: carbonaceous, some small coaly intervals, sheared, core pulverized.
182.00 - 192.32	10.32	Siltstone: carbonaceous, sheared, numerous listric surfaces, small irregular coaly rootlets throughout, minute calcite filled fractures, pyrite nodules and stringers, core broken and crushed.
<u>HULCROSS MEMBER-COMMOTION FORMATION</u>		
192.32 - 201.74	9.42	Siltstone: uniform, occasional brown mud band (clast), rare plant fragment, occasional calcite filled fracture, sheared, core intact.
201.74 - 203.90	2.16	Sandstone: very fine grained, grades to a siltstone, numerous calcite filled fractures, bedding highly disturbed core broken and crushed. BCA=24°
203.90 - 227.69	23.79	Siltstone: interbedded with 10% very fine grained sandstone, sheared, occasional calcite filled fracture, minor brown mud bands, slump features. BCA=32°
227.69 - 247.26	19.57	Siltstone: uniform, sheared, calcite filled fractures, pyrite specks, phases of carbonaceous siltstone, core intact.
247.26 - 257.56	10.30	Siltstone: brown mud bands, occasional very fine grained sandstone phase, calcite filled fractures, sheared.

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-13

LOCATION:

- (a) Coal Licence: 3946
- (b) N.T.S. 93-I-15, c-18-B
- (c) Drill Hole Co-ordinates: N 13462.22 - E 4299.64
- (d) Elevation: 1439.48m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B4
TOTAL DEPTH: 209.4m

DATE DRILLED: July 21 - 25, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MDD 78-13

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 6.09	6.09	CASING
		<u>GATES MEMBER COMMOTION FORMATION</u>
6.09 - 23.68	17.59	Siltstone: less than 10% sandstone interbeds, mildly bioturbated, small coaly rootlets throughout, minute calcite filled fractures. BCA = 62°
23.68 - 28.51	4.83	Mudstone: carbonaceous, small coaly rootlets, minute vitreous bands throughout, minor shearing.
		COAL SEAM B-4
28.51 - 28.57	0.06	Coal: 10% vitreous, metallic lustre, core intact.
28.57 - 28.99	0.42	Coal: 20% vitreous metallic lustre, core intact.
28.99 - 29.30	0.31	Coal: 60% vitreous, metallic lustre, core broken and crushed.
29.30 - 30.05	0.75	Mudstone: carbonaceous, core intact.
30.05 - 30.33	0.28	Coal: 10% vitreous, metallic lustre, hard, minor shearing, core broken.
30.33 - 30.68	0.35	Coal: 50% vitreous, metallic lustre, core intact.
30.68 - 30.75	0.07	Coal: dirty, dull, sheared, high specific gravity.
30.75 - 30.99	0.24	Mudstone: carbonaceous, sheared.
30.99 - 31.41	0.42	Coal: soft, dull, sheared, breaks into flakes, fairly high specific gravity.
31.41 - 31.47	0.06	Coal: 10% vitreous, metallic lustre, core broken.
31.47 - 31.70	0.23	Coal: 40% vitreous, earthy lustre, core pulverized.

MDD 78-13

31.70 - 31.82	0.12	Coal: 70% vitreous, earthy lustre, core intact.																									
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0408</td> <td>28.51 - 29.30</td> <td>0.79</td> <td>14.65</td> <td>3½</td> </tr> <tr> <td>2257</td> <td>29.30 - 30.05</td> <td>0.75</td> <td>91.5</td> <td>NA</td> </tr> <tr> <td>0409</td> <td>30.05 - 30.99</td> <td>0.70</td> <td>17.78</td> <td>5</td> </tr> <tr> <td>0410</td> <td>30.99 - 31.82</td> <td>1.07</td> <td>47.37</td> <td>3½</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0408	28.51 - 29.30	0.79	14.65	3½	2257	29.30 - 30.05	0.75	91.5	NA	0409	30.05 - 30.99	0.70	17.78	5	0410	30.99 - 31.82	1.07	47.37	3½
Sample	Interval	Width	Dry Ash	F.S.I.																							
0408	28.51 - 29.30	0.79	14.65	3½																							
2257	29.30 - 30.05	0.75	91.5	NA																							
0409	30.05 - 30.99	0.70	17.78	5																							
0410	30.99 - 31.82	1.07	47.37	3½																							
31.82 - 34.04	2.22	Mudstone: carbonaceous, heared, numerous vitreous band 4-5 cm. in widht, core fairly broken.																									
34.04 - 34.51	0.47	Coal: dull, 20% vitreous bands, hard, sheared, fairly high specific gravity.																									
34.51 - 35.74	1.23	Coal: 80% vitreous, metallic lustre, core intact.																									
35.74 - 36.83	1.09	Coal: 40% vitreous, metallic lustre, core intact.																									
36.83 - 37.19	0.36	Coal: 20% vitreous, earthy lustre, core pulverized.																									
37.10 - 37.59	0.40	Coal: 90% vitreous, core broken in large pieces.																									
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0411</td> <td>34.04 - 34.51</td> <td>0.47</td> <td>32.21</td> <td>6½</td> </tr> <tr> <td>0412</td> <td>34.51 - 35.74</td> <td>1.23</td> <td>13.48</td> <td>5</td> </tr> <tr> <td>0413</td> <td>35.74 - 36.83</td> <td>1.09</td> <td>4.44</td> <td>7½</td> </tr> <tr> <td>0414</td> <td>36.83 - 37.59</td> <td>0.76</td> <td>6.73</td> <td>7</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0411	34.04 - 34.51	0.47	32.21	6½	0412	34.51 - 35.74	1.23	13.48	5	0413	35.74 - 36.83	1.09	4.44	7½	0414	36.83 - 37.59	0.76	6.73	7
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0411	34.04 - 34.51	0.47	32.21	6½																							
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0414	36.83 - 37.59	0.76	6.73	7																							
37.59 - 47.92	10.33	Siltstone: interbedded with fine grained sandstone, small irregular coaly rootlets throughout, mildly bioturbated, minor shearing. BCA = 58°.																									
		COAL SEAM B-3																									
47.92 - 48.60	0.68	Coal: 40% vitreous, earthy lustre, core intact.																									
48.60 - 49.21	0.61	Coal: 50% vitreous, earthy lustre, core intact.																									
49.21 - 49.49	0.28	Mudstone: carbonaceous																									
49.49 - 50.09	0.60	Coal: 60% vitreous, metallic lustre, core intact.																									
50.09 - 50.59	0.50	Coal: 30% vitreous, earthy lustre, core intact.																									
50.50 - 51.18	0.59	Mudstone: carbonaceous, occasional vitreous band, core intact.																									

MDD 78-13

51.18 - 51.48	0.30	Coal: 20% vitreous, earthy lustre, core intact.																									
51.48 - 51.80	0.32	Coal: 80% vitreous, earthy lustre, core intact.																									
		<table border="1"> <thead> <tr> <th>Samples</th> <th></th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0415:</td> <td>47.92 - 49.21</td> <td>1.29</td> <td>5.50</td> <td>7½</td> </tr> <tr> <td>0416:</td> <td>49.21 - 50.59</td> <td>1.38</td> <td>32.96</td> <td>4</td> </tr> <tr> <td>0417:</td> <td>50.59 - 51.18</td> <td>0.59</td> <td>84.12</td> <td>NA</td> </tr> <tr> <td>0418:</td> <td>51.18 - 51.80</td> <td>0.62</td> <td>7.61</td> <td>7</td> </tr> </tbody> </table>	Samples		Width	Dry Ash	F.S.I.	0415:	47.92 - 49.21	1.29	5.50	7½	0416:	49.21 - 50.59	1.38	32.96	4	0417:	50.59 - 51.18	0.59	84.12	NA	0418:	51.18 - 51.80	0.62	7.61	7
Samples		Width	Dry Ash	F.S.I.																							
0415:	47.92 - 49.21	1.29	5.50	7½																							
0416:	49.21 - 50.59	1.38	32.96	4																							
0417:	50.59 - 51.18	0.59	84.12	NA																							
0418:	51.18 - 51.80	0.62	7.61	7																							
51.80 - 52.95	1.15	Mudstone: carbonaceous, vitreous bands 1-2 cm. in width common.																									
52.95 - 57.87	4.92	Sandstone: fine grained, interbedded with siltstone, small irregular coaly rootlets throughout, mildly bioturbated.																									
57.87 - 65.39	7.52	Sandstone: medium grained, light grey, occasional band of fine pebble conglomerate, pebbles well rounded and well sorted.																									
65.39 - 67.41	2.02	Sandstone: fine grained, interbedded with siltstone, small coaly rootlets throughout. BCA = 60°																									
67.41 - 74.72	7.31	Sandstone: medium to coarse grained, light grey, fine pebble conglomerate band at top of interval, small coaly rootlets throughout, minor cross bedding, occasional siltstone phase.																									
74.72 - 75.29	0.57	Siltstone: carbonaceous, some coal, core pulverized.																									
75.29 - 75.79	0.50	Sandstone: fine grained, interbedded with siltstone.																									
75.79 - 87.48	11.69	Siltstone: interbedded with fine grained sandstone, bioturbated, small irregular coaly rootlets throughout. BCA = 46° - 56°																									
87.48 - 88.18	0.70	Mudstone: carbonaceous.																									
88.18 - 103.28	15.10	Sandstone: fine grained, interbedded with siltstone, mildly bioturbated, minor cross bedding, small coaly rootlets throughout, minute calcite filled fractures. BCA = 68°																									

MDD 78-13

COAL SEAM B-1

103.28 - 103.66	0.38	Coal: 20% vitreous, dull, sheared, core pulverized.
103.66 - 104.29	0.63	Coal: 60% vitreous, metallic lustre, hard, core intact.
104.29 - 104.65	0.36	Coal: 70% vitreous, metallic lustre, core broken in large pieces.
104.65 - 104.87	0.22	Coal: 30% vitreous, earthy lustre, core pulverized.
		Sample 0419: 103.28 - 104.87
		<u>Width</u> <u>Dry Ash</u> <u>F.S.I</u>
		1.59 20.1 7½
104.87 - 107.80	2.93	Mudstone: carbonaceous, small coaly rootlets and bright bands throughout.
107.80 - 126.88	19.08	Sandstone: medium grained, occasional small coaly rootlet, cross bedded, worm burrowed (large, white) intervals common towards base of interval. BCA = 64°
126.88 - 136.55	9.67	Sandstone: fine grained, clean, cross bedded. BCA = 60°
136.55 - 170.41	33.86	Sandstone: fine grained, interbedded with 20% siltstone, minor cross bedding, minute calcite filled fractures. BCA = 62°

MOOSEBAR FORMATION

170.41 - 209.38	38.97	Siltstone: interbedded with less than 40% fine grained sandstone with less than 20% siltstone at base of interval.
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E.O.H.

AR-MONKMAN-BELLCOURT 78(3)A
BORE HOLE DATA 1978



MONKMAN COAL PROJECT
1978 EXPLORATION REPORT
APPENDIX C - BOOK 2
GEOLOGICAL LOGS

PACIFIC PETROLEUMS LTD.

543

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MUD 78-14

LOCATION:

- (a) Coal Licence: 3944
- (b) N.T.S. 93-I-10, b-84-J
- (c) Drill Hole Co-ordinates: N 8866.33 - E 4837.11
- (d) Elevation: 1532.12m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B12
TOTAL DEPTH: 288.6m

DATE DRILLED: Aug. 28 - Sept. 3, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 543

OPEN FILE

MUD 78-14

<u>Interval</u> (metres)	<u>Width</u> (metres)	
0 - 3.66	3.66	CASING
		<u>GATES MEMBER - COMMOTION FORMATION</u>
3.66 - 5.62	1.96	Sandstone: fine grained interbedded with siltstone, weathered, ferruginous staining, core broken, small, irregular coaly rootlets, mildly bioturbated
5.62 - 6.46	0.84	Siltstone: occasional brown mud band, core broken COAL SEAM B12
6.46 - 6.71	0.25	Coal band: 100% vitreous, dull earthy lustre, core pulverized
6.71 - 6.83	0.12	Coal: band, 30% vitreous
6.83 - 8.10	1.27	Mudstone: carbonaceous, coaly bands 1-2 cm in width, broken
8.10 - 8.23	0.13	Coal Band: dull, earthy
8.23 - 8.53	0.30	Mudstone: carbonaceous and coaly, core broken
8.53 - 14.33	5.80	Sandstone: fine grained, occasional siltstone phase, small coaly rootlets throughout, core broken
14.33 - 17.88	3.55	Sandstone: fine grained, small coaly rootlets throughout, mildly bioturbated, core intact BCA = 80°
17.88 - 18.18	0.30	Siltstone: core intact
18.18 - 18.34	0.16	Mudstone: carbonaceous, core broken COAL SEAL B11
18.34 - 18.66	0.32	Coal: 20% vitreous, earthy lustre, core broken in large pieces
18.66 - 18.74	0.08	Coal: 40% vitreous, metallic lustre
18.74 - 18.76	0.02	Mudstone: carbonaceous
18.76 - 18.98	0.22	Coal: 70% vitreous, metallic lustre, lyrite specks throughout, core intact

MUD 78-14

18.98 - 19.02	0.04	Carbonaceous and coaly mudstone
		Sample Interval Width Dry Ash F.S.I.
		0421 18.34-19.02 0.68 20.0 5
19.02 - 19.77	0.75	Mudstone and Siltstone: Carbonaceous, core intact
19.77 - 19.95	0.18	Mudstone: carbonaceous-coaly, pyrite specks and stringers
19.95 - 21.67	1.72	Sandstone: fine grained, interbedded with siltstone, small irregular coaly rootlets, mildly bioturbated
21.67 - 21.91	0.24	Mudstone: carbonaceous
21.91 - 23.47	1.56	Sandstone: medium grained, cross-bedded BCA = 80°
23.47 - 32.51	9.04	Siltstone: with occasional fine grained sandstone intervals, plant fossils, 30%-40% sandstone interbeds towards base of interval, occasional worm burrow, small coaly rootlets throughout, mildly bioturbated BCA = 82°
32.51 - 35.66	3.15	Sandstone: medium grained, clean, rare siltstone band, minor cross-bedding
35.66 - 44.53	8.87	Sandstone: fine grained, interbedded with siltstone, occasional siltstone phase, numerous large coaly rootlets, floral bioturbation
		COAL SEAM B10
44.53 - 44.81	0.28	Coal: 40% vitreous, dull earthy lustre, core broken into large pieces
44.81 - 45.11	0.30	Coal: 60% vitreous, dull, earthy lustre, core intact
		Sample Interval Width Dry Ash F.S.I.
		0422 45.53-45.11 0.58 11.1 7½
45.11 - 45.41	0.30	Siltstone: carbonaceous
45.41 - 49.27	3.86	Siltstone: carbonaceous, plant fossils, core broken occasional calcite filled fractures, occasional coal band 3-5 cm in width, pyrite specks and stringers
49.27 - 50.93	1.66	Same as above
50.93 - 65.21	14.28	Sandstone: fine grained with occasional medium

MUD 78-14

grained intervals, moderately bioturbated,
small coaly rootlets throughout, occasional
brown mud band, core intact BCA = 82°

65.21 - 66.94	1.73	Sandstone: fine grained, small irregular coaly rootlets throughout, mildly bioturbated, core intact BCA = 80°
COAL SEAM B9		
66.94 - 67.10	0.16	Coal: 40% vitreous, metallic lustre, pyrite specks throughout, intact
67.10 - 67.40	0.30	Coal: 20% vitreous, dull earthy lustre, core broken in large pieces
67.40 - 67.54	0.14	Mudstone: coaly, broken
67.54 - 67.74	0.20	Coal: hard, 20% vitreous, metallic lustre, core pulverized
67.74 - 68.16	0.42	Coal: hard, solid, 20% vitreous, earthy lustre, pyrite specks common
68.16 - 68.26	0.10	Coal: dull, hard, dirty, fairly high specific gravity, core intact
68.26 - 68.76	0.50	Coal: 70% vitreous, metallic lustre, solid, last 10 cm-30% vitreous
68.76 - 69.19	0.43	Core missing
69.19 - 69.69	0.50	Coal: 50-60% vitreous, metallic lustre, hard, pyrite specks throughout, intact
69.69 - 70.31	0.62	Coal: 30% vitreous, earthy lustre, hard, core intact
70.31 - 70.71	0.40	Coal: 30%-20% vitreous, metallic lustre, hard, core solid, pyrite specks, 70.45 m-70.53 m- carbonaceous siltstone parting
70.71 - 71.01	0.30	Coal: 30% vitreous, metallic lustre, hard, pyrite specks abundant, core intact, first 6 cm fairly high S.G.
71.01 - 71.87	0.86	Coal: 20% vitreous, metallic lustre, hard, pyrite throughout, core intact
71.87 - 72.03	0.16	Coal: 50% vitreous, earthy lustre, pyrite specks throughout, core intact

FAULT ZONE

MUD 78-14

72.03 - 72.18	0.15	Mudstone: coaly, pyrite, core intact
72.18 - 72.39	0.21	Coal: 60% vitreous, earthy lustre, core intact
72.39 - 72.79	0.40	Coal: 70% vitreous, metallic lustre, hard, pyrite common
72.79 - 73.91	1.12	Carbonaceous mudstone: numerous small coaly rootlets, minor shearing, pyrite specks and stringers numerous, core broken
73.91 - 75.29	1.38	Coal: recovered 73 cm, 20% vitreous, dull earthy lustre, core pulverized, pyrite throughout
75.29 - 75.69	0.40	Coal: soft, dull, sheared, pyrite specks throughout
75.69 - 76.11	0.42	Coal: 20% vitreous, metallic lustre, pyrite common, sheared, core pulverized
76.11 - 76.82	0.71	Coal: recovered 26 cm, dull earthy coal, soft, ground, pyrite throughout
76.82 - 77.26	0.44	Coal: 30% vitreous, metallic lustre, abundant pyrite, core hard, intact
77.26 - 77.69	0.43	Coal: 20% vitreous, metallic lustre, pyrite common
77.69 - 78.33	0.64	Coal: recovered 36 cm, 30% vitreous, metallic lustre, pyrite throughout, core intact
78.33 - 78.35	0.02	Carbonaceous mudstone
78.35 - 78.83	0.48	Coal: 40% vitreous, metallic lustre, hard, pyrite throughout, core intact
78.83 - 79.17	0.34	Coal: 60% vitreous, earthy lustre, core intact
79.17 - 79.60	0.43	Coal: dull, hard, 20% minute vitreous bands, numerous large specks and stringers of pyrite, fairly high specific gravity, core intact
79.60 - 79.70	0.10	Coal: 30% vitreous, dull earthy lustre, pyrite throughout, core intact

Samples	Interval	Width	Dry Ash	F.S.I.
0423	66.94-67.74	0.80	32.6	2
0424	67.74-69.19	1.45	14.7	1½
0425	69.19-70.71	1.52	18.1	2
0426	70.71-72.03	1.32	9.2	3½
0427	72.03-72.79	0.76	24.0	6½

MUD 78-14

	0428	72.79-73.91	1.12	82.0	NA
	0429	73.91-75.29	1.38	42.5	1
	0430	75.29-76.82	1.53	25.4	1½
	0431	76.82-78.33	1.51	8.0	3½
	0432	78.33-79.70	1.37	29.7	6½
79.70 - 84.43	4.73	Mudstones and siltstones: plant fossils, numerous coaly rootlets throughout, coal band at 82.52 to 82.85			
84.43 - 85.69	1.26	Sandstone: fine grained, plant fossils, small coaly rootlets throughout, mildly bioturbated			
85.69 - 88.78	3.09	Sandstone: fine grained, interbedded with siltstone, small coaly rootlets throughout, occasional calcite filled fracture BCA = 76°			
88.78 - 89.28	0.50	Mudstone: carbonaceous, small coaly bands, core broken			
		COAL SEAM B8			
89.28 - 89.54	0.26	Coal: 70% vitreous, metallic lustre, hard core, intact			
89.54 - 89.84	0.30	Coal: 30% vitreous, metallic lustre, core intact			
89.84 - 90.02	0.18	Carbonaceous mudstone: small vitreous bands throughout			
90.02 - 90.10	0.08	Coal: 60% vitreous, metallic lustre			
90.10 - 90.32	0.22	Coal: 40% vitreous, dull earthy lustre, dirty, quite high specific gravity			
90.32 - 90.60	0.28	Bone coal: high specific gravity			
90.60 - 90.82	0.22	Coaly mudstone: with occasional coal band			
		Samples	Interval	Width	Dry Ash F.S.I.
		0433	89.28-89.84	0.56	21.8 5
		0434	89.84-90.82	0.98	59.0 1
90.82 - 93.99	3.17	Carbonaceous mudstone: coal bands 3-4 cm in width, minor shearing, small coaly rootlets throughout			
93.99 - 99.94	5.95	Siltstone: carbonaceous, small coaly rootlets throughout, slump features, core intact			
99.94 - 100.23	0.29	Carbonaceous mudstone: core solid			

MUD 78-14

COAL SEAM B7

100.23 - 100.50	0.27	Coal: dirty, fairly solid, sheared, small vitreous bands throughout
100.50 - 100.74	0.24	Coal: 30% vitreous, dull earthy lustre, core broken in large pieces
100.74 - 100.94	0.20	Coal: 70% vitreous, metallic lustre, core intact
100.94 - 101.28	0.34	Coal: 30% vitreous, dull earthy lustre, core intact
101.28 - 101.40	0.12	Bone coal: fairly high specific gravity
		Sample Interval Width Dry Ash F.S.I
		0435 100.23-101.40 1.17 33.8 7
101.40 - 102.23	0.83	Mudstone: carbonaceous, small vitreous bands throughout, core solid
102.23 - 103.76	1.53	Mudstone: carbonaceous, large coaly rootlets throughout, small vitreous bands common
103.76 - 103.99	0.23	Coal band: 70% vitreous, earthy lustre
103.99 - 106.51	2.52	Mudstone: carbonaceous, occasional coaly band, up to 16 cm in width, coaly rootlets throughout, occasional carbonaceous siltstone phase

COAL SEAM B6 (upper)

106.51 - 106.64	0.13	Coal: 30% vitreous, earthy lustre
106.64 - 107.09	0.45	Coal: 80% vitreous, metallic lustre, core intact
107.09 - 107.55	0.46	Coal: 70% vitreous, metallic lustre, core intact
107.55 - 107.75	0.20	Mudstone: carbonaceous, core intact
107.75 - 107.83	0.08	Coal: 30% vitreous, earthy lustre
107.83 - 108.03	0.20	Coal: 60% vitreous, dull earthy lustre, sheared, core solid
		Samples Interval Width Dry Ash F.S.I.
		0436 106.51-107.55 1.04 8.0 8½
		0437 107.55-108.03 0.48 58.8 3
108.03 - 108.24	0.21	Mudstone: carbonaceous, core intact

MUD 78-14

108.24 - 114.07	5.83	Sandstone: fine grained, occasional carbonaceous siltstone interval, small coaly rootlets throughout, minor flow features BCA = 76°
114.07 - 114.40	0.33	Mudstone: carbonaceous
114.40 - 114.72	0.32	Sandstone: fine grained, as above
114.72 - 116.35	1.63	Carbonaceous mudstone: minor shears, coaly rootlets throughout, minute vitreous bands common, coal bands up to 10 cm in width, core intact
116.35 - 117.11	0.76	Siltstone: carbonaceous
117.11 - 119.18	2.07	Sandstone: fine grained, plant fossils, numerous small coaly rootlets throughout, mildly bioturbated
119.18 - 122.58	3.40	Siltstone: with very fine grain sandstone interbeds, small coaly rootlets throughout, core intact
122.58 - 122.85	0.27	Carbonaceous mudstone COAL SEAM B6 (lower)
122.85 - 123.35	0.50	Coal: 30% vitreous, earthy lustre, hard, core intact
123.35 - 124.35	1.00	Coaly mudstone: very high specific gravity, sheared, occasional pyrite speck, 3-4 cm bands of coal throughout
124.35 - 124.69	0.34	Coal: 30% vitreous, dull earthy lustre, core intact
124.69 - 124.87	0.18	Mudstone: carbonaceous, sheared
124.87 - 125.07	0.20	Coal: 10% vitreous, dull, hard
125.07 - 125.19	0.12	Carbonaceous mudstone: core intact
125.19 - 125.42	0.23	Coal: 60% vitreous, earthy lustre, core intact
125.42 - 126.12	0.70	Coal: 30% vitreous, metallic lustre, hard, core intact
126.12 - 126.38	0.26	Coal: 20% vitreous, dull earthy lustre, core intact, pyrite specks throughout
126.38 - 126.50	0.12	Coal: 30% vitreous, dull, core broken in large pieces

MUD 78-14

	Samples	Interval	Width	Dry Ash	F.S.I.
	Q438	122.85-124.35	1.50	51.8	1
	Q439	124.35-125.19	0.84	53.5	1
	0440	125.19-126.50	1.31	13.7	4
126.50 - 136.06		9.56	Siltstone: uniform, occasional calcite filled fracture		
136.06 - 157.27		21.21	Siltstone: uniform, occasional small coaly rootlets		
157.27 - 166.30		9.03	Siltstone: carbonaceous, small irregular coaly rootlets throughout		
166.30 - 169.27		2.97	Mudstone: carbonaceous, coaly rootlets throughout, small vitreous bands common, core fairly intact		
			COAL SEAM B4		
169.27 - 169.77		0.50	Coal: 40% vitreous, dull earthy lustre, core intact		
169.77 - 169.85		0.08	Coal: dirty, fairly high specific gravity		
169.85 - 170.75		0.90	Coal: 60-70% vitreous, metallic lustre, core intact		
170.75 - 171.15		0.40	Mudstone: carbonaceous and coaly, vitreous bands 3-4 cm in width		
171.15 - 171.39		0.24	Mudstone: carbonaceous, sheared, core intact		
171.39 - 171.81		0.42	Coal: solid, 60% vitreous, earthy lustre, clean		
171.81 - 172.51		0.70	Coal: solid, 80% vitreous, metallic lustre		
172.51 - 172.91		0.40	Mudstone: carbonaceous, core intact		
172.91 - 173.51		0.60	Coal: solid, clean, 70% vitreous, metallic lustre		
173.51 - 173.54		0.03	Mudstone: carbonaceous, coaly		
173.54 - 173.62		0.08	Coal: 80% vitreous, core intact		
173.62 - 173.74		0.12	Mudstone: carbonaceous, core intact		
173.74 - 173.95		0.21	Coal: solid, 40% vitreous, metallic lustre		
173.95 - 174.02		0.07	Mudstone: carbonaceous		
174.02 - 174.38		0.36	Coal: small, 1 cm dirty coal bands throughout, 30% vitreous, earthy lustre, hard, core intact		

MUD 78-14

174.38 - 175.04	0.66	Coal: 60% vitreous, dull, earthy lustre, core intact																																																		
175.04 - 176.80	1.76	Mudstone: carbonaceous, vitreous bands 3-4 cm in width common sheared, core intact																																																		
176.80 - 176.87	0.07	Coal: dull, fairly high specific gravity, core intact																																																		
176.87 - 177.98	1.11	Coal: 80% vitreous, earthy lustre, solid, clean																																																		
177.98 - 178.58	0.60	Coal: soft, fairly solid, 70% vitreous, metallic lustre																																																		
178.58 - 178.82	0.24	Coal: 30% vitreous, metallic lustre, core broken in large pieces																																																		
178.82 - 179.03	0.21	Coal: 70% vitreous, metallic lustre, core broken in large pieces																																																		
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0441</td> <td>169.27-170.75</td> <td>1.48</td> <td>12.5</td> <td>7½</td> </tr> <tr> <td>0442</td> <td>170.75-171.39</td> <td>0.64</td> <td>77.7</td> <td>NA</td> </tr> <tr> <td>0443</td> <td>171.39-172.51</td> <td>1.12</td> <td>17.1</td> <td>7½</td> </tr> <tr> <td>0444</td> <td>172.51-172.91</td> <td>0.40</td> <td>88.6</td> <td>NA</td> </tr> <tr> <td>0445</td> <td>172.91-174.02</td> <td>1.11</td> <td>31.4</td> <td>4</td> </tr> <tr> <td>0446</td> <td>174.02-175.04</td> <td>1.02</td> <td>27.6</td> <td>6½</td> </tr> <tr> <td>2258</td> <td>175.04-176.80</td> <td>1.76</td> <td>74.4</td> <td>½</td> </tr> <tr> <td>0447</td> <td>176.80-177.98</td> <td>1.18</td> <td>10.3</td> <td>6</td> </tr> <tr> <td>0448</td> <td>177.98-179.03</td> <td>1.05</td> <td>11.2</td> <td>7½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0441	169.27-170.75	1.48	12.5	7½	0442	170.75-171.39	0.64	77.7	NA	0443	171.39-172.51	1.12	17.1	7½	0444	172.51-172.91	0.40	88.6	NA	0445	172.91-174.02	1.11	31.4	4	0446	174.02-175.04	1.02	27.6	6½	2258	175.04-176.80	1.76	74.4	½	0447	176.80-177.98	1.18	10.3	6	0448	177.98-179.03	1.05	11.2	7½
Samples	Interval	Width	Dry Ash	F.S.I.																																																
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0445	172.91-174.02	1.11	31.4	4																																																
0446	174.02-175.04	1.02	27.6	6½																																																
2258	175.04-176.80	1.76	74.4	½																																																
0447	176.80-177.98	1.18	10.3	6																																																
0448	177.98-179.03	1.05	11.2	7½																																																
179.03 - 179.48	0.45	Mudstone: carbonaceous																																																		
179.48 - 182.58	3.10	Siltstone: carbonaceous, plant fossils, core intact, BCA = 72°, occasional coaly band up to 2-3 cm in width																																																		
182.58 - 187.74	5.16	Sandstone: fine to medium grained, carbonaceous partings, minor cross bedding																																																		
187.74 - 191.83	4.09	Siltstone: interbedded with fine grained sandstone, small coaly rootlets throughout, mildly bioturbated																																																		
191.83 - 191.95	0.12	Coaly mudstone																																																		
191.95 - 192.02	0.07	Coal: dull, 20% vitreous bands, core intact																																																		
192.02 - 192.19	0.17	Coaly mudstone: soft, platy																																																		
192.19 - 192.41	0.22	Mudstone: carbonaceous, core intact																																																		

COAL SEAL B3

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

310

320

330

130

20.87

23.13

Scale 1:120



PACIFIC PETROLEUMS LTD.

SUPPLY DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 5

ADD 77-8

28

MUD 78-14

216.62 - 218.54	1.92	Siltstone: plant fossils, small coaly rootlets throughout, minute calcite filled fractures, occasional vitreous bands (less than .5 cm in width)
218.54 - 223.03	4.49	Sandstone: fine grained, mildly bioturbated, small irregular coaly rootlets throughout, minute calcite filled fractures, BCA = 67 ⁰
223.03 - 224.42	1.39	Mudstone: carbonaceous, small vitreous bands up to 1 cm in width common, core intact
224.42 - 224.79	0.37	Coal: band, 40% vitreous, core broken and crushed
224.79 - 226.89	2.10	Siltstone: interbedded with very fine grained sandstone, small coaly rootlets throughout, minor shearing
COAL SEAM B1		
226.89 - 226.99	0.10	Coaly siltstone: solid, high specific gravity
226.99 - 227.69	0.70	Coal: solid, 30% vitreous, earthy lustre
227.69 - 228.42	0.73	Coal: 40% vitreous, metallic lustre, core hard, intact
228.42 - 228.80	0.38	Coal: 30% vitreous, metallic lustre, hard, intact
228.80 - 229.06	0.26	Coal: 60% vitreous, metallic lustre, hard, intact
229.06 - 229.10	0.04	Mudstone: carbonaceous
229.10 - 229.13	0.03	Coal: vitreous
229.13 - 229.26	0.13	Mudstone: carbonaceous, minute vitreous bands
229.26 - 229.48	0.22	Coal: 60% vitreous, earthy lustre, core intact
229.48 - 229.52	0.04	Coal: vitreous, pulverized
229.52 - 231.83	2.31	Siltstone: with carbonaceous mudstone phases, occasional coaly band 2-3 cm in width, coaly rootlets throughout, minute fractures filled with calcite
231.83 - 232.06	0.23	Coal: 30% vitreous, dull, earthy, hard, coal intact
232.06 - 232.14	0.08	Mudstone: carbonaceous, sheared
232.14 - 232.24	0.10	Coal: dull soft, platy

MUD 78-14

232.24 - 232.44	0.20	Mudstone: carbonaceous, bright coal bands																																			
232.44 - 232.52	0.08	Coal: vitreous																																			
232.52 - 232.80	0.28	Mudstone: Carbonaceous, sheared, vitreous bands 2-3 cm in width, core intact																																			
232.80 - 233.36	0.56	Coal: 40% vitreous bands, earthy lustre, core intact																																			
233.36 - 233.72	0.36	Mudstone: carbonaceous																																			
233.72 - 233.89	0.17	Mudstone: coaly, minute vitreous bands, core broken and crushed, sheared																																			
233.89 - 234.82	0.93	Coal: hard, solid, clean, 80% vitreous																																			
234.82 - 235.28	0.46	Coal: 80% vitreous, core intact																																			
235.28 - 235.54	0.26	Coal: vitreous, pulverized																																			
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0452</td> <td>226.89-227.69</td> <td>0.80</td> <td>18.1</td> <td>5</td> </tr> <tr> <td>0453</td> <td>227.69-228.80</td> <td>1.11</td> <td>10.7</td> <td>7</td> </tr> <tr> <td>0454</td> <td>228.80-229.52</td> <td>0.72</td> <td>31.5</td> <td>6½</td> </tr> <tr> <td>0455</td> <td>231.83-232.80</td> <td>0.97</td> <td>51.3</td> <td>1½</td> </tr> <tr> <td>0456</td> <td>232.80-233.89</td> <td>1.09</td> <td>50.8</td> <td>1</td> </tr> <tr> <td>0457</td> <td>233.89-235.54</td> <td>1.65</td> <td>5.8</td> <td>8</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0452	226.89-227.69	0.80	18.1	5	0453	227.69-228.80	1.11	10.7	7	0454	228.80-229.52	0.72	31.5	6½	0455	231.83-232.80	0.97	51.3	1½	0456	232.80-233.89	1.09	50.8	1	0457	233.89-235.54	1.65	5.8	8
Samples	Interval	Width	Dry Ash	F.S.I.																																	
0452	226.89-227.69	0.80	18.1	5																																	
0453	227.69-228.80	1.11	10.7	7																																	
0454	228.80-229.52	0.72	31.5	6½																																	
0455	231.83-232.80	0.97	51.3	1½																																	
0456	232.80-233.89	1.09	50.8	1																																	
0457	233.89-235.54	1.65	5.8	8																																	
235.54 - 236.17	0.63	Mudstone: carbonaceous, vitreous coal bands up to 6 cm in width																																			
236.17 - 239.34	3.17	Siltstone: interbedded with fine grained sandstone, coaly rootlets throughout, mildly bioturbated, vitreous bands up to 1 cm in width BCA = 68°																																			
239.34 - 258.66	19.32	Sandstone: medium grained, light grey, cross bedded at top of interval, large white worm burrowed intervals, clean, well sorted																																			
258.66 - 270.36	11.70	Sandstone: fine grained, occasional brecciated zone, clean, well sorted																																			
		MOOSEBAR FORMATION (upper)																																			
270.36 - 288.65	18.29	Sandstone: fine grained, with siltstone interbeds (20%) or bands, minor slump features BCA = 72°- 74°																																			

E.O.H.

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MUD 78-15

LOCATION:

- (a) Coal Licence: 3200
- (b) N.T.S. 93-I-10, b-65-J
- (c) Drill Hole Co-ordinates: N 7934.23 - E 3189.61
- (d) Elevation: 1693.15m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B3 to B12
TOTAL DEPTH: 382.0m

DATE DRILLED: July 26 - 28/Aug. 13 - 28, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MUD 78-15

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 3.82	3.82	CASING BOULDER CREEK MEMBER - COMMOTION FORMATION
3.82 - 11.68	7.86	Sandstone: very coarse grained with fine pebble conglomerate phases, occasional fine grained sandstone intervals, small coaly rootlets throughout
11.68 - 17.12	5.44	Sandstone: very fine grained, light grey, large intervals of claystone - soft, weathered, plant fossils, core solid BCA = 74 ^o
17.12 - 20.62	3.50	Mudstone: carbonaceous, with claystone phases, plant fossils, minor shearing, core fairly solid but soft
20.62 - 21.63	1.01	Sandstone: fine to medium grained, small irregular coaly rootlets, minor cross-bedding, solid
21.63 - 21.74	0.11	Coal: 80% vitreous, solid
21.74 - 21.82	0.08	Coal: dirty, fairly high specific gravity
21.82 - 21.95	0.13	Coal: 60% vitreous, earthy lustre, soft, core pulverized
21.95 - 22.48	0.53	Mudstone: carbonaceous, soft, weathered
22.48 - 23.36	0.88	Coal: 60% vitreous, metallic lustre, pyrite specks throughout, core broken in large pieces 23.24 - 23.36 30% vitreous, earthy lustre, core broken
		Sample Interval Width Dry Ash F.S.I.
		0420 22.48 - 23.36 0.88 18.7 3½
23.36 - 44.36	21.00	Sandstone: medium grained, light grey, occasional fine pebble conglomerate band, grades to a fine grained sandstone at base of interval, core solid, clean BCA = 76 ^o
44.36 - 70.93	26.57	Sandstone: fine grained, interbedded with siltstone, occasional small coaly rootlets, occasional interval mildly bioturbated, occasional brown mud band BCA = 76 ^o
HULCROSS MEMBER - COMMOTION FORMATION		

MUD 78-15 (Con't)

70.93 - 103.18	32.25	Siltstone: interbedded with very fine grained sandstone (30%), minor cross bedding, rare plant fossils and worm burrows, small intervals mildly bioturbated, occasional pyrite speck or bleb. At 86.31 - 86.41, ash or clay band BCA = 80° - 82°
103.18 - 130.15	26.97	Sandstone: very fine grained interbedded with 40% siltstone, less siltstone towards base of interval (25%) As above, 122.89, ash-clay band
130.15 - 130.57	0.42	Sandstone: fine grained, interbedded with 20% siltstone, minor cross bedding, mildly bioturbated, occasional 6 cm band of coarse grained sand or pebble conglomerate, minute calcite blebs and calcite filled fractures
130.57 - 132.84	2.27	Mudstone: carbonaceous, bright coal bands throughout, sheared, coal band 131.78 - 131.98, core broken
132.84 - 133.46	0.62	Sandstone: fine grained, minute coalified rootlets throughout, floral bioturbation, minor cross-bedding BCA = 80°
133.46 - 135.93	2.47	Siltstone: small coaly rootlets throughout, core solid COAL SEAM B12
135.93 - 136.13	0.20	Coal: 10% vitreous, earthly lustre, core broken
136.13 - 136.40	0.27	Coal: 40% vitreous, metallic lustre, core broken
136.40 - 136.42	0.02	Coal: Dull, minute bright bands, hard, fairly high specific gravity
		Sample Interval Width Dry Ash F.S.I.
		0516 135.93 - 136.42 0.49 13.5 7½
136.42 - 136.51	0.09	Mudstone: carbonaceous, core intact
136.51 - 139.60	3.09	Sandstone: fine to medium grained, small coaly rootlets throughout, floral bioturbation, minor cross bedding, minor shears, occasional calcite filled fracture BCA - 77°
139.60 - 145.39	5.79	Siltstone: with occasional mudstone phase, dark grey to black, small coaly rootlets throughout, occasional shear along carbonaceous parting, some minute vitreous bands, a few minute fractures filled with calcite, core intact

MUD 78-15 (Con't)

145.39 - 146.51	1.12	Siltstone: interbedded with claystone, heavily fractured, minute calcite filled fractures, occasional small coaly rootlet, core broken
146.51 - 148.44	1.93	Sandstone: fine grained, cross-bedded, small coaly rootlets, laminated in places, minor shears with calcite along sheared surfaces
148.44 - 151.49	3.05	Siltstone: uniform, plant fossil fragments, occasional brown mud band or clast, core intact
151.49 - 152.52	1.03	Mudstone: carbonaceous, bright coal bands throughout, 2 coal bands up to 20 cm in width, core broken
152.52 - 157.26	4.74	Siltstone: occasional carbonaceous phase, brown mud bands and clasts throughout, bioturbated, small coaly rootlets and minute calcite filled fractures throughout
157.26 - 158.24	0.98	Sandstone: medium grained, small coaly rootlets throughout, cross bedded
158.24 - 161.23	2.99	Siltstone: with minor interbeds of fine grained sandstone, occasional mud clasts, minute calcite filled fractures, some plant fossil fragments
161.23 - 166.00	4.77	Sandstone: fine grained, light grey interbedded with siltstone, occasional mud clasts, small coaly rootlets, minor cross-bedding, occasional calcite filled fracture BCA = 80° - 82°
166.00 - 169.77	3.77	Siltstone, dark grey-black, uniform, some brown mud clasts, rare coaly rootlet, core intact
169.77 - 174.26	4.49	Sandstone: medium grained, occasional siltstone phase (up to 50 cm in width), cross bedded, minor bioturbation, small coaly rootlets common in the sandstone phases
174.26 - 182.92	8.66	Siltstone: black, with occasional carbonaceous mudstone phase coal bands 4-6 cm in width, one band 22 cm in width, small coaly rootlets throughout, bioturbated
182.92 - 186.85	3.93	Sandstone: with minor siltstone interbeds, sandstone fine to medium grained, occasional small coaly rootlet, bioturbated, minor shears, minor cross bedding and slump features
186.85 - 187.60	0.75	Sandstone: interbedded with siltstone, fine grained, bioturbated, some small coaly rootlets - sharp basal contact

MUD 78-15 (Con't)

COAL SEAM B9

187.60 - 187.91	0.31	Coal: 60% vitreous, earthy lustre, hard, core intact
187.91 - 188.16	0.25	Coal: 40% vitreous, earthy lustre, core broken in large pieces
188.16 - 188.24	0.08	Mudstone: carbonaceous
188.24 - 188.29	0.05	Coal: dull, minute bright bands, high specific gravity, core intact
188.29 - 188.45	0.24	Mudstone: carbonaceous, sheared
188.45 - 188.86	0.41	Coal: 10% vitreous, hard, metallic lustre, core broken in large pieces
188.86 - 189.10	0.24	Coal: 10% vitreous, metallic lustre, hard, core intact
189.10 - 189.23	0.13	Coal: 10% vitreous, earthy lustre, core broken in large pieces
189.23 - 189.42	0.19	Coal: 20% vitreous, metallic lustre, hard, core intact
189.42 - 189.65	0.23	Coal: 40% vitreous, metallic lustre, hard, core intact
189.65 - 190.05	0.40	Coal: 30% vitreous, metallic lustre, hard, core intact
190.05 - 190.08	0.03	Coal: 20% vitreous, metallic lustre
190.08 - 190.14	0.06	Coal: 10% vitreous, metallic lustre, very hard, core intact
190.14 - 190.25	0.11	Coal: 10% vitreous, earthy lustre, sheared
190.25 - 190.32	0.07	Mudstone: carbonaceous
190.32 - 190.63	0.31	Coal: 60% vitreous, metallic lustre, hard, core intact
190.63 - 191.19	0.56	Coal: 40% vitreous, metallic lustre, core broken and crushed
191.19 - 192.45	1.26	Coal: 20% vitreous, metallic lustre, core broken and highly crushed
192.45 - 193.24	0.79	Core missing

MUD 78-15 (Con't)

193.24 - 193.93	0.69	Siltstone: carbonaceous, bioturbated, small coaly rootlets throughout, core intact
193.93 - 194.19	0.26	Coal: 40% vitreous, metallic lustre, core broken in large pieces, minor shearing
194.19 - 194.95	0.76	Siltstone: interbedded with fine grained sandstone, bioturbated, small coaly rootlets throughout, core intact
194.95 - 195.68	0.73	Core missing
195.68 - 195.89	0.21	Claystone: core crushed and ground
195.89 - 196.07	0.18	Mudstone: coaly, sheared, high specific gravity, core intact
196.07 - 196.17	0.10	Coal: 10% vitreous, metallic lustre, hard, core crushed and ground
196.17 - 196.38	0.21	Coal: 20% vitreous, metallic lustre, hard, core intact
196.38 - 196.71	0.33	Coal: 40% vitreous, earthy lustre, core intact
196.71 - 197.20	0.49	Core missing
197.20 - 197.44	0.24	Coal: 20% vitreous, metallic lustre, hard, core broken in large pieces
197.44 - 197.55	0.11	Coal: Dull, granular, core intact
197.55 - 197.93	0.38	Coal: 20% vitreous, earthy lustre, core intact
197.93 - 198.11	0.18	Coal: 10% vitreous, metallic lustre, hard, core intact
198.11 - 198.13	0.02	Mudstone: carbonaceous
198.13 - 198.33	0.20	Coal: 20% vitreous, metallic lustre, hard, core intact
198.33 - 198.38	0.08	Coal: 60% vitreous
198.38 - 198.48	0.10	Coal: 10% vitreous, metallic lustre, hard, core intact
198.48 - 198.73	0.25	Coal: 30% vitreous, earthy lustre, core intact
198.73 - 199.07	0.34	Coal: 70% vitreous, earthy lustre, core intact
199.07 - 199.57	0.50	Coal: 30% vitreous, metallic lustre, hard, core intact

MUD 78-15 (Con't)

199.57 - 199.72	0.15	Coal: 80% vitreous, core intact																																													
199.72 - 199.86	0.14	Coal: 90% vitreous																																													
199.86 - 199.90	0.04	Mudstone: carbonaceous																																													
199.90 - 200.25	0.35	Coal: 60% vitreous, earthy lustre, core intact																																													
200.25 - 200.37	0.12	Coal: dull, 10% minute bright bands, fairly high specific gravity																																													
200.37 - 200.50	0.13	Mudstone: carbonaceous, some bright coal bands, core intact																																													
200.50 - 200.80	0.30	Mudstone: coaly, numerous bright bands throughout, high specific gravity, core intact																																													
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Samples	Interval	Width	Dry Ash	F.S.I.																																											
0517	188.24-188.86	0.62	36.1	2																																											
0518	188.86-190.05	1.19	17.7	2																																											
0519	190.05-192.45	2.40	16.4	2½																																											
0520	193.24-194.95	1.71	89.0	NA																																											
0521	195.68-196.71	1.03	48.9	½																																											
0522	197.20-198.73	1.53	21.7	1½																																											
0523	198.73-200.25	1.52	12.8	5																																											
0524	200.25-200.80	0.55	67.0	1½																																											
200.80 - 205.75	4.95	Sandstone: fine to medium grained with minor siltstone interbeds, small coaly rootlets throughout, minor cross-bedding																																													
205.75 - 207.09	1.34	Carbonaceous Mudstone: small bright bands throughout, numerous small plant fragments, core intact																																													
207.09 - 207.24	0.15	Coal Band: 90% vitreous																																													
207.24 - 215.49	8.25	Mudstone: carbonaceous with occasional siltstone phase, small bright coal bands throughout, occasional coal band up to 15 cm in width, core intact																																													
215.49 - 222.08	6.59	Siltstone: grading to a very fine grained sandstone, occasional brown mud clast, occasional small coaly rootlet																																													
222.08 - 234.72	12.64	Sandstone: medium grained, light grey, occasional siltstone band, some small coaly rootlets, cross-bedded BCA = 77°																																													
234.72 - 238.81	4.09	Sandstone: fine grained, interbedded with siltstone, bioturbated, occasional small coaly rootlet, numerous plant fossil fragments																																													

MUD 78-15 (Con't)

238.81 - 242.93	4.12	Siltstone: with numerous brown mud bands, slump features, occasional small coaly rootlet, plant fossil fragments, core intact															
242.93 - 243.20	0.27	Mudstone: coaly, core intact															
		COAL SEAM B7															
243.20 - 243.38	0.18	Coal: 70% vitreous, metallic lustre, core intact															
243.38 - 243.66	0.28	80% vitreous, core broken in large pieces															
243.66 - 243.76	0.10	70% vitreous, core intact															
243.76 - 243.91	0.15	Mudstone: carbonaceous, core solid															
243.91 - 244.21	0.30	Coal: 60% vitreous, earthy lustre, core intact															
244.21 - 244.81	0.60	Coal: 60% vitreous, core broken and crushed															
244.81 - 245.16	0.35	20% vitreous, metallic lustre, hard, fairly high specific gravity, core broken into large pieces															
245.16 - 245.26	0.10	same as above															
245.26 - 245.68	0.42	60% vitreous, core broken into large pieces															
245.68 - 245.80	0.12	Coal: dull, minute bright bands, core intact															
245.80 - 246.13	0.33	80% vitreous, core pulverized															
246.13 - 246.25	0.12	Coal: dull, minute vitreous bands, core pulverized															
		<table border="0"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0525</td> <td>243.20-244.21</td> <td>1.01</td> <td>26.5</td> <td>6</td> </tr> <tr> <td>0526</td> <td>244.21-246.25</td> <td>2.04</td> <td>30.0</td> <td>7½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0525	243.20-244.21	1.01	26.5	6	0526	244.21-246.25	2.04	30.0	7½
Samples	Interval	Width	Dry Ash	F.S.I.													
0525	243.20-244.21	1.01	26.5	6													
0526	244.21-246.25	2.04	30.0	7½													
246.25 - 246.55	0.30	Carbonaceous mudstone															
246.55 - 251.53	4.98	Sandstone: fine grained, interbedded with siltstone, occasional mudstone phase, occasional small coaly rootlet, mildly bioturbated, some brown mud clasts, and slump features, core solid															
251.53 - 252.72	1.19	Mudstone: carbonaceous, occasional bright coal band, core intact															
		COAL SEAM B6(u)															
252.72 - 252.83	0.11	Coal: Dull, soft, breaks into flakes, sheared															
252.83 - 252.95	0.12	Coal: 10% vitreous, dull, sheared, fairly high specific gravity, interbedded with carbonaceous mudstone															

MUD 78-15 (Con't)

252.95 - 253.26	0.31	Coal: 80% vitreous, earthy lustre, core pulverized
		Sample Interval Width Dry Ash F.S.I.
		0527 252.72-253.26 0.54 31.5 8½
253.26 - 253.44	0.18	Mudstone: carbonaceous
253.44 - 255.64	0.20	Sandstone: with occasional carbonaceous siltstone phase, bioturbated, slump features, core intact
255.64 - 257.18	1.54	Siltstone and mudstone: carbonaceous, small bright sands throughout, sheared, core intact
		COAL SEAM B6(1)
257.18 - 257.33	0.15	Coal: Dull, bright bands, breaks into flakes, sheared
257.33 - 257.45	0.12	Mudstone: carbonaceous, sheared, core intact
257.45 - 257.65	0.20	Coal: Dull, soft, breaks into flakes, sheared
257.65 - 257.77	0.12	Mudstone: carbonaceous
257.77 - 257.88	0.11	Coal: 10% vitreous, earthy lustre, core fairly intact
257.88 - 258.18	0.70	Coal: Dull, soft, breaks into flakes, sheared
		Sample Interval Width Dry Ash F.S.I.
		0528 257.18-258.18 1.00 39.0 4½
258.18 - 259.42	0.24	Mudstone: carbonaceous, occasional siltstone phase, highly sheared and broken, small coaly bands throughout
259.42 - 260.60	1.18	Mudstone: carbonaceous, highly sheared, core intact, minute calcite filled fractures BCA = 14 ⁰
260.60 - 263.35	2.75	Sandstone: fine grained interbedded with minor siltstone, highly sheared, broken, some calcite filled fractures, plant fossils, bioturbated BCA = 40 ⁰
263.35 - 264.84	1.49	Siltstone and mudstone: carbonaceous, sheared, small coaly rootlets throughout BCA = 40 ⁰
		COAL SEAM B6
264.84 - 265.48	0.64	Coal: dull, soft, sheared, breaks into flakes, core pulverized

MUD 78-15 (Con't)

265.48 - 265.78	0.30	Mudstone: coaly and carbonaceous, some coal bands, pulverized, all mixed in box
		Sample Interval Width Dry Ash F.S.I.
		Q529 264.84-265.78 0.94 68.1 1
265.78 - 266.40	0.62	Mudstone: sheared, small calcite filled fractures (numerous)
266.40 - 266.85	0.45	Coal: dull, soft, sheared, breaks into flakes, core pulverized
266.85 - 267.92	1.07	Sandstone: fine grained, calcite filled fractures throughout, small coaly rootlets BCA = 14 ⁰
267.92 - 270.76	2.84	Sandstone: fine grained, occasional siltstone phase, some coaly rootlets, calcite filled fractures, heavily bioturbated, some large worm burrows
270.76 - 280.16	9.40	Sandstone: medium grained, light grey, some small white filled fractures, occasional coaly rootlet at base of interval, cross-bedded BCA = 56 ⁰
280.16 - 285.00	4.84	Siltstone: interbedded with minor amounts of fine grained sandstone, heavily bioturbated, slump features common, some small coaly rootlets, bedding highly disturbed, core intact
		COAL SEAM B7
285.00 - 285.26	0.26	Coal: 20% vitreous, earthy lustre, sheared, soft, core intact
285.26 - 285.60	0.34	Coal: 60% vitreous, earthy lustre, minor shears, core broken in large pieces
285.60 - 285.86	0.26	Mudstone: carbonaceous
285.86 - 285.98	0.12	Coal: 20% vitreous, metallic lustre, core pulverized
285.98 - 286.48	0.50	Coal: 70% vitreous, earthy lustre, hard, core intact
286.48 - 287.03	0.55	Bone Coal 286.48 - 286.66 286.66 - 286.74 - Carbonaceous Mudstone 286.74 - 287.03 Bone coal, very hard, high specific gravity
287.03 - 287.20	0.17	Coal: 20% vitreous, metallic lustre, core broken

MUD 78-15 (Con't)

287.20 - 287.95	0.75	Coal: 60% vitreous, earthy lustre, core intact
287.95 - 288.03	0.08	Coal: 40% vitreous, earthy lustre, core solid
288.03 - 288.17	0.14	Mudstone: carbonaceous
288.17 - 288.44	0.27	Coal: 20% vitreous, soft, earthy lustre, core intact
288.44 - 288.65	0.21	Mudstone: carbonaceous
		Samples Interval Width Dry Ash F.S.I.
		0530 285.00-286.48 1.48 21.2 7
		0531 286.48-287.03 0.55 49.8 1/2
		0532 287.03-287.95 0.92 3.4 8 1/2
		0533 287.95-288.65 0.70 50.6 3 1/2
288.65 - 291.69	3.04	Sandstone: fine grained, small coaly rootlets throughout, calcite filled fractures, bioturbated
291.69 - 294.84	3.15	Siltstone: some carbonaceous intervals BCA = 68° - 70°
294.84 - 301.80	6.96	Siltstone/mudstone: occasionally carbonaceous, bioturbated, small coal bands common
		COAL SEAM B6 (ZONE)
301.80 - 309.65	7.85	Mudstone: some siltstone phases, coal bands throughout, some bands up to 30 cm in width, sheared, occasional calcite filled fracture, core broken
309.65 - 319.73	10.08	Mudstone: carbonaceous, small irregular coalified rootlets throughout, some calcite filled fractures, core intact
319.73 - 333.40	13.67	Siltstone: interbedded with fine grained sandstone, some small coaly rootlets, bioturbated, slump features, minor shears, core intact BCA = 78° - 80°
333.40 - 341.68	8.28	Mudstone: becomes carbonaceous towards base of interval, black, small irregular coaly rootlets throughout, core intact, some minute calcite filled fractures
341.68 - 343.90	2.22	Mudstone: carbonaceous and coaly, numerous minute bright bands, coal bands 2 - 3 cm in width, core broken
343.90 - 344.41	0.51	Mudstone: carbonaceous, core solid

MUD 78-15 (Con't)

COAL SEAM B4

344.41 - 344.82	0.41	Coal band: 40% vitreous, earthy lustre, soft, core broken in large pieces
344.82 - 345.52	0.70	Siltstone: plant fossil fragments, core intact
345.52 - 345.92	0.40	Coal: 60% vitreous, earthy lustre, fairly hard, minor shears, core intact
345.92 - 346.04	0.12	Coal: 10% vitreous, dull, earthy lustre, core broken in large pieces

Sample	Interval	Width	Dry Ash	F.S.I.
0546	345.52-346.04	0.52	19.5	4

346.04 - 353.36	7.32	Mudstone: carbonaceous, minute bright bands common, small coaly rootlets throughout, coal band from 352.12 - 352.50, small vitreous bands up to 0.5 cm in diameter common, core broken
353.36 - 366.78	13.42	Sandstone: fine grained, interbedded with siltstone, small irregular coaly rootlets throughout, plant fossil fragments, occasional coaly band 2 - 3 cm in width, bioturbated, slump features, occasional shear

COAL SEAM B3

366.78 - 366.90	0.12	Coal: 20% vitreous, metallic lustre, core broken in large pieces
366.90 - 367.30	0.40	Coal: 70% vitreous, earthy lustre, fairly hard, core intact
367.30 - 367.58	0.28	Coal: 70% vitreous, earthy lustre, core broken in large pieces
367.58 - 368.40	0.82	Mudstone/Siltstone: carbonaceous, core intact
368.40 - 368.70	0.30	Coal: Dull, 30% vitreous bands, core broken and crushed
368.70 - 369.17	0.47	Coal: 70% vitreous, earthy lustre, fairly hard, core intact
369.17 - 369.19	0.02	Coal: Dull, minute bright bands throughout, hard, core intact

Samples	Interval	Width	Dry Ash	F.S.I.
0547	366.78-367.58	0.80	5.3	6½
0548	368.40-369.19	0.79	11.9	6

MUD 78-15 (Con't)

369.19 - 369.41	0.22	Mudstone: carbonaceous, core intact
369.41 - 377.14	7.73	Sandstone: fine grained interbedded with some siltstone, small coaly rootlets throughout, occasional carbonaceous mudstone phase, some calcite filled fractures, bioturbated
377.14 - 379.20	2.06	Mudstone/Siltstone: carbonaceous
379.20 - 381.91	2.71	Sandstone: fine to medium grained, small coaly rootlets throughout, minute calcite filled fractures common, core highly broken BCA - 64°

E.O.H.

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MUD 78-16

LOCATION:

- (a) Coal Licence: 3197
- (b) N.T.S. 93-I-10, c-56-J
- (c) Drill Hole Co-ordinates: N 8009.84 - E 2245.39
- (d) Elevation: 1741.81m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B12
TOTAL DEPTH: 404.5m

DATE DRILLED: July 27 - 30, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MUD 78-16

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>										
0 - 3.00	3.00	CASING										
<u>GATES MEMBER - COMMOTION FORMATION</u>												
3.00 - 12.32	9.32	Sandstone: interbedded with minor amounts of siltstone, sheared, calcite along sheared surfaces, occasional coaly rootlet, slump features, cross-bedded, ferruginous staining throughout, core broken, BCA=58°-60°.										
12.32 - 17.40	5.08	Mudstone: medium grey, soft, breaks easily, some carbonaceous intervals, some coal bands up to 30 cm in width, core broken. BCA=45°.										
17.40 - 18.48	1.08	Mudstone: carbonaceous, plant fossil fragments, small coaly stringers throughout, bedding indistinct, sheared, occasional pyrite specks.										
18.48 - 19.18	0.70	COAL SEAM B-11										
		Coal: 10% vitreous, metallic lustre, sheared, pyrite specks throughout, core broken.										
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I</th> </tr> </thead> <tbody> <tr> <td>0549:</td> <td>18.48 - 19.18</td> <td>0.70</td> <td>20.6</td> <td>4</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I	0549:	18.48 - 19.18	0.70	20.6	4
Samples	Interval	Width	Dry Ash	F.S.I								
0549:	18.48 - 19.18	0.70	20.6	4								
19.18 - 29.26	10.08	Mudstone: as above.										
29.26 - 51.64	22.38	Sandstone: medium grained, light grey, cross-bedded, shears along bedding, carbonaceous partings and some pyrite specks along bedding, occasional small coaly rootlet, ferruginous staining common. BCA at 40 m = 32° at 45 m = 40° at 50 m = 15°										
51.64 - 53.74	2.10	Sandstone: medium grained, light grey, clean, uniform, bedding indistinct, core intact.										
53.74 - 62.52	8.78	Sandstone: fine to medium grained with minor siltstone bands, slump features, some phases bioturbated, sheared with calcite along sheared surfaces.										
62.52 - 70.48	7.96	Sandstone: coarse grained, numerous coaly rootlets towards base of interval, minor shearing, some calcite filled fractures, core broken, BCA=31°.										

70.48 - 81.38	10.90	Sandstone: coarse to medium grained, numerous calcite filled fractures, numerous coaly rootlets, sheared, core broken. BCA at 72 m = 34° at 80 m = 7°-8°																				
81.38 - 90.53	9.15	Sandstone: fine grained, laminated, minor slump features, occasional small coaly rootlets, minor shears with calcite along sheared surfaces. BCA = 45°.																				
90.53 - 96.00	5.47	Mudstone: brown mud bands and clasts throughout, carbonaceous towards base of interval, minor shears towards base of interval, uniform.																				
96.00 - 96.62	0.62	COAL SEAM B-9 Coal: earthy lustre, soft, sheared, core pulverized.																				
96.62 - 97.24	0.62	Coal: earthy lustre, soft, sheared, breaks into flakes, core broken and crushed.																				
97.24 - 97.32	0.08	Mudstone: carbonaceous																				
97.32 - 97.76	0.44	Coal: dull, soft, sheared, breaks into flakes, sheared, core broken.																				
97.76 - 97.86	0.10	Mudstone: carbonaceous																				
97.86 - 98.02	0.16	Coal: dull, soft, sheared, breaks into flakes, core pulverized.																				
98.02 - 98.37	0.35	Coal: 30% vitreous, earthy lustre, soft, core intact.																				
98.37 - 99.37	1.00	Coal: dull, soft, sheared, breaks into flakes, core pulverized.																				
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0550:</td> <td>96.00 - 97.24</td> <td>1.24</td> <td>9.3</td> <td>7</td> </tr> <tr> <td>0551:</td> <td>97.24 - 98.02</td> <td>0.78</td> <td>42.0</td> <td>2-1/2</td> </tr> <tr> <td>0552</td> <td>98.02 - 99.37</td> <td>1.35</td> <td>9.0</td> <td>7</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0550:	96.00 - 97.24	1.24	9.3	7	0551:	97.24 - 98.02	0.78	42.0	2-1/2	0552	98.02 - 99.37	1.35	9.0	7
Samples	Interval	Width	Dry Ash	F.S.I.																		
0550:	96.00 - 97.24	1.24	9.3	7																		
0551:	97.24 - 98.02	0.78	42.0	2-1/2																		
0552	98.02 - 99.37	1.35	9.0	7																		
99.37 - 99.67	0.30	Core missing																				
99.67 - 99.84	0.17	Mudstone: carbonaceous																				
99.84 - 103.34	3.50	Sandstone: fine grained, minor cross beds, some calcite filled fractures BCA = 36°.																				
103.34 - 136.25	32.91	Mudstone: carbonaceous, occasional siltstone phase, sheared, numerous small coaly stringers throughout, pyrite specks and blebs, calcite filled fractures, some brown mud clasts, coal bands up to 30 cm in width, core broken.																				

136.25 - 139.78	3.53	Sandstone: fine grained, interbedded with siltstone, numerous small coaly rootlets, flow features, occasional calcite filled fracture. BCA=42°.
139.78 - 143.24	3.46	Sandstone: plant fragments, mildly bioturbated, occasional coalified rootlet, sheared, calcite along shears, core intact. BCA=36°.
143.24 - 149.52	6.28	Mudstone: black, very soft, carbonaceous phases, sheared, numerous coaly bands throughout, core broken.
149.52 - 151.44	1.92	Siltstone: small coaly rootlets throughout, core intact.
151.44 - 152.09	0.62	Mudstone: soft, sheared, core broken and crushed.
152.09 - 152.19	0.10	COAL SEAM B-6 Coal: soft, dull, sheared, breaks into flakes, pyrite specks throughout, core pulverized.
152.19 - 152.33	0.14	Mudstone: carbonaceous
152.33 - 152.77	0.44	Coal: soft, dull, sheared, breaks into flakes, core pulverized.
152.77 - 152.81	0.04	Mudstone: carbonaceous
152.81 - 153.04	0.23	Coal: 70% vitreous, earthy lustre, core intact. Sample Interval Width Dry Ash F.S.I. 0553: 152.09 - 153.04 0.95 36.6 7
153.04 - 153.51	0.47	Mudstone: occasional bright coal band.
153.51 - 156.35	2.84	Sandstone: fine grained, flow features, some small coaly rootlets, sheared, core intact BCA = 36°.
156.35 - 158.77	2.42	Mudstone: carbonaceous, sheared, pyrite specks, coaly rootlets and coaly stringers (0.5 cm) common, core broken.
158.77 - 166.73	7.96	Sandstone: fine grained, flow features, carbonaceous partings, numerous coalified rootlets, some intervals bedding highly disturbed, sheared, some calcite filled fractures. BCA = 38°.

166.73 - 175.57	8.84	Mudstone: carbonaceous, highly sheared - listric surfaces, numerous coaly rootlets throughout and vitreous bands up to 1 cm in width, numerous minute fractures, soft, occasional siltstone phase, core broken.
175.57 - 186.44	10.87	Sandstone: fine grained, occasional carbonaceous mudstone and siltstone phases, slump features, small irregular coaly rootlets throughout, carbonaceous partings along bedding, sheared BCA = 36°.
186.44 - 189.26	2.82	Mudstone: carbonaceous, vitreous bands 2-3 cm in width common, 1 coal band 30 cm in width, core intact.
189.26 - 194.43	5.17	Sandstone: same as above.
194.43 - 196.60	2.17	Mudstone and Siltstone: carbonaceous, sheared, pyrite nodules, some coaly bands up to 10 cm in width which are pulverized.
196.60 - 209.60	13.00	Sandstone: plant fossil fragments, same as above. BCA = 34°.
209.60 - 213.97	4.37	Sandstone: fine grained, interbedded with siltstone, small coalified rootlets throughout, bioturbated BCA = 46°.
213.97 - 216.00	2.03	Siltstone/Mudstone: plant fossil fragments, numerous small coaly rootlets, sheared, core intact.
216.00 - 216.52	0.52	Mudstone: carbonaceous, highly sheared, small bright coaly bands throughout.
216.52 - 217.92	1.40	COAL SEAM B-3 Coal: 40% vitreous, earthy lustre, highly sheared, core broken.
217.92 - 218.23	0.31	Coal: 40% vitreous, highly sheared, core pulverized.
218.23 - 219.03	0.80	Mudstone: carbonaceous, soft, heavily sheared.
219.03 - 219.21	0.18	Mudstone: coaly.
219.21 - 219.44	0.23	Coal: dull, soft, sheared, breaks into flakes, core broken.
219.44 - 219.56	0.12	Coal: metallic lustre, hard, core intact.
219.56 - 220.27	0.71	Coal: dull, soft, sheared, breaks into flakes, core pulverized.

220.27 - 221.53	1.26	Coal: 30% vitreous, earthy lustre, very soft, highly sheared, core broken.																				
221.53 - 221.65	0.12	Coal: 60% vitreous, core pulverized.																				
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0554:</td> <td>216.52 - 218.23</td> <td>1.71</td> <td>6.1</td> <td>7</td> </tr> <tr> <td>0555:</td> <td>218.23 - 219.21</td> <td>0.98</td> <td>78.0</td> <td>N/A</td> </tr> <tr> <td>0556:</td> <td>219.21 - 221.65</td> <td>2.44</td> <td>11.3</td> <td>7</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0554:	216.52 - 218.23	1.71	6.1	7	0555:	218.23 - 219.21	0.98	78.0	N/A	0556:	219.21 - 221.65	2.44	11.3	7
Sample	Interval	Width	Dry Ash	F.S.I.																		
0554:	216.52 - 218.23	1.71	6.1	7																		
0555:	218.23 - 219.21	0.98	78.0	N/A																		
0556:	219.21 - 221.65	2.44	11.3	7																		
221.65 - 226.50	4.85	Mudstone: carbonaceous, soft, calcite along sheared surfaces, occasional siltstone phase, core broken.																				
		Fault Zone																				
226.50 - 237.62	11.12	Sandstone: fine grained, light grey, some siltstone phases, sheared, bioturbated, calcite filled fractures and along sheared surfaces, some small coaly rootlets BCA=33°.																				
237.62 - 242.92	5.30	Mudstone: medium grey, soft, core intact.																				
242.92 - 255.12	12.20	Sandstone: fine grained, calcite along sheared surfaces, numerous small coaly rootlets, bioturbated, minor cross-bedding, occasional carbonaceous siltstone phase BCA = 42°.																				
255.12 - 259.40	4.28	Mudstone: small coaly rootlets throughout, sheared, occasional coaly band up to 10 cm in width.																				
259.40 - 276.45	17.05	Sandstone: fine to medium grained, small coaly rootlets throughout, minute calcite filled fractures, sheared, minor cross-bedding, some slump features, occasional siltstone phase BCA = 34°.																				
276.45 - 282.45	6.00	Mudstone: as above, core broken.																				
282.45 - 285.60	3.15	Sandstone: as above.																				
285.60 - 288.90	3.30	Mudstone: greyish brown, sheared, some phases carbonaceous, core intact.																				
288.90 - 295.75	6.85	Sandstone: fine grained, light grey, some siltstone bands, small coaly rootlets throughout, flow features BCA = 42°.																				
295.75 - 297.79	2.04	Mudstone: carbonaceous, core broken.																				
297.79 - 298.89	1.10	COAL SEAM B-2																				
		Coal: 20% vitreous, earthy lustre, highly sheared, core pulverized.																				
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0557:</td> <td>297.79 - 298.89</td> <td>1.10</td> <td>13.1</td> <td>3-1/2</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0557:	297.79 - 298.89	1.10	13.1	3-1/2										
Sample	Interval	Width	Dry Ash	F.S.I.																		
0557:	297.79 - 298.89	1.10	13.1	3-1/2																		

298.89 - 299.31	0.42	Core missing.															
299.31 - 304.36	5.05	Mudstone: carbonaceous, highly sheared, listric surfaces, coaly bands 3-4 cm in width, core broken and crushed.															
304.36 - 305.62	1.26	Siltstone: highly sheared, calcite along shears and numerous small calcite filled fractures, bedding highly disturbed, core intact.															
305.62 - 309.98	4.36	Mudstone: carbonaceous, as above.															
309.98 - 311.00	1.02	COAL SEAM B-1 Coal: 30% vitreous, earthy lustre, highly sheared, core broken in large pieces.															
311.00 - 313.04	2.04	Mudstone: as above.															
313.04 - 313.51	0.47	Coal: dull, soft, sheared, broken in large pieces.															
313.51 - 313.82	0.31	Coal: 40% vitreous, earthy lustre, soft, sheared, core intact.															
313.82 - 314.42	0.60	Coal: dull, soft, highly sheared, core pulverized, some siltstone chips mixed into the last 20 cm.															
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0558:</td> <td>309.98 - 311.00</td> <td>1.02</td> <td>8.3</td> <td>6</td> </tr> <tr> <td>0559:</td> <td>313.04 - 314.42</td> <td>1.38</td> <td>9.3</td> <td>7-1/2</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0558:	309.98 - 311.00	1.02	8.3	6	0559:	313.04 - 314.42	1.38	9.3	7-1/2
Sample	Interval	Width	Dry Ash	F.S.I.													
0558:	309.98 - 311.00	1.02	8.3	6													
0559:	313.04 - 314.42	1.38	9.3	7-1/2													
314.42 - 316.94	2.52	Siltstone interbedded with fine grained sandstone: carbonaceous partings, listric surfaces - sharp basal contact. BCA = 45°															
316.94 - 344.88	27.94	Sandstone: fine to medium grained, light grey, large white worm burrowed intervals at approximately 326 m. Some intervals - large fractures filled with calcite, at 330 m sandstone highly brecciated for approximately 20 cm. Occasional mud clast in lower part of interval, sandstone clean, uniform, core intact BCA 48°-50°.															
344.88 - 361.80	16.92	Sandstone: fine grained, light grey, occasional siltstone or mudstone band up to 10 cm in width - these bands are sheared, in places brecciated, minute fractures filled with calcite BCA = 51°.															
361.80 - 366.67	4.87	Siltstone: black, interbedded with fine grained sandstone, occasional sandstone phase, sheared, listric surfaces, calcite along shears BCA=47°.															

MUD 78-16

(cont'd)

366.67 - 369.72	3.05	Sandstone: fine grained, light grey, calcite filled fractures, minor shears, rare mud clast, well sorted, clean, core intact.
369.72 - 379.34	9.62	Sandstone: as above.
379.34 - 402.95	23.61	Sandstone: light grey, fine grained with phases and interbeds of dark grey mudstone, irregular bedding.

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MUD 78-17

LOCATION:

- (a) Coal Licence: 3198
- (b) N.T.S. 93-I-10, d-47-J
- (c) Drill Hole Co-ordinates: N 7536.32 - E 1416.33
- (d) Elevation: 1566.29m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B5 to B12
TOTAL DEPTH: 450.2m

DATE DRILLED: July 30 - Aug. 9, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 8.23	8.23	CASING
		<u>SHAFTESBURY FORMATION</u>
8.23 - 15.54	7.31	Sandstone: fine grained, interbedded with siltstone, core weathered and highly broken.
15.54 - 41.70	26.16	Sandstone: fine grained, interbedded with minor amounts of siltstone, moderately bioturbated, slump features, occasional small white worm burrow, minor slickensides at top of interval. BCA = 68°.
41.70 - 65.21	23.51	Siltstone: interbedded with fine grained sandstone, moderately bioturbated, slump features, BCA = 72°.
65.21 - 81.64	16.43	Siltstone: interbedded with fine grained sandstone, minor cross bedding, bioturbated, occasional pyrite nodule.
81.64 - 82.21	0.57	Siltstone: as above, with 1 - 2 cm bands of coarse grained sandstone.
		<u>BOULDER CREEK MEMBER - COMMOTION FORMATION</u>
82.21 - 84.43	2.22	Sandstone: medium grained, minor shearing, calcite filled fractures and along sheared surfaces.
84.43 - 89.87	5.44	Siltstone: occasional small coaly rootlet.
89.87 - 93.13	3.26	Sandstone: fine to medium grained, occasional siltstone phase, small irregular coaly rootlets throughout, bedding indistinct.
93.13 - 98.14	5.01	Siltstone: grades to a fine grained sandstone, sheared, brecciated, small calcite filled fractures, numerous coaly rootlets, occasional greenish/grey claystone phase.
98.14 - 102.72	4.58	Sandstone: fine grained, occasional calcite filled fracture, small coaly rootlets throughout.

MUD 78-17 (Cont.)

102.72 - 109.56	6.84	Sandstone: fine grained, interbedded with siltstone, occasional medium grained sandstone phase, small coaly rootlets throughout, moderately bioturbated, occasional, small, brecciated zone.
109.56 - 111.60	2.04	Siltstone: numerous minute fractures.
111.60 - 114.41	2.81	Sandstone: medium grained, dark grey, numerous coaly rootlets throughout, core broken.
114.41 - 123.40	8.99	Sandstone: medium to coarse grained, small coaly rootlets throughout, brecciated towards base of interval, occasional calcite filled fracture, minor cross-bedding, BCA = 52°.
123.40 - 133.21	9.81	Sandstone: fine grained, with some siltstone phases, bedding indistinct, small coaly rootlets throughout.
133.21 - 134.10	0.89	Sandstone: medium grained, numerous coaly rootlets throughout, bioturbated.
134.10 - 136.60	2.50	Siltstone: with some mudstone phases, small coaly rootlets throughout, core intact.
136.60 - 153.36	16.76	Sandstone: fine to medium grained with some siltstone phases, small irregular coaly rootlets throughout, bioturbated, minor cross bedding, core intact, rare worm burrow.
153.36 - 155.47	2.11	Siltstone/Mudstone: numerous small coaly rootlets throughout, core intact.
155.47 - 163.70	8.23	Sandstone: medium grained to coarse grained at base of interval, light grey, small coaly rootlets core intact, minor cross-bedding, BCA = 64°.
163.70 - 164.50	0.80	Conglomerate: fine pebble, core intact.
164.50 - 165.80	1.30	Siltstone: grading to carbonaceous mudstone, core broken, some coaly bands 3 - 6 cm in width, minor shearing.

MUD 78-17 (Cont.)

165.80 - 167.94	2.14	Sandstone: medium grained, occasional coaly rootlet, cross bedded, solid.
167.94 - 174.27	6.33	Mudstone: occasional siltstone phase, soft, highly sheared, small coaly rootlets throughout, bedding indistinct, BCA = 47?
174.27 - 174.82	0.55	Sandstone: fine grained, small coaly rootlets throughout, bedding indistinct.
174.82 - 181.67	6.85	Siltstone: carbonaceous with coaly mudstone intervals, small coaly rootlets throughout, sheared, core broken, occasional coal band-up to 20 cm in width.
181.67 - 204.20	22.53	Sandstone: coarse grained, with up to 1 m intervals of fine pebble conglomerate, some small white worm burrows, grades to a fine grained sandstone at base of interval with occasional pebble, occasional small coaly rootlet. BCA = 78°.
204.20 - 212.46	8.26	Sandstone: fine grained, interbedded with siltstone, some pyrite nodules, sheared, core fairly broken, bioturbated, slump features, minor cross-bedding, small coaly rootlets. BCA = 50° at 206.00 m BCA = 72° at 212.00 m

HULCROSS MEMBER - COMMOTION FORMATION

212.46 - 251.06	38.60	Siltstone: interbedded with fine grained sandstone, uniform, bioturbated, slump features, minor cross-bedding, minor shearing, occasional minute calcite filled fractures. BCA 212.46 - 240.69 = 76° 240.69 - 242.69 = 36° - sheared heavily - listric surfaces some minute calcite filled fractures 242.69 - 245.97 = 72° 245.97 - 246.89 = 45° sheared 246.89 - 247.61 = 42° 247.61 - 250.44 = 76° 250.44 - 251.06 = 52°
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MUD 78-17 (Cont.)

251.06 - 265.21	14.15	Siltstone: interbedded with very fine grained sandstone, sheared throughout, occasional (rare) plant fossils at: 252 m BCA = 76° 253 m BCA = 40° 254 - 265 m BCA = 77°
265.21 - 269.74	4.53	Siltstone: interbedded with very fine grained sandstone, occasional MUDSTONE phase, core highly sheared and broken, calcite filled fractures. BCA = 65°.
269.74 - 288.34	18.60	Siltstone: interbedded with very fine grained sandstone, uniform, core solid, minor cross-bedding, minor shears. BCA = 78-80°
<u>GATES MEMBER - COMMOTION FORMATION.</u>		
288.34 - 291.39	3.05	Sandstone: fine grained, minor cross-bedding, fine pebble conglomerate band 10 cm in width at top of interval, brecciated zones throughout, plant fossils.
291.39 - 299.84	8.45	Sandstone: fine grained, small coaly rootlets throughout, minor cross bedding, mildly bioturbated. BCA = 78°.
299.84 - 300.22	0.38	Mudstone: carbonaceous, pyrite specks and blebs, core intact.
300.22 - 300.54	0.32	Sandstone: medium grained, small coaly rootlets throughout.
300.54 - 301.40	0.86	Mudstone: carbonaceous, coaly, core broken, coal bands up to 10 cm in width.
301.40 - 303.89	2.49	Sandstone: fine grained, small coaly rootlets throughout, bioturbated.
303.89 - 309.38	5.49	Siltstone/Mudstone: carbonaceous, plant fossils, sheared, small coaly rootlets throughout, coal bands up to 5 - 6 cm in width.
309.38 - 313.98	4.60	Sandstone: medium grained, cross-bedded, small coaly rootlets throughout. BCA = 78°.
313.98 - 316.07	2.09	Siltstone: interbedded with very fine grained sandstone, small coaly rootlets throughout.

MUD 78-17 (Cont.)

316.07 - 318.17	2.10	Siltstone: uniform, core intact.
318.17 - 319.87	1.70	Mudstone/Siltstone: carbonaceous, coaly, coal bands 3 - 4 cm in width, core intact.
319.87 - 320.01	0.14	Coal band.
320.01 - 320.30	0.29	Sandstone: fine grained, coaly rootlets throughout.
320.30 - 326.64	6.34	Sandstone: fine grained, small coaly rootlets throughout, cross-bedded, bioturbated, minor shearing. BCA = 66°.
326.64 - 330.83	4.19	Siltstone: occasional carbonaceous mudstone interval.
330.83 - 345.51	14.68	Sandstone: fine grained, occasional phases of siltstone and mudstone, small coaly rootlets throughout, moderately bioturbated, occasional coaly band: 3 - 4 cm in width. BCA = 74°.
345.51 - 347.12	1.61	Sandstone: fine grained, interbedded with siltstone, small coaly rootlets throughout, bioturbated.
		COAL SEAM B9
347.12 - 347.24	0.12	Coal: 40% vitreous, dull earthy lustre, core intact.
347.24 - 347.34	0.10	Coal: dull, earthy, highly sheared, broken into flakes.
347.34 - 347.55	0.21	Mudstone: coaly, highly sheared.
347.55 - 348.29	0.74	Mudstone: carbonaceous, core intact.
348.29 - 348.82	0.53	Coal: hard, intact, 10% vitreous, metallic lustre.
348.82 - 349.06	0.24	Coal: hard, intact, metallic lustre, fairly high specific gravity.
349.06 - 349.62	0.56	Coal: 30% vitreous, metallic lustre, core broken in large pieces.

MUD 78-17 (Cont.)

349.62 - 349.68	0.06	Coal: 10% vitreous, metallic lustre.																														
349.68 - 349.86	0.18	Coal: 10% vitreous, hard, dull, fairly high specific gravity, core intact.																														
349.86 - 349.94	0.08	Coal: boney																														
349.94 - 350.26	0.32	Coal: ground, and crushed, hard, metallic lustre.																														
350.26 - 350.48	0.22	Coal: 20% vitreous, metallic lustre, hard, core broken large pieces.																														
350.48 - 350.59	0.11	Coal: 40% vitreous, metallic lustre, core hard, intact.																														
350.59 - 350.79	0.20	Coal: 20% vitreous, metallic lustre, hard, core intact.																														
350.79 - 351.03	0.24	Coal: 40% vitreous, earthy lustre, solid.																														
351.03 - 351.10	0.07	Coal, earthy lustre, fairly high specific gravity.																														
351.10 - 351.31	0.21	Coal: 40% vitreous, earthy lustre, core intact.																														
351.31 - 351.43	0.12	Bone coal.																														
351.43 - 351.75	0.32	Mudstone: coaly, core broken in large pieces.																														
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I</th> </tr> </thead> <tbody> <tr> <td>0473</td> <td>347.12 - 347.55</td> <td>0.43</td> <td>32.2</td> <td>6 1/2</td> </tr> <tr> <td>2259</td> <td>347.55 - 348.29</td> <td>0.74</td> <td>81.5</td> <td>NA</td> </tr> <tr> <td>0472</td> <td>348.29 - 349.62</td> <td>1.33</td> <td>18.7</td> <td>1</td> </tr> <tr> <td>0474</td> <td>349.62 - 350.48</td> <td>0.86</td> <td>24.9</td> <td>1</td> </tr> <tr> <td>0475</td> <td>350.48 - 351.75</td> <td>1.27</td> <td>31.6</td> <td>4</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I	0473	347.12 - 347.55	0.43	32.2	6 1/2	2259	347.55 - 348.29	0.74	81.5	NA	0472	348.29 - 349.62	1.33	18.7	1	0474	349.62 - 350.48	0.86	24.9	1	0475	350.48 - 351.75	1.27	31.6	4
Samples	Interval	Width	Dry Ash	F.S.I																												
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0474	349.62 - 350.48	0.86	24.9	1																												
0475	350.48 - 351.75	1.27	31.6	4																												
351.75 - 352.25	0.50	Mudstone: carbonaceous, sheared, occasional coaly band up to 3 - 4 cm in width.																														
352.25 - 353.95	1.70	Sandstone: fine grained, small coaly rootlets throughout, moderately bioturbated, minor siltstone interbeds.																														
353.95 - 356.30	2.35	Siltstone: plant fossils, small irregular coaly rootlets throughout.																														
356.30 - 361.70	5.40	Sandstone: fine grained, small coaly rootlets throughout, core intact, minor cross-bedding.																														

MUD 78-17 (Cont.)

361.70 - 362.30	0.60	Mudstone: coaly, hard, core fairly intact, occasional vitreous bands 2 - 3 cm in width.
362.30 - 363.98	1.68	Siltstone: small, coaly rootlets, plant fossils, core intact.
		COAL SEAM B8
363.98 - 364.18	0.20	Coal: 60% vitreous, earthy lustre, core intact.
364.18 - 364.29	0.11	Coal: hard, metallic lustre, fairly high specific gravity.
364.29 - 364.47	0.18	Coal: 20 - 30% vitreous, metallic lustre, hard, core intact.
364.47 - 364.61	0.14	Coal: 30% vitreous, metallic lustre, hard core intact.
364.61 - 364.76	0.15	Coal: 60% vitreous, earthy lustre, core intact.
		Sample Interval Width Dry Ash F.S.I.
		0476 363.98 - 364.76 0.78 28.1 4 ½
364.76 - 365.14	0.38	Siltstone: carbonaceous.
365.14 - 374.20	9.06	Sandstone: fine grained with siltstone phases throughout, small coaly rootlets throughout, plant fossils, bioturbated, core intact.
374.20 - 376.98	2.78	Sandstone: fine grained to medium grained at base of interval, brecciated at top of interval, coaly rootlets throughout, minor cross-bedding.
376.98 - 381.55	4.57	Conglomerate: fine pebble, pebbles up to 1 cm in diameter, occasional coarse grained sandstone band, small coaly rootlets towards base of interval.
381.55 - 386.88	5.33	Sandstone: medium grained, small coaly rootlets throughout. BCA = 78°. Top of interval brecciated.
386.88 - 391.67	4.79	Conglomerate: pebbles ranging from 0.5 cm to 1 cm in diameter, occasional coarse grained sandstone phase, small coaly rootlets throughout.
391.67 - 393.65	1.98	Siltstone: solid, uniform, occasional small coaly rootlet.
393.65 - 395.50	1.85	Mudstone: carbonaceous, sheared, core fairly broken, small vitreous bands throughout.

MUD 78-17 (Cont.)

COAL SEAM B7

395.50 - 395.60	0.10	Coal: 30% vitreous, hard, earthy lustre, core intact.																				
395.60 - 395.75	0.15	Coal: 40% vitreous, metallic lustre, core pulverized.																				
395.75 - 396.05	0.30	Coal: 30% vitreous, dull earthy lustre, core broken in large pieces.																				
396.05 - 396.27	0.22	Coal: 70% vitreous, earthy lustre, core intact.																				
396.27 - 396.38	0.11	Coal: 30% vitreous, dull earthy lustre, hard, fairly high specific gravity, core intact.																				
396.38 - 396.55	0.17	Coal: 40% vitreous, earthy lustre core broken in large pieces.																				
396.55 - 396.73	0.18	Coal: 20% vitreous, metallic lustre, hard, core intact.																				
396.73 - 396.88	0.15	Coal: 10% vitreous, metallic lustre, very hard, core intact, fairly high specific gravity.																				
396.88 - 397.12	0.24	Coal: 40% vitreous, dull earthy lustre, core broken into large pieces.																				
397.12 - 397.38	0.26	Bone Coal: High specific gravity.																				
397.38 - 397.78	0.40	Coal: 60% vitreous, metallic lustre, core intact.																				
397.78 - 397.98	0.20	Coal: 50% vitreous, dull earthy lustre, core broken into large pieces.																				
397.98 - 398.06	0.08	Coaly mudstone.																				
398.06 - 398.37	0.31	Coal: 20% vitreous, dull earthy lustre, sheared, core broken into large pieces.																				
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0477</td> <td>395.50-396.55</td> <td>1.05</td> <td>8.0</td> <td>7 ½</td> </tr> <tr> <td>0478</td> <td>396.55-397.38</td> <td>0.83</td> <td>32.9</td> <td>3 ½</td> </tr> <tr> <td>0479</td> <td>397.38-398.37</td> <td>0.99</td> <td>20.0</td> <td>7 ½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0477	395.50-396.55	1.05	8.0	7 ½	0478	396.55-397.38	0.83	32.9	3 ½	0479	397.38-398.37	0.99	20.0	7 ½
Samples	Interval	Width	Dry Ash	F.S.I.																		
0477	395.50-396.55	1.05	8.0	7 ½																		
0478	396.55-397.38	0.83	32.9	3 ½																		
0479	397.38-398.37	0.99	20.0	7 ½																		
398.37 - 398.61	0.24	Carbonaceous mudstone: sheared.																				

MUD 78-17 (Cont.)

398.61 - 400.11	1.50	Sandstone: Fine grained, small coaly rootlets throughout, bioturbated.										
400.11 - 401.48	1.37	Carbonaceous mudstone: Sheared, core broken, occasional coal band up to 5 cm in width.										
401.48 - 404.79	3.31	Sandstone: Fine grained, plant fossils, small coaly rootlets throughout. BCA = 77°.										
404.79 - 405.67	0.88	Mudstone: Carbonaceous and coaly, minor shears, core fairly broken, coal bands 15 to 20 cm in width.										
405.67 - 408.66	2.99	Siltstone: interbedded with fine grained sandstone, small coaly rootlets throughout, bioturbated.										
408.66 - 410.56	1.90	Mudstone and Siltstone: plant fossils, carbonaceous.										
410.56 - 410.91	0.35	Carbonaceous mudstone: sheared.										
COAL SEAM B6 (1)												
410.91 - 411.41	0.50	Coal: soft dull, and coaly mudstone, sheared, core pulverized and mixed in box.										
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0480</td> <td>410.91 - 411.41</td> <td>0.50</td> <td>61.9</td> <td>1 ½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0480	410.91 - 411.41	0.50	61.9	1 ½
Samples	Interval	Width	Dry Ash	F.S.I.								
0480	410.91 - 411.41	0.50	61.9	1 ½								
411.41 - 412.11	0.70	Mudstone: carbonaceous and coaly, coal bands 5 to 6 cm in width.										
412.11 - 413.08	0.97	Mudstone: carbonaceous.										
413.08 - 416.66	3.58	Sandstone: fine grained, occasional small coaly rootlets, bedding indistinct.										
416.66 - 419.71	3.05	Sandstone: medium grained, small coaly rootlets throughout, minor bioturbation.										
419.71 - 425.86	6.15	Sandstone: coarse grained, grading to pebble conglomerate at base of interval, numerous coaly rootlets throughout, minor shearing.										
425.86 - 428.40	2.54	Sandstone: medium grained, floral bioturbation, numerous coaly rootlets throughout. BCA = 76°.										
428.40 - 431.90	3.50	Mudstone: carbonaceous, sheared, numerous coaly rootlets throughout, small coaly bands 5 to 6 cm in width.										

MUD 78-17 (Cont.)

COAL SEAM B5

431.90 - 432.20	0.30	Coal: Hard, dull, 10% small vitreous bands.
432.20 - 432.35	0.15	Coal: Hard, metallic lustre, high specific gravity.
432.35 - 432.57	0.22	Coal: 10% vitreous, earthy lustre, core broken into large pieces.
432.57 - 432.92	0.35	Coal: dirty, hard, sheared, broken into large pieces, high specific gravity.
432.92 - 432.97	0.05	Carbonaceous mudstone.
432.97 - 433.97	1.00	Mudstone: interbedded with soft dull coal, sheared, core pulverized 5 to 6 cm mudstone, 5 to 6 cm coal throughout.
433.97 - 434.27	0.30	Coal and mudstone: pulverized.
434.27 - 434.40	0.13	Carbonaceous mudstone: core broken.
434.40 - 435.67	1.27	Carbonaceous mudstone: sheared, broken.
435.67 - 436.14	0.47	Coal: 30% vitreous, hard metallic lustre, core broken into large pieces.

Samples	Interval	Width	Dry Ash	F.S.I..
0481	431.90 - 432.92	1.02	55.8	1
0482	432.92 - 434.40	1.48	81.9	NA
2260	434.40 - 435.67	1.27	82.1	NA
0483	435.67 - 436.14	0.47	26.6	5 ½

436.14 - 437.60	1.46	Siltstone: small coaly rootlets throughout.
437.60 - 444.22	6.62	Sandstone: medium grained, light grey, occasional calcite band 1 to 2 cm in width, core intact.
444.22 - 445.39	1.17	Sandstone: medium grained, numerous small coaly rootlets. BCA = 60°.
445.39 - 450.19	4.80	Conglomerate: fine pebbles, grading to coarser pebbles (2 cm in diameter) at base of interval, occasional coaly rootlet at top of interval. E.O.H.

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MUD 78-18

LOCATION:

- (a) Coal Licence: 3197
- (b) N.T.S. 93-I-10, b-55-J
- (c) Drill Hole Co-ordinates: N 7192.10 - E 2857.97
- (d) Elevation: 1572.31m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing pulled

FORMATION TESTED: Boulder Creek Member
COAL SEAMS INTERSECTED: None
TOTAL DEPTH: 300.8m

DATE DRILLED: Aug. 6 - 12, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MUD 78-18

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 16.96	16.96	CASING
		BOULDER CREEK MEMBER - COMMOTION FORMATION
16.96 - 27.19	10.23	Conglomerate: medium grained, dark grey sandstone matrix, pebbles poorly sorted from 0.5 cm to 5 cm in diameter, ferruginous staining throughout.
27.19 - 29.80	2.61	Sandstone: medium grained, medium grey, occasional pebble band, core intact.
29.80 - 36.87	7.07	Conglomerate: fine pebbles, 0.5 cm in diameter, rounded, some bands of pebbles 2 - 3 cm. in diameter, small calcite filled fractures throughout.
36.87 - 41.60	4.73	Siltstone: uniform, sheared with minor amounts of calcite along sheared surfaces. BCA = 28°.
41.60 - 66.34	24.74	Conglomerate: pebbles poorly sorted, from 0.5 cm. to 6 cm. in diameter, occasional medium grained sandstone phase, ferruginous staining throughout, small calcite filled fractures, coaly rootlets and inclusions at base of interval.
66.34 - 75.04	8.70	Siltstone: sheared, small coaly rootlets throughout, pyrite specks and blebs common.
75.04 - 78.56	3.52	Conglomerate: pebbles 1 cm in diameter fairly well sorted, coarse grained sandstone matrix, small calcite filled fractures, coaly rootlets at top of interval.
78.56 - 79.26	0.70	Sandstone: coarse grained, occasional pebble.
79.26 - 99.06	19.80	Sandstone: fine grained, small coaly rootlets throughout, bioturbated at top of interval, cross bedded at base, sheared at base of interval. BCA = 28° - 30°.
99.06 - 105.72	6.66	Sandstone: fine grained, small coaly rootlets throughout, bioturbated. BCA = 26°.

MBD-78-28 (Cont'd)

299.65 - 300.01	0.36	Mudstone: carbonaceous, dark grey, minute coal bands, sheared, core broken.
300.01 - 300.41	0.40	Claystone: light grey, carbonaceous specks.
300.41 - 316.83	16.42	Sandstone: interbedded with siltstone, (ratio 1/1) some carbonaceous specks and small coaly rootlets, mildly bioturbated, BCA = 68 ⁰ .
316.83 - 319.63	2.80	Sandstone: fine grained, medium grey, heavily bioturbated.
319.63 - 321.30	1.67	Siltstone: interbedded with fine grained sandstone, some coaly rootlets near base of unit, core intact.
321.30 - 322.24	0.94	Mudstone: carbonaceous, sheared, small bright coal bands throughout, core broken.
322.24 - 322.40	0.16	Coal: dull, sheared, pulverized.
322.40 - 323.70	1.30	Mudstone: as above.
COAL SEAM B9		
232.70 - 232.90	0.20	Coal: hard, metallic lustre, core intact.
323.90 - 323.92	0.02	Coal: dull, intact.
323.92 - 324.00	0.08	Coal: earthy lustre, core intact.
324.00 - 324.09	0.09	Mudstone: carbonaceous
324.09 - 324.17	0.08	Coal: dull, core pulverized
324.17 - 324.20	0.03	Mudstone
324.20 - 324.48	0.28	Coal: dull, core pulverized.
324.48 - 324.58	0.10	Mudstone: carbonaceous, sheared
324.58 - 324.98	0.40	Coal and mudstone: sheared, core pulverized and mixed in box.
324.98 - 325.71	0.73	Core missing.
325.71 - 325.81	0.10	Coal: earthy lustre, 10% vitreous, sheared, core pulverized.

MUD 78-18 (Cont'd.)

135.56 - 136.25	0.69	Coal: earthy lustre, soft, sheared, breaks into flakes, core pulverized.															
136.25 - 137.55	1.30	Mudstone and Coal: highly sheared, pyrite specks common, core pulverized and mixed in box.															
<table border="1"> <thead> <tr> <th>Samples:</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I</th> </tr> </thead> <tbody> <tr> <td>0484</td> <td>131.09 - 133.20</td> <td>2.11</td> <td>19.1</td> <td>1</td> </tr> <tr> <td>0485</td> <td>135.56 - 137.55</td> <td>1.99</td> <td>55.6</td> <td>1</td> </tr> </tbody> </table>			Samples:	Interval	Width	Dry Ash	F.S.I	0484	131.09 - 133.20	2.11	19.1	1	0485	135.56 - 137.55	1.99	55.6	1
Samples:	Interval	Width	Dry Ash	F.S.I													
0484	131.09 - 133.20	2.11	19.1	1													
0485	135.56 - 137.55	1.99	55.6	1													
137.55 - 137.85	0.30	Mudstone: carbonaceous, core broken.															
137.85 - 139.71	1.86	Siltstone: interbedded with minor amounts of fine grained sandstone, core intact.															
139.71 - 146.52	6.81	Siltstone: grades to a carbonaceous mudstone at base of interval, small coaly rootlets, sheared.															
146.52 - 154.53	8.01	Sandstone: fine grained, occasional carbonaceous siltstone phase, small coaly rootlets throughout, sheared, occasional calcite filled fractures. BCA = 20°.															
154.53 - 155.15	0.62	Mudstone: highly sheared, listric surfaces, core broken.															
155.15 - 156.58	1.43	Siltstone: sheared, coaly rootlets throughout.															
156.58 - 157.60	1.02	Mudstone: carbonaceous, sheared.															
157.60 - 158.34	0.74	Mudstone: coaly, highly sheared, pyrite specks throughout, small coal bands throughout, core pulverized.															
158.34 - 159.72	1.38	Siltstone: carbonaceous, numerous small coaly rootlets throughout, core intact.															
159.72 - 172.52	12.80	Siltstone: some fine grained sandstone phases, small coaly rootlets throughout, minor shears along bedding, occasional calcite filled fractures and along sheared surfaces. BCA = 18°.															
172.52 - 185.16	12.64	Sandstone: fine grained, small coaly rootlets throughout, occasional carbonaceous mudstone phases, minor shears with pyrite.															

MUD 78-18 (Cont'd.)

185.16 - 189.12	3.96	Siltstone: interbedded with fine grained sandstone, mildly bioturbated.
		COAL SEAM
189.12 - 190.07	0.95	Coal band: dull, earthy lustre, 10% vitreous bands, sheared, core broken.
		Sample: Interval Width Dry Ash F.S.I.
		0486 189.12 - 190.07 0.95 49.0 1
190.07 - 191.32	1.25	Mudstone: carbonaceous, highly sheared, listric surfaces, bright coal along sheared surfaces, core broken.
191.32 - 191.92	0.60	Coal band: dull, highly sheared, breaks into flakes, core pulverized.
191.92 - 196.63	4.71	Mudstone: carbonaceous, some siltstone phases, small coaly rootlets throughout, core intact.
		COAL SEAM
196.63 - 197.20	0.57	Coal: metallic lustre, highly sheared, core pulverized.
197.20 - 197.55	0.35	Coal: 10% vitreous, metallic lustre, sheared, core broken in large pieces.
197.55 - 197.73	0.18	Mudstone: coaly, core intact.
197.73 - 198.17	0.44	Coal: metallic lustre, hard, sheared, core broken in large pieces.
198.17 - 198.28	0.11	Mudstone: coaly, minute vitreous bands throughout, core intact.
		Sample: Interval Width Dry Ash F.S.I.
		0487 196.63 - 198.28 1.65 42.2 1
198.28 - 204.25	5.97	Mudstone and Siltstone: small coaly rootlets throughout, occasional carbonaceous phase, sheared, calcite and pyrite along sheared surfaces. BCA = 18°.
204.25 - 205.04	0.79	Coal band: some coaly mudstone, soft, dull, breaks into flakes, sheared, core highly broken.
		Sample: Interval Width Dry Ash F.S.I.
		0488 204.25 - 205.04 0.79 70.7 1

MUD 78-18 (Cont'd.)

205.04 - 206.34	1.30	Mudstone: carbonaceous and coaly, sheared, coal along shears, highly broken.
206.34 - 209.15	2.81	Sandstone: fine grained, minor shears, pyrite along shear surfaces, core intact.
209.15 - 211.84	2.69	Mudstone: carbonaceous, occasional coal band up to 10 cm. in width.
211.84 - 216.26	4.42	Siltstone: interbedded with minor amounts of sandstone, small coaly rootlets throughout, bioturbated, sheared, occasional calcite filled fractures.
216.26 - 217.28	1.02	Sandstone: medium grained, small coaly rootlets throughout, core intact.
217.28 - 221.10	3.82	Siltstone/Mudstone: some carbonaceous phases, sheared, occasional 5-6 cm. coaly band, core broken.
221.10 - 221.38	0.28	Mudstone: coaly, core broken.
		COAL SEAM
221.38 - 222.50	1.12	Coal: soft, earthy lustre, pyrite specks throughout, sheared, core pulverized.
		Sample: Interval Width Dry Ash F.S.I.
		0489 221.38 - 222.50 1.12 40.2 3
222.50 - 226.93	4.43	Conglomerate: fine pebble dark grey, well sorted, pebbles 1 cm. in diameter, matrix coal and silt.
226.93 - 233.49	6.56	Conglomerate: as above but matrix grades to sandstone at base of interval.
233.49 - 249.69	16.19	Conglomerate: coarsens towards base of interval, poorly sorted, pebbles from 1 cm. to 8 cm. in diameter, matrix - fine grained sand, dark grey, minute fractures throughout.
249.69 - 257.70	8.02	Sandstone: medium grained, dark grey, with conglomerate bands and pebbles throughout, minor shearing core broken. BCA = 22°.

MUD 78-8 (Cont'd.)

257.70 - 262.30	4.60	Sandstone: medium grained, dark grey, small pebbles throughout, minor shearing, massive bedding indistinct, stylolites (pressure - solution features) common.
262.30 - 264.45	2.15	Conglomerate: poorly sorted, pebbles from 1 cm. to 8 cm. in diameter, heavily fractured, high matrix content.
264.45 - 280.39	15.94	Sandstone: fine grained, medium to dark grey, uniform, sheared, occasional calcite filled fractures and calcite along sheared surfaces, small coaly rootlets throughout, grades to unit at base. BCA = 18° - 20°.
280.39 - 286.35	5.96	Siltstone: uniform, sheared with calcite along shears.
286.35 - 290.17	3.82	Siltstone: some carbonaceous mudstone intervals, sheared.
290.17 - 297.88	7.71	Siltstone: interbedded with fine grained sandstone, sheared, calcite along shear surfaces, core intact. BCA = 20°.

E.O.H.

P A C I F I C P E T R O L E U M S L T D.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MUD 78-19

LOCATION:

- (a) Coal Licence: 3196
- (b) N.T.S. 93-I-10, c-53-J
- (c) Drill Hole Co-ordinates: N 6620.69 - E 4494.95
- (d) Elevation: 1411.14m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates and Boulder Creek Members
COAL SEAMS INTERSECTED: B9
TOTAL DEPTH: 232.5m

DATE DRILLED: July 31 - Aug. 5, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MUD 78-19

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 22.86	22.86	CASING
<u>GATES MEMBER - COMMOTION FORMATION</u>		
22.86 - 24.79	1.93	Sandstone: fine grained, ferruginous staining common, some small coaly rootlets. BCA = 78°.
24.79 - 29.72	4.93	Mudstone: ferruginous staining, core broken and crushed.
29.72 - 30.92	1.20	Sandstone: medium grained, minor cross bedding.
30.92 - 31.32	0.40	Mudstone: core broken and crushed.
31.32 - 32.21	0.89	Mudstone: carbonaceous, one 18cm. coal band, core broken.
32.21 - 48.12	15.91	Siltstone: interbedded with fine grained sandstone, occasional carbonaceous mudstone phase, small coal bands up to 6 cm in width, small coaly rootlets throughout, mildly bioturbated.
48.12 - 55.47	7.35	Sandstone: fine grained, light grey, occasional coaly rootlet, core intact. BCA = 76°
COAL SEAM B-9		
55.47 - 55.73	0.26	Coal: dull, soft, minor shears, breaks into flakes.
55.73 - 56.05	0.32	Coal: dull, soft, sheared, peaty.
56.05 - 56.17	0.12	Mudstone: coaly, very soft.
56.17 - 56.56	0.39	Coal: 10% vitreous, earthy lustre, minor shears, core broken in large pieces.
56.56 - 56.93	0.37	Coal: dull, earthy, sheared, pyrite specks throughout, core intact.
56.93 - 57.41	0.48	Coal: 20% vitreous, dull, earthy lustre, sheared.
57.41 - 57.66	0.25	Coal: 20% vitreous, earthy lustre, sheared, pyrite specks, core intact.
57.66 - 57.92	0.26	Mudstone: soft, coaly, core intact.

MUD 78-19 (Cont'd.)

57.92 - 58.27	0.35	Coal: dull, soft, peaty, sheared, core broken in large pieces.
58.27 - 59.14	0.87	Sandstone: medium grained, light grey, small coaly rootlets throughout, occasional calcite filled fracture. BCA = 7°.
59.14 - 59.59	0.45	Coal: with some carbonaceous mudstone, sheared, core pulverized and mixed in box.
59.59 - 62.07	2.48	Sandstone: fine grained, light grey, sheared, occasional calcite filled fractures. BCA = 5°.
62.07 - 65.08	3.01	Sandstone: medium grained, light grey, BCA = 8°.
65.08 - 65.84	0.76	Coal: soft, dull, peaty, sheared, with 30% fine grained sandstone, core pulverized and mixed in box.
65.84 - 67.07	1.23	Coal: soft, dull, sheared, some coaly mudstone chips, core pulverized.
67.07 - 67.67	0.60	Core missing.
67.67 - 69.19	1.52	Coal: 20% vitreous, earthy lustre, sheared, pyrite specks throughout, core pulverized.
69.19 - 69.33	0.14	Mudstone: carbonaceous.
69.33 - 70.57	1.24	Coal: soft, dull, peaty, sheared, pyrite specks throughout, core pulverized.
70.57 - 71.02	0.45	Core missing.
71.02 - 72.24	1.22	Coal: 30% vitreous, metallic lustre, sheared, pyrite specks throughout, core broken and crushed.
72.24 - 73.44	1.20	Coal: 20% vitreous, earthy lustre, sheared, core broken in large pieces.
73.44 - 73.59	0.15	Mudstone: carbonaceous, sheared.

Note: B9 seam faulted and sheared.

MUD 78-19 (Cont'd.)

Interval	Thickness	Description																																																							
73.59 - 73.76	0.17	Coal: dull, earthy, sheared, core pulverized.																																																							
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0458</td> <td>55.47 - 56.56</td> <td>1.09</td> <td>31.1</td> <td>2</td> </tr> <tr> <td>0459</td> <td>56.56 - 57.66</td> <td>1.10</td> <td>13.2</td> <td>1½</td> </tr> <tr> <td>0460</td> <td>57.66 - 58.27</td> <td>0.61</td> <td>51.9</td> <td>1½</td> </tr> <tr> <td>0461</td> <td>59.14 - 59.59</td> <td>0.45</td> <td>52.3</td> <td>1</td> </tr> <tr> <td>0462</td> <td>65.08 - 65.84</td> <td>0.76</td> <td>60.8</td> <td>1</td> </tr> <tr> <td>0463</td> <td>65.84 - 67.67</td> <td>1.83</td> <td>20.5</td> <td>1½</td> </tr> <tr> <td>0464</td> <td>67.67 - 69.33</td> <td>1.66</td> <td>18.3</td> <td>1</td> </tr> <tr> <td>0465</td> <td>69.33 - 71.02</td> <td>1.69</td> <td>29.1</td> <td>2</td> </tr> <tr> <td>0466</td> <td>71.02 - 72.24</td> <td>1.22</td> <td>9.6</td> <td>5½</td> </tr> <tr> <td>0467</td> <td>72.24 - 73.76</td> <td>1.52</td> <td>20.9</td> <td>7½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0458	55.47 - 56.56	1.09	31.1	2	0459	56.56 - 57.66	1.10	13.2	1½	0460	57.66 - 58.27	0.61	51.9	1½	0461	59.14 - 59.59	0.45	52.3	1	0462	65.08 - 65.84	0.76	60.8	1	0463	65.84 - 67.67	1.83	20.5	1½	0464	67.67 - 69.33	1.66	18.3	1	0465	69.33 - 71.02	1.69	29.1	2	0466	71.02 - 72.24	1.22	9.6	5½	0467	72.24 - 73.76	1.52	20.9	7½
Samples	Interval	Width	Dry Ash	F.S.I.																																																					
0458	55.47 - 56.56	1.09	31.1	2																																																					
0459	56.56 - 57.66	1.10	13.2	1½																																																					
0460	57.66 - 58.27	0.61	51.9	1½																																																					
0461	59.14 - 59.59	0.45	52.3	1																																																					
0462	65.08 - 65.84	0.76	60.8	1																																																					
0463	65.84 - 67.67	1.83	20.5	1½																																																					
0464	67.67 - 69.33	1.66	18.3	1																																																					
0465	69.33 - 71.02	1.69	29.1	2																																																					
0466	71.02 - 72.24	1.22	9.6	5½																																																					
0467	72.24 - 73.76	1.52	20.9	7½																																																					
73.76 - 77.00	3.24	Siltstone: carbonaceous, coaly rootlets throughout, pyrite specks common, occasional calcite filled fractures, heavily sheared, core broken. BCA = 42°.																																																							
77.00 - 77.23	0.23	Coal band: core pulverized.																																																							
77.23 - 79.55	2.32	Siltstone: with coaly mudstone phases, sheared, coal bands 3-4 cm. in width, core broken.																																																							
		BOULDER CREEK MEMBER - COMMOTION FORMATION																																																							
79.55 - 84.09	4.54	Sandstone: fine to medium grained, occasional coaly rootlet, calcite filled fractures, minor shears. BCA = 36°.																																																							
84.09 - 90.00	5.91	Sandstone: fine grained, interbedded with siltstone, small coaly rootlets throughout, mildly bioturbated. BCA = 62°.																																																							
90.00 - 99.27	9.27	Siltstone/Mudstone: carbonaceous, small vitreous bands throughout, sheared, occasional calcite filled fractures, core broken. BCA = 28°.																																																							
99.27 - 103.25	3.98	Siltstone: interbedded with fine grained sandstone, occasional small coaly rootlet.																																																							
103.25 - 106.07	2.82	Mudstone: carbonaceous, heavily sheared, listric surfaces, occasional coaly bands 5-6 cm. in width, core broken and crushed, BCA = 8°.																																																							
106.07 - 109.56	3.49	Mudstone: carbonaceous, highly sheared, pyrite specks common, occasional coal band 3-4 cm. in width.																																																							
109.56 - 116.91	7.35	Siltstone: small coaly rootlets throughout, occasional calcite filled fractures, core intact. BCA = 10°.																																																							

MUD 78-19 (Cont'd.)

116.91 - 117.11	0.20	Coal band: soft, dull, peaty, sheared, core pulverized.
117.11 - 125.58	8.47	Mudstone: carbonaceous, some siltstone phases, listric surfaces, numerous calcite filled fractures and calcite along shears, occasional coal band 6-8 cm. in width, core broken. BCA = 8°.
125.58 - 143.19	17.61	Sandstone: fine grained, interbedded with siltstone, small irregular coaly rootlets throughout, occasional calcite filled fracture, core intact. BCA = 5° - 8°.
143.19 - 147.32	4.13	Mudstone/Siltstone: carbonaceous, small coaly rootlets throughout.
147.32 - 153.51	6.19	Sandstone: fine grained, with carbonaceous mudstone and siltstone phases, small coaly rootlets throughout, minor shears, occasional calcite filled fractures.
153.51 - 176.41	22.90	Sandstone: medium grained, light grey, sheared, listric surfaces, numerous coaly rootlets throughout, coal bands 1-2 cm. in width, highly bioturbated intervals, small calcite filled fractures. BCA = 16° - 32°.
176.41 - 194.16	17.75	Siltstone: small coaly rootlets throughout, minor shears, occasional calcite filled fracture, core intact. BCA = 22°.
194.16 - 195.80	1.64	Sandstone: very fine grained, interbedded with siltstone, small coaly rootlets throughout, occasional calcite filled fractures, core broken.
COAL SEAM		
195.80 - 196.47	0.67	Coal: 30% vitreous, earthy lustre, sheared, core broken and crushed.
196.47 - 196.60	0.13	Mudstone: carbonaceous.
196.60 - 196.90	0.30	Mudstone: coaly, sheared, pulverized.
196.90 - 198.07	1.17	Coal: dull, peaty, soft, some mudstone chips at base of interval, core pulverized.
198.07 - 198.42	0.35	Core missing.

Samples	Interval	Width	Dry Ash	F.S.I.
0468	195.80 - 196.90	1.10	38.8	1½
0469	196.90 - 198.42	1.52	21.1	7

MUD 78-19 (Cont'd.)

198.42 - 200.95	2.53	Sandstone: fine grained, sheared, listric surfaces, calcite filled fractures, BCA = 20°.										
200.95 - 203.89	2.94	Siltstone/Mudstone: carbonaceous, small coaly rootlets throughout, sheared.										
203.89 - 219.66	15.77	Sandstone: fine to medium grained, with occasional siltstone phases, some calcite filled fractures, minor shearing, small irregular coaly rootlets throughout, moderately bioturbated. BCA = 18° - 24°.										
219.66 - 223.73	4.07	Siltstone: grading to a mudstone at base of interval, carbonaceous, sheared, listric surfaces, occasional coal band 2-3 cm. in width.										
COAL SEAM												
223.73 - 224.06	0.33	Coal: dull, peaty, soft, sheared, core pulverized.										
224.06 - 224.46	0.40	Mudstone: coaly, core pulverized.										
224.46 - 224.64	0.18	Mudstone: carbonaceous.										
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0470</td> <td>223.73 - 224.64</td> <td>0.91</td> <td>58.5</td> <td>1</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0470	223.73 - 224.64	0.91	58.5	1
Sample	Interval	Width	Dry Ash	F.S.I.								
0470	223.73 - 224.64	0.91	58.5	1								
224.64 - 230.73	6.09	Siltstone: carbonaceous, small coaly rootlets throughout, minor shearing.										
230.73 - 230.93	0.20	Mudstone: carbonaceous, sheared, core broken.										
230.93 - 232.00	1.07	Coal: earthy lustre, sheared, core pulverized.										
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0471</td> <td>230.93 - 232.00</td> <td>1.07</td> <td>12.2</td> <td>7</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0471	230.93 - 232.00	1.07	12.2	7
Sample	Interval	Width	Dry Ash	F.S.I.								
0471	230.93 - 232.00	1.07	12.2	7								
232.00 - 232.56	0.56	Mudstone: carbonaceous, sheared, minute coal bands throughout, core broken.										

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MUD 78-20

LOCATION:

- (a) Coal Licence: 3198
- (b) N.T.S. 93-I-10, d-58-J
- (c) Drill Hole Co-ordinates: N 8933.74 - E 1605.18
- (d) Elevation: 1635.36m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B12
TOTAL DEPTH: 398.0m

DATE DRILLED: Aug. 10 - 27, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>										
0 - 4.97	4.97	OVERBURDEN										
<u>HULCROSS MEMBER - COMMOTION FORMATION</u>												
4.97 - 8.23	3.26	Sandstone: fine grained, crushed.										
8.23 - 11.89	3.66	Siltstone: interbedded with fine grained sandstone, 2 small (1-2 cm) ash bands, core broken.										
11.89 - 19.26	7.37	Sandstone: interbedded with siltstone, minor shears, minor cross bedding, core broken. BCA = 54°										
<u>GATES MEMBER - COMMOTION FORMATION</u>												
19.26 - 19.90	0.64	Conglomerate: fine pebble.										
19.90 - 32.61	12.71	Sandstone: fine to medium grained, cross-bedded, occasional small coaly rootlet. BCA = 55°										
32.61 - 33.45	0.84	Siltstone: carbonaceous, minor shears										
COAL SEAM B12												
33.45 - 34.45	1.00	Coal: earthy lustre, core broken in large pieces.										
34.45 - 34.85	0.40	Coal and Coaly Mudstone: core pulverized.										
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th><u>Sample</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0490</td> <td>33.45 - 34.85</td> <td>1.40</td> <td>9.60</td> <td>7</td> </tr> </tbody> </table>	<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0490	33.45 - 34.85	1.40	9.60	7
<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>								
0490	33.45 - 34.85	1.40	9.60	7								
34.85 - 35.56	0.71	Siltstone: sheared, coaly rootlets throughout specks and blebs of pyrite common, core broken.										
35.56 - 52.29	16.73	Sandstone: occasional siltstone phase, small coaly rootlets throughout, bedding indistinct, medium grained sandstone at base of interval with minor cross bedding.										
52.29 - 52.50	0.21	Mudstone: carbonaceous, sheared, broken, pyrite throughout.										
52.50 - 52.90	0.40	Coal and Coaly Mudstone: sheared, pyrite throughout, core pulverized.										
52.90 - 56.68	3.78	Siltstone: carbonaceous, mudstone phases, numerous coaly rootlets, sheared, pyrite specks and stringers, core broken.										
COAL SEAM B11												
56.68 - 57.04	0.36	Coal: dull, earthy lustre, sheared, pyrite throughout, core pulverized.										
57.04 - 57.31	0.27	Mudstone: coaly and carbonaceous.										
57.31 - 57.58	0.27	Coal: dirty, sheared, pyrite throughout.										

<u>Interval</u>	<u>Width</u>	<u>Description</u>															
57.58 - 58.26	0.68	Mudstone: with bands of coal up to 10 cm in width, pyrite throughout, core broken.															
		<table border="1"> <thead> <tr> <th><u>Sample</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0491</td> <td>56.68 - 58.26</td> <td>1.58</td> <td>66.4</td> <td>1</td> </tr> </tbody> </table>	<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0491	56.68 - 58.26	1.58	66.4	1					
<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>													
0491	56.68 - 58.26	1.58	66.4	1													
58.26 - 64.12	5.86	Siltstone: with fine grained sandstone phases, sheared, small coaly rootlets throughout, core intact.															
64.12 - 69.19	5.07	Sandstone: fine grained, mildly bioturbated, minor shears, calcite filled fractures (along bedding).															
69.19 - 76.44	7.25	Siltstone: uniform, occasional rip-up clasts.															
76.44 - 78.33	1.89	Siltstone: carbonaceous, sheared, occasional coal band 3 - 6 cm in width, core broken.															
78.33 - 89.62	11.29	Sandstone: fine grained, interbedded with siltstone, 2 small coal bands up to 15 cm in width, minor shears, pyrite associated with coal bands, minor bioturbation. BCA = 62°															
89.62 - 97.61	7.99	Siltstone: some carbonaceous mudstone phases, vitreous bands up to 0.5 cm in width.															
97.61 - 108.81	11.20	Sandstone: fine grained, medium grey, bioturbated, minor shears, calcite and coaly rootlets along sheared surfaces.															
		COAL SEAM B9															
108.81 - 110.95	2.14	Coal: 10% minute vitreous bands, metallic lustre, small pyrite specks throughout core broken, sheared and pulverized. (recovered 1.90 m).															
110.95 - 111.51	0.56	Coal: metallic lustre, core intact.															
111.51 - 111.77	0.26	Coal: 60% vitreous, earthy lustre, hard, core intact.															
111.77 - 111.99	0.22	Coal and Coaly Mudstone: soft, dull, core pulverized.															
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0492</td> <td>108.81-110.95</td> <td>2.14</td> <td>17.1</td> <td>1 1/2</td> </tr> <tr> <td>0493</td> <td>110.95-111.99</td> <td>1.04</td> <td>32.0</td> <td>6 1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0492	108.81-110.95	2.14	17.1	1 1/2	0493	110.95-111.99	1.04	32.0	6 1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>													
0492	108.81-110.95	2.14	17.1	1 1/2													
0493	110.95-111.99	1.04	32.0	6 1/2													
111.99 - 113.50	1.51	Siltstone: carbonaceous, coaly rootlets throughout.															
113.50 - 121.18	7.68	Sandstone: fine grained, interbedded with minor siltstone, small coaly rootlets throughout, mildly bioturbated. BCA = 57°															
121.18 - 122.73	1.55	Siltstone: uniform, core intact.															

<u>Interval</u>	<u>Width</u>	<u>Description</u>															
		COAL SEAM B8															
122.73 - 123.16	0.43	Coal: 40% vitreous, earthy lustre, core intact.															
123.16 - 123.29	0.13	Mudstone: coaly, sheared, core intact.															
123.29 - 125.38	2.09	Mudstone: carbonaceous, some siltstone phases, small coaly rootlets throughout, core intact.															
125.38 - 125.78	0.40	Coal: earthy lustre, minor shears, hard, core intact.															
125.78 - 125.92	0.26	Bone Coal: steely grey, very hard, fairly high specific gravity, core intact.															
125.92 - 126.24	0.32	Coal: 30% vitreous, earthy lustre, core intact.															
126.24 - 126.27	0.03	Mudstone: coaly.															
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<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I</u>													
0494	122.73-123.29	0.56	31.3	7													
0495	125.38-126.27	0.89	35.6	3													
126.27 - 134.43	8.16	Siltstone: occasional mudstone phase, small coaly rootlets, numerous minute fractures, calcite filled fractures, core intact.															
134.43 - 152.02	17.59	Sandstone: fine grained grading to medium grained at base of interval, mildly bioturbated, numerous coaly rootlets at base of interval, core intact. BCA = 65°															
152.02 - 154.16	2.14	Conglomerate: pebbles 0.05 - 1 cm in diameter, occasional small coaly rootlet.															
154.16 - 157.90	3.74	Sandstone: medium grained, minor cross-bedding. BCA = 40°															
157.90 - 159.62	1.72	Sandstone: fine grained interbedded with minor siltstone, mildly bioturbated, small coaly rootlets throughout.															
159.62 - 162.80	3.18	Siltstone: phases of carbonaceous mudstone, vitreous bands up to 2cm in width. One coal band 20 cm wide at 160.13															
		COAL SEAM B7															
162.80 - 163.45	0.65	Coal: metallic lustre, 10% vitreous bands, hard, core intact.															
163.45 - 163.68	0.23	Coal: 20% vitreous, earthy lustre, core broken.															
163.68 - 164.02	0.34	Coal: 40% vitreous, metallic lustre, core intact.															

<u>Interval</u>	<u>Width</u>	<u>Description</u>																				
164.02 - 164.42	0.40	Coal: 40% vitreous, earthy lustre, core intact.																				
164.42 - 164.49	0.07	Coal: 10% minute vitreous bands, steely grey, very hard, core intact.																				
164.49 - 164.59	0.10	Coal: 60% vitreous, metallic lustre, core intact.																				
164.59 - 164.76	0.17	Coal: 10% vitreous bands, steely grey, very hard, fairly high specific gravity																				
164.76 - 164.91	0.15	Coal: same as above.																				
164.91 - 165.79	0.88	Coal: 30% vitreous, metallic lustre, hard, core intact.																				
165.79 - 165.91	0.12	Coal: dull, soft, some carbonaceous mudstone, breaks into flakes.																				
165.91 - 166.23	0.32	Coal: 10% vitreous, earthy lustre, core intact.																				
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0511</td> <td>162.80-164.02</td> <td>1.22</td> <td>6.9</td> <td>8</td> </tr> <tr> <td>0512</td> <td>164.02-164.91</td> <td>0.89</td> <td>37.4</td> <td>4</td> </tr> <tr> <td>0513</td> <td>164.91-166.23</td> <td>1.32</td> <td>14.6</td> <td>8 1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0511	162.80-164.02	1.22	6.9	8	0512	164.02-164.91	0.89	37.4	4	0513	164.91-166.23	1.32	14.6	8 1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																		
0511	162.80-164.02	1.22	6.9	8																		
0512	164.02-164.91	0.89	37.4	4																		
0513	164.91-166.23	1.32	14.6	8 1/2																		
166.23 - 167.92	1.69	Siltstone: carbonaceous, minor shears, occasional specks of pyrite, vitreous bands up to 0.05 cm in width common.																				
167.92 - 168.32	0.40	Coal Band: 20% vitreous, dull, earthy lustre, soft, sheared.																				
168.32 - 168.67	0.35	Mudstone: carbonaceous.																				
168.67 - 172.82	4.15	Sandstone: fine grained, occasional siltstone and carbonaceous mudstone intervals, minor shears, cross bedded.																				
172.82 - 175.87	3.05	Siltstone: minute coaly rootlets throughout, occasional coal band up to 10 cm in width, minor shearing, core intact.																				
175.87 - 176.94	1.07	Mudstone: coaly, minute vitreous bands, minor shears.																				
176.94 - 188.06	11.12	Sandstone: fine grained, interbedded with siltstone, moderately bioturbated, slump features, occasional rip-up clasts. BCA = 58°																				
188.06 - 189.13	1.07	Mudstone: carbonaceous, minor shears, core intact.																				
189.13 - 189.86	0.73	Mudstone: carbonaceous and coaly, coal bands 4 - 5 cm in width common, sheared, core broken.																				
189.86 - 190.30	0.44	Mudstone: same as above.																				
		COAL SEAM B5 (Upper)																				
190.30 - 191.23	0.93	Coal: earthy lustre, 10% vitreous, sheared, core pulverized.																				

<u>Interval</u>	<u>Width</u>	<u>Description</u>										
191.23 - 191.46	0.21	Mudstone: coaly, small vitreous bands throughout.										
191.46 - 191.58	0.12	Coal: earthy lustre, core broken.										
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<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry. Ash</u>	<u>F.S.I.</u>								
0514	190.30-191.58	1.28	51.3	1								
191.58 - 194.00	2.42	Mudstone: carbonaceous, small coaly rootlets throughout, coal bands up to 5 cm in width, minor shears, core intact.										
194.00 - 200.08	6.08	Sandstone: fine grained with occasional siltstone interval, minor cross bedding.										
200.08 - 201.05	0.97	Mudstone: occasional small coaly rootlet, core intact.										
		COAL SEAM B5 (Lower)										
201.05 - 201.29	0.24	Coal: earthy lustre, hard, sheared, core broken into large pieces.										
201.29 - 201.38	0.09	Mudstone: coaly.										
201.38 - 201.73	0.35	Coal: dull, soft, sheared, breaks into flakes.										
201.73 - 201.81	0.08	Coal: dull, hard, sheared, fairly high specific gravity.										
201.81 - 202.13	0.32	Coal: 20% vitreous, earthy lustre, sheared, core broken into large pieces.										
202.13 - 202.48	0.35	Mudstone: coaly, hard, minor shears, core broken in large pieces.										
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<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>								
0515	201.05-202.48	1.43	49.3	2								
202.48 - 206.33	3.85	Siltstone: occasional carbonaceous mudstone interval, minor shears, small coaly rootlets at top of interval.										
206.33 - 212.45	6.12	Siltstone: grading to a fine grained sandstone at base of interval, small irregular coaly rootlets throughout, occasional carbonaceous mudstone phase with small bright coal bands (0.5 cm) in width.										
212.45 - 216.81	4.36	Sandstone: fine to medium grained, some brown mud clasts, occasional small coaly rootlet, core solid. BCA = 50°										
216.81 - 223.03	6.22	Sandstone: medium to coarse grained, medium grey, occasional pebble and pebble band up to 25 cm in width, minor cross bedding. BCA = 52°										
223.03 - 234.59	11.56	Conglomerate: fairly high medium grained sand matrix, pebbles .05 cm to 3 cm in diameter, occasional coalified plant rootlet.										

<u>Interval</u>	<u>Width</u>	<u>Description</u>
234.59 - 244.00	9.41	Conglomerate: with phases of coarse grained sandstone, coalified plant rootlets throughout, occasional small vitreous band.
244.00 - 251.37	7.37	Sandstone: medium to very coarse grained, occasional pebble or small pebble band, small coaly rootlets and vitreous bands throughout.
251.37 - 267.57	16.20	Conglomerate: with large (1 m) phases of medium to coarse grained sandstone, numerous coaly rootlets and bright coal bands throughout, pebbles fairly well rounded - coarsening towards base of interval. BCA = 49°
267.57 - 268.31	0.74	Mudstone: carbonaceous, occasional small bright coal band, abrupt contact with conglomerate at top.
268.31 - 276.00	7.69	Sandstone: fine grained interbedded with minor siltstone, occasional carbonaceous mudstone phase, small coaly rootlets throughout, bioturbated, minor cross bedding. BCA = 52°
276.00 - 276.70	0.70	Mudstone: carbonaceous, occasional bright coal band.
		COAL SEAM B4
276.70 - 276.91	0.21	Coal: dull, 10% bright bands, fairly high specific gravity, core intact.
276.91 - 276.99	0.08	Mudstone: carbonaceous.
276.99 - 277.19	0.20	Coal: 70% vitreous, earthy lustre, soft, core intact.
277.19 - 277.23	0.04	Coal: coaly mudstone, dull, sheared, core broken in large pieces.
		<u>Sample</u> <u>Interval</u> <u>Width</u> <u>Dry Ash</u> <u>F.S.I.</u>
		0534 276.70-277.23 0.53 51.7 4 1/2
277.23 - 280.36	3.13	Sandstone: fine grained, interbedded with siltstone, as above.
280.36 - 81.00	0.64	Mudstone: carbonaceous, bright coal bands throughout.
281.00 - 281.23	0.23	Coal Band:
281.23 - 281.56	0.33	Mudstone: carbonaceous.
281.56 - 288.15	6.59	Siltstone: interbedded with fine grained sandstone, mildly bioturbated, plant fossil fragments, occasional small coaly rootlet. BCA = 58°
288.15 - 288.25	0.10	Mudstone: carbonaceous

<u>Interval</u>	<u>Width</u>	<u>Description</u>																				
		COAL SEAM B3																				
288.25 - 288.65	0.40	Coal and Mudstone: core pulverized and mixed in box.																				
288.65 - 289.30	0.65	Coal: 40% vitreous, earthy lustre, core fairly hard, intact.																				
289.30 - 289.63	0.33	Coal 70% vitreous, earthy lustre, core intact.																				
289.63 - 289.74	0.11	Coal: dull, earthy, less than 10% bright bands, core intact.																				
289.74 - 290.35	0.61	Mudstone: carbonaceous, core solid, occasional small coaly band.																				
290.35 - 290.75	0.40	Coal: 60% vitreous, metallic lustre, fairly hard, core broken in large pieces.																				
290.75 - 291.08	0.33	Coal: 20% vitreous, earthy lustre, core intact.																				
291.08 - 291.69	0.61	Coal: dull, earthy lustre, 40% vitreous bands, core intact.																				
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<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																		
0535	288.25-289.63	1.38	6.6	6 1/2																		
0536	289.63-290.35	0.72	78.9	NA																		
0537	290.35-291.69	1.34	8.6	7																		
291.69 - 295.88	4.19	Siltstone: interbedded with fine grained sandstone, occasional mudstone phase, small coaly rootlets throughout, minor bioturbation.																				
295.88 - 318.92	23.04	Sandstone: fine to medium grained, siltstone interbeds at top of interval, small coaly rootlets throughout, phases heavily bioturbated, coress bedded. BCA = 66°																				
318.92 - 322.53	3.61	Mudstone: carbonaceous, small coaly bands throughout, coal band up to 26 cm in width, core fairly solid, minute fractures filled with calcite.																				
		COAL SEAM B2																				
322.53 - 323.06	0.53	Coal: 40% vitreous, earthy lustre, core broken and mixed in box.																				
323.06 - 323.37	0.31	Coal: 30% vitreous, earthy lustre, core broken in large pieces.																				
323.37 - 323.56	0.19	Mudstone: carbonaceous																				
323.56 - 323.78	0.22	Coal: 20% vitreous, dull, earthy, core broken and crushed.																				
323.78 - 324.72	0.94	Mudstone: carbonaceous, small bright bands throughout, core broken.																				
324.72 - 325.08	0.36	Coal: dull, earthy, 20% vitreous bands, core intact.																				

<u>Interval</u>	<u>Width</u>	<u>Description</u>			
325.08 - 325.19	0.11	Coal: 30% vitreous, earthy lustre, core intact.			
325.19 - 325.55	0.36	Coal: 60% vitreous, earthy - dull lustre, occasional pyrite specks, core intact.			
325.55 - 325.61	0.06	Coal: dull, hard, core intact.			
325.61 - 325.84	0.23	Coal: 30 - 40% vitreous, dull earthy, core intact.			
325.84 - 326.32	0.48	Coal: 60% vitreous, dull, earthy lustre, core intact.			
326.32 - 326.36	0.04	Coal: dull, fairly dirty, soft.			
326.36 - 326.58	0.22	Coal: dull, 10% vitreous, minor shears, core broken.			
326.58 - 326.68	0.10	Coal: dull, dirty, soft, broken.			
			<u>Samples</u>	<u>Interval</u>	<u>Width</u>
			0538	322.53-323.06	0.53
			0539	323.06-323.78	0.72
			0605	323.78-324.72	
			0540	324.72-325.84	1.12
			0541	325.84-326.68	0.84
				<u>Dry Ash</u>	<u>F.S.I.</u>
				14.3	4 1/2
				44.4	2 1/2
				7.6	7
				23.2	6 1/2
326.68 - 327.66	0.02	Mudstone: carbonaceous			
327.66 - 329.86	0.20	Siltstone: core intact, small coaly rootlets throughout, bioturbated, minor shears.			
329.86 - 331.34	1.48	Mudstone: carbonaceous, occasional coaly band, core broken.			
331.34 - 332.34	1.00	Siltstone: core intact.			
332.34 - 332.56	1.22	Mudstone: carbonaceous			
		COAL SEAM B1			
332.56 - 332.86	0.30	Coal: 10% vitreous, hard, metallic lustre, core intact.			
332.86 - 333.26	0.40	Coal: 40% vitreous, earthy lustre, core intact.			
333.26 - 337.11	3.85	Mudstone: carbonaceous, occasional small 2 - 5 cm coaly band, core intact.			
337.11 - 337.72	0.61	Coal: 10% vitreous, earthy lustre, soft, breaks into flakes, minor shears, broken into large pieces.			
337.72 - 337.94	0.22	Coal: same as above.			
337.94 - 338.40	0.46	Mudstone: carbonaceous, minor shears, bright coal bands, core broken.			
338.40 - 338.68	0.28	Coal: 70% vitreous, earthy lustre, core broken in large pieces.			

<u>Interval</u>	<u>Width</u>	<u>Description</u>																									
338.68 - 338.71	0.03	Coal: dull, dirty, core intact.																									
338.71 - 338.87	0.18	Coal: 40% vitreous, earthy lustre, fairly soft, core broken and crushed.																									
338.87 - 338.99	0.12	Mudstone: carbonaceous, core intact.																									
338.99 - 339.05	0.06	Coal: 60% vitreous, core intact.																									
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0542</td> <td>332.56-333.26</td> <td>0.70</td> <td>8.4</td> <td>6 1/2</td> </tr> <tr> <td>0543</td> <td>337.11-337.94</td> <td>0.83</td> <td>11.0</td> <td>5</td> </tr> <tr> <td>0544</td> <td>337.94-338.40</td> <td>0.46</td> <td>77.9</td> <td>1/2</td> </tr> <tr> <td>0545</td> <td>338.40-339.05</td> <td>0.65</td> <td>33.5</td> <td>7 1/2</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0542	332.56-333.26	0.70	8.4	6 1/2	0543	337.11-337.94	0.83	11.0	5	0544	337.94-338.40	0.46	77.9	1/2	0545	338.40-339.05	0.65	33.5	7 1/2
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																							
0542	332.56-333.26	0.70	8.4	6 1/2																							
0543	337.11-337.94	0.83	11.0	5																							
0544	337.94-338.40	0.46	77.9	1/2																							
0545	338.40-339.05	0.65	33.5	7 1/2																							
339.05 - 340.86	1.81	Siltstone: interbedded with sandstone, occasional carbonaceous mudstone phase, core intact.																									
340.86 - 372.77	31.91	Sandstone: medium to fine grained, light grey, small coaly rootlets at top of interval, large white worm burrowed intervals throughout. BCA = 62°. Occasional small 4 - 5 cm brecciated zone near base of interval, core intact.																									
372.77 - 385.57	12.80	Sandstone: fine grained with 10 - 15% siltstone interbeds, occasional large white worm burrows. BCA = 64° core intact, occasional rip-up clast.																									

E.O.H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MUD 78-21

LOCATION:

- (a) Coal Licence: 3199
- (b) N.T.S. 93-I-10, b-74-J
- (c) Drill Hole Co-ordinates: N 8013.03 - E 4399.19
- (d) Elevation: 1642.62m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B12
TOTAL DEPTH: 335.9m

DATE DRILLED: Sept. 3 - 7, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MUD 78-21

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
CASING - 5.44	5.44	CASING
		<u>HULCROSS FORMATION</u>
5.44 - 9.98	4.54	Mudstone: Dark gray, with frequent thin interbeds of gray fine grain sandstone. BCA = 74°; iron stained, weathered, core broken.
9.98 - 35.24	25.26	Mudstone: as above.
		<u>GATES MEMBER - COMMOTION FORMATION</u>
35.24 - 35.65	0.41	Conglomerate: granular, dark gray, angular grains of gray chert and argillite, sandstone phases at top and base.
35.65 - 36.01	0.36	Claystone Carbonaceous: black, coal bands and inclusions, core broken.
36.01 - 36.14	0.13	Coal and Claystone: interbedded, black carbonaceous claystone, very frequent bright coal bands.
36.14 - 36.24	0.10	Coal: 40% vitreous, core solid, peacock stained.
36.24 - 36.84	0.60	Carbonaceous Claystone: black, plant fragments, coal bands, pyritised worm burrows at the top.
36.84 - 37.98	1.14	Mudstone: dark gray with thin interbeds of gray siltstone. Bedding strongly disturbed by bioturbation.
37.98 - 38.80	0.82	Siltstone: dark gray
38.80 - 42.35	3.55	Sandstone: medium grain, light gray with frequent phases in the interbeds of gray siltstone. BCA = 67°.
42.35 - 43.95	1.60	Siltstone: dark gray with few thin interbeds of fine grain sandstone. One phase of fine grain sandstone at base.
43.95 - 44.08	0.13	Coal: 50% vitreous, core broken.

MUD 78-21 (Cont'd.)

44.08 - 44.14	0.06	Coal: 50% vitreous, core pulverized.
44.14 - 45.49	1.35	Mudstone: dark gray, carbonaceous phases and coal bands.
45.49 - 45.59	0.10	Coal and claystone interbedded: carbonaceous claystone with very frequent bright coal bands.
45.59 - 45.99	0.40	Mudstone: dark gray, bright coal bands.
45.99 - 46.09	0.10	Coal and claystone interbedded: same as above, with bands of pyrite.
46.09 - 46.22	0.13	Coal: 30% vitreous, core solid.
46.22 - 46.25	0.03	Carbonaceous claystone:
46.25 - 46.30	0.05	Coal: 30% vitreous, core solid.
46.30 - 47.50	1.20	Sandstone: fine grain, light gray with phases and interbeds of dark gray siltstone, abundance of plant root penetration marks.
47.50 - 47.95	0.45	Siltstone: dark gray
47.95 - 48.25	0.30	Carbonaceous claystone: black with bright coal bands towards the base.
48.25 - 50.03	1.78	Sandstone: fine grained, light gray with frequent interbeds of gray siltstone. Bedding is very irregular.
50.03 - 51.27	1.24	Mudstone: dark gray with interbeds of gray siltstone throughout. BCA = 73 ^o . Bedding is very regular.
		COAL SEAM B11
51.27 - 51.37	0.10	Coal: 30% vitreous, core solid.
51.37 - 51.43	0.06	Coal: 10% vitreous, core solid.
51.43 - 51.52	0.09	Coal: 30% vitreous, core solid.
51.52 - 51.63	0.11	Coal: 50% vitreous, core solid.
51.63 - 51.70	0.07	Coal: 10% vitreous, core solid.

MUD 78-21 (Cont'd.)

51.70 - 51.76	0.06	Coal: 70% vitreous, core solid.
51.76 - 51.82	0.06	Carbonaceous claystone: black with large irregular coal inclusions.
51.82 - 51.90	0.08	Coal: 50% vitreous, core solid.
51.90 - 51.98	0.08	Coal: 70% vitreous, core solid.
51.98 - 52.02	0.04	Coal: 50% vitreous, core pulverized.
*Core missing - Coal = 0.37m.		
Samples	Interval	Width Dry Ash F.S.I.
0560	51.27 - 52.02	0.75 14.77 4½
52.02 - 56.75	4.73	Sandstone: light gray, medium grained with phases and interbeds of dark gray mudstone throughout, BCA = 65°. Bedding is irregular in top half.
56.75 - 58.74	1.99	Mudstone: dark gray, bright coal bands near the top, concretions near the top.
58.74 - 59.98	1.24	Sandstone: fine to medium grained, grain size increases at the base. Crossbedded towards the base. Mudstone sedimentary breccia clasts near the base. Interbeds of mudstone in the top half. One slicken sided calcite filled fracture near the base.
59.98 - 60.70	0.72	Mudstone: dark gray.
60.70 - 68.79	8.09	Sandstone: light gray, medium grain, with phases and interbeds of gray siltstone and mudstone throughout. Bedding disturbed by slumping at the top and base.
68.79 - 69.68	0.89	Sandstone: medium grain, light gray sedimentary breccia phases in the center.
69.68 - 70.29	0.61	Mudstone: dark gray with thin interbeds of medium grain, light gray sandstone at the top and base.
70.29 - 70.95	0.66	Sandstone: medium grain, light gray with thin carbonaceous parting on the bedding. Bedding very regular.

MUD 78-21 (Cont'd.)

70.95 - 76.07	5.12	Mudstone: dark gray with few sandstone phases towards the top.
76.07 - 76.32	0.25	Sandstone: coarse grained, light gray, cross bedded, carbonaceous partings and inclusions on the bedding.
76.32 - 78.17	1.85	Mudstone: dark gray
78.17 - 78.86	0.69	Carbonaceous claystone: black, bright coal bands.
		COAL SEAM B10
78.86 - 78.91	0.05	Coal: 50% vitreous, core solid.
78.91 - 78.96	0.12	Coal: 10% vitreous, core solid.
78.96 - 79.08	0.12	Coal: 50% vitreous, core solid.
79.08 - 79.13	0.04	Coal: 30% vitreous, core solid.
79.13 - 79.23	0.10	Coal: 50% vitreous, core solid.
79.23 - 79.26	0.03	Coal: bright.
79.26 - 79.30	0.04	Coal: 40% vitreous, core broken.
79.30 - 79.33	0.03	Coal: 50% vitreous, sheared and pulverized.
79.33 - 79.37	0.04	Coal: 70% vitreous, core solid.
79.37 - 79.42	0.05	Coal: 50% vitreous, core broken.
79.42 - 80.80	1.38	Mudstone: dark gray, with bright coal band and phases of carbonaceous claystone, fine grained light gray sandstone interbeds.
80.80 - 80.87	0.07	Carbonaceous claystone: black bright coal bands.
80.87 - 80.96	0.09	Coal and claystone interbedded: black carbonaceous claystone with very frequent bright coal band, core badly broken.
80.96 - 82.09	1.13	Carbonaceous claystone: black with occasional bright coal bands.
82.09 - 83.44	1.35	Siltstone: gray with interbeds of dark gray mudstone.

MUD 78-21 (Cont'd.)

83.44 - 83.89	0.45	Carbonaceous claystone: black with frequent bright coal bands, heavily sheared near the base.
83.89 - 84.63	0.74	Sandstone: fine grained, light gray with frequent mudstone phases and interbeds. Concretion near the base.
85.63 - 85.09	0.46	Carbonaceous claystone: black, bright coal bands.
85.09 - 94.86	9.77	Sandstone: medium grained, light gray with frequent regular phases and interbeds of dark gray siltstone and mudstone. Zones of slump disturbed bedding. BCA = 75°
94.86 - 96.6	1.80	Sandstone: light gray, medium grained, with frequent thin interbeds of carbonaceous claystone.
96.66 - 102.20	5.54	Sandstone: light gray, medium to large grained. Occasional carbonaceous partings on bedding, few phases of sedimentary breccia.
102.20 - 103.77	1.57	Mudstone: dark gray with phases and interbeds of fine grained, light gray sandstone. Bedding very irregular near the base.
103.77 - 103.79	0.02	Carbonaceous claystone: black COAL SEAM B9
103.79 - 103.85	0.06	Coal: 40% vitreous, core solid.
103.85 - 103.90	0.05	Coal: 20% vitreous, core solid.
103.90 - 103.99	0.09	Coal: 70% vitreous, core solid.
103.99 - 104.01	0.02	Carbonaceous claystone: black, core solid.
104.01 - 104.05	0.04	Coal: bright, core solid.
104.04 - 104.16	0.11	Coal: 50% vitreous, core solid.
104.16 - 104.27	0.11	Carbonaceous claystone: black, core solid.
104.27 - 104.34	0.07	Coal: stoney, core solid.
104.34 - 104.53	0.19	Coal: dull, core solid.
104.53 - 104.69	0.16	Coal: 20% vitreous, core solid.

MUD 78-21 (Cont'd.)

104.69 - 104.79	0.10	Coal: dull, core solid.
104.79 - 104.87	0.08	Coal: 20% vitreous, core solid.
104.87 - 104.91	0.04	Coal: bright, core solid.
104.91 - 105.02	0.11	Coal: 50% vitreous, core solid.
105.02 - 105.66	0.64	Coal: dull, core solid.
105.66 - 105.82	0.16	Coal: 30% vitreous, core solid.
105.82 - 108.89	0.07	Coal: dull, core solid.
108.89 - 105.96	0.06	Coal: 30% vitreous, core solid.
105.95 - 106.15	0.20	Coal: dull, core solid.
106.15 - 106.29	0.14	Coal: 70% vitreous, core solid.
106.29 - 106.33	0.04	Coal: 50% vitreous, core solid.
106.33 - 106.37	0.04	Coal: 70% vitreous, core solid.
106.37 - 106.42	0.05	Coal: stoney, core solid.
106.42 - 106.45	0.03	Coal: bright, core solid.
106.45 - 106.65	0.20	Coal: 30% vitreous, core solid.
106.65 - 106.76	0.11	Coal: dull, core solid.
106.76 - 106.83	0.07	Coal: 30% vitreous, core solid.
106.83 - 107.06	0.23	Coal: dull, core solid.
107.06 - 107.16	0.10	Coal: 30% vitreous, core solid.
107.16 - 107.28	0.12	Carbonaceous claystone: black, bright coal bands, core solid.
107.28 - 107.43	0.15	Coal: dull, core solid.
107.43 - 107.72	0.29	Coal: dull, core solid.
107.72 - 107.83	0.11	Coal: 30% vitreous, core solid.
107.83 - 107.84	0.01	Coal: stoney, core solid.
107.84 - 107.87	0.03	Coal: bright, core solid.

MUD 78-21 (Cont'd.)

107.87 - 107.93	0.06	Coal: 50% vitreous, core solid.
107.93 - 107.97	0.04	Coal: stoney, core solid.
107.97 - 108.01	0.04	Coal: bright, core solid.
108.01 - 108.10	0.09	Coal: 50% vitreous, core solid.
108.10 - 108.12	0.02	Coal: stoney, core solid.
108.12 - 108.19	0.07	Coal: 70% vitreous, core solid.
108.19 - 108.25	0.06	Coal: 50% vitreous, core pulverized.
108.46 - 108.60	0.14	Coal: 50% vitreous, core solid.
108.60 - 108.61	0.01	Coal: stoney, core solid.
108.61 - 108.69	0.08	Coal: 50% vitreous, core solid.
108.69 - 108.71	0.02	Coal: stoney, core solid.
108.71 - 108.77	0.06	Coal: 50% vitreous, core solid.
108.77 - 108.96	0.19	Carbonaceous claystone: black, bright coal bands.
108.96 - 109.05	0.09	Coal: 70% vitreous, core solid.
109.05 - 109.25	0.20	Coal: 50% vitreous, core solid.
109.25 - 109.41	0.16	Coal: 30% vitreous, core solid.
109.41 - 109.59	0.18	Coal: 70% vitreous, core solid.
109.89 - 109.98	0.09	Carbonaceous claystone:
109.75 - 109.89	0.14	Coal and claystone interbedded
109.89 - 109.98	0.14	Coal: 70% vitreous, core solid.

Samples	Interval	Width	Dry Ash	F.S.I.
0561	103.97 - 104.16	0.37	10.61	7½
0562	104.16 - 104.27	0.11	75.75	NA
0563	104.27 - 107.16	2.89	13.67	1½
0564	107.16 - 107.28	0.12	67.50	1
0565	107.28 - 108.77	0.49	13.63	3½
0566	108.77 - 109.05	0.28	56.34	1
0567	109.05 - 109.59	0.54	9.27	7½
0568	109.59 - 109.98	0.39	53.80	3½

MUD 78-21 (Cont'd.)

109.98 - 111.90	1.92	Siltstone: gray, with phases and interbeds of carbonaceous claystone and bright coal bands.
111.90 - 113.50	1.60	Carbonaceous claystone: black, with few phases of gray siltstone, bright coal bands.
113.50 - 117.20	3.70	Sandstone: fine grained, light gray with frequent interbeds of dark gray mudstone. BCA = 75°.
117.20 - 120.41	3.21	Mudstone: dark gray, carbonaceous phases with bright coal bands.
120.41 - 121.45	1.04	Carbonaceous claystone: black, numerous bright coal bands.
121.45 - 121.50	0.05	Coal: 50% vitreous, core solid.
121.50 - 121.65	0.15	Coal: dull, core solid.
121.65 - 121.72	0.07	Coal: stoney, core solid.
121.72 - 121.80	0.08	Coal: 30% vitreous, core solid.
121.80 - 121.87	0.07	Coal: stoney, core solid.
121.87 - 122.34	0.47	Carbonaceous claystone: black, bright coal bands.
122.34 - 122.48	0.14	Coal: 30% vitreous, core solid.
122.48 - 122.75	0.27	Carbonaceous claystone: as above.
122.75 - 122.80	0.05	Coal: 50% vitreous, core solid.
122.80 - 122.83	0.03	Coal: stoney, core solid.
122.83 - 122.88	0.05	Coal: 70% vitreous, core solid.
122.88 - 123.00	0.12	Carbonaceous claystone: black, bright coal bands.
123.00 - 132.43	9.43	Siltstone: dark gray with frequent dark gray mudstone phases. Fine grained with light gray sandstone interbeds.
132.43 - 132.52	0.09	Carbonaceous claystone: black
132.52 - 132.56	0.04	Coal: stoney, core broken
132.56 - 132.83	0.27	Carbonaceous claystone: black

MUD 78-21 (Cont'd.)

132.83 - 132.87	0.04	COAL SEAM B7
132.83 - 132.87	0.04	Coal: 30% vitreous, core solid.
132.87 - 132.91	0.04	Coal: dull, core solid.
132.91 - 132.97	0.06	Coal: 50% vitreous, core broken.
132.97 - 133.05	0.05	Coal and claystone interbedded: black carbonaceous claystone with very frequent bright coal bands.
133.05 - 134.63	0.58	Mudstone: dark gray, carbonaceous at top, bright coal bands.
134.63 - 134.68	0.05	Coal: dull, core broken.
134.68 - 134.95	0.27	Coal: 30% vitreous, strongly cleated, core solid.
134.95 - 135.06	0.11	Coal: 50% vitreous, core solid.
135.06 - 135.13	0.07	Coal: 70% vitreous, core solid.
135.13 - 135.16	0.03	Coal: 70% vitreous, core pulverized.
135.16 - 135.44	0.28	Mudstone: dark gray.
135.44 - 135.49	0.05	Coal: 50% vitreous, core solid.
135.49 - 136.04	0.55	Mudstone: dark gray
136.04 - 136.06	0.02	Carbonaceous claystone: black.
136.06 - 136.09	0.03	Coal: bright, core solid.
136.09 - 136.15	0.06	Coal: dull, core solid.
136.15 - 136.21	0.06	Coal: 50% vitreous, core solid.
136.21 - 136.31	0.10	Coal: 70% vitreous, core solid.
136.31 - 136.43	0.12	Coal: 50% vitreous, core solid.
136.43 - 136.47	0.04	Coal: bright, core solid.
136.47 - 136.51	0.04	Coal: 50% vitreous, core solid
136.51 - 136.62	0.11	Coal: bright, core solid.
136.62 - 136.78	0.16	Coal: 70% vitreous, core solid.

MUD 78-21 (Cont'd.)

136.78 - 136.93	0.15	Coal: 50% vitreous, core solid.
136.93 - 137.04	0.11	Coal: 70% vitreous, core broken.
137.04 - 137.17	0.13	Mudstone: Carbonaceous, black.
137.17 - 137.24	0.07	Coal: 70% vitreous, core broken.
137.24 - 137.40	0.16	Coal: 30% vitreous, core broken.
137.40 - 137.52	0.12	Coal: 50% vitreous, core broken.

Samples	Interval	Width	Dry Ash	F.S.I
0569	132.83 - 133.05	0.22	20.34	7½
0570	133.05 - 134.63	1.58	90.41	NA
0571	134.63 - 135.16	0.53	8.42	7
0572	135.16 - 135.44	0.28	90.43	NA
0573	135.44 - 135.49	0.05	21.77	7½
0574	135.49 - 136.06	0.57	89.88	NA
0575	136.06 - 137.04	0.98	7.60	8
0576	137.04 - 137.17	0.13	87.23	NA
0577	137.17 - 137.52	0.35	23.04	7½

137.52 - 138.23	0.71	Core Missing
138.23 - 138.64	0.41	Carbonaceous mudstone: black, bright coal bands.
138.64 - 141.51	2.87	Sandstone: light gray, medium grained with frequent thin interbeds of carbonaceous mudstone. BCA = 75°.
141.51 - 151.93	10.42	Mudstone: dark gray, carbonaceous phases, bright coal bands, few phases of dark gray siltstone and light gray sandstone.
151.93 - 152.06	0.13	Mudstone: carbonaceous, bright coal bands at base.
		COAL SEAM B6u
152.06 - 152.11	0.05	Coal: 50% vitreous, core solid.
152.11 - 152.25	0.14	Mudstone: carbonaceous
152.25 - 152.39	0.14	Coal: 10% vitreous, core solid.
152.39 - 152.49	0.10	Carbonaceous claystone: black, bright coal bands.
152.49 - 152.58	0.09	Coal: 50% vitreous, core solid.

MUD 78-21 (Cont'd.)

152.58 - 153.68	1.10	Carbonaceous claystone: black, frequent bright coal bands.			
153.68 - 153.86	0.18	Coal: 70% vitreous, core solid.			
153.86 - 154.08	0.22	Carbonaceous claystone: black, bright coal bands.			
154.08 - 154.23	0.15	Core Missing			
154.23 - 154.53	0.30	Carbonaceous claystone: heavily sheared.			
154.53 - 154.58	0.05	COAL SEAM B6 (lower)			
154.53 - 154.58	0.05	Coal: 70% vitreous, core solid.			
154.58 - 154.76	0.18	Coal: 30% vitreous, core solid.			
154.76 - 154.80	0.04	Coal: stoney, core solid.			
154.80 - 155.11	0.31	Coal: dull, core solid.			
155.11 - 155.19	0.08	Coal: 30% vitreous, core solid.			
155.19 - 155.24	0.05	Coal: dull, core solid.			
155.24 - 155.62	0.38	Coal and claystone interbedded: black, carbonaceous claystone, with very frequent bright coal bands.			
155.62 - 157.15		Samples	Interval	Width	Dry Ash F.S.I.
		0578	154.53 - 155.24	0.71	9.39 3½
		0579	155.24 - 155.62	0.38	50.76 1
155.62 - 157.15	1.53	Carbonaceous claystone: black, bright coal bands			
157.15 - 157.17	0.02	Coal: bright, core pulverized.			
157.17 - 171.95	14.78	Mudstone: dark gray with frequent phases of gray siltstone, numerous concretions.			
171.95 - 196.27	24.32	Mudstone: dark gray with very frequent thin interbeds of light gray sandstone, irregular bedding. BCA = 72°.			
196.27 - 197.45	1.18	Mudstone: dark gray, carbonaceous at base.			
197.45 - 197.52	0.07	Carbonaceous claystone: black, numerous bright coal bands.			

MUD 78-21 (Cont'd.)

COAL SEAM B4		
197.52 - 197.60	0.08	Coal: 20% vitreous, core solid.
197.60 - 197.71	0.11	Coal: dull, core solid.
197.71 - 197.91	0.20	Coal: 30% vitreous, core broken.
197.91 - 198.01	0.90	Coal: dull, core solid.
198.01 - 198.11	0.10	Coal: 50% vitreous, core solid.
198.11 - 198.16	0.05	Coal: bright, core solid.
198.16 - 198.23	0.07	Coal: dull, core solid.
198.23 - 198.42	0.19	Carbonaceous claystone: black, numerous bright coal bands.
198.42 - 198.55	0.13	Coal: 50% vitreous, core solid.
198.55 - 198.66	0.11	Coal: 20% vitreous, core solid.
198.66 - 198.72	0.06	Coal: stoney, core solid.
198.72 - 198.80	0.08	Coal: dull, core solid.
198.80 - 198.82	0.02	Carbonaceous claystone: black.
198.82 - 198.89	0.07	Coal: 70% vitreous, core solid.
198.89 - 199.00	0.11	Coal: 50% vitreous, core solid.
199.00 - 199.05	0.05	Coal: dull, core solid.
199.05 - 199.16	0.11	Coal: dull, core solid.
199.16 - 199.27	0.11	Coal: 30% vitreous, core solid.
199.27 - 199.42	0.15	Coal: 50% vitreous, core solid.
199.42 - 199.44	0.02	Carbonaceous claystone: black, bright coal bands.
199.44 - 199.46	0.02	Coal: bright, core solid.
199.46 - 199.91	0.45	Carbonaceous claystone: bright, coal bands
199.91 - 200.06	0.15	Coal: bright, core badly broken.
200.06 - 200.14	0.08	Coal: 30% vitreous, core solid.

MUD 78-21 (Cont'd.)

200.14 - 200.23	0.09	Coal: 30% vitreous, core solid.
200.23 - 200.36	0.13	Coal: bright, core solid.
200.36 - 200.54	0.18	Carbonaceous claystone: black, bright coal bands.
200.54 - 200.60	0.06	Coal: 50% vitreous, core solid.
200.60 - 200.98	0.38	Carbonaceous claystone: black, bright coal bands.
200.98 - 201.05	0.07	Coal and claystone interbedded.
201.05 - 201.14	0.09	Coa;: dull, core broken.
201.14 - 201.20	0.06	Coal: bright, core pulverized.
201.20 - 201.32	0.12	Coal: dull, core solid.
201.32 - 201.37	0.05	Coal: 50% vitreous, core solid.
201.37 - 201.42	0.05	Carbonaceous claystone: black.
201.42 - 201.51	0.09	Coal: 50% vitreous, core solid.
201.51 - 202.20	0.69	Carbonaceous claystone: black, large coal bands
202.20 - 202.47	0.27	Coal and claystone interbedded.
202.47 - 202.67	0.20	Carbonaceous claystone: black.
202.67 - 202.70	0.03	Coal: bright, core solid.
202.70 - 202.72	0.02	Carbonaceous claystone.
202.72 - 202.79	0.07	Coal: Bright, core solid.
202.79 - 203.10	0.31	Carbonaceous claystone: black.
203.10 - 203.17	0.07	Coal and claystone interbedded.
203.17 - 203.20	0.03	Coal: 50% vitreous, core solid.
203.20 - 203.26	0.06	Carbonaceous claystone.
203.26 - 203.31	0.05	Coal: dull, core solid.
203.31 - 203.51	0.20	Coal: 50% vitreous, core solid.
203.51 - 203.60	0.09	Coal: 10% vitreous, core solid.

MUD 78-21 (Cont'd.)

203.60 - 203.66	0.06	Coal: 50% vitreous, core solid.
203.66 - 203.77	0.11	Coal: 10% vitreous, core solid.
203.77 - 203.89	0.12	Coal: dull, core solid.
203.89 - 203.97	0.08	Coal: stoney, core solid.
203.97 - 204.05	0.08	Coal: 50% vitreous, core solid.
204.05 - 204.07	0.02	Coal: stoney, core solid.
204.07 - 204.24	0.17	Coal: 50% vitreous, core solid.
204.24 - 204.35	0.11	Coal: dull, core solid.
204.35 - 204.51	0.16	Coal: bright, core solid.
204.51 - 205.05	0.54	Carbonaceous claystone: black.
205.05 - 205.17	0.12	Coal: 50% vitreous, core solid.
205.17 - 205.27	0.10	Carbonaceous claystone: black, coal bands.
205.27 - 205.41	0.14	Coal: 50% vitreous, core solid.

Samples	Interval	Width	Dry Ash	F.S.I.
0580	197.52 - 198.23	0.71	13.93	6½
0581	198.23 - 198.42	0.19	70.02	1
0582	198.42 - 199.42	1.00	17.32	4
0583	199.42 - 199.91	0.49	82.22	NA
0584	199.91 - 200.36	0.45	11.52	7
0585	200.36 - 201.05	0.69	54.47	2
0586	201.05 - 201.37	0.32	11.31	4½
0587	201.37 - 203.26	1.89	69.51	1½
0588	203.26 - 204.51	1.25	13.51	7
0589	204.51 - 205.05	0.54	80.29	NA
0590	205.05 - 205.17	0.12	8.82	8
0591	205.17 - 205.27	0.10	51.25	2½
0592	205.27 - 205.41	0.14	17.20	6½

205.41 - 205.54	0.13	Carbonaceous claystone: black, coal bands.
205.54 - 206.65	1.11	Core Missing.
206.65 - 219.62	12.97	Sandstone: medium grained, gray, with frequent interbeds and phases of dark gray mudstone. BCA = 76°.

MUD 78-21 (Cont'd.)

219.62 - 220.10	0.48	Carbonaceous claystone: black, frequent bright coal bands.			
220.10 - 220.23	0.13	COAL SEAM B3			
220.10 - 220.23	0.13	Coal: 30% vitreous, core solid.			
220.23 - 220.26	0.03	Coal: bright, core pulverized.			
220.26 - 220.35	0.09	Coal: 30% vitreous, core solid.			
220.35 - 220.40	0.05	Coal: bright, coal pulverized.			
220.40 - 220.75	0.35	Coal: 30% vitreous, core solid.			
220.75 - 221.43	0.68	Coal: siltstone, dark gray, thin mudstone interbeds, bright coal inclusions.			
221.43 - 221.66	0.23	Coal: 50% vitreous, solid core.			
221.66 - 221.70	0.04	Coal: bright, core solid.			
221.70 - 221.78	0.08	Coal: 50% vitreous, core solid.			
221.78 - 221.86	0.08	Coal: 20% vitreous, core solid.			
221.86 - 222.01	0.15	Coal: 50% vitreous, core solid.			
221.01 - 222.06	0.05	Coal: bright, core solid.			
		Samples	Interval	Width	Dry Ash F.S.I.
		0593	220.10 - 220.75	0.65	8.10 4½
		0594	220.75 - 221.43	0.68	86.79 NA
		0595	221.43 - 222.06	0.63	9.09 7
222.06 - 224.00	1.94	Sandstone: fine grained, light gray phases of carbonaceous mudstone. Plant rootlets.			
224.00 - 224.61	0.61	Carbonaceous claystone: black, bright coal bands at the base.			
224.61 - 227.38	2.77	Sandstone: medium grain, light gray crossbedded.			
227.38 - 227.70	0.32	Carbonaceous mudstone: black, coal bands.			
227.70 - 230.03	2.33	Sandstone: medium grain, gray, frequent gray siltstone interbeds, carbonaceous mudstone at top and base.			
230.03 - 231.75	1.72	Carbonaceous mudstone: black, coal bands, one gray siltstone in center.			

MUD .78-21 (Cont'd.)

231.75 - 240.49	8.74	Siltstone: gray with frequent dark gray mudstone interbeds throughout. BCA = 75°.		
240.49 - 240.63	0.14	Siltstone: as above, slicken sided calcite fractures.		
240.63 - 240.71	0.08	Siltstone: as above, undisturbed.		
240.71 - 240.81	0.10	Siltstone: as above, slicken sided calcite filled fractures.		
240.81 - 253.07	12.26	Sandstone: medium grain, light gray with frequent mudstone interbeds throughout.		
253.07 - 254.27	1.20	Claystone: light gray, silty, bentonitic		
254.27 - 256.94	2.67	Mudstone: dark grey, carbonaceous at the base.		
256.94 - 257.30	0.36	Carbonaceous claystone: bright coal bands.		
COAL SEAM B2				
257.30 - 257.43	0.07	Coal: 30% vitreous, core solid.		
257.43 - 257.50	0.07	Coal: 70% vitreous, core solid.		
257.50 - 257.61	0.11	Coal: bright, core broken.		
257.61 - 258.66	0.05	Mudstone: dark gray, light gray siltstone interbeds.		
258.66 - 258.85	0.19	Carbonaceous claystone: Black, coal bands.		
258.85 - 259.00	0.15	Coal boney: core solid.		
259.00 - 259.21	0.21	Carbonaceous claystone: bright coal bands.		
259.21 - 259.24	0.03	Coal: bright, core solid.		
259.24 - 259.77	0.53	Carbonaceous claystone: black, phases of gray siltstone.		
Samples	Interval	Width	Dry Ash	F.S.I
0596	257.30 - 257.61	0.65	8.10	7
0597	257.61 - 259.77	2.16	80.04	NA
COAL SEAM B1				
259.77 - 259.92	0.15	Coal: 70% vitreous, core solid.		

MUD 78-21 (Cont'd.)

259.92 - 260.10	0.18	Coal: 50% vitreous, core solid.
260.10 - 260.17	0.07	Coal: bright, core pulverized.
260.17 - 260.34	0.17	Coal: dull, core solid.
260.34 - 260.58	0.24	Coal: 50% vitreous, core solid.
260.58 - 260.63	0.05	Coal: 30% vitreous, core solid.
260.63 - 260.68	0.05	Coal: 50% vitreous, core solid.
260.68 - 260.91	0.23	Core Missing.
260.91 - 261.06	0.15	Coal: 20% vitreous, core solid.
261.06 - 261.14	0.08	Coal: dull, core solid.
261.14 - 261.23	0.09	Coal: 30% vitreous, core solid.
261.23 - 261.32	0.09	Coal: dull, core solid.
261.32 - 261.42	0.10	Coal: 50% vitreous, core solid.
261.42 - 261.62	0.20	Coal: 30% vitreous, core solid.
261.62 - 261.79	0.17	Coal: 50% vitreous, core solid.
261.79 - 261.94	0.15	Coal: 70% vitreous, core solid.
261.94 - 261.98	0.04	Coal: stoney, core solid.
261.98 - 262.10	0.12	Coal: 50% vitreous, core solid.
262.10 - 262.23	0.13	Coal: 70% vitreous, core solid.
262.23 - 262.29	0.06	Coal: 30% vitreous, core solid.
262.29 - 262.36	0.07	Coal: 70% vitreous, core solid.
262.36 - 262.47	0.11	Coal: 30% vitreous, core solid.
262.47 - 263.00	0.53	Claystone: dark gray, carbonaceous phases, coal bands.
263.00 - 263.02	0.02	Coal: 50% vitreous, core solid.
263.02 - 263.04	0.02	Claystone: carbonaceous, black.
263.04 - 263.13	0.09	Coal: 30% vitreous, core solid.
263.13 - 263.78	0.65	Mudstone: dark gray, carbonaceous at top.

MUD 78-21 (Cont'd.)

263.78 - 263.84	0.06	Coal: 50% vitreous, core solid.
263.84 - 264.06	0.22	Coal: 30% vitreous, core broken.
264.06 - 264.21	0.15	Carbonaceous claystone: black, coal bands.
264.21 - 264.31	0.10	Coal: 50% vitreous, core solid.
264.31 - 254.39	0.08	Coal: stoney, core solid.
254.39 - 263.45	0.06	Coal: dull, core solid.
264.45 - 264.67	0.22	Coal and claystone interbedded.
264.67 - 264.83	0.16	Coal: 20% vitreous, core broken.
264.83 - 264.85	0.02	Carbonaceous claystone: black.
264.85 - 264.96	0.11	Coal: dull, core solid.
264.96 - 265.10	0.14	Coal: 30% vitreous, core solid.
265.10 - 265.24	0.14	Coal and claystone interbedded.
265.24 - 265.36	0.12	Coal: 50% vitreous, core solid.
265.36 - 265.44	0.08	Coal: dull, core solid.
265.44 - 265.55	0.11	Coal: 50% vitreous, core solid.
265.55 - 265.62	0.07	Coal: 70% vitreous, core solid.
265.62 - 265.74	0.12	Coal: bright, core solid.
265.74 - 265.82	0.08	Coal: 70% vitreous, core solid.
265.82 - 265.93	0.11	Coal: 30% vitreous, core solid.
265.93 - 266.06	0.13	Coal: dull, core solid.
266.06 - 266.14	0.08	Coal: 50% vitreous, core solid.
266.14 - 266.24	0.10	Coal: 70% vitreous, core solid.
266.24 - 266.32	0.08	Coal: 50% vitreous, core solid.
266.32 - 266.48	0.16	Coal: 70% vitreous, core solid.
266.48 - 266.52	0.04	Coal: 50% vitreous, core solid.
266.52 - 266.65	0.13	Coal: bright, core solid.

MUD 78-21 (Cont'd.)

266.65 - 266.72	0.07	Coal: 50% vitreous, core broken.																																								
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0598</td> <td>259.77 - 262.47</td> <td>2.70</td> <td>9.84</td> <td>6</td> </tr> <tr> <td>0599</td> <td>262.47 - 263.78</td> <td>1.31</td> <td>85.27</td> <td>NA</td> </tr> <tr> <td>0600</td> <td>263.78 - 264.06</td> <td>0.28</td> <td>19.76</td> <td>7</td> </tr> <tr> <td>0601</td> <td>264.06 - 264.21</td> <td>0.15</td> <td>56.04</td> <td>1</td> </tr> <tr> <td>0601</td> <td>264.21 - 264.45</td> <td>0.24</td> <td>22.28</td> <td>3½</td> </tr> <tr> <td>0602</td> <td>264.45 - 264.67</td> <td>0.22</td> <td>51.98</td> <td>1</td> </tr> <tr> <td>0603</td> <td>264.67 - 266.72</td> <td>2.05</td> <td>13.87</td> <td>7½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0598	259.77 - 262.47	2.70	9.84	6	0599	262.47 - 263.78	1.31	85.27	NA	0600	263.78 - 264.06	0.28	19.76	7	0601	264.06 - 264.21	0.15	56.04	1	0601	264.21 - 264.45	0.24	22.28	3½	0602	264.45 - 264.67	0.22	51.98	1	0603	264.67 - 266.72	2.05	13.87	7½
Samples	Interval	Width	Dry Ash	F.S.I.																																						
0598	259.77 - 262.47	2.70	9.84	6																																						
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0601	264.06 - 264.21	0.15	56.04	1																																						
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0602	264.45 - 264.67	0.22	51.98	1																																						
0603	264.67 - 266.72	2.05	13.87	7½																																						
266.72 - 266.88	0.06	Carbonaceous Claystone: black.																																								
266.88 - 268.51	1.63	Sandstone: fine grained, gray, with frequent interbeds of dark gray siltstone, BCA = 73°.																																								
268.51 - 268.87	0.36	Sandstone: coarse grained light gray, clean and massive.																																								
268.87 - 270.82	1.95	Sandstone: fine grained, gray, frequent thin interbeds of dark gray siltstone.																																								
270.82 - 271.50	0.68	Mudstone: dark gray, carbonaceous at base.																																								
271.50 - 272.13	0.63	Sandstone: fine gained, fray, phases and interbeds of dark gray mudstone, bedding irregular.																																								
272.13 - 272.35	0.22	Coal and claystone interbedded:																																								
272.55 - 272.59	0.04	Sandstone: medium grained, light gray.																																								
272.59 - 272.69	0.10	Carbonaceous mudstone: black.																																								
272.69 - 301.72	29.03	Sandstone: medium grained, light gray, massive, very clean, large light coloured worm burrows near top, few sedimentary breccia beds near base.																																								
<u>MOOSEBAR FORMATION (upper)</u>																																										
301.72 - 326.02	24.30	Sandstone: medium grained, light gray with frequent phases and interbeds of dark gray mudstone. BCA = 76°.																																								
326.02 - 337.11	11.09	Mudstone: dark gray, with thin fine grained light gray sandstone interbed, abundant small dark coloured worm burrows, heavily bioturbated.																																								

E.O.H.

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-22

LOCATION:

- (a) Coal Licence: 3224
- (b) N.T.S. 93-I-15, d-7-B
- (c) Drill Hole Co-ordinates: N 11981.58 - E 5063.65
- (d) Elevation: 1437.12m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B12
TOTAL DEPTH: 439.5m

DATE DRILLED: Sept. 8 - 15, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: G. Jordan

GEOPHYSICAL LOGS: . Dev., Dens/Cal, GRN, FBL

MDD 78-22

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0.00 - 3.21	3.21	OVERBURDEN
		<u>BOULDER CREEK MEMBER - COMMOTION FORMATION</u>
3.21 - 4.75	1.54	Conglomerate: Light grey granule, subrounded grains of grey, white and black chert and argillite, phases of coarse grained light grey sandstone.
4.75 - 20.42	15.67	Sandstone: Medium grained, light grey, some thin pebble bands near top, very clean, massive.
		<u>HULCROSS MEMBER - COMMOTION FORMATION</u>
20.42 - 24.69	4.27	Mudstone: Dark grey with very frequent fine grained sandstone interbeds, bedding is irregular, BCA - 66°.
24.69 - 24.79	0.10	Mudstone: Dark grey, as above, glauconitic.
24.79 - 53.57	28.78	Mudstone: As above without glauconite.
53.57 - 53.69	0.12	Claystone: White, soft, expanded, bentonitic.
53.69 - 101.49	47.80	Mudstone: Dark grey, as above, BCA - 68°.
101.49 - 101.63	0.14	Claystone: White, soft, expanded bentonitic.
101.63 - 108.76	7.13	Mudstone: Dark grey, as above, BCA - 71°.
108.76 - 110.20	1.44	<u>GATES MEMBER - COMMOTION FORMATION</u>
		Sandstone: Coarse grained light grey crossbedded. Few phases of carbonaceous mudstone with pyritised worm burroughs.
110.20 - 110.33	0.13	Conglomerate: Light grey, granular at top, pebble at base, grains of pyrite grey white black chert.
110.33 - 110.39	0.06	Coal: 50% vitreous core solid.
110.39 - 110.45	0.06	Coal and Claystone Interbedded: Black carbonaceous claystone with numerous bright coal bands.
110.45 - 111.00	0.55	Mudstone: Dark grey with very frequent pyritised worm burrows.
111.00 - 111.18	0.18	Coal and Claystone Interbedded: Black carbonaceous claystone with numerous bright coal bands, abundant pyrite.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
111.18 - 111.29	0.11	Coal: 50% vitreous abundant pyrite.
111.29 - 111.86	0.57	Mudstone: Dark grey with very frequent pyritised worm burrows, plant rootlets in the lower half.
111.86 - 112.18	0.32	Mudstone: Dark grey, carbonaceous phases.
112.18 - 112.22	0.04	Coal and Claystone: interbedded.
112.22 - 113.01	0.79	Sandstone: Fine grain grey with mudstone interbeds bedding disturbed by slumping.
113.01 - 113.67	0.66	Mudstone: Dark grey carbonaceous phases, bright coal bands, pyretic worm burrows.
		Coal Seam B12
113.67 - 113.89	0.22	Coal: Dull core solid.
113.89 - 114.00	0.11	Coal: 30% vitreous solid.
114.00 - 114.05	0.05	Coal: 50% vitreous
114.05 - 114.10	0.05	Coal: 20% vitreous
114.10 - 114.26	0.16	Coal: 50% vitreous
114.26 - 114.29	0.03	Coal: 30% vitreous
114.29 - 114.37	0.08	Coal: 70% vitreous
114.37 - 114.44	0.07	Coal: 50% vitreous
		<u>Samples</u> <u>Interval</u> <u>Width</u> <u>Dry Ash</u> <u>F.S.I.</u>
		0606 113.67-114.44 0.77 4.32 7
114.44 - 114.47	0.03	Coal and Claystone: Interbedded.
114.47 - 115.69	1.22	Mudstone: Dark grey, grey siltstone phases in the center.
115.69 - 115.75	0.06	Mud: Brown soft.
115.75 - 116.22	0.47	Mudstone: As above.
116.22 - 116.31	0.09	Claystone: Black bright coal bands, carbonaceous.
116.31 - 116.58	0.27	Coal and Claystone: Interbedded.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
116.58 - 116.65	0.07	Coal: 30% vitreous, core solid.
116.65 - 116.70	0.05	Coal: Stoney.
116.70 - 118.32	1.62	Siltstone: Grey, with carbonaceous mudstone phases, coal bands with carbonaceous mudstone.
118.32 - 121.01	2.69	Siltstone: Grey with dark grey mudstone phases, fine grain sandstone interbeds at top and base plant rootlets throughout.
121.01 - 121.46	0.45	Mudstone: Dark grey, carbonaceous at base.
121.46 - 124.05	2.59	Sandstone: Light grey, medium grain crossbedded, dark grey siltstone phases and interbeds coalified plant rootlets, BCA - 65°.
124.05 - 124.09	0.04	Mudstone: Carbonaceous.
124.09 - 124.15	0.06	Coal: Bright, core solid.
124.15 - 124.51	0.36	Coal and Claystone: Interbedded carbonaceous claystone with very frequent large bright coal bands.
124.51 - 126.01	1.50	Mudstone: Dark grey with regular interbeds of grey siltstone, BCA - 67°.
126.01 - 126.68	0.67	Mudstone: Dark grey, carbonaceous at the base.
126.68 - 126.74	0.06	Coal: 70% vitreous, core pulverized.
126.74 - 126.85	0.11	Coal: Dull core solid.
126.85 - 126.89	0.04	Stoney: Solid.
126.89 - 127.01	0.12	Coal: 50% vitreous, core solid.
127.01 - 127.16	0.15	Mudstone: Black, carbonaceous.
127.16 - 127.62	0.46	Coal and Claystone: Interbedded pyrite inclusions.
127.62 - 127.92	0.30	Siltstone: Dark grey, light grey sandstone interbeds towards the base.
127.92 - 128.69	0.77	Sandstone: Medium grain, light grey thin carbonaceous partings on crossbedding.
128.69 - 130.15	1.46	Claystone: Black bright coal bands towards the top, carbonaceous.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
130.15 - 132.10	1.95	Mudstone: Dark grey, few sandstone phases.
132.10 - 132.60	0.50	Sandstone: Light grey, dark grey mudstone interbeds.
132.60 - 133.79	1.19	Siltstone: Dark grey.
133.79 - 137.97	4.18	Sandstone: Light grey, medium grain, frequent mudstone interbeds and phases throughout, BCA - 67°.
137.97 - 148.58	10.61	Sandstone: Coarse grain, few mudstone interbeds at top.
148.58 - 149.15	0.57	Mudstone: Dark grey, concretions.
149.15 - 150.56	1.41	Sandstone: Coarse grained, as above.
150.56 - 151.13	0.57	Mudstone: Dark grey.
151.13 - 151.43	0.30	Sandstone: Medium grained, light grey, thin carbonaceous partings on bedding.
151.43 - 152.02	0.59	Mudstone: Dark grey, interbeds, light grey sandstone.
152.02 - 152.13	0.11	Coal: 50% vitreous, core solid.
152.13 - 152.31	0.18	Coal: Dull.
152.31 - 152.40	0.09	Claystone: Carbonaceous.
152.40 - 152.43	0.03	Coal: Bright, solid.
152/43 - 152.87	0.44	Claystone: Black, bright coal bands, carbonaceous.
152.87 - 153.01	0.14	Coal: 30% vitreous, core broken.
153.01 - 155.73	2.72	Claystone: Black, numerous bright coal bands, carbonaceous.
155.73 - 156.34	0.61	Mudstone: Dark grey, coaley inclusions.
156.34 - 157.15	0.81	Sandstone: Medium grain, light grey frequent large phases of dark grey mudstone.
157.15 - 157.67	0.52	Mudstone: Dark grey.
157.67 - 159.32	1.65	Mudstone: Dark grey with phases of light grey medium grain sandstone.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
159.32 - 160.49	1.17	Sandstone: Medium grain, light grey, few mudstone phases.
160.49 - 160.87	0.38	Mudstone: Dark grey.
160.87 - 164.14	3.27	Sandstone: Medium to coarse grained, light grey with thin carbonaceous partings on bedding.
164.14 - 168.77	4.63	Mudstone: Dark grey with very frequent thin interbeds of light grey fine grained sandstone, BCA - 67°.
168.77 - 170.52	1.75	Mudstone: Dark grey. Coal Seam B9
170.52 - 170.69	0.17	Coal: Dull, core solid.
170.69 - 170.74	0.05	Coal: Bright, core solid.
170.74 - 170.88	0.14	Coal: 30% vitreous, core solid.
170.88 - 170.94	0.06	Coal: 70% vitreous, core solid.
170.94 - 171.01	0.07	Coal: 30% vitreous, core solid.
171.01 - 171.15	0.14	Coal: 50% vitreous, core solid.
171.15 - 171.25	0.10	Coal: Dull, core solid.
171.25 - 171.30	0.05	Coal: 50% vitreous, core solid.
171.30 - 171.40	0.10	Coal: 30% vitreous, core solid.
171.40 - 171.45	0.05	Coal: 70% vitreous, core solid.
171.45 - 171.59	0.14	Coal: 50% vitreous, core solid.
171.59 - 171.75	0.16	Coal: Dull, core solid.
171.75 - 171.90	0.15	Coal: 30% vitreous, core solid.
171.90 - 171.94	0.04	Coal: Stoney, core solid.
171.94 - 172.00	0.06	Coal: 30% vitreous, core solid.
172.00 - 172.16	0.16	Coal: Dull, core solid.
172.16 - 172.36	0.20	Coal: 30% vitreous, core solid.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
172.36 - 172.50	0.14	Coal: 50% vitreous, core broken.
172.50 - 172.72	0.22	Coal: 30% vitreous, solid core.
172.72 - 172.78	0.06	Coal: 50% vitreous, solid core.
172.78 - 172.83	0.05	Claystone: carbonaceous.
172.83 - 172.85	0.02	Coal and Claystone: Interbedded.
172.85 - 172.96	0.11	Coal: 50% vitreous, core broken.
172.96 - 173.02	0.06	Claystone: carbonaceous.
173.02 - 173.05	0.03	Coal: 50% vitreous, core solid.
173.05 - 173.08	0.03	Claystone: carbonaceous.
173.08 - 173.21	0.13	Coal: 70% vitreous, core solid.
173.21 - 173.25	0.04	Coal: 30% vitreous, core solid.
173.25 - 173.34	0.09	Coal: 70% vitreous, core solid.
173.34 - 173.60	0.26	Coal: Dull.
173.60 - 173.68	0.08	Coal: 50% vitreous, core solid.
173.68 - 173.74	0.06	Coal: 70% vitreous.
173.74 - 173.82	0.08	Coal: Bright.
173.82 - 173.91	0.09	Coal: 30% vitreous.
173.91 - 173.98	0.07	Coal: 70% vitreous.
173.98 - 174.12	0.14	Coal: 30% vitreous.
174.12 - 174.16	0.04	Mudstone: carbonaceous.
174.16 - 174.19	0.03	Coal and Claystone: interbedded.
174.19 - 174.22	0.03	Coal: Bright.
174.22 - 174.24	0.02	Claystone: carbonaceous.
174.24 - 174.27	0.03	Coal: Bright.
174.27 - 174.32	0.05	Coal: 30% vitreous.
174.32 - 174.43	0.11	Coal: 70% vitreous.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>																																								
174.43 - 174.52	0.09	Coal and Claystone: Interbedded.																																								
174.52 - 174.58	0.06	Coal: Bright.																																								
174.58 - 174.66	0.08	Coal: Stoney.																																								
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0607</td> <td>170.52-171.59</td> <td>1.07</td> <td>12.21</td> <td>3½</td> </tr> <tr> <td>0608</td> <td>171.59-172.16</td> <td>0.57</td> <td>7.52</td> <td>3</td> </tr> <tr> <td>0609</td> <td>172.16-172.78</td> <td>0.62</td> <td>27.54</td> <td>1½</td> </tr> <tr> <td>0610</td> <td>172.78-173.08</td> <td>0.30</td> <td>11.28</td> <td>4½</td> </tr> <tr> <td>0611</td> <td>173.08-174.12</td> <td>1.04</td> <td>5.23</td> <td>4½</td> </tr> <tr> <td>0612</td> <td>174.12-174.24</td> <td>0.12</td> <td>34.60</td> <td>4½</td> </tr> <tr> <td>0613</td> <td>174.24-174.66</td> <td>0.42</td> <td>18.29</td> <td>6½</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0607	170.52-171.59	1.07	12.21	3½	0608	171.59-172.16	0.57	7.52	3	0609	172.16-172.78	0.62	27.54	1½	0610	172.78-173.08	0.30	11.28	4½	0611	173.08-174.12	1.04	5.23	4½	0612	174.12-174.24	0.12	34.60	4½	0613	174.24-174.66	0.42	18.29	6½
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																																						
0607	170.52-171.59	1.07	12.21	3½																																						
0608	171.59-172.16	0.57	7.52	3																																						
0609	172.16-172.78	0.62	27.54	1½																																						
0610	172.78-173.08	0.30	11.28	4½																																						
0611	173.08-174.12	1.04	5.23	4½																																						
0612	174.12-174.24	0.12	34.60	4½																																						
0613	174.24-174.66	0.42	18.29	6½																																						
174.66 - 174.84	0.18	Claystone: Black with frequent bright coal bands, carbonaceous.																																								
174.84 - 176.54	1.70	Siltstone: Grey with mudstone phases.																																								
176.54 - 178.46	1.92	Sandstone: Medium grain, light grey, numerous dark grey mudstone phases.																																								
178.46 - 186.36	7.90	Sandstone: Coarse grained, light grey, granule conglomerate phases near the base crossbedded.																																								
186.36 - 187.46	1.10	Conglomerate: Granule light grey subangular grains of grey and white chert, very large irregular bright coal inclusions.																																								
187.46 - 189.35	1.89	Mudstone: Dark grey, carbonaceous phases.																																								
189.35 - 189.55	0.20	Coal and Claystone: Interbedded.																																								
189.55 - 190.16	0.61	Claystone: Bright coal bands, carbonaceous.																																								
190.16 - 190.37	0.21	Coal and Claystone: Interbedded, pyrite inclusions.																																								
190.37 - 190.58	0.21	Coal: 50% vitreous, core solid, dull.																																								
190.58 - 190.66	0.08	Coal: 50% vitreous.																																								
190.66 - 194.45	3.79	Mudstone: Dark grey.																																								
194.45 - 199.15	4.70	Siltstone: Grey, mudstone phases, sandstone phases towards the base.																																								
199.15 - 203.30	4.15	Sandstone: Light grey, medium grain, crossbedded phases of dark grey mudstone throughout, bedding disturbed by bioturbation, BCA - 65°.																																								

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
203.30 - 204.11	0.81	Sandstone: Coarse grain, light grey, one pebble conglomerate phase near the top, large irregular coal inclusions.
204.11 - 204.15	0.04	Coal: 50% vitreous.
204.15 - 204.69	0.54	Conglomerate: Granula, light grey, subrounded grains of grey and white chert, large irregular coaly rootlets.
204.69 - 207.87	3.18	Sandstone: Medium grain, light grey, crossbedded very thin, coaly partings on bedding.
207.87 - 209.25	1.38	Sandstone: Medium grain, light grey, characterized by large irregular siltstone sedimentary breccia fragments.
209.25 - 211.03	1.78	Siltstone: Dark grey.
211.03 - 212.00	0.97	Sandstone: Coarse grain, light grey with large irregular coal inclusions.
212.00 - 216.42	4.42	Siltstone: Grey, with phases of fine grained crossbedded sandstone.
216.42 - 219.18	2.76	Siltstone: Dark grey.
219.18 - 225.41	6.23	Sandstone: Medium to coarse grain. Grain size increases towards the base. Phases of granular conglomerate towards the base, large irregular coal inclusions crossbedded.
225.41 - 226.91	1.50	Sandstone: Medium grain, light grey, large coal inclusions, bedding disturbed by root punctures.
226.91 - 229.95	3.04	Sandstone: Coarse grain, light grey, crossbedded, abundant large irregular coal inclusions throughout. Coal Seam B7
229.95 - 230.11	0.16	Coal: 30% vitreous, core solid.
230.11 - 230.14	0.03	Coal: Stoney, core solid.
230.14 - 230.29	0.15	Coal: 50% vitreous, core solid.
230.29 - 230.40	0.11	Coal: Bright, core solid.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>			
230.40 - 230.47	0.07	Coal: 50% vitreous, core solid.			
230.47 - 230.61	0.14	Coal: Dull, core solid.			
230.61 - 230.65	0.04	Coal: 50% vitreous, core solid.			
230.65 - 230.76	0.11	Coal: 75% vitreous, core broken.			
230.76 - 230.86	0.10	Coal: 50% vitreous, core solid.			
			<u>Samples</u>	<u>Interval</u>	<u>Width</u>
			0614	229.95-230.86	0.91
					<u>Dry Ash</u>
					20.53
					<u>F.S.I.</u>
					7
230.86 - 231.69	0.83	Mudstone: Dark grey, carbonaceous claystone.			
231.69 - 231.83	0.14	Coal: 50% vitreous, core solid.			
231.83 - 231.95	0.12	Coal and Claystone: interbedded.			
231.95 - 232.05	0.10	Coal: 50% vitreous, core solid.			
232.05 - 238.42	6.37	Mudstone: Dark grey, carbonaceous phases, bright coal bands.			
238.42 - 239.00	0.58	Sandstone: Fine grain, light grey, dark grey mudstone interbeds.			
239.00 - 239.88	0.88	Mudstone: Dark grey, as above.			
239.88 - 241.08	1.20	Sandstone: Light grey, as above.			
241.08 - 241.35	0.27	Mudstone: Black, carbonaceous.			
		Coal Seam B6			
241.35 - 241.44	0.09	Coal: Stony, core solid.			
241.44 - 241.60	0.16	Coal: 70% vitreous, solid.			
241.60 - 241.68	0.08	Coal: Bright, solid.			
241.68 - 241.73	0.05	Coal: Bright, core broken.			
241.73 - 241.81	0.08	Coal: 50% vitreous, core solid.			
241.81 - 241.92	0.11	Coal: 70% vitreous, core solid.			
241.92 - 242.04	0.12	Coal: Bright.			

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
260.58 - 260-72	0.14	Claystone: Carbonaceous.
260.72 - 260.76	0.04	Coal: Bright, pulverized.
260.76 - 260.82	0.06	Coal: Stony, broken.
260.82 - 261.21	0.39	Core Missing.
261.21 - 261.30	0.09	Claystone: Carbonaceous, bright coal bands.
261.30 - 261.47	0.17	Coal: 50% vitreous, core solid.
261.47 - 261.52	0.05	Coal: 30% vitreous, core solid.
261.52 - 261.58	0.06	Coal: Dull, core solid.
261.58 - 261.73	0.15	Coal: 30% vitreous, core solid.
261.73 - 261.87	0.14	Coal: Dull, core solid.
261.87 - 261.90	0.03	Coal: Bright, core solid.
261.90 - 261.94	0.04	Coal: Stony, core solid.
261.94 - 262.09	0.15	Coal: Dull, core solid.
262.09 - 262.24	0.15	Coal: 30% vitreous, core solid.
262.24 - 262.38	0.14	Coal: Dull, core solid.
262.38 - 262.55	0.17	Coal: 50% vitreous, core solid.
262.55 - 262.85	0.30	Claystone: carbonaceous, bright coal bands.
262.85 - 262.96	0.11	Coal: 50% vitreous.
262.96 - 263.15	0.19	Claystone: Carbonaceous, bright coal bands.
263.15 - 163.28	0.13	Coal: 30% vitreous.
263.28 - 263.46	0.18	Coal: 50% vitreous.
263.46 - 263.62	0.16	Coal: Dull.
263.62 0 263.68	0.06	Coal: 50% vitreous, core broken.
263.68 - 264.05	0.37	Claystone: carbonaceous, black bright coal bands.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>																														
264.05 - 264.26	0.21	Core missing.																														
264.26 - 264.37	0.11	Coal: 50% vitreous, core broken.																														
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0616</td> <td>260.20-261.30</td> <td>1.10</td> <td>52.52</td> <td>2</td> </tr> <tr> <td>0617</td> <td>261.30-262.55</td> <td>1.25</td> <td>15.76</td> <td>4½</td> </tr> <tr> <td>0618</td> <td>261.55-263.15</td> <td>0.60</td> <td>53.07</td> <td>1½</td> </tr> <tr> <td>0619</td> <td>263.15-263.68</td> <td>0.53</td> <td>17.46</td> <td>6</td> </tr> <tr> <td>0620</td> <td>263.68-264.37</td> <td>0.69</td> <td>62.96</td> <td>1½</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0616	260.20-261.30	1.10	52.52	2	0617	261.30-262.55	1.25	15.76	4½	0618	261.55-263.15	0.60	53.07	1½	0619	263.15-263.68	0.53	17.46	6	0620	263.68-264.37	0.69	62.96	1½
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																												
0616	260.20-261.30	1.10	52.52	2																												
0617	261.30-262.55	1.25	15.76	4½																												
0618	261.55-263.15	0.60	53.07	1½																												
0619	263.15-263.68	0.53	17.46	6																												
0620	263.68-264.37	0.69	62.96	1½																												
264.37 - 267.92	3.55	Claystone: Carbonaceous, bright coal bands, phases of dark grey mudstone near the base.																														
267.92 - 275.06	7.14	Siltstone: Dark grey, few mudstone interbeds, BCA - 70°.																														
275.06 - 278.90	3.84	Sandstone: Medium grain, light grey, irregular interbeds of dark grey mudstone.																														
278.90 - 284.03	5.13	Mudstone: Dark grey.																														
284.03 - 284.59	0.56	Sandstone: Medium grain, light grey crossbedded, thin carbonaceous partings on bedding.																														
284.59 - 288.15	3.56	Mudstone: Dark grey, carbonaceous phases towards the base.																														
		Coal Seam B4																														
288.15 - 288.29	0.14	Coal: Dull, core solid.																														
288.29 - 288.46	0.17	Coal: 30% vitreous, core solid.																														
288.46 - 288.53	0.07	Coal: 50% vitreous, core broken.																														
288.53 - 288.65	0.12	Coal: Dull.																														
288.65 - 289.15	0.50	Claystone: Dark grey.																														
289.15 - 289.32	0.17	Coal: Dull, core solid.																														
289.32 - 289.39	0.07	Coal: 50% vitreous, solid.																														
289.39 - 289.42	0.03	Coal: Bright, solid.																														
289.42 - 289.53	0.11	Coal: 70% vitreous, core broken.																														
289.53 - 289.72	0.19	Coal and Claystone: Interbedded.																														

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
289.72 - 289.83	0.11	Coal: 50% vitreous, core solid.
289.83 - 289.87	0.04	Claystone: carbonaceous
289.87 - 290.00	0.13	Coal: Dull, core solid.
290.00 - 290.17	0.17	Core Missing.
290.17 - 290.27	0.10	Coal: 50% vitreous, core solid.
290.27 - 290.41	0.14	Coal: 30% vitreous, core solid.
290.41 - 290.52	0.11	Coal: Dull, core solid.
290.52 - 290.56	0.04	Coal: 50% vitreous, solid.
290.56 - 290.64	0.08	Coal: 70% vitreous, core broken.
290.64 - 290.72	0.08	Coal: 50% vitreous, core solid.
290.72 - 293.40	2.68	Claystone: Carbonaceous, black, frequent bright coal bands.
293.40 - 293.54	0.14	Coal: 30% vitreous, core broken.
293.54 - 293.74	0.10	Coal: 50% vitreous, core broken.
293.74 - 293.86	0.12	Coal: 70% vitreous, core broken.
293.86 - 294.44	0.58	Core Missing.
294.44 - 294.55	0.11	Coal: 30% vitreous, core solid.
294.55 - 294.74	0.19	Coal: Dull, core solid.
294.74 - 294.94	0.20	Coal: 50% vitreous, core solid.
294.94 - 295.09	0.15	Coal: 30% vitreous, core solid.
295.09 - 295.18	0.09	Coal: 50% vitreous, core solid.
295.18 - 295.25	0.07	Coal: Bright, core solid.
295.75 - 295.34	0.09	Coal: 70% vitreous, core broken.
295.34 - 295.41	0.07	Coal: Bright, pulverized.
295.41 - 295.51	0.10	Coal: 50% vitreous, core solid.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>																																			
295.51 - 295.61	0.10	Coal: 30% vitreous, core solid.																																			
295.61 - 295.65	0.04	Coal: Dull, core solid.																																			
295.65 - 295.72	0.07	Coal: 30% vitreous.																																			
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<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																																	
0621	288.15-288.65	0.50	18.58	5																																	
0622	288.65-289.15	0.50	88.23	NA																																	
0623	289.15-289.53	0.38	12.46	7½																																	
0624	289.53-290.72	1.19	31.34	4½																																	
0625	290.72-294.44	1.04	14.31	3																																	
0626	294.44-295.92	1.28	6.08	7½																																	
295.72 - 297.69	1.97	Mudstone: Dark grey, carbonaceous phases.																																			
297.69 - 301.57	3.88	Sandstone: Light grey, fine grain with frequent thin interbeds of dark grey mudstone, BCA - 69°.																																			
301.57 - 312.07	10.50	Mudstone: Dark grey, carbonaceous phases, coal bands. Coal Seam B3																																			
312.07 - 312.23	0.16	Coal and Claystone: Interbedded.																																			
312.23 - 312.52	0.29	Coal: 50% vitreous, core solid.																																			
312.52 - 312.57	0.05	Coal: 30% vitreous, core solid.																																			
312.57 - 312.68	0.11	Coal: 50% vitreous, core solid.																																			
312.68 - 312.75	0.07	Coal: Dull, core solid.																																			
312.75 - 312.84	0.09	Coal: 50% vitreous, core solid.																																			
312.84 - 312 90	0.06	Coal: Dull, core solid.																																			
312.50 - 313.10	0.20	Coal: 50% vitreous, core solid.																																			
313.10 - 313.15	0.05	Coal: 70% vitreous, core solid.																																			
313.15 - 313.49	0.34	Claystone: Carbonaceous, core solid.																																			
313.49 - 313.56	0.07	Coal: 50% vitreous, core solid.																																			
313.56 - 313.70	0.14	Coal: Bright, core solid.																																			
313.70 - 313.80	0.10	Coal: 50% vitreous, core solid.																																			

<u>Interval</u>	<u>Footage</u>	<u>Description</u>			
313.80 - 313.87	0.07	Coal: Dull, core solid.			
313.87 - 313.94	0.07	Coal: 50% vitreous, core solid.			
313.94 - 313.99	0.05	Coal: Dull (fusain), core solid.			
313.99 - 314.08	0.09	Coal: 50% vitreous, core solid.			
314.08 - 314.25	0.17	Coal: 30% vitreous, core solid.			
314.25 - 314.39	0.14	Coal: 50% vitreous, core solid.			
314.39 - 314.50	0.11	Claystone: carbonaceous.			
314.50 - 316.08	1.53	Core Missing.			
			<u>Samples</u>	<u>Interval</u>	<u>Width</u>
					<u>Dry Ash</u>
					<u>F.S.I.</u>
			0627	312.07-312.23	0.16
			0628	312.23-313.15	0.92
			0629	313.15-313.49	0.34
			0630	313.49-316.08	2.59
					81.83
					5.46
					86.62
					16.42
					NA
					7
					NA
					5½
316.08 - 316.93	0.85	Claystone: carbonaceous.			
316.93 - 317.27	0.34	Coal and Claystone: Interbedded, fissile.			
317.27 - 317.38	0.11	Coal: 50% vitreous, core solid.			
317.28 - 317.56	0.18	Coal: 30% vitreous, core solid.			
317.56 - 317.60	0.04	Claystone: Carbonaceous, bright coal bands.			
317.60 - 318.15	0.55	Siltstone: Dark grey, coalified, root puncture marks throughout.			
318.15 - 318.54	0.39	Sandstone: Medium grain, light grey, crossbedded, root punctures.			
318.54 - 320.50	1.96	Siltstone: Grey, dark grey mudstone phases.			
320.50 - 322.00	1.50	Mudstone: Dark grey, carbonaceous phases.			
322.00 - 322.07	0.07	Coal and Claystone: Core pulverized.			
322.07 - 325.67	3.60	Siltstone: Dark grey, phases of dark grey mudstone.			
325.67 - 330.27	4.60	Mudstone: Dark grey, carbonaceous phases.			

<u>Interval</u>	<u>Footage</u>	<u>Description</u>
330.27 - 336.20	5.93	Siltstone: Dark grey, large dark grey mudstone phases.
336.20 - 339.83	3.63	Siltstone: Dark grey with frequent interbeds of light grey fine grain sandstone, BCA - 65°.
339.83 - 345.75	5.92	Sandstone: Medium to coarse grain, grain size increases towards the base, characterized by zones of sedimentary siltstone breccia.
345.75 - 350.80	5.05	Sandstone: Coarse grain, crossbedded, one sedimentary breccia phase in center.
350.80 - 351.96	1.16	Mudstone: Carbonaceous, bright coal bands.
351.96 - 352.69	0.73	Mudstone: Dark grey, thin siltstone interbeds, carbonaceous at the base.
		Coal Seam B2
352.69 - 352.72	0.03	Coal: Dull, core solid.
352.72 - 352.86	0.14	Coal: 50% vitreous, core solid.
352.86 - 352.92	0.06	Coal: 30% vitreous, core solid.
352.92 - 353.06	0.14	Coal: Dull, core solid.
353.06 - 353.48	0.42	Mudstone: carbonaceous.
353.48 - 355.70	2.22	Siltstone: Grey, sandstone phases, root punctures.
355.70 - 357.40	1.70	Mudstone: Dark grey, thin siltstone interbeds, carbonaceous at top.
357.40 - 359.83	2.43	Sandstone: Light grey, medium grain, crossbedded.
359.83 - 363.40	3.57	Siltstone: Grey with occasional sandstone and siltstone interbeds.
363.40 - 365.18	1.78	Mudstone: Dark grey with regular siltstone interbeds.
365.18 - 365.86	0.68	Sandstone: Light grey, medium grain, frequent interbeds of siltstone, (grey).
365.86 - 367.86	2.00	Mudstone: Dark grey with frequent regular interbeds of grey siltstone.
367.86 - 368.55	0.69	Mudstone: Carbonaceous, bright coal bands.

<u>Interval</u>	<u>Footage</u>	<u>Description</u>										
		Coal Seam Bl										
368.55 - 368.67	0.12	Coal and Claystone: Interbedded, core intact, very heavily sheared.										
368.67 - 368.87	0.20	Coal: Dull, core solid.										
368.87 - 369.01	0.14	Coal: 30% vitreous, solid.										
369.01 - 369.24	0.23	Coal: 50% vitreous, solid.										
369.24 - 369.28	0.04	Claystone: Dark grey, bright coal bands.										
369.28 - 369.41	0.13	Coal: 30% vitreous, core solid.										
		<table border="1"> <thead> <tr> <th><u>Samples</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I.</u></th> </tr> </thead> <tbody> <tr> <td>0631</td> <td>368.55-369.41</td> <td>0.86</td> <td>24.97</td> <td>5</td> </tr> </tbody> </table>	<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>	0631	368.55-369.41	0.86	24.97	5
<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>								
0631	368.55-369.41	0.86	24.97	5								
369.41 - 369.77	0.36	Mudstone: Dark grey, carbonaceous at top.										
369.77 - 369.87	0.10	Coal: 50% vitreous, core broken.										
369.87 - 371.79	1.92	Mudstone: Dark grey with interbeds of light grey fine grained sandstone.										
371.79 - 372.73	0.94	Sandstone: Light grey with interbeds of dark grey mudstone slumped bedding.										
372.73 - 374.17	1.44	Mudstone: Dark grey, siltstone interbeds, bright coal bands, BCA - 67 ^o .										
374.17 - 398.55	24.38	Sandstone: Coarse grain, light grey crossbedded, fine carbonaceous partings on bedding, zones of large light colored worm burroughs.										
		<u>Moosebar Formation (Upper)</u>										
398.55 - 439.52	40.97	Sandstone: Medium grain, light grey, crossbedded, with frequent interbeds dary grey mudstone, small dark colored worm burroughs at the base, bedding strongly bioturbated.										

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-23

LOCATION:

- (a) Coal Licence: 3226
- (b) N.T.S. 93-I-15, d-29-B
- (c) Drill Hole Co-ordinates: N 14470.56 - E 4957.22
- (d) Elevation: 1194.02m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B12
TOTAL DEPTH: 392.3m

DATE DRILLED: Sept. 17 - 23, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: G. Jordan

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 8.24	8.24	CASING
<u>BOULDER CREEK MEMBER - COMMOTION FORMATION</u>		
8.24 - 11.88	3.64	Sandstone: light grey, medium grained, with phases of chert pebble conglomerate.
11.88 - 26.52	14.64	Sandstone: light grey medium grained, cross bedded, very clean.
<u>HULCROSS MEMBER - COMMOTION FORMATION</u>		
26.52 - 36.66	10.14	Sandstone: medium grained, light grey, frequent phases of dark grey mudstone.
36.66 - 99.28	62.62	Sandstone and Mudstone: interbedded, light grey sandstone with frequent thin interbeds of dark grey mudstone, worm burrows, some bioturbated phases.
99.28 - 99.35	0.07	Sandstone and Mudstone: interbedded, as above, very abundant calcite filled fractures.
99.35 - 115.10	15.75	Sandstone and Mudstone: interbedded, undisturbed as above.
115.10 - 115.28	0.18	Sandstone and Mudstone: interbedded, calcite filled fractures as above, tectonic disturbance (?).
115.28 - 124.53	9.25	Sandstone and Mudstone: interbedded, undisturbed as above. BCA = 72°.
<u>GATES MEMBER - COMMOTION FORMATION</u>		
124.53 - 125.12	0.59	Sandstone: light grey, coarse grained, siltstone interbeds towards base.
125.12 - 125.58	0.46	Conglomerate: light grey, granule.
125.58 - 126.27	0.69	Siltstone and Mudstone: interbedded.
126.27 - 126.78	0.51	Mudstone: carbonaceous with bright coal bands.
126.78 - 127.93	1.15	Mudstone: dark grey with occasional siltstone interbeds.

MDD-78-23 (Cont'd.)

COAL SEAM B-11

127.93 - 128.06	0.13	Coal: dull, sheared, core broken.		
128.06 - 128.45	0.39	Coal: 30% vitreous, sheared, core intact.		
128.45 - 128.82	0.37	Coal: 50% vitreous, sheared, core intact.		
Sample:	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0632:	127.93-128.82	0.89	5.62	7
128.82 - 134.20	5.38	Mudstone: dark grey with interbeds and phases of light grey, fine grained sandstone. BCA = 68°.		
134.20 - 135.40	1.20	Mudstone: dark grey, carbonaceous phases.		
135.40 - 145.02	9.62	Sandstone: light grey, fine grained, small scale cross bedding, frequent interbeds of grey siltstone.		
145.02 - 145.29	0.27	Mudstone: carbonaceous.		
145.29 - 145.39	0.10	Coal band: 50% vitreous.		
145.39 - 145.71	0.32	Mudstone: dark grey.		
145.71 - 145.83	0.12	Coal band: 10% vitreous.		
145.83 - 153.12	7.29	Mudstone: dark grey, phases of light grey, medium grained sandstone.		
153.12 - 163.17	10.05	Sandstone: light grey, medium grained, phases of irregular coaly inclusions and dark grey mudstone.		
163.17 - 164.97	1.80	Siltstone and Sandstone: interbedded, light grey, fine grained sandstone with frequent interbeds of grey siltstone.		

COAL SEAM B-10

164.97 - 165.30	0.33	Coal: 50% vitreous, core solid.
165.30 - 165.41	0.11	Coal: 70% vitreous, core solid.
165.41 - 165.53	0.12	Coal: bright, core solid.
165.53 - 165.67	0.14	Coal: 70% vitreous, core solid.
165.67 - 165.78	0.11	Coal: 50% vitreous, core solid.

MDD-78-23 (Cont'd.)

	<u>Sample:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
	0633:	164.97-165.78	0.81	13.36	6 1/2
165.78 - 166.20		0.42	Mudstone: dark grey, few interbeds of light grey sandstone.		
166.20 - 166.25		0.05	Coal and Claystone interbedded.		
166.25 - 176.91		10.66	Mudstone: as above.		
176.91 - 178.21		1.30	Sandstone: light grey, medium grained, with interbeds of dark grey mudstone, bedding strongly disturbed by bioturbation, shelly fossil fragments.		
178.21 - 178.26		0.05	Coal: 30% vitreous, core broken.		
178.26 - 178.92		0.66	Sandstone: bioturbated, as above.		
178.92 - 178.94		0.02	Coal: 30% vitreous, core broken.		
178.94 - 179.57		0.63	Mudstone: dark grey, carbonaceous at face.		
179.57 - 179.62		0.05	Coal: dull, core broken.		
179.62 - 180.12		0.50	Mudstone: dark grey, carbonaceous phases, bright coal bands.		
180.12 - 180.19		0.07	Coal and Claystone: interbedded, core broken.		
180.19 - 180.32		0.13	Coal: dull, sheared, core broken.		
180.32 - 183.34		3.02	Mudstone: dark grey, carbonaceous phases.		
183.34 - 183.61		0.27	Coal: 50% vitreous, core intact.		
183.61 - 183.81		0.20	Coal and Claystone: interbedded.		
183.81 - 184.27		0.46	Mudstone: dark grey.		
184.27 - 185.59		1.32	Siltstone: dark grey, interbeds of light grey, fine grained sandstone near base.		
185.59 - 197.93		12.34	Mudstone: dark grey, scattered phases of light grey, medium grained sandstone.		
			<u>COAL SEAM B-9</u>		
197.93 - 198.19		0.26	Coal: 30% vitreous, core broken.		

MDD-78-23 (Cont'd.)

198.19 - 198.39	0.20	Coal: dull, core intact.															
198.39 - 198.61	0.22	Coal: 10% vitreous, core intact.															
198.61 - 198.99	0.38	Coal: 30% vitreous, core intact.															
198.99 - 199.21	0.22	Coal: dull, core intact.															
199.21 - 199.41	0.20	Coal: 30% vitreous, core intact.															
199.41 - 199.69	0.28	Coal: 50% vitreous, core intact.															
199.69 - 199.77	0.08	Claystone: carbonaceous.															
199.77 - 199.97	0.20	Coal: 70% vitreous, core intact.															
199.97 - 200.04	0.07	Coal: 50% vitreous, core intact.															
200.04 - 200.09	0.05	Coal: 30% vitreous, core intact															
200.09 - 200.16	0.07	Coal: stoney, core intact.															
200.16 - 200.43	0.27	Coal: 50% vitreous, core broken.															
		<table border="1"> <thead> <tr> <th><u>Samples:</u></th> <th><u>Interval</u></th> <th><u>Width</u></th> <th><u>Dry Ash</u></th> <th><u>F.S.I</u></th> </tr> </thead> <tbody> <tr> <td>0634:</td> <td>197.93-199.69</td> <td>1.76</td> <td>12.83</td> <td>3 1/2</td> </tr> <tr> <td>0635:</td> <td>199.69-200.43</td> <td>0.74</td> <td>26.92</td> <td>5 1/2</td> </tr> </tbody> </table>	<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I</u>	0634:	197.93-199.69	1.76	12.83	3 1/2	0635:	199.69-200.43	0.74	26.92	5 1/2
<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I</u>													
0634:	197.93-199.69	1.76	12.83	3 1/2													
0635:	199.69-200.43	0.74	26.92	5 1/2													
200.43 - 202.07	1.64	Sandstone: medium grained, light grey, cross bedded. BCA = 60°.															
202.07 - 204.03	1.96	Mudstone: dark grey, carbonaceous phases, bright coal bands.															
204.03 - 204.18	0.15	Coal: 30% vitreous, core intact.															
204.18 - 207.11	2.93	Mudstone: dark grey, carbonaceous phases.															
207.11 - 208.05	0.94	Sandstone: grey, silty.															
208.05 - 208.58	0.53	Mudstone: dark grey, carbonaceous at base.															
208.58 - 208.73	0.15	Coal: stoney.															
208.73 - 210.41	1.68	Mudstone: dark grey, siltstone phase in centre.															
210.41 - 210.49	0.08	Coal: stoney, core intact.															
210.49 - 210.59	0.10	Coal: 50% vitreous, core intact.															

MDD-78-23 (Cont'd.)

210.59 - 210.67	0.08	Claystone: carbonaceous.
210.67 - 210.81	0.14	Coal: stoney
210.81 - 210.95	0.14	Coal: 50% vitreous, core intact.
210.95 - 211.23	0.28	Claystone: carbonaceous, frequent bright coal bands.
211.23 - 212.27	1.04	Sandstone: grey, silty, abundant plant rootlets.
212.27 - 214.44	2.17	Sandstone: light grey, fine grained, with frequent irregular coaly inclusions and dark grey mudstone phases.
214.44 - 219.38	4.94	Mudstone: dark grey with occasional interbeds of light grey siltstone.
219.38 - 222.16	2.78	Sandstone: light grey, fine grained with interbeds of dark grey mudstone, cross bedded towards the base.
222.16 - 229.07	6.91	Sandstone: very coarse grained, light grey, large scale cross bedding, occasional pebble.
229.07 - 233.03	3.96	Conglomerate: light grey, granule, small matrix content, porous, coaly inclusions towards the base.
233.03 - 239.61	6.58	Mudstone: dark grey, carbonaceous phases, bright coal bands.
<u>COAL SEAM B-</u>		
239.61 - 239.67	0.06	Mudstone: carbonaceous, black.
239.67 - 239.80	0.13	Coal: 50% vitreous, core intact.
239.80 - 239.90	0.10	Coal: 30% vitreous, core intact.
239.90 - 239.98	0.08	Claystone: carbonaceous.
239.98 - 240.14	0.16	Coal: Dull, core intact.
240.14 - 240.28	0.14	Coal: 50% vitreous, core intact.
240.28 - 240.41	0.13	Coal: 30% vitreous, core broken.

MDD-78-23 (Cont'd.)

240.41 - 240.49	0.08	Coal: 30% vitreous, core intact.																				
240.49 - 240.71	0.22	Coal: 50% vitreous, core intact.																				
240.71 - 240.77	0.06	Claystone: carbonaceous, core broken.																				
240.77 - 240.85	0.08	Coal: dull, core broken.																				
240.85 - 241.16	0.31	Claystone: carbonaceous.																				
241.16 - 241.29	0.13	Coal: Dull, core intact.																				
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<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>																		
0636:	239.61-239.98	0.37	34.27	5																		
0637:	239.98-240.71	0.73	14.86	6 1/2																		
0638:	240.71-241.29	0.58	58.82	3																		
241.29 - 241.56	0.27	Claystone: carbonaceous, bright coal bands.																				
241.56 - 248.54	6.98	Mudstone: dark grey, occasional interbeds of light grey siltstone, carbonaceous at base.																				
248.54 - 248.61	0.07	Coal: Dull, core broken.																				
248.61 - 248.73	0.12	Mudstone: carbonaceous.																				
248.73 - 248.79	0.06	Coal: 50% vitreous, core intact.																				
248.79 - 248.83	0.04	Mudstone: dark grey.																				
248.83 - 248.92	0.09	Coal: 50% vitreous, core intact.																				
248.92 - 248.96	0.04	Coal: 50% vitreous, core broken.																				
248.96 - 250.70	1.74	Mudstone: dark grey.																				
250.70 - 250.81	0.11	Coal: 50% vitreous, core intact.																				
250.81 - 252.44	1.63	Mudstone: dark grey, carbonaceous phases with large bright coal bands.																				
252.44 - 252.52	0.08	Mudstone: as above, core pulverized and mixed with bright coal.																				
252.52 - 252.56	0.04	Coal: 50% vitreous, core intact.																				
252.56 - 252.69	0.13	Coal: 50% vitreous, core broken and crushed.																				

MDD 78-23 (Cont'd.)

252.69 - 253.34	0.65	Mudstone: dark grey.
253.34 - 253.43	0.09	Coal: 70% vitreous, core pulverized.
253.43 - 275.92	22.49	Siltstone: grey with frequent interbeds, dark grey mudstone and light grey, fine grained sandstone. BCA = 65°
<u>COAL SEAM B-5</u>		
275.92 - 276.08	0.16	Coal and Claystone: core broken and badly mixed.
276.08 - 276.46	0.38	Claystone: carbonaceous, black, numerous bright coal bands.
276.46 - 276.62	0.16	Coal: 50% vitreous, core broken.
276.62 - 276.64	0.02	Claystone: carbonaceous..
276.64 - 276.68	0.04	Coal: 50% vitreous, sheared.
276.63 - 276.73	0.05	Claystone: carbonaceous.
276.73 - 276.87	0.14	Coal: Dull, core broken.
276.87 - 276.90	0.03	Claystone: carbonaceous.
276.90 - 277.06	0.16	Coal: dull, core broken.
277.06 - 277.09	0.03	Coal: bright, core pulverized.
277.09 - 277.15	0.06	Coal: 50% vitreous, core intact.
277.15 - 277.21	0.06	Coal: stoney, core intact.
277.21 - 277.47	0.26	Coal: 70% vitreous, core broken.
277.47 - 277.55	0.08	Coal: 30% vitreous, core intact.
277.55 - 277.67	0.12	Coal: dull, core broken.
277.67 - 277.87	0.20	Coal: 50% vitreous, core broken.

MDD-78-23 (Cont'd.)

277.87 - 277.90	0.03	Coal: 70% vitreous, core intact.
277.90 - 277.98	0.08	Coal: dull, core intact.
277.98 - 278.19	0.21	Claystone: carbonaceous.
278.19 - 278.28	0.09	Coal: dull, core broken.
278.28 - 278.31	0.03	Claystone: carbonaceous.
278.31 - 278.40	0.09	Coal: 50% vitreous, sheared.
		<u>Samples:</u> <u>Interval</u> <u>Width</u> <u>Dry Ash</u> <u>F.S.I.</u>
		0639: 275.92-276.90 0.98 74.88 N/A
		0640: 276.90-277.98 1.08 23.87 4 1/2
		0641: 277.98-278.40 0.42 52.83 1 1/2
278.40 - 284.96	5.56	Mudstone: dark grey with frequent phases of carbonaceous claystone with large bright coal bands.
283.96 - 319.96	36.00	Mudstone: dark grey with occasional interbeds of light grey siltstone. BCA = 70 ⁰ .
319.96 - 321.68	1.72	Mudstone: dark grey, carbonaceous phases.
		<u>COAL SEAM B-4</u>
321.68 - 321.86	0.18	Coal: dull, core intact.
321.86 - 321.91	0.05	Coal: dull, core pulverized.
321.91 - 322.00	0.09	Coal: dull, core intact.
322.00 - 322.21	0.21	Coal: 50% vitreous.
322.21 - 322.26	0.05	Coal: bright, core intact.
322.26 - 322.33	0.07	Coal: 30% vitreous, core broken.
322.33 - 322.78	0.45	Mudstone: dark grey, sheared.
322.78 - 323.04	0.26	Coal: dull, core broken, with 30% carbonaceous mudstone.
323.04 - 323.52	0.48	Coal: soft, 70% vitreous, sheared, core broken and crushed.
323.52 - 324.24	0.72	Coal: 20% vitreous, dull, fairly high specific gravity, core broken.

MDD-78-23 (Cont'd.)

324.24 - 324.58	0.34	Mudstone: carbonaceous.
324.58 - 324.83	0.25	Coal: 10% vitreous, interbedded with very thin carbonaceous mudstone bands.
324.83 - 325.09	0.26	Coal: 40% vitreous, core pulverized.
325.09 - 325.48	0.39	Mudstone: carbonaceous, core broken.
325.48 - 325.84	0.36	Coal: vitreous, core broken and crushed.
325.84 - 325.93	0.09	Coal: 30% vitreous, dirty.
325.93 - 326.04	0.11	Coal: vitreous.
326.04 - 326.94	0.90	Coal: 10% vitreous, dull, broken in large pieces.
326.94 - 327.52	0.58	Coal: 20% vitreous, core broken in large pieces.
327.52 - 327.85	0.33	Coal: 40% vitreous, core pulverized (recovered 10 cm.)
327.85 - 328.23	0.38	Coal: 20% vitreous, dull, with minute bands of dirty coal.
328.23 - 328.47	0.24	Coal: dirty.
328.47 - 328.53	0.06	Mudstone: carbonaceous.
328.53 - 328.84	0.31	Coal: 50% vitreous.
328.84 - 329.74	0.90	Coal: 30% vitreous, core broken in large pieces.
329.74 - 329.90	0.16	Coal: 30% vitreous, core broken and crushed.

<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0642:	321.68-322.33	0.65	16.15	5
0643:	322.33-323.04	0.71	78.51	N/A
0644:	323.04-324.24	1.20	30.72	3 1/2
0645:	324.24-325.09	0.85	19.11	6
0646:	325.09-325.48	0.39	57.73	1 1/2
0647:	325.48-326.04	0.56	18.53	4
0648:	326.04-328.23	2.19	11.17	4 1/2
0649:	328.23-328.53	0.30	10.06	7
0650:	328.53-329.90	1.37	5.38	7 1/2

329.90 - 330.20	0.30	Mudstone: carbonaceous, sheared, plant fossil fragments. BCA = 67°.
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MDD-78-23 (Cont'd.)

330.20 - 334.94	4.74	Mudstone: coaly rootlets throughout. BCA = 66°.
334.94 - 335.08	0.14	Mudstone: carbonaceous, sheared. BCA = 64°.
<u>COAL SEAM B-3</u>		
335.08 - 335.23	0.15	Coal: dirty.
335.23 - 335.52	0.29	Coal: 20% vitreous, clean.
335.52 - 335.63	0.11	Coal: 70% vitreous, clean.
335.63 - 336.15	0.52	Coal: 30% vitreous, core broken in large pieces.
336.15 - 336.39	0.24	Coal: 50% vitreous, core broken in large pieces.
336.39 - 336.60	0.21	Mudstone: carbonaceous at top.
336.60 - 337.05	0.45	Coal: 30% vitreous, clean, core broken in large pieces.
337.05 - 337.10	0.05	Coal: dull, dirty.
337.10 - 337.80	0.70	Coal: 30% vitreous, clean, core broken in large pieces.
337.80 - 338.00	0.20	Mudstone: carbonaceous.
338.00 - 338.14	0.14	Coal: 50% vitreous, core broken and crushed.
338.14 - 338.78	0.64	Coal: 60% vitreous, core broken in large pieces.
338.78 - 339.09	0.31	Mudstone.
339.09 - 339.17	0.08	Coal: 40% vitreous, core broken and crushed.
339.17 - 339.36	0.19	Mudstone.
339.36 - 339.96	0.60	Coal: dull with clean vitreous 2 cm. bands, core broken in large pieces.

<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I</u>
0651:	335.08-336.39	1.31	8.92	7 1/2
0652:	336.39-336.60	0.21	79.93	N/A
0653:	336.60-337.80	1.20	13.00	5 1/2
0654:	337.80-338.00	0.20	76.02	1
0655:	338.00-338.78	0.78	6.30	8
0656:	338.78-339.36	0.58	80.84	1
0657:	339.36-339.96	0.60	12.47	7 1/2

MDD-78-23 (Cont'd.)

339.96 - 341.31	1.35	Mudstone: carbonaceous. BCA = 72° - 75°.
341.31 - 346.60	5.29	Sandstone: medium grained, rare pebble, occasional mud clast. BCA = 70°.
346.60 - 347.55	0.95	Conglomerate: pebble with coarse grained sandstone phases.
347.55 - 350.84	3.29	Sandstone: fine to medium grained.
350.84 - 350.91	0.07	Conglomerate: pebble, high matrix.
350.91 - 352.65	1.74	Sandstone: fine grained.
352.65 - 354.33	1.68	Mudstone: BCA = 69°.
354.33 - 354.41	0.08	Coal: pulverized.
354.41 - 355.00	0.59	Mudstone.
355.00 - 355.30	0.30	Coal: dull, 30% vitreous.
355.30 - 363.45	8.15	Mudstone: with sandy lenses. BCA = 70°.
363.45 - 367.89	4.44	Sandstone: cross bedded, finely laminated, coarsens downward.
367.89 - 368.85	0.96	Sandstone: coarse grained, massive.
368.85 - 372.57	3.72	Sandstone: coarse grained, with large mud clasts, massive. BCA = 72°.
372.57 - 373.99	1.42	Sandstone: coarse grained, carbonaceous partings.
373.99 - 374.91	0.92	Conglomerate: granular, chert grains.
374.91 - 375.30	0.39	Mudstone.
375.30 - 375.60	0.30	Conglomerate: granular, chert grains.
375.60 - 379.73	4.13	Siltstone: occasional mudstone and fine grained sandstone interbeds.
379.73 - 379.88	0.15	Mudstone: plant fossil fragments.
379.88 - 380.13	0.25	Coal: 30% vitreous, dull, broken.
380.13 - 381.11	0.98	Mudstone: BCA = 80°.

MDD-78-23 (Cont'd.)

COAL SEAM B-1

381.11 - 381.60	0.49	Coal: dirty, core pulverized, recovered 15 cm.
381.60 - 381.69	0.09	Mudstone: carbonaceous.
381.69 - 382.66	0.97	Coal: 60% vitreous, clean, blocky.

<u>Samples:</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0658:	381.11-381.60	0.49	82.33	N/A
0659:	381.60-381.69	0.09	42.07	3 1/2
0660:	381.69-382.66	0.97	6.90	7 1/2

382.66 - 382.72	0.06	Mudstone.
382.72 - 382.82	0.10	Mudstone: carbonaceous.
382.82 - 383.19	0.37	Mudstone: blocky, core broken.
383.19 - 384.19	1.00	Mudstone: some sandy lenses. BCA = 81°.
384.19 - 392.28	8.09	Sandstone: medium grained, well sorted. BCA = 77°.

P A C I F I C P E T R O L E U M S L T D.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MDD 78-24

LOCATION:

- (a) Coal Licence: 3227
- (b) N.T.S. 93-I-15, c-50-B
- (c) Drill Hole Co-ordinates: N 1012.45 - E 16568.79
- (d) Elevation: 1012.45m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing pulled

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B4
TOTAL DEPTH: 261.2m

DATE DRILLED: Sept. 25 - 28, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 80.92	80.92	CASING
		<u>GATES MEMBER - COMMOTION FORMATION</u>
80.92 - 97.32	16.40	Sandstone: medium grained to fine grained, light grey, dark grey siltstone bands and phases throughout, brecciated, numerous irregular coaly rootlets throughout, minor shears, minor cross-bedding, near base of interval highly bioturbated with brown mud casts, plant fossil fragments, core broken throughout. BCA = 56° - 62°
97.32 - 114.75	17.43	Siltstone: dark grey, with minor (less than 5%) fine grained sandstone interbeds, occasional brown mud casts, occasional plant fossil fragment, grades to a carbonaceous mudstone towards base of interval, minute fractures throughout, core intact. BCA = 62°
		COAL SEAM B4
114.75 - 114.81	0.06	Coal: Dull, 10% vitreous bands, core broken, fairly high specific gravity.
114.81 - 114.91	0.10	Coal: 75% vitreous, metallic lustre, core intact.
114.91 - 115.00	0.09	Mudstone: carbonaceous, bright coal bands.
115.00 - 115.22	0.22	Coal: 30% vitreous, metallic lustre, hard, core intact.
115.22 - 115.66	0.44	Mudstone: carbonaceous, small coaly rootlets throughout, core intact.
115.66 - 115.73	0.07	Coal: 20% vitreous, hard, metallic lustre, fairly high specific gravity.
115.73 - 115.85	0.12	Coal: 20% vitreous (minute bands), dull, hard, core intact.
115.85 - 115.95	0.10	Coal: 40% vitreous, metallic lustre, hard, core intact.
115.95 - 116.05	0.10	Coal: 40% vitreous, metallic lustre, hard, core intact.
116.05 - 116.11	0.06	Coal: 10% vitreous, dull, core intact.

MDD 78-24 (con't.)

116.11 - 116.14	0.03	Mudstone: coaly, sheared, core intact.
116.14 - 116.31	0.17	Coal: 30% vitreous, core intact, dull, shear
116.31 - 116.39	0.08	Coal: 70% vitreous, core intact.
116.39 - 116.51	0.12	Coal: 75% vitreous, metallic lustre, core intact.
116.51 - 116.56	0.05	Mudstone: carbonaceous, core intact.
116.56 - 116.78	0.22	Coal: 40% vitreous, hard, metallic lustre, core intact, sheared.
116.78 - 117.08	0.30	Coal: 70% vitreous, earthy lustre, core intact.
117.08 - 117.31	0.23	Mudstone: carbonaceous, core intact.
117.31 - 117.73	0.42	Coal: 90% vitreous, metallic lustre, minor shears, core intact.
117.73 - 117.92	0.19	Coal: Core missing.
117.92 - 118.16	0.24	Mudstone: carbonaceous, sheared.
118.16 - 118.52	0.36	Coal: 90% vitreous, core broken.
118.52 - 118.57	0.05	Coal: coaly mudstone, core intact.
118.57 - 118.81	0.24	Coal: 70% vitreous, metallic lustre, core intact.
118.81 - 118.88	0.07	Coal: 40% vitreous, soft, sheared.
118.88 - 119.03	0.15	Mudstone: carbonaceous, sheared.
119.03 - 121.01	1.98	Coal: 30% vitreous, metallic lustre, core pulverized, recovered 52 cm.
121.01 - 121.56	0.55	Coal: Core missing.
121.56 - 121.67	0.11	Mudstone: carbonaceous.
121.67 - 121.85	0.18	Coal: 80% vitreous, metallic lustre, core broken.
121.85 - 121.89	0.04	Coal: coaly sandstone.
121.89 - 122.02	0.13	Coal: 30% vitreous, dull, core intact.
122.02 - 122.30	0.28	Coal: 80% vitreous, core broken.
122.30 - 122.54	0.24	Coal: dull, hard, core intact.

MDD 78-24 (con't.)

122.54 - 123.14	0.60	Coal: 70% vitreous, metallic lustre, core broken in large pieces, recovered 4 cm.
123.14 - 123.16	0.02	Mudstone: carbonaceous.
123.16 - 123.54	0.38	Coal: 30% vitreous, hard, metallic lustre, core broken.
123.54 - 123.72	0.18	Coal: 80% vitreous, core intact.
123.72 - 123.93	0.21	Coal: dull, hard, core intact.
123.93 - 124.17	0.24	Coal: 30% vitreous, metallic lustre.
124.17 - 124.56	0.39	Core missing.
124.56 - 124.94	0.38	Coal: 40% vitreous, metallic lustre, core broken in large pieces.
124.94 - 125.42	0.48	Coal: 80% vitreous, metallic lustre.
125.42 - 125.70	0.28	Coal: 40% vitreous, earthy lustre, core intact.
125.70 - 125.88	0.18	Coal: 80% vitreous, earthy lustre.
125.88 - 126.44	0.56	Coal: 60% vitreous, earthy lustre, core broken in large pieces.
126.44 - 127.10	0.66	Core missing.

Samples	Interval	Width	Dry Ash	F.S.I.
0694:	114.75 - 114.91	0.16	39.4	1 1/2
0695:	114.91 - 115.66	0.75	82.2	N.A.
0696:	115.66 - 117.08	1.42	39.1	2 1/2
0697:	117.08 - 117.31	0.23	87.1	N.A.
0698:	117.31 - 117.92	0.61	11.3	8 1/2
0699:	117.92 - 118.16	0.24	81.8	N/A
0700:	118.16 - 118.81	0.65	12.7	9
0701:	118.81 - 121.01	2.20	37.9	3 1/2
0702:	121.01 - 122.54	1.53	23.0	5 1/2
0703:	122.54 - 123.14	0.60	8.1	7

MDD 78-24 (con't.)

		0704:	123.14 - 123.93	0.79	22.6	1
		0705:	123.93 - 125.88	1.95	5.7	7 1/2
		0706:	125.88 - 127.10	1.22	6.3	7 1/2
127.10 - 128.10	1.00	Siltstone: dark grey, carbonaceous, grades to unit at base				
128.10 - 147.17	19.07	Sandstone: fine to medium grained, light grey, occasional siltstone interbed or phase, carbonaceous partings, minor cross bedding, minor shears and calcite filled fractures. BCA = 58 ⁰				
147.17 - 149.22	2.05	Mudstone: carbonaceous, small coaly bands throughout, sheared, listric surfaces, core intact				
		COAL SEAM B3				
149.22 - 149.97	0.75	Coal: 30% vitreous, metallic lustre, last 10 cm high specific gravity, core broken				
149.97 - 150.20	0.23	Coal: 80% vitreous, core broken in large pieces				
150.20 - 150.34	0.14	Coal: 40% vitreous, earthy lustre, sheared, core broken				
150.34 - 150.73	0.39	Coal: 40% vitreous, metallic lustre, sheared, core intact				
150.73 - 151.18	0.45	Coal: 70% vitreous, earthy lustre, core intact				
151.18 - 151.51	0.33	Mudstone: carbonaceous, sheared, core intact				
151.51 - 151.60	0.09	Coal: 30% vitreous, dull earthy lustre, core intact				
151.60 - 151.84	0.24	Coal: 60% vitreous, metallic lustre, core intact				
151.84 - 152.10	0.26	Coal: 30% vitreous, earthy lustre, core intact				
152.10 - 152.19	0.09	Coal: 40% vitreous, hard, metallic lustre, core intact				
152.19 - 152.59	0.40	Coal: 80% vitreous, earthy lustre, core intact				
152.59 - 152.69	0.10	Coal: 30% vitreous, dull, sheared, core intact				

MDD 78-24 (con't.)

152.69 - 152.83	0.14	Mudstone: carbonaceous, core intact
152.83 - 153.38	0.55	Coal: 70% vitreous, earthy lustre, core intact
153.38 - 153.59	0.21	Coal: 30% vitreous, dull, earthy lustre core intact
153.59 - 153.66	0.07	Coal: dull, core intact
153.66 - 153.86	0.20	Mudstone: carbonaceous, coaly, sheared, core intact
153.86 - 154.00	0.14	Coal: 10% vitreous, earthy lustre, sheared, core intact
154.00 - 154.33	0.33	Coal: 40% vitreous, earthy lustre, core broken
154.33 - 154.48	0.15	Coal: 80% vitreous, core broken
154.48 - 154.60	0.12	Mudstone: coaly, high specific gravity
154.60 - 154.71	0.11	Coal: 20% vitreous, earthy lustre
154.71 - 154.79	0.08	Coal: 80% vitreous, core pulverized

Samples	Interval	Width	Dry Ash	F.S.I.
0707:	149.22 - 151.18	1.96	4.6	8
0708:	151.18 - 151.51	0.33	86.2	N/A
0709:	151.51 - 152.69	1.18	10.1	7
0710:	152.69 - 152.83	0.14	78.7	1/2
0711:	152.83 - 153.59	0.76	4.9	9
0712:	153.59 - 154.33	0.74	37.0	6 1/2
0713:	154.33 - 154.79	0.46	58.1	2 1/2

154.79 - 157.00	2.21	Siltstone: some carbonaceous intervals, core intact
157.00 - 159.10	2.10	Sandstone: fine grained, medium, grey, carbonaceous partings

MDD 78-24 (cont'd.)

159.10 - 163.68	4.58	Sandstone: fine grained, medium grey, carbonaceous partings, occasional siltstone phase, some small coaly rootlets. BCA = 76 ^o
163.68 - 165.60	1.92	Sandstone: fine to medium grained, light grey massive clean
165.60 - 169.77	4.17	Same as above.
169.77 - 169.95	0.18	Conglomerate: dark grey, pebble, high sand and coal matrix COAL SEAM B2
169.95 - 170.45	0.50	Coal: 80% vitreous, metallic lustre, core intact
170.45 - 170.54	0.09	Coal: 40% vitreous, earthy lustre, core intact
		Sample Interval Width Dry Ash F.S.I.
		0714: 169.95 - 170.54 0.59 11.3 1
170.54 - 171.34	0.80	Siltstone: interbedded with fine grained sandstone, carbonaceous partings
171.34 - 180.77	9.43	Sandstone: medium grained, medium grey, carbonaceous partings in bedding, rare coaly rootlet. BCA = 76 ^o
180.77 - 181.18	0.41	Mudstone: core intact, some small bright coal bands
181.18 - 181.27	0.09	Siltstone: carbonaceous, numerous small bright bands, core intact
181.27 - 181.47	0.20	Coal: 30% vitreous, earthy lustre, core broken
181.47 - 181.49	0.02	Mudstone: sheared, broken
181.49 - 181.67	0.18	Coal: dull, 10% small vitreous bands, fairly high specific gravity, core broken
181.67 - 182.00	0.33	Siltstone and fine grained Sandstone: dark grey, sheared, carbonaceous partings, core broken
182.00 - 182.10	0.10	Mudstone: coaly
182.10 - 182.30	0.20	Coal: dull, sheared, core pulverized
182.30 - 182.41	0.11	Siltstone: carbonaceous, sheared
182.41 - 182.57	0.16	Coal: sheared, dull, high specific gravity, core broken

MDD 78-24 (cont'd.)

		Sample	Interval	Width	Dry Ash	F.S.I.
		0715:	181.27 - 182.57	1.30	81.8	7 1/2
182.57 - 192.80	10.23					
						Sandstone: -medium grained, medium grey, carbonaceous partings on bedding, occasional calcite filled fracture, core broken BCA = 54 ^o
192.80 - 197.16	4.36					
						Mudstone: with fine grained sandstone, phases, sheared heavily, carbonaceous partings, core broken and crushed
						COAL SEAM B1
197.16 - 197.20	0.04					
						Coal: vitreous, core pulverized
197.20 - 197.21	0.01					
						Siltstone: sheared
197.21 - 198.73	1.52					
						Coal: 30% vitreous, earthy lustre, heavily sheared, core pulverized, recovered 42 cm.
198.73 - 200.25	1.52					
						Coal: 30% vitreous, dull, core pulverized, recovered 26 cm.
		Sample	Interval	Width	Dry Ash	F.S.I.
		0716:	197.16 -	3.09	19.1	3
200.25 - 203.00	2.75					
						Mudstone: sheared, listric surfaces, small coal bands (0.5 cm) throughout, core broken and crushed
203.00 - 203.30	0.30					
						Mudstone: dark grey, core intact
203.30 - 207.18	3.88					
						Sandstone: fine grained, occasional mudstone phase, sheared, bioturbated, some small coaly rootlets, minor cross bedding, core broken. BCA = 38 ^o
207.18 - 230.73	23.55					
						Sandstone: medium grained, light grey, carbonaceous partings along bedding calcite filled fractures, sheared, sandstone fines downward, minor cross bedding. BCA = 32 ^o
230.73 - 251.40	20.67					
						Sandstone: fine grained, light grey, occasional carbonaceous partings on bedding, minor shearing, some small calcite filled fractures at base of interval. BCA = 16 ^o - 22 ^o
251.40 - 261.21	9.81					
						Sandstone: fine grained, light grey, sheared, 10% siltstone interbeds, some brecciated intervals, occasional calcite filled fracture, rare carbonaceous parting, minor cross bedding. BCA = 38 ^o

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MSD 78-25

LOCATION:

- (a) Coal Licence: 3142
- (b) N.T.S. 93-I-8, c-20-F
- (c) Drill Hole Co-ordinates: N 24900± - E 70600± (not surveyed)
- (d) Elevation: 1440±m

AZIMUTH & INCLINATION: Vertical
CORE SIZE: NQ (22.2mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Boulder Creek Member
COAL SEAMS INTERSECTED: None
TOTAL DEPTH: 346.56m

DATE DRILLED: Aug. 31 - Sept. 9, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia and G. Jordan

GEOPHYSICAL LOGS: None

MSD 77-25

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 21.12	21.12	CASING
<u>SHAFTESBURY FORMATION</u>		
21.12 - 93.40	72.28	Siltstone: dark grey, minor interbeds of fine grained sandstone (less than 10%), rare coalified rootlets and carbonaceous specks, some pyrite nodules towards base of interval, bedding indistinct in some intervals - swirls of fine grained sandstone, core intact. BCA = 68°
93.40 - 125.49	32.09	Siltstone: interbedded with fine grained sandstone pyrite specks and nodules (up to 0.5 cm in diameter) throughout, minor flow features; sandstone content increases from 10% at top of interval to 20% at base of interval, core intact. BCA = 67°
125.49 - 176.18	50.69	Siltstone: interbedded with fine grained sandstone, sandstone increases from 20% at top of interval to 40% at base of interval, rare carbonaceous speck, minor shearing, listric surfaces, shears along bedding planes, minor flow features, core intact. BCA = 67°
<u>BOULDER CREEK MEMBER - COMMOTION FORMATION</u>		
176.18 - 176.27	0.09	Conglomerate: dark grey pebble, subrounded pebbles of grey and brown chert.
176.27 - 183.94	7.67	Claystone: grey, sandy, abundant plant remains throughout, strongly bioturbated, zone of pyritized worm burrows near top of interval.
183.94 - 191.06	7.12	Sandstone: fine to medium grained, light grey, grain size increases towards the base, cross bedded, carbonaceous partings on bedding, coal partings and inclusions near base. BCA = 65°
191.06 - 193.83	2.77	Conglomerate: light grey, granule, pebble conglomerate bands throughout, grey and white chert and argillite.
193.83 - 200.66	6.83	Conglomerate: light grey, pebble, subrounded pebbles of grey, black and white chert and argillite, calcite cement, matrix 20%.

MSD 77-25 (cont'd.)

200.66 - 201.03	0.37	Sandstone: fine grained, dark grey, with irregular interbeds of dark grey siltstone.
201.03 - 202.92	1.89	Conglomerate: light grey, granular with phases of pebble conglomerate throughout, pebbles of grey, white, black, pink and green chert and argillite.
202.92 - 206.04	3.12	Sandstone: light grey, medium grained, massive, very clean.
206.04 - 214.28	8.24	Conglomerate: light grey, pebble, phases of medium grained sandstone at top, rounded to subrounded pebbles of grey, white, pink and green chert and argillite, abrupt basal contact.
214.28 - 215.56	1.28	Claystone: dark grey, silty at base, characterized by veins and inclusions of hematite (Red Ochre) throughout, irregular slickensides throughout, grades to unit at base.
215.56 - 218.61	3.05	Siltstone: dark grey, sandy, irregular slickensides near top, grades to unit at base.
218.61 - 225.57	6.96	Sandstone: medium grained, dark grey, with irregular interbeds of dark grey siltstone throughout.
225.57 - 230.36	4.79	Sandstone: medium to coarse grained, grain-size increases towards the base, cross bedded, fine carbonaceous partings on bedding, few phases of sedimentary breccia. BCA = 70°
230.36 - 232.39	2.03	Conglomerate: pebble, light grey, rounded pebbles of grey, white and black chert and argillite, medium grained, light grey sandstone phases throughout, large irregular coal bands and inclusions at top.
232.39 - 234.19	1.80	Sandstone: grey, fine grained with irregular interbeds of dark grey siltstone throughout.
234.19 - 235.16	0.97	Claystone: carbonaceous, black, with bright coal bands.
235.16 - 237.44	2.28	Siltstone: grey, with phases and interbeds of fine grained sandstone throughout, grades to cross bedded sandstone at base, phases of carbonaceous claystone.

MSD 77-25 (cont'd.)

237.44 - 239.34	1.90	Claystone: carbonaceous, black with a few phases of grey mudstone.
239.34 - 239.85	0.51	Siltstone: dark grey, sandy, massive, strongly bioturbated, coalified plant fragments and rootlets throughout.
239.85 - 240.98	1.13	Claystone: carbonaceous, black, coal inclusions, slickensides on fractures.
240.98 - 241.04	0.06	Coal: bright, core pulverized.
241.04 - 244.20	3.16	Sandstone: grey, fine grained, interbeds of dark grey siltstone, plant fragments throughout, carbonaceous at top.
244.20 - 244.83	0.63	Claystone: carbonaceous, black.
244.83 - 246.29	1.46	Siltstone: dark grey, plant rootlets throughout, strongly bioturbated.
246.29 - 249.23	2.94	Claystone: carbonaceous, black, coal bands and inclusions.
249.23 - 249.36	0.13	Coal and Claystone: strongly sheared and mixed.
249.36 - 249.87	0.51	Claystone: carbonaceous, as above.
249.87 - 250.83	0.96	Siltstone: grey, massive, plant rootlets throughout, strongly bioturbated.
250.83 - 252.07	1.24	Sandstone: fine grained, grey, massive, plant rootlets throughout.
252.07 - 255.96	3.89	Siltstone: dark grey, carbonaceous phases, plant rootlets throughout.
255.96 - 274.02	18.06	Claystone: carbonaceous, black, numerous thick, bright coal bands, pyritized worm burrows near base.
274.02 - 275.44	1.42	Sandstone: medium grained, grey, with interbeds of carbonaceous claystone in the lower half. BCA = 65°
275.44 - 276.51	1.07	Mudstone: dark grey, grey siltstone interbeds near top, concretions near base.
276.51 - 279.07	2.56	Sandstone: grey, medium grained with frequent phases and intervals of carbonaceous claystone, bedding very irregular, coalified plant rootlets at base.

MSD 77-25 (cont'd.)

279.07 - 296.70	17.63	Conglomerate: granule, light grey, grains of grey, white, green, and black chert, very small matrix content, large pebbles at base.
296.70 - 300.44	3.74	HULCROSS MEMBER - COMMOTION FORMATION Sandstone: medium to coarse grained, cross bedded, interbeds of carbonaceous claystone, strongly bioturbated in centre with shelly fossil fragments.
300.44 - 304.67	4.23	Claystone: black, phases of abundant shelly fossils.
304.67 - 308.06	3.39	GATES MEMBER - COMMOTION FORMATION Claystone: carbonaceous, black with frequent large bright coal bands.
308.06 - 309.67	1.61	Claystone: medium grey, massive with abundant plant rootlets throughout.
309.67 - 310.41	0.74	Claystone: carbonaceous, black with frequent bright coal bands.
310.41 - 310.49	0.08	Coal: 30% vitreous, sheared, core intact.
310.49 - 310.77	0.28	Coal: 10% vitreous, sheared, core intact.
310.77 - 310.87	0.10	Coal: 30% vitreous, sheared, core intact.
310.87 - 310.93	0.06	Claystone: carbonaceous.
310.93 - 311.01	0.08	Coal: 30% vitreous, sheared, core intact.
311.01 - 311.38	0.37	Claystone: dark grey, heavily sheared towards the base.
311.38 - 311.86	0.48	Coal: 40% vitreous, heavily sheared, core broken.
311.86 - 314.26	2.40	Siltstone: grey, with frequent regular interbeds of fine grained sandstone. BCA = 68°
314.26 - 314.41	0.15	Claystone: carbonaceous, black.
314.41 - 314.66	0.25	Coal: 50% vitreous, minor shearing, core intact.
314.66 - 315.35	0.69	Claystone: carbonaceous, black with frequent large bright coal bands.
315.35 - 323.94	8.59	Sandstone: medium grained, light grey, cross bedded with frequent interbeds of dark grey sandstone. BCA = 63°
323.94 - 325.85	1.91	Mudstone: dark grey, plant rootlets in top half of interval.
325.85 - 328.90	3.05	Claystone: carbonaceous, black with frequent bright coal bands.

MSD 77-25 (cont'd.)

328.90 - 346.56

17.66

Sandstone: medium grained, light grey,
cross bedded, with frequent phases of
dark grey siltstone throughout.

E.O.H.

PACIFIC PETROLEUMS LTD.

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MND 78-26

LOCATION:

- (a) Coal Licence: 3138
- (b) N.T.S. 93-I-8, b-96-C
- (c) Drill Hole Co-ordinates: N 23235 - E 64110
- (d) Elevation: 1609.5m

AZIMUTH & INCLINATION: 050°, -72°
CORE SIZE: NQ (22.2mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Minnes Group
COAL SEAMS INTERSECTED: None
TOTAL DEPTH: 387.4m

DATE DRILLED: Sept. 14 - 23, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: G. Jordan

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 3.24	3.24	CASING
		<u>CADOMIN FORMATION</u>
3.24 - 9.72	6.48	Conglomerate: light grey, pebble, rounded grains of grey, white and pink chert and argillite, some phases of coarse grained light grey sandstone.
9.72 - 11.58	1.86	Sandstone: light grey, medium grained, cross bedded, clean, few large pebbles near base.
11.58 - 13.73	2.15	Conglomerate: light grey, pebble, as above.
		<u>MINNES GROUP</u>
13.73 - 14.19	0.46	Mudstone: dark grey, carbonaceous at top, core broken.
14.19 - 14.55	0.36	Siltstone: light grey, massive.
14.55 - 16.21	1.66	Mudstone: grey, carbonaceous at top, silty towards base.
16.21 - 17.58	1.37	Sandstone: grey, very fine grained, massive.
17.58 - 23.34	5.76	Sandstone: medium grained, light grey, cross bedded, few phases of coaly rootlets.
23.34 - 23.57	0.23	Conglomerate: granule, light grey, little matrix, abundant carbonaceous cement.
23.57 - 28.77	5.20	Mudstone: dark grey, carbonaceous, massive.
28.77 - 29.05	0.28	Sandstone: coarse grained, light grey, massive, few small pebble bands.
29.05 - 32.61	3.56	Conglomerate: grey, pebble, subangular fragments of grey and white chert, large irregular coaly inclusions, abundant sandstone matrix.
32.61 - 34.10	1.49	Sandstone: light grey, medium grained, massive, few large coaly inclusions.

MND 78-26 (Cont'd.)

34.10 - 35.00	0.90	Conglomerate: pebble, as above.
35.00 - 35.62	0.62	Sandstone: medium grained, as above.
35.62 - 42.10	6.48	Mudstone: dark grey, few silty phases.
42.10 - 43.35	1.25	Sandstone: very fine grained, light grey, dark grey mudstone interbeds, coaly inclusions near the base.
43.35 - 43.60	0.25	Claystone: carbonaceous, black, bright coal bands.
43.60 - 50.32	6.72	Siltstone: medium grey, with frequent phases of light grey medium grained sandstone. BCA = 83°.
50.32 - 58.07	7.75	Sandstone: medium grained, light grey, coarser towards base, cross bedded, clean, small scale folding or slumping at top of interval.
58.07 - 59.20	1.13	Conglomerate: light grey, granule, sub-angular grains of grey and white chert, very large sandstone matrix.
59.20 - 60.53	1.33	Sandstone: light grey, coarse grained, frequent pebble bands throughout.
60.53 - 65.70	5.17	Mudstone: dark grey, frequent small carbonaceous phase with bright coal bands.
65.70 - 72.14	6.44	Siltstone: grey, with frequent fine grained sandstone phases and interbeds throughout. BCA = 78°.
72.14 - 73.50	1.36	Sandstone: light grey, medium grained, fine carbonaceous partings on bedding. BCA = 79°.
73.50 - 75.91	2.41	Mudstone: dark grey, with frequent light grey, sandstone and siltstone interbeds, bedding slumped in places.
75.91 - 81.47	5.56	Sandstone: fine grained, occasional thin siltstone interbeds.

MND 78-26 (Cont'd.)

81.47 - 83.95	2.48	Conglomerate: grey, pebble, rounded pebbles of grey, white, and black chert, abundant sandstone matrix.
83.95 - 83.98	0.03	Coal: 30% vitreous, core intact.
83.98 - 84.03	0.05	Claystone: carbonaceous, black.
84.03 - 84.15	0.12	Coal: 50% vitreous, core broken.
84.15 - 84.28	0.13	Claystone: carbonaceous, black.
84.28 - 84.32	0.04	Coal: 50% vitreous, core broken.
84.32 - 84.43	0.11	Core loss.
84.43 - 85.93	1.50	Claystone: carbonaceous, black, bright coal bands, thin grey mudstone interbeds.
85.93 - 86.16	0.23	Coal and claystone: interbedded, heavily sheared.
86.16 - 87.48	1.32	Siltstone: grey, with medium grained sandstone interbeds toward base.
87.48 - 92.53	5.05	Sandstone: light grey, medium grained, crossbedded, becomes coarse grained towards the base.
92.53 - 93.26	0.73	Sandstone: light grey, very coarse grained with numerous very large coaly inclusions.
93.26 - 93.94	0.68	Conglomerate: granular, light grey, sub-angular grains of grey and white chert, little matrix, abundant carbonate cement.
93.94 - 98.75	4.81	Sandstone: grey, very fine grained, frequent siltstone interbeds, few small carbonaceous mudstone phases. BCA = 82°.
98.75 - 98.99	0.24	Mudstone: carbonaceous, black.
98.99 - 105.47	6.48	Sandstone: very fine grained, with siltstone and carbonaceous mudstone as above.
105.47 - 109.62	4.15	Mudstone: dark grey with thin siltstone interbeds.

MND 78-26 (Cont'd)

109.62 - 110.27	0.65	Sandstone: light grey, fine grained, thin siltstone interbeds, irregular bedding.
110.27 - 111.54	1.27	Siltstone: medium grey, one sandstone phase in center.
111.54 - 111.94	0.40	Sandstone: light grey, fine grained small scale crossbedding.
111.94 - 112.23	0.29	Siltstone: medium grey as above.
112.23 - 112.78	0.55	Sandstone: fine grained as above.
112.78 - 113.56	0.78	Mudstone: dark grey, thin siltstone interbeds.
113.56 - 113.65	0.09	Coal: 50% vitreous, core broken.
113.65 - 113.67	0.02	Coal: 30% vitreous, core broken.
113.67 - 113.81	0.14	Coal: 30% vitreous, core pulverized.
113.81 - 113.96	0.15	Coal: 50% vitreous, core powdered.
113.96 - 114.11	0.15	Coal: 30% vitreous, core badly broken.
114.11 - 114.19	0.08	Coal: 50% vitreous, core powdered.
114.19 - 114.33	0.14	Coal: 30% vitreous, core broken.
114.33 - 114.91	0.58	Core missing.
114.91 - 114.94	0.03	Coal: 50% vitreous, core broken.
114.94 - 115.02	0.08	Claystone: carbonaceous.
115.02 - 115.10	0.08	Coal: 30% vitreous.
115.10 - 115.52	0.42	Mudstone: dark grey.
115.52 - 115.57	0.05	Coal: 50% vitreous, core powdered.
115.57 - 115.68	0.11	Coal and claystone: core powdered.
115.68 - 115.77	0.09	Claystone: dark grey.
115.77 - 115.87	0.10	Coal: 50% vitreous, core powdered.

MND 78-26 (Cont'd.)

115.87 - 115.92	0.05	Core missing.			
			Samples	Interval	Width Dry Ash F.S.I
			0661	113.56 - 114.94	1.38 27.2 7
			0662	114.94 - 115.52	0.58 81.0 N/A
			0663	115.52 - 115.87	0.35 64.7 1
115.92 - 118.29	2.37	Mudstone: dark grey, frequent phases of sandstone.			
118.29 - 118.39	0.10	Coal: 30% vitreous.			
118.39 - 118.55	0.16	Claystone: carbonaceous, bright coal bands.			
118.55 - 118.87	0.32	Mudstone: dark grey, carbonaceous phases, bright coal bands.			
118.87 - 123.94	5.07	Sandstone: fine to medium grained with frequent phases of dark grey mudstone.			
123.94 - 124.07	0.13	Carbonaceous mudstone: black.			
124.07 - 125.09	1.02	Siltstone: grey with coalified plant rootlets.			
125.09 - 130.75	5.66	Sandstone: light grey, medium grained with frequent dark grey mudstone interbeds. BCA = 78°			
130.75 - 130.95	0.20	Mudstone: dark grey, small coaly inclusions.			
130.95 - 131.04	0.09	Coal: dull, core solid.			
131.04 - 131.17	0.13	Coal: 30% vitreous, solid.			
131.17 - 131.20	0.03	Coal: stoney, solid.			
131.20 - 131.30	0.10	Coal: 50% vitreous, solid.			
131.30 - 131.43	0.13	Coal: 70% vitreous, solid.			
			Samples	Interval	Width Dry Ash F.S.I
			0664	130.95 - 131.43	0.48 27.6 4½
131.43 - 133.92	2.49	Siltstone: dark grey with frequent dark grey mudstone phases.			

MND 78-26 (Cont'd.)

133.92 - 134.62	0.70	Mudstone: carbonaceous, black.
134.62 - 134.80	0.18	Coal and claystone: interbedded.
134.80 - 138.20	3.40	Siltstone: grey with dark grey mudstone phases.
138.20 - 140.75	2.55	Sandstone: medium grained, light grey, crossbedded, thin carbonaceous partings on bedding.
140.75 - 143.51	2.76	Sandstone: coarse grained, light grey, phases of pebble conglomerate, abundant large irregular coaly inclusions throughout.
143.51 - 144.80	1.29	Sandstone: medium grained, light grey, crossbedded.
144.80 - 145.27	0.47	Conglomerate: light grey, pebble, grains of grey and white chert.
145.27 - 151.71	6.44	Sandstone: very coarse grained, medium grained at top, frequent phases of pebble conglomerate, abundant large irregular coaly inclusions throughout.
151.71 - 154.75	3.04	Sandstone: fine grained, with phases of medium grained light grey sandstone increasing towards the base.
154.75 - 157.63	2.88	Sandstone: light grey, medium grained, with phases and bands of rounded chert pebble conglomerate.
157.63 - 159.73	2.10	Conglomerate: pebble, light grey with subrounded grains of white and grey chert, few large irregular coaly inclusions.
159.73 - 160.77	1.04	Siltstone: grey with irregular phases of dark grey and carbonaceous mudstone.
160.77 - 161.45	0.68	Sandstone: light grey, medium grained, with small irregular coaly inclusions.
161.45 - 161.82	0.37	Mudstone: dark grey.
161.82 - 161.85	0.03	Coal: 70% vitreous, core solid.

MND 78-26 (Cont'd.)

161.85 - 161.86	0.01	Claystone: carbonaceous.																														
161.86 - 161.96	0.10	Coal: 30% vitreous, core solid.																														
161.96 - 162.15	0.19	Claystone: carbonaceous, grey, bright coal bands.																														
161.15 - 162.18	0.03	Coal: dull, core solid.																														
162.18 - 162.29	0.11	Coal: 30% vitreous, core solid.																														
162.29 - 162.36	0.07	Coal: 50% vitreous, core solid.																														
162.36 - 162.49	0.13	Coal: carbonaceous claystone, bright coal bands.																														
162.49 - 162.65	0.16	Coal: 30% vitreous.																														
162.65 - 162.74	0.09	Coal: 50% vitreous.																														
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0665</td> <td>161.82 - 161.96</td> <td>0.14</td> <td>26.4</td> <td>8</td> </tr> <tr> <td>0666</td> <td>161.96 - 162.15</td> <td>0.19</td> <td>72.7</td> <td>1/2</td> </tr> <tr> <td>0667</td> <td>162.15 - 162.36</td> <td>0.21</td> <td>10.4</td> <td>8 1/2</td> </tr> <tr> <td>0668</td> <td>162.36 - 162.49</td> <td>0.13</td> <td>73.9</td> <td>1/2</td> </tr> <tr> <td>0669</td> <td>162.49 - 162.74</td> <td>0.25</td> <td>8.7</td> <td>9</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0665	161.82 - 161.96	0.14	26.4	8	0666	161.96 - 162.15	0.19	72.7	1/2	0667	162.15 - 162.36	0.21	10.4	8 1/2	0668	162.36 - 162.49	0.13	73.9	1/2	0669	162.49 - 162.74	0.25	8.7	9
Samples	Interval	Width	Dry Ash	F.S.I.																												
0665	161.82 - 161.96	0.14	26.4	8																												
0666	161.96 - 162.15	0.19	72.7	1/2																												
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0668	162.36 - 162.49	0.13	73.9	1/2																												
0669	162.49 - 162.74	0.25	8.7	9																												
162.74 - 163.02	0.28	Mudstone: carbonaceous.																														
163.02 - 169.80	6.78	Siltstone: grey, with frequent phases of fine grained light grey sandstone and dark grey mudstone.																														
169.80 - 170.85	1.05	Sandstone: light grey, fine grained, small scale cross bedding. BCA = 81°																														
170.85 - 174.90	4.05	Sandstone: light grey, coarse grained, massive, occasional irregular coaly rootlet.																														
174.90 - 175.93	1.03	Mudstone: dark grey, carbonaceous phases.																														
175.93 - 176.18	0.25	Coal: 30% vitreous, core intact.																														
176.18 - 176.39	0.21	Coal: 50% vitreous, core pulverized.																														
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Sample	Interval	Width	Dry Ash	F.S.I.																												
0670	175.93 - 176.39	0.46	13.3	8																												
176.39 - 176.77	0.38	Claystone: carbonaceous, black, bright coal bands.																														
176.77 - 176.82	0.05	Coal: 50% vitreous, core broken.																														

MND 78-26 (Cont'd.)

176.82 - 176.89	0.07	Claystone: carbonaceous, as above.																				
176.89 - 176.92	0.03	Sandstone: light grey, fine grained.																				
176.92 - 185.42	8.50	Siltstone: grey, with frequent interbeds of light grey fine grained sandstone. BCA = 80°.																				
185.42 - 188.94	3.52	Sandstone: light grey, fine grained, small scale cross bedding, large irregular coaly rootlets near base.																				
188.94 - 190.31	1.37	Conglomerate: light grey, pebble, subrounded grains of grey and white chert, 50% sand matrix.																				
190.31 - 190.37	0.06	Coal: 70% vitreous, core intact.																				
190.37 - 190.51	0.14	Coal: dull, core intact.																				
190.51 - 190.52	0.01	Coal: bright, core broken.																				
190.52 - 190.66	0.14	Claystone: carbonaceous.																				
190.66 - 190.79	0.13	Coal: 70% vitreous, core pulverized.																				
190.79 - 190.92	0.13	Coal: 30% vitreous, core broken.																				
190.92 - 191.00	0.08	Coal: dull, core intact.																				
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Samples	Interval	Width	Dry Ash	F.S.I																		
0671	190.31 - 190.52	0.21	27.6	5½																		
0672	190.52 - 190.66	0.14	89.5	N/A																		
0673	190.66 - 191.00	0.34	35.6	6½																		
191.00 - 191.90	0.90	Siltstone: dark grey, carbonaceous mudstone phases, bright coal bands.																				
191.90 - 192.54	0.64	Sandstone: light grey, fine grained, thin carbonaceous partings on bedding. BCA = 72°																				
192.54 - 193.69	1.15	Siltstone: grey, phases of dark grey mudstone.																				
193.69 - 194.00	0.31	Sandstone: fine grained, light grey, small scale cross bedding.																				
194.00 - 194.17	0.17	Siltstone: dark grey.																				
194.17 - 194.47	0.30	Sandstone: fine grained, as above.																				
194.47 - 195.17	0.70	Mudstone: dark grey, occasional siltstone interbeds.																				

MND 78-26 (Cont'd.)

195.17 - 195.22	0.05	Mudstone: carbonaceous, black with bright coal bands.
195.22 - 198.44	3.22	Siltstone: grey, carbonaceous mudstone phases.
198.44 - 199.71	1.27	Sandstone: light grey, medium grained, small scale cross bedding, fine carbonaceous partings on bedding.
199.71 - 208.29	8.58	Siltstone: grey, occasional fine grained sandstone interbeds.
208.29 - 208.39	0.10	Mudstone: carbonaceous, black, coal bands, calcite filled fractures throughout, minor tectonic disturbances.
208.39 - 212.84	4.45	Siltstone: as above.
212.84 - 213.75	0.91	Sandstone: light grey, medium grained, small scale cross bedding, fine carbonaceous partings on bedding.
213.75 - 221.47	7.72	Siltstone: grey, dark grey mudstone and cross bedded sandstone phases.
221.47 - 223.47	2.00	Sandstone: medium grained, sedimentary breccia, bedding disturbed.
223.47 - 225.59	2.12	Mudstone: dark grey with irregular siltstone interbeds, carbonaceous at base.
225.59 - 226.08	0.49	Claystone: light grey, coalified plant rootlets.
226.08 - 228.46	2.38	Siltstone: grey with frequent interbeds of dark grey mudstone, carbonaceous phases with bright coal bands.
228.46 - 230.18	1.72	Sandstone: light grey, medium grained, cross bedded, thin carbonaceous partings on bedding.
230.18 - 231.18	1.00	Mudstone: dark grey with frequent regular interbeds of grey siltstone. BCA = 73°.
231.18 - 242.21	11.03	Sandstone: light grey, medium grained, cross bedded with siltstone and mudstone phases.

MND 78-26 (Cont'd)

242.21 - 242.63	0.42	Mudstone: carbonaceous, black with bright coal bands.
242.63 - 242.68	0.05	Coal: bright, core solid.
242.68 - 242.71	0.03	Pyrite:
242.71 - 242.82	0.11	Coal: 30% vitreous, core solid.
242.82 - 243.41	0.59	Mudstone: dark grey.
243.41 - 244.71	1.30	Sandstone: light grey, medium grained, cross bedded.
244.71 - 246.85	2.14	Mudstone: dark grey.
246.85 - 247.50	0.65	Sandstone: medium grained, light grey small scale cross bedding.
247.50 - 250.34	2.84	Mudstone: dark grey, occasional siltstone phases.
250.34 - 251.63	1.29	Sandstone: as above.
251.63 - 253.60	1.97	Mudstone: dark grey, sandy towards the base.
253.60 - 267.61	14.01	Sandstone: coarse grained, medium grained at top, large scale cross bedding, phases of chert pebble conglomerate in the lower half.
267.61 - 276.59	8.98	Conglomerate: light grey, subrounded grains of grey, white and green chert, very well cemented, very low porosity.
276.59 - 277.59	1.00	Mudstone: dark grey, thin siltstone interbeds. BCA = 72°.
277.59 - 278.10	0.51	Siltstone: as above, calcite filled fractures, moderate tectonic disturbance.
278.10 - 283.98	5.88	Siltstone: grey, with phases of dark grey mudstone and fine grained sandstone.
283.98 - 284.41	0.43	Mudstone: dark grey.
284.41 - 284.53	0.12	Coal: 30% vitreous, core solid.

MND 78-26 (Cont'd)

284.53 - 286.93	2.40	Mudstone: dark grey, silty, few bright coal bands.
286.93 - 286.96	0.03	Mudstone: carbonaceous.
286.96 - 287.00	0.04	Coal: dull, core solid.
287.00 - 287.04	0.04	Coal: bright, core pulverized.
287.04 - 287.11	0.07	Coal: 30% vitreous, core solid.
287.11 - 287.43	0.32	Mudstone: carbonaceous.
287.43 - 292.17	4.74	Siltstone: grey, with mudstone and fine grained sandstone phases.
292.17 - 293.61	1.44	Sandstone: light grey, fine grained, small scale cross bedding.
293.61 - 297.05	3.44	Mudstone: dark grey, occasional siltstone interbeds.
297.05 - 299.42	2.37	Sandstone: light grey, fine grained, phases and interbeds of dark grey mudstone.
299.42 - 301.93	2.51	Mudstone: dark grey, with frequent siltstone interbeds.
301.93 - 302.13	0.20	Coal: core solid, 30% vitreous.
302.13 - 302.19	0.06	Coal: dull, core broken.
302.19 - 302.23	0.04	Coal: bright, core pulverized.
302.23 - 302.29	0.06	Coal: stoney, core solid.
		Sample: Interval Width Dry Ash F.S.I.
		0674: 301.93-302.29 0.36 27.7 8
302.29 - 302.56	0.27	Mudstone: dark grey.
302.56 - 305.40	2.84	Siltstone: grey with frequent light grey, fine grained sandstone phases.
305.40 - 306.13	0.73	Mudstone: dark grey.
306.13 - 306.25	0.12	Coal: 30% vitreous, core broken.

MND 78-26 (Cont'd.)

306.25 - 308.11	1.86	Sandstone: fine grained, light grey, thin interbeds of grey siltstone. BCA = 75°.
308.11 - 309.25	1.14	Mudstone: dark grey.
309.25 - 309.45	0.20	Coal and claystone interbedded.
309.45 - 309.67	0.22	Coal: 30% vitreous, core broken.
309.67 - 310.03	0.36	Mudstone: carbonaceous, black bright coal bands.
310.03 - 313.03	3.00	Siltstone: dark grey, bedding irregular.
313.03 - 318.43	5.40	Sandstone: medium grained, light grey, small scale cross bedding, becomes coarse grained at base.
318.43 - 320.23	1.80	Conglomerate: light grey, with phases of coarse grained sandstone.
320.23 - 322.61	2.38	Conglomerate: light grey, pebble, sub-angular grains of grey and white chert.
322.61 - 323.26	0.65	Sandstone: grey, fine grained, coaly rootlets.
323.26 - 323.29	0.03	Coal: bright, core broken.
323.29 - 327.67	4.38	Mudstone: dark grey, carbonaceous phases.
327.67 - 331.22	3.55	Siltstone: grey, one sandstone phase at top.
331.22 - 332.40	1.18	Sandstone: light grey, medium grained.
332.40 - 332.53	0.13	Coal: 50% vitreous, core solid.
332.53 - 332.93	0.40	Mudstone: carbonaceous, black, bright coal bands at base.
332.93 - 333.03	0.10	Coal: 30% vitreous, core solid.
333.03 - 333.09	0.06	Coal: 50% vitreous, core pulverized.
333.09 - 333.21	0.21	Mudstone: carbonaceous.
333.21 - 334.37	1.16	Mudstone: dark grey, light grey, fine grained sandstone phases, core broken, calcite filled fractures.

MND 78-26 (Cont'd)

334.37 - 335.49	1.12	Mudstone: dark grey.
335.49 - 344.61	9.12	Siltstone: grey with phases of dark grey mudstone and light grey, fine grained sandstone.
344.61 - 346.07	1.46	Mudstone: dark grey.
346.07 - 346.23	0.16	Mudstone: carbonaceous, slightly pyritized.
346.23 - 349.13	2.90	Mudstone: dark grey, sheared.
349.13 - 357.66	8.53	Sandstone: light grey, fine grained, 1 cm coal band at 351.05 m, occasional phases of mudstone or siltstone.
357.66 - 358.37	0.71	Mudstone: dark grey, becoming carbonaceous after top 0.3 m.
358.37 - 359.14	0.77	Sandstone: medium grained, cross bedded, light grey, pyrite.
359.14 - 359.54	0.40	Mudstone: dark grey, sheared.
359.54 - 359.59	0.05	Coal: 30% vitreous, broken.
359.59 - 363.60	4.01	Sandstone: light grey, fine grained, siltstone phases, cross bedded.
363.60 - 364.15	0.55	Mudstone: dark grey. BCA = 65°.
364.15 - 364.18	0.03	Coal: 100% vitreous, pulverized.
364.18 - 364.76	0.58	Mudstone: dark grey.
364.76 - 364.83	0.07	Sandstone: medium grained.
364.83 - 364.86	0.03	Coal: 100% vitreous, unbroken.
364.86 - 364.99	0.13	Mudstone: dark grey, fine grained sandstone interbeds.
364.99 - 365.05	0.06	Coal: 100% vitreous, pulverized.
365.05 - 365.74	0.69	Mudstone: carbonaceous sheared.
365.74 - 367.24	1.50	Mudstone: dark grey, phases of fine and medium grained sandstone.

MND 78-26 (Cont'd.)

367.24 - 367.34	0.10	Coal: 10% vitreous, broken.
367.34 - 371.67	4.33	Siltstone: grey, mudstone phases which become more frequent toward the base. BCA = 72°
371.67 - 377.31	5.64	Sandstone: fine grained, cross bedded, frequent mudstone intervals.
377.31 - 379.57	2.26	Sandstone: 50% fine grained, 50% medium grained, rare mudstone intervals.
379.57 - 380.28	0.71	Sandstone: coarse grained, massive, occasionally carbonaceous.
380.28 - 382.92	2.64	Conglomerate: pebble, chert and sandstone pebbles, occasional coaly lenses, coarse sand matrix.
382.92 - 384.35	1.43	Sandstone: coarse grained, massive.

E.O.H. at 384.35.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MXD 78-27

LOCATION:

- (a) Coal Licence: 3148
- (b) N.T.S. 93-I-8, a-61-F
- (c) Drill Hole Co-ordinates: N 29565 - E 78425 (not surveyed)
- (d) Elevation: 1495m

AZIMUTH & INCLINATION: 050°, -65°
CORE SIZE: NQ (22.2mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B13
TOTAL DEPTH: 459.3m

DATE DRILLED: Sept. 24 - Oct. 2, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: L.A. Smith

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

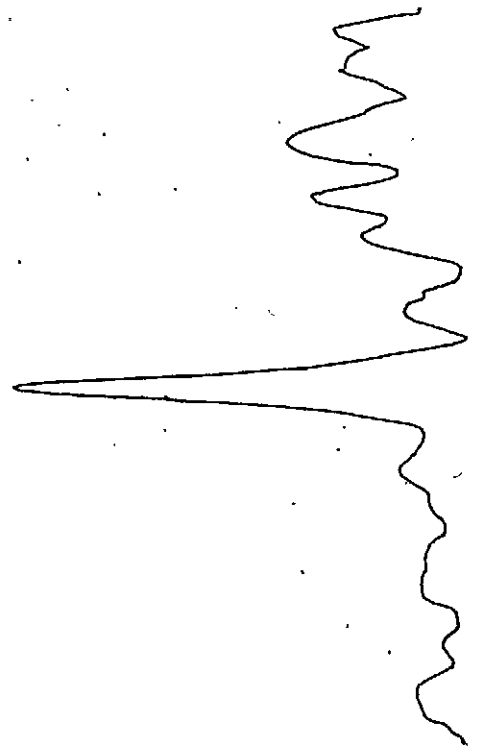
3.10



3.20

3.30

87.20

87.69



	PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT		MH 78-13
SEAM SECTION B 2 L		

MXD 78-27 (cont'd.)

37.61 - 37.64	0.03	Mud Seams, bits of ground mudstone
37.64 - 38.15	0.51	Mudstone:
38.15 - 39.46	1.31	Siltstone/fine Sandstone: interbeds 0.04 coal at 38.50, BCA = 70°
38.46 - 40.40	0.94	Fine Sandstone: minor siltstone band at 39.70, BCA = 73°
40.40 - 58.91	18.51	Siltstone/fine Sandstone: interbedded, 56.40 - 47.90, some bioturbation, BCA = 65°
58.91 - 58.94	0.03	Mud seam: ground siltstone
58.94 - 59.08	0.14	Conglomerate: pebble
59.08 - 63.09	4.01	Sandstone: medium to fine grained, clean, minor light bands, BCA = 68°
63.09 - 63.17	0.08	Conglomerate: sandstone and mudstone, pebbles
63.17 - 63.22	0.05	Sandstone: fine grained
<u>HULCROSS MEMBER - COMMOTION FORMATION</u>		
63.22 - 64.32	1.10	Siltstone and fine Sandstone: some bioturbation
64.32 - 74.78	10.46	Mudstone/Siltstone: interbedded and some fine sandstone
74.78 - 80.32	5.54	Sandstone: fine to medium grained with some interbedded siltstone, some banding, wavy, some minor turbation, BCA = 64°
80.32 - 88.21	7.89	Mudstone: interbedded with siltstone and fine banded sandstone, some dark, wavy banding, minor plant fragments, BCA = 67°
<u>GATES MEMBER - COMMOTION FORMATION</u>		
88.21 - 88.30	0.09	Mudstone:
88.30 - 88.36	0.06	Muddy brown and dull coal, soft.

MXD 78-27 (cont'd.)

88.36 - 88.47	0.11	Mudstone:
88.47 - 88.50	0.03	Coal: dull, bony
88.50 - 88.52	0.02	Coal: brown
88.52 - 88.65	0.13	Mudstone:
88.65 - 88.72	0.07	Bone Coal:
88.72 - 89.24	0.52	Mudstone: polished "pressure slip" surfaces, carbonaceous
89.24 - 89.32	0.08	Coal: broken, dull
89.32 - 89.40	0.08	Coal: with approximately 30% vitreous bands, dull
89.40 - 89.46	0.06	Coal: brown
89.46 - 89.56	0.10	Mudstone: carbonaceous
89.56 - 89.59	0.03	Coal: dull
89.59 - 90.04	0.45	Mudstone: with plant fragments
90.04 - 90.16	0.12	Coal: powdery, dull
90.16 - 94.37	4.21	Mudstone: with some fine sandstone 91.32 - 91.60 - .28 m slickensides in mudstone, minor bright coal fragments, main unit grades to:
94.37 - 96.62	2.25	Sandstone: medium-fine, banded with dark bands, bottom 0.05 m grades to mudstone, some wavy bands, BCA = 70°
96.62 - 111.86	15.24	Mudstone: siltstone, fine-medium sandstone, interbedded numerous plant fragments, sandstone beds to 1 m thick. Some banded sandstone/siltstone unit becomes carbonaceous at bottom, BCA = 70° - 75°
111.86 - 112.37	0.51	Coal: clean but dull with 50% vitreous bands from 12.48 - 12.54 (0.05 m) rest less than 5% vitreous.

MXD 78-27 (cont'd.)

112.27 - 112.97	0.60	Mudstone: carbonaceous
112.97 - 113.03	0.06	Mudstone: soft with minor vitreous bits
113.03 - 113.15	0.12	Mudstone: carbonaceous
113.15 - 113.34	0.19	Coal: dull, bony
113.34 - 113.40	0.06	Coal: soft, broken, 75% vitreous
113.40 - 113.51	0.11	Mudstone: carbonaceous
113.51 - 115.46	1.95	Siltstone: grades to:
115.46 - 117.00	1.54	Sandstone: fine, banded with 50% thin carbonaceous bands, grades to: BCA 72 ^o .
117.00 - 120.50	5.50	Sandstone: banded, moderately cross-bedded, dark bands, fine-medium grained, grades to:
120.50 - 125.45	4.95	Sandstone: medium, some small (less than 3 cm) mudstone fragments, cross-bed towards bottom, fairly clean, grades to: BCA 71 ^o .
125.45 - 133.08	10.53	Sandstone: medium-coarse with minor bands of fine pebble conglomerate (approximately 10 cm), bottom 0.22 m, pebble conglomerate sharp contact to:
133.08 - 133.20	0.12	Mudstone: very carbonaceous, grades to interval below.
113.20 - 133.50	0.30	Mudstone: carbonaceous, grades to interval below.
133.50 - 144.50	11.00	Mudstone on top to siltstone and fine sandstone interbed alternating with beds of medium fine sandstone, minor cross-bedding, grades to interval below, BCA 75 ^o .
144.50 - 148.54	4.04	Mudstone: carbonaceous
148.54 - 148.65	0.11	Coal: soft, broken, dull
148.65 - 148.85	0.20	Coal: dull, minor bony coal
148.85 - 149.40	0.55	Mudstone: carbonaceous, abundant plant fragments
149.40 - 161.80	12.40	Siltstone: alternating with fine sandstone beds to 0.5 meters

MXD 78-27 (cont'd.)

161.80 - 162.00	0.20	Mudstone: carbonaceous
162.00 - 162.19	0.19	Mudstone: carbonaceous with minor dull coal
162.19 - 162.29	0.10	Mudstone: carbonaceous
162.29 - 163.60	1.31	Sandstone: fine to medium, minor darker bands, grades to interval below, BCA 75°.
163.60 - 178-91	15.31	Mudstone/Siltstone: interbeds, with some beds fine sandstone to 0.1 meter
178.91 - 178.92	0.01	Coal: 50% vitreous
178.92 - 184.89	5.97	Sandstone: medium-fine, some thin (1 mm) carbonaceous bands, otherwise clean, thin calcite veins in lower 3 meters with a BCA 20° for veins 1 millimeter thick, bedding BCA 71°.
184.89 - 186.20	1.31	Mudstone to Siltstone: some minor plant fragments, upper contact sharp, grades to interval below.
186.20 - 188.10	1.90	Sandstone: lightly banded, BCA 70°.
188.10 - 188.80	0.70	Siltstone: minor plant fragments, grades to interval below.
188.80 - 196.40	7.60	Fine Sandstone to Siltstone: some small scale cross-bedding, BCA 70°.
196.40 - 198.06	1.66	Siltstone and Mudstone: abundant plant fossils, a lot of leaves, last 0.2 meters carbonaceous.
198.06 - 198.36	0.30	Coal: 0.20 recovered, broken, soft, dull, 10% vitreous.
198.36 - 219.79	21.43	Siltstone: some fine sandstone beds to 0.4 meters, plant fragments, some minor bioturbation, minor mudstone.
COAL SEAM B-11		
219.79 - 219.84	0.05	Coal: dull, dirty
219.84 - 219.90	0.06	Coal: 50% bright
219.90 - 220.06	0.16	Coal: dull
220.06 - 220.14	0.08	Coal: 20% bright
220.14 - 220.33	0.19	Coal: vitreous, 75% bright

MXD 78-27 (cont'd.)

220.33 - 220.41	0.08	Coal: dull, 10% bright, broken				
220.41 - 220.45	0.04	Coal: dull, powdery				
220.45 - 220.53	0.08	Coal: dirty with 10% bright bands				
220.53 - 220.71	0.18	Coal: dull, 5% bright				
220.71 - 220.76	0.05	Mudstone: with 5% bright bands				
220.76 - 220.91	0.15	Coal: 95% bright				
		Samples	Interval	Width	Dry Ash	F.S.I.
		0679	219.79 - 220.33	0.54	36.2	4½
		0680	220.33 - 220.76	0.43	39.4	6½
		0681	220.76 - 220.91	0.15	10.4	9
220.91 - 221.12	0.21	Siltstone: with minor fine sandstone and plant fragments.				
221.12 - 221.18	0.06	Coal: broken, powdery, 50% bright.				
221.18 - 221.28	0.10	Siltstone: with minor fine sandstone and plant fragments.				
221.28 - 224.92	3.64	Sandstone: fine, minor siltstone, abundant plant fragments, some bioturbation near top, bedding banded to indistinct, BCA 65°-75°.				
224.92 - 225.73	0.81	Mudstone: minor siltstone, abundant plant fragments, minor carbonaceous fragments, 0.01 dull coal at 225.35 meters				
		COAL SEAM B-10				
225.73 - 225.78	0.05	Coal: dull				
225.78 - 226.06	0.28	Coal: bright				
226.06 - 226.26	0.20	Mudstone: carbonaceous with plant fragments				
226.26 - 226.35	0.09	Coal: dull and dirty with 5% bright bands				
226.35 - 226.56	0.21	Mudstone: carbonaceous with plant fragments				
226.56 - 226.58	0.02	Coal: bone				
226.58 - 226.65	0.07	Coal: bright				
226.65 - 226.74	0.09	Coal: dull, 10% bright bands				

MXD 78-27 (cont'd.)

226.74 - 226.85	0.11	Mudstone: very carbonaceous, greater than 5% bright coal bands.				
226.85 - 226.94	0.09	Coal: dull, 30% bright				
226.94 - 227.00	0.06	Coal: dull, dirty				
227.00 - 227.04	0.04	Coal: bright 60%				
227.04 - 227.25	0.21	Coal: dull, 25% bright bands to .005 meters				
227.25 - 227.31	0.06	Coal: dull, powdery				
		Samples	Interval	Width	Dry Ash	F.S.I.
		0682	225.73 - 226.06	0.33	6.3	7
		0683	226.06 - 226.58	0.52	76.3	1½
		0684	226.58 - 227.31	0.73	46.4	3½
227.31 - 227.41	0.10	Mudstone: carbonaceous				
227.41 - 230.24	2.83	Siltstone: minor mudstone and fine sandstone bedding mostly indistinct, BCA 70°.				
230.24 - 230.80	0.36	Mudstone: some plant fragments				
230.80 - 234.13	3.33	Siltstone: some carbonaceous bands and minor fine sandstone.				
234.13 - 238.52	4.39	Sandstone: fine, some dark banding, BCA 70°.				
238.52 - 239.52	1.00	Mudstone: 0.90 recovery, 0.10 core loss, carbonaceous, plant fragments.				
239.52 - 240.31	0.79	Sandstone: fine, dark banding, BCA 70°.				
240.31 - 241.16	0.85	Mudstone: carbonaceous, less than 10% dull coal.				
241.16 - 241.47	0.31	Coal: dull, 5% bright bands				
241.47 - 241.64	0.17	Coal: bright 85%				
241.64 - 241.88	0.24	Coal: bright 60%				
241.88 - 242.09	0.21	Coal: dull, 20% bright bands				
242.09 - 242.21	0.12	Coal: dull, less than 5% bright.				
242.21 - 242.36	0.15	Coal: bright 90%				

MXD 78-27 (cont'd.)

267.74 - 267.88	0.14	Mudstone: bottom .06 meters very carbonaceous.
267.88 - 267.89	0.01	Coal: bright 95%
267.89 - 267.93	0.04	Mudstone: very carbonaceous
267.93 - 267.97	0.04	Coal: bright 90%
267.97 - 267.13	0.16	Mudstone: very carbonaceous
267.13 - 267.30	0.17	Siltstone
267.30 - 267.31	0.01	Coal: bright 80%
267.31 - 271.45	4.14	Siltstone: some bright coal bands less than .01 meters, grades to interval below.
271.45 - 274.33	2.88	Sandstone: fine with wavy dark bands, BCA 70°.
274.33 - 281.43	7.10	Sandstone: medium white with "peppery" bands, minor calcite veining at about 5:20° with core axis, minor occasional carbonaceous parting, BCA 70°.
281.43 - 282.55	1.12	Siltstone: with minor fine sandstone, core broken to brecciated with carbonaceous partings and increasing calcite veining, bottom 0.30 meters very brecciated with some gouge.
282.55 - 283.60	1.05	Sandstone: fine with minor siltstone, core more competent but still broken, increase in calcite veining, 0.02 calcite vein with brecciation at bottom, BCA 50°.
283.60 - 283.70	0.10	Mudstone: carbonaceous, broken
283.70 - 283.79	0.09	Coal: dull, dirty, powdery
283.79 - 283.93	0.14	Mudstone: carbonaceous, .02 brecciated
283.93 - 284.02	0.09	Mudstone: very carbonaceous
284.02 - 284.57	0.55	Core loss
284.57 - 286.80	2.23	Siltstone: grades to fine sandstone to medium sandstone at bottom, abundant calcite veins, slickensided, BCA 65°.

MXD 78-27 (cont'd.)

242.36 - 242.56	0.20	Coal: dull, broken to powdery, 10% bright.
242.56 - 242.93	0.37	Missing core
		Sample Interval Width Dry Ash F.S.I.
		0685 241.16 - 242.56 1.63 24.1 2
242.93 - 243.10	0.17	Coal: bright
243.10 - 245.97	7.87	Mudstone: minor silty zones, carbonaceous, minor coaly bands less than 0.1 meter.
245.97 - 264.26	18.29	Sandstone: siltstone interbed, fine sandstone banded with siltstone, interbed with black partially carbonaceous siltstone to 3 meters thick, zones of medium-fine sandstone to 0.2 meters thick, minor plant fragments, BCA 71 ⁰ .
264.26 - 264.34	0.08	Mudstone: carbonaceous
264.34 - 264.46	0.12	Mudstone: soft, carbonaceous
		COAL SEAM B-9
264.46 - 265.04	0.58	Coal: slickensided, broken, 50% bright
265.04 - 265.13	0.09	Coal: powdery, 50% bright
265.13 - 165.42	0.29	Coal: broken, 50% bright
265.42 - 265.59	0.17	Coal: dull, 10% bright
265.59 - 265.65	0.06	Coal: powdery, dull
265.65 - 265.88	0.23	Coal: broken, 50% bright
265.88 - 267.28	1.40	Coal: 95% bright, rare dull partings less than 0.01 meters.
		Samples Interval Width Dry Ash F.S.I.
		0686 264.34 - 265.88 1.54 29.4 2½
		0687 265.88 - 267.28 1.40 8.8 5½
267.28 - 267.56	0.28	Mudstone: carbonaceous
267.56 - 267.57	0.01	Coal: bright
267.57 - 267.67	0.10	Mudstone: carbonaceous
267.67 - 267.73	0.06	Coal: dull, dirty
267.73 - 267.74	0.01	Coal: bright 95%

MXD 78-27 (cont'd.)

286.80 - 288.00	1.20	Mudstone: upper part carbonaceous, some slickenside, grades to interval below.			
288.00 - 288.50	0.50	Siltstone: some fine sandstone interbeds at bottom, grades to interval below.			
288.50 - 290.21	1.71	Sandstone: fine, fine to medium in places, faint banding, BCA 70°.			
290.21 - 290.39	0.18	Siltstone			
290.39 - 291.16	0.77	Mudstone: carbonaceous to very carbonaceous at bottom.			
COAL SEAM B-9					
291.16 - 291.21	0.05	Coal: dull, powdery, 10% bright			
291.21 - 291.42	0.21	Coal: dull, 5% bright bands, dirty bands			
291.42 - 291.81	0.39	Coal: bright, 75% bright bands			
291.81 - 291.91	0.10	Mudstone: very carbonaceous			
291.91 - 292.12	0.21	Mudstone: very carbonaceous, 10% bright bands coal.			
292.12 - 292.21	0.09	Coal: dull, less than 5% bright bands			
292.21 - 293.58	1.37	Coal: less than 90% bright, small, (less than .005 meters), dull bands			
293.58 - 293.62	0.04	Mudstone: carbonaceous			
293.62 - 294.08	0.46	Coal: 85% bright			
294.08 - 294.10	0.02	Mudstone: very carbonaceous			
294.10 - 294.14	0.04	Coal: dull, 15% bright			
294.14 - 294.50	0.36	Coal: dull, 40% bright bands			
294.50 - 294.66	0.16	Coal: bright 65%			
294.66 - 294.76	0.10	Coal: bright 95%			
	Samples	Interval	Width	Dry Ash	F.S.I.
	0688	291.16 - 292.21	1.05	50.3	1½
	0689	292.21 - 293.58	1.37	10.8	5½
	0690	293.58 - 294.10	0.52	9.7	7½
	0691	294.10 - 294.76	0.66	5.6	8

MXD 78-27 (cont'd.)

294.76 - 295.30	0.54	Mudstone: very carbonaceous, minor bright bands coal (less than .005 meters).										
295.30 - 297.37	2.07	Mudstone: carbonaceous, minor dull bands coal (less than .005 meters).										
297.37 - 297.46	0.09	Coal: dull, interbedded 50% with mudstone.										
297.46 - 298.32	0.86	Mudstone: .76 recovery, plant fragments.										
298.32 - 301.23	2.91	Siltstone: with thin (to 1 centimeter) band fine sandstone.										
301.23 - 303.30	2.07	Sandstone: fine, interbedded with siltstone bands, interbeds normally less than 1 centimeter thick, BCA 75°.										
303.30 - 303.89	0.59	Siltstone: with minor fine sandstone.										
303.89 - 317.50	13.61	Sandstone: fine, alternating with siltstone phases, sequences similar to 297.46 to 303.89, some minor mudstone areas, zones of sandstone/siltstone normally 2 meters thick, 2 centimeters 70% bright coal at 315.65, BCA 65°-75°.										
COAL SEAM B-6 (Upper)												
317.50 - 318.58	1.08	Coal: dull, bluish tinge, very clean and monotonous, vitreous bands lacking, bottom .25 meters concoidal fracture.										
318.58 - 318.68	0.10	Coal: bright, broken to powdery, 60% vitreous.										
318.68 - 318.75	0.07	Mudstone: carbonaceous										
318.75 - 318.83	0.08	Coal: dull, less than 2% bright										
		<table border="1"> <thead> <tr> <th>Sample</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0692</td> <td>317.50 - 318.83</td> <td>1.33</td> <td>15.0</td> <td>7½</td> </tr> </tbody> </table>	Sample	Interval	Width	Dry Ash	F.S.I.	0692	317.50 - 318.83	1.33	15.0	7½
Sample	Interval	Width	Dry Ash	F.S.I.								
0692	317.50 - 318.83	1.33	15.0	7½								
318.83 - 321.18	2.35	Mudstone: carbonaceous with plant and leaf fragments, intermitant coal bands less than 1 centimeter at about .4 meter intervals average.										
COAL SEAM B-6 (Lower)												
321.18 - 321.26	0.08	Coal: bright, 90% vitreous										

MXD 78-27 (cont'd.)

321.26 - 321.33	0.07	Coal: dull, 5% bright bands
321.33 - 321.40	0.07	Mudstone: plant fragments
321.40 - 321.53	0.13	Coal: dull
321.53 - 321.60	0.07	Coal: dull, broken to powdery, 10% vitreous
321.60 - 323.35	1.65	Siltstone: abundant plant fragments, banded towards bottom, BCA 75 ⁰ .
323.35 - 323.52	0.17	Coal: dull, 25% bright bands
323.52 - 324.98	1.46	Siltstone: abundant plant fragments
324.98 - 325.09	0.11	Coal: bright, 75% vitreous bands
325.09 - 325.22	0.13	Mudstone
325.22 - 325.24	0.02	Coal: bright 80%
325.24 - 325.99	0.75	Mudstone: with 5% bright coal bands to 1 centimeter, very carbonaceous, abundant plant fragments.
		COAL SEAM B-5
325.99 - 326.03	0.04	Coal: dull, dirty, powdery
326.03 - 326.06	0.03	Mudstone
326.06 - 326.09	0.03	Coal: dull, dirty, powdery
326.09 - 326.53	0.44	Coal: dull, clean, less than 5% bright
		Sample Interval Width Dry Ash F.S.I.
		0693 225.99 - 226.53 0.54 33.0 5½
326.53 - 327.22	0.69	Siltstone: abundant plant fragments, carbonaceous
327.22 - 327.24	0.02	Coal: bone
327.24 - 327.53	0.29	Coal: dull, clean to 10% bright bands
327.53 - 328.14	0.51	Siltstone: carbonaceous, abundant plant fragments, BCA 71 ⁰ .
328.14 - 328.46	0.32	Mudstone: very carbonaceous, to 5% bright coal bands-less than 0.5 centimeters.
328.46 - 328.64	0.18	Coal: bright, 90% vitreous

MXD 78-27 (cont'd.)

328.64 - 330.20	1.56	Sandstone: fine to medium, clean, banded towards bottom, BCA 73 ^o .
330.20 - 330.90	0.70	Sandstone: fine, banded
330.90 - 331.95	1.05	Siltstone: mudstone, carbonaceous phases, plant fragments.
331.95 - 332.55	0.60	Sandstone: fine to medium, faintly banded, BCA 75 ^o .
332.55 - 342.90	10.35	Siltstone: fine sandstone and laminated siltstone/find sandstone, plant fragments in top 5 meters, very carbonaceous, soft carbonaceous zones at 335.23 (0.02 meters), 335.67 (0.05 meters), 0.02 meters bright coal at 335.72 meters.
342.90 - 345.41	2.51	Sandstone: fine increasing to medium at bottom, becomes matrix for conglomerate below, BCA 77 ^o .
345.41 - 363.04	16.63	Conglomerate: fine cobble, to 80% chert pebbles and cobbles, normally fairly open matrix, few sand zones, less than 2% green chert, less than 0.5% pink chert, 5-10% black argil pebbles, the rest mostly white to light grey chert.
363.04 - 363.24	0.20	Sandstone: medium to coarse with coal fragment less than .5 centimeter thick and partings BCA 60 ^o -70 ^o .
363.24 - 363.85	0.61	Sandstone: medium to coarse, banded, BCA 70 ^o .
363.85 - 364.17	0.32	Conglomerate: as above at 345.41 - 363.04
364.17 - 364.27	0.10	Sandstone: medium to coarse, banded, BCA 68 ^o .
364.27 - 371.12	6.85	Conglomerate: cobble, chert cobbles predominant notably increased proportion of pink chert approximately 10%, green approximately 10%, decrease in white to approximately 20%, grey 25%, dark grey 25%, others 10-15% matrix medium sandstone, little or no fine pebbles.

MXD 78-27 (cont'd.)

371.12 - 373.82	2.70	Conglomerate: pebble, with thin (less than .5 centimeters) coal partings and fragments increasing to bottom, pink chert low (less than 2%), good range in particle size from fine sand up.
373.82 - 374.44	0.62	Sandstone: medium with coal fragments and partings to 1 centimeter, BCA 60°.
374.44 - 376.00	1.56	Siltstone: fine, dark brown-grey
376.00 - 377.36	1.36	Siltstone: with tiny plant fragments
377.36 - 379.13	1.77	Siltstone: fine, dark brown-grey jointing with an angle to core axis less than 5%.
379.13 - 380.45	1.32	Siltstone: highly joined low angle to axis, core broken, calcite veinlets.
380.45 - 381.40	0.95	Siltstone: grading to fine sandstone at bottom
381.40 - 383.98	2.58	Conglomerate: pebble to fine cobble, approximately 60% chert pebbles, pink absent, green less than 2%, minor coal partings to .5 centimeters.
383.98 - 386.27	2.29	Sandstone: medium to fine decreasing to fine at bottom, lightly banded, minor cross-bedded, BCA 75°.
386.27 - 387.82	1.55	Siltstone: with minor fine sandstone bands, plant fragments, bottom .2 meters carbonaceous.
387.82 - 387.93	0.11	Coal: dirty, dull, 5% bright specks and bands
387.93 - 388.26	0.33	Mudstone: carbonaceous with plant fragments, some pressure slickensides.
388.26 - 388.30	0.04	Mudstone: mud seam with chunks of mudstone
388.30 - 388.75	0.45	Mudstone: carbonaceous with plant fragments COAL SEAM B-4
388.75 - 388.79	0.04	Coal: 95% bright
388.79 - 388.96	0.17	Mudstone: carbonaceous with plant fragments
388.96 - 389.06	0.08	Coal: dull, less than 5% bright bands
389.06 - 389.17	0.11	Coal: 50% bright bands

MXD 78-27 (cont'd.)

389.17 - 389.27	0.10	Coal: dull																				
389.27 - 389.51	0.24	Coal: bright, 90% vitreous																				
389.51 - 389.58	0.07	Coal: dull, 20% bright bands																				
389.58 - 390.20	0.68	Mudstone: carbonaceous with up to 10% bright coal bands to 1 centimeter thick.																				
390.20 - 390.25	0.09	Coal: very dirty																				
390.25 - 390.37	0.12	Coal: dull, 10% bright bands																				
390.37 - 390.44	0.07	Coal: bright, 70% bright bands																				
390.44 - 390.51	0.07	Coal: dull, 30% bright																				
390.51 - 390.60	0.09	Coal: dirty																				
390.60 - 391.30	0.70	Coal: 50% bright bands																				
391.30 - 393.15	1.85	Mudstone: carbonaceous, abundant plant fragments, bright coal seams to 2 centimeters thick to 5% of core.																				
393.15 - 394.15	1.00	Coal: 0.50 recovery, 0.50 core loss, about 50% bright																				
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0717</td> <td>388.75 - 391.30</td> <td>2.55</td> <td>59.6</td> <td>1</td> </tr> <tr> <td>0718</td> <td>391.30 - 393.15</td> <td>1.85</td> <td>82.0</td> <td>NA</td> </tr> <tr> <td>0719</td> <td>393.15 - 394.15</td> <td>1.00</td> <td>13.1</td> <td>5½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0717	388.75 - 391.30	2.55	59.6	1	0718	391.30 - 393.15	1.85	82.0	NA	0719	393.15 - 394.15	1.00	13.1	5½
Samples	Interval	Width	Dry Ash	F.S.I.																		
0717	388.75 - 391.30	2.55	59.6	1																		
0718	391.30 - 393.15	1.85	82.0	NA																		
0719	393.15 - 394.15	1.00	13.1	5½																		
394.15 - 394.40	0.25	Siltstone: carbonaceous, grading down to fine sandstone																				
394.40 - 397.16	2.76	Sandstone: fine to medium, banded fairly clean, cross-bedded, BCA 70°.																				
397.16 - 400.06	2.90	Sandstone: medium to coarse, some very coarse, abundant coal fragments, less than .2 centimeters thick.																				
400.06 - 411.22	11.16	Siltstone: banded with fine sandstone, occasional plant fragments, some cross-bedded, BCA 75°.																				
411.22 - 417.65	6.43	Sandstone: fine, banded with some siltstone, calcite filled joints at approximately 20° to core axis, abundant plant fragments, BCA 73°.																				

MXD 78-27 (cont'd.)

417.65 - 418.60	0.95	Siltstone: banded with fine sandstone, carbonaceous with abundant plant fragments and fossils as in 400.06 - 411.22
418.60 - 418.75	0.15	Siltstone: to mudstone, very carbonaceous COAL SEAM B1/B2/B3
418.75 - 418.86	0.11	Coal: dull, broken to powdery
418.86 - 418.91	0.05	Coal: dull
418.91 - 419.07	0.16	Coal: dull with 10% bright bands
419.07 - 419.13	0.06	Coal: 60% bright bands
419.13 - 419.62	0.49	Coal: dull, 40% bright
419.62 - 419.77	0.15	Coal: 60% bright, broken
419.77 - 420.77	1.00	Core lost
420.77 - 421.53	0.76	Coal: 80% vitreous, metallic lustre, core intact
421.53 - 422.13	0.60	Coal: 60% vitreous, earthy lustre, hard, core intact.
422.13 - 422.78	0.65	Coal: 60% vitreous, metallic lustre, hard, pyrite specks throughout, core intact.
422.78 - 422.86	0.08	Coal: 20% vitreous, earthy lustre, core intact.
422.86 - 423.16	0.30	Coal: 60% vitreous, metallic lustre, core intact.
423.16 - 423.48	0.32	Coal: 80% vitreous, metallic lustre, core intact.
423.48 - 423.58	0.10	Coal: 30% vitreous, earthy lustre, core intact.
423.58 - 424.02	0.44	Coal: 90% vitreous, hard, metallic lustre, core intact.
424.02 - 424.47	0.45	Coal: 30% vitreous, hard, metallic lustre, core intact.
424.47 - 424.68	0.21	Coal: vitreous, core pulverized.
424.68 - 424.70	0.02	Mudstone: carbonaceous.

MXD 78-27

424.70 - 425.30	0.60	Coal: 20% vitreous bands, hard, metallic lustre, core intact.																														
425.30 - 425.56	0.26	Coal: 40% vitreous, dull, pyrite specks, core intact.																														
425.56 - 425.81	0.25	Coal: 80% vitreous, core intact																														
425.81 - 426.56	0.75	Coal: 60% vitreous, earthy lustre, core intact.																														
426.56 - 426.94	0.38	Coal: 30% vitreous, earthy lustre, core intact.																														
		<table border="0"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>F.S.I.</th> </tr> </thead> <tbody> <tr> <td>0720</td> <td>420.77 - 422.33</td> <td>1.56</td> <td>10.0</td> <td>5½</td> </tr> <tr> <td>0721</td> <td>422.33 - 422.86</td> <td>0.53</td> <td>10.2</td> <td>2</td> </tr> <tr> <td>0722</td> <td>422.86 - 424.47</td> <td>1.61</td> <td>11.1</td> <td>4</td> </tr> <tr> <td>0723</td> <td>424.47 - 425.56</td> <td>1.09</td> <td>10.0</td> <td>4½</td> </tr> <tr> <td>0724</td> <td>425.56 - 426.94</td> <td>1.38</td> <td>10.2</td> <td>7</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	F.S.I.	0720	420.77 - 422.33	1.56	10.0	5½	0721	422.33 - 422.86	0.53	10.2	2	0722	422.86 - 424.47	1.61	11.1	4	0723	424.47 - 425.56	1.09	10.0	4½	0724	425.56 - 426.94	1.38	10.2	7
Samples	Interval	Width	Dry Ash	F.S.I.																												
0720	420.77 - 422.33	1.56	10.0	5½																												
0721	422.33 - 422.86	0.53	10.2	2																												
0722	422.86 - 424.47	1.61	11.1	4																												
0723	424.47 - 425.56	1.09	10.0	4½																												
0724	425.56 - 426.94	1.38	10.2	7																												
426.94 - 459.33	32.39	Sandstone: medium to fine grained, light grey, rare pebble, some carbonaceous partings in bedding (at top interval), occasional worm burrows, minor shears with calcite along sheared surfaces.																														

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MBD 78-28

LOCATION:

- (a) Coal Licence: 3160
- (b) N.T.S. 93-I-8, c-28-L
- (c) Drill Hole Co-ordinates: N 35135 - E 63900 (not surveyed)
- (d) Elevation: 1550m

AZIMUTH & INCLINATION: 050°, -70°
CORE SIZE: NQ (22.2mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped
Grout plug installed

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B13
TOTAL DEPTH: 428.0m

DATE DRILLED: Oct. 4 - 14, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: P.J. Proudlock

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN

MBD-78-28

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 5.49	5.49	CASING BOULDER CREEK MEMBER - COMMOTION FORMATION
5.49 - 6.70	1.21	Conglomerate: pebbles, chert common (recovered 82 cm).
6.70 - 14.40	7.70	Sandstone: medium to very coarse grained, some fine pebble conglomerate, top 2 m medium grained, then coarse to very coarse grained, carbonaceous partings towards bottom of interval BCA = 60°-70°.
14.40 - 19.51	5.11	Conglomerate: pebble, pink and green chert, 0.02 m mud band at 18.05, core broken from 17.85 m - 18.10m.
19.51 - 19.91	0.40	Sandstone: medium to coarse grained, well sorted.
19.91 - 20.91	1.00	Claystone: brecciated, slump structures, light grey core soft and broken.
20.91 - 22.63	1.72	Siltstone: interbedded with fine sandstone.
22.63 - 27.90	5.27	Sandstone: fine to medium grained, fairly well sorted, occasional thin fractured zones, a few pebbles in the bottom 1 m. BCA = 65°.
27.90 - 32.61	4.71	Conglomerate: pebble, not well sorted, some white cementing towards bottom, not calcite, occasional chert pebble.
32.61 - 33.22	0.61	Siltstone: with some pebble conglomerate bands and some medium to coarse grained sandstone bands. Iron staining along partings.
33.22 - 33.40	0.18	Mud band: with brecciated chunks of siltstone, light grey, iron stain.
33.40 - 34.27	0.87	Siltstone: dark grey, core broken, grades to unit below.
34.27 - 38.98	4.71	Sandstone: very fine grained at top, grades to very coarse grained at bottom, medium grey, fairly well sorted, iron staining along fractures BCA = 66°.
38.98 - 59.86	20.88	Conglomerate: fine pebble to pebble, grades from fine pebbles to small cobbles in top 1.3 m, below which interval is a mixture of coarse grained sandstone to pebble conglomerate, moderately well sorted.

MBD-78-28 (Cont'd)

38.98 - 59.86	20.88	46.13 - 46.74 m matrix is fine grained sandstone with some mudstone clasts, top and bottom of interval have iron stained fractures, pink and green chert pebbles. BCA = 67° - 73°.
59.86 - 60.05	0.19	Ash band, light grey
60.05 - 63.09	3.04	Siltstone to fine grained sandstone: numerous joints, medium grained, core broken and ground along joints.
63.09 - 66.48	3.39	Sandstone: fine to medium grained, well sorted, clean, minor banding towards bottom. BCA = 62°.
66.48 - 66.93	0.45	Claystone: medium grey, grades to a siltstone at bottom.
66.93 - 67.04	0.11	Conglomerate: pebble, with mudstone clasts.
67.04 - 67.49	0.45	Siltstone: brecciated with minor fine grained sandstone, slump features.
67.49 - 67.65	0.16	Conglomerate: pebble
67.65 - 81.08	13.43	Mudstone: dark to medium grey, uniform, some areas of broken core and sheared surfaces.
81.08 - 82.48	1.40	Sandstone: fine grained, with bands and clasts of mudstone.
82.48 - 97.77	15.29	Sandstone: coarse grained, 2 bands of pebble conglomerate, chert not common, occasional carbonaceous parting, sandstone has black/white appearance, fairly well sorted. BCA = 65° - 75°
97.77 - 99.70	1.93	Mudstone: carbonaceous, sheared, sharp upper contact (recovered 1.4 m).
99.70 - 103.85	4.15	Siltstone: dark grey, minor intervals of very fine grained sandstone, plant fragments and carbonaceous partings common, minor shearing, lower contact sharp. BCA = 70°.
103.85 - 113.12	9.27	Conglomerate: pebble, with coarse grained sandstone with minor pebble bands at bottom, sandstone intervals banded, some carbonaceous partings and clasts above 106.6 m. BCA = 66°.
113.12 - 123.90	10.78	Sandstone: medium to fine grained, medium to light grey, lightly to moderately banded, clean, uniform, minor carbonaceous siltstone bands (1 mm) at 123.50 m - 123.66 m, sharp basal contact. BCA = 68°.

MBD-78-78 (Cont'd)

HULCROSS MEMBER - COMMOTION FORMATION

123.90 - 150.66 26.76 Siltstone: interbedded with fine grained sandstone; thinly banded zones show small scale cross beds (top to middle of interval), some bioturbation at base of interval.

SHELL ZONE (20 m) at 150.55 m BCA = 67° - 70°.

150.66 - 150.75 0.09 Conglomerate: fine pebble, bluish appearance, some pyrite, occasional white calcareous shell fragments, sharp contact.

GATES MEMBER - COMMOTION FORMATION

150.75 - 151.05 0.30 Siltstone: carbonaceous

151.05 - 151.10 0.05 Coal; dull, dirty

151.10 - 151.49 0.39 Coal: dull, with up to 30% bright bands, core broken (recovered 0.25 m).

151.49 - 155.72 4.23 Siltstone: minor fine grained sandstone in upper 1.5 m, plant fragments throughout.

155.72 - 156.18 0.46 Coal: dull; 20% bright bands

156.18 - 158.85 2.67 Siltstone and mudstone: some carbonaceous zones, occasional shearing.

158.85 - 162.25 3.40 Sandstone: fine grained, banded, small cross beds. BCA = 60° - 70°.

162.25 - 162.69 0.44 Siltstone: carbonaceous, with minor coal bands (up to 2 cm in width).

162.69 - 166.63 3.94 Sandstone: fine grained, grades to medium grained at bottom of interval. BCA = 70°.

166.63 - 179.12 12.49 Sandstone: medium to coarse grained, minor siltstone, lightly banded, carbonaceous clasts common between 176.60 - 177.32 m, siltstone clasts between 177.32 - 177.45 m. BCA = 60°.

179.12 - 184.50 5.38 Siltstone: with fine grained sandstone bands and swirls.

184.50 - 185.37 0.87 Siltstone: carbonaceous

185.37 - 185.39 0.02 Coal: bright, 75% vitreous

185.39 - 185.55 0.16 Coal: dull, 30% bright bands

185.55 - 185.75 0.20 Coal: dull, boney, core broken

185.75 - 185.87 0.12 Coal: bone, core broken

MBD-78-78 (Cont'd)

185.87 - 185.98	0.11	Coal: bone
185.98 - 186.17	0.19	Siltstone: carbonaceous
186.17 - 186.35	0.18	Core lost
186.35 - 194.16	5.81	Siltstone: with minor fine grained sandstone zones
194.16 - 213.42	19.26	Sandstone: fine grained, interbedded with siltstone, small scale cross beds, minor carbonaceous partings. BCA = 57° - 69°.
COAL SEAM B13		
213.42 - 213.48	0.06	Coal: dull, hard
213.48 - 213.61	0.13	Coal: dull, friable, sheared, 20% vitreous.
213.61 - 213.94	0.33	Coal: bright, friable, sheared, 70% vitreous.
213.94 - 214.00	0.06	Coal: dull, sheared, 30% vitreous
214.00 - 214.18	0.18	Mudstone: carbonaceous, soft, sheared, broken.
214.18 - 214.30	0.12	Coal: bright, 90% vitreous
214.30 - 214.48	0.18	Coal: dull, soft, powdery, 20% vitreous.
214.48 - 214.88	0.40	Core lost
214.88 - 215.22	0.34	Mudstone: soft, sheared, carbonaceous
215.22 - 215.29	0.07	Coal: dull, soft, sheared
215.29 - 215.33	0.04	Mudstone: carbonaceous
215.33 - 215.40	0.07	Coal: dull, sheared, soft, 35% vitreous.
215.40 - 215.44	0.04	Mudstone: carbonaceous, sheared, soft
215.44 - 215.46	0.02	Coal: soft, powdery
215.46 - 215.62	0.16	Coal: bright, sheared
215.62 - 215.78	0.16	Mudstone, carbonaceous
215.78 - 215.81	0.03	Coal: dull, soft, sheared
215.81 - 216.13	0.32	Core lost
216.13 - 216.89	0.76	Mudstone: carbonaceous, grades to a dirty coal, sheared.

MBD-78-78 (Cont'd)

216.89 - 217.50	0.61	Sandstone: carbonaceous, slump features.
217.50 - 217.63	0.13	Mudstone: carbonaceous, sharp contacts
217.63 - 218.80	1.17	Sandstone: medium grained, banded, some cross bedding.
218.80 - 227.80	9.00	Siltstone: interbedded with fine sandstone, some worm burrows, minor carbonaceous partings, slump features. BCA = 65°.
227.80 - 228.18	0.38	Siltstone: carbonaceous, abundant plant fragments.
228.18 - 228.35	0.17	Coal: dull, 40% vitreous, sheared
228.35 - 229.36	1.01	Siltstone: carbonaceous, sheared
229.36 - 229.39	0.03	Coal: bright
229.39 - 229.47	0.08	Coal: dull, hard, 10 - 20% vitreous bands.
229.47 - 229.75	0.28	Coal: bright; 50% vitreous bands.
229.75 - 229.81	0.06	Mudstone: carbonaceous
229.81 - 243.03	13.22	Siltstone: interbedded with fine grained sandstone, bioturbated, slump features. BCA = 60° - 70°.
243.03 - 245.28	2.25	Mudstone: carbonaceous, small scale conical pressure features with slickensides (recovered 1.05 m).
245.28 - 254.81	9.53	Sandstone: medium to coarse grained, lightly banded, minor carbonaceous partings, fairly clean BCA = 55° - 70°.
254.81 - 255.15	0.74	Sandstone: medium to fine grained, with numerous thin carbonaceous partings.
255.15 - 257.53	2.38	Sandstone: coarse grained, black/white, bright coal partings and clasts in bottom 1 m.
257.53 - 257.56	0.03	Mudstone: carbonaceous
COAL SEAM B12		
257.56 - 257.57	0.01	Coal: bright, 90% vitreous
257.57 - 257.68	0.11	Coal: dull, 10% thin vitreous bands, hard.
257.68 - 257.72	0.04	Mudstone: carbonaceous

MBD-78-28 (Cont'd)

257.72 - 257.89	0.17	Coal: dull, 30% vitreous bands															
257.89 - 258.06	0.17	Coal: bright, 70% vitreous															
258.06 - 258.16	0.10	Coal: sheared, bright, 50% vitreous															
258.16 - 258.90	0.74	Mudstone: carbonaceous, with thin coal partings															
258.90 - 259.01	0.11	Sandstone: medium grained, coal partings 1 cm.															
259.01 - 259.34	0.33	Sandstone: medium grained, minor siltstone bands															
259.34 - 260.37	1.03	Sandstone: coarse grained, pebble conglomerate bands, bright coal partings up to 0.5 cm.															
260.37 - 260.63	0.26	Coal: dull, hard, 30% vitreous															
260.63 - 260.88	0.25	Coal: dull, powdery, 10% vitreous, sheared, core broken.															
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<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>													
0738	257.56-258.16	0.60	47.28	1½													
0739	260.37-260.88	0.51	10.24	6½													
260.88 - 261.27	0.39	Mudstone: carbonaceous, sheared															
261.27 - 261.58	0.31	Coal; bright, 70 - 80% vitreous															
261.58 - 262.18	0.60	Mudstone: carbonaceous															
262.18 - 268.78	6.60	Sandstone: fine grained, light grey, brecciated near base, carbonaceous partings along bedding. Minor cross bedding - occasional small coaly rootlet. BCA = 55.															
268.78 - 276.42	7.64	Siltstone: dark grey, uniform, occasional carbonaceous speck, rare fine grained sandstone interbed (less than 5%).															
276.42 - 277.17	0.75	Conglomerate: pebbles up to 1 cm in diameter, high sand matrix - coarse grained, subrounded, occasional coaly rootlet towards base.															
277.17 - 277.91	0.74	Siltstone: as above, bioturbated.															
277.91 - 279.50	1.59	Sandstone: medium grained, light grey, minor cross bedding, occasional pebble band.															

MBD-78-28 (Cont'd)

279.50 - 290.00	10.50	Conglomerate: pebbles from 0.5 cm to 6 cm in diameter, high matrix, pink, green, white and grey chert, occasional sandstone phase, near base.
290.00 - 290.76	0.76	Conglomerate: granule, dark grey, small coaly rootlets throughout, core broken.
290.76 - 294.63	3.87	Sandstone: fine grained, cross bedded, carbonaceous partings along bedding, mildly bioturbated, grades to unit at base.
294.63 - 295.37	0.74	Mudstone: sheared, listric surfaces, small bright coal bands throughout.
		COAL SEAM B11
295.37 - 295.70	0.33	Coal: sheared, dull, 10% vitreous bands, core broken.
295.70 - 295.96	0.26	Mudstone: uniform, core intact.
295.96 - 296.38	0.42	Coal: earthy lustre, hard, fairly high specific gravity, sheared.
296.38 - 296.40	0.02	Mudstone: coaly
296.40 - 299.15	2.75	Mudstone: carbonaceous, sheared, bright coal bands throughout, core intact.
		COAL SEAM B10
299.15 - 299.17	0.02	Coal: bone
299.17 - 299.33	0.16	Coal: 70% vitreous, core intact.
299.33 - 299.40	0.07	Mudstone: minute coal bands, pyrite specks, core intact.
299.40 - 299.47	0.07	Coal: dull, pulverized.
299.47 - 299.55	0.08	Mudstone: coaly, broken
299.55 - 299.65	0.10	Coal: dull, soft, core pulverized.

<u>Samples</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0740	295.37 - 296.40	1.03	28.04	4
0741	299.15 - 299.65	0.50	35.58	2½

MBD-78-28 (Cont'd)

299.65 - 300.01	0.36	Mudstone: carbonaceous, dark grey, minute coal bands, sheared, core broken.
300.01 - 300.41	0.40	Claystone: light grey, carbonaceous specks.
300.41 - 316.83	16.42	Sandstone: interbedded with siltstone, (ratio 1/1) some carbonaceous specks and small coaly rootlets, mildly bioturbated, BCA = 68 ⁰ .
316.83 - 319.63	2.80	Sandstone: fine grained, medium grey, heavily bioturbated.
319.63 - 321.30	1.67	Siltstone: interbedded with fine grained sandstone, some coaly rootlets near base of unit, core intact.
321.30 - 322.24	0.94	Mudstone: carbonaceous, sheared, small bright coal bands throughout, core broken.
322.24 - 322.40	0.16	Coal: dull, sheared, pulverized.
322.40 - 323.70	1.30	Mudstone: as above.
COAL SEAM B9		
232.70 - 232.90	0.20	Coal: hard, metallic lustre, core intact.
323.90 - 323.92	0.02	Coal: dull, intact.
323.92 - 324.00	0.08	Coal: earthy lustre, core intact.
324.00 - 324.09	0.09	Mudstone: carbonaceous
324.09 - 324.17	0.08	Coal: dull, core pulverized
324.17 - 324.20	0.03	Mudstone
324.20 - 324.48	0.28	Coal: dull, core pulverized.
324.48 - 324.58	0.10	Mudstone: carbonaceous, sheared
324.58 - 324.98	0.40	Coal and mudstone: sheared, core pulverized and mixed in box.
324.98 - 325.71	0.73	Core missing.
325.71 - 325.81	0.10	Coal: earthy lustre, 10% vitreous, sheared, core pulverized.

MBD-78-28 (Cont'd)

325.81 - 325.96	0.15	Coal: dull, sheared, pulverized
325.96 - 326.00	0.04	Mudstone: carbonaceous, core intact.
326.00 - 326.22	0.22	Coal: 30% vitreous, earthy lustre, core broken.
326.22 - 326.75	0.53	Core missing.
326.75 - 327.02	0.27	Coal: dull, sheared, pulverized.
327.02 - 327.19	0.17	Mudstone: carbonaceous, core broken.
327.19 - 327.42	0.23	Mudstone and coal: sheared, core pulverized and mixed in box.
327.42 - 327.56	0.14	Coal: 30% vitreous, sheared, earthy lustre, core broken.
327.56 - 327.60	0.04	Mudstone: carbonaceous.
327.60 - 327.73	0.13	Coal: dull, earthy lustre, 10% vitreous, core broken in large pieces.
327.73 - 330.40	2.67	Core missing
330.40 - 330.63	0.23	Coal: metallic lustre 10% vitreous, core broken in large pieces.
330.63 - 330.81	0.18	Coal: dirty, light specific gravity, dull, hard, sheared, core broken in large pieces.
330.81 - 331.32	0.51	Core Missing

<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0742	323.70 - 324.98	1.28	43.70	1½
0743	324.98 - 326.22	1.24	13.23	3
0744	326.22 - 327.73	1.51	35.35	1
0745	327.73 - 331.32	3.59	49.99	1

331.32 - 337.41	6.09	Mudstone: carbonaceous phases, sheared, listric surfaces, small bright coal bands near top of interval, grades to unit at base, core intact.
337.41 - 340.46	3.05	Siltstone: dark grey, mildly bioturbated, some small coaly rootlets, core intact.

MBD-78-28 (Cont'd)

370.46 - 364.85	24.39	Sandstone: medium to coarse grained, light grey, occasional small pebble band, some granule conglomerate phases, brecciated zones near top of interval, coaly rootlets common, minor shearing, minor cross bedding, some calcite filled fractures, core intact. BCA = 68°.
364.85 - 367.11	2.26	Sandstone: fine grained, light grey, interbedded with siltstone, brecciated at top, cross bedded.
367.11 - 376.30	9.19	Siltstone: interbedded with fine grained sandstone, occasional minute coal band, carbonaceous partings along bedding. BCA = 70°.
376.30 - 383.13	6.83	Sandstone: fine grained, grades to coarse grained at base of unit, cross bedding, minor carbonaceous partings along bedding.
383.13 - 387.57	4.44	Conglomerate: poorly sorted, green, white and grey chert, occasional coaly rootlet.
387.57 - 390.74	3.17	Sandstone: medium grained, medium grey, occasional small conglomerate band, occasional siltstone phase, minor cross bedding, carbonaceous partings along bedding planes.
390.74 - 394.13	3.39	Conglomerate: as above, high sandstone matrix.
394.13 - 395.80	1.67	Siltstone: carbonaceous phases, occasional mudstone phase, plant fossil fragments, small coaly rootlets.
395.80 - 398.65	2.85	Sandstone: fine grained, minor cross bedding, mildly bioturbated, brecciated, carbonaceous partings.
COAL SEAM B4		
398.65 - 398.76	0.11	Coal: earthy lustre, core intact.
398.76 - 399.07	0.31	Mudstone: carbonaceous
399.07 - 399.27	0.20	Coal: 10% vitreous, earthy lustre, core intact.
399.27 - 399.37	0.10	Mudstone: carbonaceous
399.37 - 399.56	0.19	Coal: 10% vitreous, earthy lustre, core intact.

<u>Sample</u>	<u>Interval</u>	<u>Width</u>	<u>Dry Ash</u>	<u>F.S.I.</u>
0746	398.65-399.56	0.91	46.66	4

MBD-78-28 (Cont'd)

399.56 - 401.42	1.86	Siltstone/mudstone: carbonaceous, bright coal bands up to 3 cm in width, core broken.
401.42 - 407.84	6.42	Sandstone: phases of carbonaceous mudstone, fine grained, minor cross bedding, mildly bioturbated.
407.84 - 409.44	1.60	Mudstone: carbonaceous, minor shears, core intact. COAL SEAMS B1/B2/B3
409.44 - 409.82	0.38	Coal: sheared, metallic lustre, 20% vitreous, core broken.
409.82 - 409.87	0.05	Mudstone: carbonaceous, bright bands
409.87 - 410.27	0.40	Coal: 30% vitreous, metallic lustre, core pulverized.
410.27 - 410.52	0.25	Coal: metallic lustre, hard, fairly high specific gravity, core intact.
410.52 - 410.56	0.04	Mudstone: carbonaceous
410.56 - 410.86	0.30	Coal: dirty, sheared, pyrite throughout, core pulverized.
410.86 - 411.30	0.44	Coal: 10% vitreous, metallic lustre, hard, core intact.
411.30 - 411.42	0.12	Mudstone: coaly, sheared, core broken.
		<u>Samples</u> <u>Interval</u> <u>Width</u> <u>Dry Ash</u> <u>F.S.I.</u>
		0747 409.44-410.56 1.12 20.27 3½
		0748 410.56-411.42 0.86 36.18 2
411.42 - 425.85	14.43	Siltstone: interbedded with sandstone, occasional carbonaceous mudstone phase.
425.85 - 434.64	8.79	Conglomerate: pebbles 0.5 cm to 6 cm in diameter, poorly sorted, pink, green, white and black chert.

E. O. H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MWD 78-29

LOCATION:

- (a) Coal Licence: 3172
- (b) N.T.S. 93-I-10, d-46-A
- (c) Drill Hole Co-ordinates: N 45590 - E 57350 (not surveyed)
- (d) Elevation: 1130m

AZIMUTH & INCLINATION: 050°, -70°
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Boulder Creek Member
COAL SEAMS INTERSECTED: None
TOTAL DEPTH: 200.0m

DATE DRILLED: Sept. 29 - Oct. 5, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: None

<u>Interval (metres)</u>	<u>Width (metres)</u>	
0 - 30.20	30.20	Casing
		SHAFTESBURY FORMATION
30.20 - 35.66	5.46	Siltstone: dark grey, uniform, 10% fine grained sandstone interbeds, core broken and crushed, minor shearing BCA = 70°
35.66 - 78.33	42.67	Siltstone: dark grey, uniform, 10% fine grained sandstone interbeds and swirls, minor cross bedding, minor shears with calcite along sheared surfaces, minor flow features BCA = 74°.
78.33 - 121.68	43.35	Siltstone: as above with 30% sandstone interbeds, pyrite stringers and occasional nodules near base of interval flow features, heavily bioturbated, BCA = 72°.
		BOULDER CREEK MEMBER - COMMOTION FORMATION
121.68 - 121.77	0.09	Chert: pebble 8 cm in diameter
121.77 - 124.80	3.03	Sandstone: dark grey, carbonaceous partings, some interbedded siltstone, pyrite specks and nodules.
124.80 - 126.20	1.40	Sandstone: medium grained, light grey, occasional carbonaceous partings, pyrite, some shears with calcite.
126.20 - 131.83	5.63	Claystone: medium grey, specks of Red Ochre, core broken.
131.83 - 133.70	1.87	Siltstone: dark grey, uniform
133.70 - 136.25	2.55	Claystone: medium to light grey, as above.
136.25 - 139.29	3.04	Sandstone: medium grained, coaly specks and rootlets, minor cross bedding, minor shears, pyrite nodules, core solid.
139.29 - 200.80	61.51	Sandstone: as above with intervals or phases of light grey claystone and dark grey siltstone. BCA = 72°.

E. O. H.

P A C I F I C P E T R O L E U M S L T D .

MONKMAN COAL PROJECT

Diamond Drill Log

HOLE NO: MWD 78-30

LOCATION:

- (a) Coal Licence: 3172
- (b) N.T.S. 93-I-10, c-55-A
- (c) Drill Hole Co-ordinates: N 46735 - E 57760 (not surveyed)
- (d) Elevation: 1205m

AZIMUTH & INCLINATION: 050°, -70°
CORE SIZE: HQ (63.5mm)

ABANDONMENT PROCEDURE: Casing left in hole and capped

FORMATION TESTED: Gates Member
COAL SEAMS INTERSECTED: B1 to B7
TOTAL DEPTH: 393.0m

DATE DRILLED: Oct. 6 - 20, 1978
DRILLED BY: D.W. Coates Enterprises Ltd.
LOGGED BY: A.E. Bienia

GEOPHYSICAL LOGS: Dev., Dens/Cal, GRN, FBL

MWD 78-30

<u>Interval</u> (metres)	<u>Width</u> (metres)	<u>Description</u>
0 - 33.46	33.46	Casing
GATES MEMBER - COMMOTION FORMATION		
33.46 - 41.76	8.30	Sandstone: fine grained, medium grey, interbedded with siltstone, carbonaceous partings along bedding, small coally rootlets, small calcite filled fractures core broken. BCA = 52°.
41.76 - 42.18	0.42	Coal: dull, 50% mudstone, core pulverized and mixed in box.
42.18 - 45.06	2.88	Siltstone: grades to a mudstone at base, minor shears, small coally rootlets, core broken.
45.06 - 55.40	10.34	Sandstone: interbedded with siltstone, mildly bioturbated, plant fossil fragments. BCA = 60°.
55.40 - 55.74	0.34	Siltstone: dark grey, plant fossil fragments, core intact.
55.74 - 55.95	0.21	Coal: dull, core pulverized.
55.95 - 57.00	1.05	Mudstone:
57.00 - 63.09	6.09	Siltstone: interbedded with minor fine grained sandstone, some carbonaceous partings, grades to unit at base of interval.
63.09 - 72.24	9.15	Sandstone: fine grained, medium grey, interbedded with siltstone, minor cross bedding, flow features, carbonaceous partings on bedding, minor calcite filled fractures. BCA=62°.
72.24 - 74.92	2.68	Siltstone: carbonaceous, sheared, small coally rootlets throughout, plant fossil fragments, pyrite specks, core intact.
74.92 - 77.45	2.53	Sandstone: fine grained, medium grey, interbedded with siltstone, small coally rootlets throughout, bedding highly disturbed, crossbedded, minor shears.

MWD 78-30 (Cont.)

77.45 -	81.04	3.59	Siltstone: mud clasts, some carbonaceous phases, heavily bioturbated, pyrite stringers and nodules, coaly rootlets throughout.
81.04 -	81.28	0.24	Coal: metallic lustre, sheared, pyrite throughout, core intact.
81.28 -	82.07	0.79	Siltstone: as above.
82.07 -	87.48	5.41	Mudstone: black, soft, highly carbonaceous, sheared heavily, numerous coaly rootlets, minute fractures throughout, pyrite specks.
87.48 -	90.01	5.53	Siltstone: dark grey, minute fractures throughout, core intact.
90.01 -	91.68	1.67	Sandstone: fine grained, medium grey, interbedded with siltstone, mildly bioturbated, occasional brown mud clast.
91.68 -	93.00	1.32	Mudstone: black, carbonaceous, listric surfaces, core broken.
93.00 -	93.16	0.16	Coal and Mudstone: interbedded, sheared, core broken.
93.16 -	93.19	0.03	Coal: 30% vitreous, pyrite throughout.
93.19 -	93.29	0.10	Mudstone: coaly, sheared.
93.29 -	93.57	0.28	Mudstone: and coal, sheared, core pulverized and mixed in box.
93.57 -	93.65	0.08	Coal: soft, dull, sheared.
93.65 -	94.30	0.65	Mudstone: black, coaly, bright bands throughout, sheared, core broken and crushed.
94.30 -	94.38	0.08	Coal: as above.
94.38 -	94.64	0.26	Mudstone: as above.
94.64 -	94.80	0.16	Coal: earthy lustre, core pulverized.
94.80 -	95.00	0.20	Mudstone: as above.

MWD 78-30 (Cont.)

95.00 - 97.37	2.37	Mudstone/Claystone: dark grey, soft, sheared, numerous small coaly rootlets, core intact.
97.37 - 108.81	11.44	Sandstone: fine grained, light grey, interbedded with siltstone, some small calcite filled fractures, minor shears, moderately bioturbated. BCA = 62°.
108.81 - 110.60	1.79	Mudstone: black, carbonaceous, sheared, numerous small coaly rootlets and minute bright bands.
110.60 - 112.72	2.12	Siltstone: interbedded with fine grained sandstone, brown mud bands, heavily bioturbated.
112.72 - 114.91	2.19	Sandstone: fine grained, light grey, interbedded with siltstone, minor cross bedding, carbonaceous partings along bedding, core intact.
114.91 - 115.31	0.40	Mudstone: dark grey, some pyrite.
115.31 - 117.66	2.35	Sandstone: as above, BCA = 54°.
117.66 - 120.54	2.88	Siltstone: dark grey, numerous small irregular coaly rootlets, brown mud bands, minor shears.
120.54 - 121.01	0.47	Claystone: medium grey, soft.
121.01 - 122.21	1.20	Mudstone: black, carbonaceous, numerous coaly rootlets, soft, core intact.
122.21 - 122.31	0.10	Coal: 10% vitreous, earthy lustre, sheared.
122.31 - 122.45	0.14	Coal: metallic lustre, hard, high specific gravity, sheared.
		Sample Interval Width Dry Ash F.S.
		0749 122.21 - 122.45 0.24 46.10 2
122.45 - 122.66	0.21	Mudstone: sheared, as above.
122.66 - 124.37	1.71	Mudstone: black, carbonaceous, sheared.
124.37 - 125.60	1.23	Siltstone: as above.

MWD 78-30 (Cont.)

125.60 - 133.20	7.60	Sandstone: fine grained, light grey, brown mud bands and clasts throughout, minor crossbedding, floral bioturbation, pyrite, carbonaceous partings on bedding. BCA = 62°.
133.20 - 136.75	3.55	Mudstone: as above.
136.75 - 142.34	5.59	Sandstone: fine grained, interbedded with siltstone, moderately bioturbated, minor crossbedding, small coaly rootlets carbonaceous partings.
142.34 - 143.25	0.91	Mudstone: carbonaceous, pyrite stringers and nodules.
143.25 - 143.77	0.52	Sandstone: medium grained, as above.
143.77 - 144.96	1.19	Siltstone: interbedded with fine grained sandstone.
144.96 - 146.90	1.94	Mudstone: medium to dark grey, carbonaceous coal bands up to 10 cm, sheared, pyrite specks and stringers.
146.90 - 148.60	1.70	Siltstone: interbedded with fine grained sandstone, minor crossbedding, slump features, carbonaceous partings.
148.60 - 149.33	0.73	Sandstone: light grey, medium grained, flow features, minor crossbedding, carbonaceous partings.
149.33 - 151.06	1.73	Mudstone
151.06 - 154.54	3.48	Sandstone: as above.
154.54 - 157.79	3.25	Mudstone: carbonaceous, sheared.
157.79 - 163.39	5.60	Sandstone: fine grained, light grey, interbedded with siltstone, carbonaceous partings, small coaly rootlets, minor crossbedding, occasional calcite filled fracture. BCA = 65°.
163.39 - 164.07	0.68	Mudstone: black, as above.
164.07 - 166.14	2.07	Sandstone: as above.
166.14 - 166.96	0.82	Mudstone: black, carbonaceous, sheared.
166.96 - 169.47	2.51	Siltstone: interbedded with sandstone, brown mud bands, carbonaceous partings, bioturbated.

MWD 78-30 (Cont.)

169.47 - 170.83	1.36	Mudstone: black, carbonaceous, sheared.
170.83 - 172.20	1.37	Siltstone: interbedded with fine grained sandstone, brown mud bands, slump features, sheared.
172.20 - 180.80	8.60	Sandstone: fine to medium grained, coarsens downward, carbonaceous, partings along bedding, minor shears, crossbedded, slump features, BCA = 60°.
180.80 - 181.97	1.17	Sandstone: medium grained, interbedded with siltstone, small coaly rootlets throughout.
181.97 - 182.80	0.83	Siltstone: minor interbeds of fine grained sandstone, plant fossil fragments, pyrite specks, minor shears.
182.80 - 182.95	0.15	Mudstone: carbonaceous, black, sheared, pyrite specks.
182.95 - 183.01	0.06	Coal: sheared, earthy, fairly high specific gravity.
183.01 - 183.35	0.34	Mudstone: carbonaceous, sheared, core broken.
		COAL SEAM
183.35 - 183.73	0.38	Coal: pulverized, sheared, listric surfaces breaks into flakes.
183.73 - 184.03	0.30	Coal: dull, sheared, pyrite specks, core broken, fairly high S.G.
184.03 - 184.41	0.38	Coal: earthy lustre, sheared, core broken.
184.41 - 186.79	2.38	Core missing.
186.79 - 186.95	0.16	Coal: dirty, sheared, high S.G., core intact.
186.95 - 186.99	0.04	Coal: earthy lustre, core intact.
186.99 - 187.47	0.48	Coal: dull, dirty, sheared, 50% mudstone, core pulverized and mixed in box.
187.47 - 188.66	1.19	Core missing.
188.66 - 189.03	0.37	Coal: dull, dirty, sheared, core pulverized.

MWD 78-30 (Cont.)

189.03 - 189.43	0.40	Mudstone: carbonaceous, sheared, core broken.																														
189.43 - 189.63	0.20	Coal: dirty, core broken.																														
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>FSI</th> </tr> </thead> <tbody> <tr> <td>0750</td> <td>183.35 - 184.41</td> <td>1.06</td> <td>15.81</td> <td>5</td> </tr> <tr> <td>0751</td> <td>184.41 - 187.47</td> <td>3.06</td> <td>59.46</td> <td>2</td> </tr> <tr> <td>0752</td> <td>188.66 - 189.03</td> <td>1.00</td> <td>67.21</td> <td>NA</td> </tr> <tr> <td>0753</td> <td>189.03 - 189.43</td> <td>0.40</td> <td>72.32</td> <td>NA</td> </tr> <tr> <td>0754</td> <td>189.43 - 189.63</td> <td>0.20</td> <td>72.67</td> <td>NA</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	FSI	0750	183.35 - 184.41	1.06	15.81	5	0751	184.41 - 187.47	3.06	59.46	2	0752	188.66 - 189.03	1.00	67.21	NA	0753	189.03 - 189.43	0.40	72.32	NA	0754	189.43 - 189.63	0.20	72.67	NA
Samples	Interval	Width	Dry Ash	FSI																												
0750	183.35 - 184.41	1.06	15.81	5																												
0751	184.41 - 187.47	3.06	59.46	2																												
0752	188.66 - 189.03	1.00	67.21	NA																												
0753	189.03 - 189.43	0.40	72.32	NA																												
0754	189.43 - 189.63	0.20	72.67	NA																												
189.63 - 194.16	4.53	Mudstone: black, sheared, numerous coaly rootlets, soft.																														
194.16 - 196.60	2.44	Sandstone: fine grained, dark grey, occasional coaly rootlet, bioturbated.																														
196.60 - 205.71	9.11	Sandstone: medium to coarse grained, light grey, minor crossbedding, mud clasts towards base, occasional calcite filled fracture, numerous coaly rootlets at 200 m minor shears, carbonaceous partings along bedding, BCA = 58°.																														
205.71 - 206.35	0.64	Mudstone: dark grey, uniform, core intact.																														
206.35 - 209.40	3.05	Sandstone: fine grained, slump features, bioturbated.																														
209.40 - 211.80	2.40	Sandstone: fine grained, interbedded with siltstone, mildly bioturbated, slump features, core intact.																														
211.80 - 213.40	1.60	Mudstone: dark grey, minute fractures throughout, numerous plant fossil fragments, core intact.																														
213.40 - 217.10	3.70	Siltstone: medium grey, carbonaceous specks, plant fossil fragments, minor shears.																														
217.10 - 222.13	5.03	Sandstone: light grey, medium to coarse grained, carbonaceous partings along bedding, crossbedded, coaly rootlets towards base. BCA = 63°.																														
222.13 - 224.94	2.81	Conglomerate: granule, some pebbles 1 - 2 cm, coaly rootlets throughout.																														

MWD 78-30 (Cont.)

224.94 - 229.32	4.38	Sandstone: light grey, medium to coarse grained, coaly rootlet throughout, some pebble bands up to 10 cm in width, cross-bedding.
229.32 - 235.40	6.08	Conglomerate: pebble, pink, green chert, pebbles 0.5 cm - 4 cm in diameter.
235.40 - 240.00	4.60	Sandstone: light grey, medium to coarse grained, cross-bedded, carbonaceous partings on bedding, coarsens towards base. BCA = 62°.
240.00 - 240.28	0.28	Mudstone:
240.28 - 243.80	3.52	Sandstone: fine grained, light grey, mildly bioturbated.
243.80 - 245.20	1.40	Sandstone: coarse grained, occasional pebble band, numerous coaly rootlets.
245.20 - 257.00	11.80	Conglomerate: pebbles 1 to 6 cm in diameter, well rounded, high sand matrix.
257.00 - 258.90	1.90	Mudstone: carbonaceous, black, sheared, pyrite specks, sheared, small coaly rootlets throughout, core broken in large pieces.
COAL SEAM B7		
258.90 - 259.20	0.30	Coal: 10% vitreous, earthy lustre, core broken in large pieces.
259.20 - 259.48	0.28	Coal and Mudstone: dirty, sheared, core broken and crushed.
259.48 - 260.54	1.06	Mudstone: black, sheared, as above.
260.54 - 260.92	0.38	Mudstone: coaly, soft, sheared, core pulverized.
260.92 - 261.21	0.29	Mudstone: black, sheared, core intact.
261.21 - 262.73	1.52	Siltstone: interbedded with fine grained sandstone, cross-bedded carbonaceous partings, core intact.

MWD 78-30 (Cont.)

262.73 - 263.18	0.45	Mudstone: coaly, sheared, core broken in large pieces.
263.18 - 263.33	0.15	Coal: dull, earthy lustre, fairly high specific gravity, core intact.
263.33 - 263.48	0.15	Coal: as above.
263.48 - 263.88	0.40	Coal: dirty, earthy lustre, sheared, fairly high S.G., core intact.
263.88 - 264.36	0.48	Mudstone: as above.
264.36 - 265.79	1.43	Mudstone: carbonaceous, sheared, occasional coal band 3 - 4 cm in width, minute fractures, core intact.

Samples	Interval	Width	Dry Ash	FSI
0755	258.90 - 259.48	0.58	50.54	1
0756	262.73 - 264.36	1.63	70.54	1
0757	264.36 - 265.79	1.43	86.00	NA

COAL SEAM B6

265.79 - 266.04	0.25	Coal: 10% vitreous, hard, metallic lustre, sheared, core intact.
266.04 - 266.38	0.34	Coal: 10% vitreous, dull, sheared, core broken in large pieces.
266.38 - 266.95	0.57	Coal: 20% vitreous, earthy lustre, sheared, pyrite specks, core broken
266.95 - 267.31	0.36	Core missing.
267.31 - 268.20	0.89	Coal: 30% vitreous, metallic lustre, sheared, pyrite specks, core pulverized.
268.20 - 268.60	0.40	Coal: earthy lustre, 20% vitreous, sheared, pyrite specks, core broken.
268.60 - 268.75	0.15	Mudstone: coaly.
268.75 - 268.93	0.18	Coal and Mudstone: interbedded.

MWD 78-30 (Cont.)

Interval	Thickness	Description
268.93 - 269.28	0.35	Mudstone: carbonaceous and coaly, sheared.
		Samples Interval Width Dry Ash FSI
		0758 265.79 - 267.31 1.52 9.62 4½
		0759 267.31 - 268.20 0.89 40.55 2½
		0760 268.20 - 268.60 0.40 11.03 7½
		0761 268.60 - 269.28 0.68 75.88 1
269.28 - 270.25	0.97	Mudstone: black, carbonaceous, sheared.
270.25 - 276.18	5.93	Siltstone: interbedded with fine grained sandstone, bioturbated, occasional brown mud band.
276.18 - 278.30	2.12	Sandstone: light grey, medium grained, carbonaceous partings along bedding, cross-bedded core intact. BCA = 63°.
278.30 - 303.50	25.20	Sandstone: fine to coarse grained, light grey, coarsens downwards, carbonaceous partings on bedding, minor cross bedding, occasional pebble band towards base, as well as numerous coaly rootlets towards base of interval. BCA = 63°.
303.50 - 303.60	0.10	Mudstone: carbonaceous.
		COAL SEAM B4
303.60 - 303.64	0.04	Coal: dull, core intact.
303.64 - 303.76	0.12	Mudstone: coaly, core intact.
303.76 - 303.89	0.13	Mudstone: carbonaceous.
303.89 - 304.15	0.26	Coal: dirty, fairly high specific gravity.
304.15 - 305.10	0.95	Coal: 10% vitreous, metallic lustre, sheared, pyrite specks, core broken.
305.10 - 305.55	0.45	Coal: dull, sheared, pyrite, core pulverized, breaks into flakes.
305.55 - 305.97	0.42	Coal: 30% vitreous, earthy lustre, pyrite specks, core intact.
305.97 - 306.17	0.20	Coal: dull, sheared, pulverized, breaks into flakes.
306.17 - 307.67	1.50	Mudstone: black, carbonaceous, sheared, pyrite.

MWD 78-30 (Cont.)

307.67 - 309.09	1.42	Siltstone: interbedded with sandstone, as above.																									
309.09 - 309.40	0.31	Mudstone: carbonaceous, as above.																									
309.40 - 309.52	0.12	Coal: earthy lustre, fairly high specific gravity, sheared, core intact.																									
309.52 - 309.80	0.28	Coal: 30% vitreous, earthy lustre, sheared, core broken.																									
309.80 - 310.12	0.32	Coal: 20% vitreous, earthy lustre, pyrite, sheared, core broken in large pieces.																									
310.12 - 310.19	0.07	Coal: dull, 10% vitreous, earthy lustre, core intact.																									
		<table border="1"> <thead> <tr> <th>Samples</th> <th>Interval</th> <th>Width</th> <th>Dry Ash</th> <th>FSI</th> </tr> </thead> <tbody> <tr> <td>0762</td> <td>303.60 - 304.15</td> <td>0.55</td> <td>69.58</td> <td>NA</td> </tr> <tr> <td>0763</td> <td>304.15 - 305.10</td> <td>0.95</td> <td>16.29</td> <td>3</td> </tr> <tr> <td>0764</td> <td>305.10 - 306.17</td> <td>1.07</td> <td>10.22</td> <td>7½</td> </tr> <tr> <td>0765</td> <td>309.40 - 310.19</td> <td>0.79</td> <td>10.78</td> <td>7½</td> </tr> </tbody> </table>	Samples	Interval	Width	Dry Ash	FSI	0762	303.60 - 304.15	0.55	69.58	NA	0763	304.15 - 305.10	0.95	16.29	3	0764	305.10 - 306.17	1.07	10.22	7½	0765	309.40 - 310.19	0.79	10.78	7½
Samples	Interval	Width	Dry Ash	FSI																							
0762	303.60 - 304.15	0.55	69.58	NA																							
0763	304.15 - 305.10	0.95	16.29	3																							
0764	305.10 - 306.17	1.07	10.22	7½																							
0765	309.40 - 310.19	0.79	10.78	7½																							
310.19 - 310.90	0.71	Mudstone: carbonaceous.																									
310.90 - 313.03	2.13	Sandstone: fine grained, minor siltstone interbeds, carbonaceous partings.																									
313.03 - 316.68	3.65	Siltstone: interbedded with fine grained sandstone, bioturbated, calcite filled fracture, occasional mudstone phase.																									
316.68 - 317.02	0.34	Coal: 10% vitreous, earthy lustre, sheared, core broken.																									
317.02 - 317.87	0.85	Mudstone: carbonaceous, 10 cm coal band at base of interval, core intact.																									
317.87 - 328.31	10.44	Siltstone: interbedded with fine grained sandstone, occasional mudstone phase, calcite filled fractures, coaly rootlets, slump features.																									
328.31 - 328.49	0.18	Mudstone: carbonaceous.																									
		COAL SEAM B3																									
328.49 - 328.59	0.10	Coal: hard, metallic lustre, sheared, core intact.																									

MWD 78-30 (Cont.)

328.59 - 329.11	0.52	Coal: 20% vitreous, metallic lustre, hard, sheared, pyrite throughout, core broken in large pieces.
		Sample Interval Width Dry Ash F.S.I.
		0766 328.31 - 329.11 0.80 15.94 7
329.11 - 330.21	1.10	Mudstone: carbonaceous, coal bands 2 - 3 cm in width, core intact.
330.21 - 331.49	1.28	Sandstone: fine grained, carbonaceous partings, bioturbated.
331.49 - 340.76	9.27	Siltstone: interbedded with fine grained sandstone, cross-bedded, occasional calcite filled fracture, mildly bioturbated, carbonaceous parting. BCA = 60°.
340.76 - 343.51	2.75	Mudstone: carbonaceous, coaly stringers, sheared.
343.51 - 347.72	4.21	Sandstone: fine grained, minor siltstone interbeds, mildly bioturbated, carbonaceous partings, plant fossil fragments.
347.72 - 352.78	5.06	Mudstone: carbonaceous, occasional coal band up to 10 cm in width.
		COAL SEAM B1
352.78 - 353.16	0.38	Mudstone: coaly, sheared, pyrite specks, core broken and crushed.
353.16 - 353.48	0.32	Coal: 10% vitreous, earthy lustre, pyrite specks, sheared, core broken in large pieces.
353.48 - 353.79	0.31	Coal: soft, dull, sheared, core pulverized, breaks into flakes.
353.79 - 353.86	0.07	Coal: soft, dull, high S.G., sheared, core pulverized.
353.86 - 354.35	0.49	Coal: and coaly mudstone; sheared, core pulverized.

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78(4)A
COOL QUALITY
1978

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COAL QUALITY

6.1 Drill Core Testing

The purpose of the drill core sampling program was to establish the overall quality of the coalfield and to provide assurance that the bulk samples were representative of the deposit.

Sampling was carried out in the field on a lithological basis, with a limit of 1.5 m on the length of any core sample. Where the upper or lower contact of a seam was difficult to ascertain because of the presence of minor partings (in the 15 cm 30 cm range) interbedded with coal bands of similar thickness, samples were generally taken over shorter lengths. In these cases a coal band would be sampled along with the parting which separated it from the main body of the seam.

Sampling was done as soon as possible after receipt of the core at the core shack, and the samples were stored under cover in sealed plastic bags. Deliveries to the laboratory were made weekly.

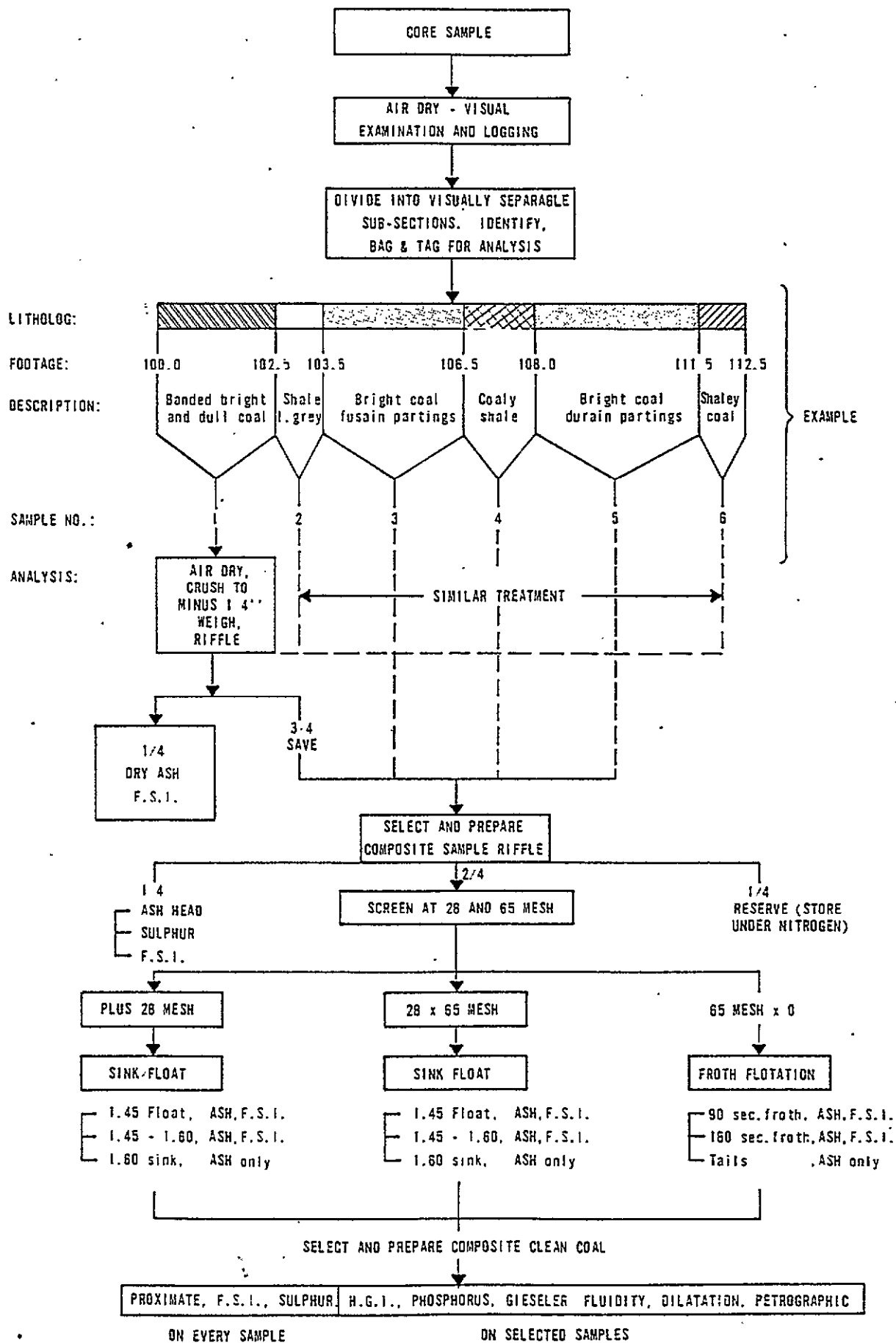
The individual samples were analysed for ash and F.S.I., and the components of the composite seam samples selected at head office. The laboratory made up the composites according to sample width. The test procedures applied to the core samples are outlined in Figure II.6-1 concise summary of the results obtained appears on pp. 79 to 100.

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

00 543

CONFIDENTIAL

FIGURE II.6-1
PACIFIC PETROLEUMS LIMITED
TESTING PROCEDURES DRILL CORE SAMPLES



6.2 Bulk Sampling Procedures

The main objective of the bulk sampling program was to provide a representative ten ton sample from each of three coal seams so that sufficient clean coal could be made available for coking tests.

Figure II.6-2 shows the testing procedures followed for bulk sampling. (See map box)

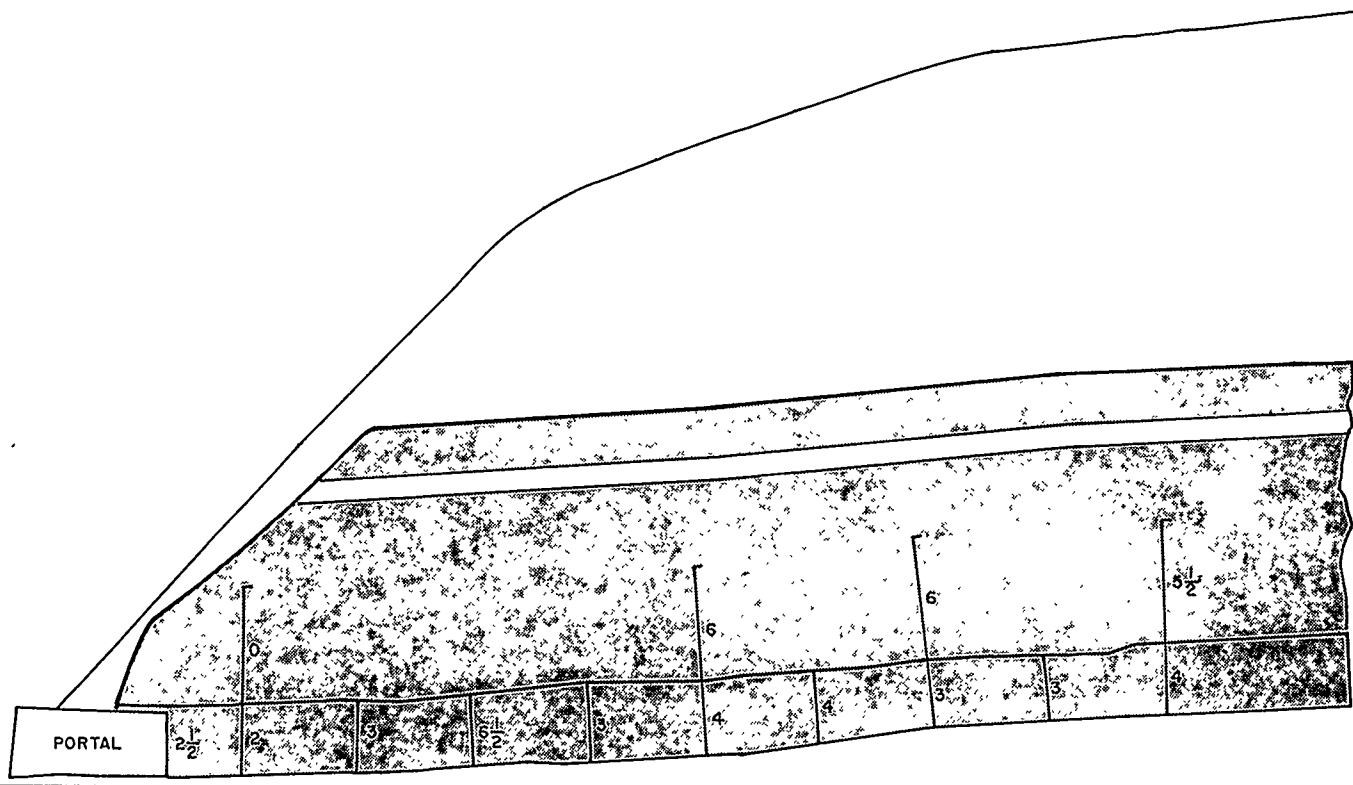
Bulk samples for the above tests were taken from three separate seams obtained from two adits. The details of these adits are illustrated in Figures II.6-6 to II.6-8. Bulk sample No. 1 (Seam B4) had a 50° raise through the seam. Bulk sample No. 2 (Seam B3), in the same adit, intersected the seam on the level. In the second adit, bulk sample No. 3 (Seam B9) had an almost vertical raise.

In No. 1, a tin-plate chute was constructed in the raise and a tin-plate receptacle placed at the bottom. The sample was taken according to the geologist's instructions, starting at the hanging wall, using air-picks. It was found necessary to remove one very tough parting near the top by blasting. The sample was picked up by a "Bobcat" front-end loader and transported to two large bins outside. As soon as the sampling was completed the bins were taken to camp and loaded on to a highboy truck for shipment to Calgary.



In No. 2 adit, the floor was covered with plywood and the sample shovelled into wheelbarrows, dumped from there into the bucket of the front-end loader and thence to the bins.

NW

SE



Elev. 1250 m

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date Feb. 16, 1979.
ADIT No. 1 (B4/B3-78-1) SECTION ON Az. 141° THROUGH DRIFT ON B4 SEAM SHOWING FSI'S	Revised Author J. Wright Drafted edy Scale 1:200 Fig. II. 6-6

NE

SW

Ground Surface

8.6m (Approx.)

SEAM B4
9.15 m.
Dip 34°

SEAM B3
3.97 m.
Dip 30°

B3 X-CUT

DRIFT
FROM
PORTAL
33.75 m

Elev. 1250 m.



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

Date Feb. 14, 1979.

ADIT No. 1 (B4/B3-78-1)

Revised

Author J. Wright

Drafted edy

Scale 1:200

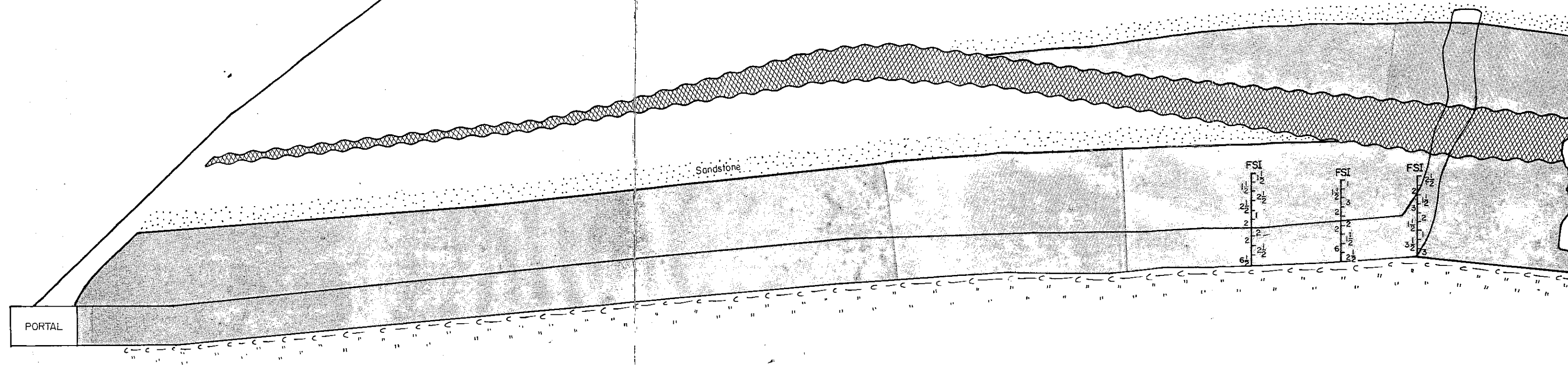
SECTION ON AZ. 231°
THROUGH B4 RAISE
AND B3 X-CUT

Fig. II.6-7

- 65 -

North

South





SEAM B9 Repeat

FAULT ZONE

SEAM B9

Elev. 1450.0 m

 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		Date Feb. 15, 1979
ADIT No. 2 (B9-78-1) SECTION ON Az. 180°		Revised
		Author J. Wright
		Drafted edy
		Scale 1:200
		Fig. II.6-8

In No. 3, the sample was allowed to fall straight down the raise on to a tarpaulin-covered receptable from which it was transported by the front-end loader to the bins.

When the results of the sampling of No. 1 adit were available there was great concern that the ash content was very high compared with the drill hole information, and a decision was made to re-sample the adit. This was done according to the same method as the first sample, but no blasting of the parting was permitted. The sample was removed by wheelbarrow, dumped on metal sheeting, then loaded on to a highboy truck for shipment to Calgary.

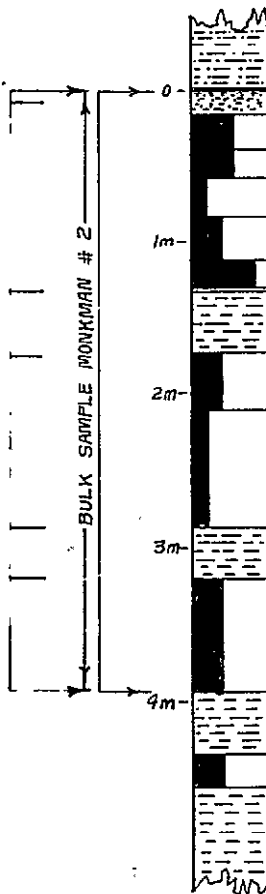
6.3 Channel Samples

Channel samples were taken in each adit. In the first two adits, the sampling was done by hand prior to excavation of the bulk sample, using a geological hammer to make a shallow (3 cm) channel across the thickness of the seam and taking samples on a lithological basis.

In the third adit (Seam B9), the channel was taken after excavation of the bulk sample, by means of an air pick. A 25 cm square channel was cut across the thickness of the seam. Samples were again taken lithologically.

The details of the sample intervals and the results obtained are illustrated in Figures II.6-3 to II.6-5. The samples were treated in the laboratory in a similar manner to core samples.



CHANNEL SAMPLE		
Ash	FSI	Sample No.
91.1	5/2	0496
8.10	7/2	0497
81.0	-	0498
13.5	5	0499
77.7	1/2	0500
5.6	9	0510



LITHOLOGY

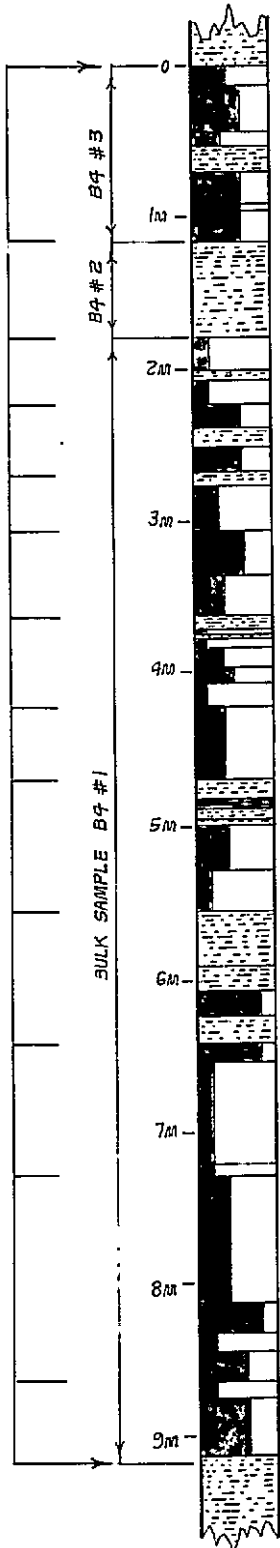
- 0.02 VITREOUS COAL
- 0.15 BONE SOFT FRIABLE
- 0.22 COAL, CLEAN, SOFT, 60% VITREOUS
- 0.01 DIRTY COAL
- 0.18 CLEAN SOFT COAL, 60% VITREOUS
- 0.27 V. HARD COAL, CLEAN 5% VITREOUS
- 0.31 COAL, CLEAN, HARD 30% VITREOUS
- 0.16 SOFT CLEAN, HIGHLY VITREOUS
- 0.04 DIRTY COAL
- 0.38 MUDSTONE, MASSIVE WEAKLY CARBONACEOUS
- 0.37 COAL, CLEAN, FRIABLE, 30% VITREOUS
- 0.77 COAL, DULL CLEAN 10% VITREOUS SOFT AND FRIABLE.
- 0.37 MUDSTONE BROWN
- 0.75 COAL 30% VITREOUS CLEAN, SOFT, BREAKS EASILY.
- MUDSTONE, COALY LAMINATIONS

Sampled by:
A. Embleau
Logged by:
L. A. Smith
August 25, 1978.

 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 		
MONKMAN COAL PROJECT		Date Feb. 22, 1979
ADIT No.1 (B4/B3-78-1) SEAM B3 SAMPLED INTERVALS		Revised
		Author L.A.S.
		Drafted by
		Scale 1:50
		Fig. II.6-3

CHANNEL SAMPLE



Ash	FSI	Sample No.
43.6	4	0725
83.9	-	0726
29.6	2 1/2	0727
5.8	8 1/2	0728
36.1	1	0729
10.6	8	0730
45.2	2 1/2	0731
13.3	6	0732
26.1	4 1/2	0733
60.3	1 1/2	0734
19.6	3	0735
5.7	8	0736
7.4	8	0737



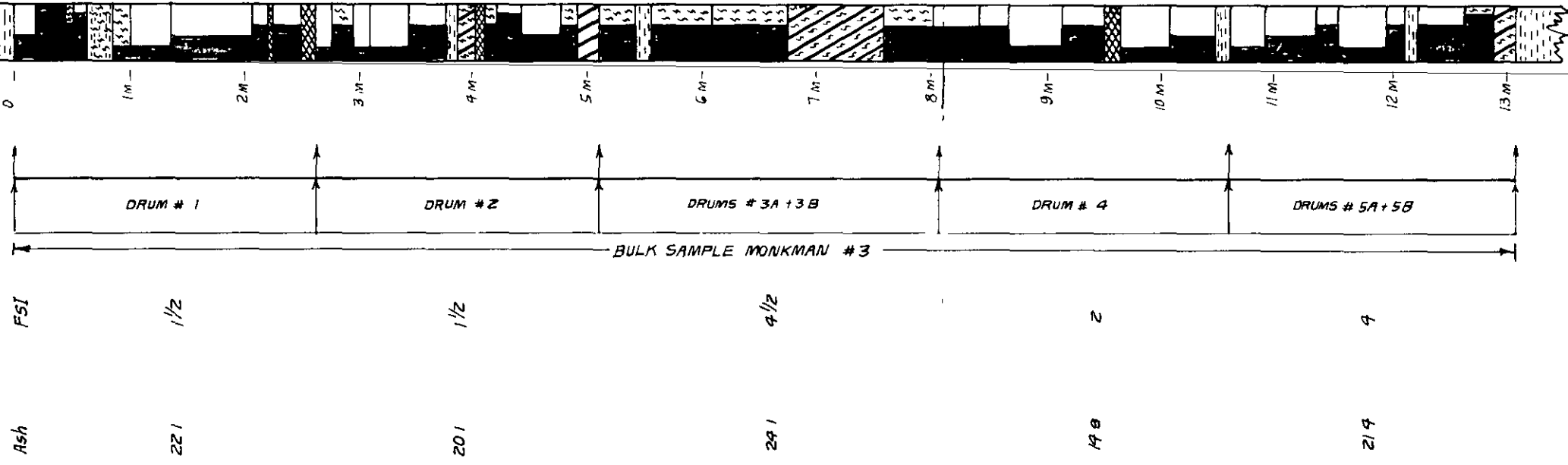
LITHOLOGY

ROOF SILTSTONE
 COAL, BRIGHT
 COAL, CLEAN, HARD, 50% BRIGHT
 COAL, DIRTY, 40% BRIGHT
 COAL, HARD, 60% BRIGHT
 DIRTY COAL
 COAL, HARD 60% VITREOUS
 MUDSTONE
 COAL, DULL, FAIRLY DIRTY THIN ROCK BANDS
 MUDSTONE, CARB.
 COAL, DULL, DIRTY
 COAL, 60% BRIGHT, CLEAN
 MUDSTONE, CARB., MOTTLED TEXT.
 COAL, CLEAN 60% BRIGHT
 MUDSTONE
 COAL, DIRTY, DULL, HARD
 COAL, VERY CLEAN, HARD BRIGHT 70% VITREOUS
 COAL, MUD DIRTY 40% VITREOUS SMALL ROCK BANDS
 CARB. MUDSTONE FINE LAMINATIONS
 DULL, DIRTY, SOFT CONG.
 MUDSTONE, CARBONACEOUS
 COAL, DULL EARTHY
 COAL, DULL, MUD EARTHY
 EARTH, LUSTRE 30% BRIGHT
 COAL DIRTY, INTERBED IN VITRAIN, MUDSTONE
 COAL DIRTY, DULL, SOFT, BONY
 COAL, CLEAN, 40% VITRAIN, DULL EARTHY LUSTRE VERY HARD
 COAL, BONY, VERY DIRTY
 COAL, CLEAN, FRIABLE 85% VITREOUS
 MUDSTONE, MASSIVE
 COAL, CLEAN, DULL, SOFT, 30% BRIGHT.
 COAL, DIRTY COAL, INTERBED. 10% VIT. BANDS ALL DIRTY HARD.
 MUDSTONE, CARB. SOFT. THIN VITREOUS DISCONTINUOUS BANDS.
 MUDSTONE
 COAL 80% VITREOUS 30% ROCK BANDS
 MUDSTONE, CARBONACEOUS SMALL THRUSTS
 COAL, CLEAN, BRIGHT. 80% VITREOUS SOFT.
 COAL, DULL, DIRTY, 10% VITREOUS
 SHALLOW FRULTS. VERY HARD
 COAL, VERY DIRTY, VERY DULL, VERY HARD
 COAL, 40% VITREOUS HARD. 20% DIRTY COAL BANDS
 10% ROCK BANDS, EARTHY LUSTRE CLEANER TO BASE.
 COAL, CLEAN, 70% VITREOUS MOD SOFT.
 COAL, DULL, DIRTY, SLICKENSIDES
 COAL SHINY, V SOFT, SHALLOW THRUSTS. SYGMOIDAL LAM, 60% VIT. FAIRLY DIRTY
 COAL, DIRTY V. HARD. RUSTY ON SHEAR PLANES
 COAL, BRIGHT, 60% VIT. SMALL THRUSTS SHEAR V. SOFT.
 <10% THIN DIRTY COAL LENS
 COAL, BONY, SHEARED, SOFT.
 FOOTWALL CRENULATED CALCITE (6mm) VEIN ON MUDSTONE, MASSIVE GREY TO BROWN

Sampled by:
 A. Wallinder
 Logged by:
 L. Smith
 Oct. 14, 1978.

 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		Date Feb. 22, 1979
ADIT No.1 (B4/B3-78-1) SEAM B4 SAMPLED INTERVALS		Revised Author L.A.S. Drawn edy Scale 1:50 Fig. II.6-4

CHANNEL SAMPLE



LITHOLOGY

MUDSTONE DARK BROWN

COAL DULL BANDED (30% VITREOUS)
BRIGHT (90% VITREOUS)
DULL & BRIGHT, SHEARED (50% VITREOUS)
BRIGHT BANDED (70% VITREOUS)

CARBONACEOUS MUDSTONE, DARK GREY - BROWN SLICKENSIDES, CALCITE VEINS

COAL DULL SHEARED (10% VITREOUS)
DULL (10% VITREOUS)

DULL BANDED (30% VITREOUS) IRON STAINS ? WEATHERED

DULL & BRIGHT (50% VITREOUS) " "
STONEY, HIGH SG, EARTHY " "
DULL & BRIGHT (50% VITREOUS) " "
STONEY, HIGH SG, EARTHY, PYRITIC " "
DULL (10% VITREOUS) " "
DULL & BRIGHT (50% VITREOUS), SHEARED
DULL (10% VITREOUS), PYRITE
DULL (10% VITREOUS)

DULL & BRIGHT (50% VITREOUS)

CARBONACEOUS CLAYSTONE DARK BROWN SLICKENSIDES & LARGE CALCITE VEINS AT BASE
COAL & CLAYSTONE HEAVILY SHEARED & MIXED
STONEY, HIGH SG, IRON STAIN ? WEATHERED
DULL & BRIGHT (50% VITREOUS) VERY HEAVILY SHEARED WEATHERED
BRIGHT BANDED (70% VITREOUS) IRON STAINING ? WEATHERED

COAL DULL BANDED (30% VITREOUS) " "

DULL & BRIGHT (50% VITREOUS), SHEARED IRON STAINING ? WEATHERED
COAL & CLAYSTONE INTERBANDED

COAL DULL & BRIGHT (50% VITREOUS), SHEARED
CARBONACEOUS CLAYSTONE DARK BROWN

COAL DULL & BRIGHT, VERY HEAVILY SHEARED

DULL & BRIGHT (50% VITREOUS) VERY HEAVILY SHEARED

COAL & CLAYSTONE VERY HEAVILY SHEARED & MIXED, STRONGLY SLICKENSIDED

COAL DULL & BRIGHT (50% VITREOUS) SHEARED, UNSTAINED ? WEATHERED

DULL & BRIGHT, 50% VITREOUS) " "
DULL & BRIGHT (50% VITREOUS) " "
DULL (10% VITREOUS) " "
DULL & BRIGHT (50% VITREOUS) " "
STONEY, HIGH SG " "
DULL (10% VITREOUS) " "

CARBONACEOUS CLAYSTONE DARK BROWN

COAL DULL (10% VITREOUS)

DULL BANDED (30% VITREOUS)

DULL & BRIGHT (50% VITREOUS)

DULL (10% VITREOUS)

CARBONACEOUS CLAYSTONE DARK BROWN

COAL DULL (10% VITREOUS)

DULL BANDED (30% VITREOUS)

DULL & BRIGHT (50% VITREOUS)

DULL (10% VITREOUS)

CARBONACEOUS CLAYSTONE DARK BROWN

COAL DULL & BRIGHT (50% VITREOUS) SHEARED
BRIGHT BANDED (70% VITREOUS) SHEARED
COAL & CLAYSTONE INTERBANDED SHEARED
CLAYSTONE DARK BROWN

Sampled by
A Embleau
Logged by
G Jordan
Sept 10, 1978

PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT	Date Feb 22, 1979 Revised _____ Author L A S Drafted edy Scale 1:50
ADIT No 2 (B9-78-1) SEAM B9 SAMPLED INTERVALS	
Fig II 6-5	

6.4 Summary of Results - Drill Core Data

The raw coal analyses and the washability results from the core testing program are presented on pp. 79 to 100 . The drill holes are arranged numerically in two groups, the first (MDD series) representing the Duke Mountain area and the second, (MUD series), Duchess Mountain. The intervals recorded are driller's depths. Elsewhere in this report, these depths have been amended to conform with the geophysical logging records; these tables are intended to record the raw data before modification. The results of sink-float tests at two specific gravities are shown, and in the same way the froth flotation over different time periods. The clean coal analysis, however, is for sink-float at 1.60 S.G. and a froth flotation of 3 minutes.

In Tables III.9-2, III.9-3, III.9-4 and III.9-5 rheological properties and petrographic analyses for both 1977 and 1978 cores are presented.

6.5 Summary of Results - Bulk Sampling

The bulk samples were shipped to Birtley Coal and Minerals Testing's wash plant facility in Calgary where they were treated according to the flowsheet presented as Figure II.6-2.

The results of the pilot plant wash tests are summarized on Table III.9-6.

Representative samples of the washed coal were shipped to the CANMET laboratory in Ottawa for carbonization tests. These are reported in Table III.9-7.

RHEOLOGICAL PROPERTIES

TABLE III.9-2
DUKE MOUNTAIN

	Ash %	VM %	FSI	Gieseler Plasticity					Ruhr Dilatometer						
				Start °C	Maximum °C		Final °C	Rge. °C	Start °C	Soft °C	Maximum Dil. °C	Contr. %	Dil. %	G Factor	
					°C	DDPM									
<u>SEAM B10</u>															
77-7	12.9	21.5	3 ½	432	456	5	477	45	350	392	468	22	NIL	0	
<u>SEAM B9</u>															
77-7	8.9	21.8	3	432	459	6	483	51	350	397	471	24	NIL	0	
77-2	10.9	22.1	5	432	459	5	483	51	340	395	NR	22	NIL	0	
<u>SEAM B6</u>															
78-10	4.8	27.4	6	420	464	75	499	79	NOT DETERMINED						
<u>SEAM B5</u>															
78-10	10.3	23.8	5 ½	434	468	42	498	64	NOT DETERMINED						
<u>SEAM B4</u>															
77-7	9.4	22.0	6	429	462	11	486	57	340	396	487	26	-13	0.76	
BULK #1	7.9	24.0	7 ½	402	473	31	506	104	-	398	476	23	20	0.99	
CHANNEL #1	9.7	23.1	7	406	476	10	504	98	-	410	476	24	2	0.94	
77-2B	7.0	23.7	7 ½	NOT DETERMINED					350	390	481	28	15	0.96	
78-11	10.0	23.9	7 ½	380	467	435	504	124	NOT DETERMINED						
78-11	7.4	24.0	7 ½	401	471	111	505	104	NOT DETERMINED						
<u>SEAM B3</u>															
77-7	8.3	21.6	7	429	468	27	495	66	360	400	491	27	-1	0.90	
BULK #2	7.9	22.8	7 ½	393	469	179	504	111	NOT DETERMINED						
78-11	6.3	24.7	7 ½	425	488	14	519	94	-	410	485	23	5	0.95	
<u>SEAM B1</u>															
77-7	9.0	21.5	7 ½	414	465	298	504	90	360	385	468	29	44	1.02	

TABLE III.9-3
DUCHESS AREA = MUD

	Ash %	VM %	FSI	Gieseler Plasticity					Ruhr Dilatometer					
				Start °C	Maximum °C DDPH		Final °C	Rge. °C	Start °C	Soft °C	Maximum Dil. °C	Contr. %	Dil. %	G Factor
<u>SEAM B9</u>														
BULK #3	7.5	24.3	3 ½	410	462	4	489	79	-	398	-	22	NIL	0
78-14	8.1	23.5	4 ½	401	465	4	493	92	-	413	-	23	NIL	0
77-4	7.6	24.0	4 ½	444	455	2	471	27	360	400	466	17	NIL	0
78-17	11.5	22.2	2 ½	445	465	3	492	47	-	401	-	21	NIL	0
77-5*			1	450	456	1	465	15	340	405	481	20	NIL	0
<u>SEAM B6</u>														
77-5	6.5	26.0	7	411	456	55	483	72	340	380	475	28	32	1.01
<u>SEAM B4</u>														
78-14	8.5	23.8	7 ½	397	469	64	501	104	NOT DETERMINED					
77-4	9.9	23.8	6 ½	423	468	36	495	72	360	394	477	24	-7	0.85
<u>SEAM B3</u>														
<u>SEAM B1</u>														
78-14	7.3	23.9	7 ½	397	470	91	506	109	-	395	467	27	20	0.99

* Sample rejected due to contamination.

TABLE III.9-4
DUKE PIT PETROGRAPHIC RESULTS

	Mean Maximum Reflectance	Vitrinite	Exinite	Semifusinite	Macrinite	Micrinite	Fusinite	Mineral Matter	% Total Reactivities	% Total Inerts	CBI	Strength Index	Coke Stability Factor	JIS Drum Index	MMF VN(REF.) VN(LAB.)	
<u>SEAM B10</u>																
77-7	1.19	44.44	2.05	22.95	9.79	3.51	9.79	7.46	55.93	44.07	2.26	4.27	42	90	27	26.9
<u>SEAM B9</u>																
77-7	1.22	47.33	0.09	23.04	9.46	2.33	10.42	6.44	57.19	42.81	2.37	4.34	42	90	26	24.4
77-2	1.20														27	25.0
78-10	1.12	39.45	4.44	29.00	3.52	11.23	7.12	5.28	54.62	45.38	2.20	3.86	37	91	29	24.2
78-22	1.13	46.73	6.33	31.22	2.65	3.47	4.29	5.31	64.15	35.85	1.49	4.20	52	92	29	27.0
<u>SEAM B7</u>																
78-6	1.12	52.77	3.70	26.49	2.87	2.87	5.54	5.75	65.94	34.06	1.35	4.17	53	92	29	29.0
<u>SEAM B6</u>																
78-10	1.09	55.07	2.35	21.45	2.13	12.91	3.95	2.13	64.12	35.88	1.43	4.04	51		30	29.0
<u>SEAM B5</u>																
78-10	1.15	47.23	1.07	25.67	2.86	10.82	8.05	4.29	55.99	44.01	2.15	4.05	41		28	26.7
78-22	1.21	52.43	3.44	24.49	2.43	4.05	6.07	7.08	64.75	35.25	1.62	4.49	53	92	26	26.1
<u>SEAM B4</u>																
77-7	1.27	49.09	0.06	23.56	8.21	3.65	11.70	3.19	56.81	43.19	2.65	4.39	41	90	24	24.4
BULK #1	1.21	54.02	1.40	27.77	3.38	4.90	4.20	4.32	64.15	35.88	1.69	4.54	53	92	26	25.2
CHANNEL #1	1.24	45.47	3.12	32.68	3.12	4.46	4.75	6.39	60.18	39.82	2.08	4.57	48	90	25	25
78-6	1.23	54.04	2.17	28.99	2.17	3.16	4.54	4.93	66.32	33.68	1.57	4.67	56	92	26	27.5
78-11	1.16	51.56	3.46	25.20	2.63	4.45	6.09	6.59	64.16	34.84	1.49	4.34	53	92	28	26.1
78-22	1.22	60.84	2.95	24.84	2.31	3.37	2.53	3.16	69.81	30.19	1.31	4.70	60	93	26	26.6
*78-9	1.21	48.45	1.69	29.38	2.54	6.49	5.93	5.50	59.55	40.45	2.06	4.40	46	90	26	25.1
<u>SEAM B3</u>																
77-7	1.32	52.71	0.02	17.92	7.08	5.00	11.04	6.04	59.90	40.10	1.97	5.42	56	92	24	23.7
BULK #2	1.32	53.70	1.85	28.81	4.32	2.67	4.53	4.12	65.25	34.75	1.97	5.35	56.3	93	24	21.8
CHANNEL #2	1.33	70.79	NIL	17.91	1.71	2.34	3.19	4.05	77.05	22.95	1.14	5.74	65	94	21	21
78-6	1.27	59.96	2.41	23.34	2.62	3.82	4.23	3.62	69.46	30.54	1.48	4.99	60	93	25	25.3
78-11	1.23	43.75	1.47	33.09	2.57	7.17	8.82	3.12	56.01	43.99	2.42	4.35	42	90	26	26.6
78-22	1.24	55.87	1.01	28.54	2.02	2.43	7.89	2.23	64.82	35.18	1.76	4.83	54	92	25	25.5
<u>SEAM B1</u>																
77-7	1.35	51.44	NIL	17.49	8.82	7.98	8.99	5.26	57.80	42.20	2.94	5.54	50	92	23	23.8
78-6	1.27	65.69	1.36	19.10	2.53	2.92	5.46	2.92	73.14	26.89	1.23	5.02	62	93	25	26.2
<u>SEAM B4</u>																
EHR BULK #1	1.25	59.2	0.3	20.8	-	7.8	6.5	5.4	69.9	30.1	1.77	4.88	54.6			25.2
<u>SEAM B3</u>																
EHR BULK #2	1.30	62.5	0.0	19.5	-	5.1	8.8	4.1	72.3	27.7	1.78	5.33	58.0			21.8

* Outside pit limits

TABLE III.9-5
 FEARLESS PIT PETROGRAPHIC RESULTS
 MURKISS

	Mean Maximum Reflectance	Vitrinite	Exinite	Semifusinite	Macrinite	Micrinite	Fusinite	Mineral Matter	% Total Reactivities	% Total Inerts	CBI	Strength Index	Coke Stability Factor	JIS Drum Index	MMF		
															VH(REF.)	VH(LAB.)	
SEAM B9																	
BULK #3	1.15	39.61	3.19	39.25	3.73	5.33	4.26	4.62	55.91	44.09	2.14	4.03	41	91	28	24.0	
78-14	1.14	37.39	3.40	36.13	4.83	6.08	6.08	6.08	53.37	46.63	2.33	3.86	35	90	29	25.4	
77-4	1.13	47.62	3.43	26.29	8.19	2.48	9.14	2.86	58.84	41.16	1.93	4.17	45	90	29	26.1	
78-21	1.10	49.58	2.11	32.28	2.74	4.22	4.85	4.22	61.80	38.20	1.59	3.98	47	91	30	27.0	
78-17	1.14	49.24	1.85	35.41	1.69	4.05	3.37	4.38	54.55	45.45	2.23	3.85	37	29	29	25.6	
77-5	1.12	34.93	6.32	25.75	10.69	4.22	13.86	4.22	49.74	50.26	2.68	3.66	26	85	29	N.D.	
SEAM B7																	
77-4	1.14	71.39	1.80	16.44	1.80	2.25	4.50	1.80	78.14	21.86	0.79	4.57	61	93	29	N.D.	
78-21	1.16	70.69	3.56	14.26	1.19	2.57	4.95	2.77	78.52	21.48	0.76	4.49	61	93	29	29.5	
77-5	1.17	57.41	4.37	13.49	8.17	2.28	11.02	3.32	65.48	34.52	1.40	4.24	53	92	28	28.0	
SEAM B6																	
78-21																	
77-4	1.20	40.09	2.03	30.86	3.60	8.33	11.26	3.83	51.63	48.37	2.78	4.11	34	90	27	N.D.	
SEAM B4																	
78-14	1.19	53.64	1.01	28.09	2.03	6.09	4.57	4.57	63.56	36.44	1.67	4.43	52	92	27	26.3	
77-4	1.20	51.31	2.79	21.45	8.58	1.49	10.26	4.10	61.07	38.93	1.86	4.40	50	92	27	26.6	
78-21	1.18	53.91	2.55	30.15	2.21	3.08	2.94	5.19	66.01	34.00	1.47	4.46	55	92	31	27.4	
SEAM B3																	
77-4	1.24	43.71	1.03	29.69	2.27	3.51	6.59	13.19	57.04	42.96	2.43	4.54	44	91+	-	N.D.	
78-21	1.04	52.82	2.51	26.09	1.88	3.97	7.51	5.22	64.22	35.78	1.75	4.55	52	92	34	25.4	
SEAM B1																	
78-14	1.25	45.79	1.45	31.59	3.62	7.25	6.23	4.05	57.76	42.24	2.39	4.62	46	90	25	26.0	
77-4	1.26	52.41	1.20	29.12	4.02	5.22	3.41	4.62	63.92	36.08	1.86	4.82	53	92	25	25.2	
78-21	1.26	52.17	1.52	31.52	2.83	3.91	5.43	2.61	62.86	37.14	1.94	4.78	52	92	27	26.9	
SEAM B9 EHR BULK #3	1.13	42.8	1.8	35.9	-	7.0	7.8	4.7	62.5	37.5	1.89	4.20	46			24.0	

* OUTSIDE PIT

TABLE III.9-6
PILOT PLANT WASH SUMMARY

	HEAVY MEDIA CIRCUIT				WATER CYCLONE CIRCUIT				FROTH FLOTATION			PRODUCT		
	FEED ASH	ASH BALANCES YIELD	WEIGHTED YIELD	THEO-RETICAL YIELD	ASH	ASH BALANCES YIELD	WEIGHTED YIELD	ASH	ASH BALANCES YIELD	WEIGHTED YIELD	ASH	ASH BALANCES YIELD	ACTUAL COMBINED YIELD	COMBINED ASH
B3 Seam (Bulk No.2)	24.7	72.9	76.6	73	6.6	96.3	60.2	9.1	77.2	48.7	7.9	75.7	70.9	7.1
B4 Seam (Bulk No.1)	34.2	46.1	46.4	50	8.7	86.5	68.7	6.9	83.5	64.0	12.1	52.1	50.2	7.8
B4 Seam (Bulk No.4)	32.1	59.8	61.1	57	8.0	76.9	60.9	11.0	84.0	41.8	12.8	61.1	58.4	8.7
B9 Seam (Bulk No.3)	19.1	76.2	74.8	72	7.3	87.9	73.6	10.5	80.6	46.8	12.4	75.6	70.8	8.3
AVERAGE	27.5	63.8	64.7	63	7.7	86.9	65.9	9.4	81.3	50.3	11.3	66.1	62.6	8.3

TABLE III.9-7

CARBONIZATION DATA

Description	<u>BULK SAMPLE</u>							
	No. 1		No. 2		No. 3		Blend	
	(Seam B4)		(Seam B3)		(Seam B9)		47.2/27.175.0	
	100%		100%		100%			
Oven Bulk Density (db) - lb/ft ³	48.2	49.0	52.9	48.8				
<u>CARBONIZATION RESULTS</u>								
Maximum Wall Pressure - lb/in ²	0.49	0.69	0.69	0.56				
Coke Yield Actual - %	76.6	77.2	75.5	76.8				
Mean Coke Size - inches	1.99	2.00	2.03	2.00				
Apparent Specific Gravity	0.910	0.945	0.908	0.922				
Percentage - 1/2 inch (breeze)	4.5	4.3	6.8	4.5				
<u>Tumbler Test (ASTM)</u>								
Stability Factor	58.7	59.3	38.1	57.6				
(Petrographic Stability Index)	54.6	58.0	46.0	55.2				
Hardness Factor	71.1	67.8	58.4	69.2				
<u>Japanese Tumbler Test (JIS)</u>								
(cumulative percentage retained on)	<u>30</u>	<u>150</u>	<u>30</u>	<u>150</u>	<u>30</u>	<u>150</u>	<u>30</u>	<u>150</u>
50 mm sieve	17.0	4.1	28.0	11.0	71.0	4.1	24.2	6.0
25 mm sieve	87.2	72.7	89.3	75.2	75.9	55.4	87.3	72.0
15 mm sieve	93.9	83.8	94.1	83.5	89.6	74.2	93.7	83.0

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B1

Source of Sample	MDD 78-1	MDD 78-2	MDD 78-2	MDD 78-4	MDD 78-5					
Interval (m): from	203.42	208.53	297.02	101.99	206.97					
to	206.35	212.20	300.73	105.05	208.18					
True Seam Thickness (m)	2.70	3.40	3.44	2.73	0.85					
Core Recovery	85	88	96	100	94					
True Sample Width (m)	2.30	2.99	3.30	2.73	0.80					
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.4	0.4	0.5	0.5	0.6					
Ash %	22.5	12.8	24.7	39.6	22.7					
Volatiles %	22.0	22.6	20.1	17.4	21.4					
Fixed Carbon %	55.1	64.2	54.7	42.5	55.3					
FSI	5½	6½	6½	5	7					
Sulphur %	0.52	0.36	0.47	0.29	0.39					
Calorific Value (kJ/kg)										
Screen Analysis:										
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	82.0	23.6	85.1	14.4	83.9	22.7	84.7	38.6	86.7	22.0
28 x 65 mesh Wt %	10.5	18.3	9.3	9.5	9.5	12.8	9.2	37.0	8.8	13.1
-65 mesh Wt %	7.5	20.0	5.6	10.9	6.6	16.3	6.1	32.0	4.5	18.2
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	69.3	75.5	81.6	88.6	67.4	76.6	55.5	58.8	74.2	77.6
28 x 65 mesh product %	72.7	79.0	87.3	93.6	79.8	85.7	58.0	62.2	78.0	87.8
Analysis of +28 mesh product:										
Ash (dry basis) %	5.8	7.3	7.2	8.4	6.2	8.1	5.4	6.0	5.5	6.4
FSI	7½		8		8½		8		8	
Analysis of 28 x 65 product:										
Ash (dry basis) %	4.6	5.8	5.2	6.5	5.1	6.2	4.5	8.6	4.6	5.2
FSI	8½		8½		9		8½		8½	
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	70.1	94.2	45.5	85.1	53.9	93.0	42.0	66.7	82.6	91.3
Analysis of product:										
Ash (dry basis) %	11.8	17.1	6.7	7.6	8.1	12.6	12.4	13.4	9.0	11.7
FSI	7½		8½		8		7		8	
Analysis of total clean coal product:										
Moisture (a.d.) %		0.6		0.5		0.5		0.5		0.5
Ash %		8.2		7.9		8.2		6.6		6.5
Volatiles %		24.2		22.7		23.8		23.8		24.4
Fixed Carbon %		67.0		68.9		67.5		69.1		68.6
FSI		7		7½		8½		8		8½
Sulphur %		0.40		0.38		0.51		0.47		0.47
P ₂ O ₅ %		0.01								0.01
Hardgrove Index		81.6								
Recovery of clean coal %		77.3		88.9		78.5		59.6		79.1

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B1

Source of Sample	MDD 78-6	MDD 78-9	MDD 78-13								
Interval (m): from	269.46	184.04	103.28								
to	271.40	187.85	104.87								
True Seam Thickness (m)	1.82	3.16	1.45								
Core Recovery	97	92	99								
True Sample Width (m)	1.76	2.91	1.44								
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	0.8	0.6	0.6								
Ash %	8.6	34.5	20.0								
Volatiles %	24.0	19.5	21.0								
Fixed Carbon %	66.6	45.4	58.4								
FSI	7	7½	7½								
Sulphur %	0.53	0.51	0.62								
Calorific Value (kJ/kg)											
Screen Analysis:											
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	
½ x 28 mesh Wt %	74.7	8.9	73.8	38.5	83.3	20.9					
28 x 65 mesh Wt %	15.3	6.1	14.8	27.5	10.1	19.0					
-65 mesh Wt %	10.0	12.2	11.4	24.5	6.6	22.0					
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	93.0	95.3	52.1	55.3	73.5	79.5					
28 x 65 mesh product %	94.2	97.1	66.8	70.2	73.3	79.9					
Analysis of +28 mesh product:											
Ash (dry basis) %	5.4	5.7	4.7	6.1	5.6	7.5					
FSI	8½		8		8						
Analysis of 28 x 65 product:											
Ash (dry basis) %	4.2	4.5	4.6	5.7	4.7	6.6					
FSI	9		8		9						
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	74.1	90.1	93.3	96.1	55.5	61.0					
Analysis of product:											
Ash (dry basis) %	5.9	7.0	21.3	22.1	10.6	12.3					
FSI	7½		8		8½						
Analysis of total clean coal product:											
Moisture (a.d.) %		0.6		0.3		0.6					
Ash %		5.9		8.4		7.7					
Volatiles %		24.5		25.1		23.5					
Fixed Carbon %		69.0		66.1		68.2					
FSI		7½		8		8					
Sulphur %		0.53		0.68		0.69					
P ₂ O ₅ %											
Hardgrove Index											
Recovery of clean coal %		95.0		62.2		78.3					

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B3

Source of Sample	MDD 78-1		MDD 78-2		MDD 78-4		MDD 78-5		MDD 78-6		
Interval (m): From	160.65		172.82		58.53		148.48		197.20		
to	165.04		184.17		64.26		155.24		202.19		
True Seam Thickness (m)	3.86		10.45		5.15		5.00		3.34		
Core Recovery	97		94		97		88		99		
True Sample Width (m)	3.74		9.82		5.00		4.40		3.31		
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	0.4		0.5		0.7		0.7		0.7		
Ash %	14.9		21.1		25.5		33.5		24.5		
Volatiles %	22.6		20.7		18.2		17.5		19.9		
Fixed Carbon %	62.1		57.7		55.6		48.3		54.9		
FSI	7½		7½		5		5		4½		
Sulphur %	0.38		0.31		0.37		0.33		0.31		
Calorific Value (kJ/kg)											
Screen Analysis:											
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	
½ x 28 mesh Wt %	82.7	15.7	84.8	22.8	87.4	29.0	82.7	37.8	83.7	28.2	
28 x 65 mesh Wt %	11.0	12.1	9.5	8.9	7.2	15.9	10.5	22.5	9.4	21.5	
-65 mesh Wt %	6.3	13.3	5.7	14.5	5.4	18.3	6.8	38.1	6.9	22.4	
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	79.1	85.8	66.1	75.8	65.0	70.5	47.3	57.4	61.6	70.8	
28 x 65 mesh product %	82.1	89.3	82.5	96.4	79.1	85.1	72.4	76.6	72.2	77.0	
Analysis of +28 mesh product:											
Ash (dry basis) %	5.5	7.0	4.4	5.5	5.3	6.8	4.3	5.5	5.3	6.9	
FSI	7½		8		7		8		7½		
Analysis of 28 x 65 product:											
Ash (dry basis) %	4.5	5.7	4.3	6.5	4.0	5.3	4.1	4.7	4.5	5.4	
FSI	8½		8½		8		8		8½		
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	50.9	86.8	65.6	94.3	64.2	74.7	48.7	87.2	74.6	91.5	
Analysis of product:											
Ash (dry basis) %	10.9	10.8	6.4	11.5	6.9	7.4	8.0	11.9	11.5	16.9	
FSI	7½		8½		8½		8½		7½		
Analysis of total clean coal product:											
Moisture (a.d.) %		0.6		0.5		1.0		0.6		0.6	
Ash %		7.0		6.0		6.3		6.1		8.2	
Volatiles %		23.7		23.7		21.2		23.5		23.1	
Fixed Carbon %		68.7		69.8		71.5		69.8		68.1	
FSI		7½		8		7		7½		7	
Sulphur %		0.43		0.38		0.53		0.46			
P ₂ O ₅ %		0.01				0.05		0.03			
Hardgrove Index		80				77					
Recovery of clean coal %		86.1		78.8		71.8		61.4		72.8	

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B3

Source of Sample	MDD 78-24	MDD 78-22									
Interval (m): from	149.22	312.07									
to	154.79	315.68									
True Seam Thickness (m)	5.37	3.36									
Core Recovery	100	67									
True Sample Width (m)	5.37	2.25									
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	0.7	0.7									
Ash %	20.5	24.0									
Volatiles %	19.5	20.1									
Fixed Carbon %	59.3	55.2									
FSI	7	5½									
Sulphur %	0.36	0.41									
Calorific Value (kJ/kg)											
Screen Analysis:											
½ x 28 mesh Wt %	89.9	21.0	88.4	24.6							
28 x 65 mesh Wt %	6.3	13.2	6.8	17.9							
-65 mesh Wt %	3.8	15.4	4.8	17.2							
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	75.6	79.7	68.7	75.9							
28 x 65 mesh product %	83.5	87.9	77.7	81.8							
Analysis of +28 mesh product:											
Ash (dry basis) %	4.7	5.7	6.1	7.7							
FSI	7½		6½								
Analysis of 28 x 65 product:											
Ash (dry basis) %	3.4	4.2	4.6	5.4							
FSI	8½		7½								
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	88.0	90.3	79.8	94.0							
Analysis of product:											
Ash (dry basis) %	8.6	9.4	9.6	12.8							
FSI	7½		5								
Analysis of total clean coal product:											
Moisture (a.d.) %		0.4		0.4							
Ash %		5.7		8.2							
Volatiles %		22.3		23.3							
Fixed Carbon %		71.6		68.1							
FSI		7½		6½							
Sulphur %		0.40		0.46							
P2 O5 %		0.05									
Hardgrove Index		76									
Recovery of clean coal %		80.6		77.2							

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B3

Source of Sample	MDD 78-9	MDD 78-10	MDD 78-11	MDD 78-13	MDD 78-23						
Interval (m): from	123.95	156.40	45.12	47.92	335.08						
to	128.66	160.40	48.69	51.80	339.96						
True Seam Thickness (m)	3.71	3.65	3.40	3.29	4.49						
Core Recovery	97	100	100	100	98						
True Sample Width (m)	3.60	3.65	3.40	3.29	4.40						
Weighted Average Analysis											
Raw Coal (Air Dried Basis):	0.5	0.7	0.9	0.9	0.5						
Moisture %											
Ash %	33.0	24.5	17.8	25.9	24.2						
Volatiles %	18.5	20.6	20.6	20.0	20.0						
Fixed Carbon %	48.0	54.2	60.7	53.2	55.3						
FSI	4	6½	6½	4½	6½						
Sulphur %	0.38	0.41	0.46	0.35	0.37						
Calorific Value (kJ/kg)											
Screen Analysis:											
½ x 28 mesh Wt %	62.6	35.9	87.2	23.0	88.8	18.7	85.9	28.3	90.5	24.5	
28 x 65 mesh Wt %	22.0	26.7	7.6	18.5	6.7	11.6	8.4	22.0	6.5	16.2	
-65 mesh Wt %	15.4	25.9	5.2	19.9	4.5	14.3	5.7	26.0	3.0	19.8	
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	55.6	62.7	72.7	77.2	77.7	82.9	67.0	70.6	69.8	75.3	
28 x 65 mesh product %	67.4	73.6	78.4	81.4	86.4	90.1	69.2	73.2	81.4	84.7	
Analysis of +28 mesh product:											
Ash (dry basis) %	4.4	6.5	5.4	6.5	5.3	6.5	5.2	6.0	5.2	6.5	
FSI	7		8		7½		7		7		
Analysis of 28 x 65 product:											
Ash (dry basis) %	3.9	5.5	5.1	5.2	3.8	4.5	4.8	5.1	4.4	5.4	
FSI	7		8		8		8		7½		
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	88.8	93.4	48.9	77.2	81.9	87.0	43.3	77.8	74.2	84.8	
Analysis of product:											
Ash (dry basis) %	18.7	21.3	10.0	12.5	7.9	8.9	11.4	15.4	9.2	11.2	
FSI	6½		8		6½		6½		7½		
Analysis of total clean coal product:											
Moisture (a.d.) %		0.5		0.5		0.7		0.5		0.5	
Ash %		8.6		5.9		6.3		5.8		6.9	
Volatiles %		23.4		24.8		24.7		24.0		23.7	
Fixed Carbon %		67.5		68.8		68.3		69.7		68.9	
FSI		6½		7½		7½		7		7½	
Sulphur %		0.49		0.47		0.52		0.40		0.41	
P ₂ O ₅ %						0.10					
Hardgrove Index											
Recovery of clean coal %		69.8		77.5		83.6		71.2		76.2	

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B4

Source of Sample	MDD 78-22	MDD 78-22	MDD 78-24								
Interval (m): from	288.15	293.40	115.66								
to	289.53	295.72	127.10								
True Seam Thickness (m)	1.29	2.17	9.91								
Core Recovery	100	75	70								
True Sample Width (m)	1.29	1.63	6.94								
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	0.4	0.4	0.7								
Ash %	41.9	10.6	24.0								
Volatiles %	17.6	22.3	19.7								
Fixed Carbon %	40.1	66.7	55.6								
FSI	3½	6	5								
Sulphur %	0.25	0.33	0.23								
Calorific Value (kJ/kg)											
	(UPPER)	(LOWER)									
Screen Analysis:	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	
½ x 28 mesh Wt %	87.3	44.8	87.8	9.6	88.9	24.8					
28 x 65 mesh Wt %	7.7	34.8	8.1	11.2	6.7	15.8					
-65 mesh Wt %	5.0	37.3	4.1	13.3	4.4	19.8					
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	42.5	51.4	84.9	96.6	60.1	71.4					
28 x 65 mesh product %	53.1	61.4	87.2	94.9	77.5	85.1					
Analysis of +28 mesh product:											
Ash (dry basis) %	7.5	10.3	6.4	8.0	5.8	8.7					
FSI	6½		6½		7½						
Analysis of 28 x 65 product:											
Ash (dry basis) %	6.9	8.2	8.5	9.3	4.7	6.3					
FSI	6½		6½		8½						
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	55.7	70.5	88.9	97.8	86.5	89.4					
Analysis of product:											
Ash (dry basis) %	15.6	19.9	10.7	11.9	11.8	12.9					
FSI	6½		6½		7½						
Analysis of total clean coal product:											
Moisture (a.d.) %		0.3		0.5		0.4					
Ash %		11.3		9.4		8.9					
Volatiles %		23.5		22.4		22.2					
Fixed Carbon %		64.9		67.7		68.5					
FSI		6½		6		7					
Sulphur %		0.38		0.34		0.36					
P ₂ O ₅ %				0.22		0.16					
Hardgrove Index				87		77					
Recovery of clean coal %		53.1		96.5		73.1					

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B4

Source of Sample	MDD 78-6	MDD 78-9	MDD 78-9	MDD 78-10	MDD 78-10					
Interval (m): from	183.38	69.37	109.02	135.47	141.64					
to	187.77	75.90	111.03	139.14	144.17					
True Seam Thickness (m)	3.10	5.87	1.58	3.24	2.23					
Core Recovery	83	100	100	100	100					
True Sample Width (m)	2.57	5.87	1.58	3.24	2.23					
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.7	0.7	0.7	0.6	0.8					
Ash %	12.0	24.9	14.8	34.0	14.5					
Volatiles %	24.4	19.9	22.4	21.0	23.6					
Fixed Carbon %	62.9	54.5	62.1	44.4	61.1					
FSI	6	5	6½	3½	7					
Sulphur %	0.25	0.33	0.51	0.24	0.34					
Calorific Value (kJ/kg)										
	(LOWER)			(UPPER)	(LOWER)					
Screen Analysis:	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	77.0	13.0	86.7	25.6	75.5	16.3	86.1	33.9	77.2	14.0
28 x 65 mesh Wt %	12.3	10.6	8.0	16.3	13.0	10.0	8.2	41.3	11.5	12.3
-65 mesh Wt %	10.7	13.4	5.3	17.0	11.5	11.8	5.7	42.8	11.3	14.9
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	77.9	87.4	59.4	72.3	81.7	86.3	48.2	60.1	79.7	88.8
28 x 65 mesh product %	82.6	90.1	77.3	85.0	87.1	92.2	47.1	53.7	83.1	87.3
Analysis of +28 mesh product:										
Ash (dry basis) %	4.7	6.5	8.0	11.3	7.2	8.2	6.9	10.4	6.5	8.3
FSI	7½		7½		7		7½		8	
Analysis of 28 x 65 product:										
Ash (dry basis) %	4.8	5.8	5.0	6.7	4.2	5.3	5.2	7.6	5.3	5.9
FSI	8		8		8		8		8	
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	81.0	95.9	73.3	81.8	69.4	77.6	77.3	86.2	78.1	95.6
Analysis of product:										
Ash (dry basis) %	8.8	11.2	10.1	10.3	7.9	8.6	30.2	35.1	11.3	13.4
FSI	6		7½		8		3½		7½	
Analysis of total clean coal product:										
Moisture (a.d.) %		0.7		0.8		0.9		0.4		0.5
Ash %		7.8		11.1		8.0		11.5		8.3
Volatiles %		25.2		22.1		21.8		25.2		25.2
Fixed Carbon %		66.3		66.0		69.3		62.9		66.0
FSI		6½		7		7		6½		7
Sulphur %		0.26		0.44		0.53		0.32		0.34
P ₂ O ₅ %		0.14								0.08
Hardgrove Index		91								93
Recovery of clean coal %		88.6		73.8		86.1		61.1		89.4

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B4

Source of Sample	MDD 78-11	MDD 78-11	MDD 78-13	MDD 78-13	MDD 78-23					
Interval (m): from	24.82	31.17	28.51	34.04	321.68					
to	28.20	33.29	31.82	37.59	329.90					
True Seam Thickness (m)	3.21	2.02	2.92	3.13	7.67					
Core Recovery	100	100	100	100	96					
True Sample Width (m)	3.21	2.02	2.92	3.13	7.36					
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.8	0.8	0.9	0.7	0.5					
Ash %	38.9	16.1	43.2	12.7	24.3					
Volatiles %	17.8	23.1	18.9	25.4	21.3					
Fixed Carbon %	42.5	60.0	37.0	61.2	53.9					
FSI	3	6½	2½	7	3½					
Sulphur %	0.36	0.53	0.21	0.33	0.19					
Calorific Value (kJ/kg)										
	(UPPER)	(LOWER)	(UPPER)	(LOWER)						
Screen Analysis:										
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	87.6	41.1	83.7	16.7	79.7	41.9	80.9	12.5	84.7	24.6
28 x 65 mesh Wt %	7.5	21.2	9.1	11.0	11.0	51.1	10.8	9.7	9.4	22.3
-65 mesh Wt %	4.9	22.6	7.2	14.8	9.3	49.6	8.3	11.7	5.9	26.5
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	45.0	52.2	76.3	84.1	43.2	53.9	83.5	89.1	61.5	72.7
28 x-65 mesh product %	72.1	78.0	84.1	90.0	38.5	44.7	87.3	89.2	67.6	73.5
Analysis of +28 mesh product:										
Ash (dry basis) %	7.4	10.1	5.6	7.4	6.8	10.1	5.4	6.4	6.0	8.0
FSI	7½		7½		6½		7½		6½	
Analysis of 28 x 65 product:										
Ash (dry basis) %	4.9	6.3	3.9	5.2	5.0	7.5	4.7	4.9	6.1	7.3
FSI	8		8		7½		8		6½	
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	71.2	76.8	58.5	65.6	66.1	79.2	71.2	97.6	83.3	92.5
Analysis of product:										
Ash (dry basis) %	11.2	12.5	8.0	9.0	31.2	38.7	7.7	10.5	17.8	21.9
FSI	7		8		5		7½		6½	
Analysis of total clean coal product:										
Moisture (a.d.) %		0.6		0.7		0.3		0.6		0.6
Ash %		10.0		7.4		13.0		6.0		9.4
Volatiles %		23.9		24.0		23.9		26.7		24.4
Fixed Carbon %		65.5		67.9		62.7		66.7		65.6
FSI		7½		7½		6		7		6½
Sulphur %		0.36		0.45		0.31		0.35		0.23
P ₂ O ₅ %		0.07		0.04						
Hardgrove Index										
Recovery of clean coal %		55.3		83.3		55.2		89.8		74.0

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B4

Source of Sample	MDD 78-1	MDD 78-2	MDD 78-4	MDD 78-5	MDD 78-6					
Interval (m): from	136.50	148.44	37.34	130.20	176.79					
to	142.34	159.84	45.48	141.76	182.16					
True Seam Thickness (m)	5.16	10.33	7.32	8.59	3.80					
Core Recovery	97	90	98	75	99					
True Sample Width (m)	5.00	9.30	7.17	6.44	3.76					
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.5	0.4	0.8	0.5	0.7					
Ash %	10.3	8.8	24.7	27.8	36.8					
Volatiles %	24.6	24.3	19.0	19.4	19.3					
Fixed Carbon %	64.6	66.5	55.5	52.3	43.2					
FSI	6½	7	4½	6	2½					
Sulphur %	0.19	0.20	0.33	0.30	0.22					
Calorific Value (kJ/kg)										
					(UPPER)					
Screen Analysis:	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	82.4	10.8	76.1	9.6	86.4	25.5	88.3	28.2	80.0	39.6
28 x 65 mesh Wt %	11.0	9.7	14.7	7.4	7.4	18.6	7.1	16.4	11.5	29.1
-65 mesh Wt %	6.6	12.8	9.2	10.4	6.2	22.7	4.6	21.6	8.5	29.2
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	78.5	89.2	84.4	89.1	64.6	73.2	60.3	69.4	37.3	55.3
28 x 65 mesh product %	78.7	89.7	90.6	94.1	76.4	83.7	79.6	84.3	53.8	64.8
Analysis of +28 mesh product:										
Ash (dry basis) %	5.0	7.1	4.9	5.7	6.1	8.1	5.5	7.7	8.0	12.1
FSI	7		8		7		7½		7	
Analysis of 28 x 65 product:										
Ash (dry basis) %	4.2	6.0	4.6	5.0	4.7	6.1	4.7	5.8	5.8	8.2
FSI	8		8½		8½		8½		8	
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	52.2	94.7	86.2	97.4	66.0	73.3	71.0	80.5	69.6	88.4
Analysis of product:										
Ash (dry basis) %	8.4	11.0	8.4	9.4	9.0	9.6	9.3	11.4	17.1	22.4
FSI	7½		5		8		8		6½	
Analysis of total clean coal product:										
Moisture (a.d.) %		0.6		0.8		1.2		0.6		0.6
Ash %		8.2		6.2		7.8		7.7		13.0
Volatiles %		24.2		23.6		22.6		25.7		23.8
Fixed Carbon %		67.0		69.4		68.4		66.0		62.6
FSI		7		7½		7½		7½		6½
Sulphur %		0.40		0.22		0.43		0.35		0.31
P ₂ O ₅ %		0.01				0.17				
Hardgrove Index		80				76				
Recovery of clean coal %		89.6		90.6		74.0		71.0		53.6

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B5

Source of Sample	MDD 78-1	MDD 78-2	MDD 78-5	MDD 78-6	MDD 78-9					
Interval (m): from	90.52	72.62	80.12	116.84	20.32					
to	95.21	76.50	82.72	122.33	22.99					
True Seam Thickness (m)	4.14	3.06	2.18	3.67	1.98					
Core Recovery	88	76	71	100	100					
True Sample Width (m)	3.64	2.33	1.55	3.67	1.98					
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.7	0.4	0.6	0.6	1.0					
Ash %	43.3	43.0	16.2	39.3	22.9					
Volatiles %	16.6	16.6	20.3	18.6	20.2					
Fixed Carbon %	39.4	39.9	62.9	41.5	55.9					
FSI	2½	4½	6	2½	1					
Sulphur %	0.37	0.49	0.54	0.38	0.80					
Calorific Value (kJ/kg)										
Screen Analysis:										
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	76.9	47.4	82.4	45.8	86.2	16.9	80.9	42.9	73.5	26.5
28 x 65 mesh Wt %	13.1	34.4	10.1	18.5	8.6	11.3	10.9	27.5	11.9	12.2
-65 mesh Wt %	10.0	29.4	7.5	18.6	5.2	12.6	8.2	25.8	14.6	12.6
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	31.8	38.7	36.6	45.5	74.2	86.0	34.1	49.5	67.9	71.5
28 x 65 mesh product %	46.9	55.7	71.6	77.4	86.6	92.2	60.6	71.3	82.3	89.3
Analysis of +28 mesh product:										
Ash (dry basis) %	6.7	9.7	5.3	7.7	6.4	8.7	7.6	11.5	3.7	4.6
FSI	6½		8		7		5½		2	
Analysis of 28 x 65 product:										
Ash (dry basis) %	5.9	8.3	4.5	5.6	5.2	6.3	6.3	9.2	3.2	4.8
FSI	8		8½		8		7		1	
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	90.0	96.2	91.6	96.6	88.4	93.3	91.5	95.8	38.9	49.5
Analysis of product:										
Ash (dry basis) %	25.5	27.6	14.4	16.4	8.2	9.0	20.8	23.1	7.3	8.4
FSI	4½		5½		7		4½		1	
Analysis of total clean coal product:										
Moisture (a.d.) %		0.7		0.7		0.5		0.3		1.2
Ash %		14.0		8.4		8.5		12.1		5.1
Volatiles %		22.4		23.3		21.5		23.4		22.9
Fixed Carbon %		62.9		67.6		69.5		64.2		70.8
FSI		7		8		6½		5½		1
Sulphur %		0.52		0.66		0.60		0.51		0.95
P ₂ O ₅ %		0.27		0.08						
Hardgrove Index				94						
Recovery of clean coal %		46.7		52.6		86.9		55.7		70.4

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B5

Source of Sample	MDD 78-10	MDD 78-22	MDD 78-23								
Interval (m): from	95.30	261.30	275.92								
to	97.54	263.68	278.40								
True Seam Thickness (m)	1.98	2.24	2.25								
Core Recovery	100	100	100								
True Sample Width (m)	1.98	2.24	2.25								
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	0.9	0.6	0.6								
Ash %	35.8	25.7	49.8								
Volatiles %	19.7	20.1	15.4								
Fixed Carbon %	43.6	53.6	34.2								
FSI	3	4½	2½								
Sulphur %	0.47	0.34	0.40								
Calorific Value (kJ/kg)											
Screen Analysis:											
½ x 28 mesh Wt %	84.7	33.2	87.1	27.2	86.8	50.5					
28 x 65 mesh Wt %	9.3	27.0	7.8	23.5	8.0	41.5					
-65 mesh Wt %	6.0	28.3	5.1	23.4	5.2	41.5					
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	57.5	63.4	61.1	68.2	30.4	40.6					
28 x 65 mesh product %	61.6	68.6	65.5	73.8	44.7	51.8					
Analysis of +28 mesh product:											
Ash (dry basis) %	8.3	9.8	7.6	9.3	8.5	11.1					
FSI	5		6		6½						
Analysis of 28 x 65 product:											
Ash (dry basis) %	6.9	3.2	6.8	8.1	6.8	8.9					
FSI	7		6½		7						
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	86.7	90.0	86.8	94.3	66.7	80.7					
Analysis of product:											
Ash (dry basis) %	20.2	21.8	17.3	20.1	24.0	30.5					
FSI	5		6		6						
Analysis of total clean coal product:											
Moisture (a.d.) %		0.5		0.4		0.4					
Ash %		10.3		11.0		12.5					
Volatiles %		23.8		23.1		26.4					
Fixed Carbon %		65.4		65.5		60.7					
FSI		5½		6		6½					
Sulphur %		0.56		0.38		0.77					
P2 O5 %		0.21				0.10					
Hardgrove Index						83					
Recovery of clean coal %		65.5		70.0		43.6					

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B6

Source of Sample	MDD 78-9	MDD 78-10									
Interval (m): from	5.28	79.10									
to	7.48	80.54									
True Seam Thickness (m)	1.73	1.19									
Core Recovery	100	100									
True Sample Width (m)	1.73	1.19									
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	0.9	0.9									
Ash %	22.5	30.0									
Volatiles %	21.4	21.5									
Fixed Carbon %	55.2	47.6									
FSI	5	6									
Sulphur %	0.75	1.03									
Calorific Value (kJ/kg)											
Screen Analysis:											
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	
½ x 28 mesh Wt %	79.3	24.0	90.8	27.7							
28 x 65 mesh Wt %	11.9	13.1	6.0	9.0							
-65 mesh Wt %	8.8	15.6	3.2	12.6							
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	68.0	71.1	68.4	69.3							
28 x 65 mesh product %	81.8	86.7	86.1	88.9							
Analysis of +28 mesh product:											
Ash (dry basis) %	4.6	5.7	4.5	4.7							
FSI	6½		7								
Analysis of 28 x 65 product:											
Ash (dry basis) %	3.7	4.7	4.3	4.5							
FSI	7½		7½								
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	20.3	29.4	82.9	95.1							
Analysis of product:											
Ash (dry basis) %	9.4	11.5	7.7	9.4							
FSI	5½		7½								
Analysis of total clean coal product:											
Moisture (a.d.) %		1.2		0.6							
Ash %		5.9		4.8							
Volatiles %		23.7		27.4							
Fixed Carbon %		69.2		67.2							
FSI		5½		6							
Sulphur %		0.82		0.77							
P ₂ O ₅ %											
Hardgrove Index											
Recovery of clean coal %		69.3		71.3							

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B7

Source of Sample	MDD 78-6	MDD 78-23	MDD 78-5								
Interval (m): from	52.96	239.61	39.30								
to	54.54	241.29	42.14								
True Seam Thickness (m)	1.01	1.52	2.50								
Core Recovery	100	100	58								
True Sample Width (m)	1.01	1.52	1.45								
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	0.7	0.5	1.0								
Ash %	21.3	36.6	47.6								
Volatiles %	25.1	21.1	14.8								
Fixed Carbon %	52.9	41.8	36.6								
FSI	5	5	1½								
Sulphur %	0.77	0.92	0.47								
Calorific Value (kJ/kg)											
Screen Analysis:											
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	
½ x 28 mesh Wt %	82.0	22.9	83.8	36.4	85.5	50.6					
28 x 65 mesh Wt %	10.8	17.8	9.8	27.8	8.8	28.6					
-65 mesh Wt %	7.2	13.2	6.4	33.2	5.7	29.2					
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	58.2	70.1	51.0	58.0	35.7	42.0					
28 x 65 mesh product %	71.4	78.5	61.7	68.8	63.0	68.0					
Analysis of +28 mesh product:											
Ash (dry basis) %	5.7	8.4	5.7	7.9	4.3	6.8					
FSI	7		6½		7½						
Analysis of 28 x 65 product:											
Ash (dry basis) %	5.1	6.6	5.8	7.1	4.4	5.7					
FSI	7½		7½		8						
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	58.6	94.3	80.4	89.7	36.5	45.8					
Analysis of product:											
Ash (dry basis) %	9.3	11.7	22.5	26.9	10.8	12.4					
FSI	7½		6½		6½						
Analysis of total clean coal product:											
Moisture (a.d.) %		0.7		0.5		0.7					
Ash %		8.6		9.2		7.0					
Volatiles %		26.3		23.6		26.7					
Fixed Carbon %		64.4		66.7		65.6					
FSI		7		6½		7					
Sulphur %		0.64		0.46		0.70					
P ₂ O ₅ %											
Hardgrove Index											
Recovery of clean coal %		72.7		61.1		44.5					

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B9

Source of Sample	MDD 78-10	MDD 78-22	MDD 78-23								
Interval (m): from	11.68	170.52	197.93								
to	14.69	174.66	200.43								
True Seam Thickness (m)	2.63	3.78	2.17								
Core Recovery	100	99	100								
True Sample Width (m)	2.63	3.74	2.17								
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	2.1	0.7	0.5								
Ash %	19.8	14.2	18.3								
Volatiles %	20.2	24.6	23.3								
Fixed Carbon %	57.9	60.5	57.9								
FSI	0	3½	4								
Sulphur %	0.36	0.28	0.38								
Calorific Value (kJ/kg)											
Screen Analysis:											
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	
½ x 28 mesh Wt %	88.7	21.0	88.5	13.1	88.7	18.2					
28 x 65 mesh Wt %	6.8	16.4	6.9	13.0	7.4	15.0					
-65 mesh Wt %	4.5	18.4	4.6	16.0	3.9	15.7					
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	64.4	73.9	77.3	87.0	66.6	80.5					
28 x 65 mesh product %	71.9	80.9	81.5	88.2	72.4	82.9					
Analysis of +28 mesh product:											
Ash (dry basis) %	4.0	6.2	5.5	7.4	5.6	9.0					
FSI	0		5		5						
Analysis of 28 x 65 product:											
Ash (dry basis) %	5.5	6.8	6.2	7.3	5.1	6.9					
FSI	0		5½		5½						
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	86.7	90.0	50.0	84.4	90.5	97.6					
Analysis of product:											
Ash (dry basis) %	11.3	11.9	9.8	11.1	12.4	14.3					
FSI	0		5		5½						
Analysis of total clean coal product:											
Moisture (a.d.) %		1.5		0.5		0.4					
Ash %		6.0		7.8		9.5					
Volatiles %		22.4		25.0		24.5					
Fixed Carbon %		70.1		66.7		65.6					
FSI		0		5		4½					
Sulphur %		0.40		0.31		0.41					
P ₂ O ₅ %		0.09				0.12					
Hardgrove Index		71.2				76					
Recovery of clean coal %		75.2		87.0		81.3					

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B1

Source of Sample	MUD 78-14	MUD 78-14	MUD 78-20	MUD 78-21						
Interval (m): from	226.89	231.83	337.11	259.77						
to	229.52	235.54	339.05	266.72						
True Seam Thickness (m)	2.42	3.42	1.77	6.65						
Core Recovery	100	100	100	97						
True Sample Width (m)	2.42	3.42	1.77	6.45						
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.6	0.9	0.8	0.5						
Ash %	19.3	30.6	33.8	30.5						
Volatiles %	22.1	18.4	17.4	19.6						
Fixed Carbon %	58.0	50.1	48.0	49.4						
FSI	7	6½	5	5						
Sulphur %	0.36	0.36	0.75	0.33						
Calorific Value (kJ/kg)										
Screen Analysis:										
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	87.7	20.4	87.6	32.8	78.5	36.0	86.8	29.7		
28 x 65 mesh Wt %	7.3	10.8	7.4	17.3	12.8	28.3	8.5	24.1		
-65 mesh Wt %	5.0	14.2	5.0	18.0	8.7	27.5	4.7	27.9		
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	72.9	79.0	58.8	62.7	56.7	62.6	63.0	69.0		
28 x 65 mesh product %	87.7	90.2	79.1	82.5	67.2	72.8	72.2	75.3		
Analysis of +28 mesh product:										
Ash (dry basis) %	6.2	7.6	5.6	6.9	7.2	8.6	6.2	7.7		
FSI	7½		8		8		5½			
Analysis of 28 x 65 product:										
Ash (dry basis) %	4.2	4.7	4.2	4.9	5.6	7.0	5.3	6.0		
FSI	8½		9		8		6½			
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	88.4	92.5	79.8	86.8	71.3	78.4	41.7	75.0		
Analysis of product:										
Ash (dry basis) %	8.2	9.4	8.2	10.1	10.6	13.6	11.2	14.0		
FSI	8		8		7½		7½			
Analysis of total clean coal product:										
Moisture (a.d.) %		0.7		0.8		0.7		0.3		
Ash %		7.3		7.0		9.1		8.4		
Volatiles %		23.9		22.1		22.2		24.6		
Fixed Carbon %		68.1		70.1		68.0		66.7		
FSI		7½		8		8		5½		
Sulphur %		0.40		0.51		0.59		0.37		
P ₂ O ₅ %		0.05								
Hardgrove Index		78								
Recovery of clean coal %		80.5		65.4		65.3		69.8		

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B3

Source of Sample	MUD 78-16	MUD 78-14	MUD 78-20	MUD 78-21						
Interval (m): from	216.52	192.41	288.25	220.10						
to	221.65	194.73	291.69	222.06						
True Seam Thickness (m)	3.69	2.21	2.92	1.90						
Core Recovery	100	100	99	100						
True Sample Width (m)	3.69	2.21	2.89	1.90						
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.8	0.8	0.8	0.4						
Ash %	22.9	39.0	21.8	36.9						
Volatiles %	20.1	15.9	20.7	18.1						
Fixed Carbon %	56.2	44.3	56.7	44.6						
FSI	5½	3½	6	3						
Sulphur %	0.57	0.48	0.48	0.48						
Calorific Value (kJ/kg)										
Screen Analysis:										
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	82.4	23.8	87.5	40.6	87.0	23.0	90.3	36.2		
28 x 65 mesh Wt %	10.2	15.8	7.2	21.6	8.0	15.3	5.9	37.7		
-65 mesh Wt %	7.4	20.4	5.3	24.7	5.0	16.9	3.8	44.8		
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	71.9	77.8	52.6	60.3	74.5	77.9	56.9	64.0		
28 x 65 mesh product %	80.0	85.3	74.3	79.0	82.7	86.4	52.0	60.0		
Analysis of +28 mesh product:										
Ash (dry basis) %	5.3	6.7	6.2	8.8	5.0	5.7	5.8	7.5		
FSI	7		8		7½		6½			
Analysis of 28 x 65 product:										
Ash (dry basis) %	4.1	5.1	4.8	6.0	3.8	4.6	6.4	7.4		
FSI	8		8½		8		7			
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	77.8	83.8	76.0	81.7	80.9	87.8	56.2	68.8		
Analysis of product:										
Ash (dry basis) %	9.4	11.3	10.8	12.8	7.3	8.8	19.4	25.9		
FSI	7½		8		7½		5			
Analysis of total clean coal product:										
Moisture (a.d.) %		0.8		0.7		0.5		0.2		
Ash %		7.0		8.8		7.8		8.8		
Volatiles %		23.1		22.1		23.0		23.1		
Fixed Carbon %		69.1		68.4		68.7		67.9		
FSI		7		7½		7		6½		
Sulphur %		0.44		0.70		0.42		0.6		
P ₂ O ₅ %										
Hardgrove Index										
Recovery of clean coal %		79.0		62.8		62.0		63.9		

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B4

Source of Sample	MUD 78-14	MUD 78-14	MUD 78-21	MUD 78-21						
Interval (m): from	169.27	176.80	197.52	203.26						
to	175.04	179.03	201.37	205.41						
True Seam Thickness (m)	5.55	2.14	3.66	2.04						
Core Recovery	100	100	100	100						
True Sample Width (m)	5.55	2.14	3.66	2.04						
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.9	0.8	0.4	0.4						
Ash %	32.4	11.3	34.2	35.2						
Volatiles %	18.7	23.0	20.4	18.7						
Fixed Carbon %	48.0	64.9	45.0	45.7						
FSI	4½	7½	4½	5½						
Sulphur %	0.28	0.59	0.23	0.52						
Calorific Value (kJ/kg)										
Screen Analysis:										
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	89.8	33.7	84.6	11.2	87.3	35.2	88.4	37.2		
28 x 65 mesh Wt %	6.0	21.0	8.9	10.9	7.7	25.2	7.0	18.5		
-65 mesh Wt %	4.2	21.5	6.5	12.9	5.0	26.1	4.6	17.4		
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	55.3	63.1	86.8	92.6	49.5	62.8	52.4	59.8		
28 x 65 mesh product %	72.4	78.0	87.0	91.7	67.7	75.2	79.1	82.1		
Analysis of +28 mesh product:										
Ash (dry basis) %	7.4	9.6	6.4	7.6	8.4	11.7	6.6	9.0		
FSI	8½		7½		6½		6½			
Analysis of 28 x 65 product:										
Ash (dry basis) %	5.4	6.7	5.3	6.4	7.3	8.5	6.2	6.7		
FSI	8½		8½		7		7			
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	80.9	86.0	76.9	88.6	51.7	80.9	87.8	95.1		
Analysis of product:										
Ash (dry basis) %	11.6	13.4	7.7	9.1	15.7	17.8	11.3	14.0		
FSI	8		7½		7					
Analysis of total clean coal product:										
Moisture (a.d.) %		0.8		0.7		0.4		0.4		
Ash %		9.5		7.5		12.1		9.3		
Volatiles %		23.8		23.8		24.6		24.1		
Fixed Carbon %		65.9		68.0		62.9		66.2		
FSI		7½		7½		6½		7		
Sulphur %		0.35		0.57		0.30		0.54		
P ₂ O ₅ %		0.18				0.24		0.06		
Hardgrove Index		78				77		117		
Recovery of clean coal %		65.0		92.3		64.7		63.0		

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B6

Source of Sample	MUD 78-14	MUD 78-17									
Interval (m): from	122.85	395.50									
to	126.50	398.37									
True Seam Thickness (m)	3.54	2.80									
Core Recovery	100	100									
True Sample Width (m)	3.54	2.80									
Weighted Average Analysis											
Raw Coal (Air Dried Basis):											
Moisture %	1.0	0.8									
Ash %	38.9	19.5									
Volatiles %	17.0	24.1									
Fixed Carbon %	43.1	55.6									
FSI	1½	6½									
Sulphur %	0.47	0.33									
Calorific Value (kJ/kg)											
Screen Analysis:											
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	
½ x 28 mesh Wt %	87.6	39.6	87.9	20.4							
28 x 65 mesh Wt %	7.0	27.1	7.5	12.2							
-65 mesh Wt %	5.4	26.7	4.6	14.7							
Flotation Tests:											
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	
Recovery:											
+28 mesh product %	40.4	53.0	70.3	75.1							
28 x 65 mesh product %	60.8	70.1	79.7	85.0							
Analysis of +28 mesh product:											
Ash (dry basis) %	7.4	11.7	4.2	5.3							
FSI	7		8								
Analysis of 28 x 65 product:											
Ash (dry basis) %	5.4	7.9	3.1	4.1							
FSI	8½		8½								
Froth Flotation:											
Duration (secs.)	90	180	90	180	90	180	90	180	90	180	
Rec. of -65 mesh portion %	73.3	79.4	86.7	90.0							
Analysis of product:											
Ash (dry basis) %	13.3	15.4	9.8	10.4							
FSI	6½		7								
Analysis of total clean coal product:											
Moisture (a.d.) %		0.7		0.7							
Ash %		11.5		5.6							
Volatiles %		22.1		27.2							
Fixed Carbon %		65.7		66.5							
FSI		6		3½							
Sulphur %		0.59		0.40							
P ₂ O ₅ %											
Hardgrove Index											
Recovery of clean coal %		55.6		76.5							

MONKMAN COAL PROJECT

Summary of Analytical Data -Seam B7

Source of Sample	MUD 78-20	MUD 78-15	MUD 78-15	MUD 78-21						
Interval (m): from	162.80	285.00	243.20	134.63						
to	166.23	288.65	246.25	137.52						
True Seam Thickness (m)	2.20	3.03	2.97	2.79						
Core Recovery	100	100	100	100						
True Sample Width (m)	2.20	3.03	2.97	2.79						
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	1.0	1.1	1.0	0.4						
Ash %	17.5	27.3	29.4	38.3						
Volatiles %	23.3	19.9	20.4	19.9						
Fixed Carbon %	58.2	51.7	49.2	41.4						
FSI	6½	5½	6	4						
Sulphur %	0.34	0.55	0.48	0.48						
Calorific Value (kJ/kg)										
Screen Analysis:										
½ x 28 mesh Wt %	84.0	17.9	87.1	28.6	87.8	30.4	89.5	39.6		
28 x 65 mesh Wt %	9.9	11.5	7.8	16.6	7.3	17.7	6.9	17.6		
-65 mesh Wt %	6.1	13.5	5.1	17.5	4.9	21.3	3.6	20.1		
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	76.7	79.4	63.3	66.4	56.2	61.8	55.2	58.0		
28 x 65 mesh product %	83.5	86.9	76.7	81.8	75.0	80.3	77.2	82.6		
Analysis of +28 mesh product:										
Ash (dry basis) %	5.1	5.7	4.3	5.2	4.1	5.9	4.7	5.5		
FSI	7		7½		7½		6½			
Analysis of 28 x 65 product:										
Ash (dry basis) %	3.1	3.7	2.8	3.8	3.3	4.6	4.5	5.2		
FSI	8½		8½		8½		7½			
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	86.2	90.2	70.5	82.1	75.2	85.1	79.2	89.6		
Analysis of product:										
Ash (dry basis) %	7.5	8.5	8.5	9.8	10.3	13.1	9.0	12.3		
FSI	8		8		8		7			
Analysis of total clean coal product:										
Moisture (a.d.) %		0.8		0.8		0.7		0.4		
Ash %		5.8		5.4		6.5		5.9		
Volatiles %		26.0		25.1		26.0		27.6		
Fixed Carbon %		67.4		68.7		66.8		66.1		
FSI		8½		7½		8		7		
Sulphur %		0.29		0.44		0.44		0.62		
P ₂ O ₅ %								0.20		
Hardgrove Index								117		
Recovery of clean coal %		80.8		68.4		64.3		60.8		

MONKMAN COAL PROJECT

Summary of Analytical Data -- Seam B9

Source of Sample	MUD 78-14	MUD 78-14	MUD 78-14	MUD 78-15	MUD 78-15					
Interval (m): from	66.94	76.82	66.94	188.24	197.20					
to	72.79	79.70	79.70	192.45	200.25					
True Seam Thickness (m)	5.76	2.84	12.57	4.13	2.99					
Core Recovery	93	90	89	100	100					
True Sample Width (m)	5.34	2.56	11.19	4.13	2.99					
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	1.2	0.9	1.1	1.2	1.2					
Ash %	17.3	18.2	27.4	18.9	17.0					
Volatiles %	23.3	23.1	19.7	21.4	22.3					
Fixed Carbon %	58.2	57.8	51.8	58.4	59.5					
FSI	3	6	2	2	3					
Sulphur %	0.39	0.51	0.42	0.24	0.41					
Calorific Value (kJ/kg)										
Screen Analysis:										
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	89.9	17.3	85.6	18.7	90.2	27.8	86.5	18.9	89.1	16.9
28 x 65 mesh Wt %	5.8	12.6	8.6	13.1	5.4	16.3	7.7	13.7	6.4	13.7
-65 mesh Wt %	4.3	17.9	5.8	15.8	4.4	23.1	5.8	17.8	4.5	17.3
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	70.8	82.2	85.6	94.2	58.0	67.3	64.0	79.6	66.8	77.7
28 x 65 mesh product %	79.8	87.8	71.3	77.8	74.8	82.7	75.4	86.6	74.8	85.9
Analysis of +28 mesh product:										
Ash (dry basis) %	6.6	8.7	5.4	6.9	6.7	9.1	5.5	8.8	6.1	8.4
FSI	4		7		4½		2½		3½	
Analysis of 28 x 65 product:										
Ash (dry basis) %	4.6	6.2	3.7	4.9	4.8	6.5	4.6	6.8	4.6	6.8
FSI	7		7½		7		4		6½	
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	75.1	81.9	70.0	80.7	69.5	77.9	71.6	84.0	69.6	86.0
Analysis of product:										
Ash (dry basis) %	9.1	10.2	6.7	8.4	10.3	12.2	10.3	12.1	10.2	11.4
FSI	5½		7½		5		3½		4½	
Analysis of total clean coal product:										
Moisture (a.d.) %		0.8		0.7		0.8		1.3		0.8
Ash %		8.8		7.5		9.2		8.3		8.8
Volatiles %		23.3		23.8		22.9		23.1		23.4
Fixed Carbon %		67.1		68.0		67.1		67.3		67.0
FSI		3½		7½		4½		3½		4
Sulphur %		0.40		0.57		0.48		0.36		0.39
P ₂ O ₅ %						0.05				
Hardgrove Index						73				
Recovery of clean coal %		82.5		92.3		68.6		80.4		78.6

MONKMAN COAL PROJECT

Summary of Analytical Data - Seam B9

Source of Sample	MUD 78-16	MUD 78-17	MUD 78-20	MUD 78-21						
Interval (m): from	96.00	348.29	108.81	103.79						
to	99.37	351.75	111.99	109.98						
True Seam Thickness (m)	2.38	3.33	2.67	5.98						
Core Recovery	99	100	92	97						
True Sample Width (m)	2.36	3.33	2.47	5.80						
Weighted Average Analysis										
Raw Coal (Air Dried Basis):										
Moisture %	0.9	1.0	1.1	0.4						
Ash %	16.9	24.9	22.0	20.7						
Volatiles %	23.3	20.2	20.5	23.7						
Fixed Carbon %	58.9	53.9	56.4	55.2						
FSI	6	1½	2½	3						
Sulphur %	0.33	0.41	0.38	0.26						
Calorific Value (kJ/kg)										
Screen Analysis:										
	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %	Wt %	Ash %
½ x 28 mesh Wt %	76.9	17.8	89.2	25.5	82.2	22.7	91.4	20.7		
28 x 65 mesh Wt %	13.7	9.3	6.5	19.1	9.9	13.9	5.4	16.0		
-65 mesh Wt %	9.4	12.1	4.3	20.6	7.9	18.6	3.2	18.5		
Flotation Tests:										
Specific Gravity of Flotation	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60	1.45	1.60
Recovery:										
+28 mesh product %	73.3	78.6	49.8	69.3	57.9	77.8	62.9	77.0		
28 x 65 mesh product %	86.5	90.0	64.6	79.0	75.3	85.8	75.6	82.7		
Analysis of +28 mesh product:										
Ash (dry basis) %	4.5	5.4	7.2	11.4	5.9	9.9	6.4	9.1		
FSI	7½		3		4		4½			
Analysis of 28 x 65 product:										
Ash (dry basis) %	3.3	4.0	5.7	8.5	4.5	6.5	7.2	8.0		
FSI	8		6½		6½		5			
Froth Flotation:										
Duration (secs.)	90	180	90	180	90	180	90	180	90	180
Rec. of -65 mesh portion %	81.4	87.6	82.0	86.2	85.9	89.8	63.0	92.4		
Analysis of product:										
Ash (dry basis) %	6.3	7.5	14.1	15.1	10.7	12.2	12.1	15.1		
FSI	7½		3		4½		5			
Analysis of total clean coal product:										
Moisture (a.d.) %		0.9		0.7		0.9		0.2		
Ash %		5.8		11.5		9.8		9.5		
Volatiles %		25.8		22.5		23.6		25.0		
Fixed Carbon %		67.5		65.3		65.7		65.3		
FSI		7		2½		3		4		
Sulphur %		0.37		0.33		0.39		0.31		
P ₂ O ₅ %								0.06		
Hardgrove Index								68		
Recovery of clean coal %		81.0		70.7		79.5		77.8		

PR. MONKMAN-BALCOUET 78(5)A.
= COAL SEAM DATA 1978



APP K (1)

MONKMAN COAL PROJECT
1978 EXPLORATION REPORT
APPENDIX A - BOOK 1
SEAM PROFILES

PACIFIC PETROLEUMS LTD.

OPEN FILE

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

00 543

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

310

320

330

183.59

187.12



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B.1

HQD 75-1

20

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

270

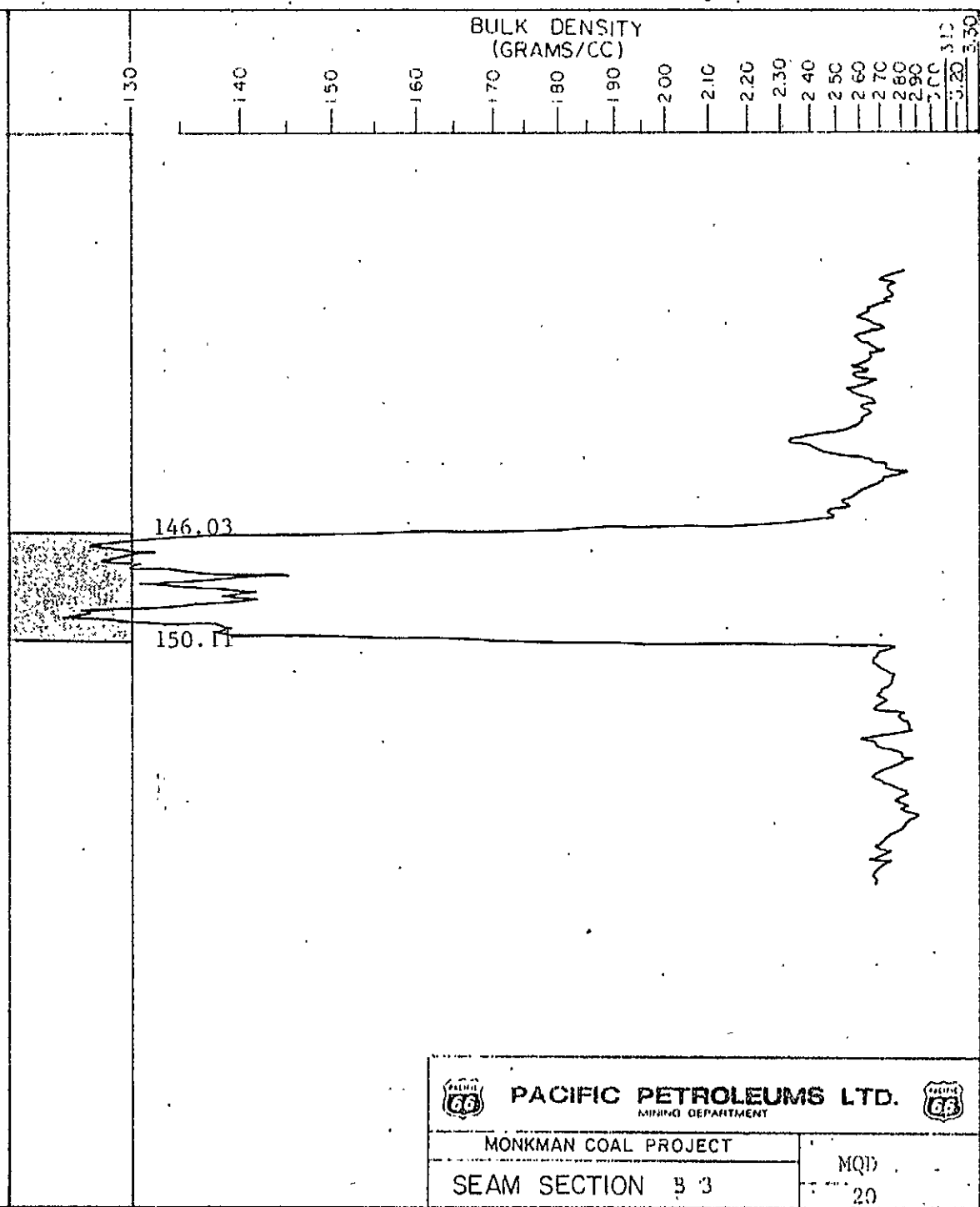
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290

300

310

320



146.03

150.11



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 3

MQD

20

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

310

320

330

130

120.15

126.13



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 4

MQD 75-1-17

17

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

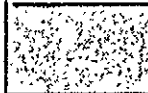
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130

54.92
55.47

63.70

66.45



PACIFIC PETROLEUMS LTD.

MINISTRY OF ENERGY AND PETROLEUM



MONKMAN COAL PROJECT

SEAM SECTION B 6

10D 75-1
15

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

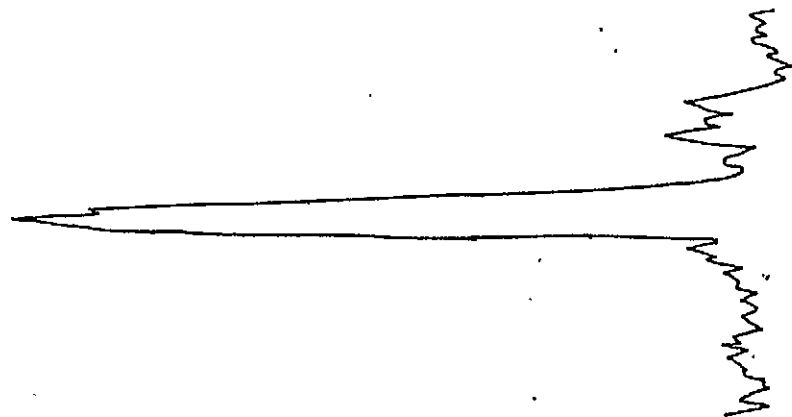
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51C

3.20 3.30

38.86

40.08



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MQD 75-1 25
SEAM SECTION B 9		

RESISTIVITY
(OHM METERS)

— 2500

— 5000

— 7500

BULK DENSITY
(GRAMS/CC)

— 1.40

— 1.50

— 1.60

— 1.70

— 1.80

— 1.90

— 2.00

— 2.10

— 2.20

— 2.30

— 2.40

— 2.50

— 2.60

— 2.70

— 2.80

— 2.90

— 3.00

— 3.10

— 3.20

— 30

77.45

80.59



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B I

MQD 75-2

RESISTIVITY
(OHM METERS)

2500

5000

7500

201.84

202.51

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

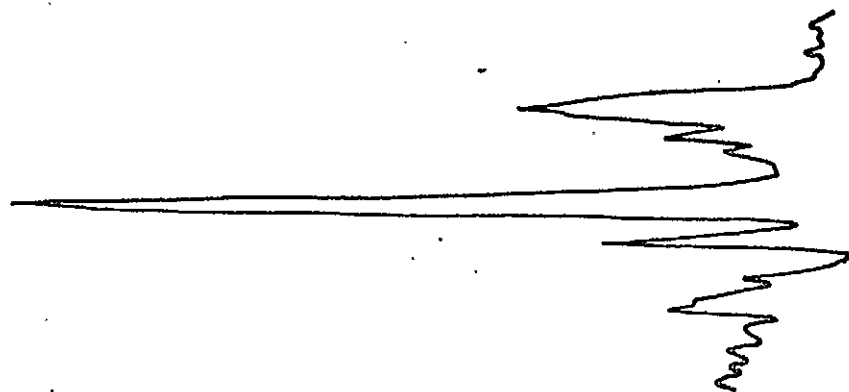
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3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.
CORPORATE HEADQUARTERS



MONKMAN COAL PROJECT

HOLE

SEAM SECTION B 1

75-3

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

166.65

167.49



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE: 75-3

SEAM SECTION B 2

DIP:

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00



3.10

3.20

3.30

135.94

146.40

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE: 75-3
SEAM SECTION: B 3	DIP:

RESISTIVITY
(OHM METERS)

2500

5000

7500

122.13

123.02

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

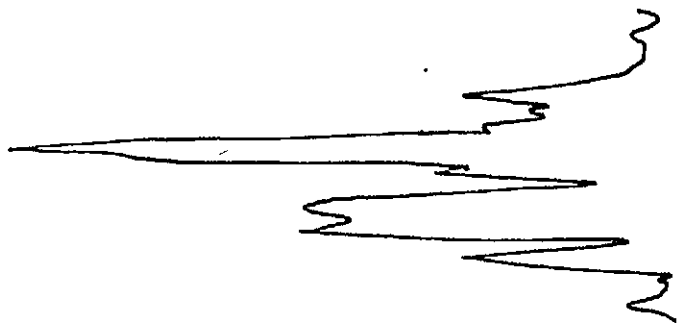
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3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE:

75-3

SEAM SECTION B4

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

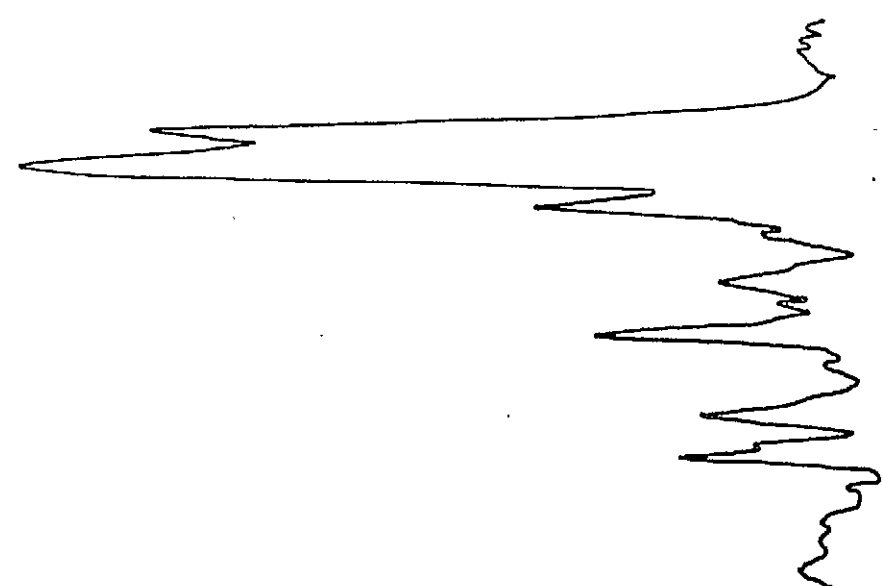
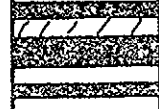
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3.20

3.30

92.96

95.98



PACIFIC PETROLEUMS LTD.
MILKING DEPARTMENT



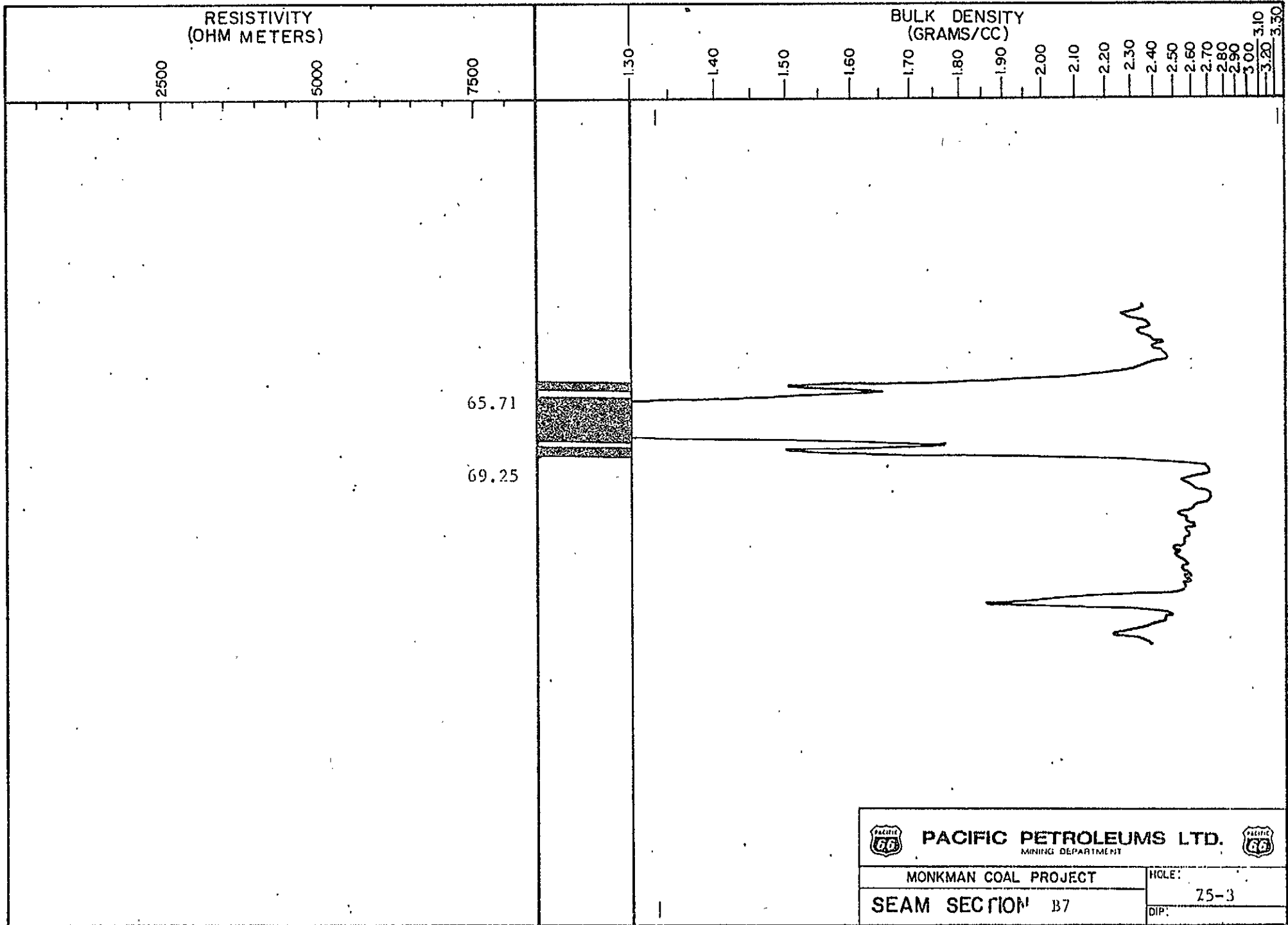
MONKMAN COAL PROJECT



HOLE:

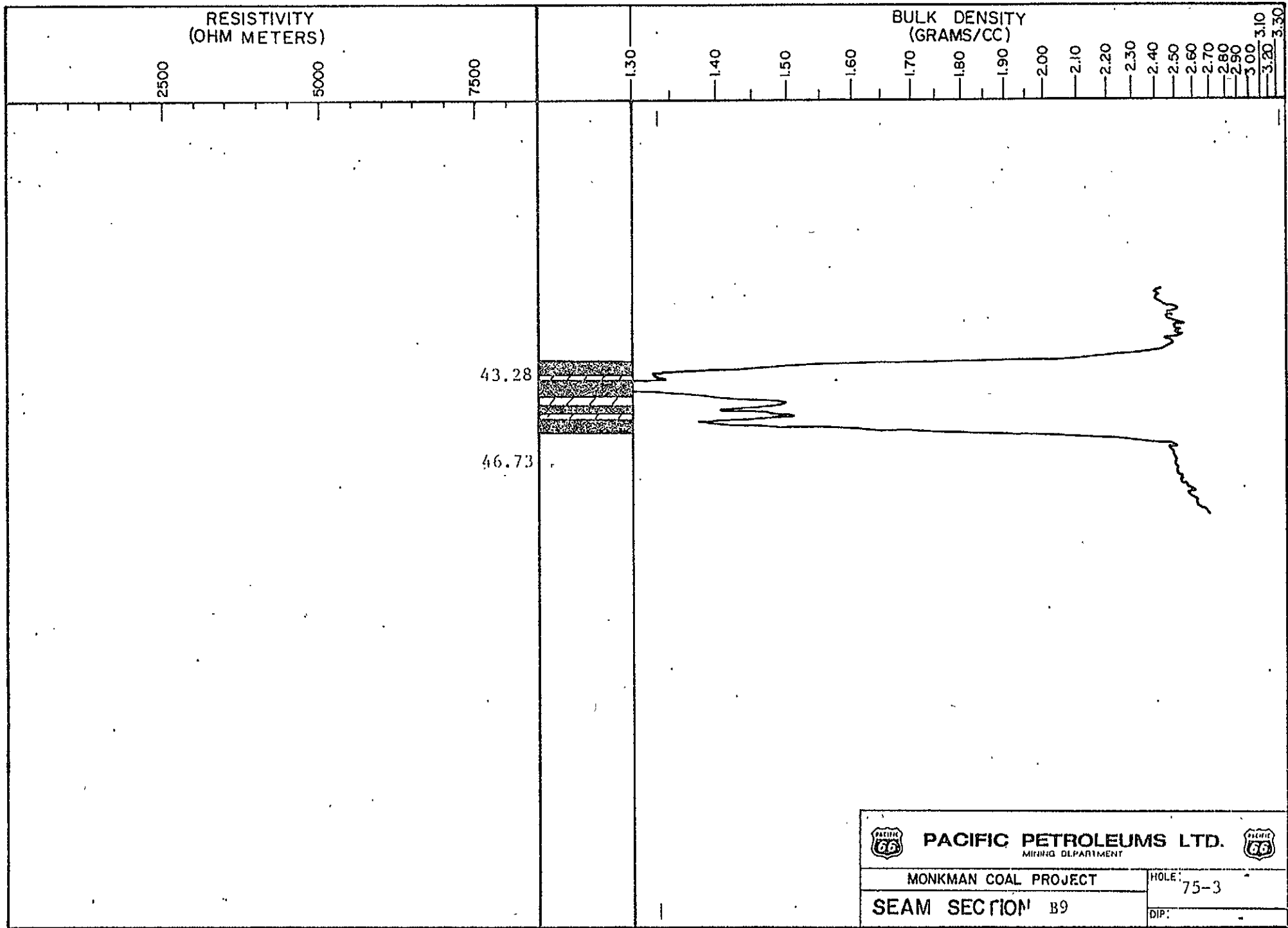
SEAM SECTION B6



75-3

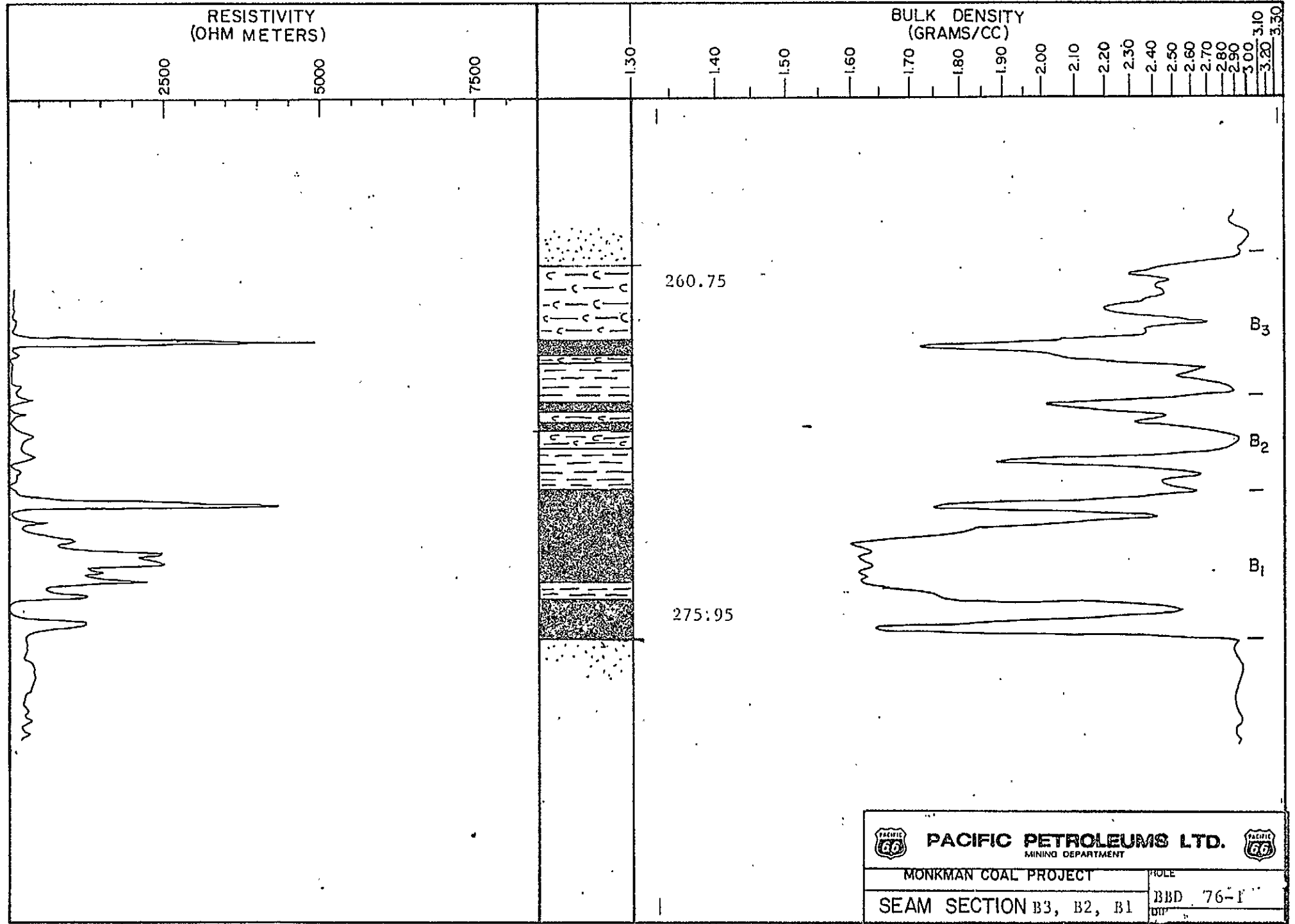
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 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B7	
HOLE:	75-3
DIP:	



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE: 75-3
SEAM SECTION B9		DIP: -



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B₃, B₂, B₁	
<small>ROLE</small> BBD '76-1'	<small>DATE</small>

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

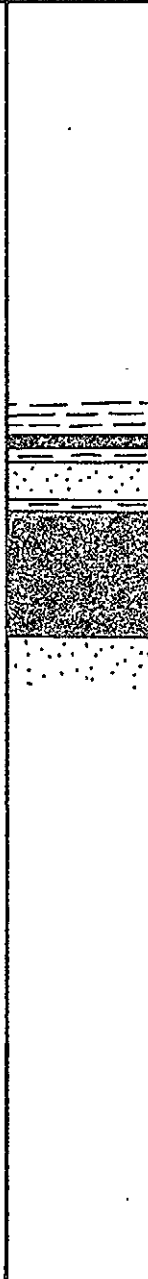
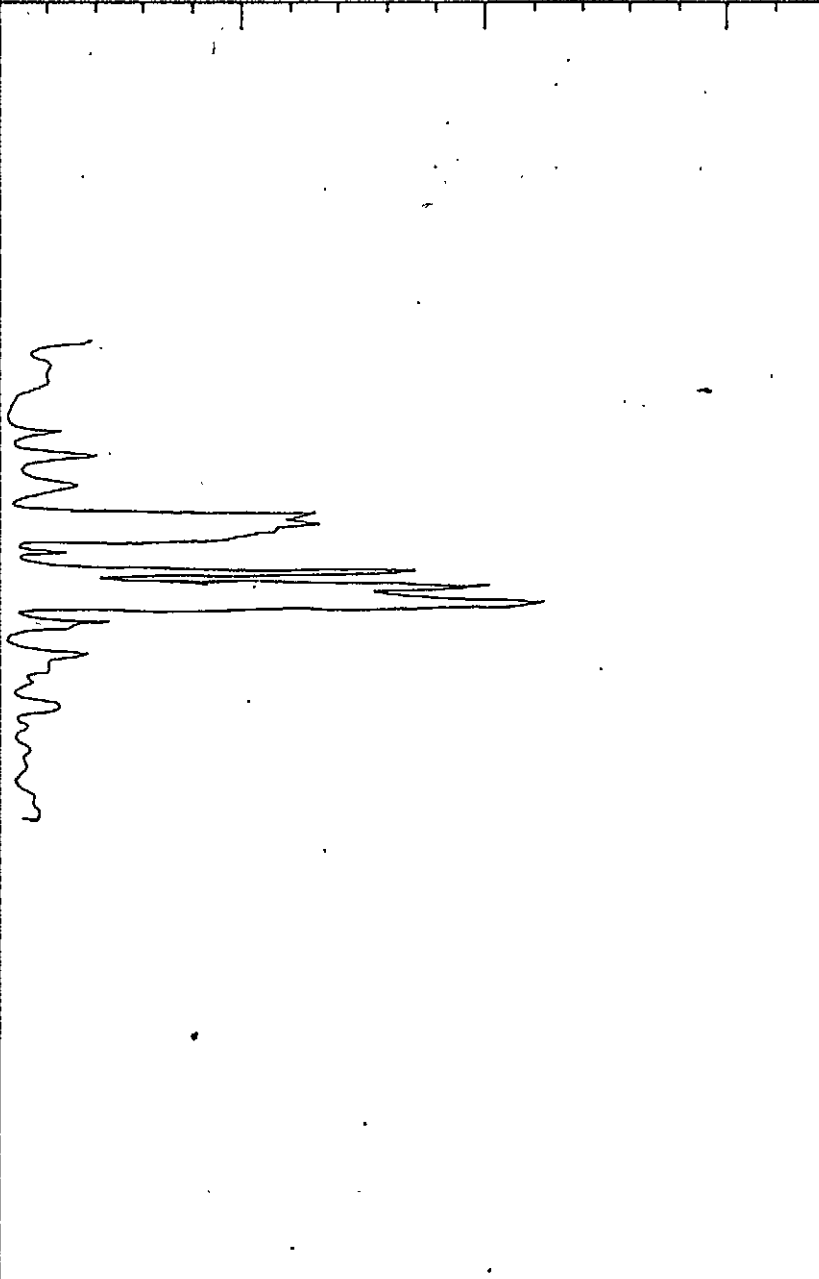
2.90

3.00

3.10

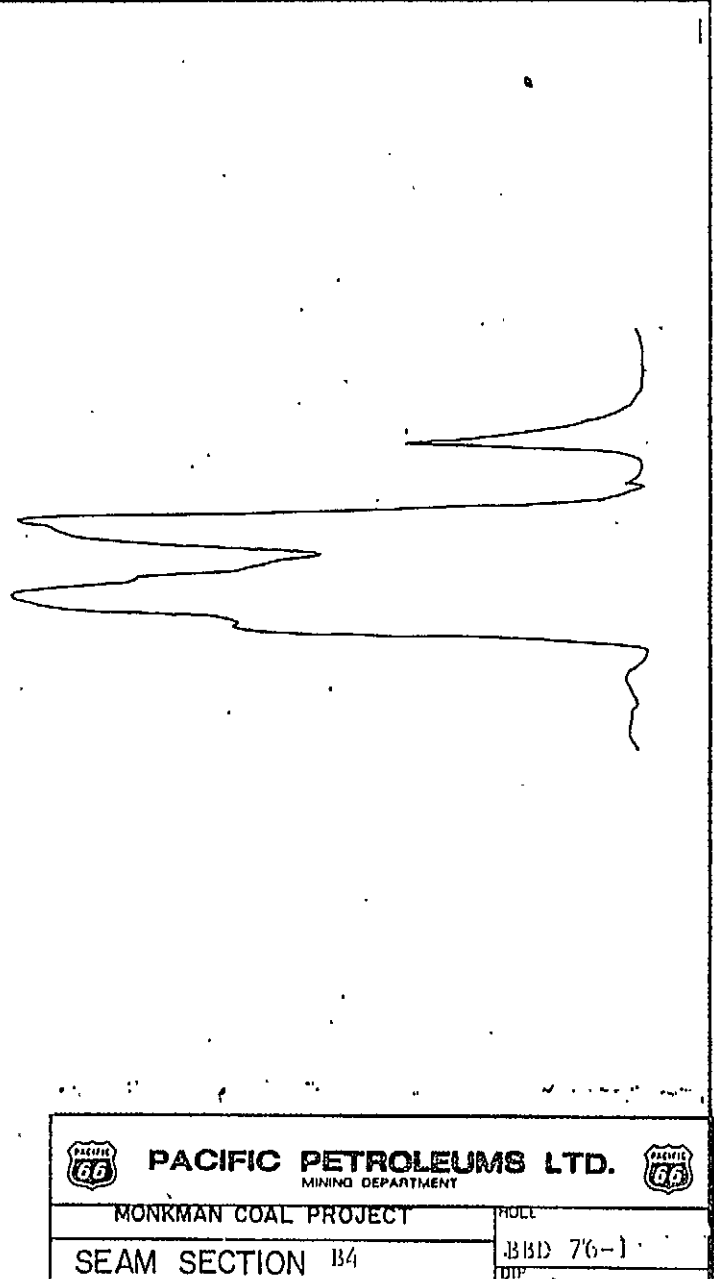
3.20



3.30

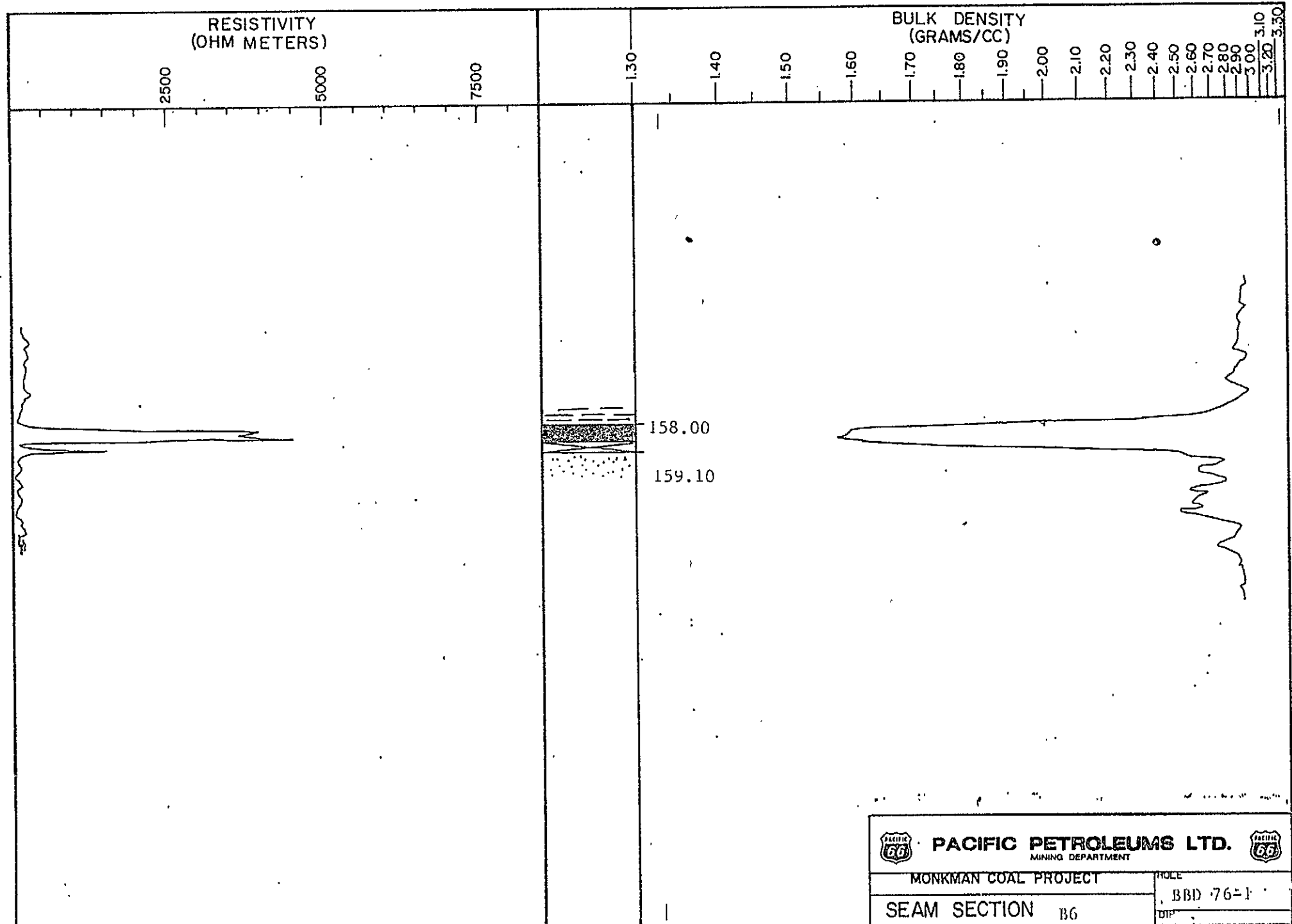




246.25

249.60



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE
SEAM SECTION B4	BBD 76-1
	DIP



 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B6	
HOLE BBD 76-1 DIP	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY³
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

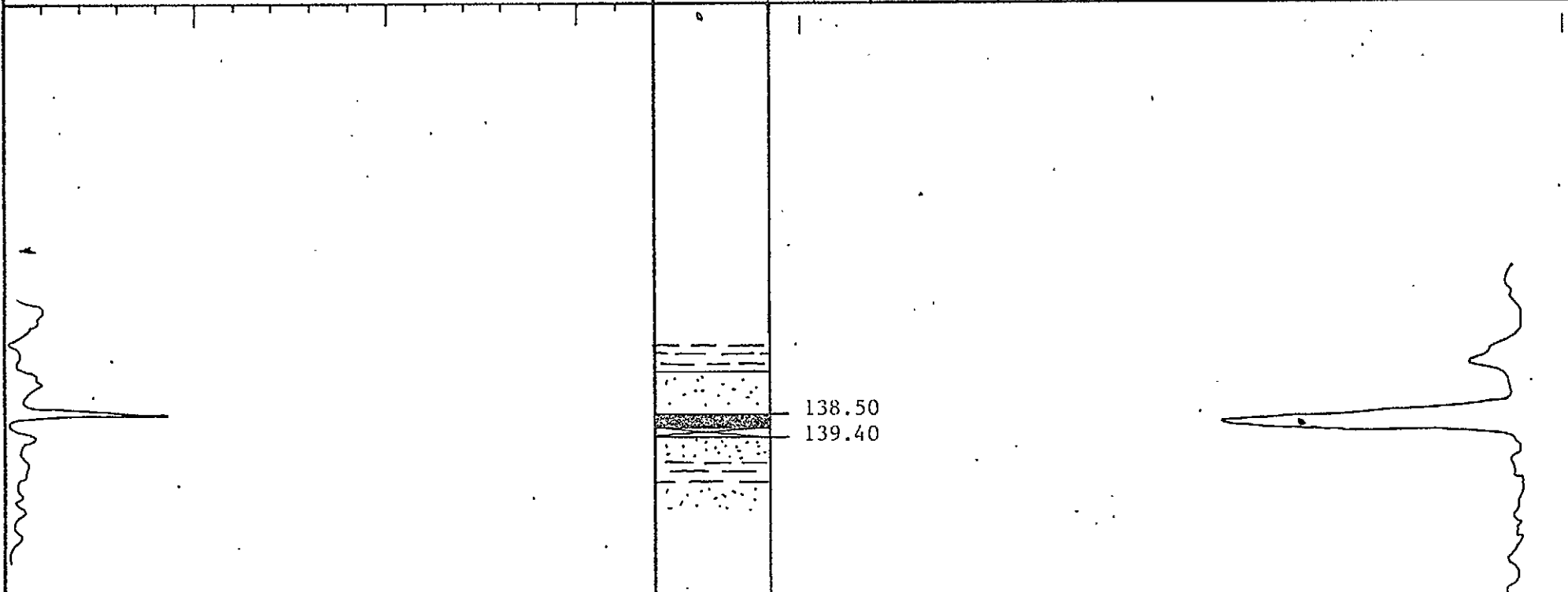
2.90

3.00

3.10

3.20

3.30



138.50

139.40



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

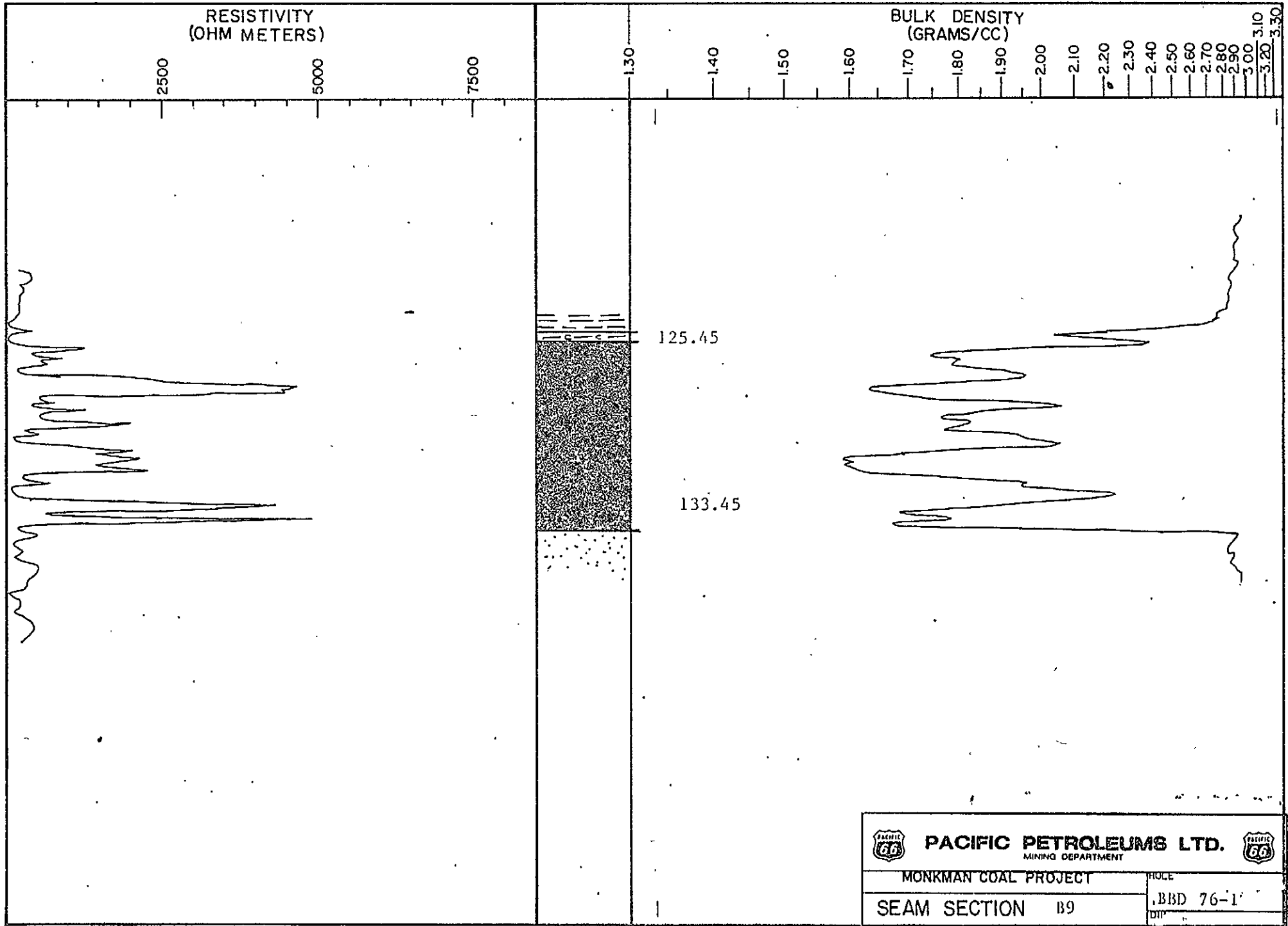
HOLE



BBD :76-1..

SEAM SECTION

B7

DIP



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B9		.BBD 76-1
		DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

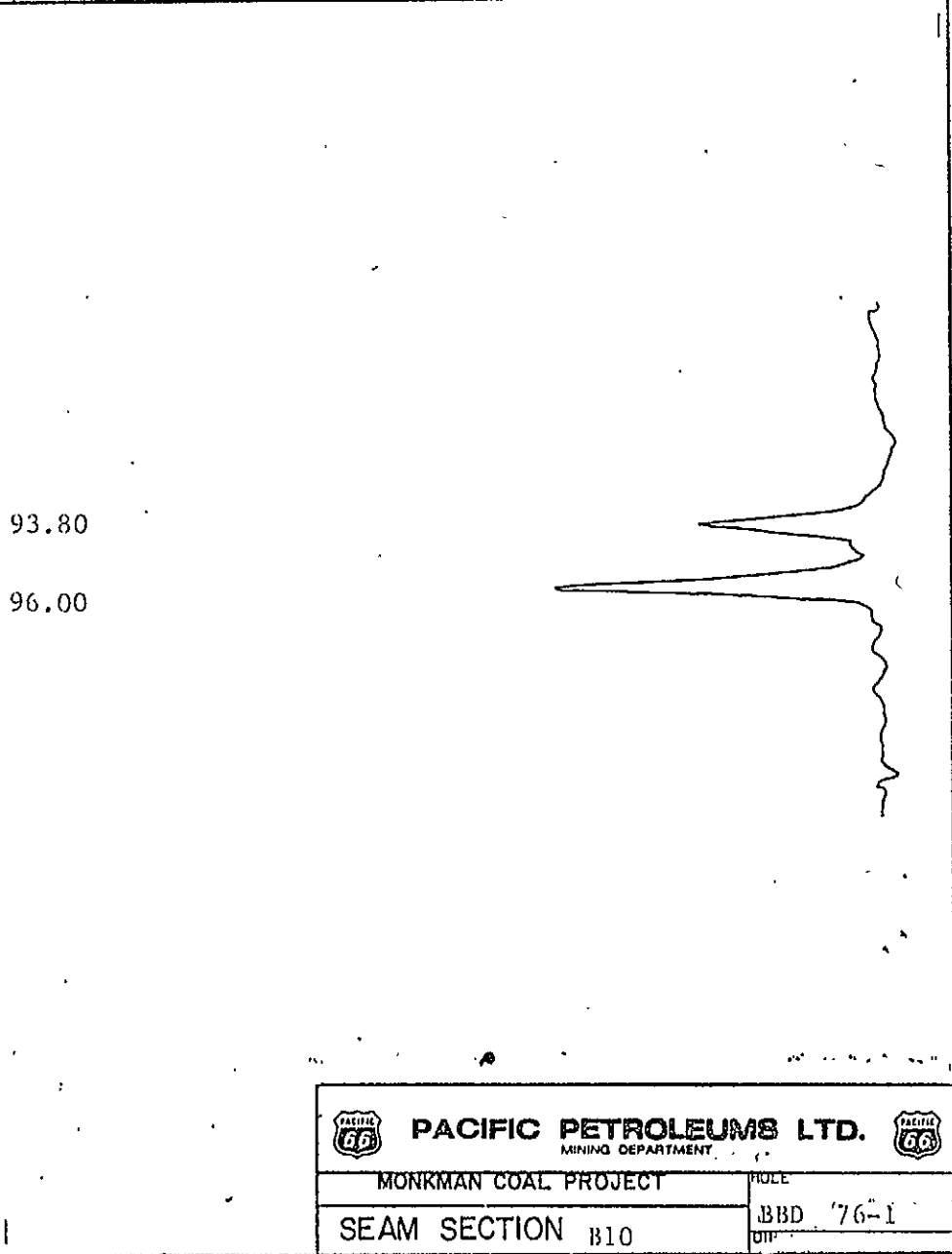
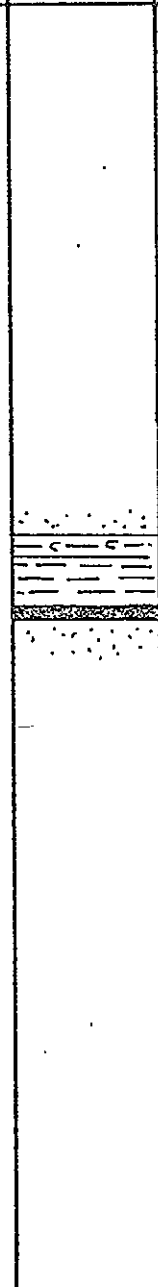
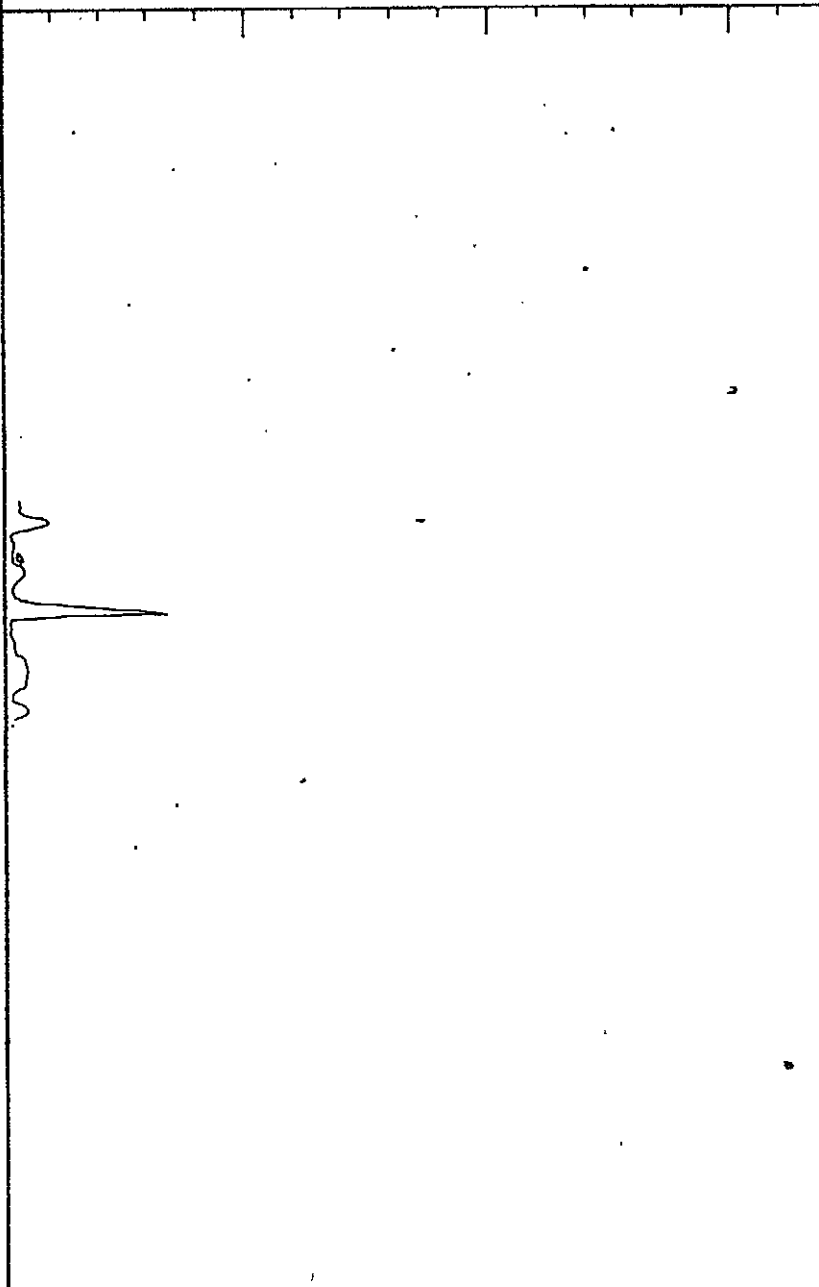
2.90

3.00



3.10

3.20

3.30



93.80
96.00

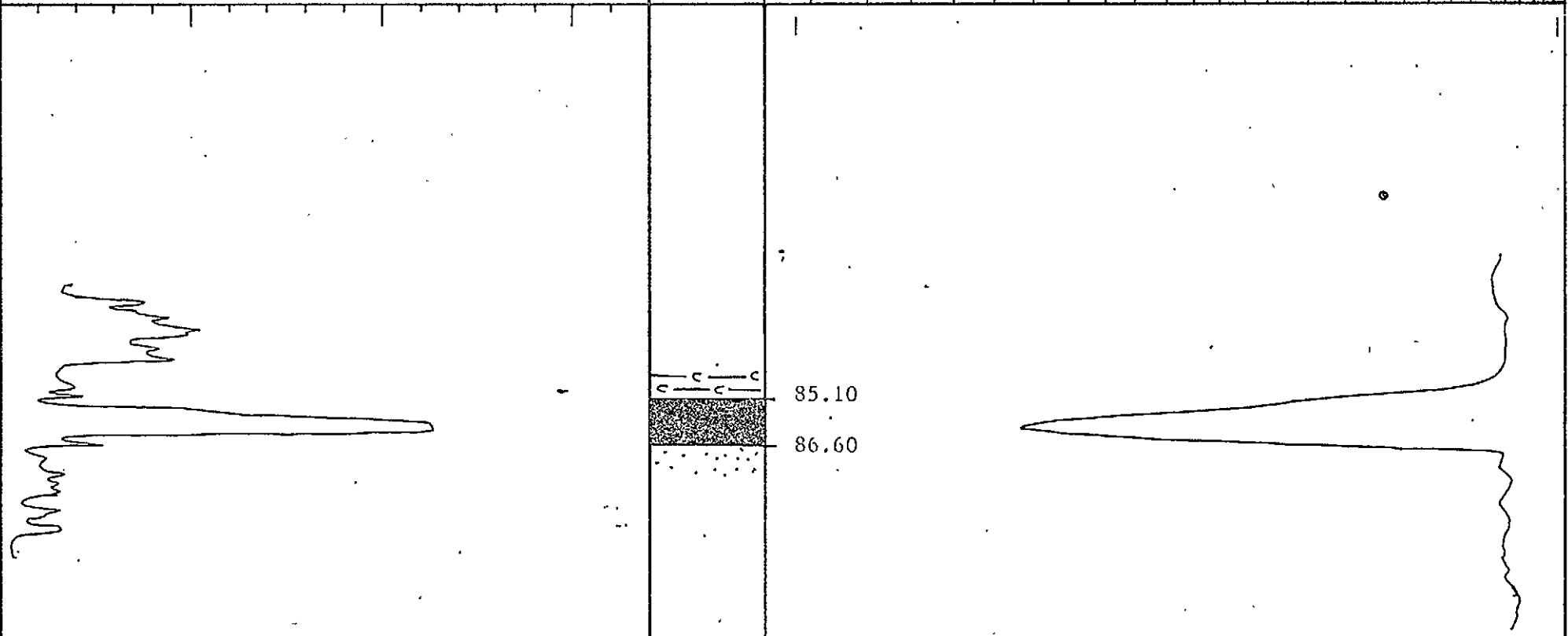
 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE
SEAM SECTION B10	JBD '76-1
	DIP

RESISTIVITY
(OHM METERS)

2500
5000
7500

BULK DENSITY
(GRAMS/CC)

1.30
1.40
1.50
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
2.40
2.50
2.60
2.70
2.80
2.90
3.00
3.10
3.20
3.30



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B11

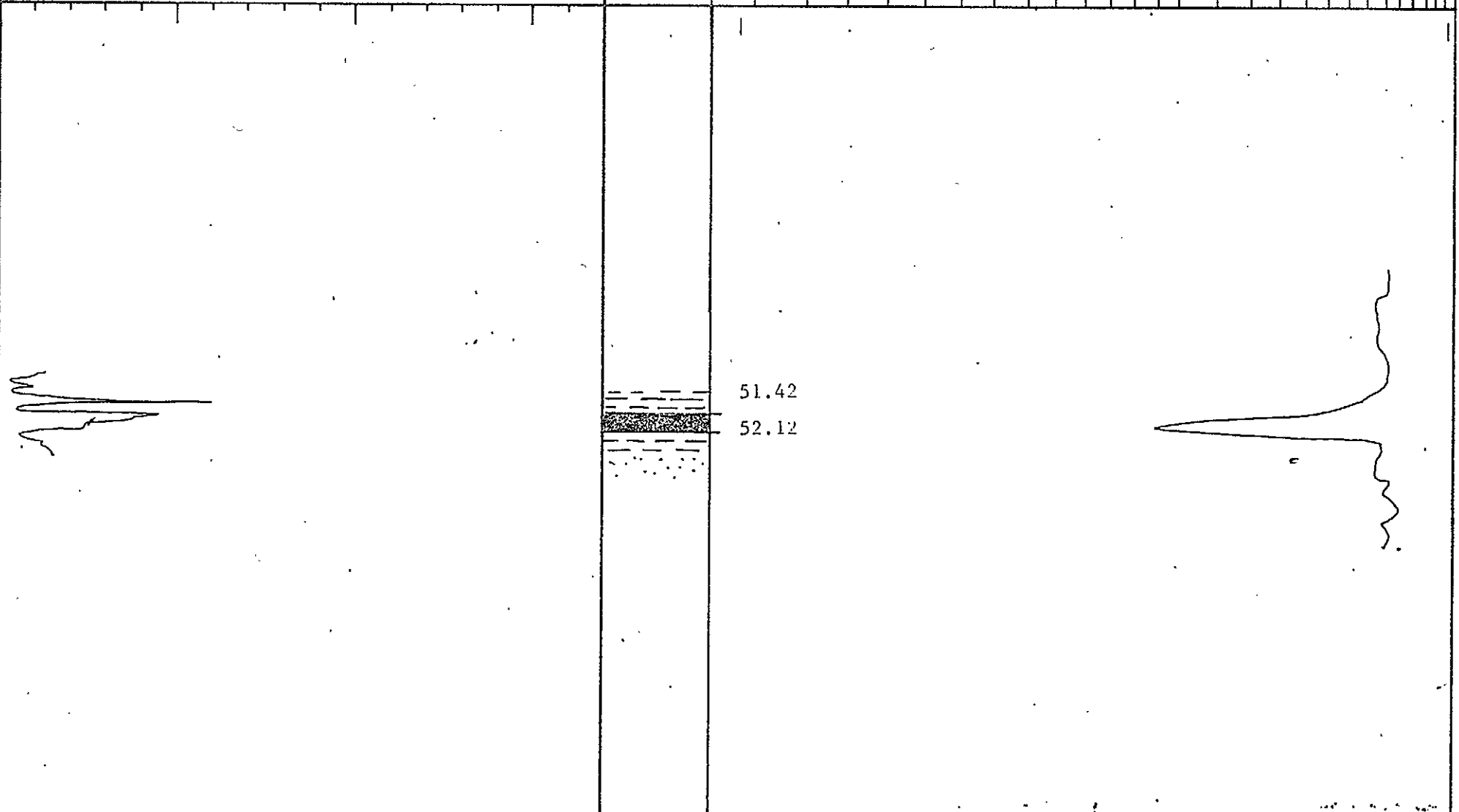
ROLL
BBD 76-1
DIT

RESISTIVITY
(OHM METERS)

2500
5000
7500

BULK DENSITY
(GRAMS/CC)

1.30
1.40
1.50
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
2.40
2.50
2.60
2.70
2.80
2.90
3.00
3.10
3.20
3.30



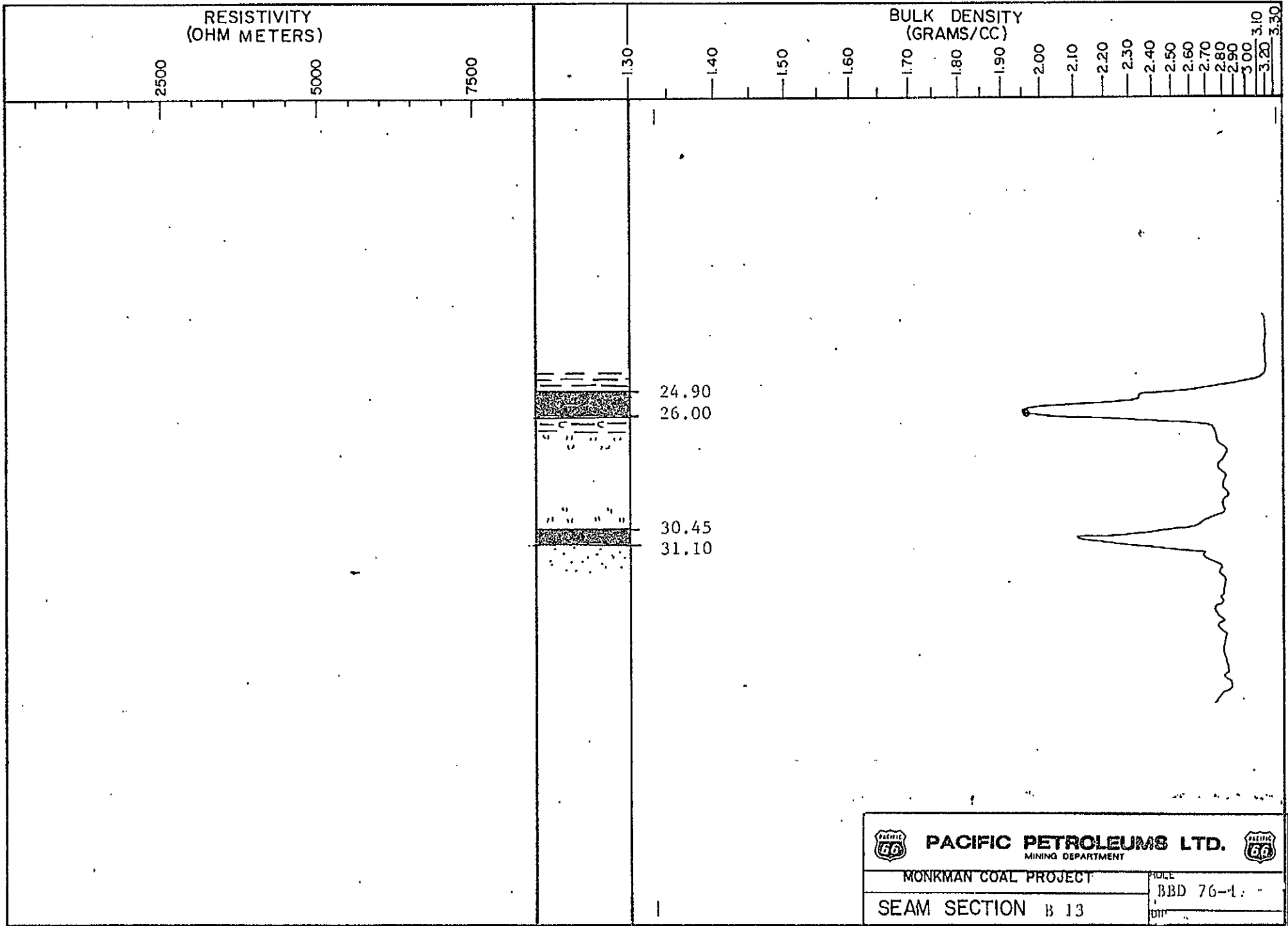

PACIFIC PETROLEUMS LTD.



 MINING DEPARTMENT

MONKMAN COAL PROJECT

SEAM SECTION B 12

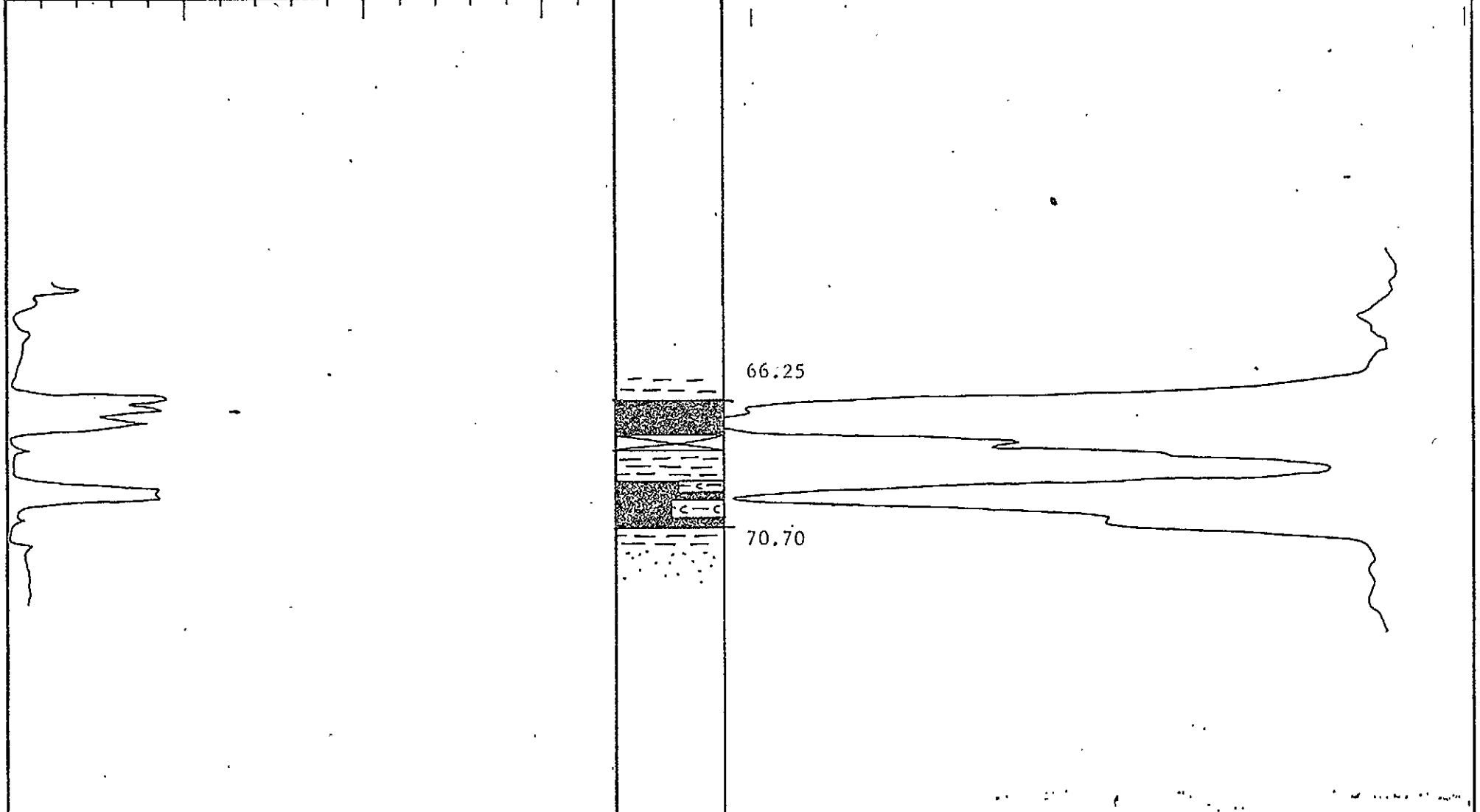
HOLE
 BBD. 76-1
 CITY





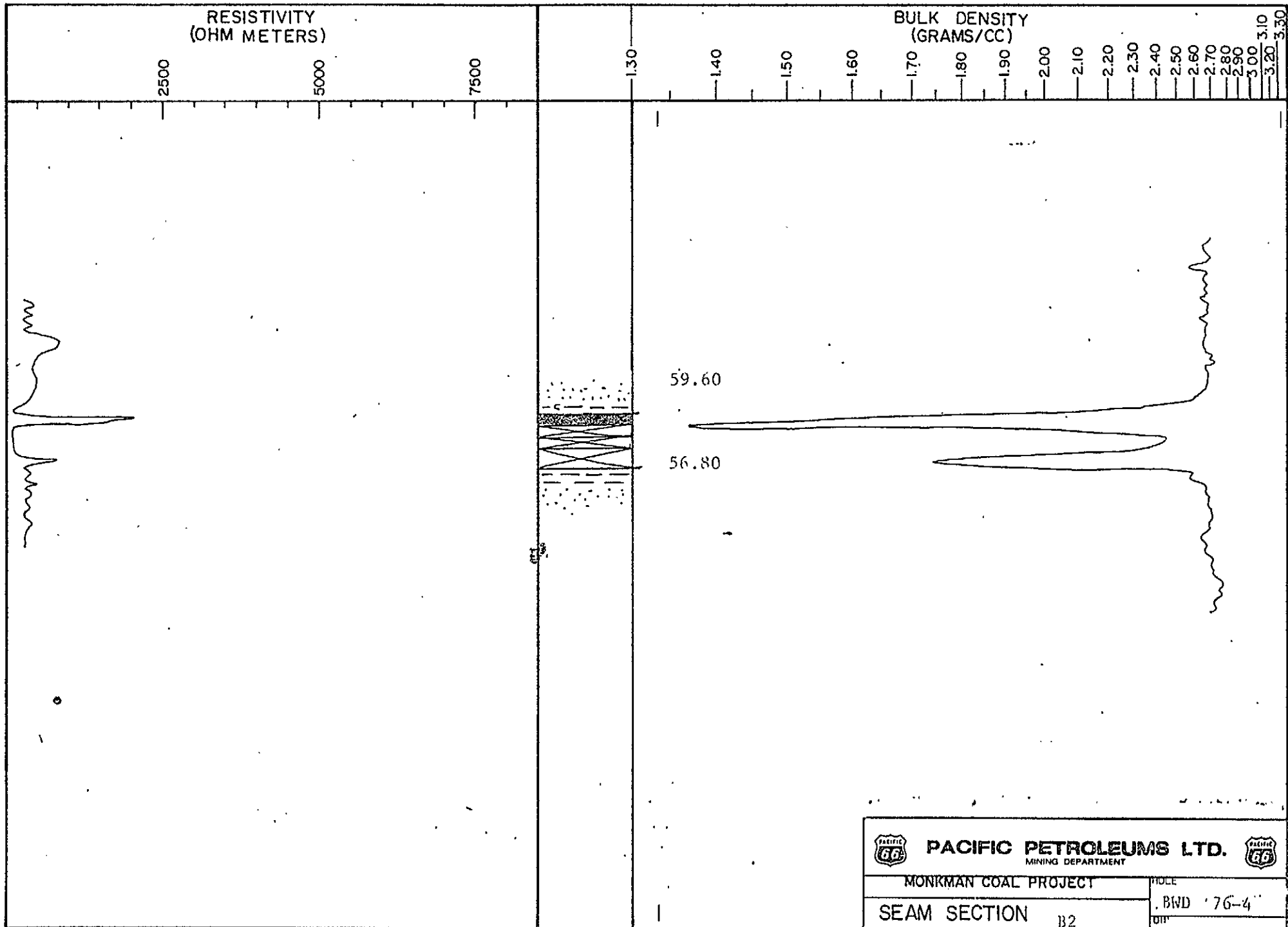
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
SEAM SECTION B 13	HOLE BBD 76-1

RESISTIVITY (OHM METERS) BULK DENSITY (GRAMS/CC)

2500 5000 7500 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B1		BWD '76-4 "
		DIP



RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

2500

5000

7500

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

59.60

56.80



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



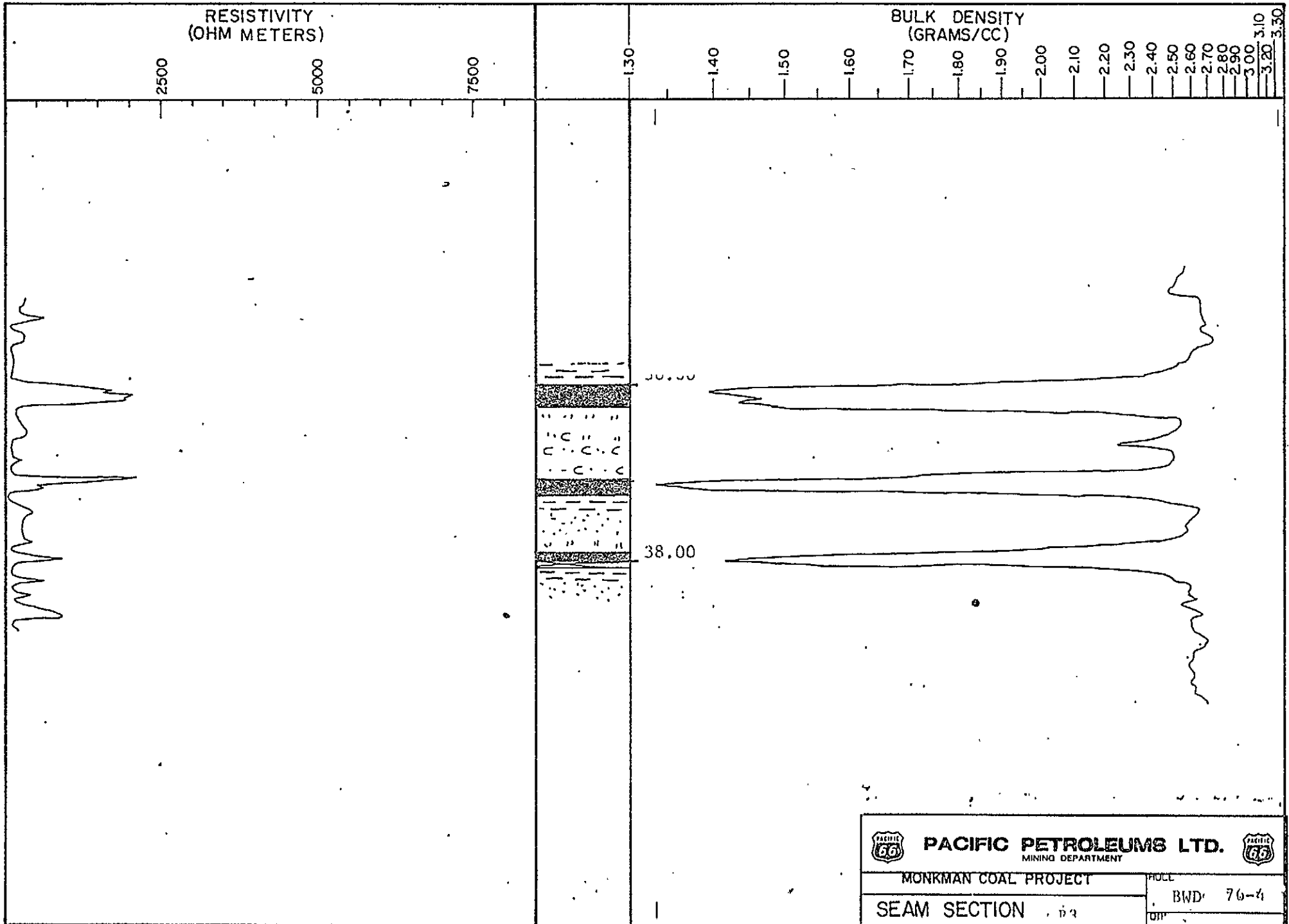
MONKMAN COAL PROJECT

HOLE

SEAM SECTION B2

BWD '76-4'

DATE



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

FULL

SEAM SECTION

BWD 76-4

TOP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

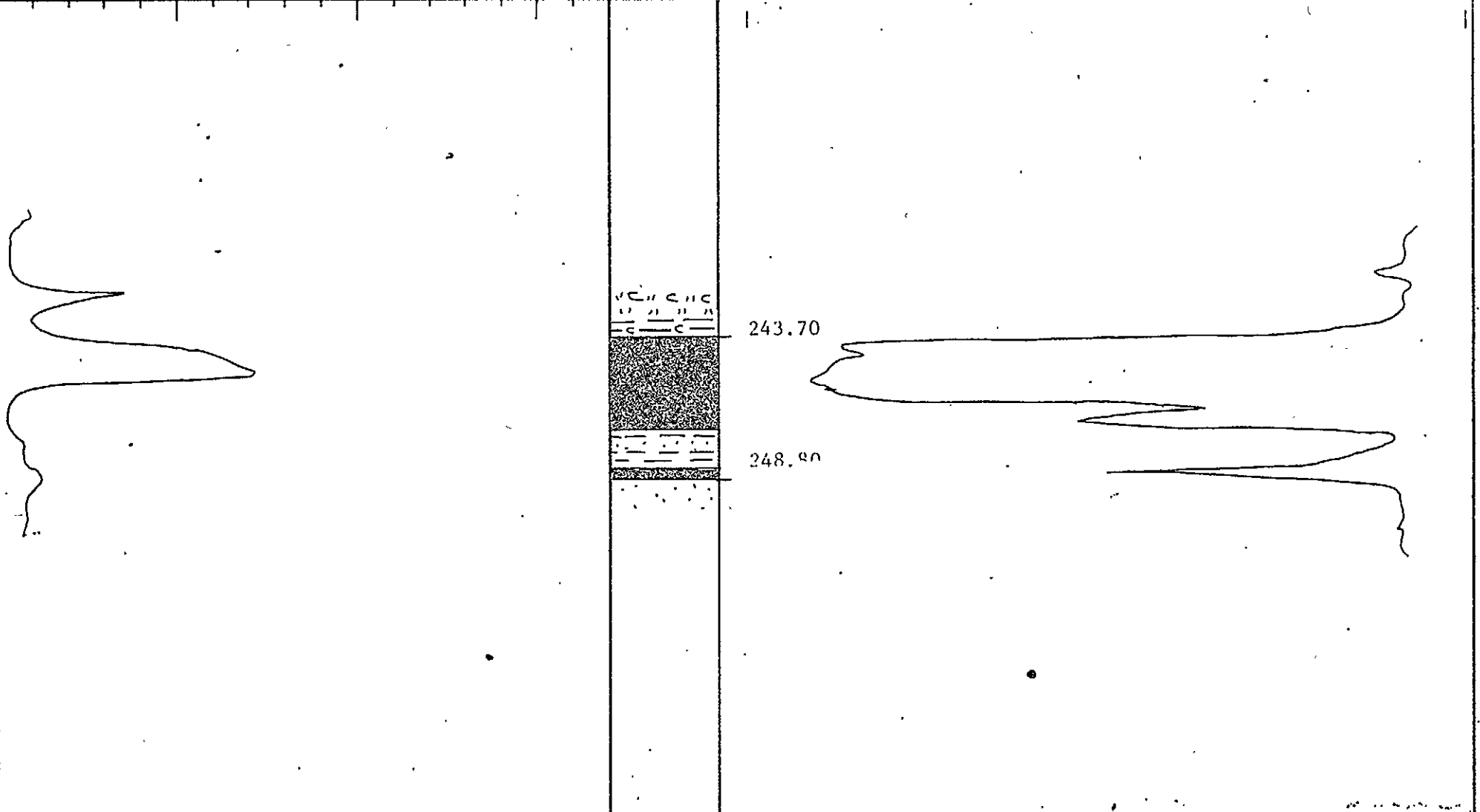
2.90

3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



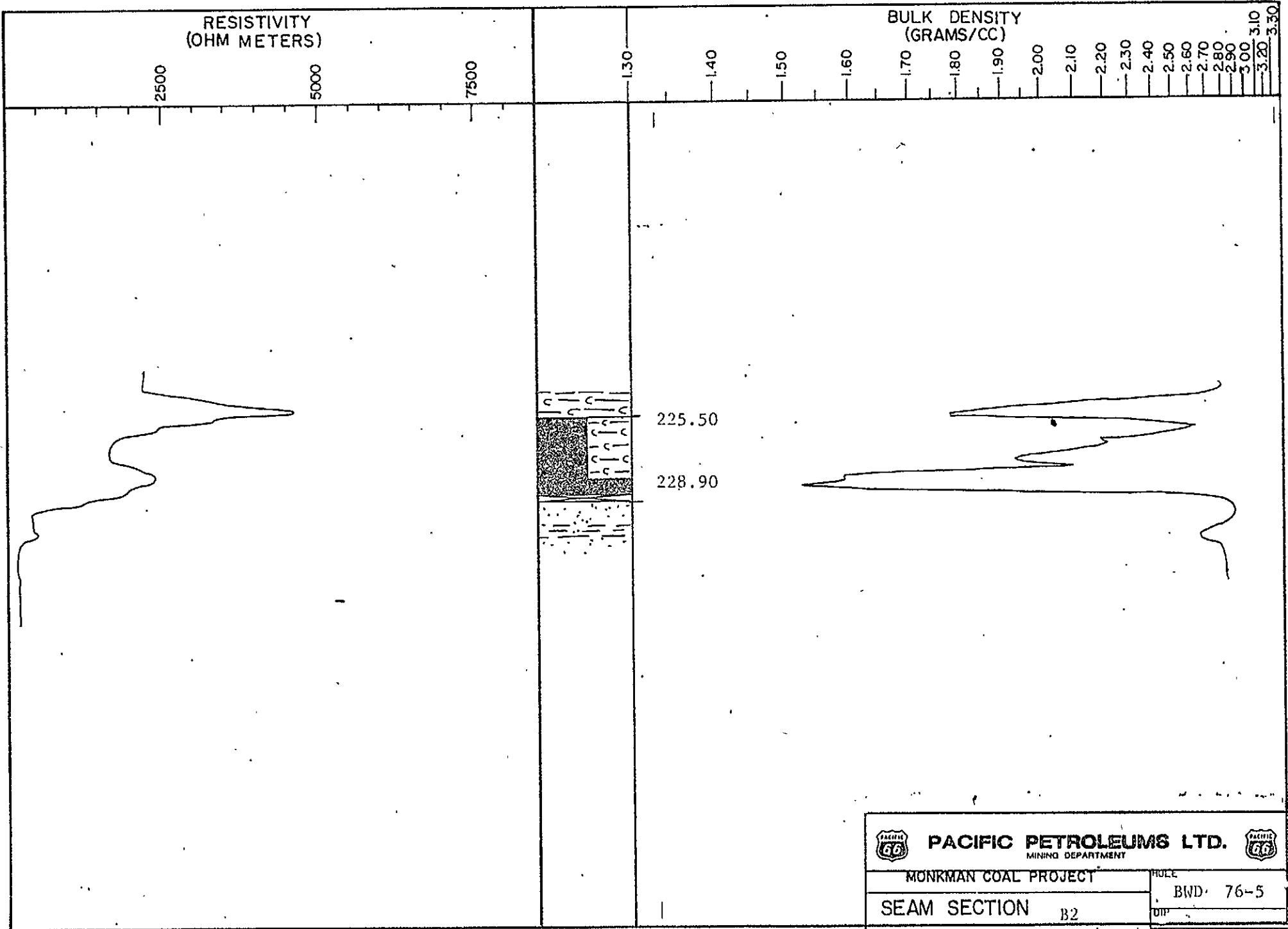
MONKMAN COAL PROJECT



SEAM SECTION B1

WELL

BWD 76-5

DIP



 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B2	HOLE BWD 76-5
	DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

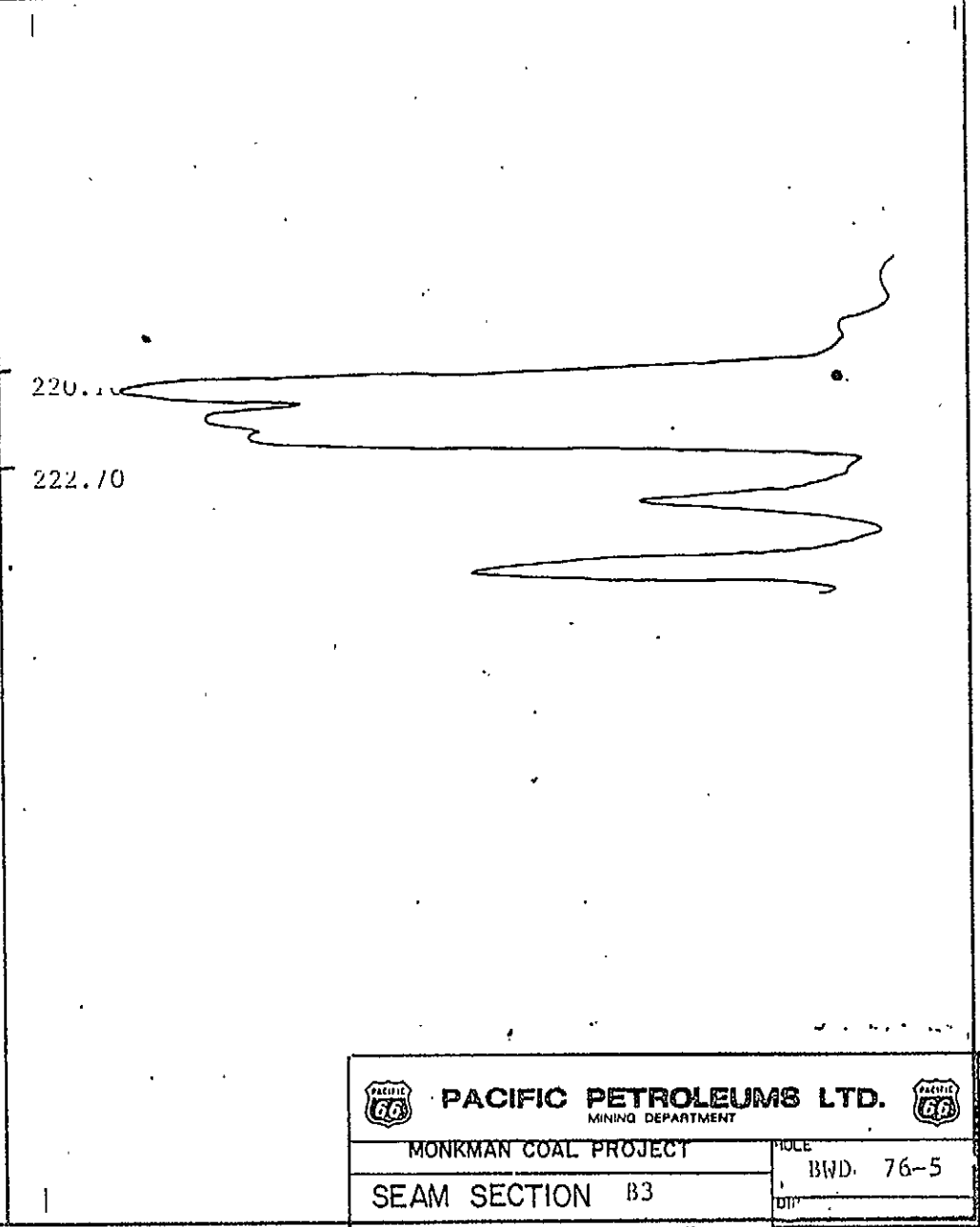
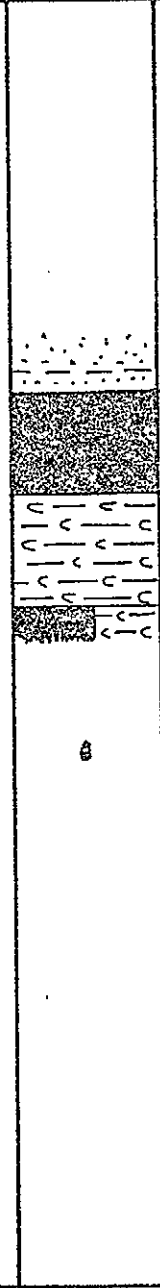
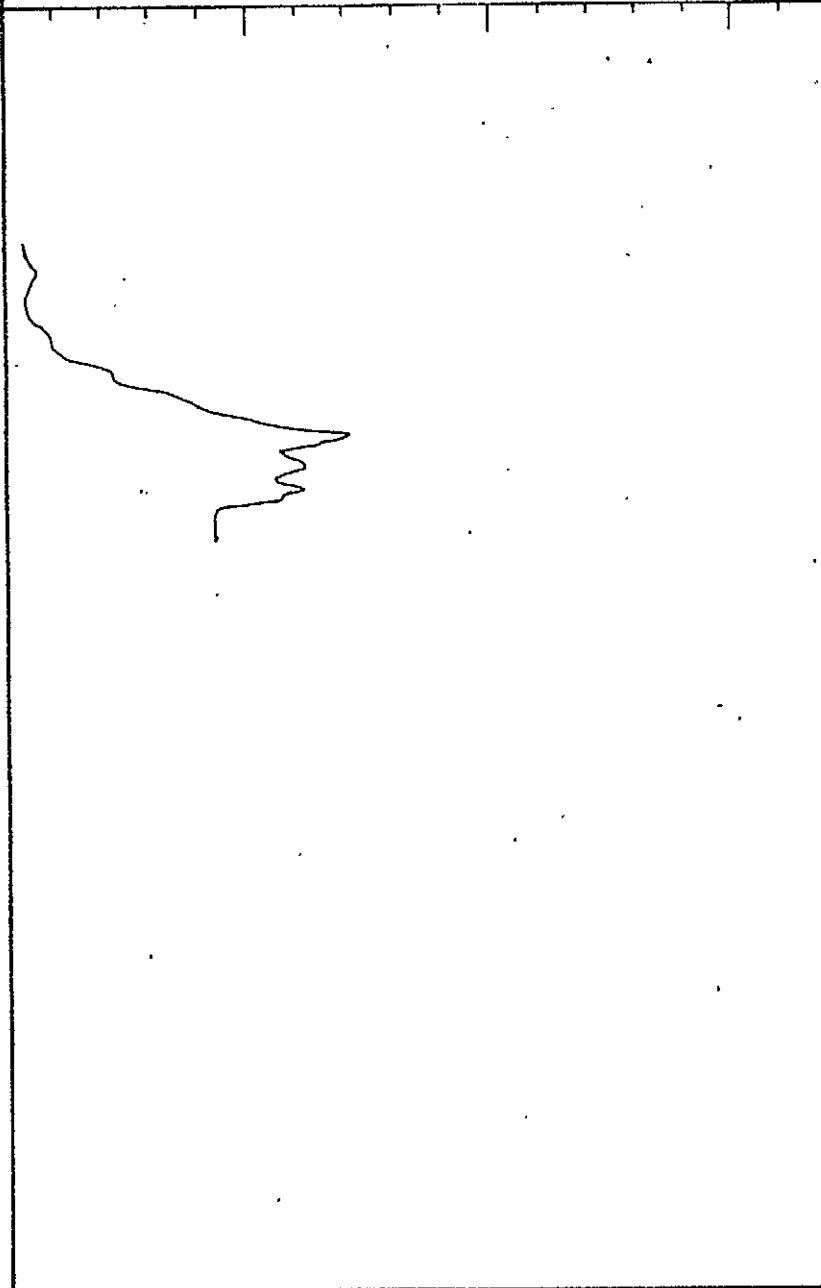
2.90



3.00

3.10

3.20

3.30



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B3	HOLE BWD. 76-5
	DTM

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

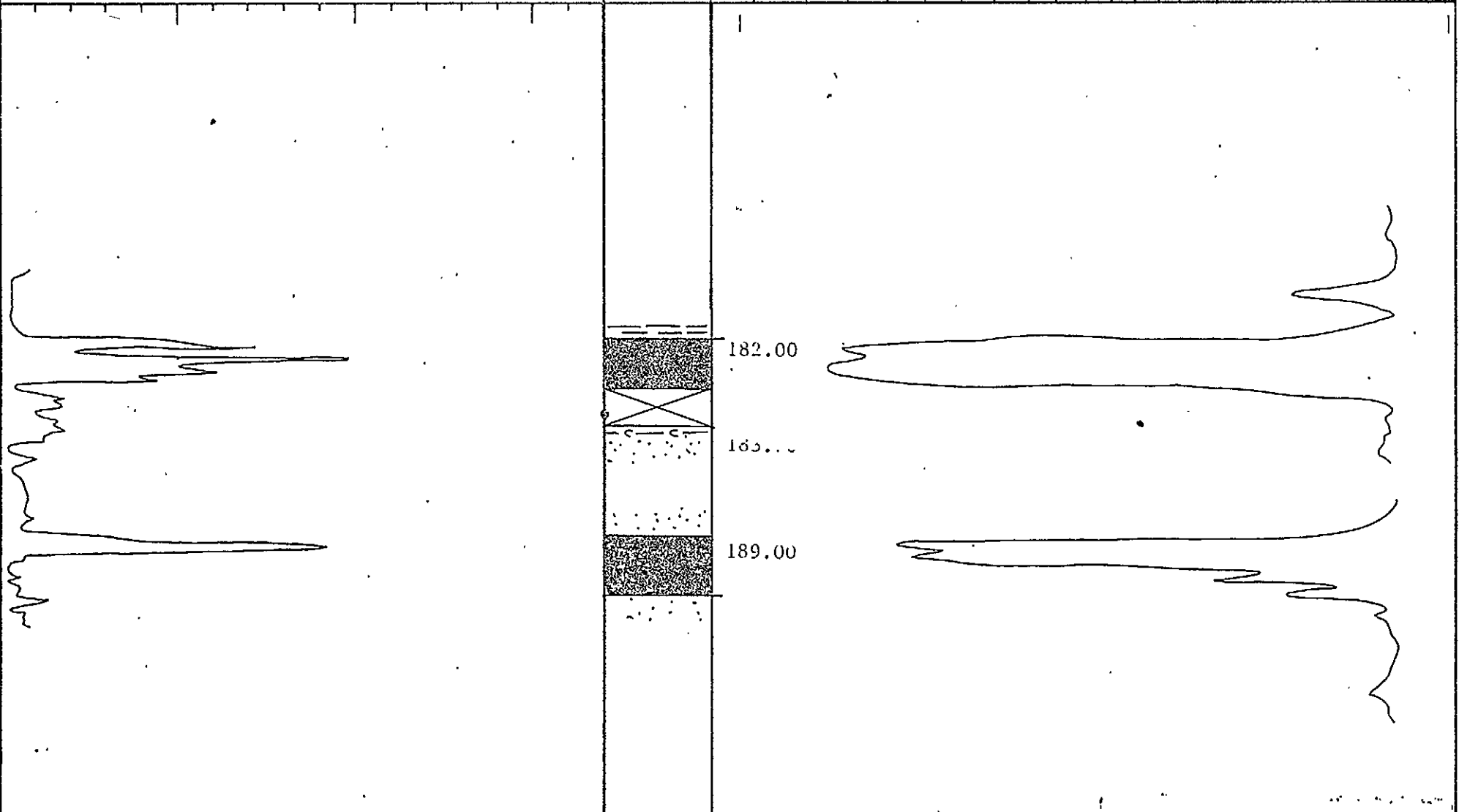
2.90

3.00

3.10

3.20



3.30



182.00

183.00

189.00

	PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT		WELL
SEAM SECTION 184		BWD: 76-5
		DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

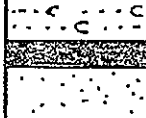
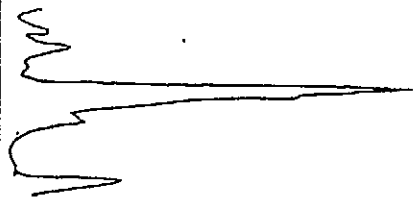
2.90

3.00

3.10

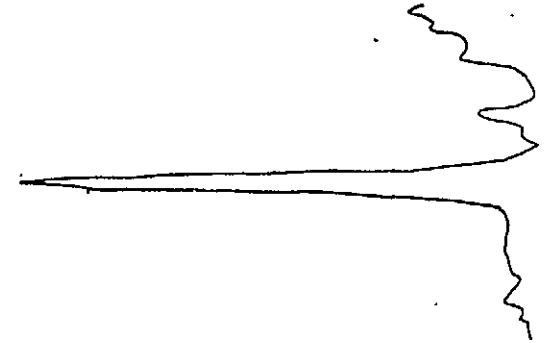
3.20



3.30

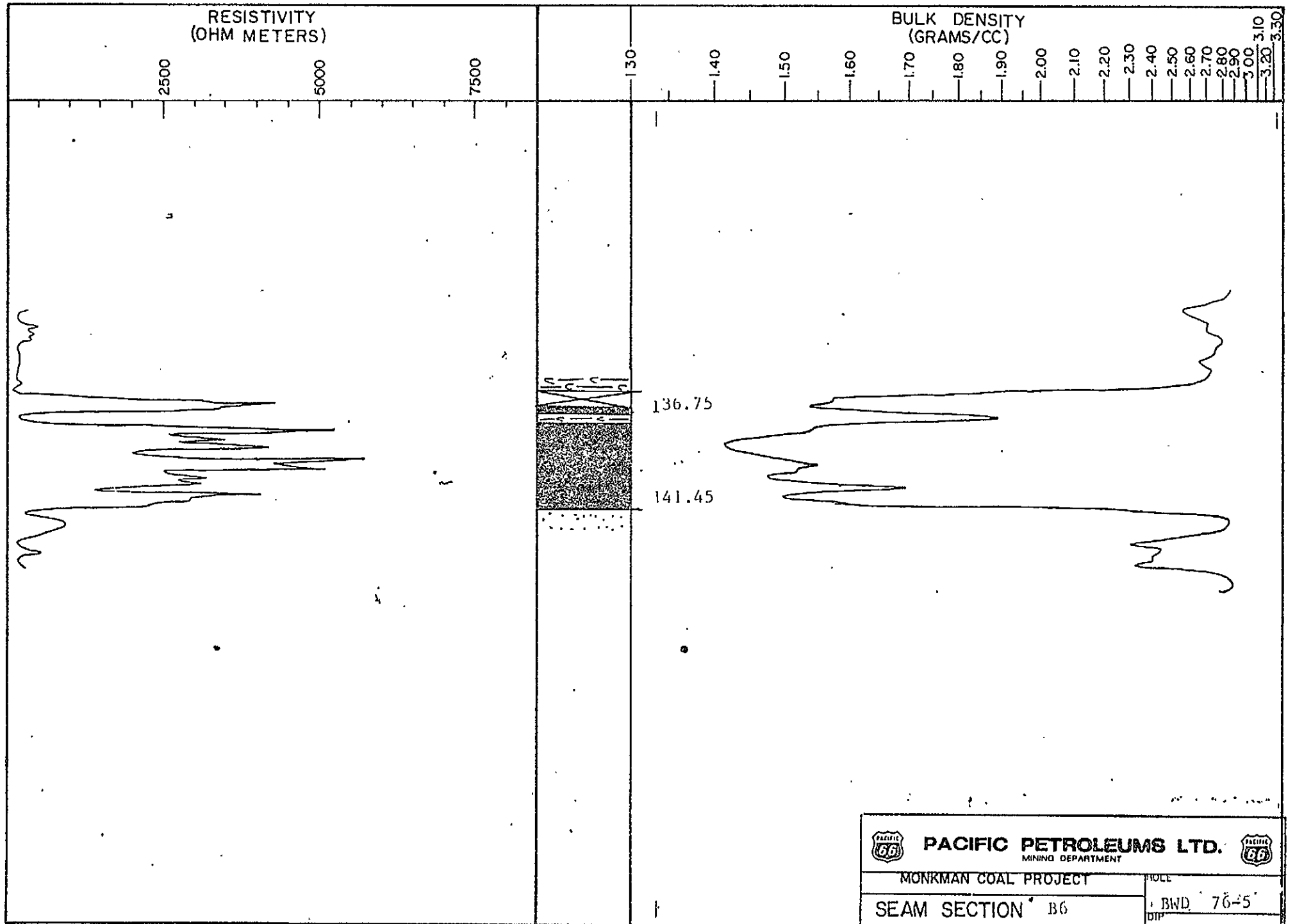




152.55

153.30



	PACIFIC PETROLEUMS LTD. MINING DEPARTMENT	
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B5		BWD 76-5
		DATE



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B6	
HOLE BWD 76-5 <small>DIP</small>	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

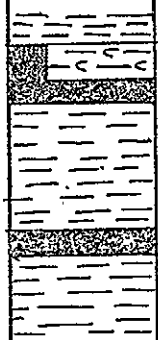
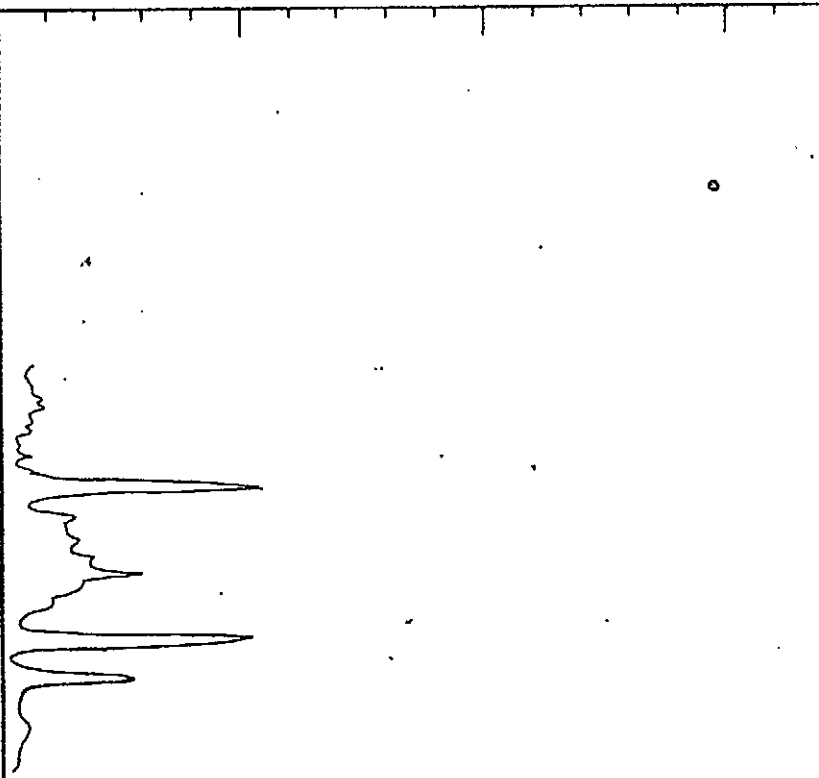
2.90

3.00

3.10

3.20

3.30

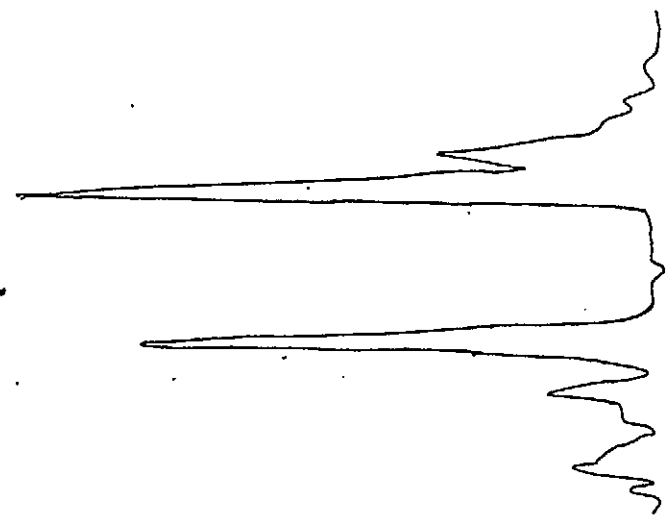


123.30

124.95

128.20

128.80



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

ROLL

SEAM SECTION B7 U.

BWD '76-5

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

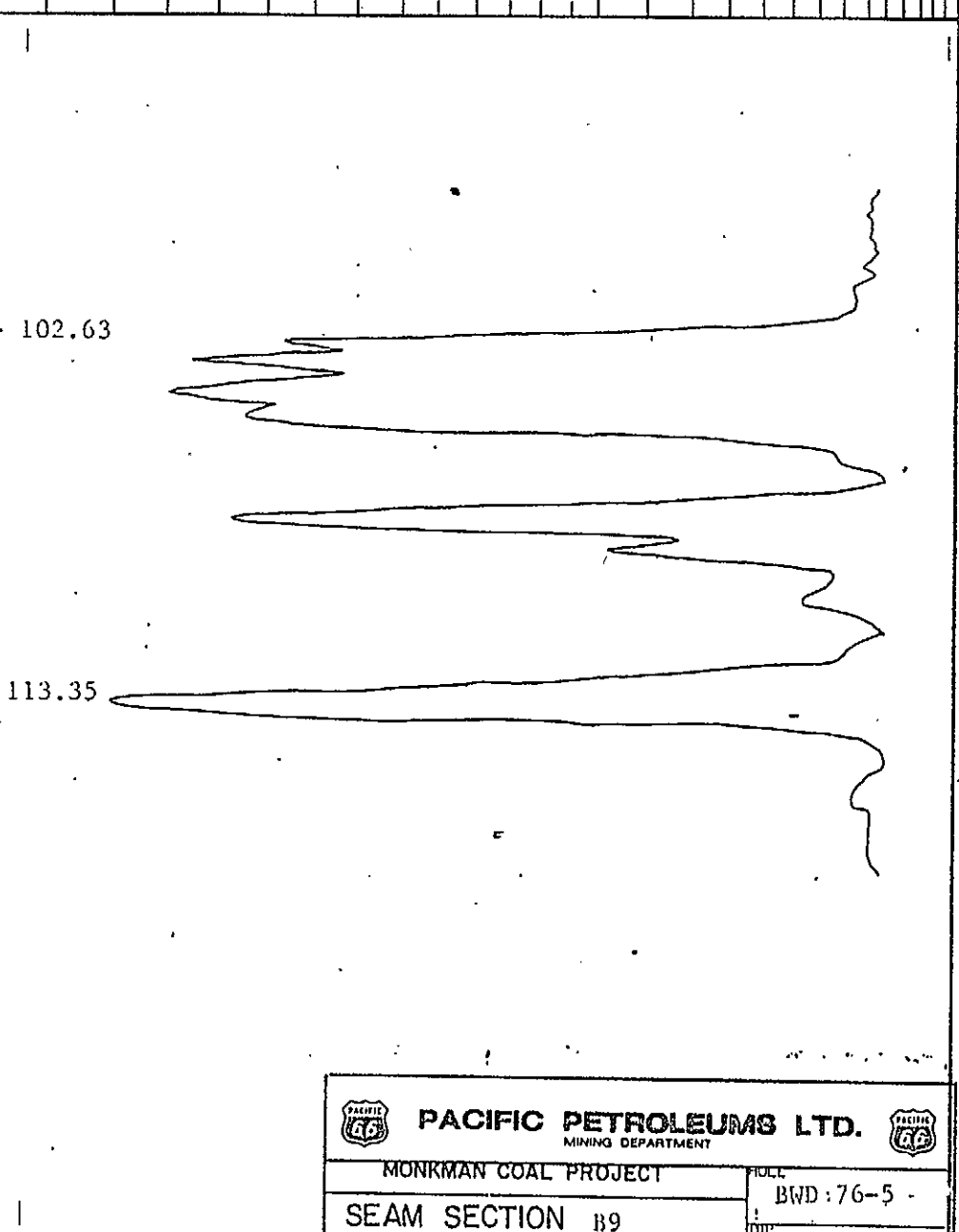
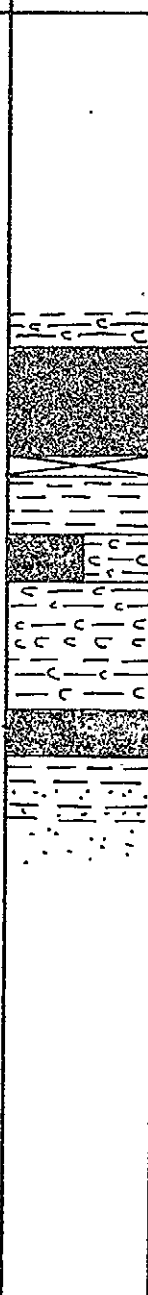
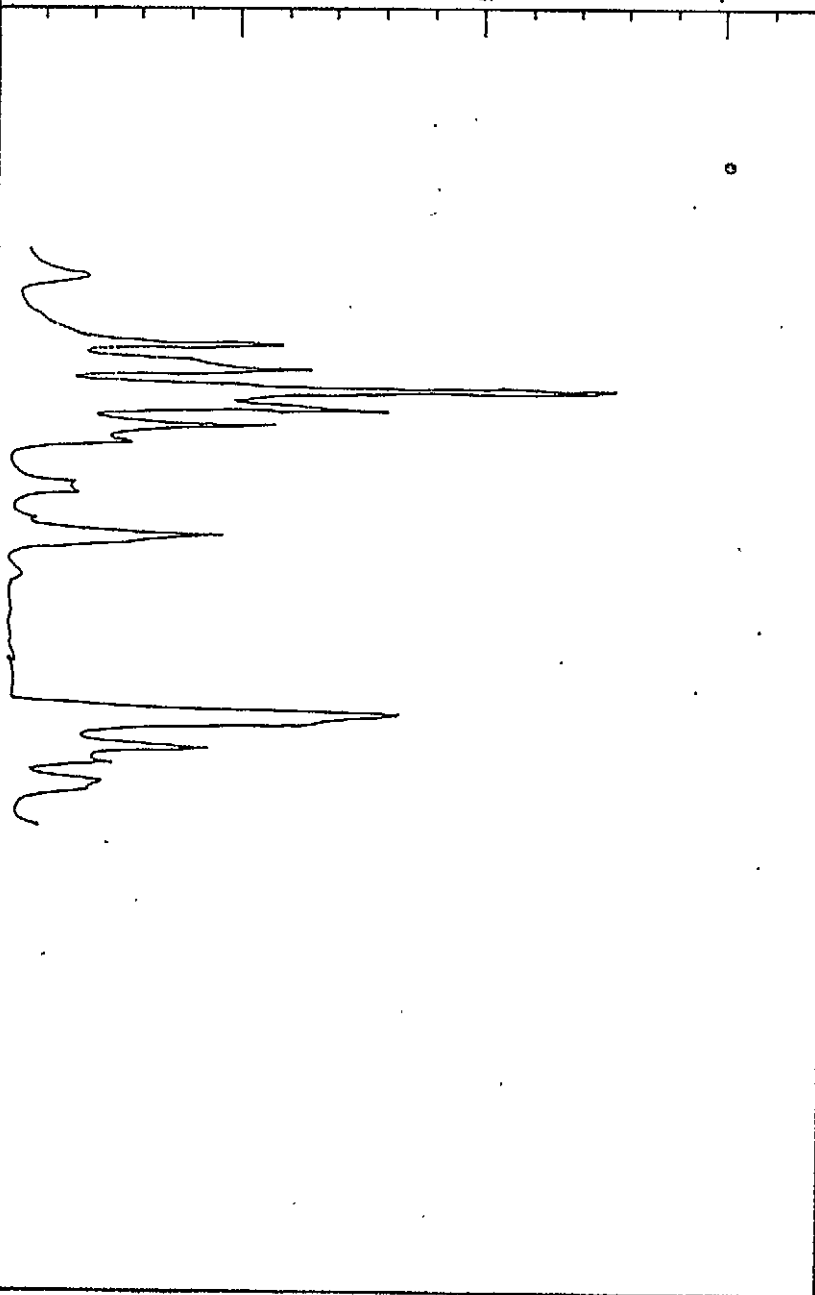
2.90

3.00

3.10



3.20

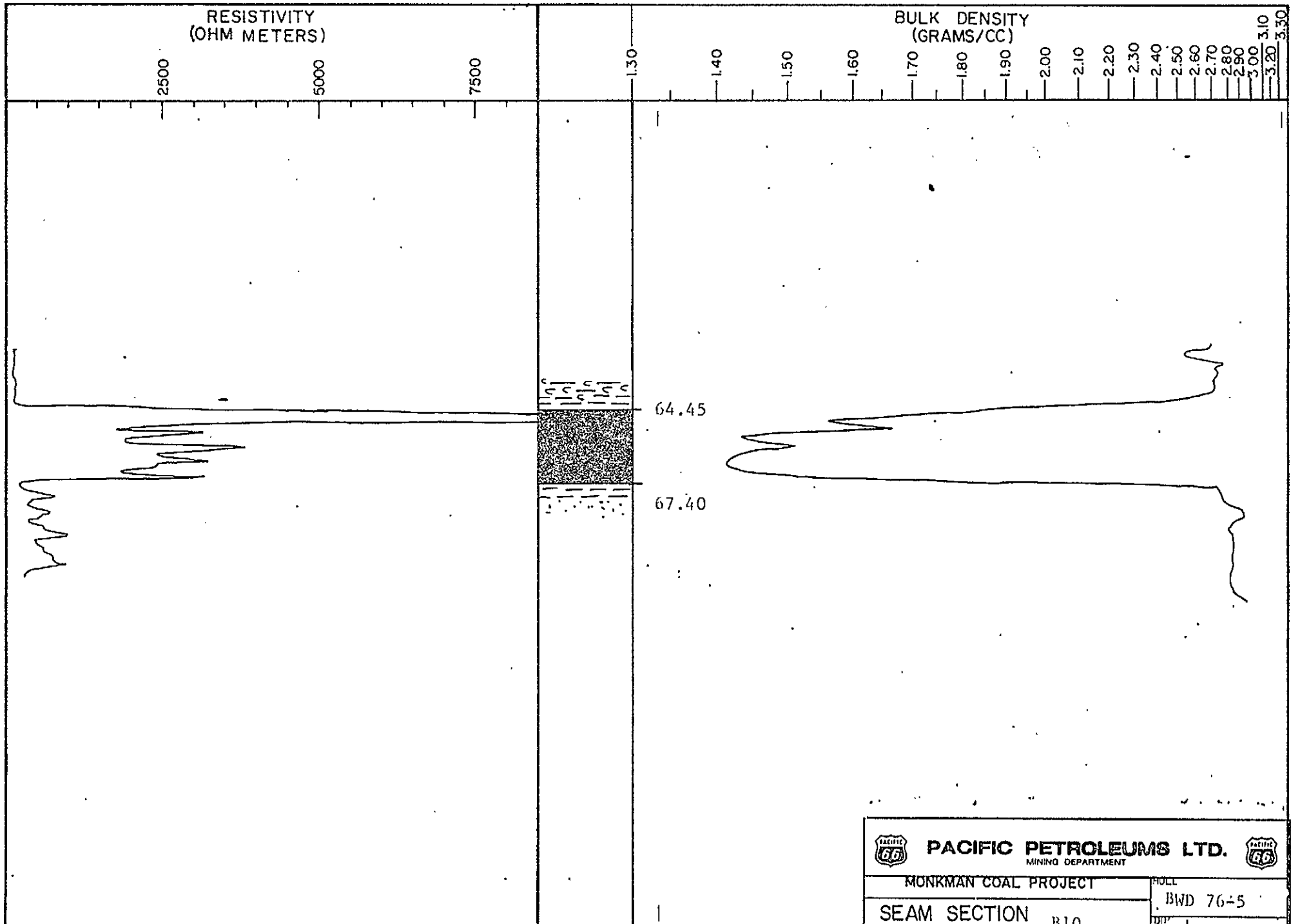
3.30





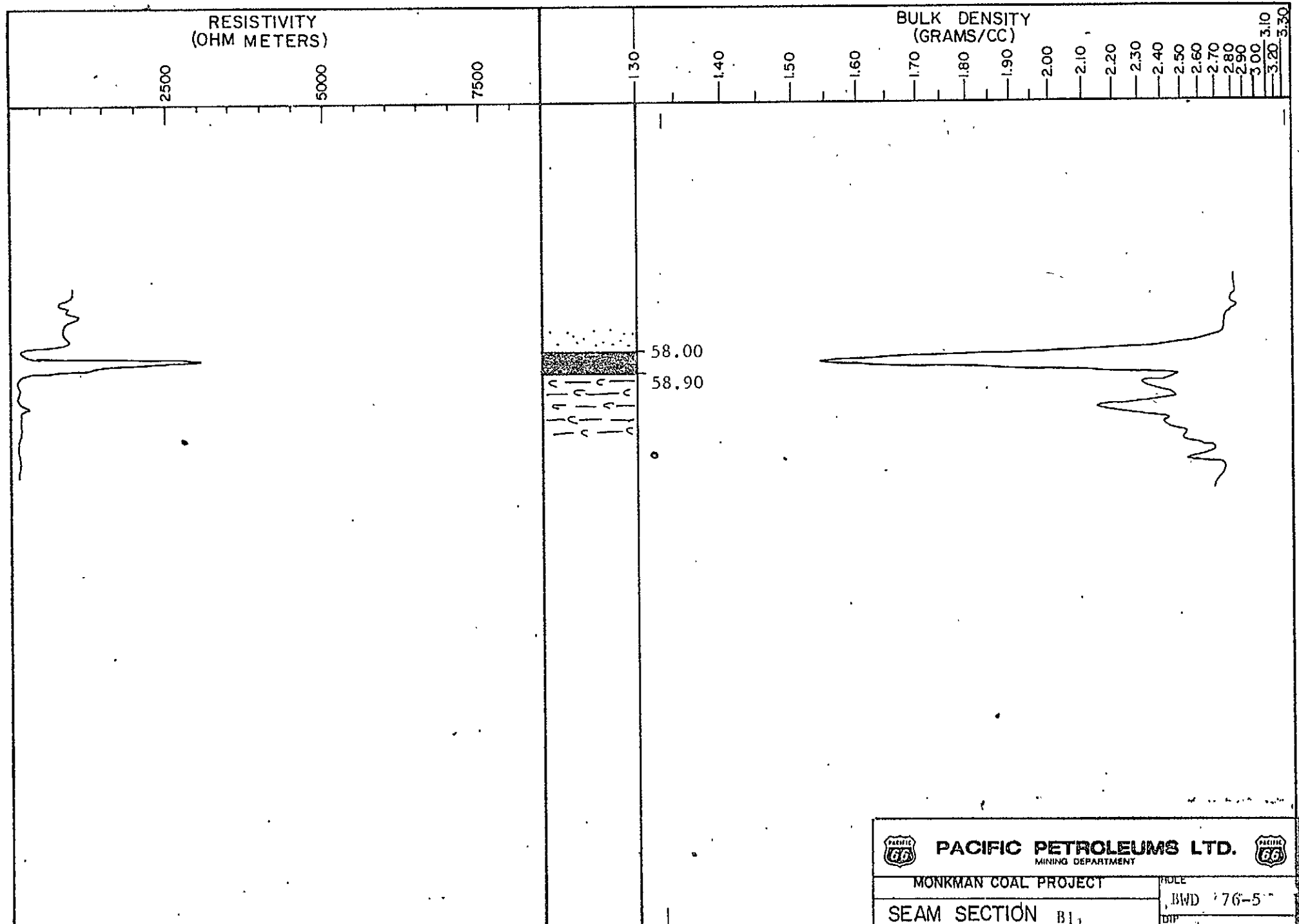
102.63

113.35

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B9	
BWD : 76-5	



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION	<small>ROLL</small> BWD 76-5
<small>B10</small>	<small>DIP</small>




RESISTIVITY
(OHM METERS)

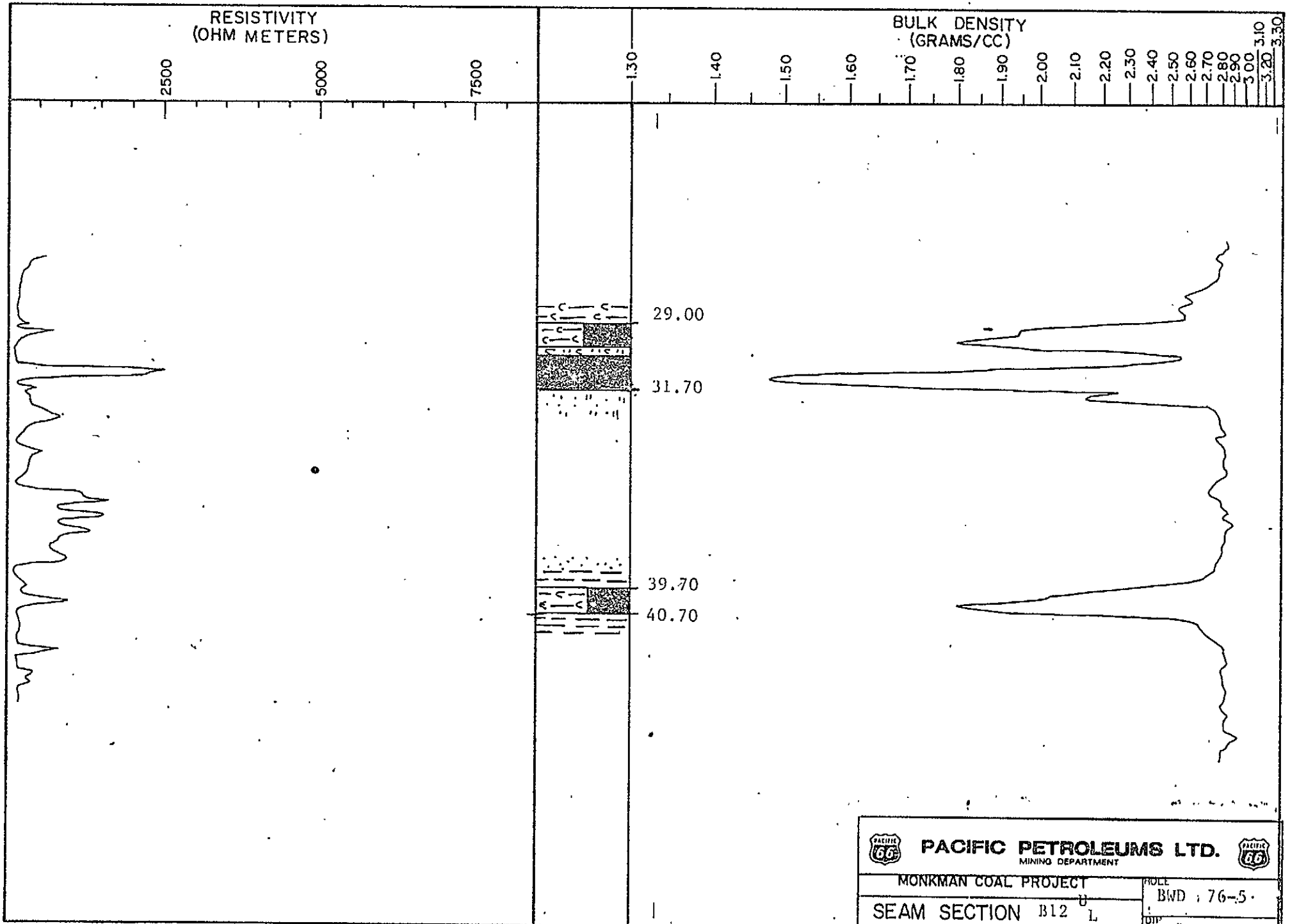
2500
5000
7500



BULK DENSITY
(GRAMS/CC)

1.30
1.40
1.50
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
2.40
2.50
2.60
2.70
2.80
2.90
3.00
3.10
3.20
3.30

58.00
58.90

 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE BWD 76-5
SEAM SECTION B1		DIP



	PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
	MONKMAN COAL PROJECT		
SEAM SECTION B12 L		HOLE BWD : 76-5	DATE

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

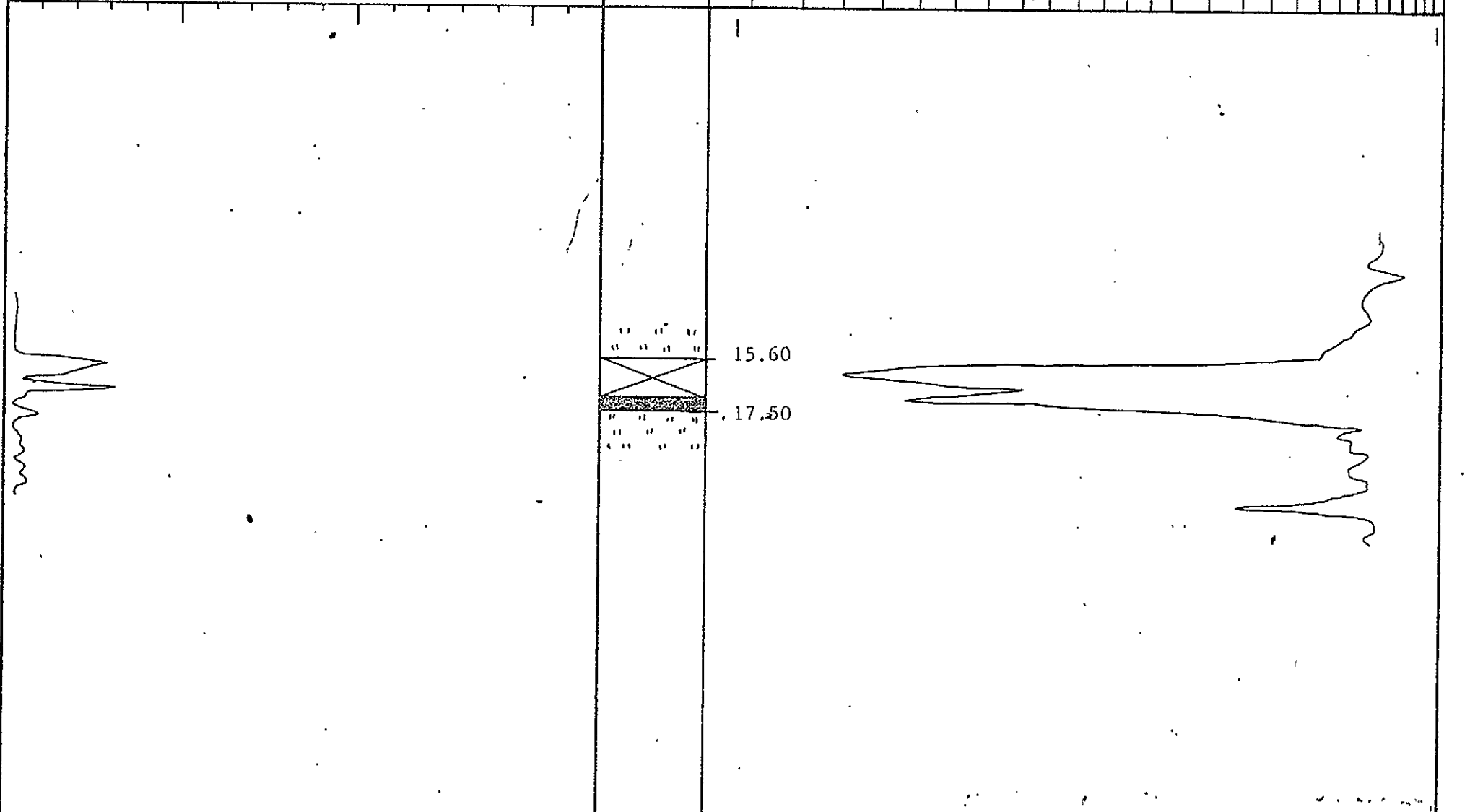
2.80



2.90

3.00

3.10

3.30



 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE
SEAM SECTION B13	BWD 767-5
	DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

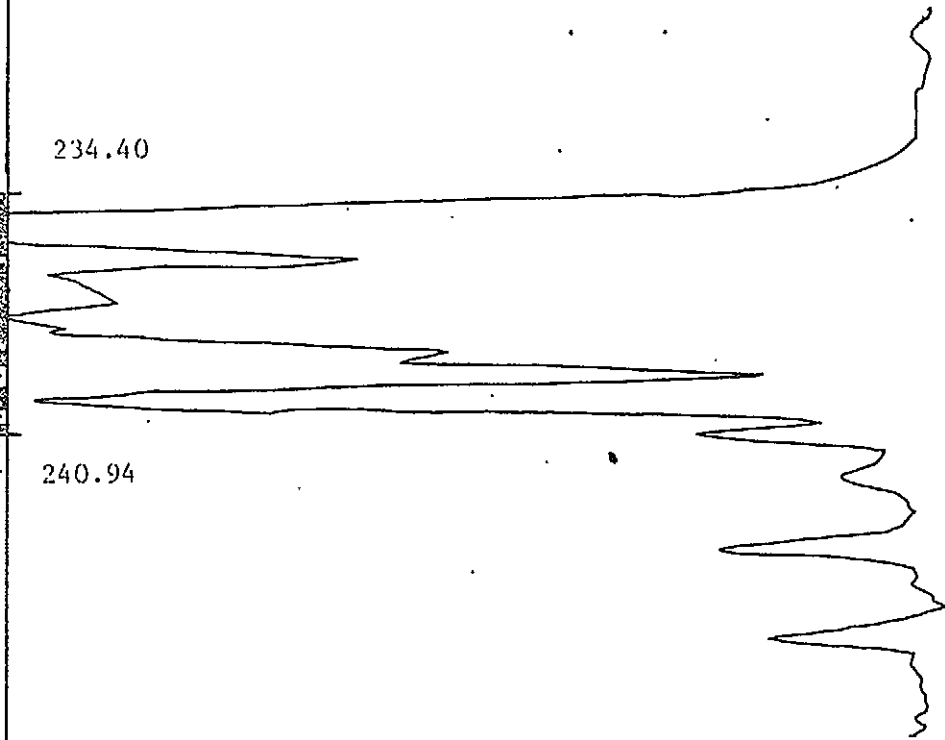
3.20

3.30



234.40

240.94



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE

SEAM SECTION B1

MOD 76-6

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00



3.10

3.20

3.30

210.40

212.50

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B2	HOLE MOD. 76-6
	DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30



197.60

202.60



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

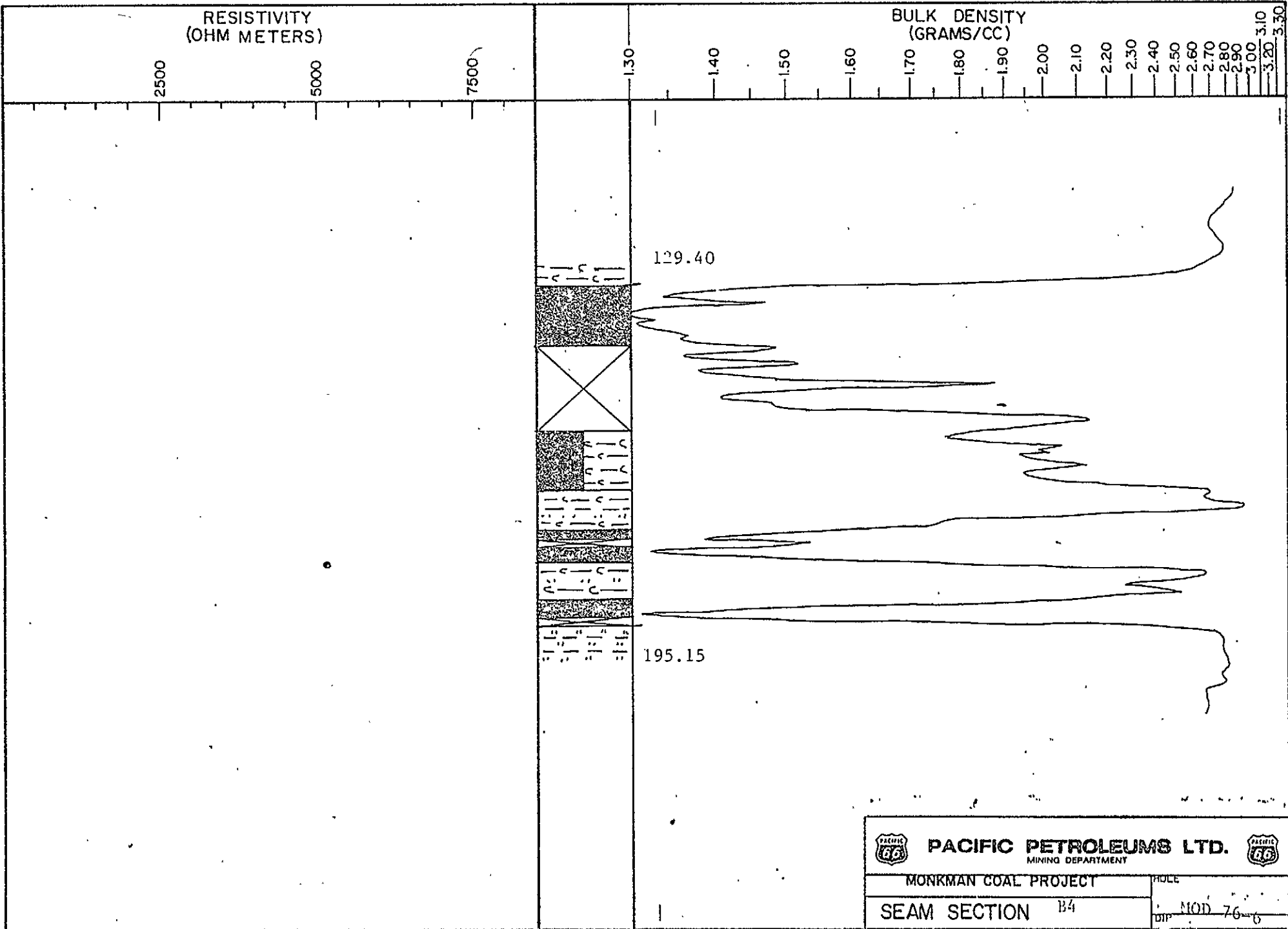




MONKMAN COAL PROJECT

HOLE

SEAM SECTION B3

MOD 76-6



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B4	
<small>HOLE</small>	<small>MOD 76-6</small>
<small>DIP</small>	<small>6</small>

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

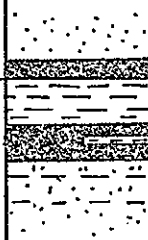
2.90

3.00

3.10

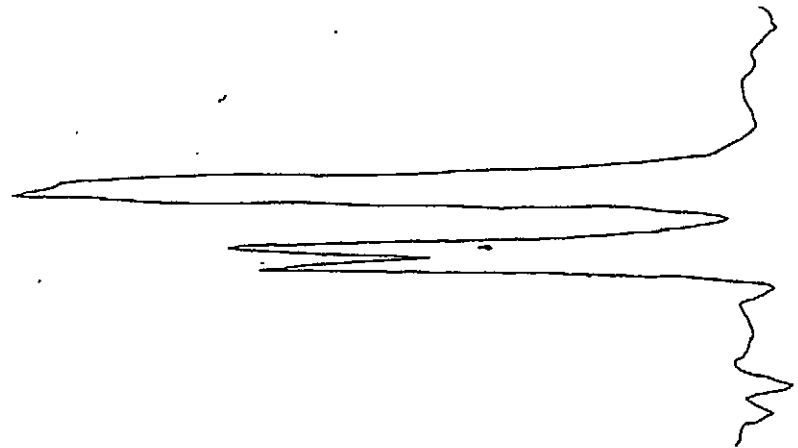
3.20

3.30



132.45

135.50



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

WELL

SEAM SECTION B5

MOD 76-6
DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

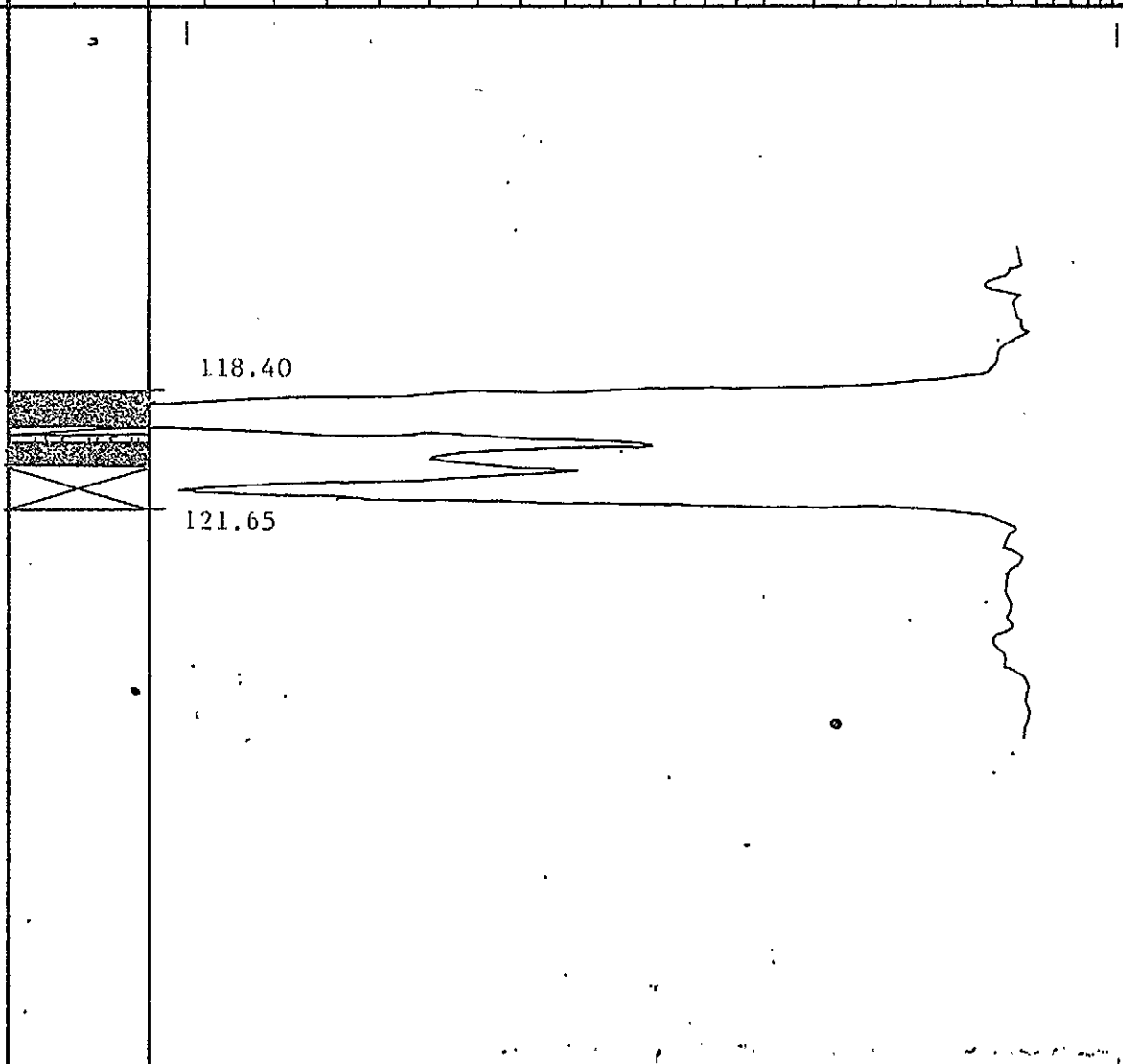
2.90



3.00

3.10

3.20

3.30



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT 	
MONKMAN COAL PROJECT	HOLE
SEAM SECTION B7	MoD' 76-6
	DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

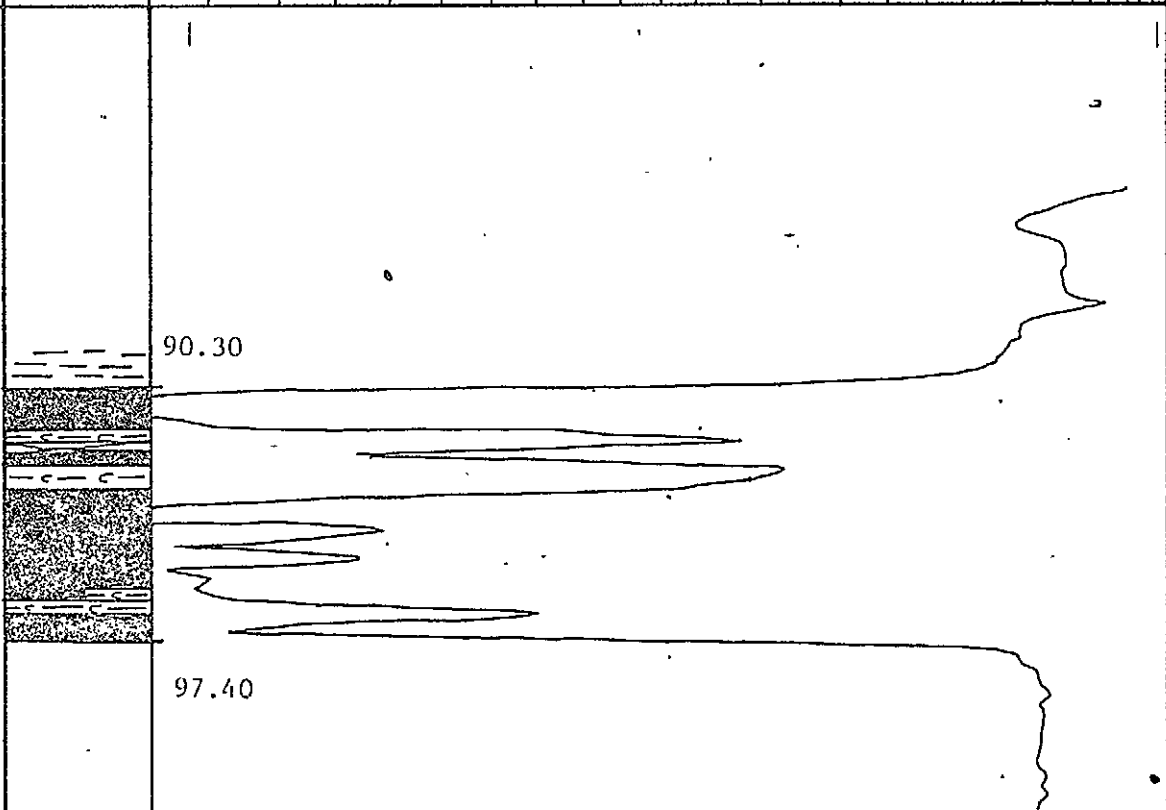
2.90

3.00

3.10

3.20

3.30



90.30

97.40



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

NO. 1

SEAM SECTION B9

MOD 76-6

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

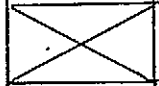
2.90

3.00

3.10

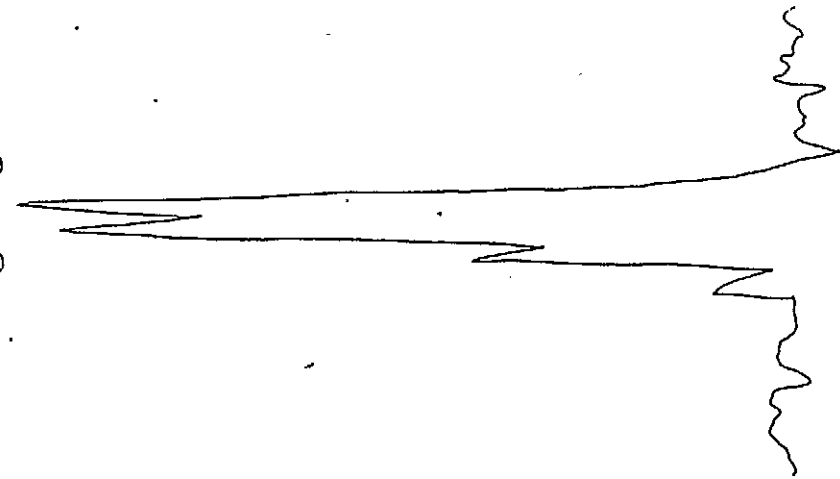
3.20

3.30



70.50

72.50



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE

MOD: 76-6

SEAM SECTION B10

DATE

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30



32.60

34.70



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

WELL

SEAM SECTION

B 12

MOD '76-6'

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

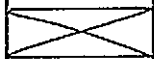
2.90

3.00

3.10

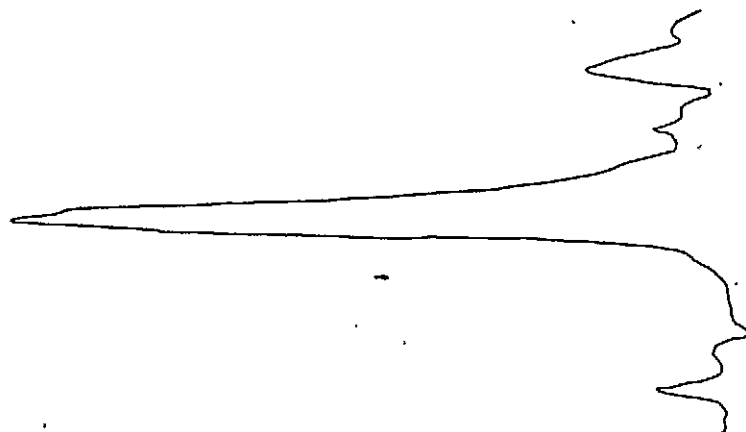
3.20

3.30



23.90

25.15



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



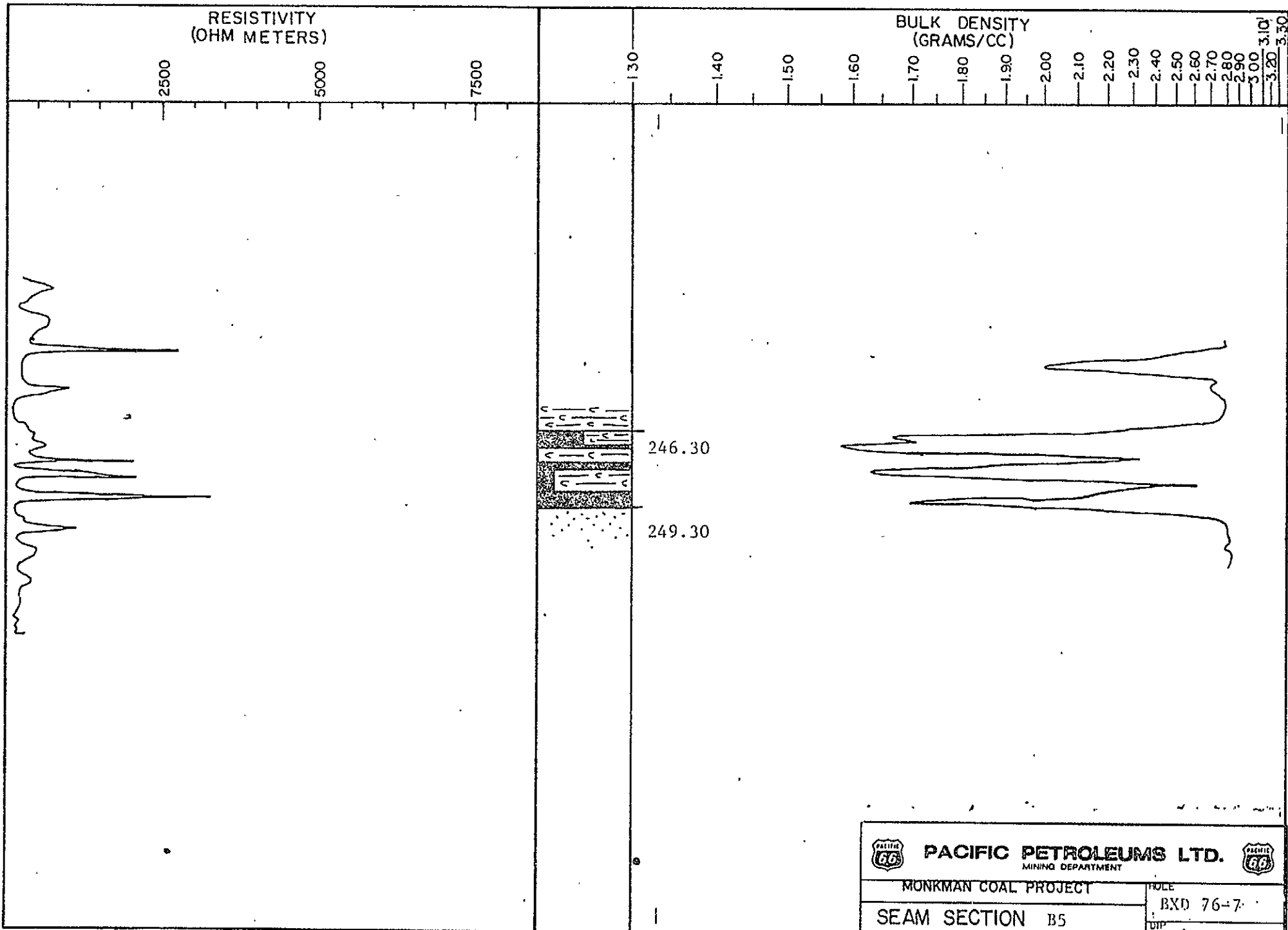
MONKMAN COAL PROJECT

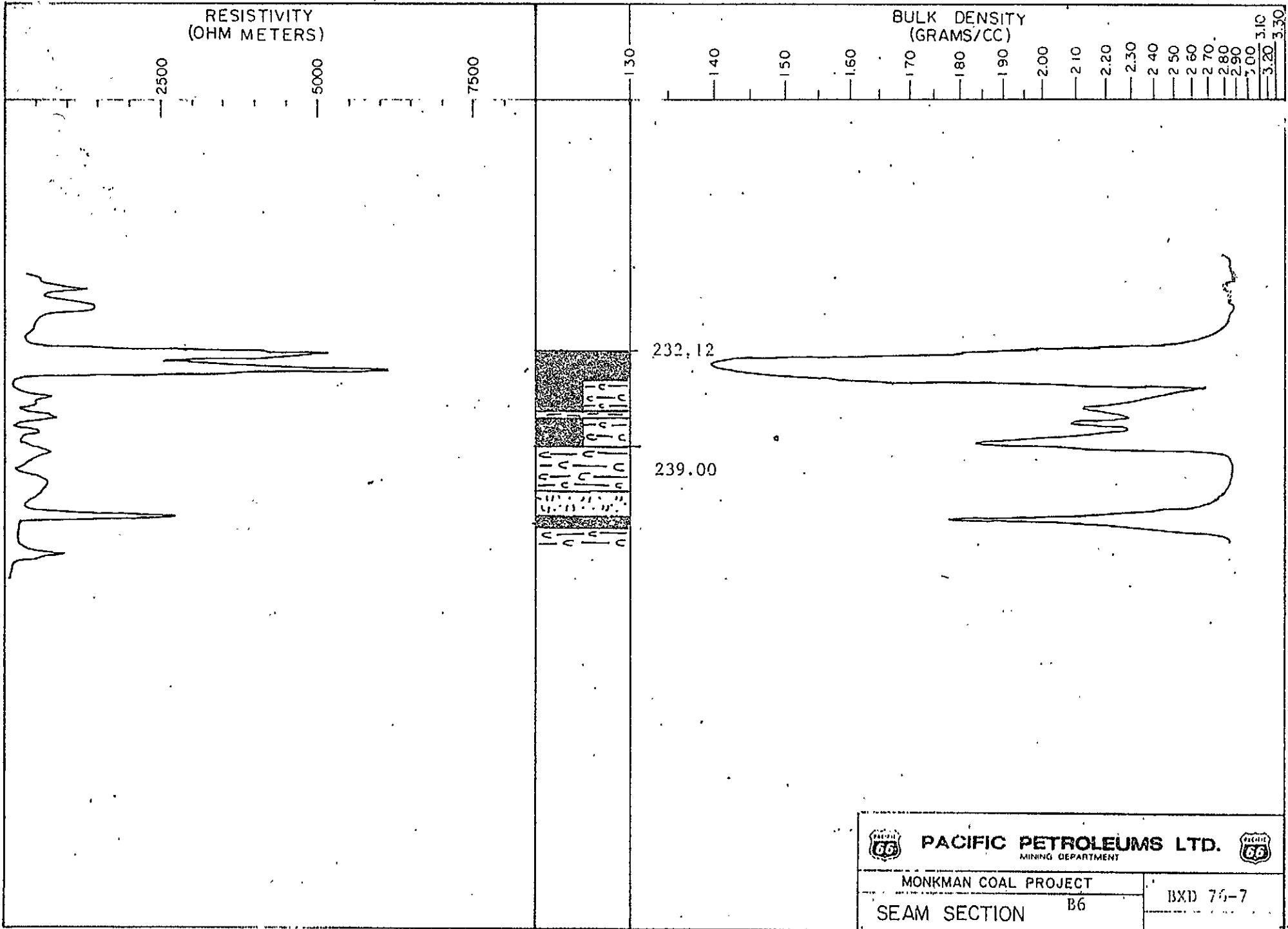
HOLE



SEAM SECTION B 13

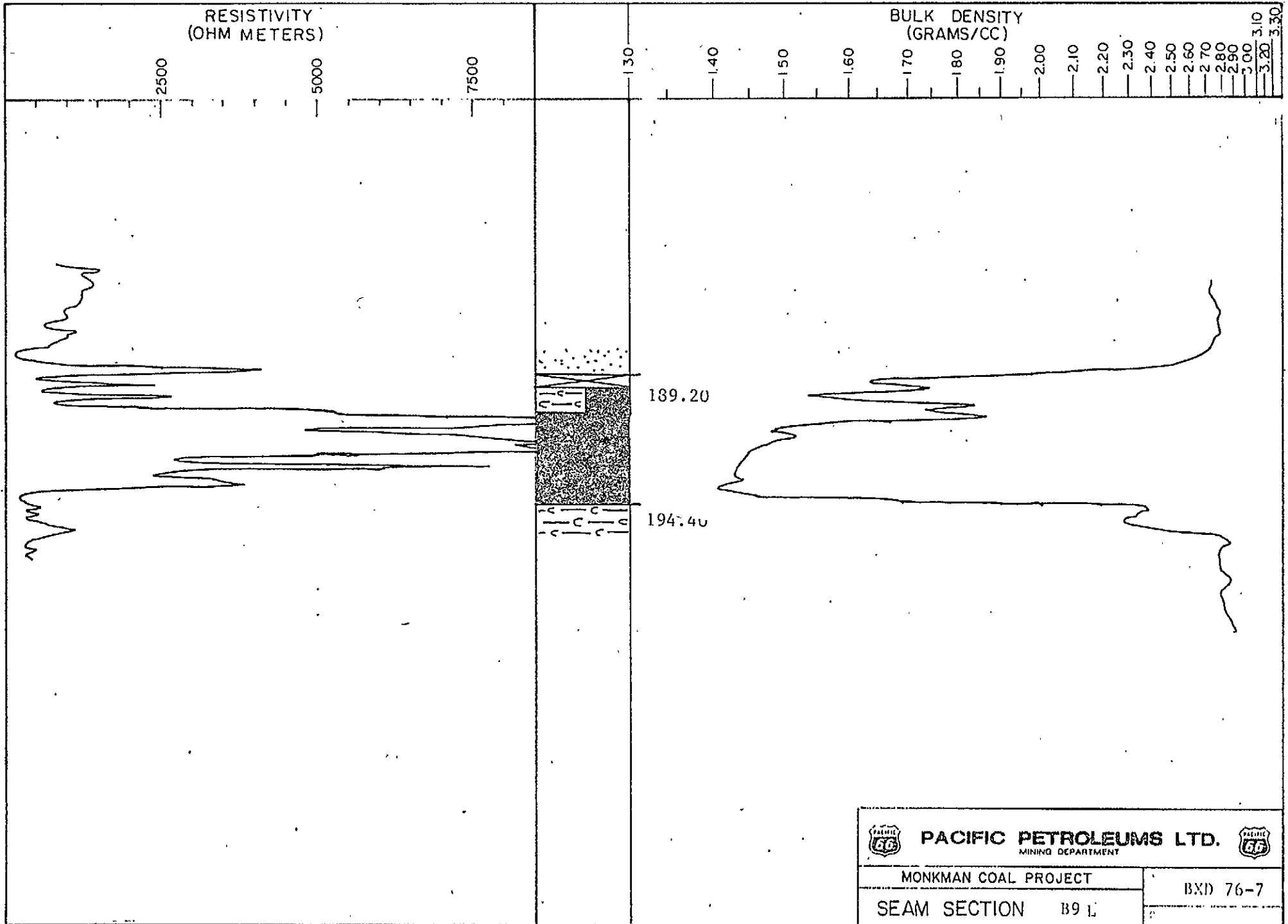
MOD '76-6

DIP





 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION	B6
BXD 76-7	

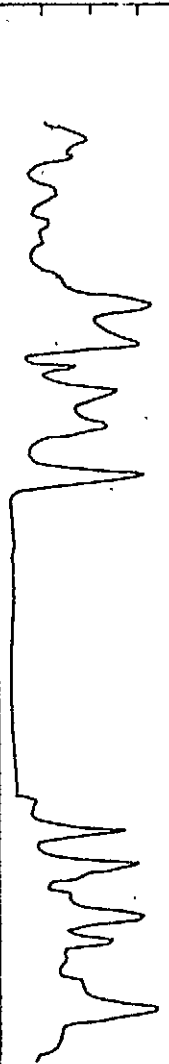


RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

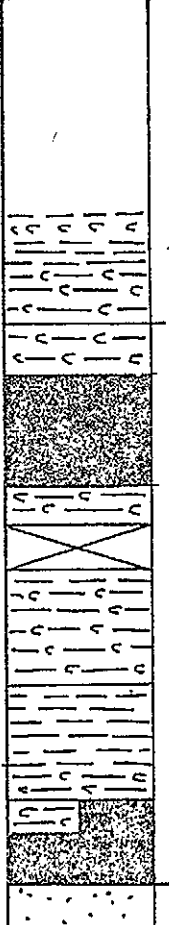
3.00

3.10

3.20

3.30

130

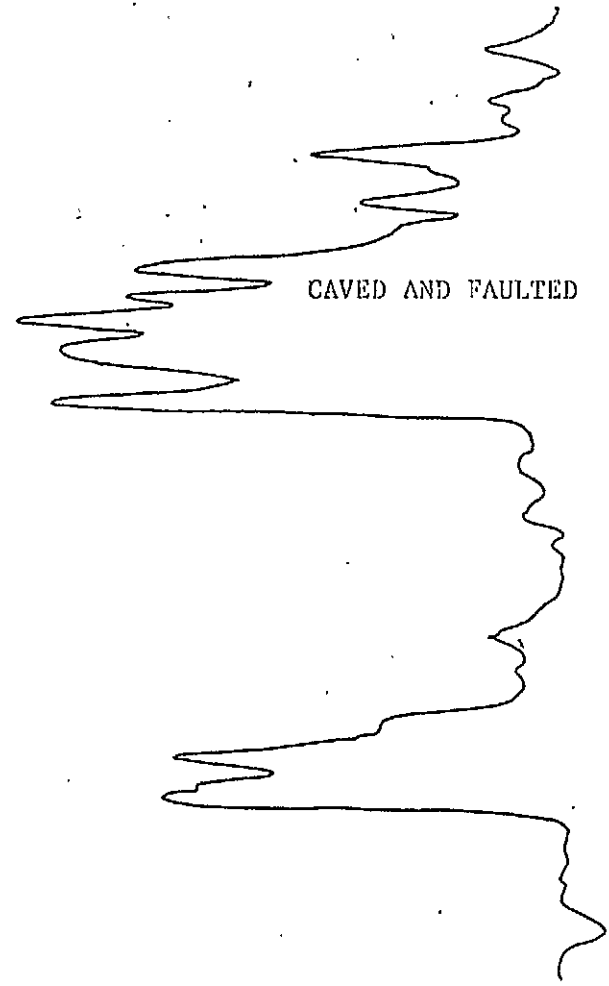


103.60



107.78

115.95

118.15



CAVED AND FAULTED

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION	B9 U
BXD 76-7	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

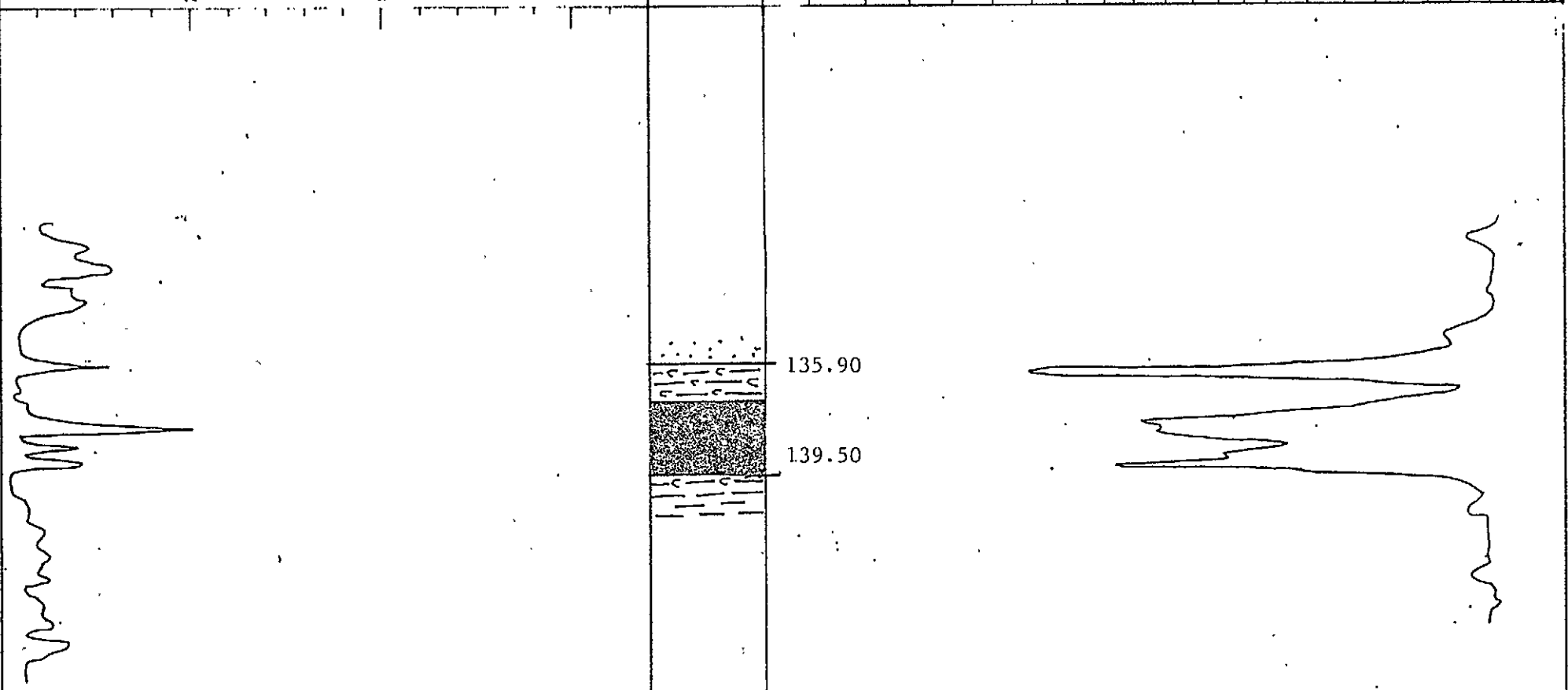
2.90

3.00

3.10

3.20

3.30



135.90

139.50



PACIFIC PETROLEUMS LTD.

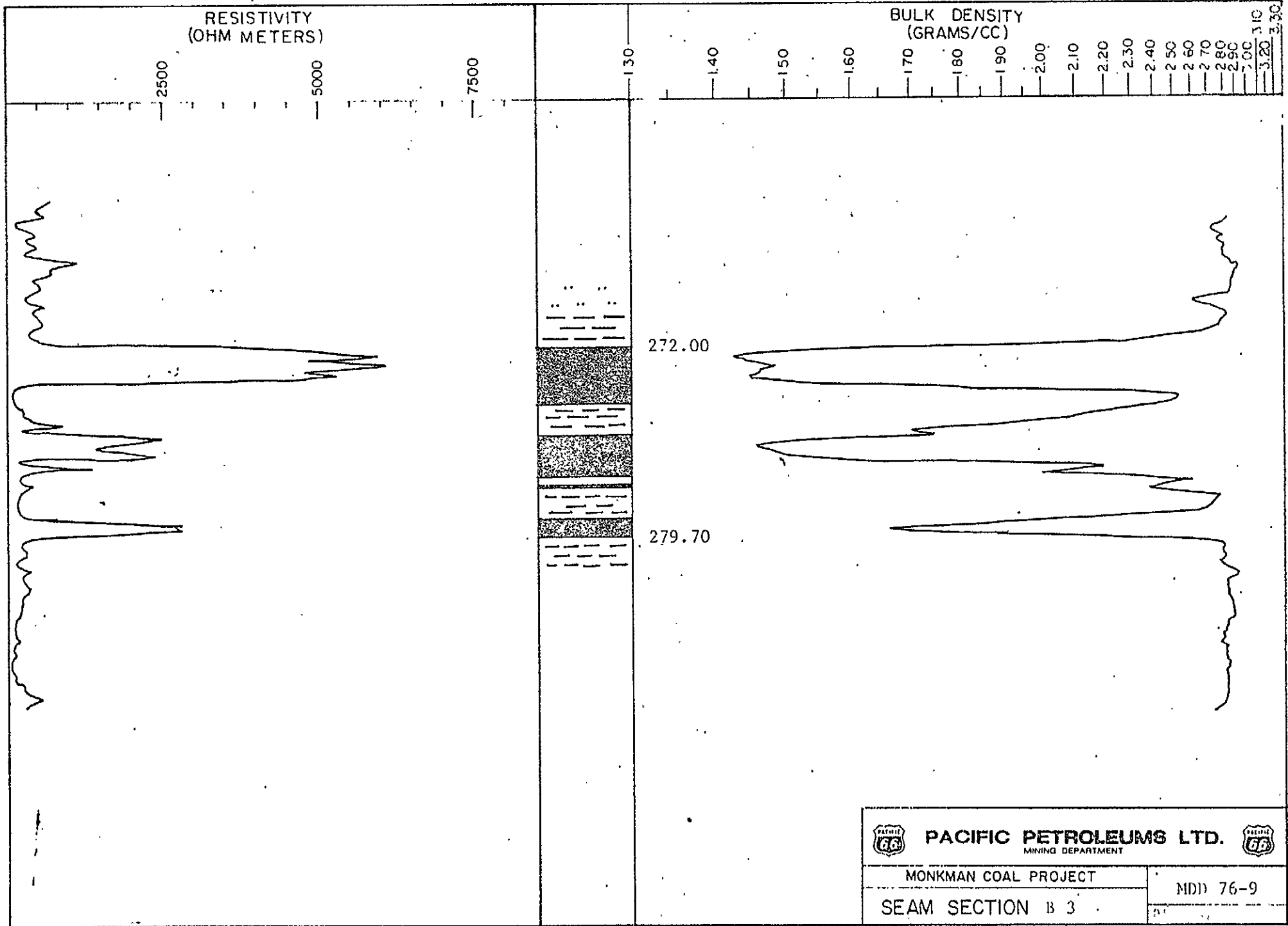
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B10

BXD 76-7



RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

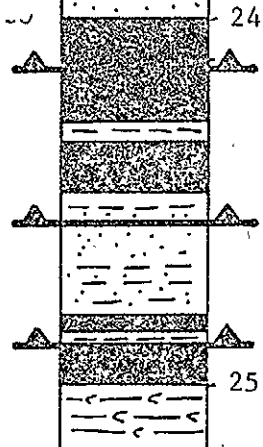
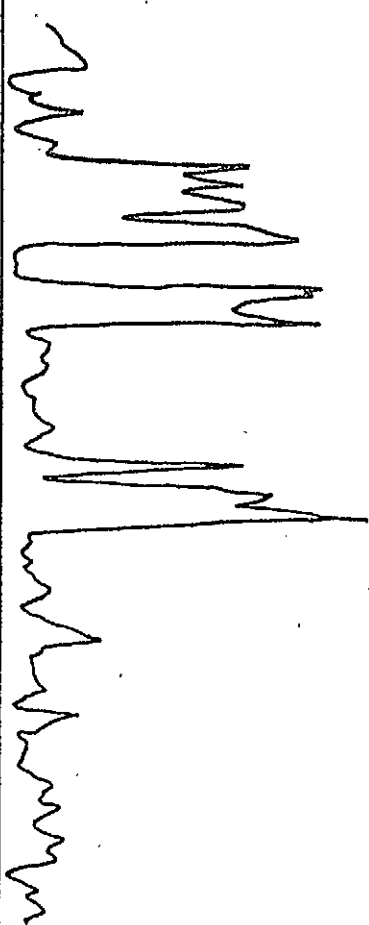
2.90

3.00

3.10

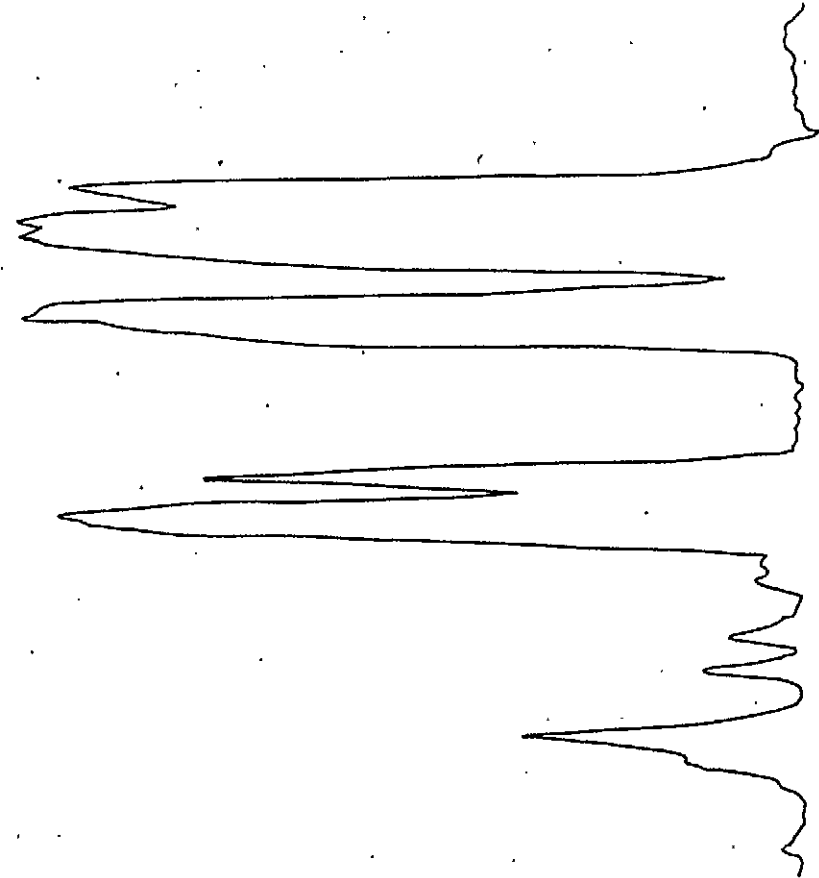
3.20

3.30



248.60

258.10



PACIFIC PETROLEUMS LTD.



Mining Department

MONKMAN COAL PROJECT

SEAM SECTION B 4

MDD 76-9

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

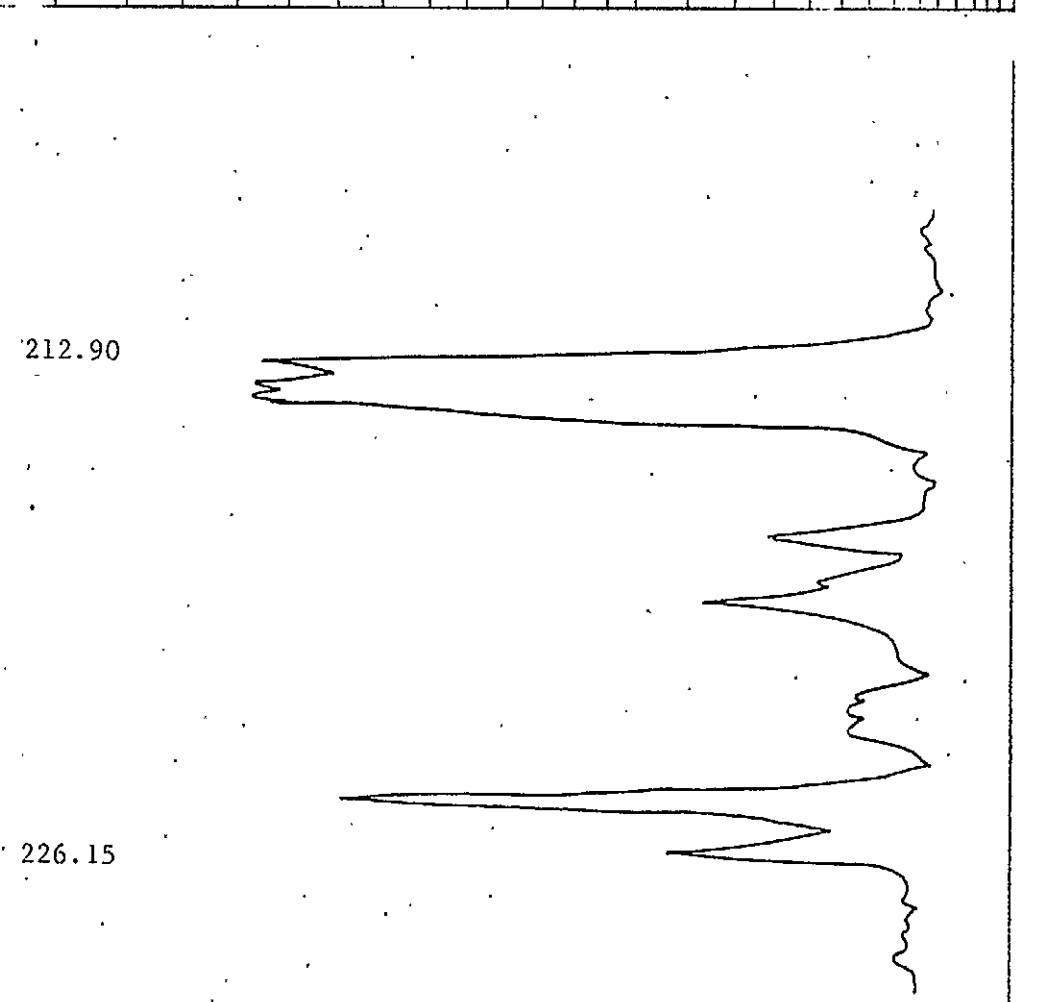
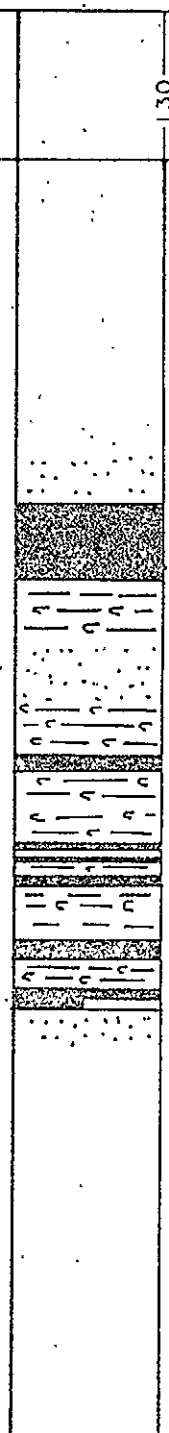
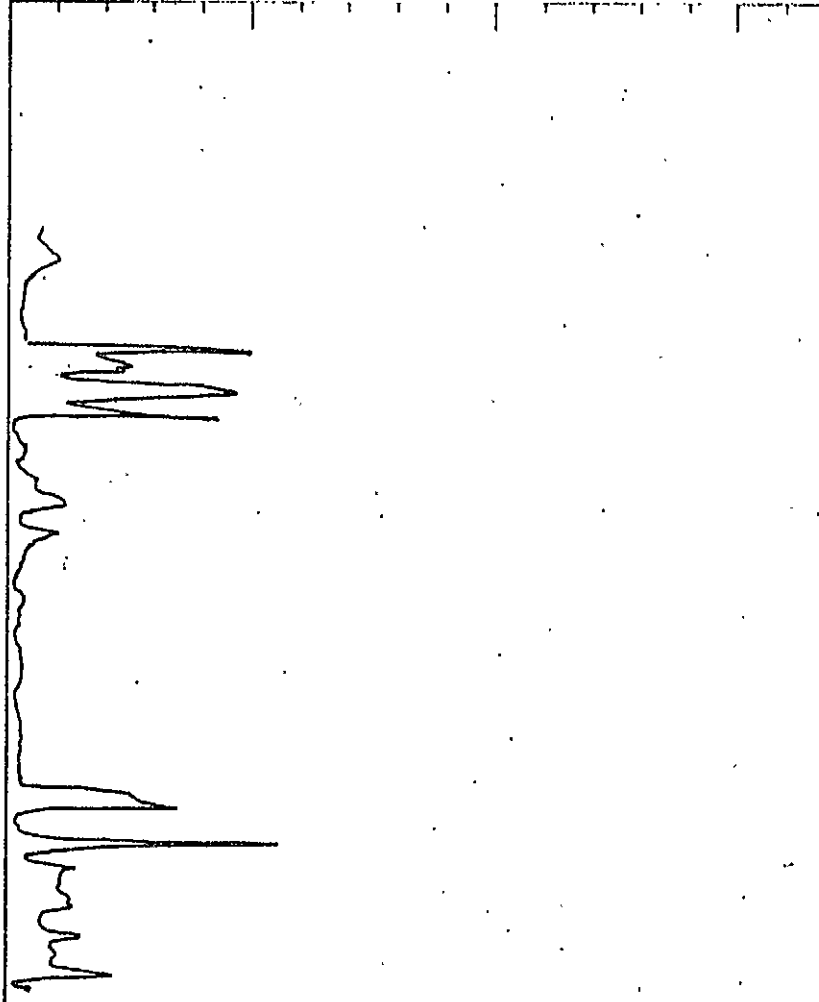
2.90



3.00

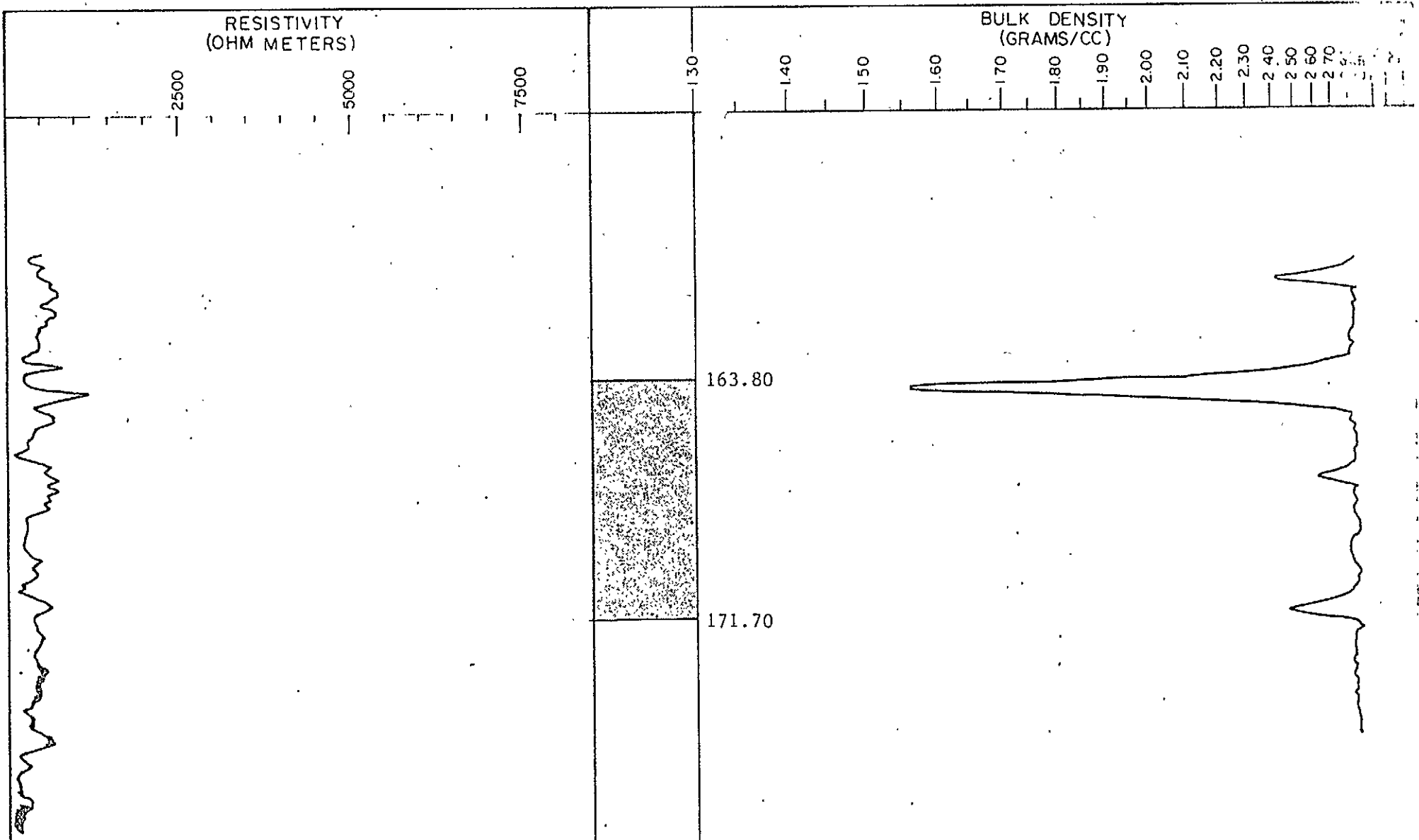
3.10



3.20

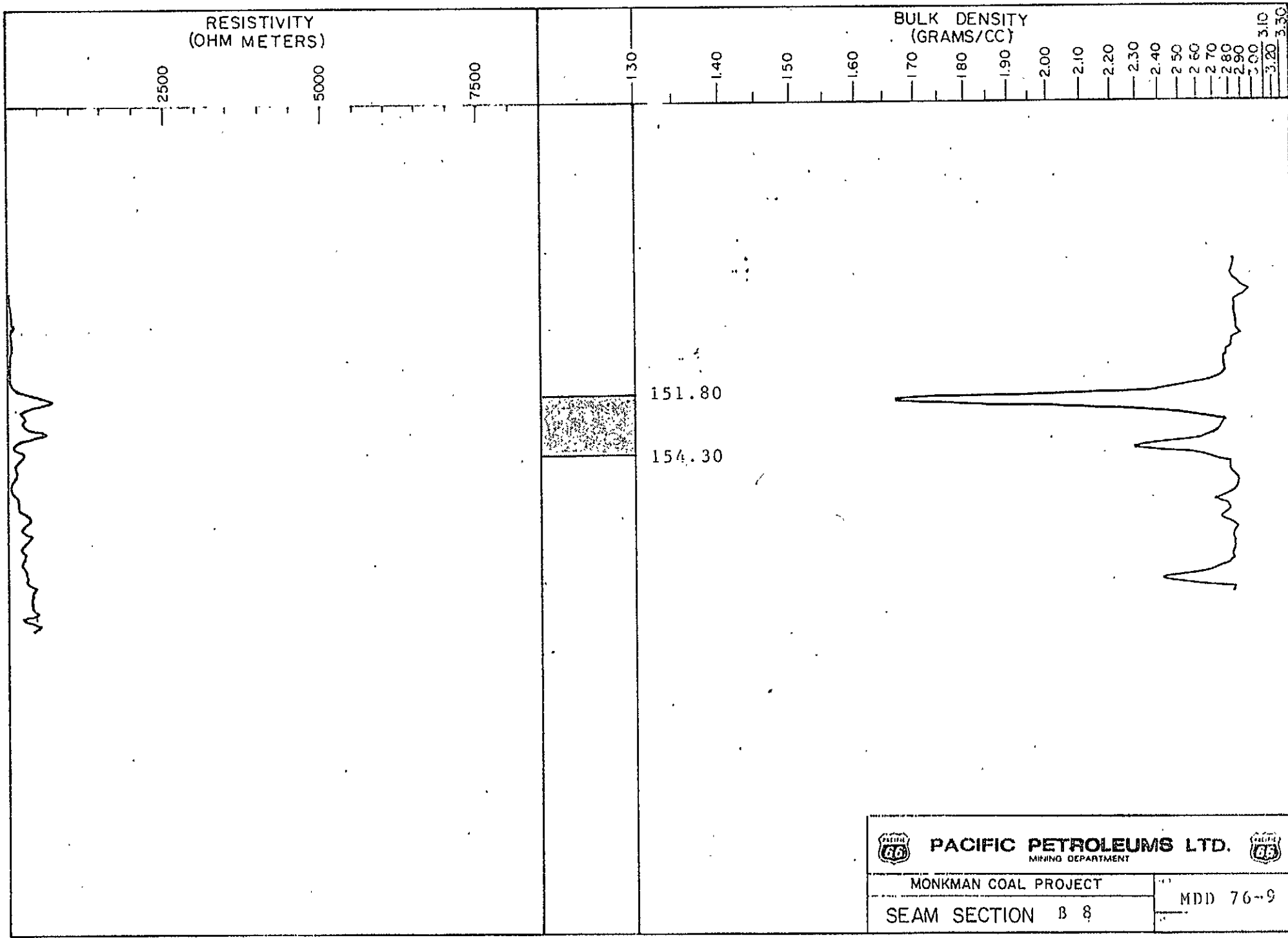
3.30





 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 6	MDD 76-9



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MDD 76-9
SEAM SECTION B 7		D



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B 8	MDD 76-9

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

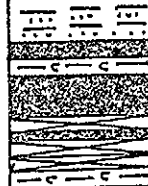
2.90

3.00

3.10

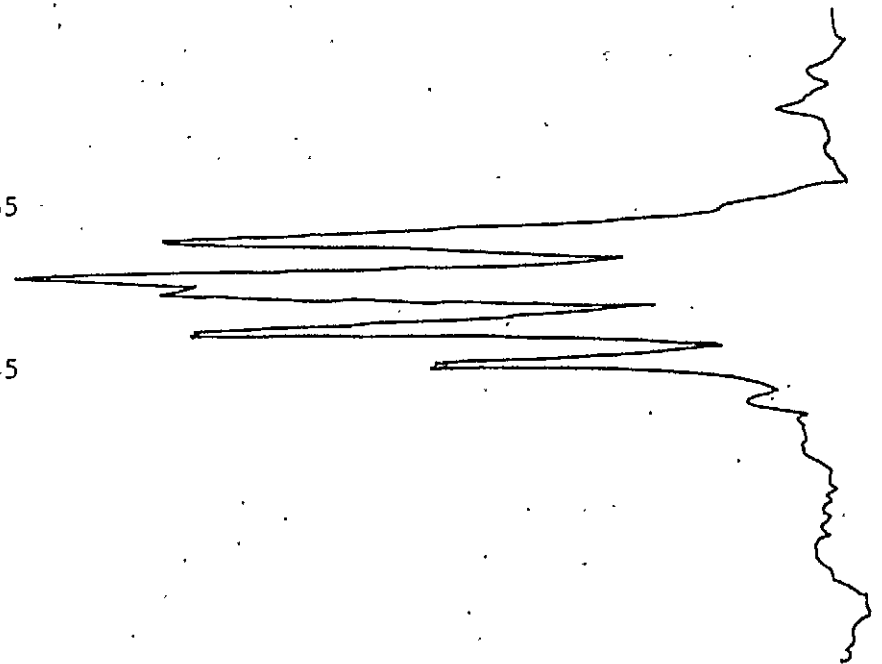
3.20

3.30



235.65

239.45



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 1

MDD 76-11

18

RESISTIVITY
(OHM METERS)

— 2500

— 5000

— 7500

BULK DENSITY
(GRAMS/CC)

— 140

— 150

— 160

— 170

— 180

— 190

— 200

— 210

— 220

— 230

— 240

— 250

— 260

— 270

— 280

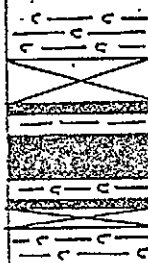
— 290

— 300

— 310

— 320

— 330



198.05

202.37



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 3

MDD 76-11

13

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

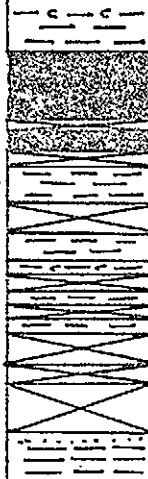
290

300

310

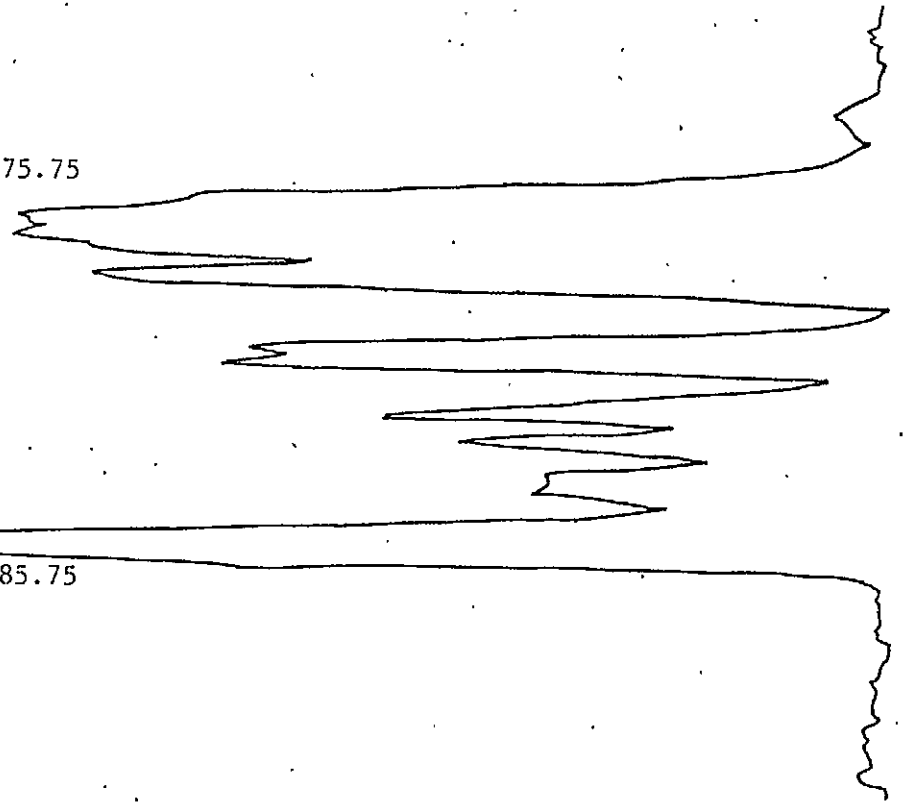
320

330



175.75

185.75



PACIFIC PETROLEUMS LTD.



MONKMAN COAL PROJECT

SEAM SECTION B 4

MDD 76-11

16

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10



3.20

3.30

130

127.60

130.60

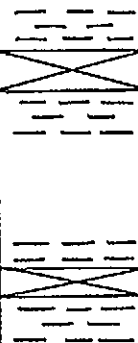
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT 	
MONKMAN COAL PROJECT	MDD 76-11
SEAM SECTION B 5	15

RESISTIVITY
(OHM METERS)

2500

5000

7500



130

103.65

104.55

109.30

110.00

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

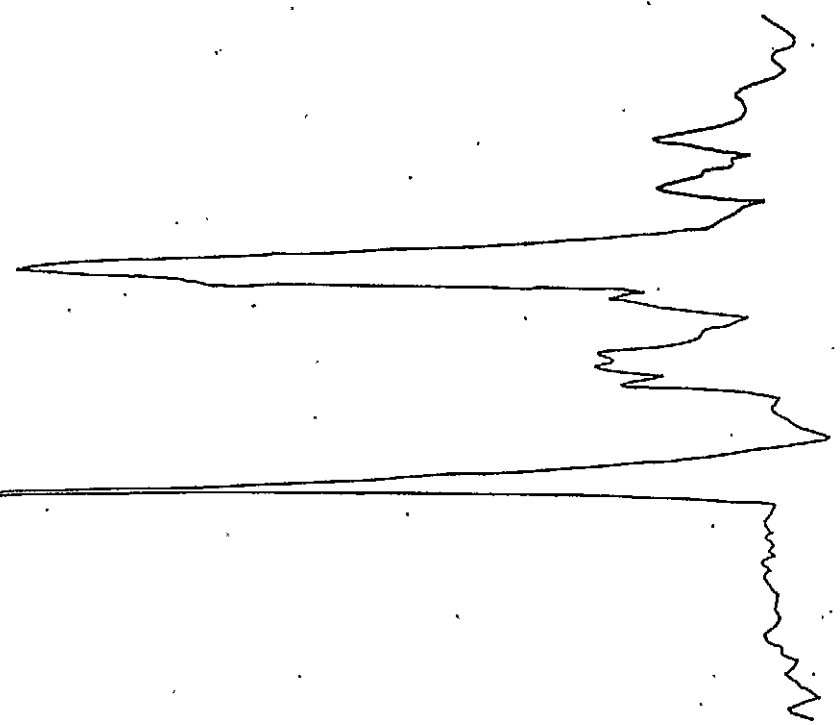
290

300

310

320

330



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 6

MDD 76-11

15

RESISTIVITY
(OHM METERS)

— 2500
— 5000
— 7500

BULK DENSITY
(GRAMS/CC)

140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330

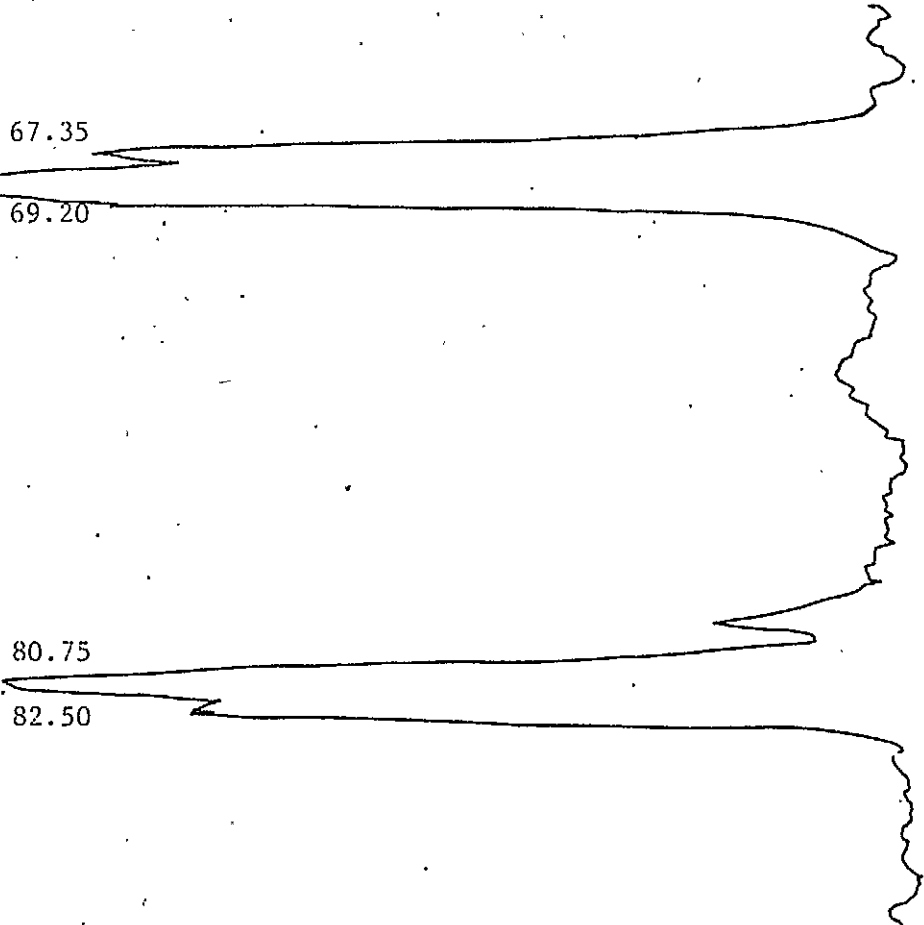


67.35

69.20

80.75

82.50



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B 7

MDD 76-11
19-24

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

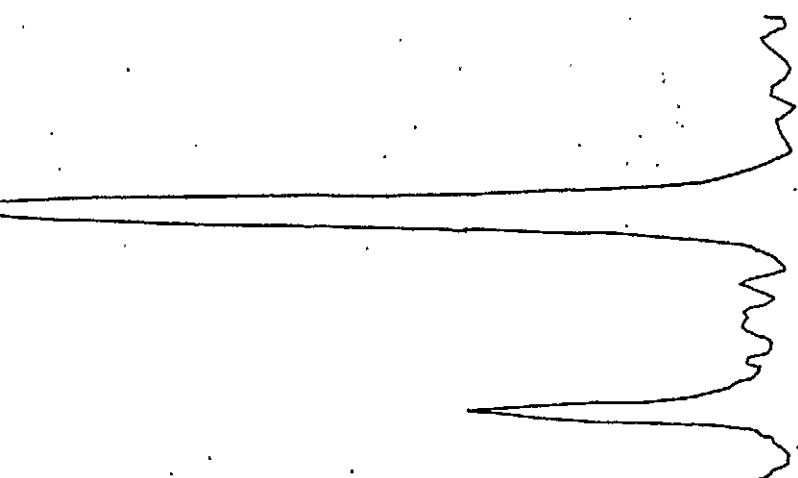
310

320

330



47.05
47.90



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B 8

MDI 76-14
17

RESISTIVITY
(OHM METERS)

— 2500

— 5000

— 7500

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

310

320

330

130

30.25

33.35



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

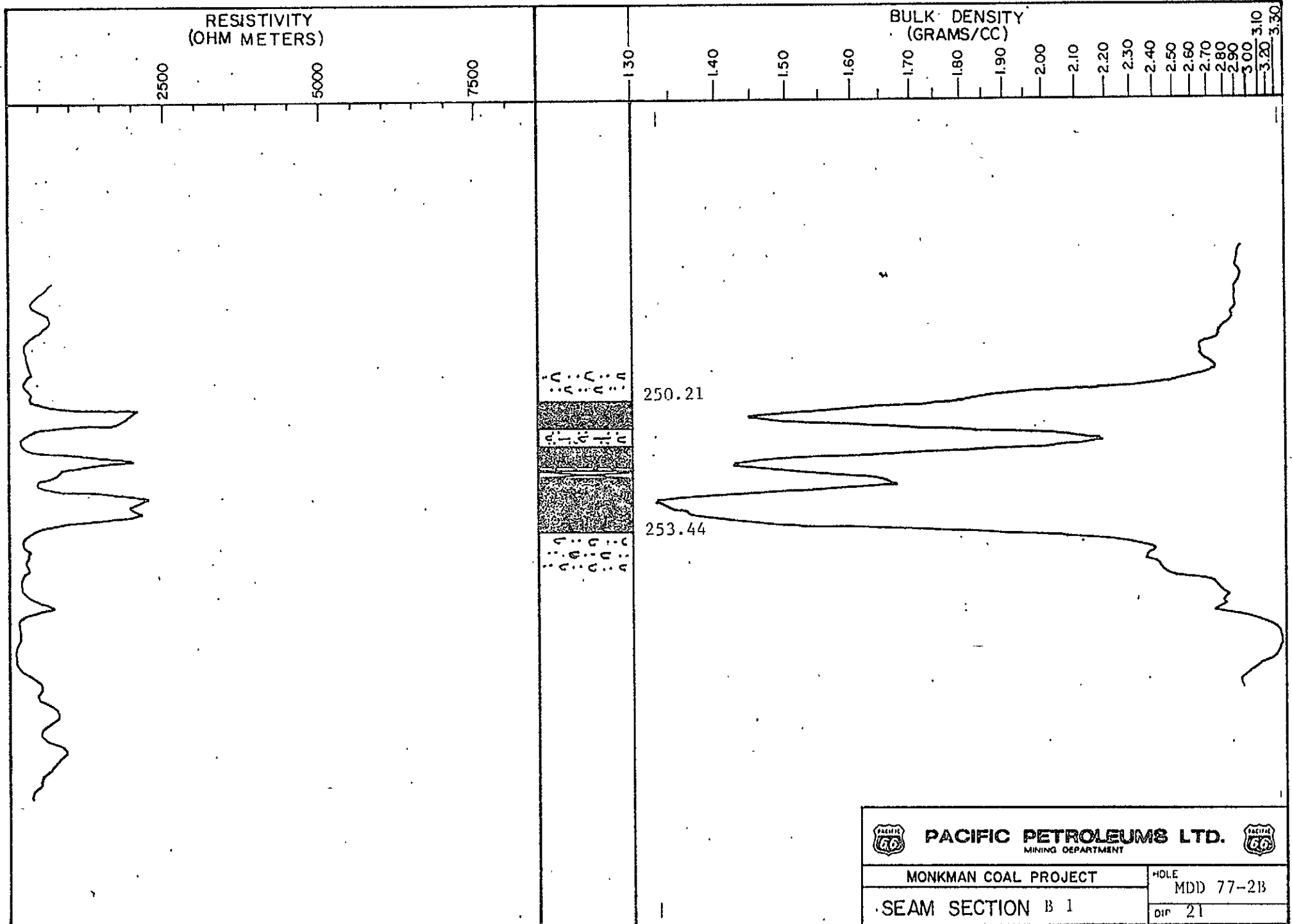




MONKMAN COAL PROJECT

SEAM SECTION B 9

MDD 76-11

20



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>		
MONKMAN COAL PROJECT		HOLE MDD 77-2B
SEAM SECTION B 1		DIP 21

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

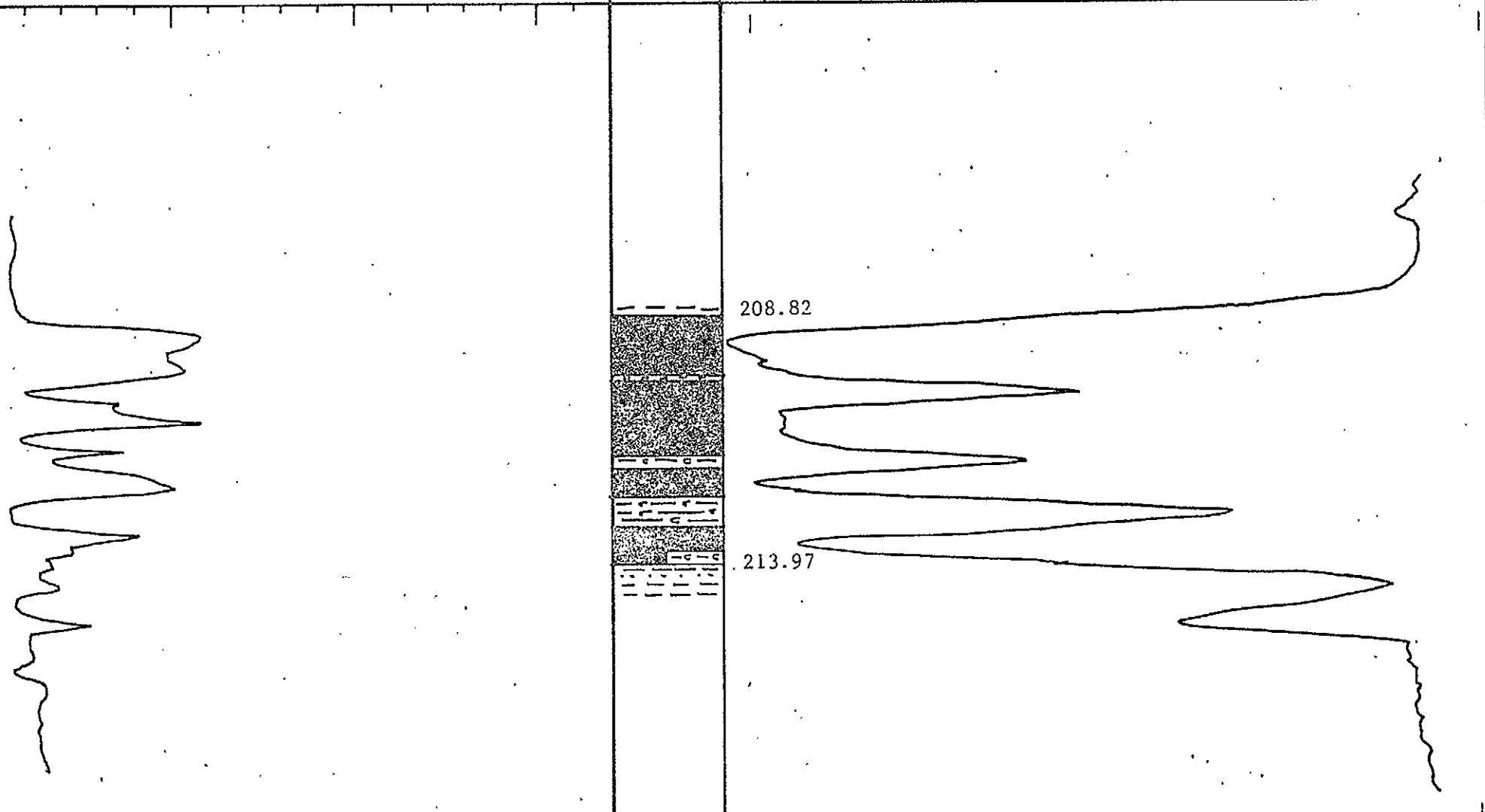
2.90

3.00

3.10



3.20

3.30



208.82

213.97

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MIDD 77-2B
SEAM SECTION B 3	DIP 24

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

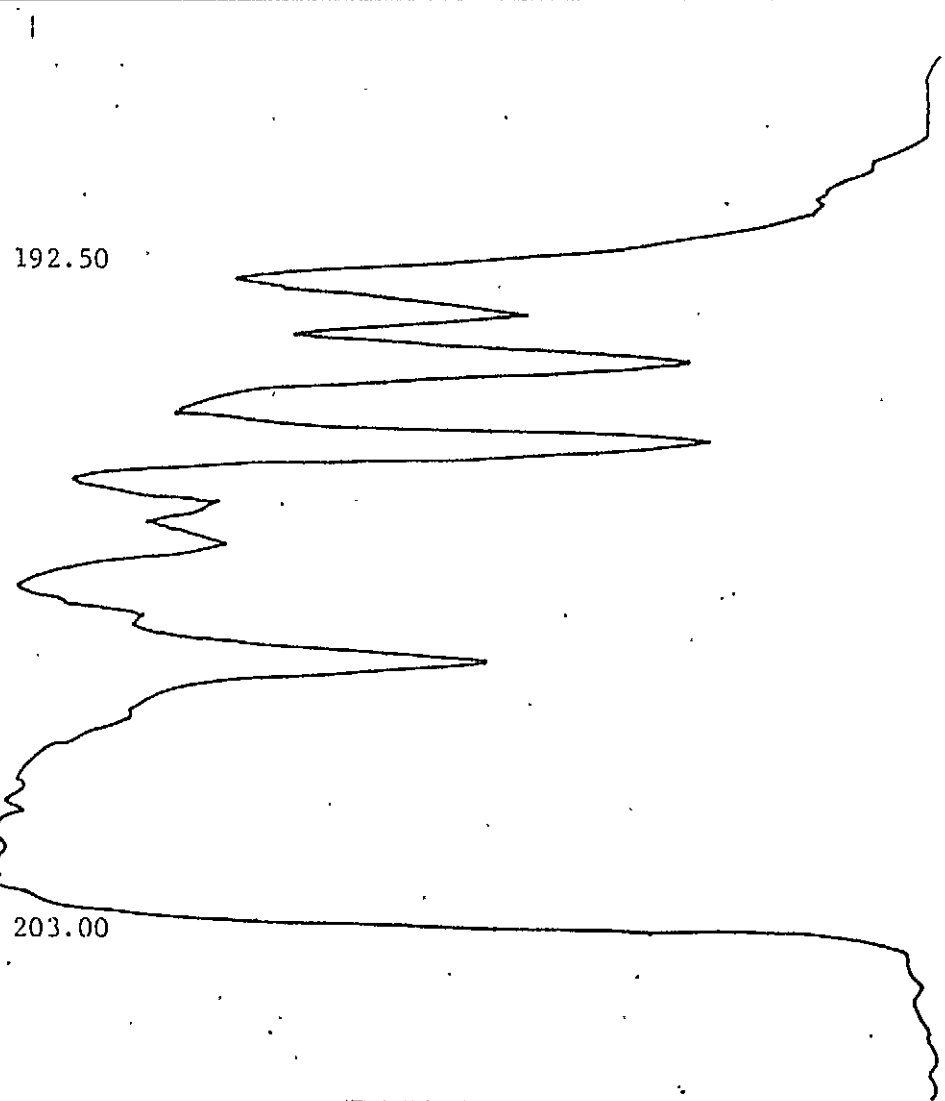
3.20



3.30



192.50

203.00



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MDD 77-2B
SEAM SECTION B 4	DIP 21

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

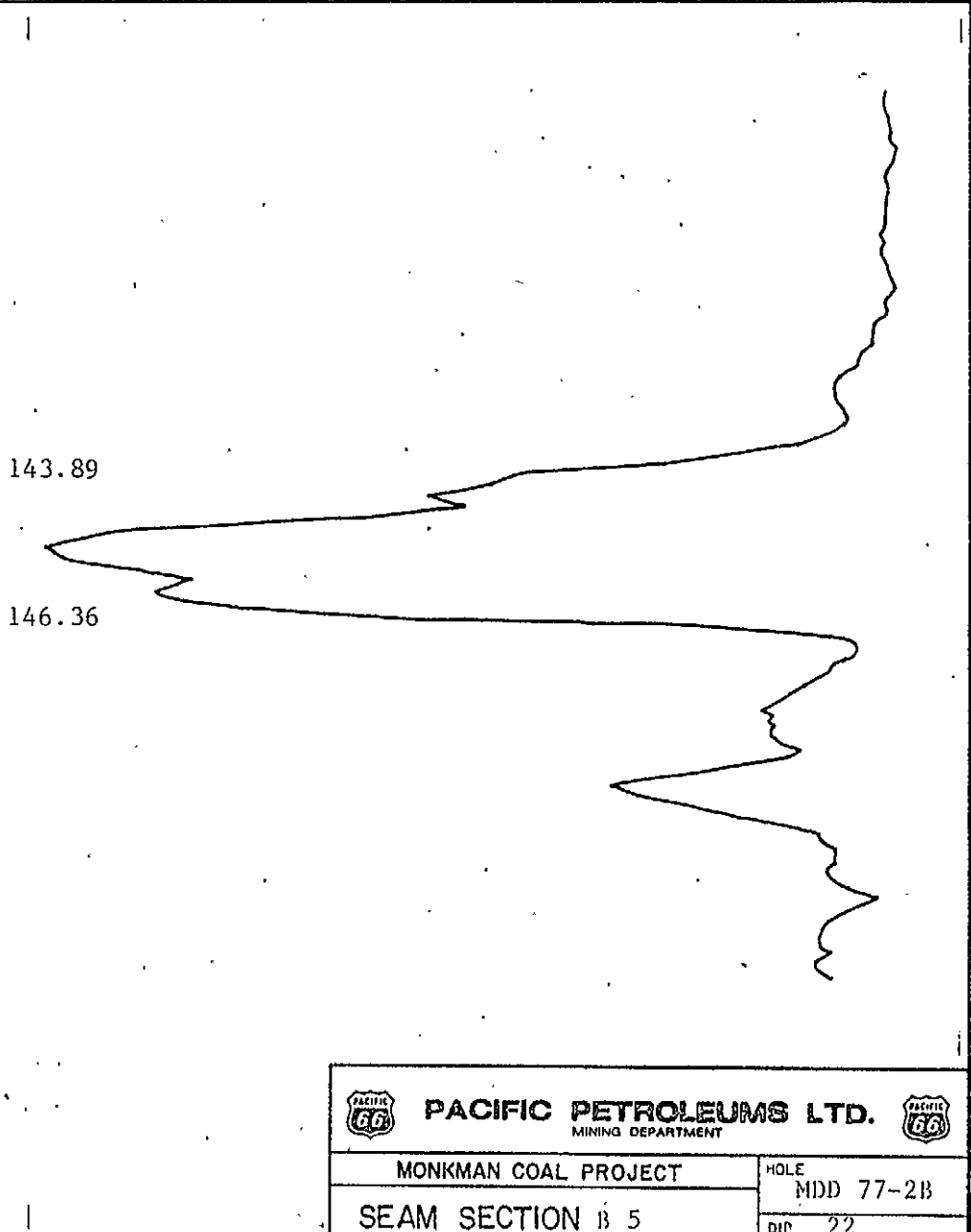
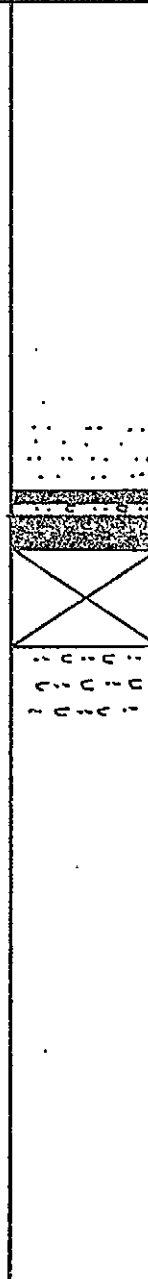
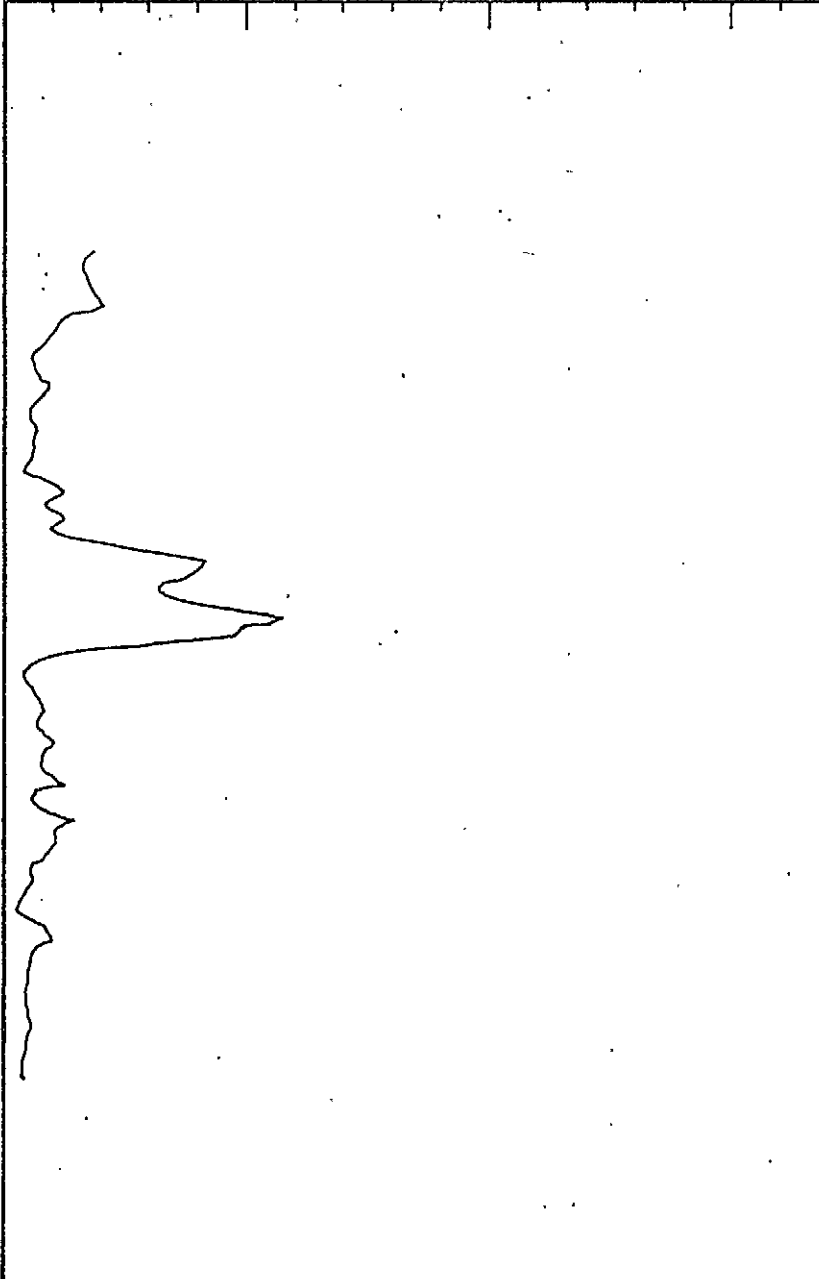
2.90

3.00

3.10



3.20

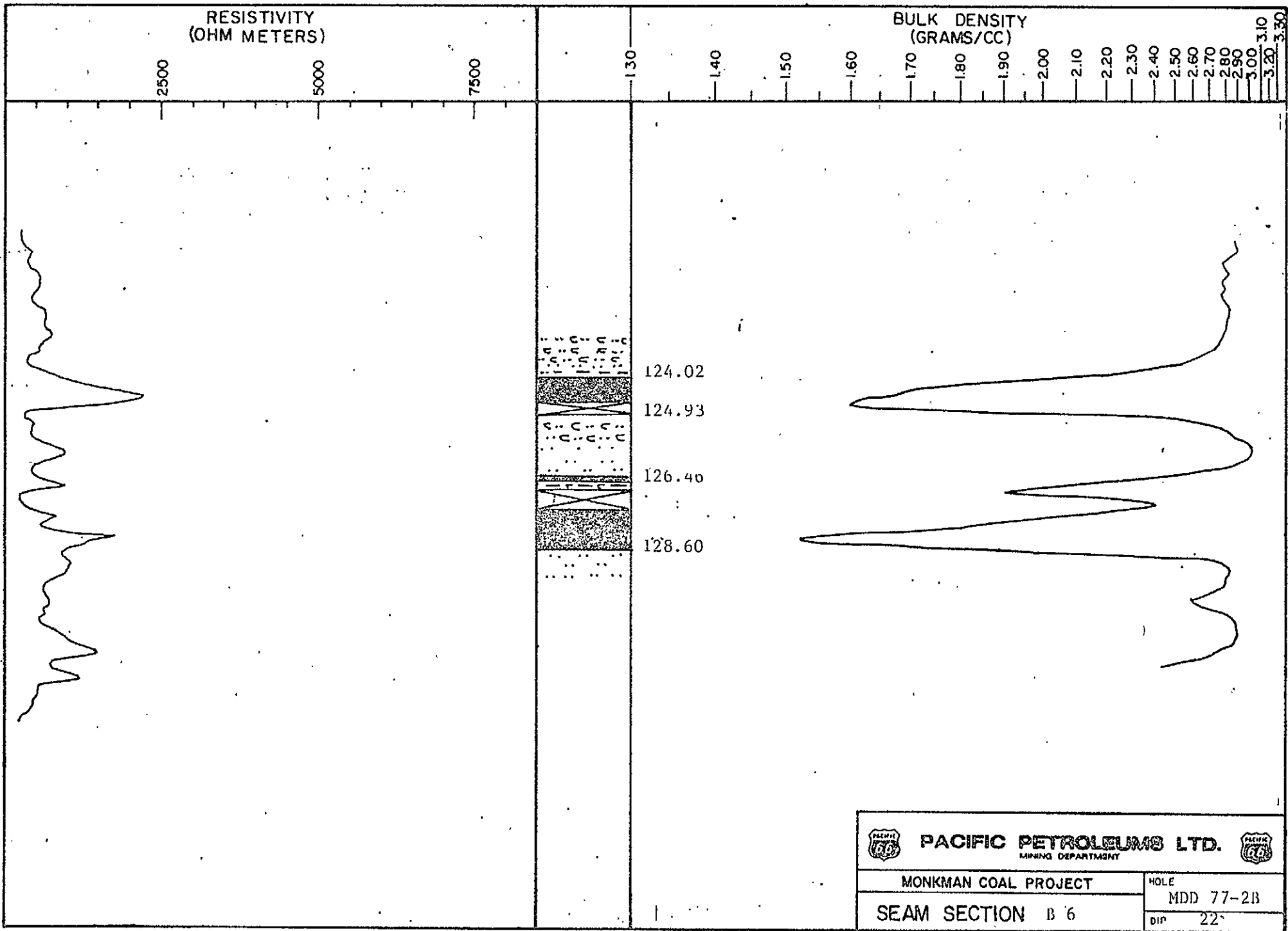
3.30





143.89

146.36

 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MDD 77-2B
SEAM SECTION B 5		DIP 22



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B 6	
HOLE MDD 77-2B	DIP 22°

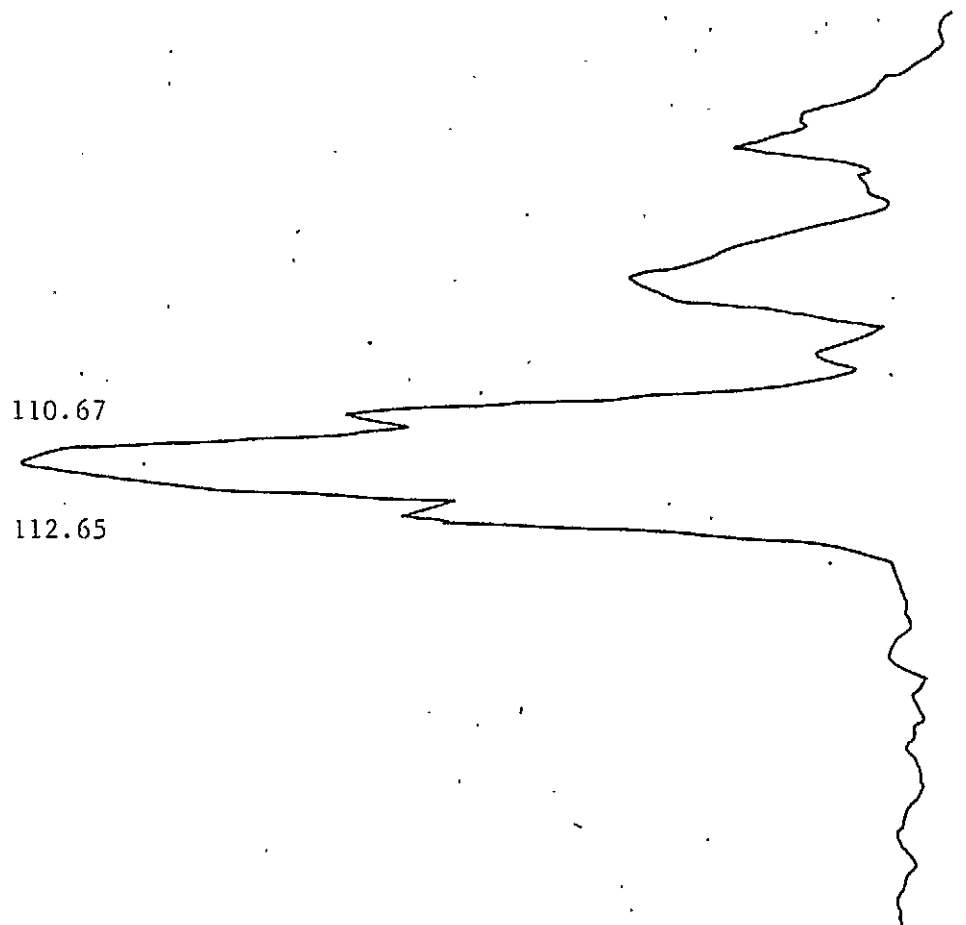
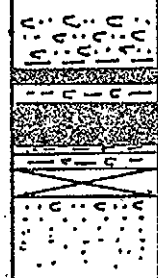
RESISTIVITY (OHM METERS)



2500 5000 7500

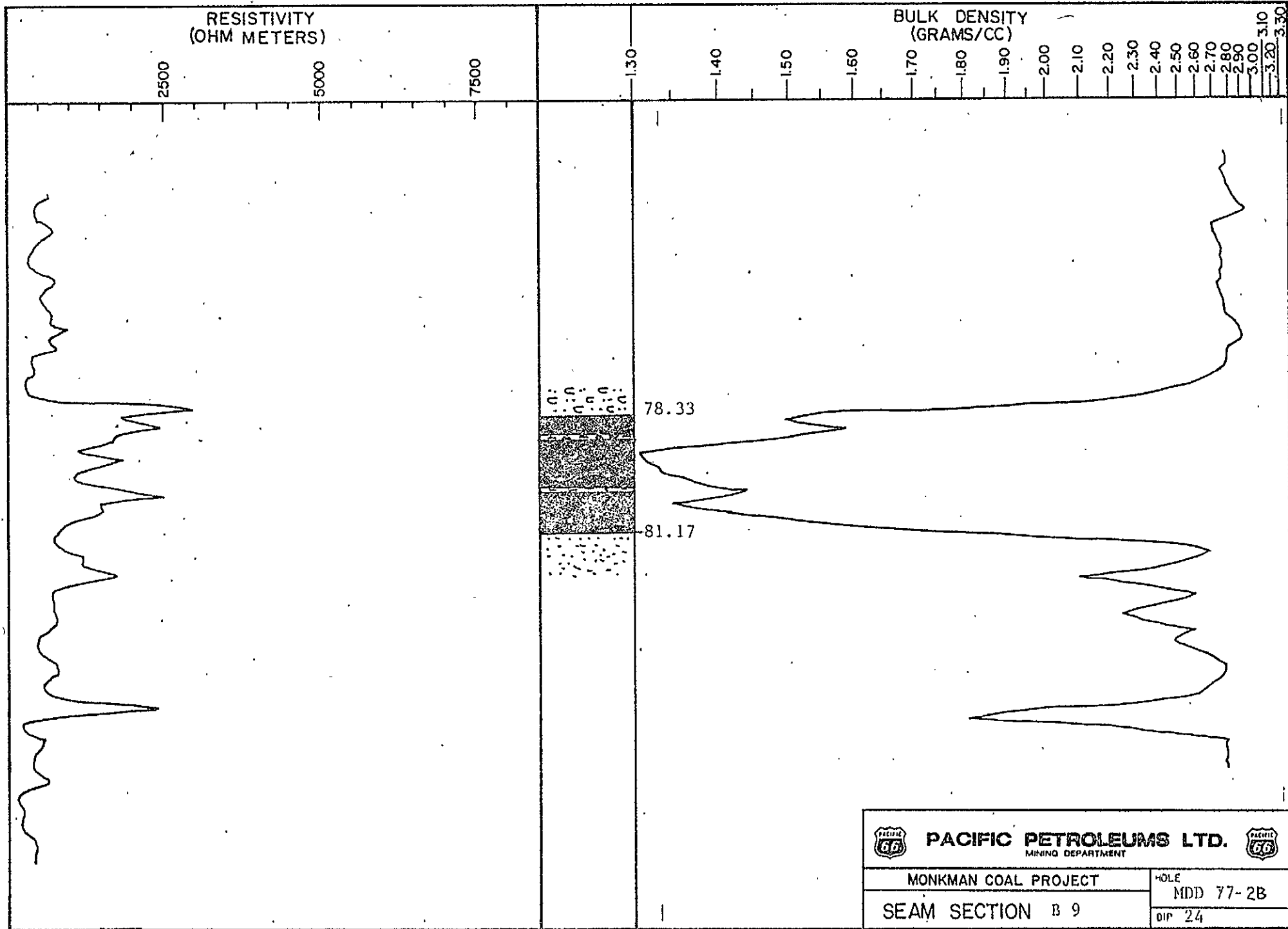
BULK DENSITY (GRAMS/CC)

1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30

Handwritten scribble



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	HOLE MDD 77-2B
SEAM SECTION B 7	DIP 22



RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

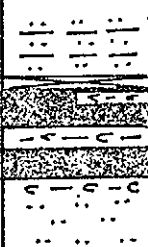
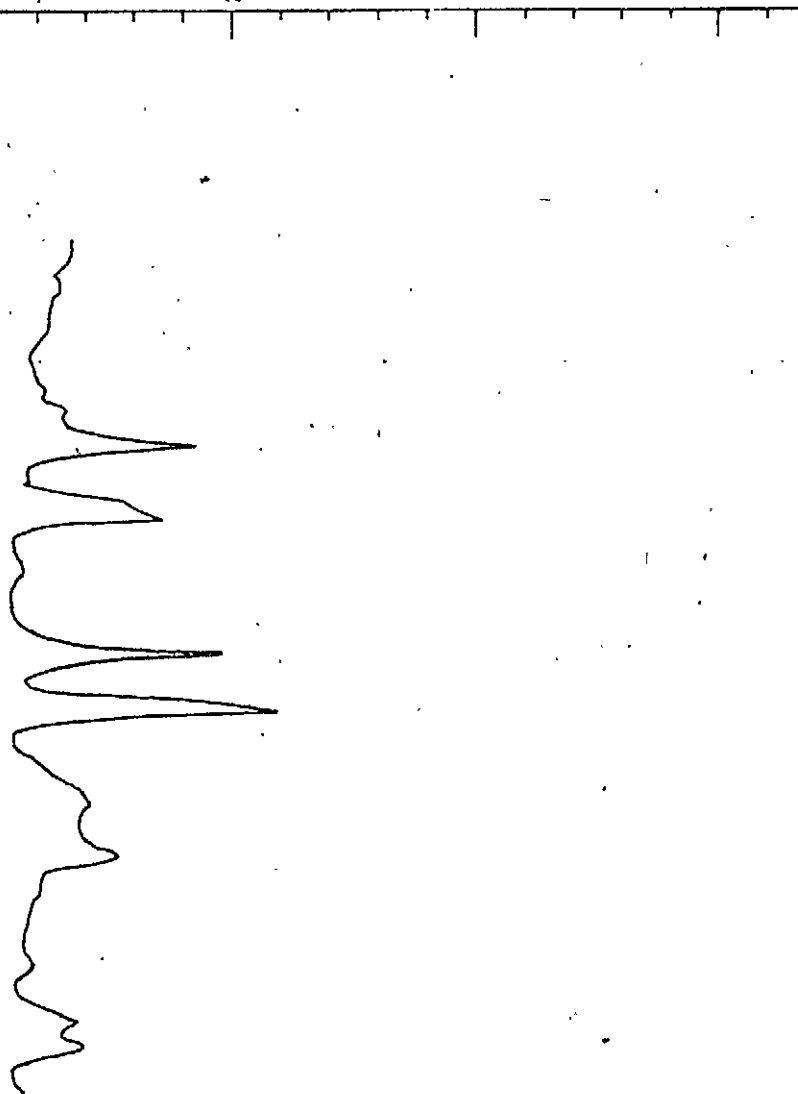
2.90

3.00

3.10

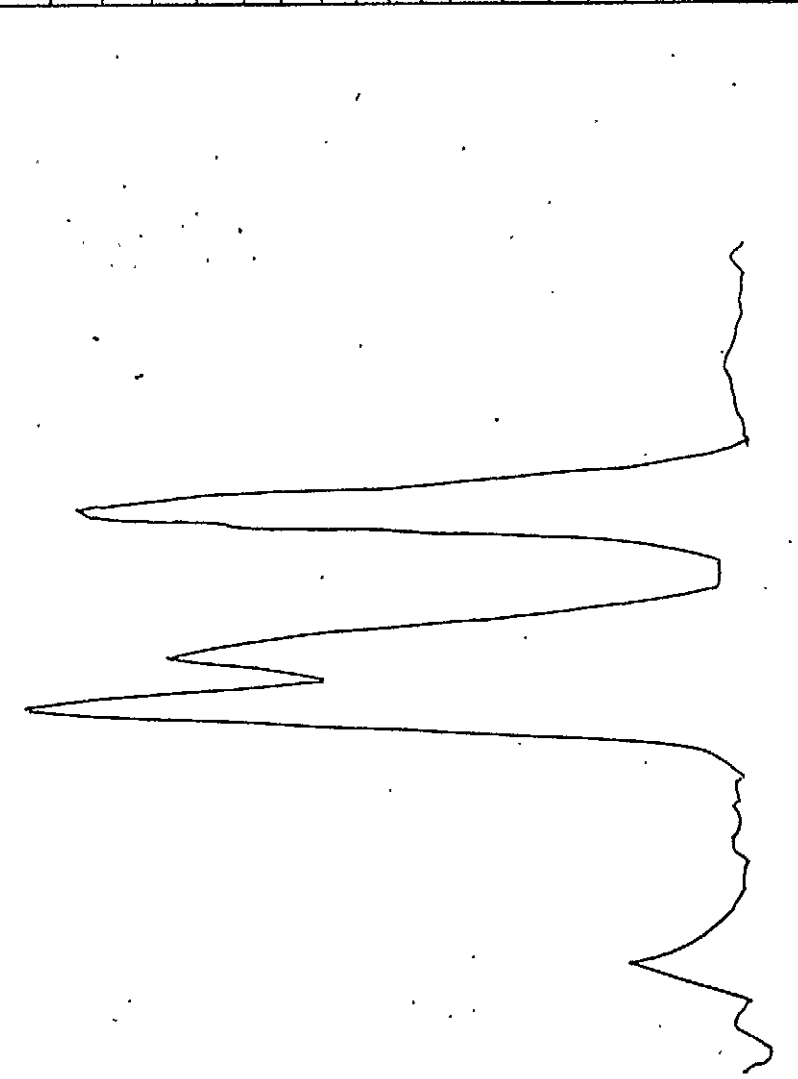
3.20

3.30



59.31

60.96



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 10

NO. OF
MDD 77-2B

DIP 23

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

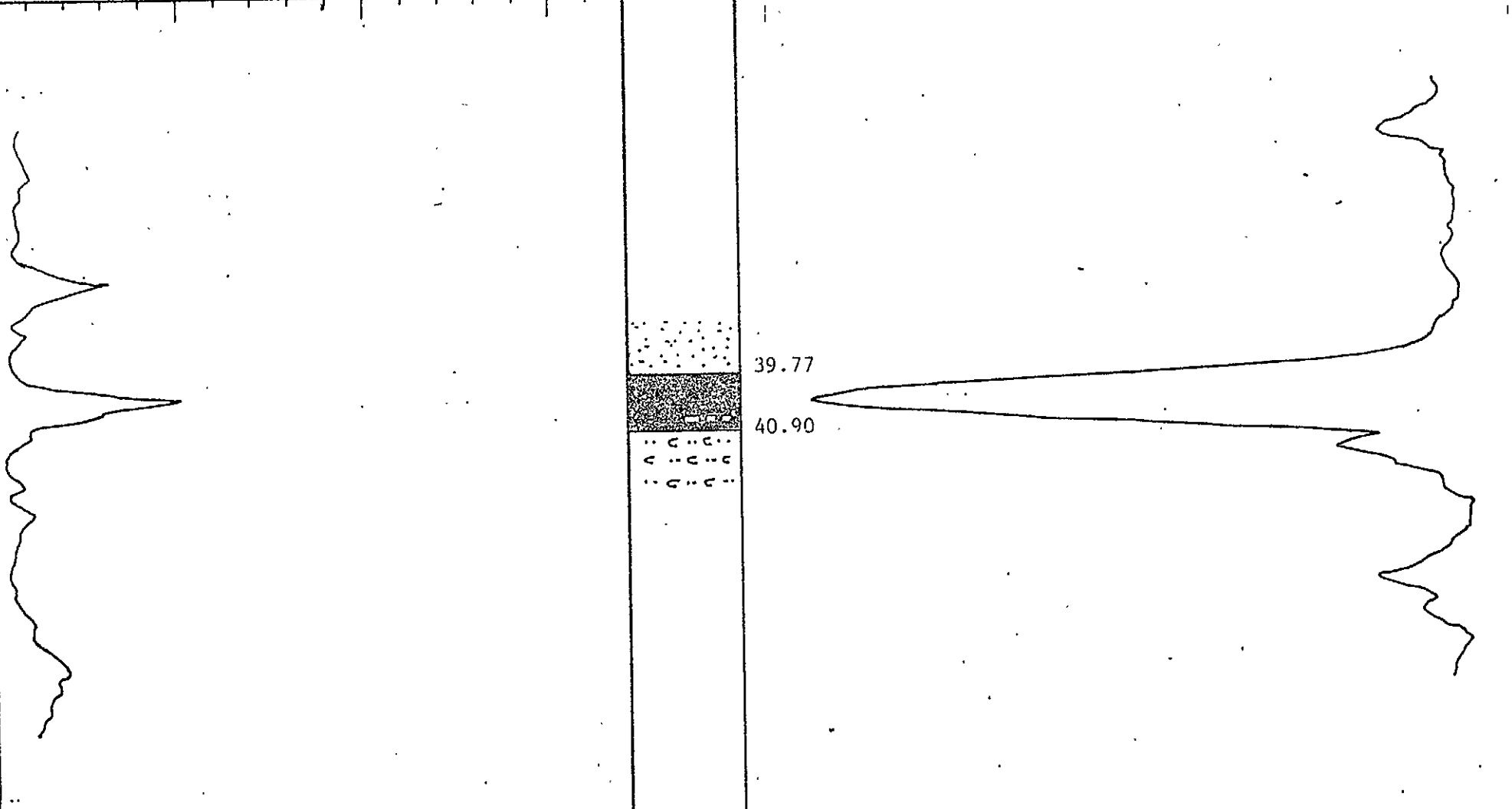
2.90

3.00

3.10

3.20

3.30



39.77

40.90



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

101.E
MDD 77-213

SEAM SECTION B 11

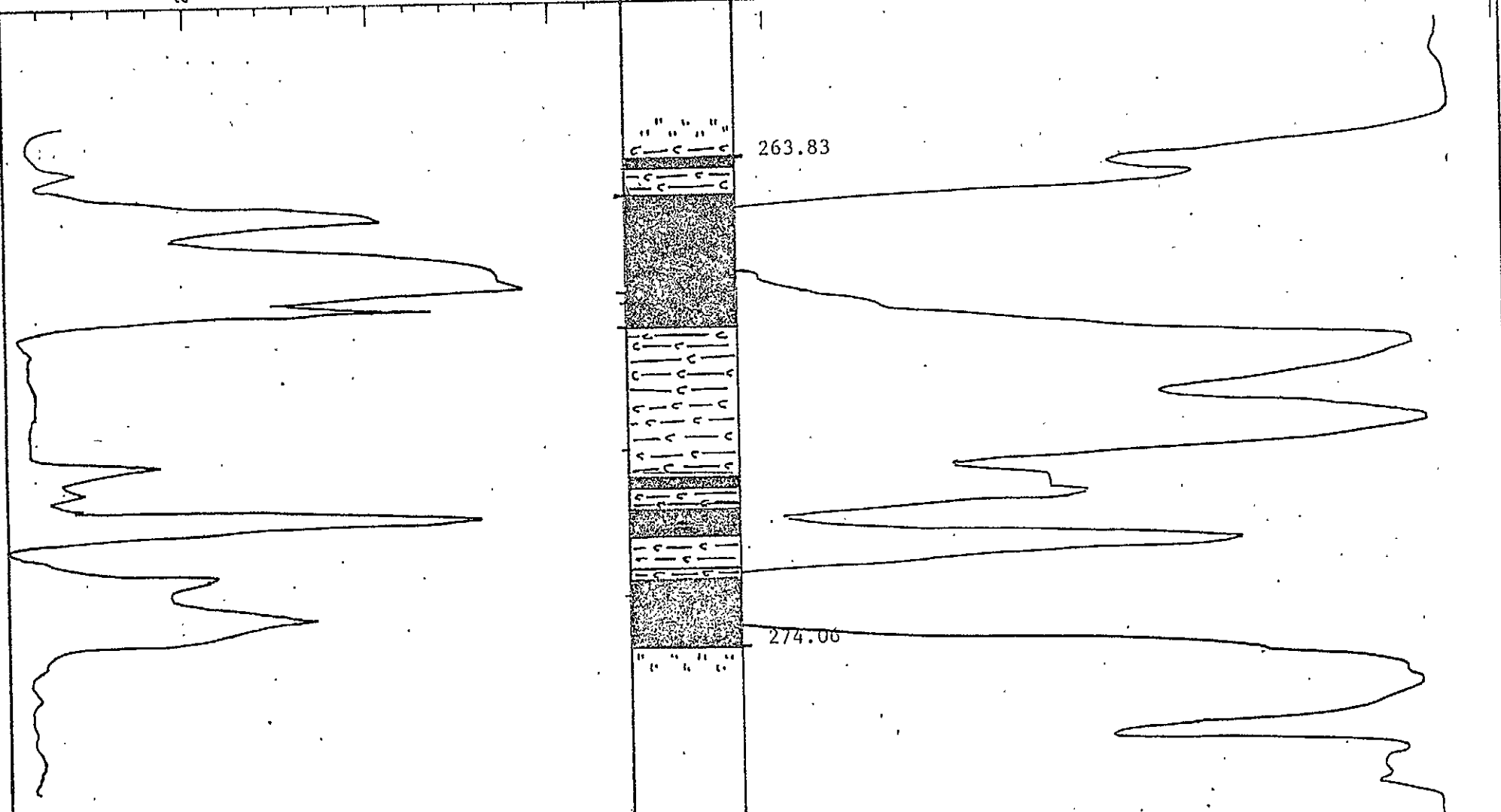
D11 22

RESISTIVITY
(OHM METERS)

2500
5000
7500

BULK DENSITY
(GRAMS/CC)

1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30



263.83

274.06



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT	HOLE MUD 77-4
SEAM SECTION B 1	DIP 14

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

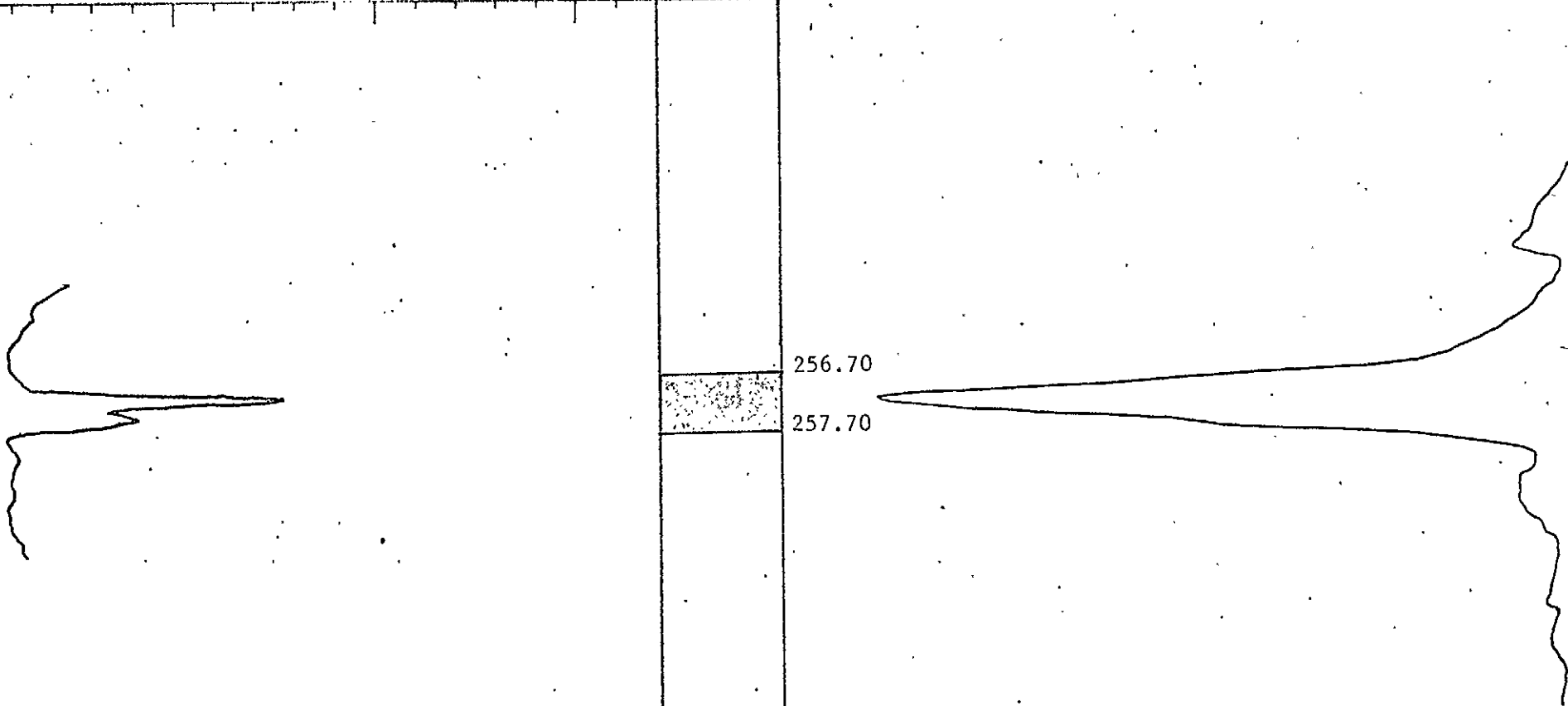
2.90

3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.

Mining Department

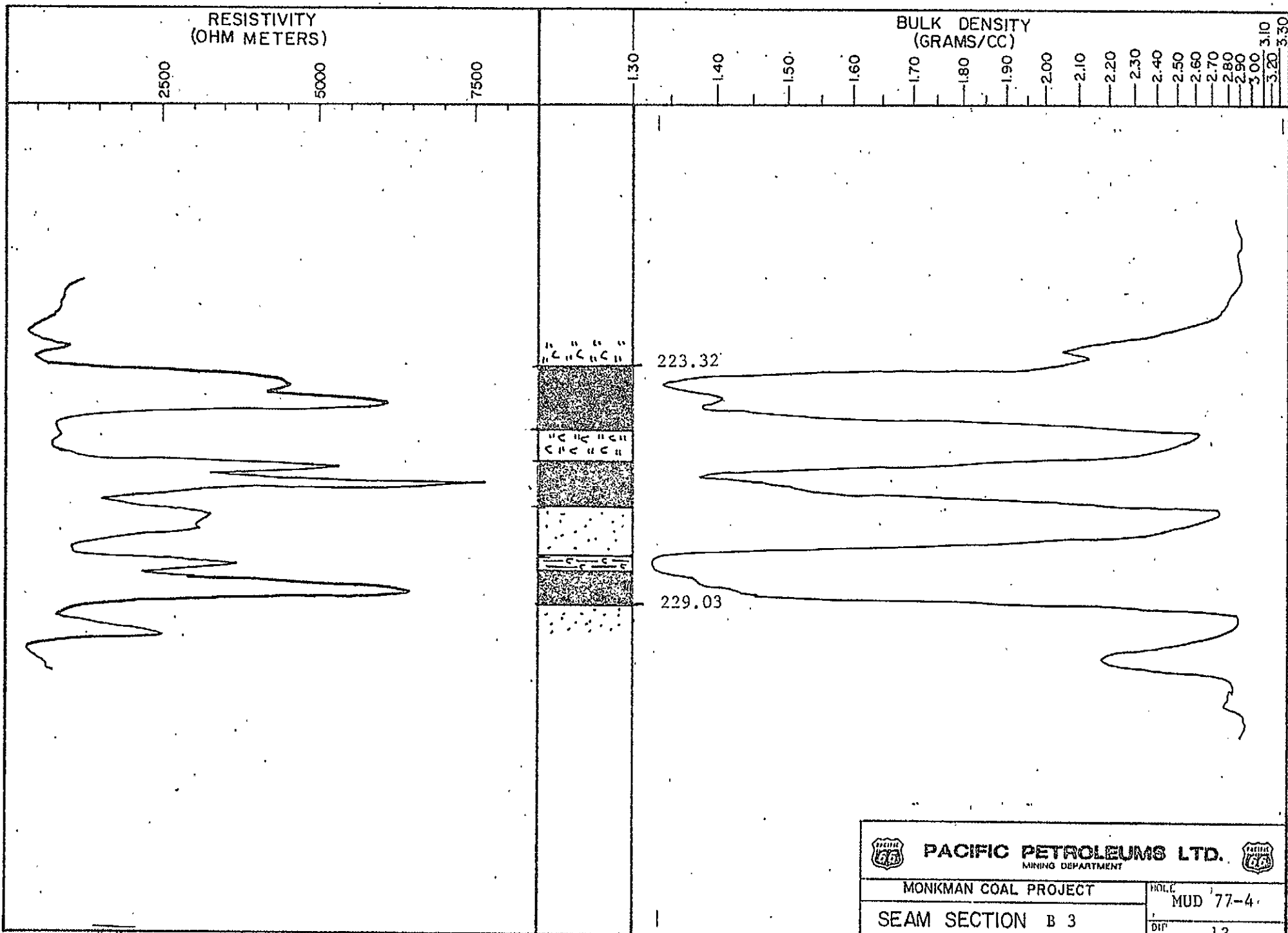


MONKMAN COAL PROJECT

MUD 77-4

SEAM SECTION B 2

14



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MUD 77-4.

SEAM SECTION B 3

DIP
13

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

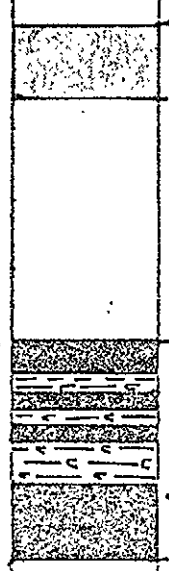
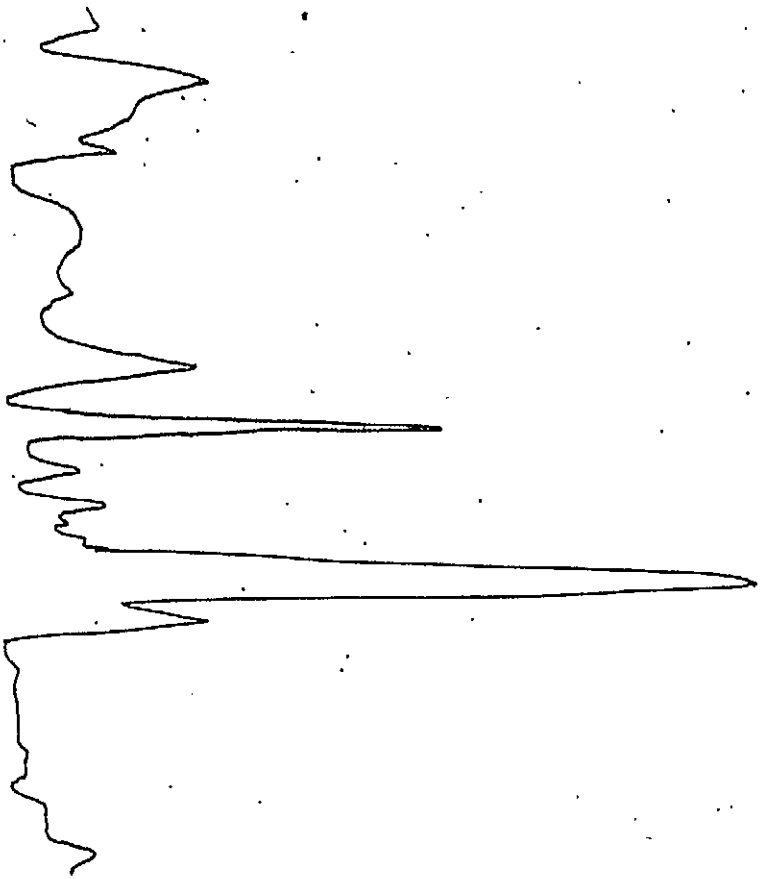
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3.00

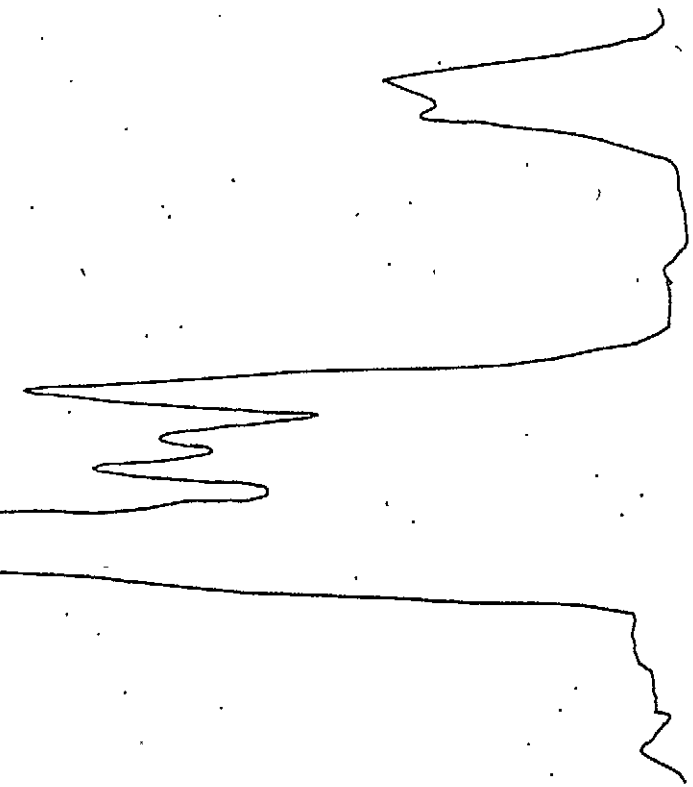
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3.20

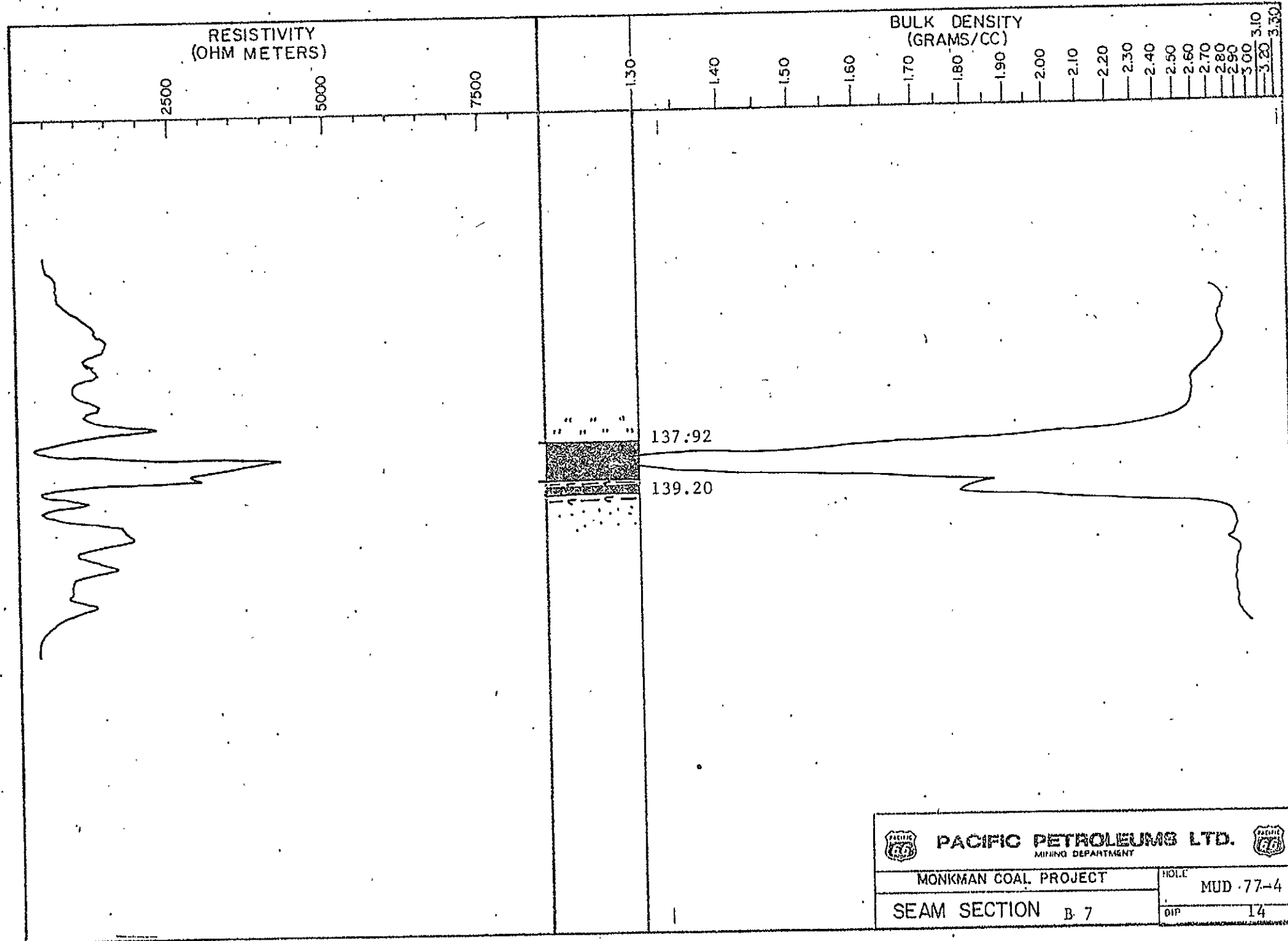
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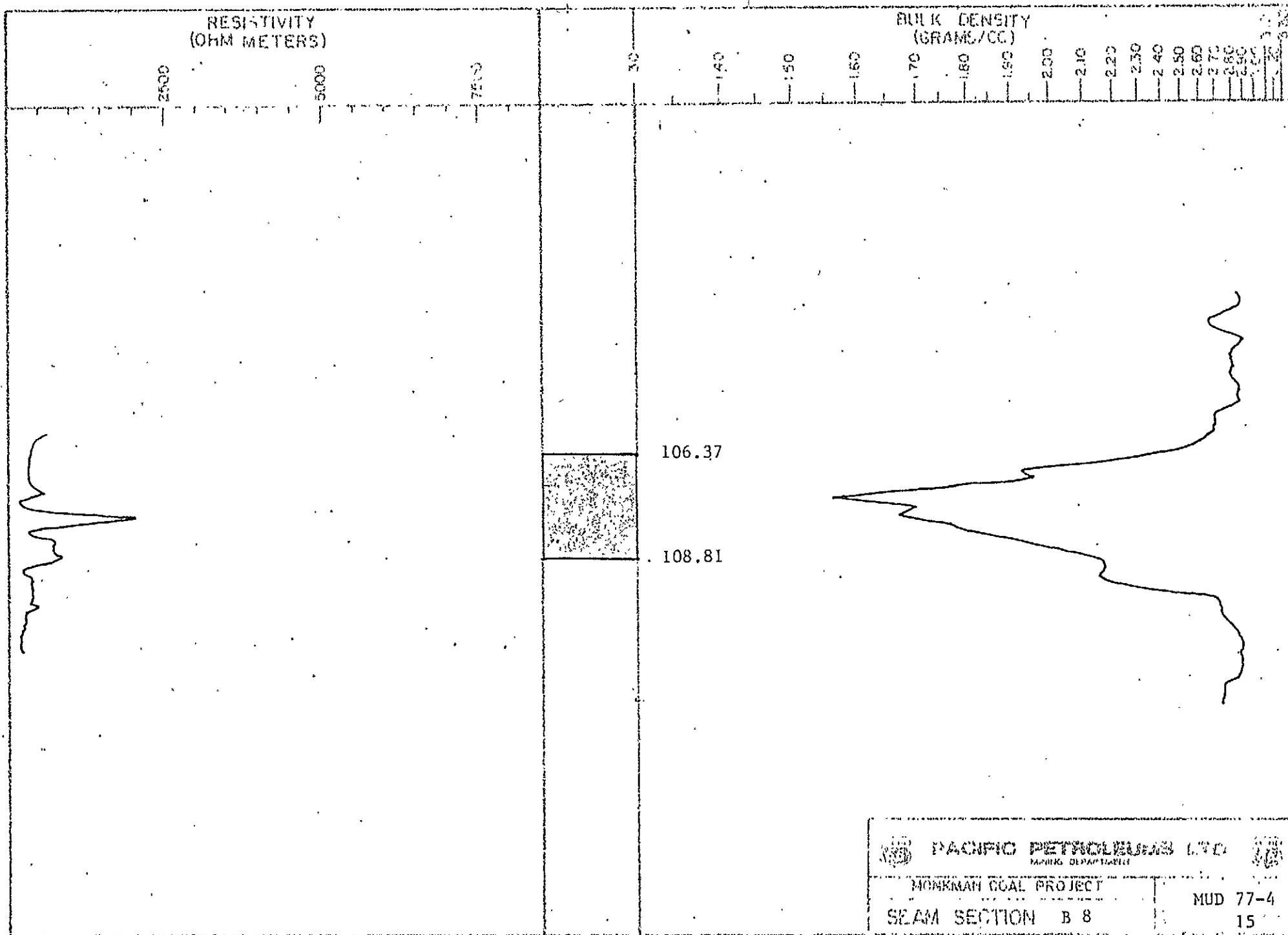
147.61
148.68
152.49
155.98




 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT 	
MONKMAN COAL PROJECT	WELL MUD 77-4
SEAM SECTION B 6	DATE 11



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT			
MONKMAN COAL PROJECT		HOLE MUD .77-4	
SEAM SECTION B 7		DIP 14	

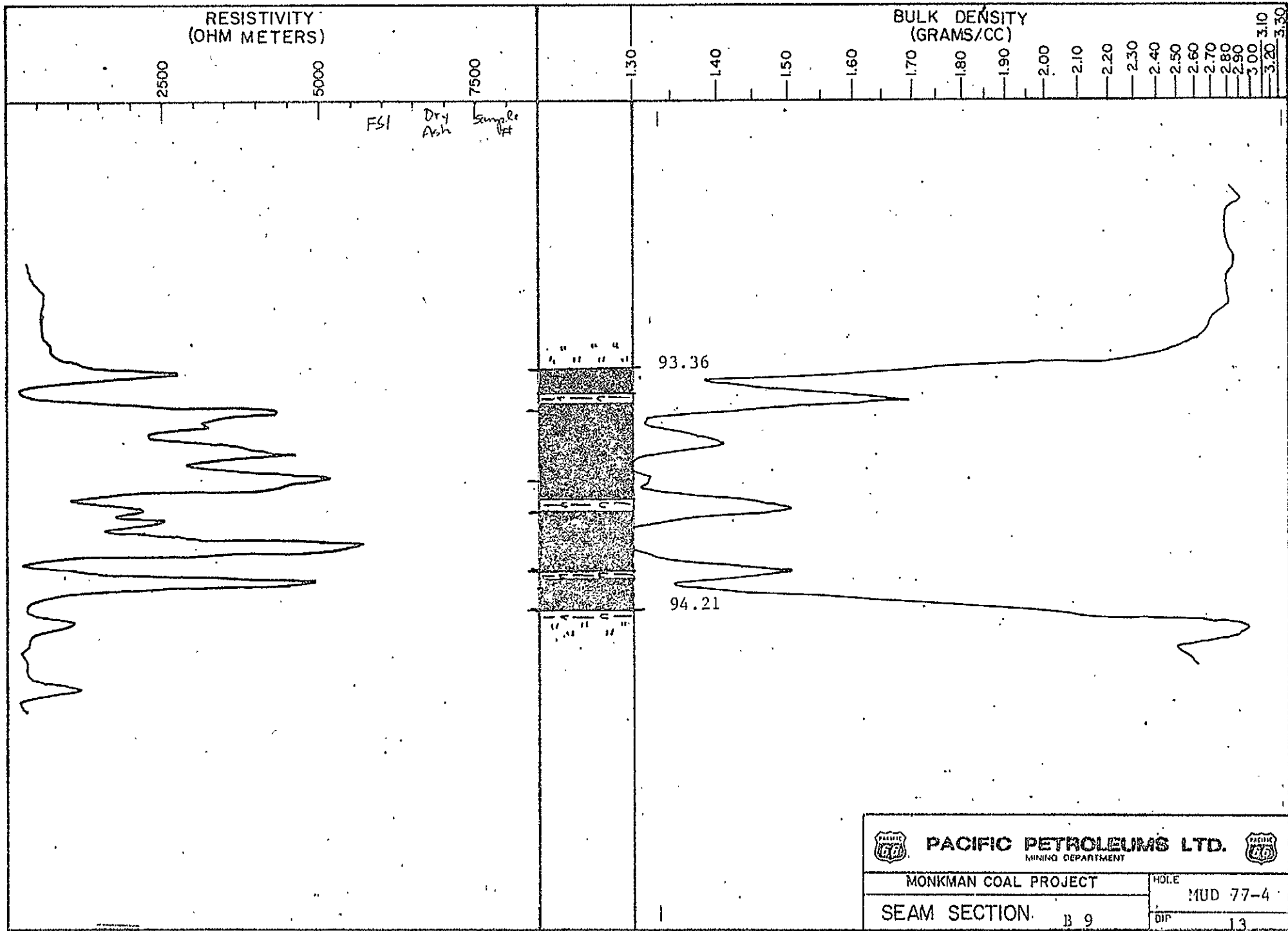



PACIFIC PETROLEUMS LTD.
 MINING DEPARTMENT

MONKMAN COAL PROJECT

SEAM SECTION B 8

MUD 77-4
 15



RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

3500

5000

7500

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

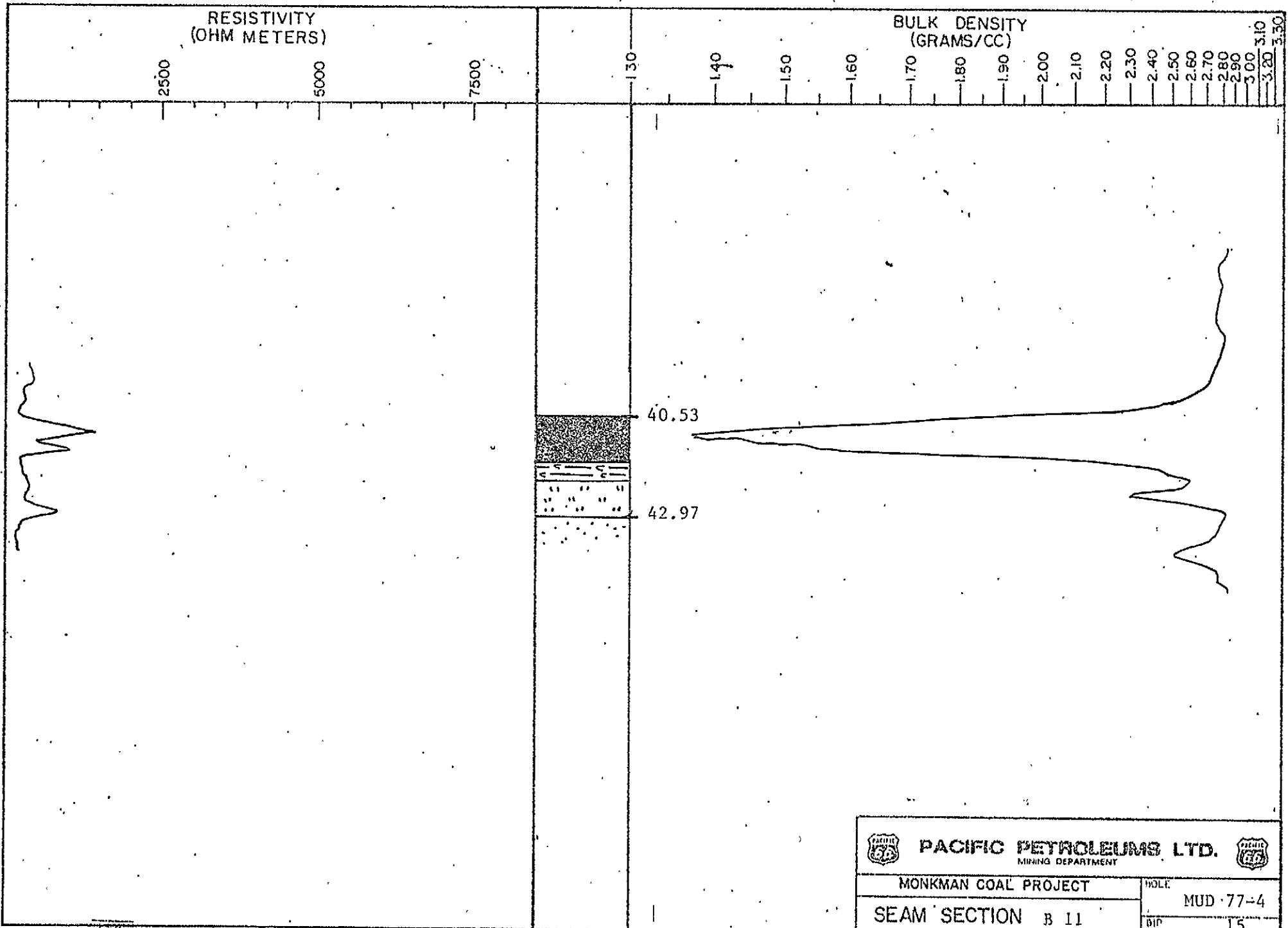
2.90



3.00

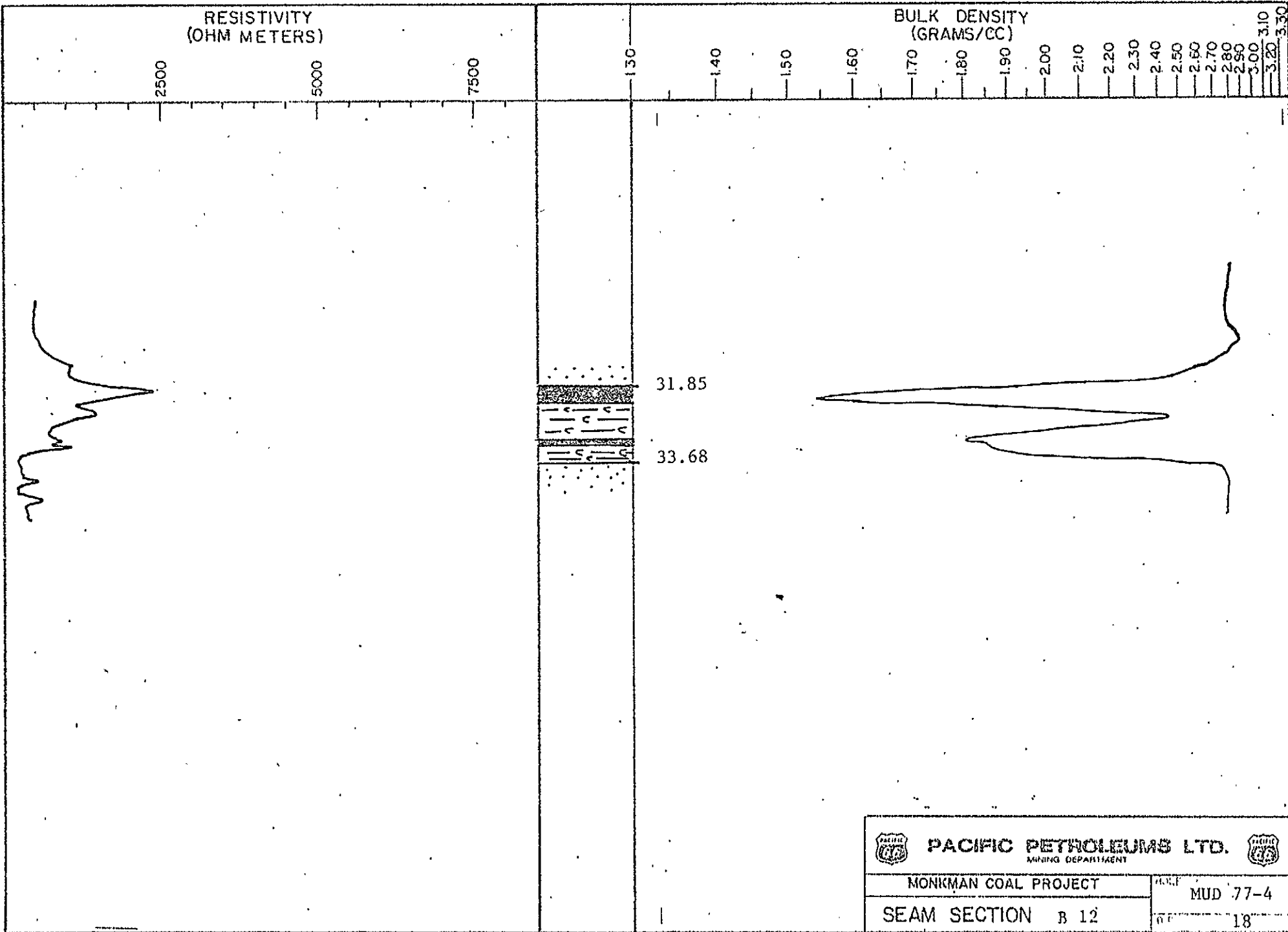
67.12

67.72

PACIFIC PETROLEUM LTD. <small>INCORPORATED IN CANADA</small>	
MICHIKAN GOAL PROJECT	
SEAM SECTION B 10	MUD 77-4 16



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>		
MONKMAN COAL PROJECT		HOLE: MUD-77-4
SEAM SECTION B 11		BIP: 15



RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

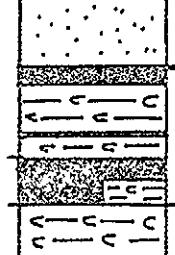
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2.70

2.80

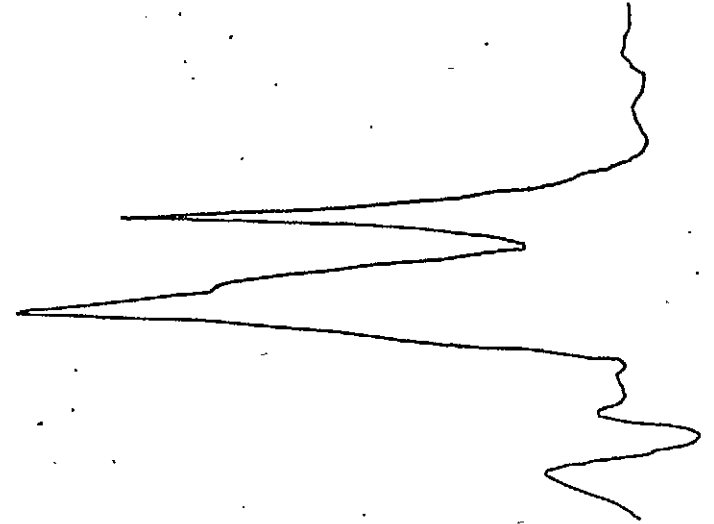
2.90

3.00 3.10 3.20 3.30



179.35

181.56



PACIFIC PETROLEUMS LTD.



MINING DEPARTMENT

MONKMAN COAL PROJECT

MUD 77-5

SEAM SECTION B 6

20

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

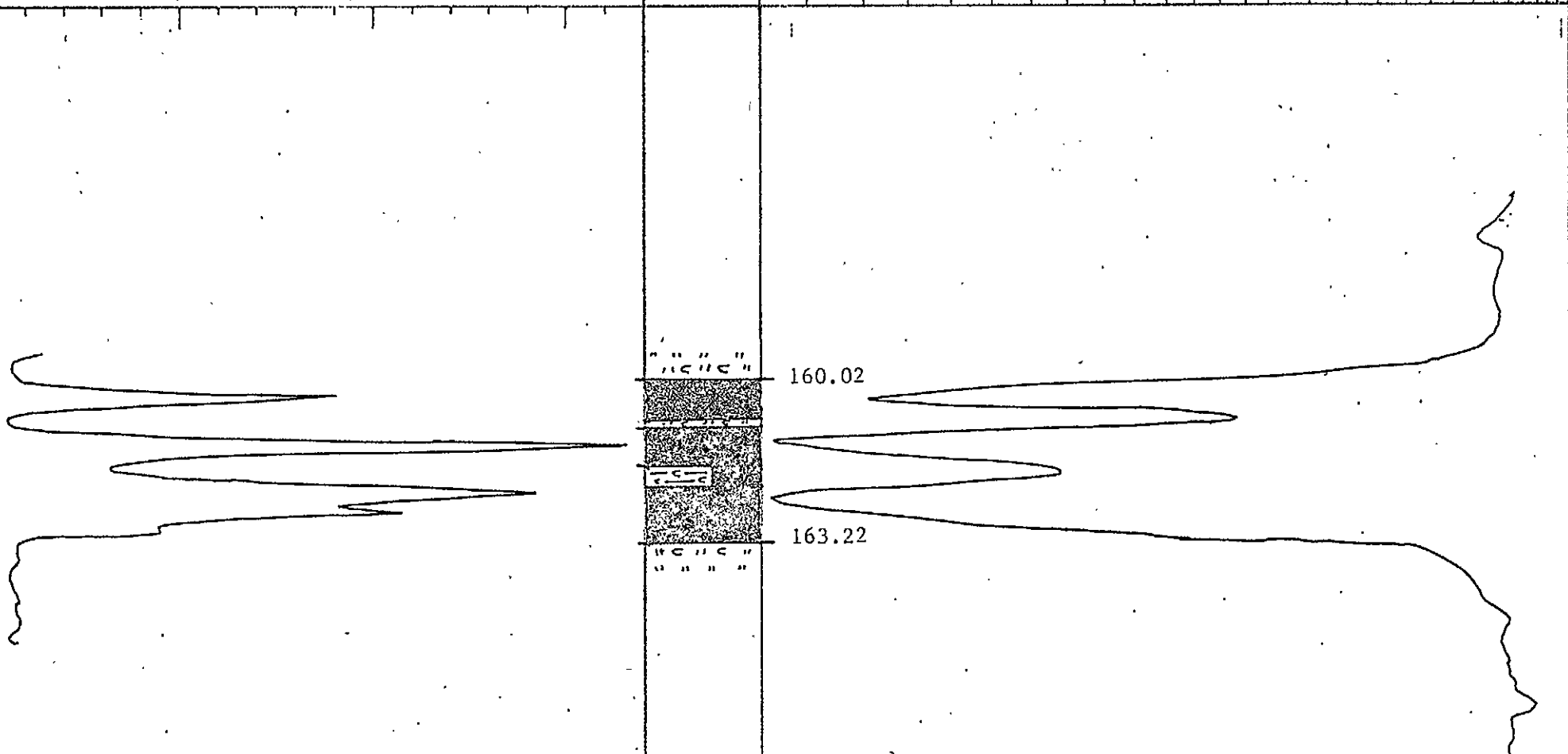
2.90

3.00

3.10

3.20

3.30



160.02

163.22



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

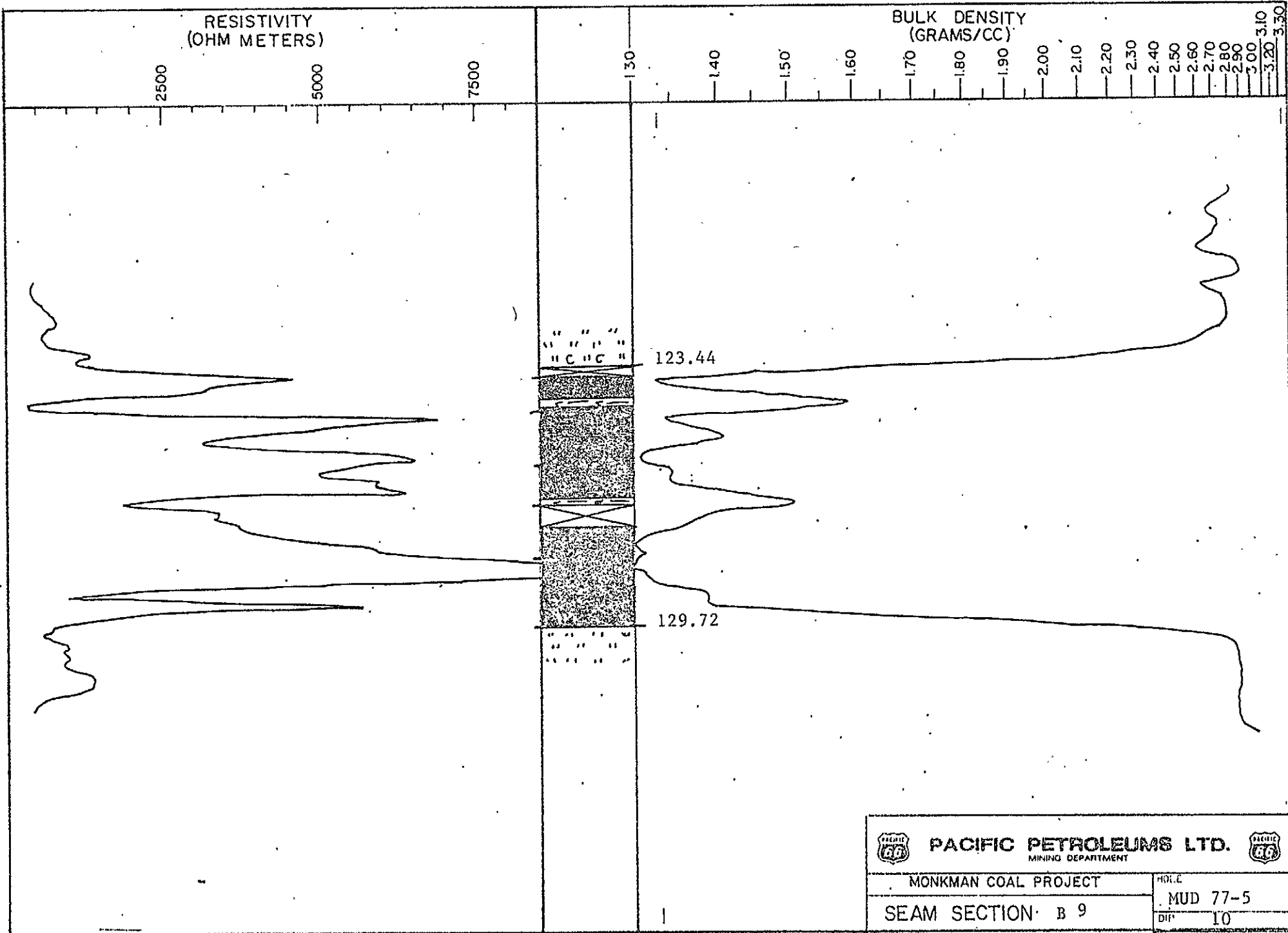




MONKMAN COAL PROJECT

SEAM SECTION B 7

MUD 77-5

10



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE NO. MUD 77-5
SEAM SECTION B 9		DIA. 10

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

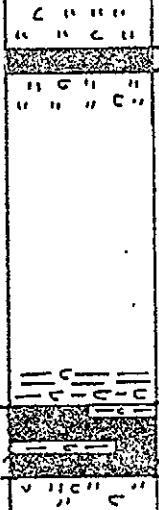
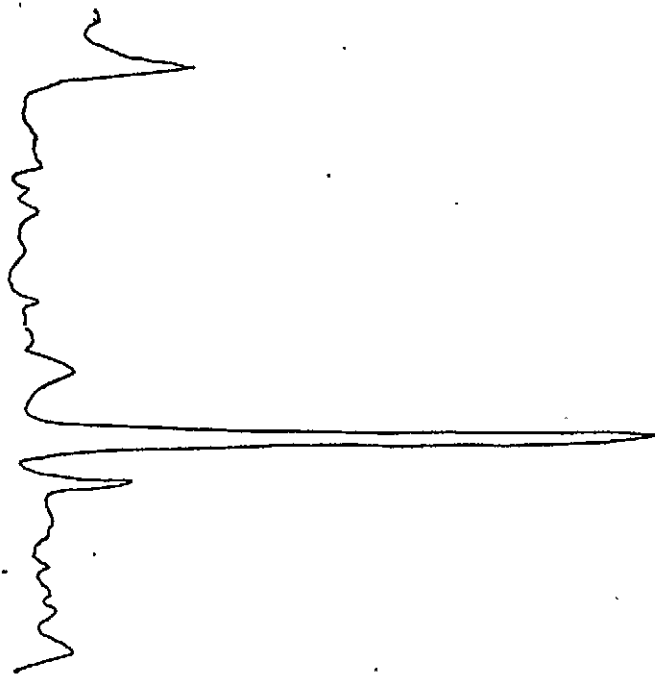
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3.00

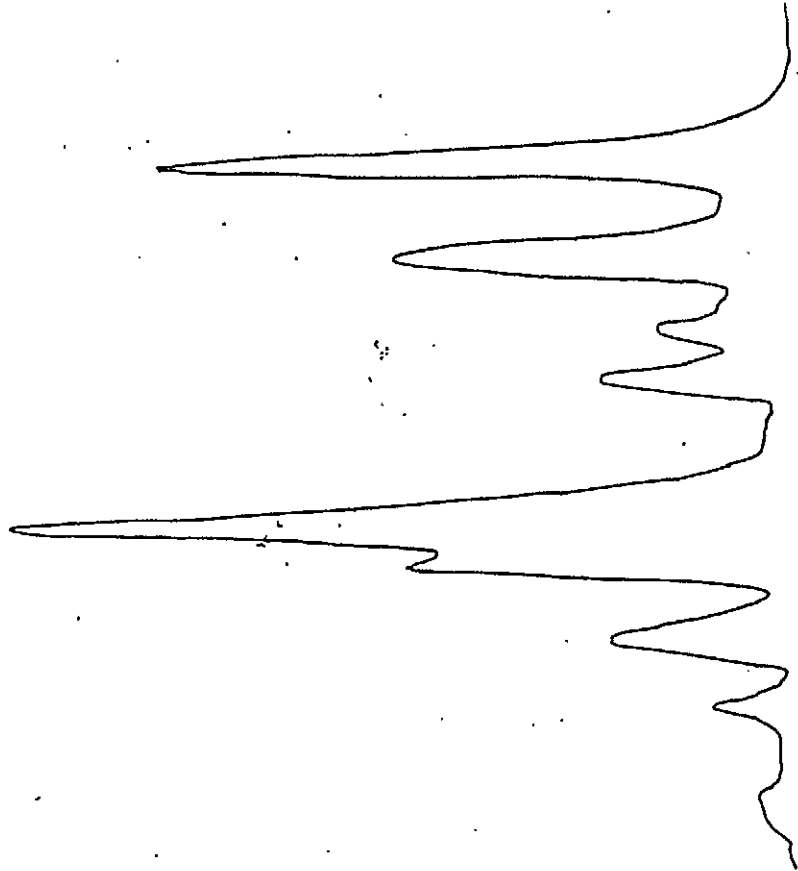
3.10

3.20

3.30



76.32
76.67
81.84
82.96



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

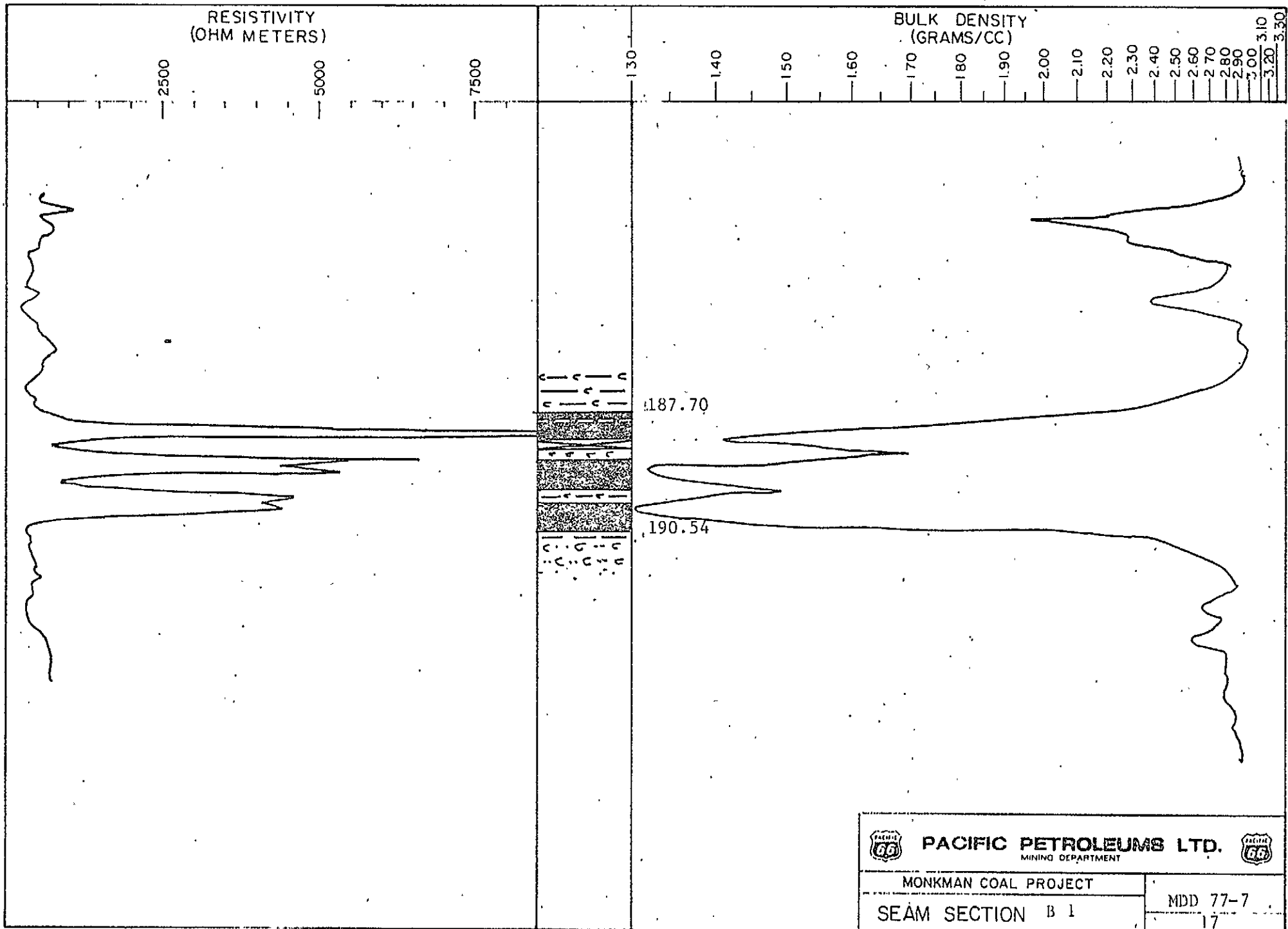


MONKMAN COAL PROJECT

SEAM SECTION B 11

HOLE
MUD 77-5

DIP 18



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 1

MDD 77-7

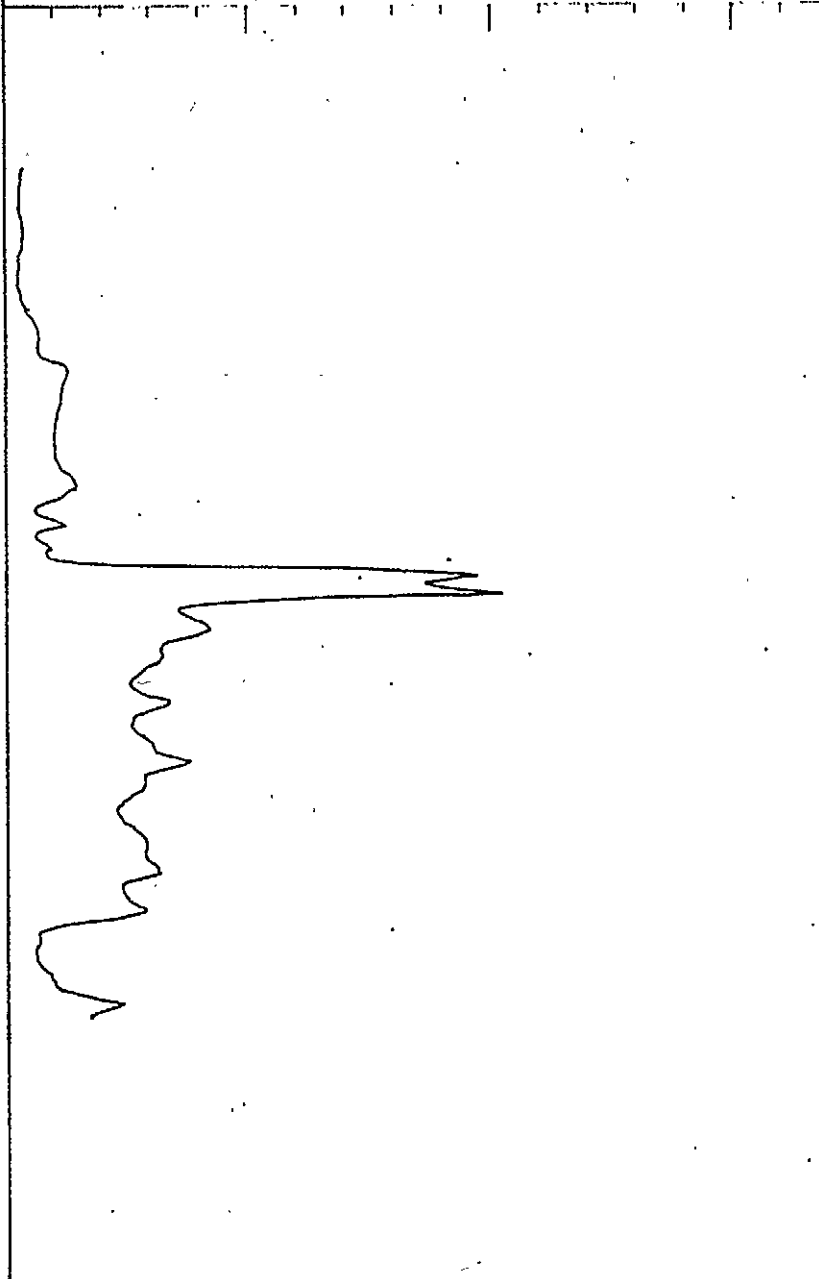
17

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

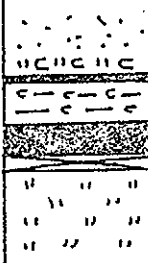
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3.00

3.10

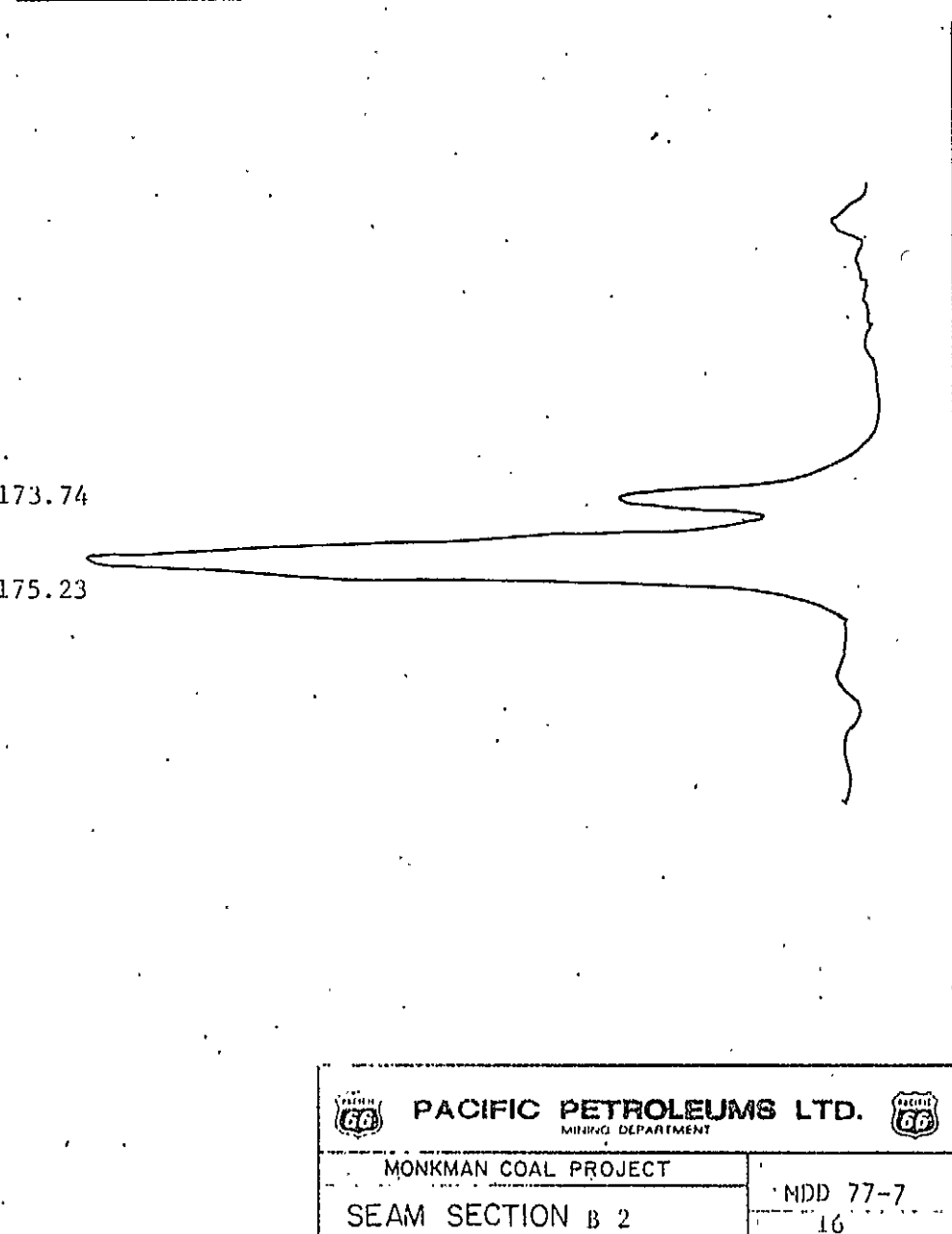
3.20

3.30



173.74

175.23



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

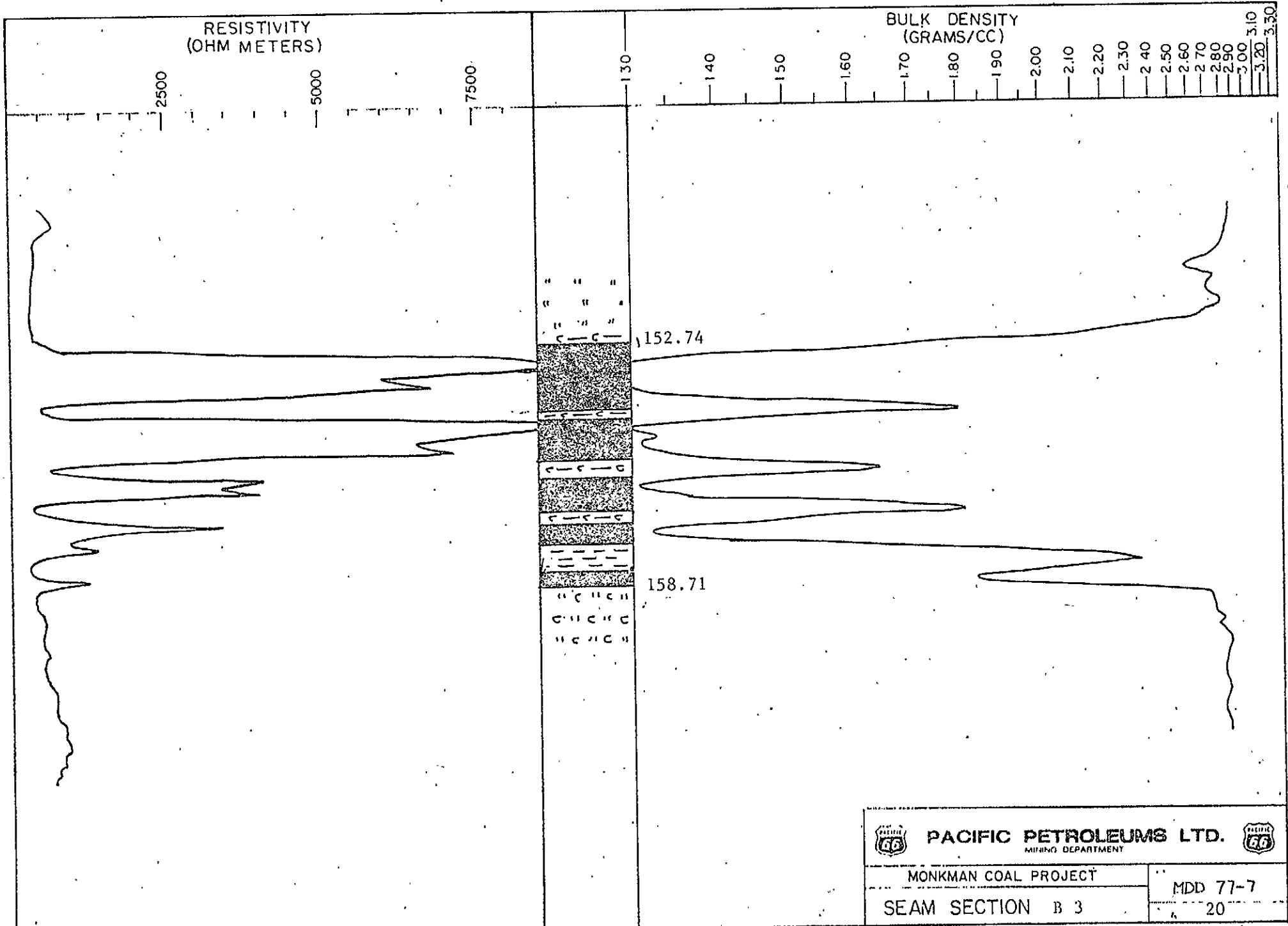




MONKMAN COAL PROJECT

SEAM SECTION B 2

MDD 77-7

16



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MDD 77-7
SEAM SECTION B 3		20

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

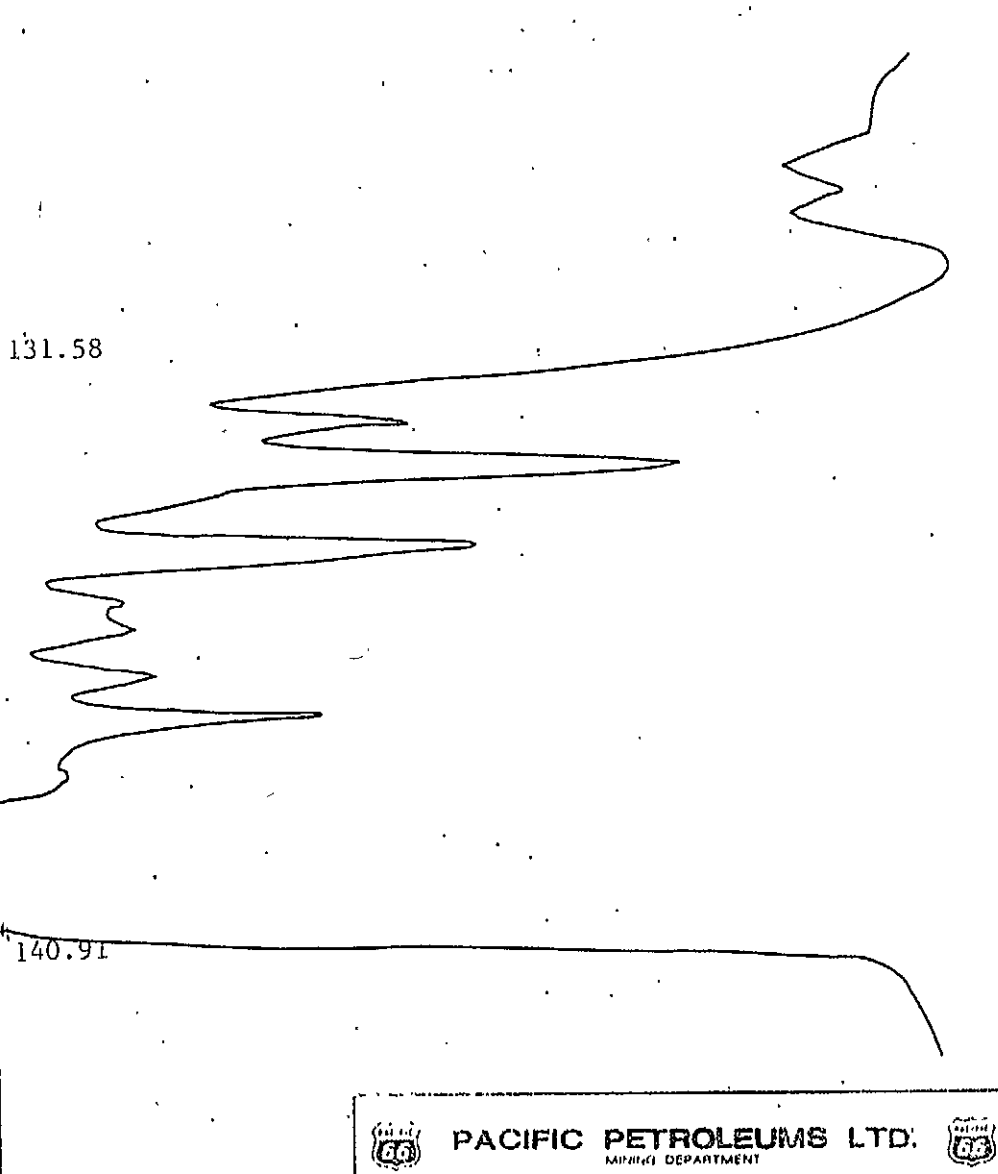
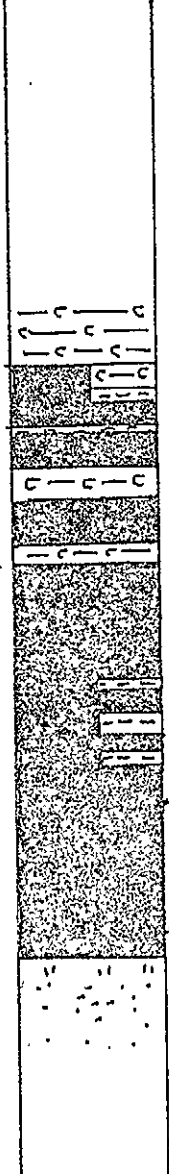
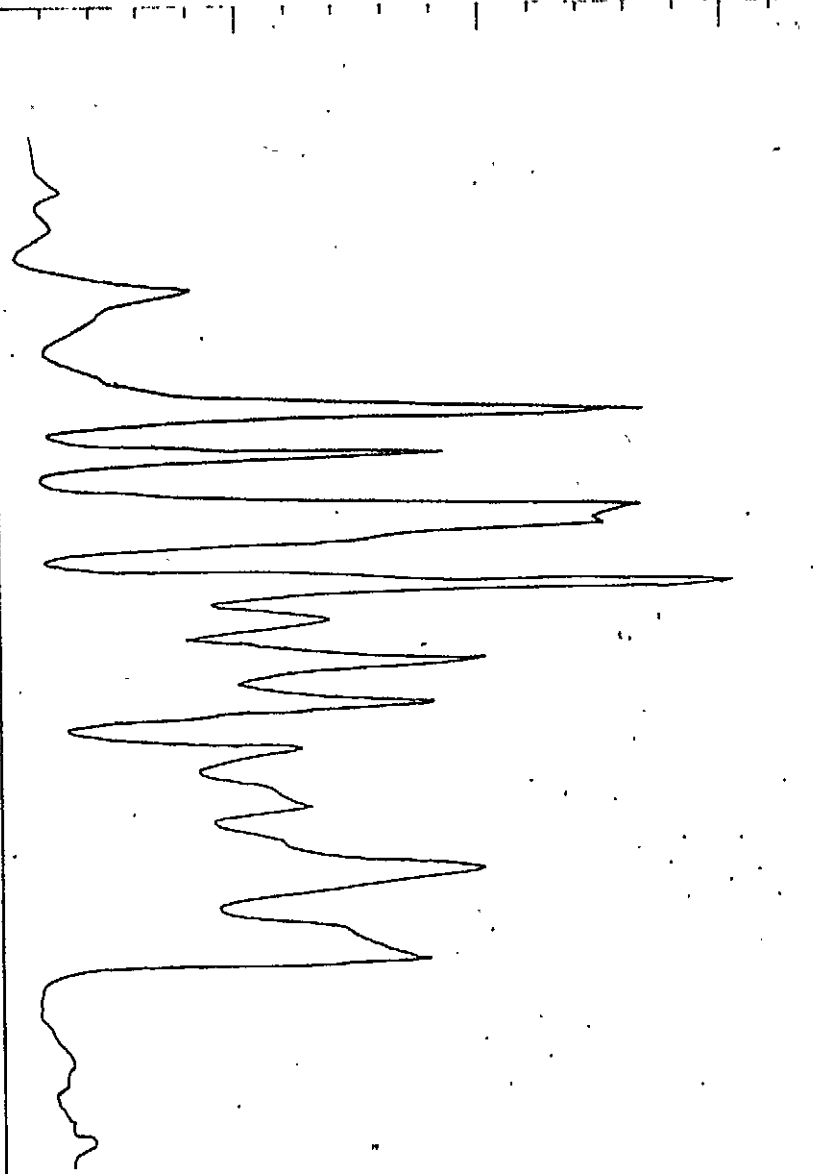
2.90

3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B.4

MIDD 77-7
20

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

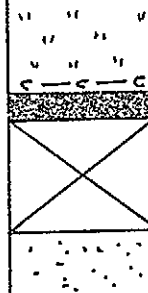
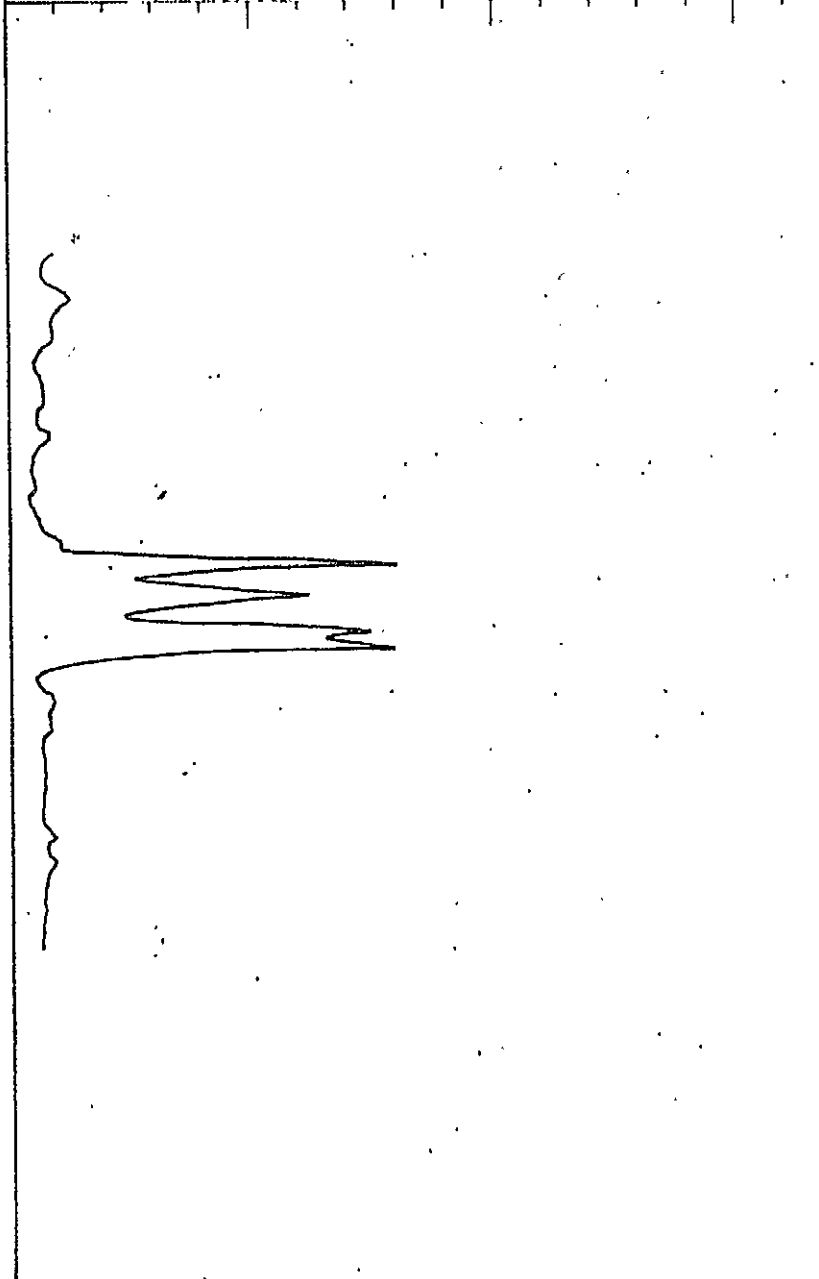
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3.00

3.10

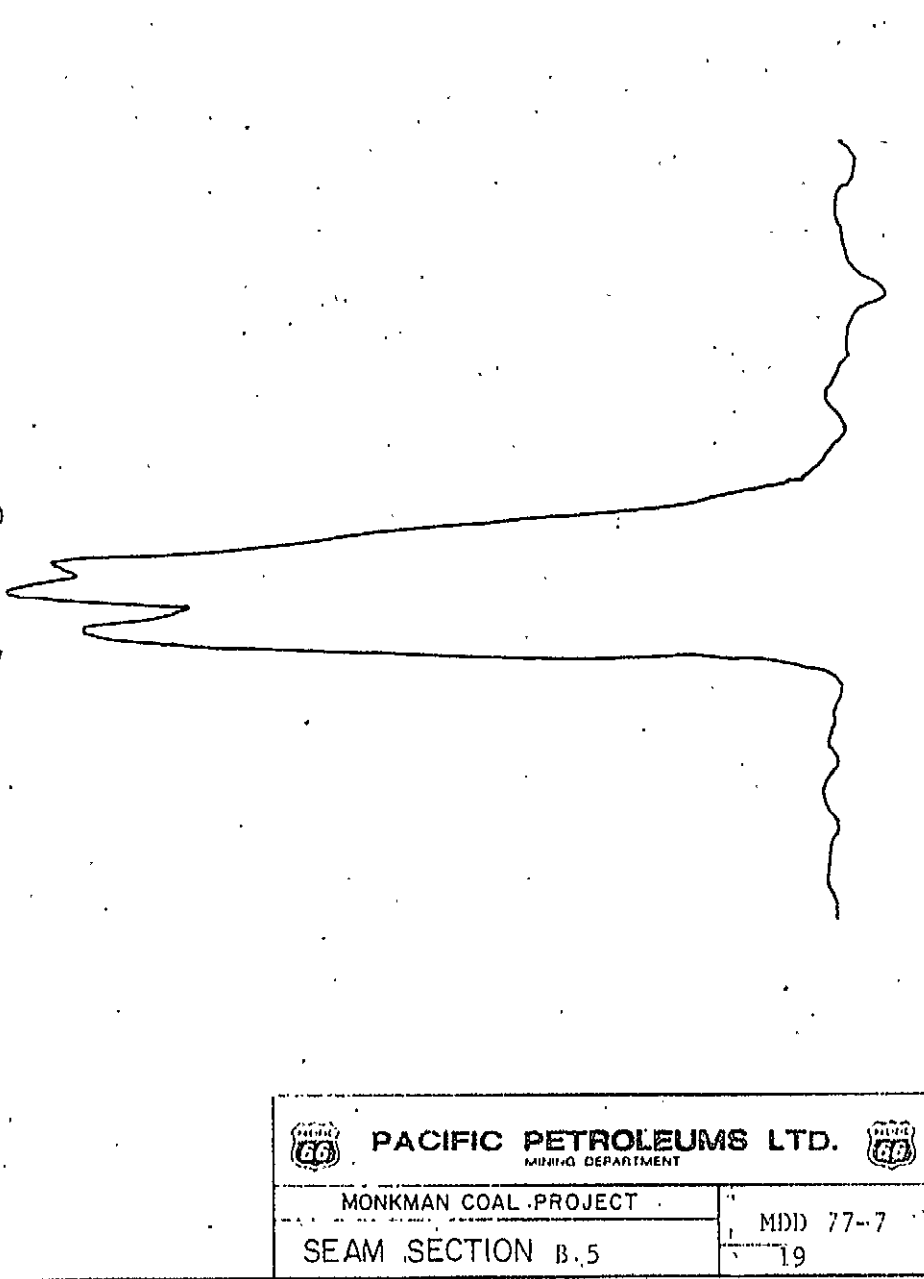
3.20

3.30



87.20

89.37



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT

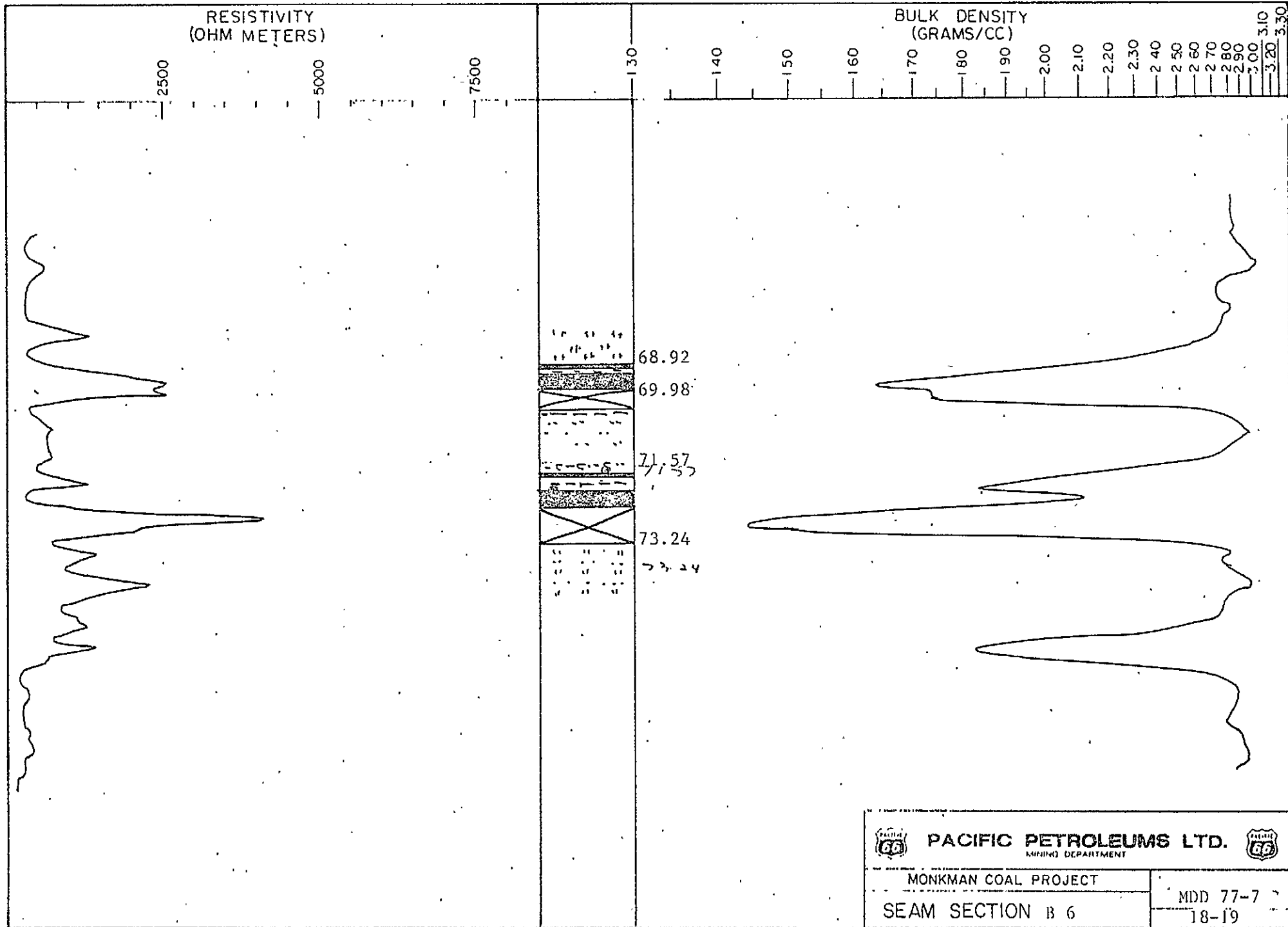




MONKMAN COAL PROJECT

SEAM SECTION B.5

MDD 77-7

19



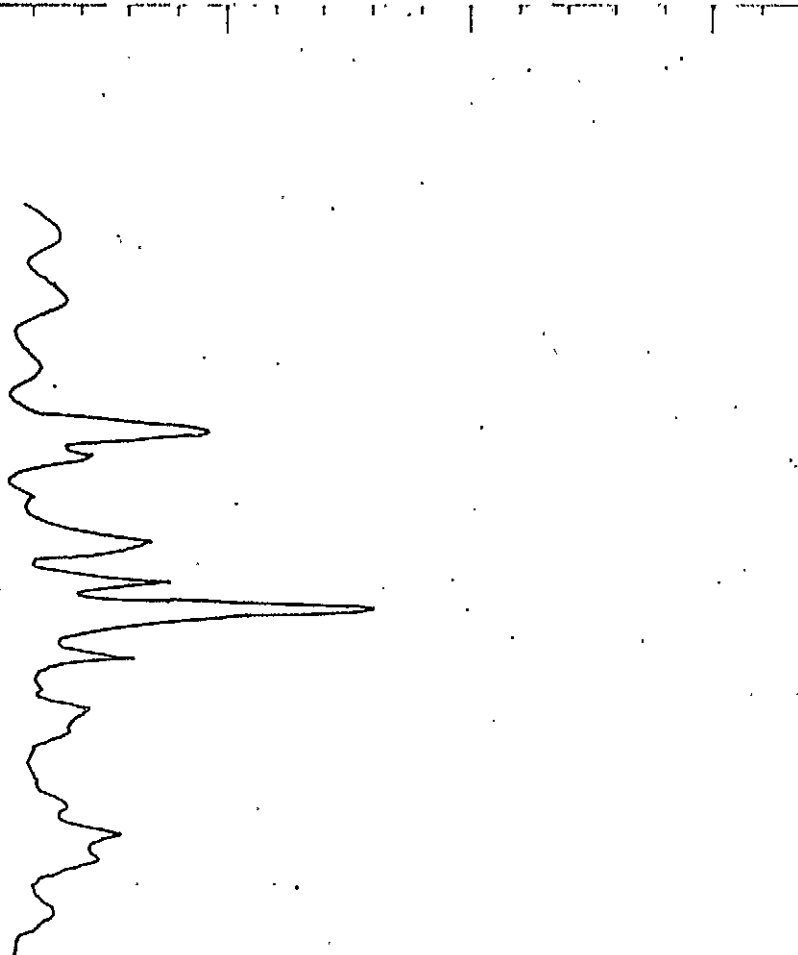
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MDD 77-7
SEAM SECTION B 6		18-19

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

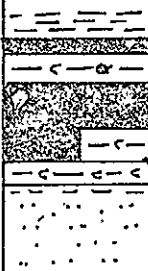
2.60

2.70

2.80

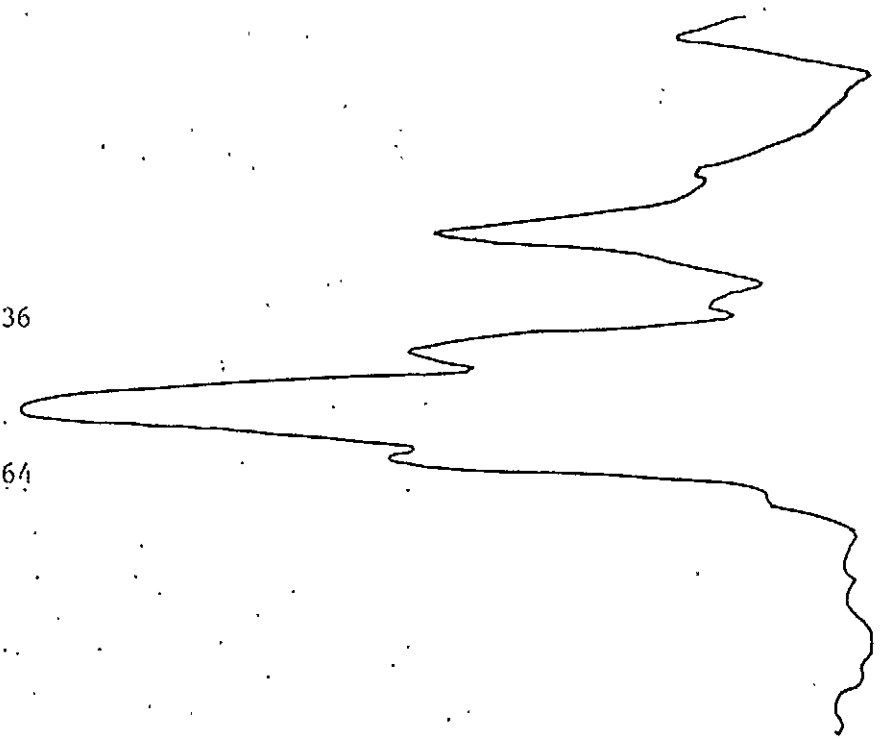
2.90

3.00 3.10 3.20 3.30



56.36

58.64



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 7

MDD 77-7

19

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

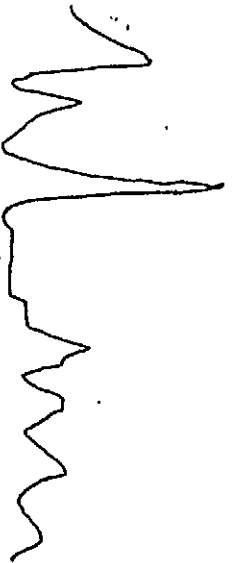
2.90

3.00

3.10

3.20

3.30



48.04

48.68



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT

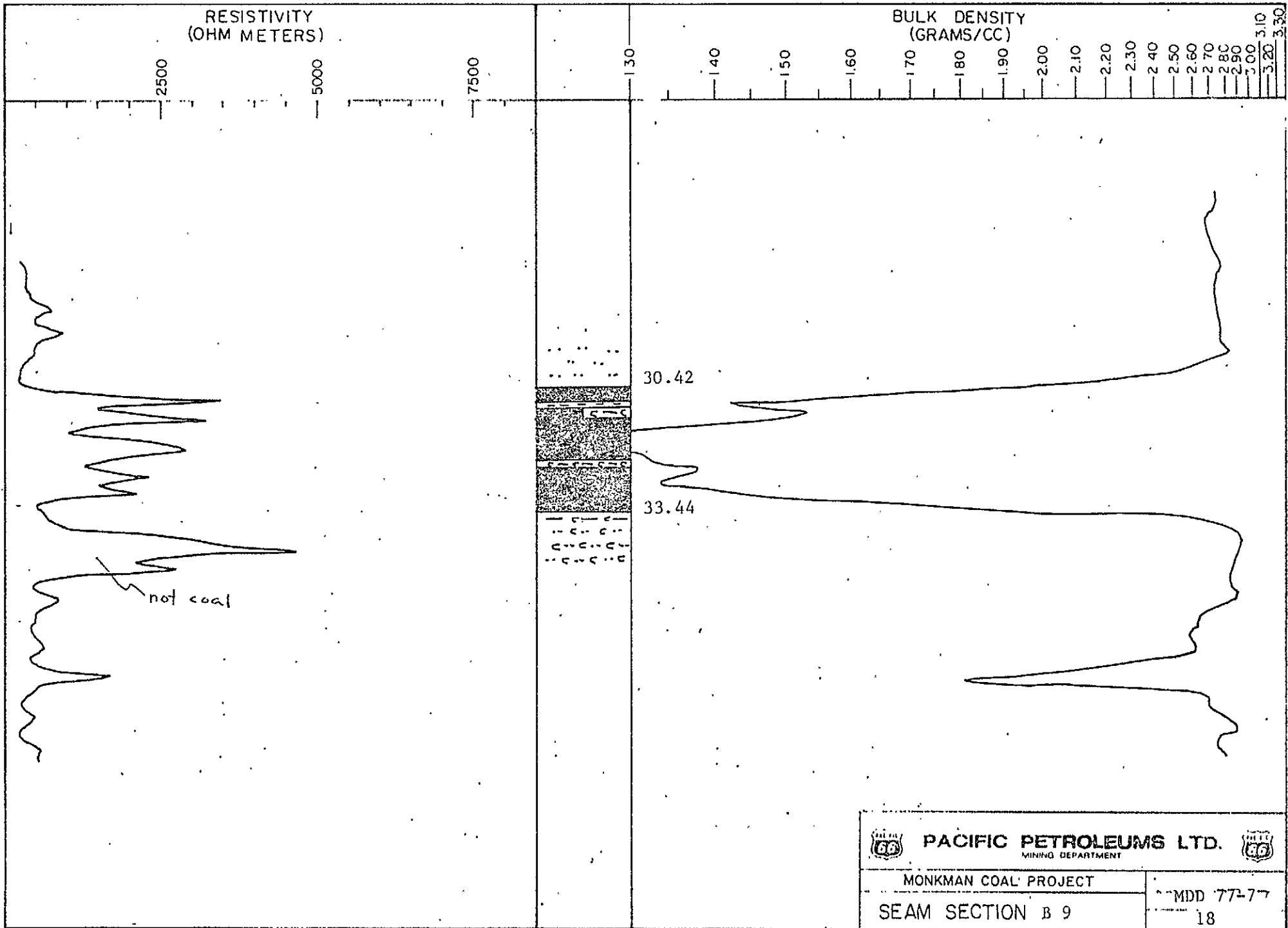


MONKMAN COAL PROJECT

SEAM SECTION B 8

MDD 77-7

19

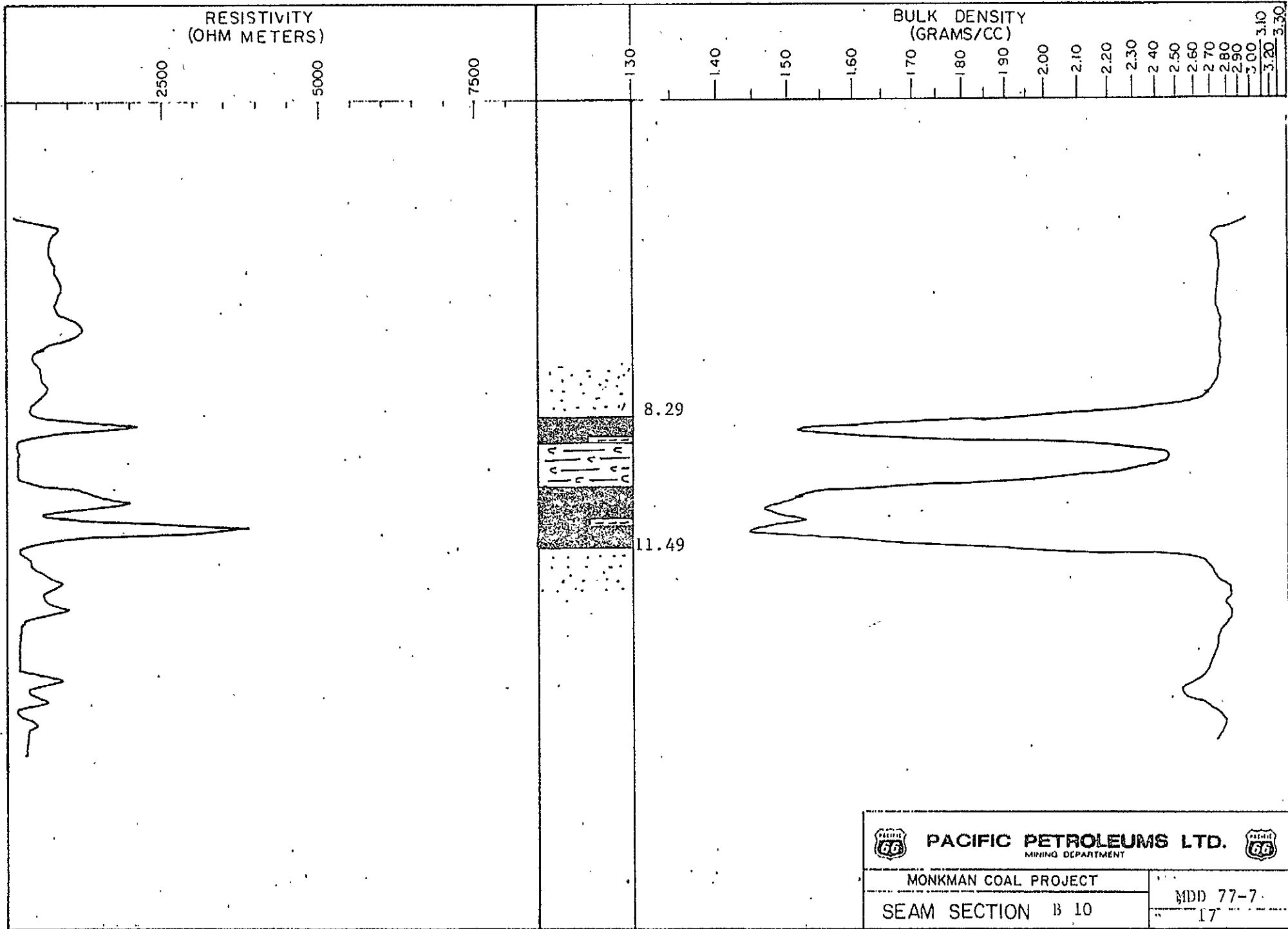




PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B 9

MDD 77-77
18



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MDD 77-7
SEAM SECTION B 10		17

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

310

320

330

87.44

94.27

Note Scale is 1:120



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

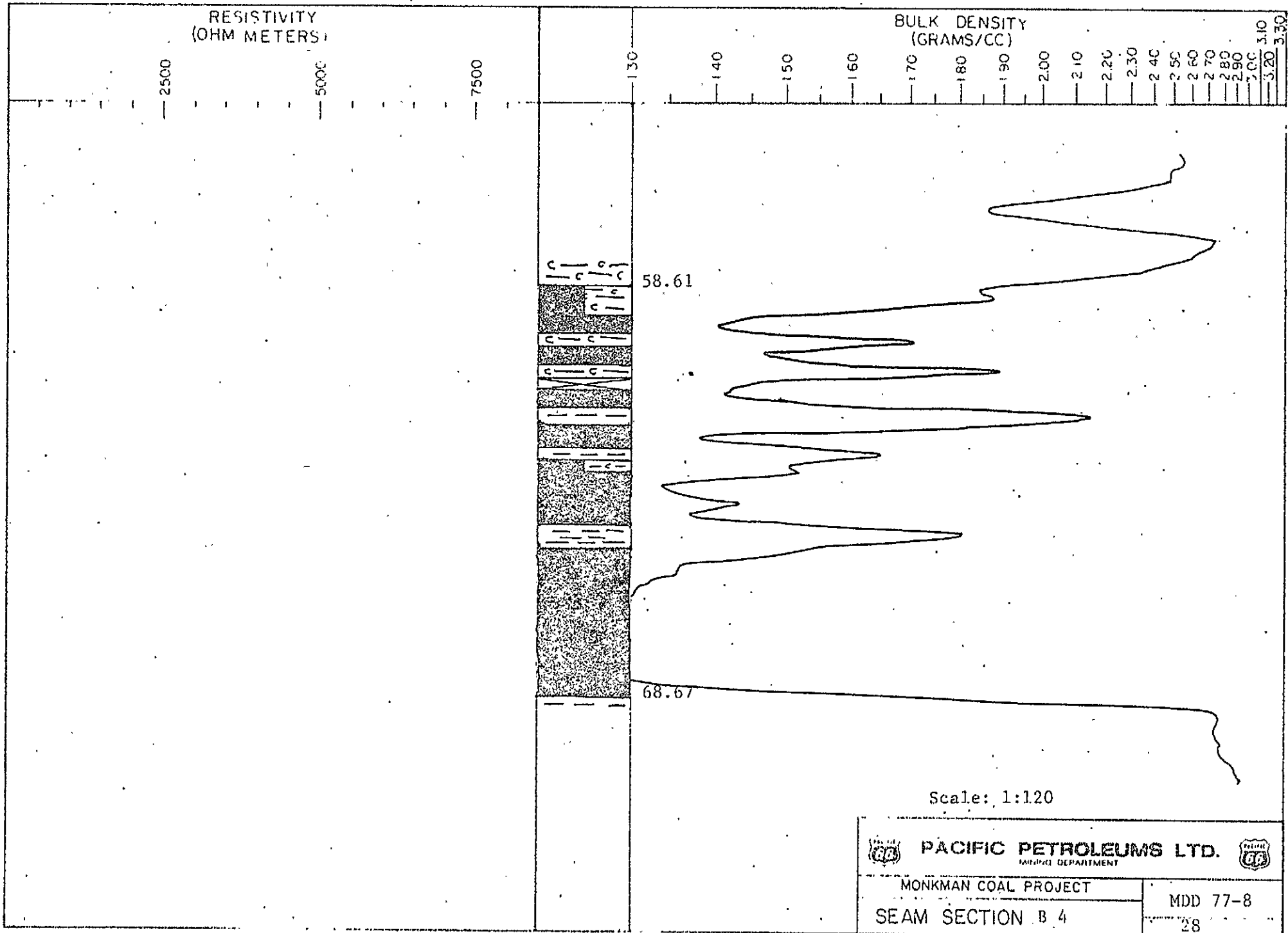


MONKMAN COAL PROJECT

SEAM SECTION B 3

MDD 77-8

28



RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

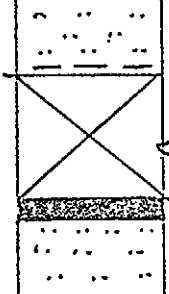
270

280

290

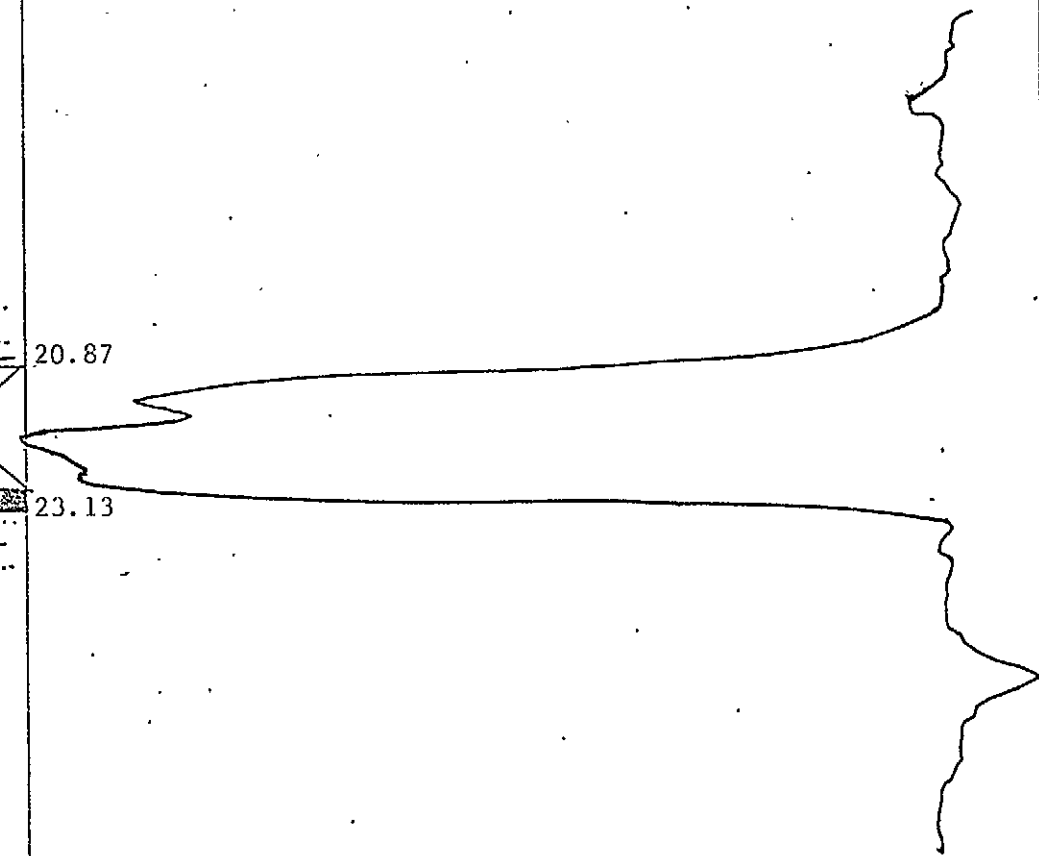
300

310
320
330



20.87

23.13



Scale 1:120

 **PACIFIC PETROLEUMS LTD.** 
MAPING DEPARTMENT

MONKMAN COAL PROJECT
SEAM SECTION B 5

NO 77-8
28

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

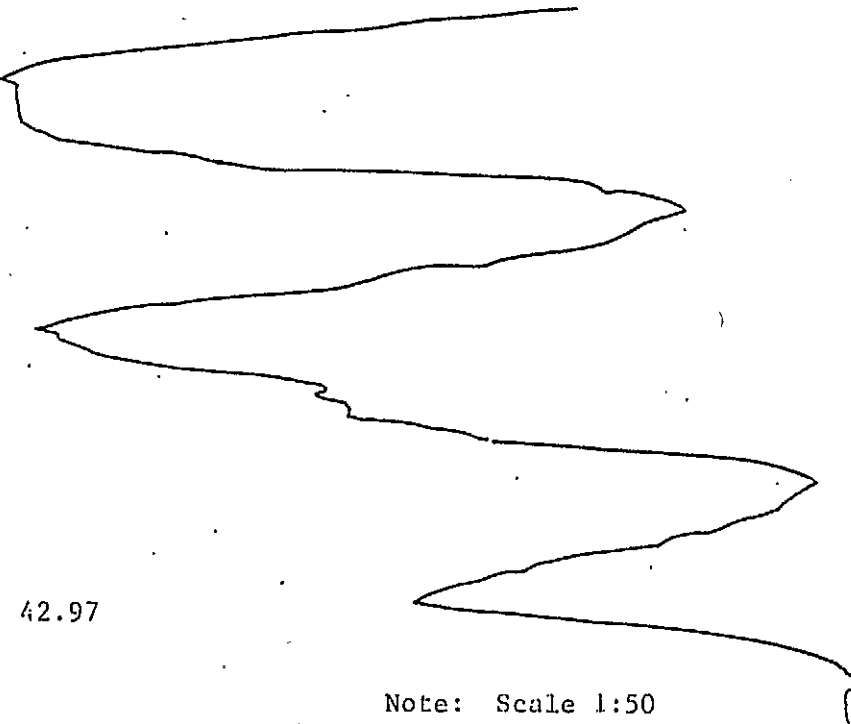
3.00

3.10

3.20



3.30

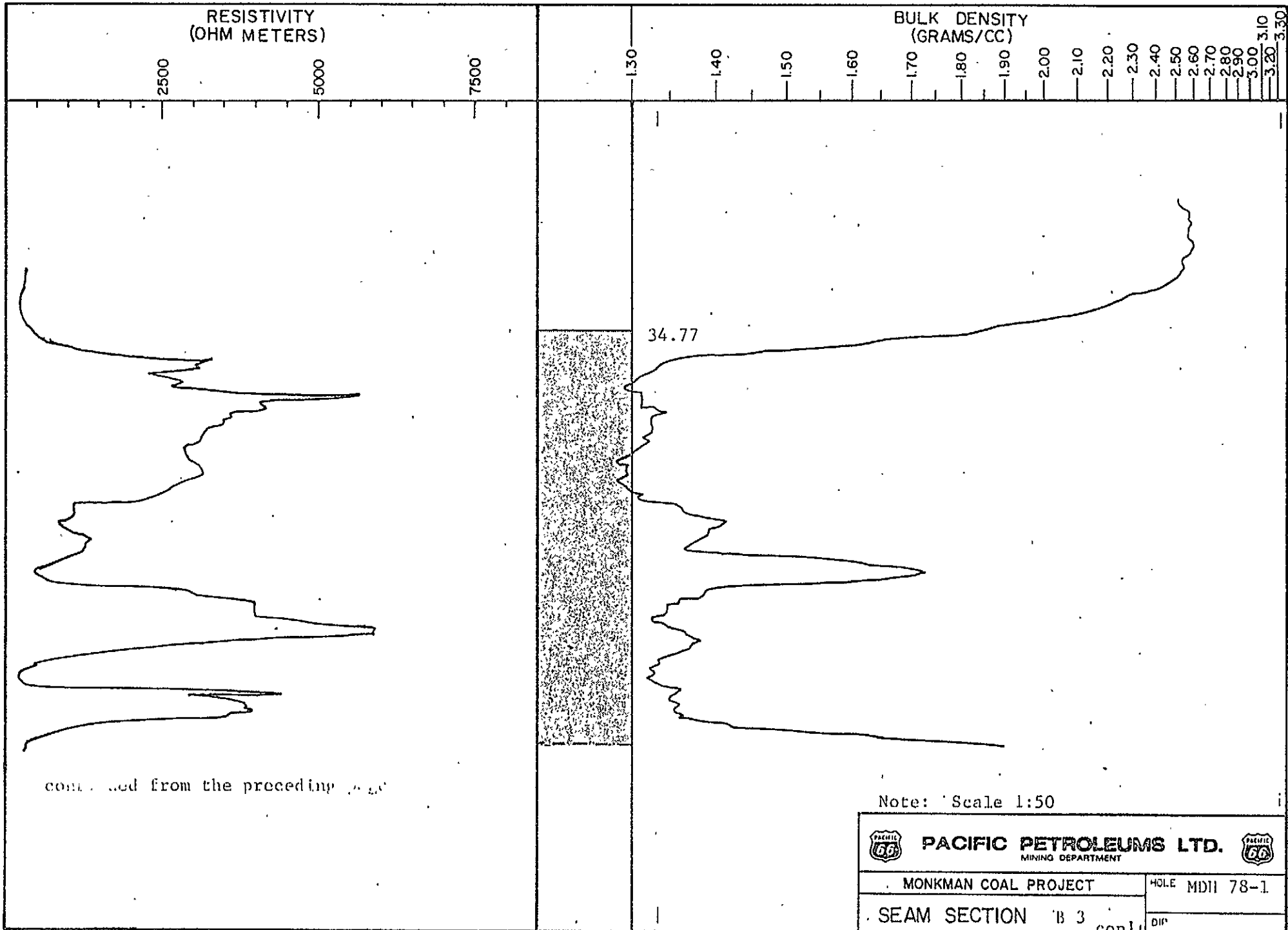
continued on the following page





42.97

Note: Scale 1:50

 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 		
MONKMAN COAL PROJECT		HOLE MDH 78-1
SEAM SECTION B-B: con'		DIP



 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 		
MONKMAN COAL PROJECT		HOLE MD11 78-1
SEAM SECTION 'B 3		DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

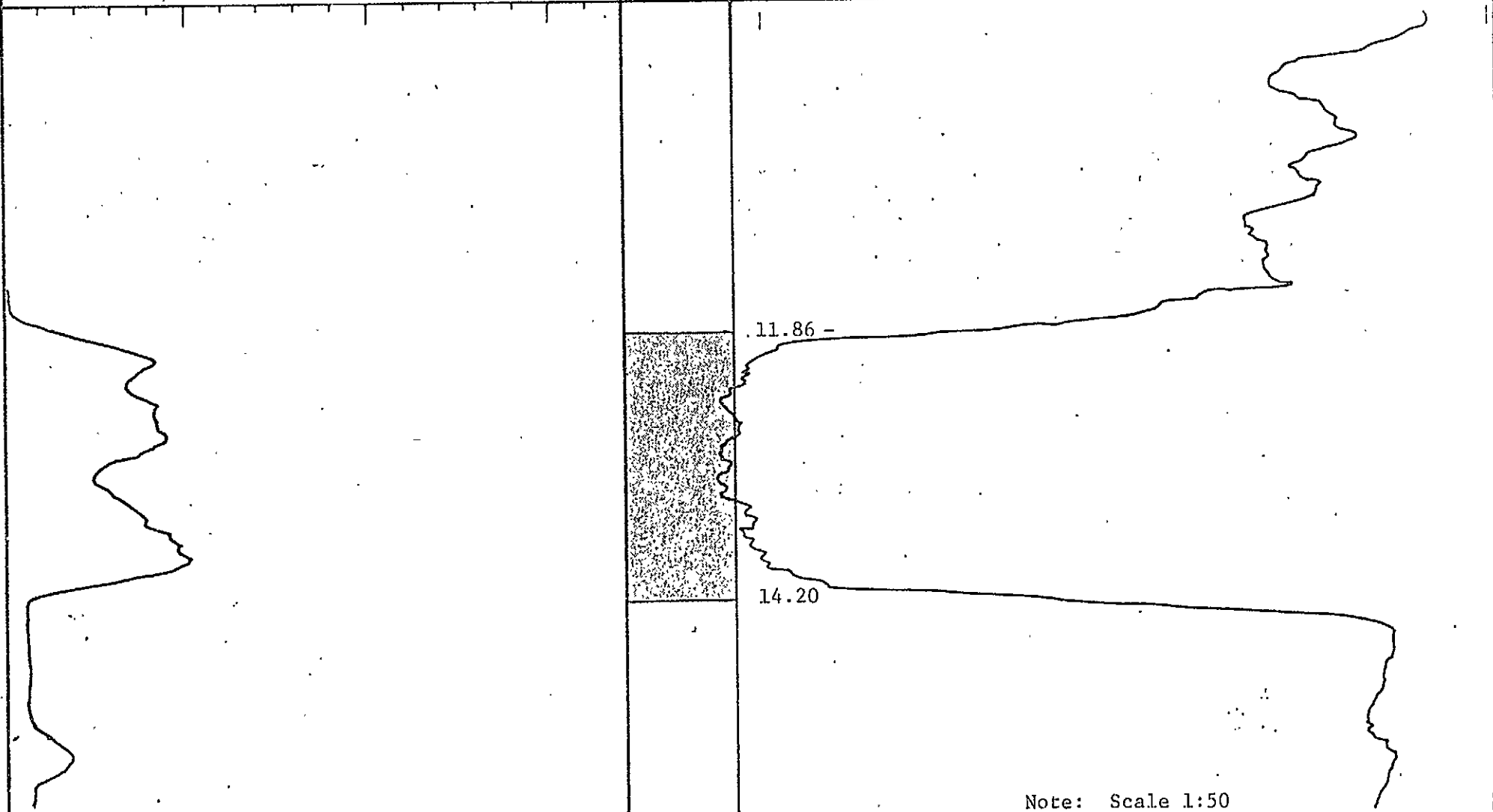
2.90

3.00

3.10

3.20

3.30



Note: Scale 1:50



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE M111 78-1

SEAM SECTION B 4

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

14.23

21.71



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MIMP 78-2

SEAM SECTION B 3

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30



8.60

15.80



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MDH-78-3

SEAM SECTION B 3

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

23.75

37.50



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



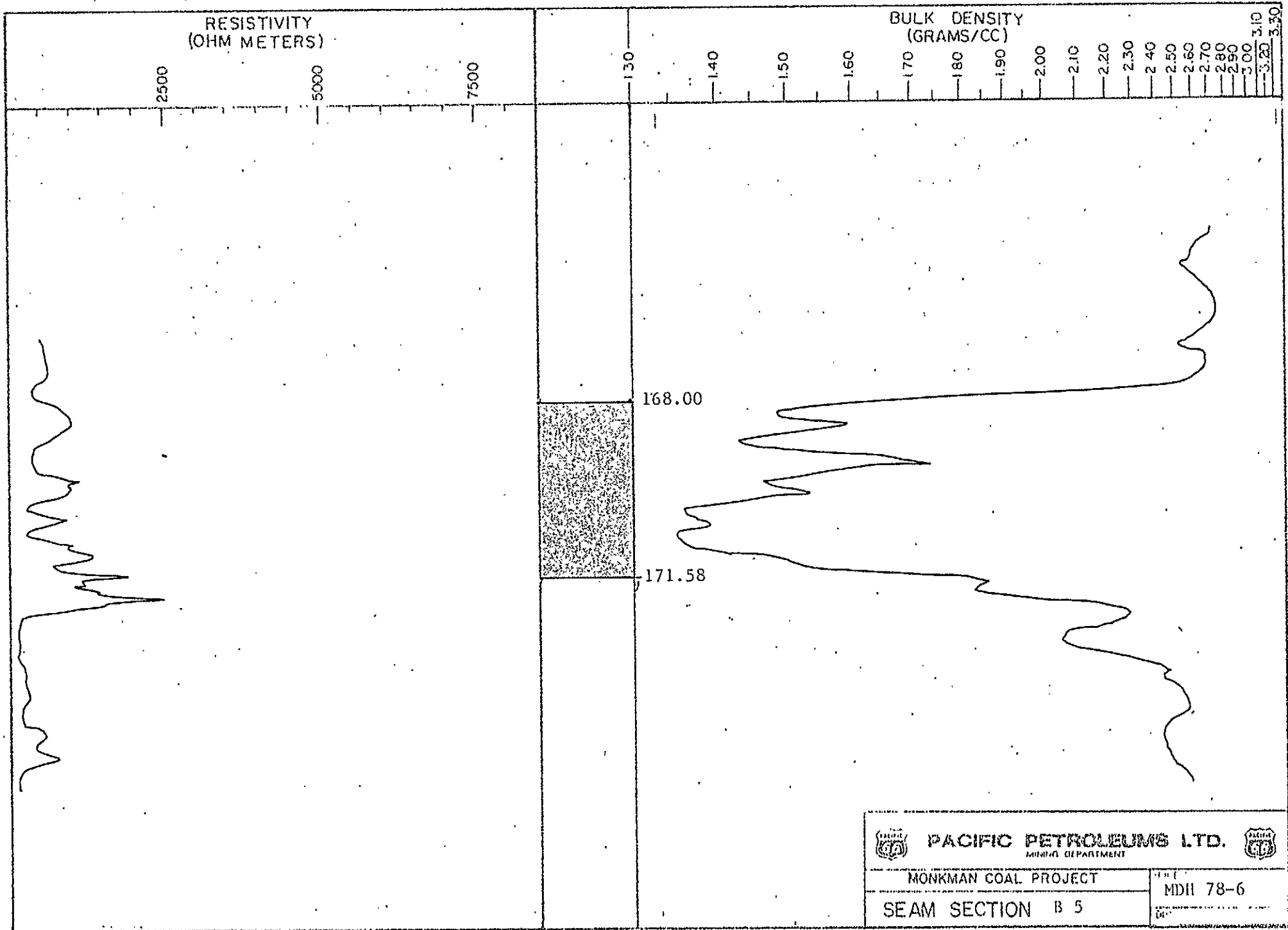
MONKMAN COAL PROJECT



HOLE

MDII 78-5

SEAM SECTION B 3

DIP




PACIFIC PETROLEUMS LTD.

 MINING DEPARTMENT
 MONKMAN COAL PROJECT
 SEAM SECTION B 5
 MDII 78-6

RESISTIVITY
(OHM METERS)

2500

5000

7500

1.30

1.40

1.50

1.60

BULK DENSITY
(GRAMS/CC)

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

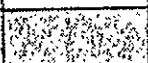
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3.00

3.10

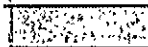
3.20

3.30



135.70

136.48



146.00

146.55



PACIFIC PETROLEUMS LTD.

KINGDOM OF SAUDI ARABIA



MONKMAN COAL PROJECT

MDH 78-6

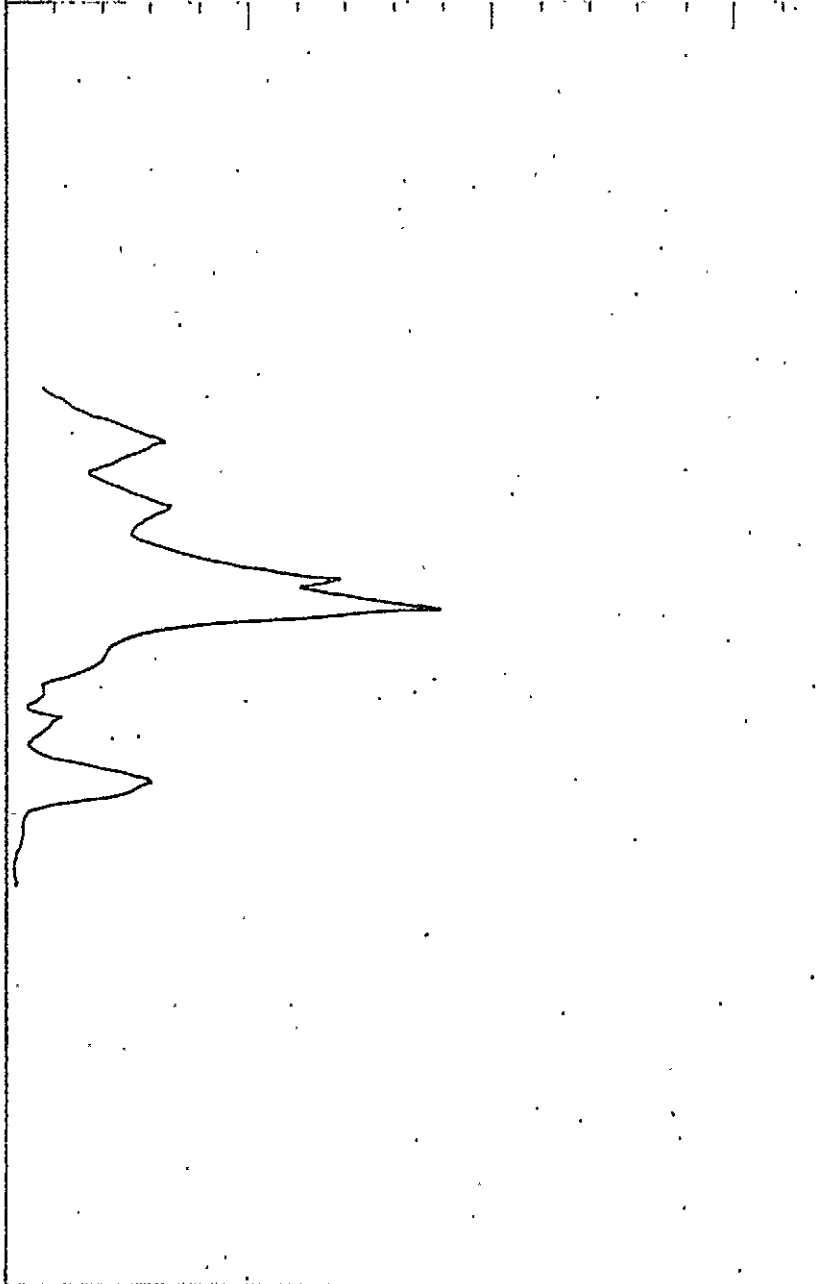
SEAM SECTION B 6

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

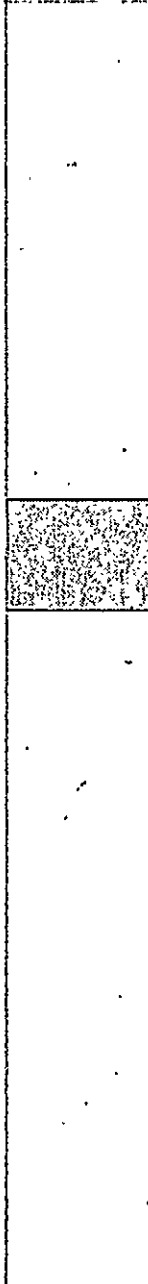
2.70

2.80

2.90

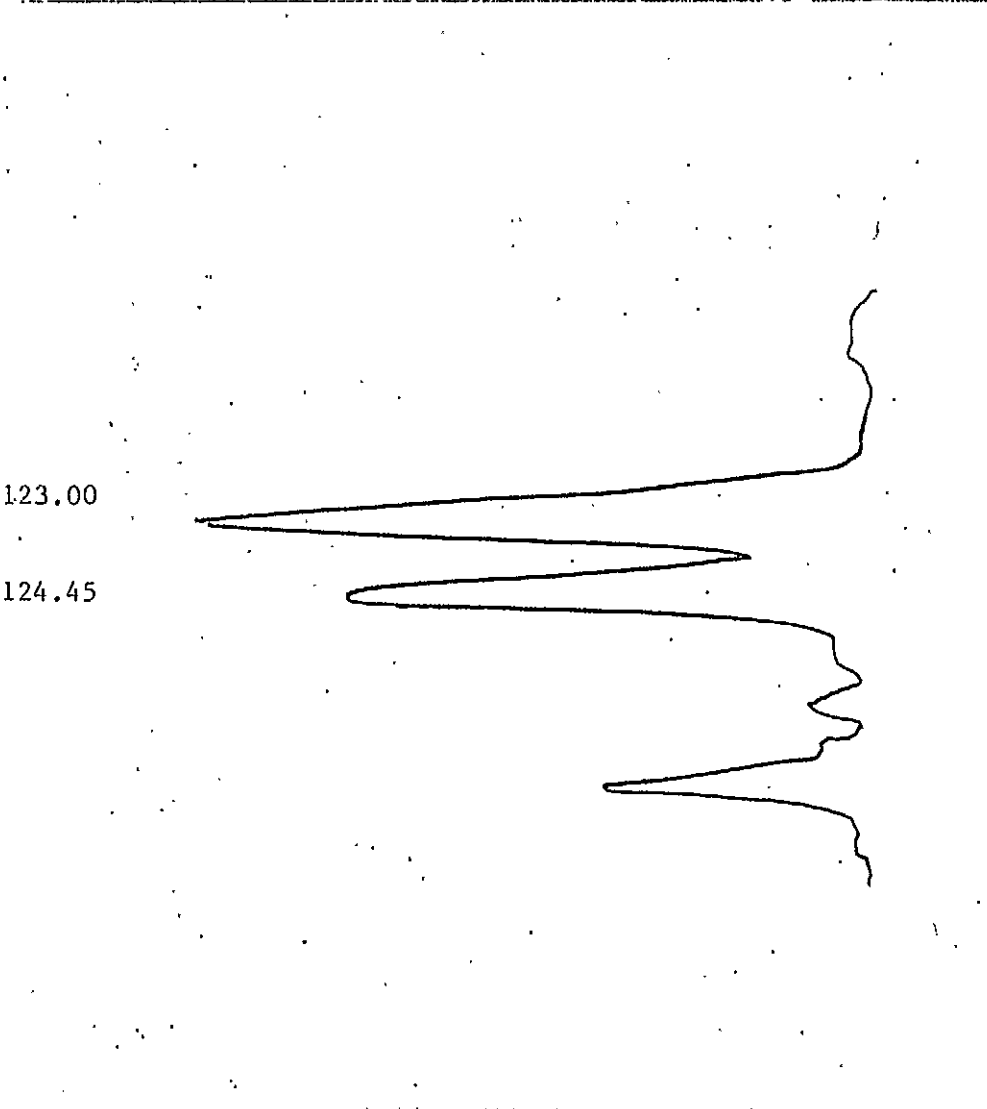
3.00

130



123.00

124.45



PACIFIC PETROLEUMS LTD.



MONKMAN GOAL PROJECT

SEAM SECTION B 7

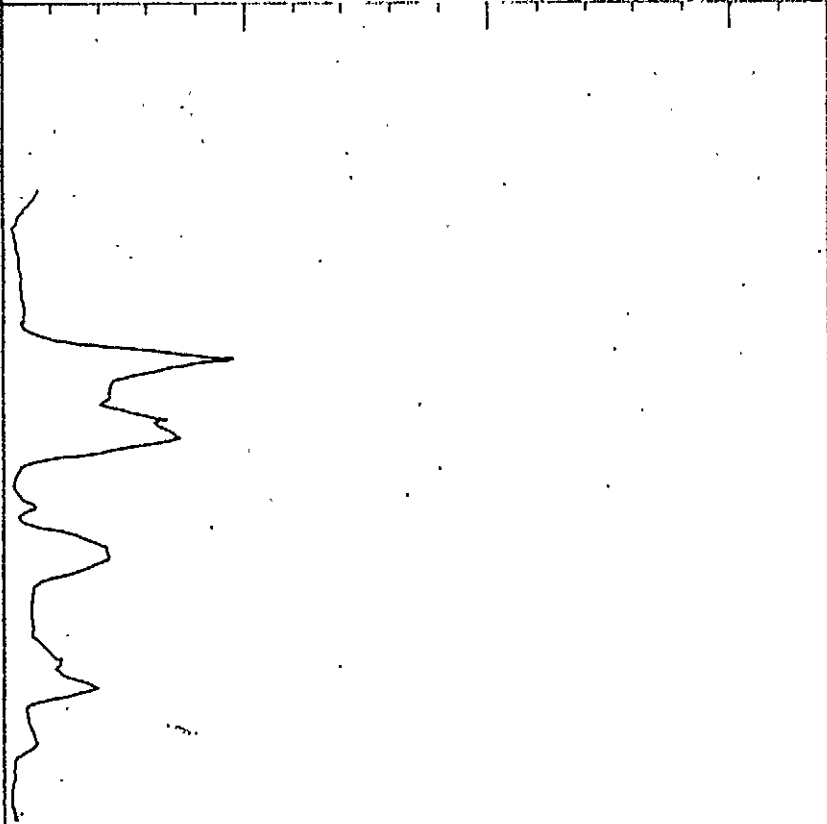
MDH 78-6

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

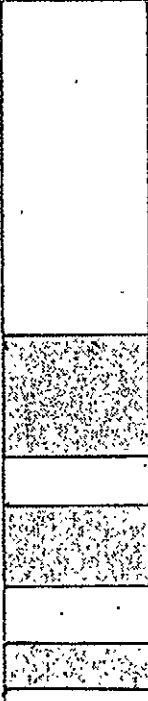
2.90

3.00

3.10

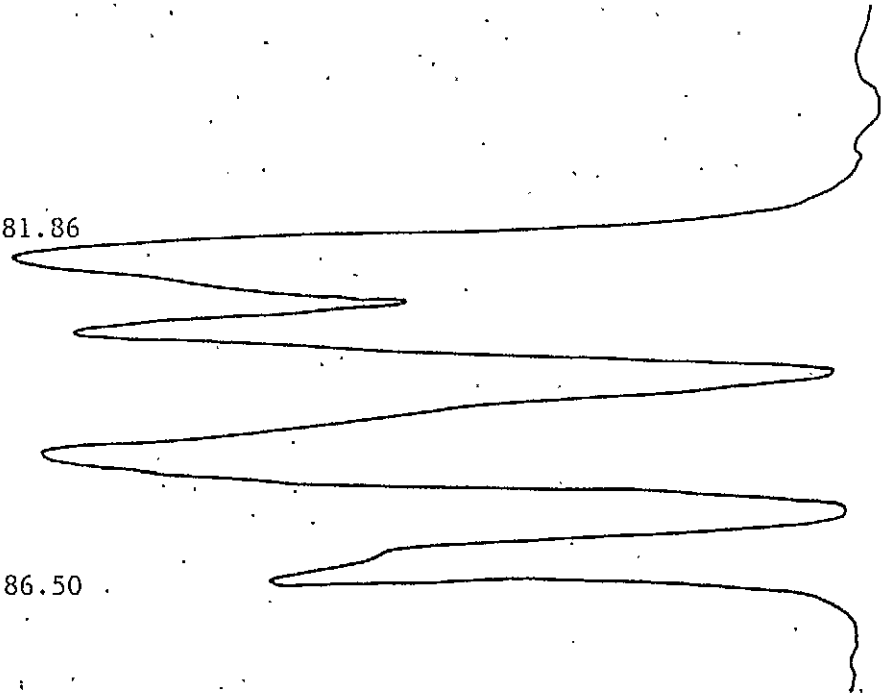
3.20

3.30



81.86

86.50



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 8

MDH 78-6

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

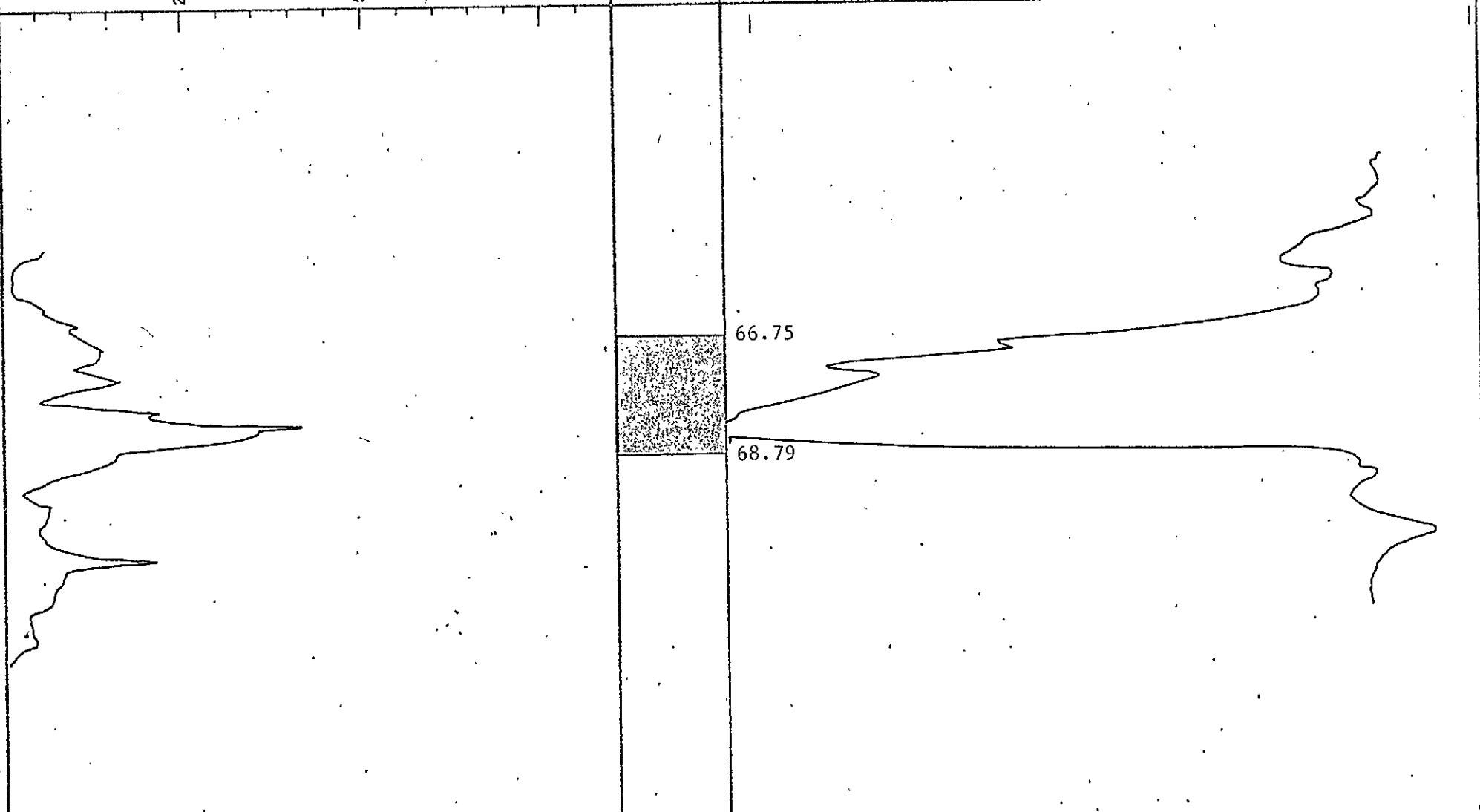
2.90

3.00

3.10

3.20

3.30



66.75

68.79



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 9

HOLE
MDH 78-6

GIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

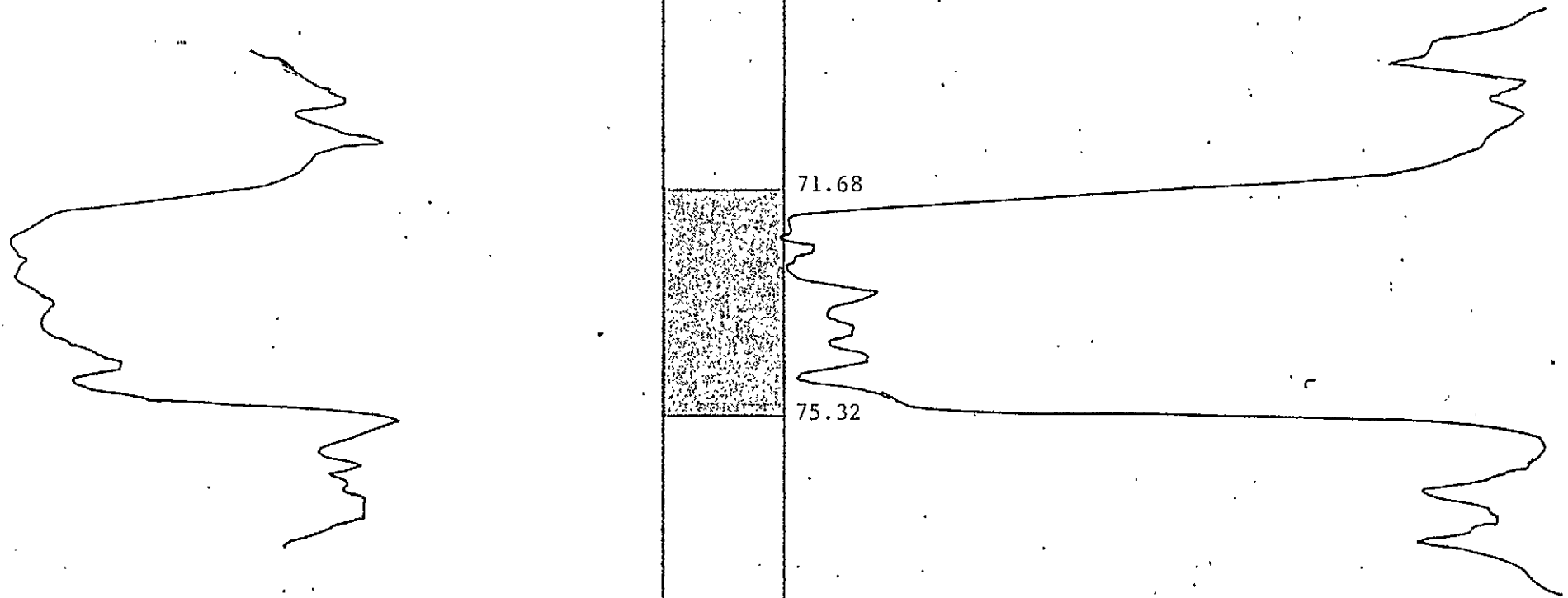
2.90

3.00

3.10

3.20

3.30



71.68

75.32



PACIFIC PETROLEUMS LTD.



MINING DEPARTMENT

MONKMAN COAL PROJECT

MDEI 78-9

SEAM SECTION B 3

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

113.68

116.65



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MDH 78-9

SEAM SECTION B 1

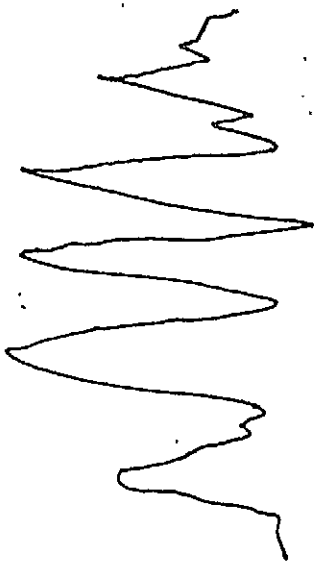
DIP

RESISTIVITY
WELL-FIELD

SUBS. DEPTH
(US. FEET)

GAMMA RAY LOG

NEUTRON LOG



49.00

52.20

PACIFIC PETROLEUM
 HUMANITARIAN PROGRAM
 TEAM SECTION B 8
 MDH 78-10

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY -
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

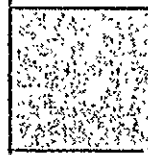
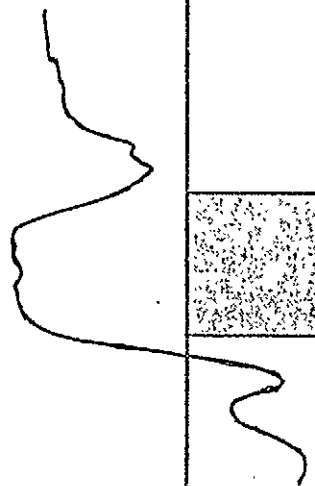
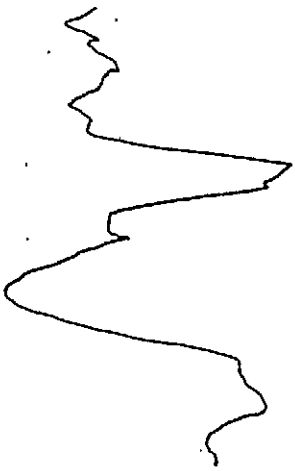
3.10

3.20

3.30

GAMMA RAY LOG

NEUTRON LOG



30.70

32.56



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

TITLE
MDH 78-10

SEAM SECTION 13 9

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

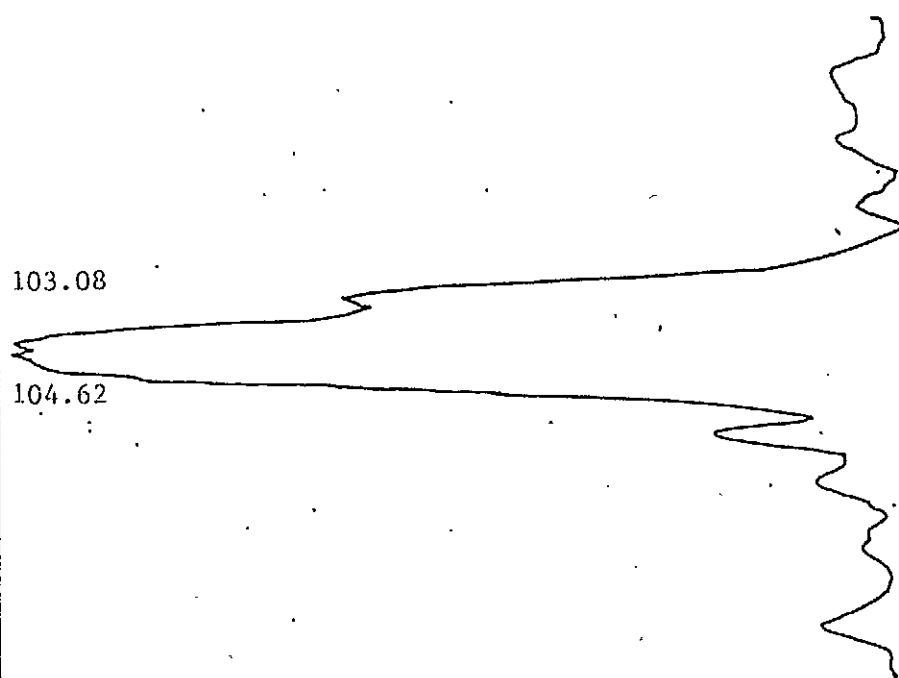
3.10

3.20

3.30

103.08

104.62



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MD11 78-13

SEAM SECTION B I I

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

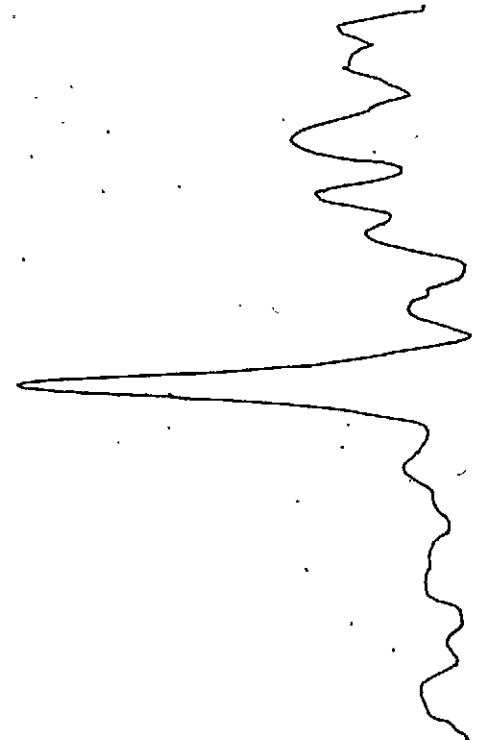
310

320

330

87.20

87.69



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 2 L

MIII 78-13

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

76.90

78.59



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

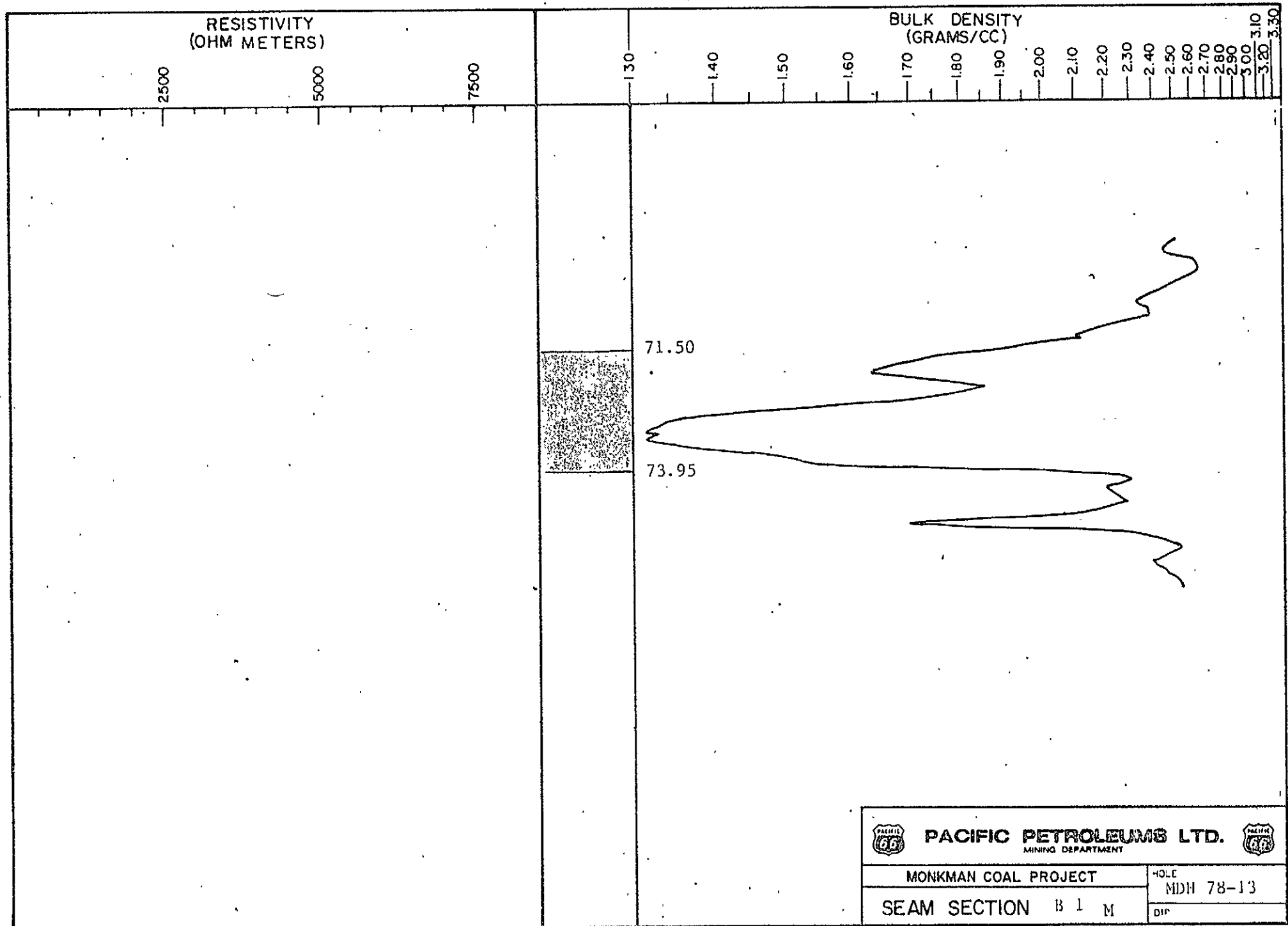



MONKMAN COAL PROJECT

HOLE
MD11 78-13

SEAM SECTION B 3 L

DIP



	
MONKMAN COAL PROJECT	
SEAM SECTION B I M	
HOLE MDN 78-13	
DIP	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

64.90

65.46



PACIFIC PETROLEUMS LTD.

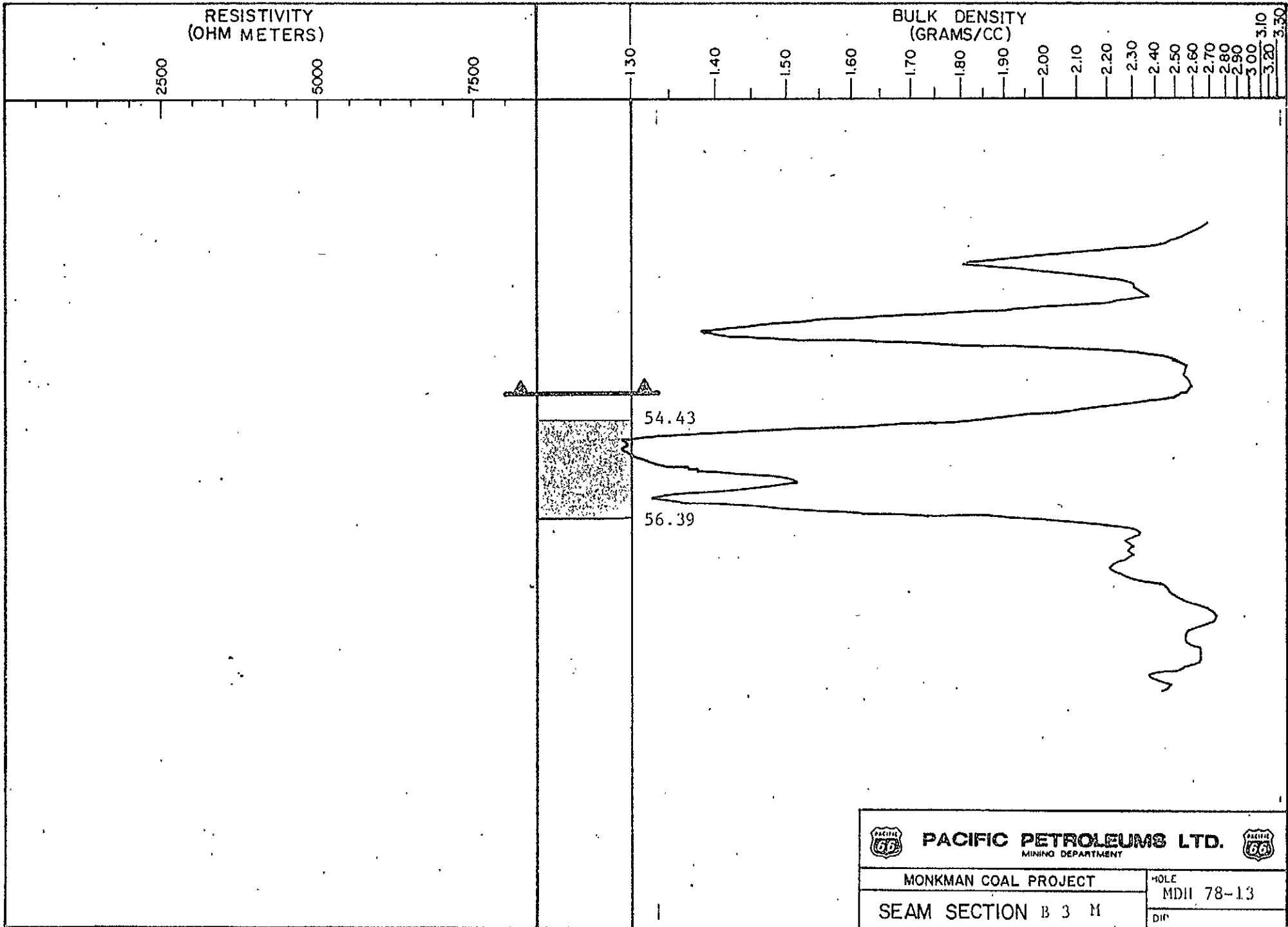
MINING DEPARTMENT





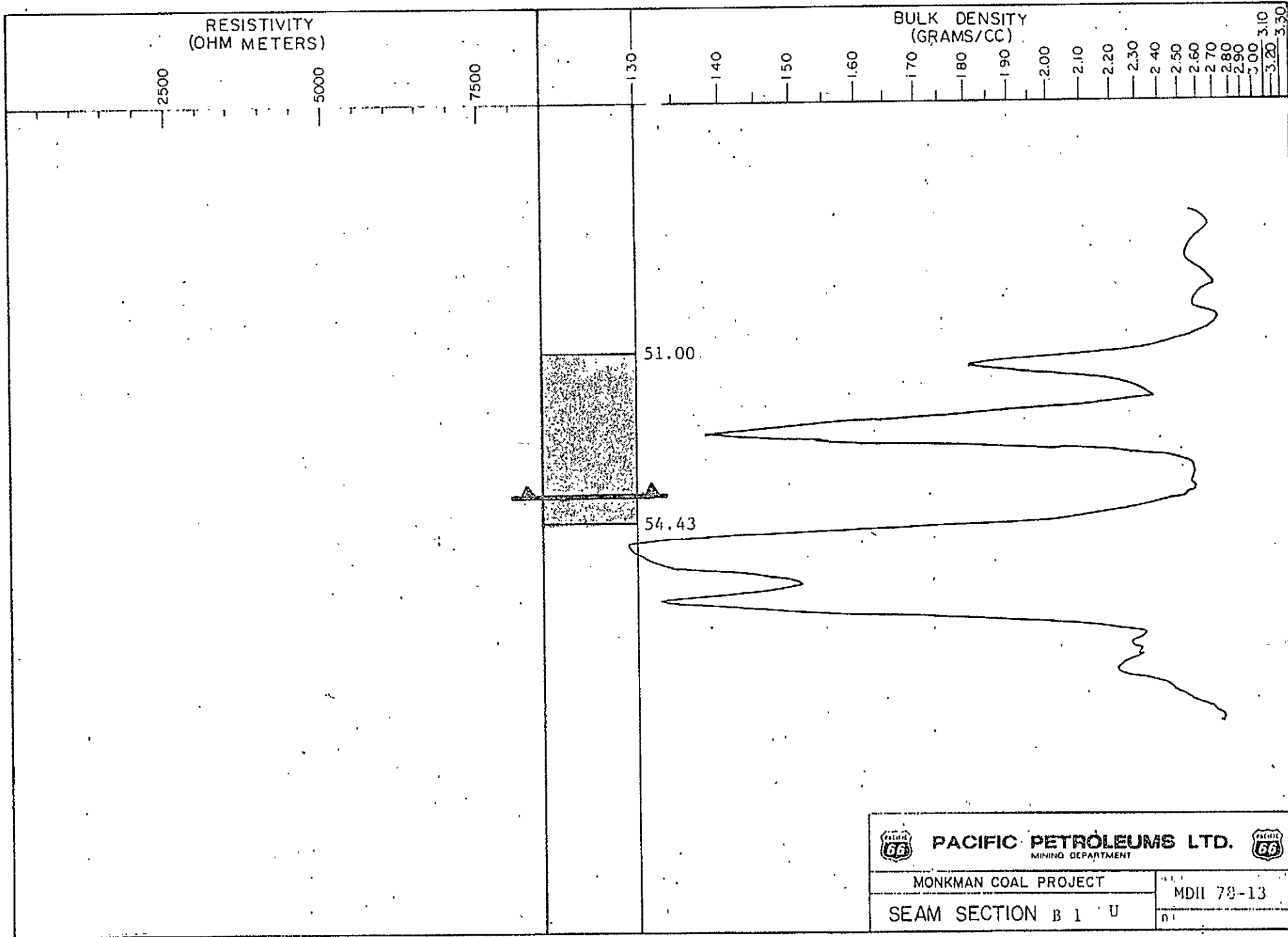
MONKMAN COAL PROJECT



SEAM SECTION B 2 M

MDH, 78-13



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>		
MONKMAN COAL PROJECT		HOLE MDH 78-13
SEAM SECTION B 3 M		DI*



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B 1 U	
MDII 78-13	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

43.59

44.15



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MDH 78-13

SEAM SECTION B 2 U

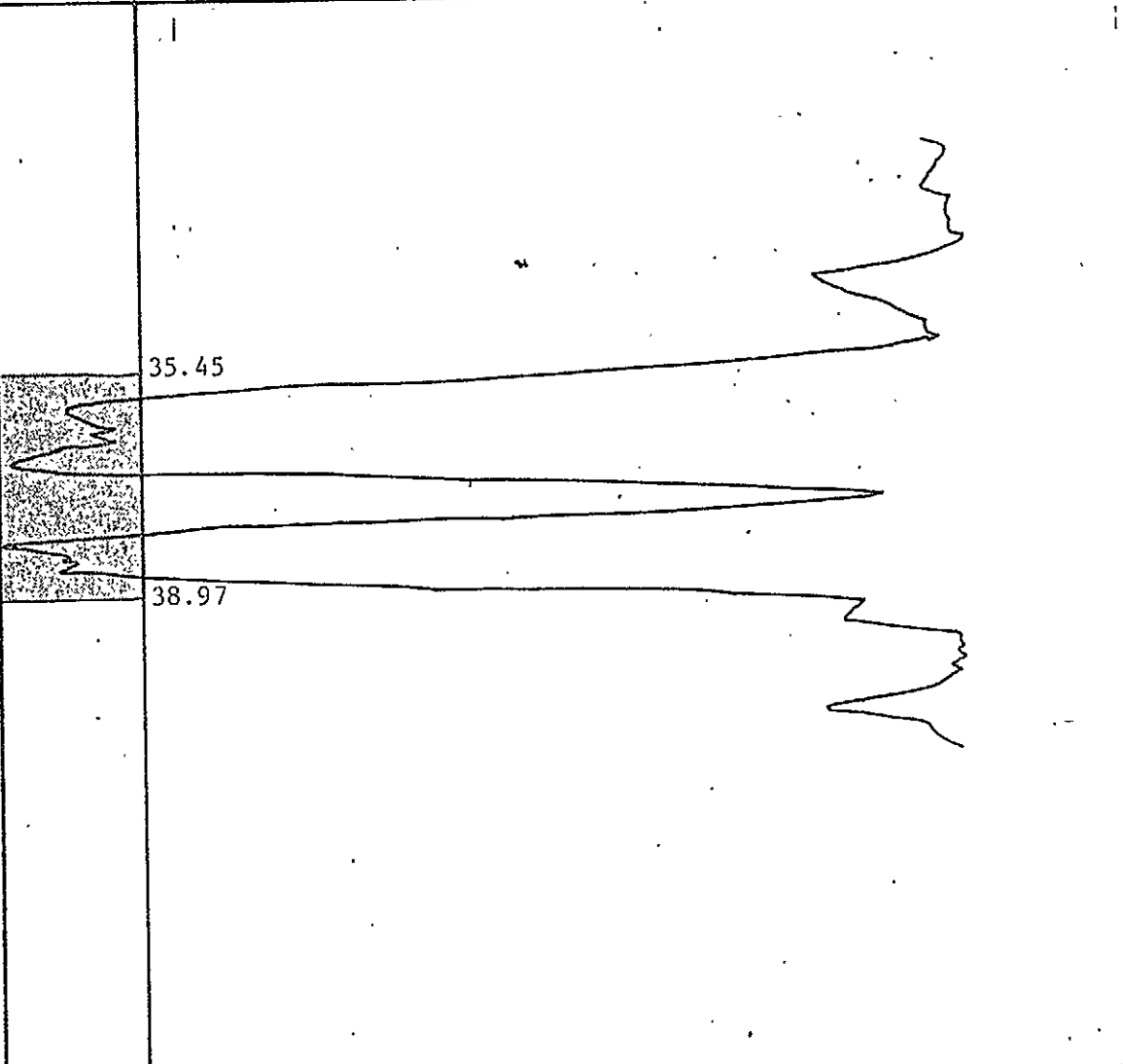
DIP



RESISTIVITY
(OHM METERS)

2500
5000
7500

BULK DENSITY
(GRAMS/CC)

1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MD11 78-13
SEAM SECTION B 3 U	DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

51.50 CASING

19.67



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MDH 78-13

SEAM SECTION B 4 U

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

76.33

86.92

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

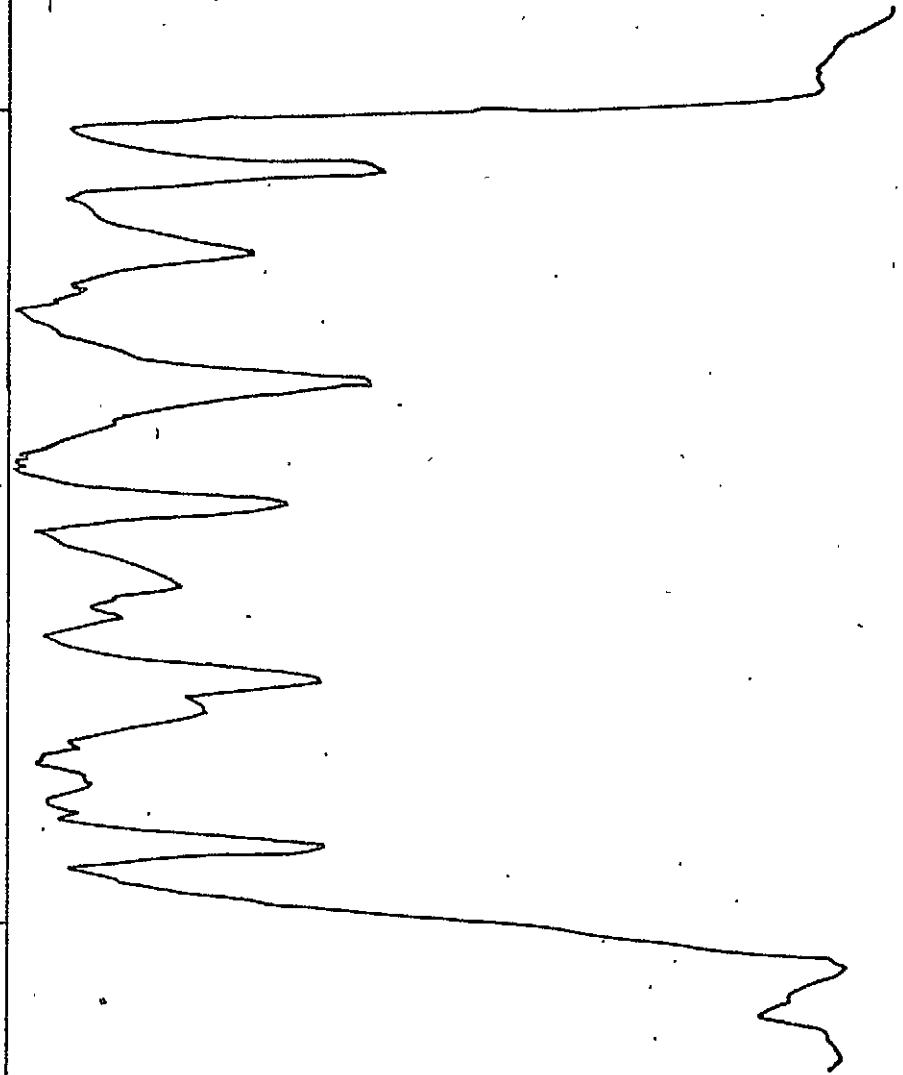
2.80

2.90

3.00

3.10

3.30



PACIFIC PETROLEUMS LTD.



MINING DEPARTMENT

MONKMAN COAL PROJECT

HOLE: MUH - 78-15

SEAM SECTION B 9

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

56.07

56.82



PACIFIC PETROLEUMS LTD.



MINING DEPARTMENT

MONKMAN COAL PROJECT

HOLE:

SEAM SECTION

B 10

MJL - 78 - 15

DIP:

RESISTIVITY
(OHM METERS)

2500

5000

7500

30.87

31.82

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

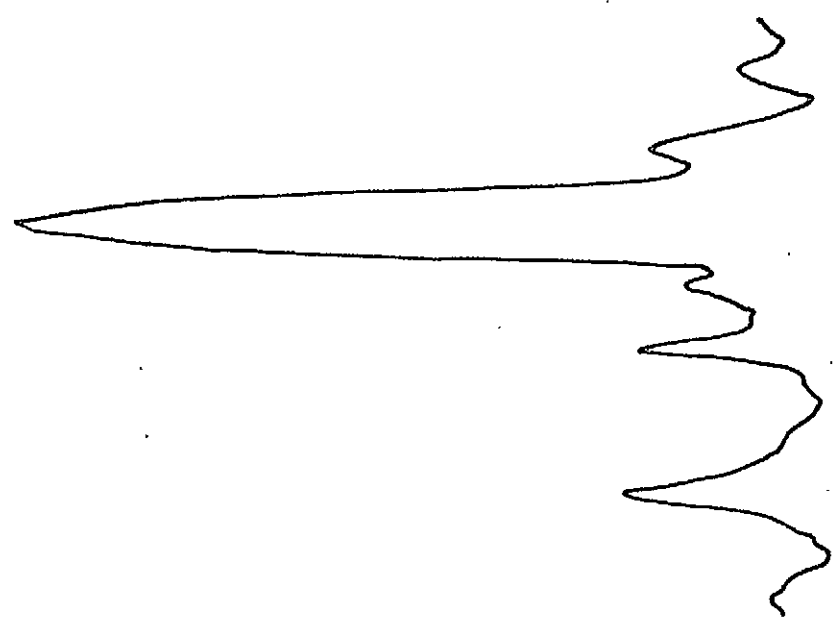
2.90

3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



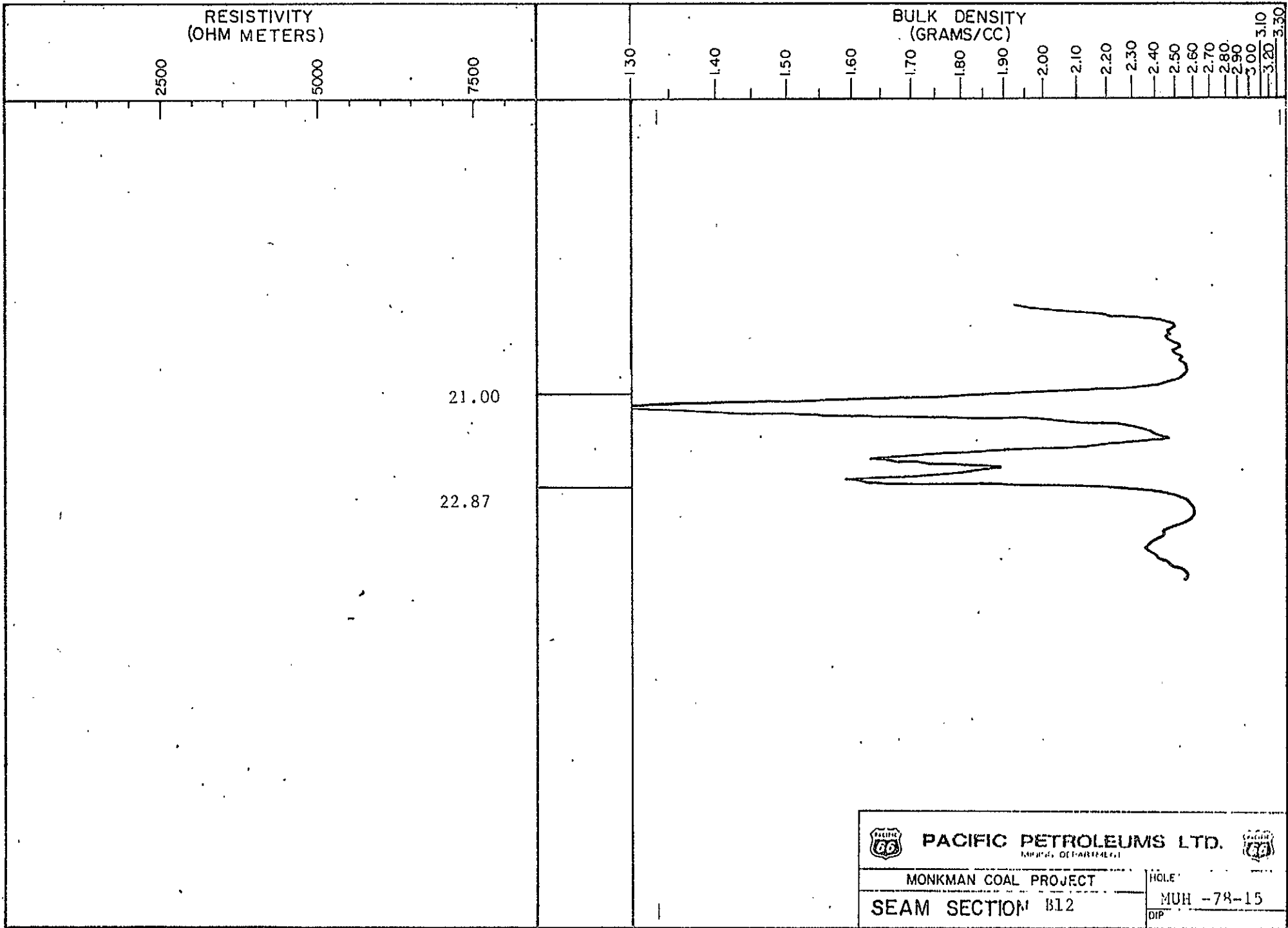
MONKMAN COAL PROJECT



HOLE:

SEAM SECTION B11

MUH -78-15

DIP:



 PACIFIC PETROLEUMS LTD. <small>NATIONAL OIL CORPORATION</small> 		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B12		MUH -78-15
		DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

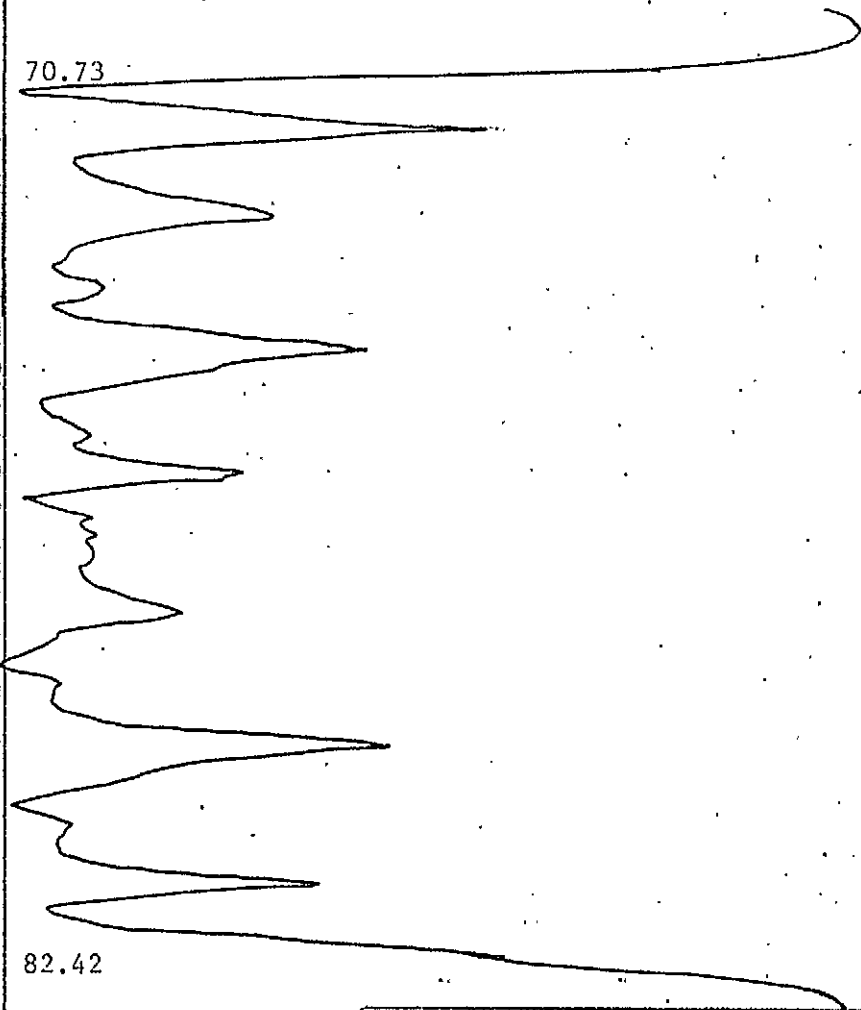
3.10

3.20

3.30

70.73

82.42



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE

SEAM SECTION B 9

MUH 78-16

DIAMETER Approx. 15

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

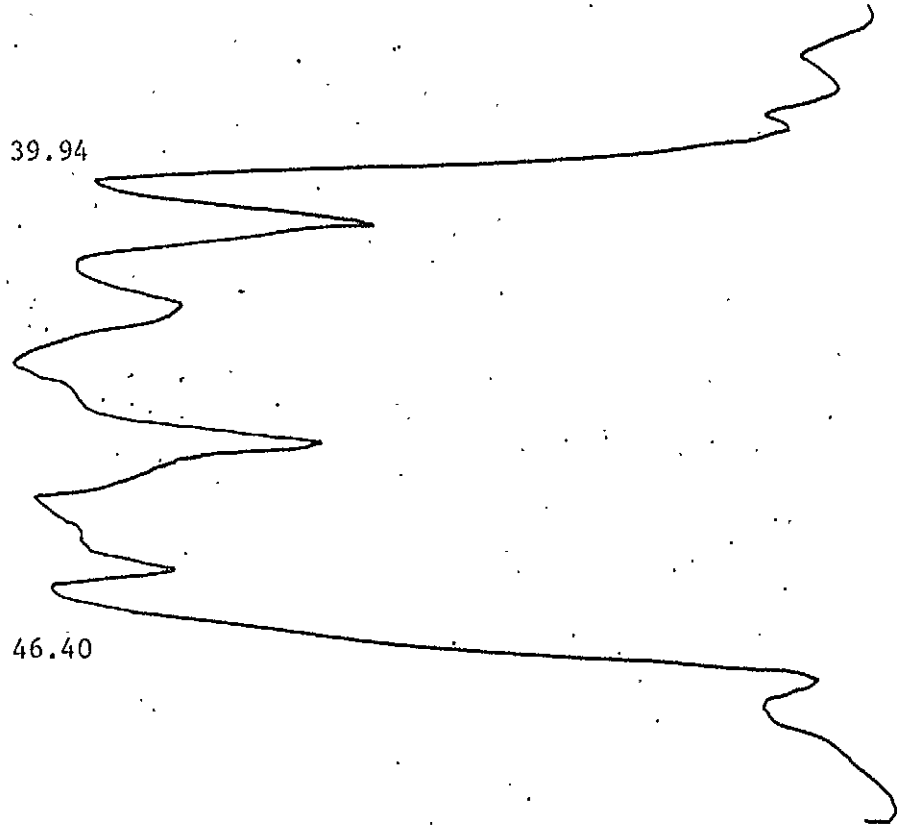
3.20

3.30



39.94

46.40



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE

SEAM SECTION B 9

MUH 78-17

DIAM. APPROX. 15

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

130

18.68

25.14



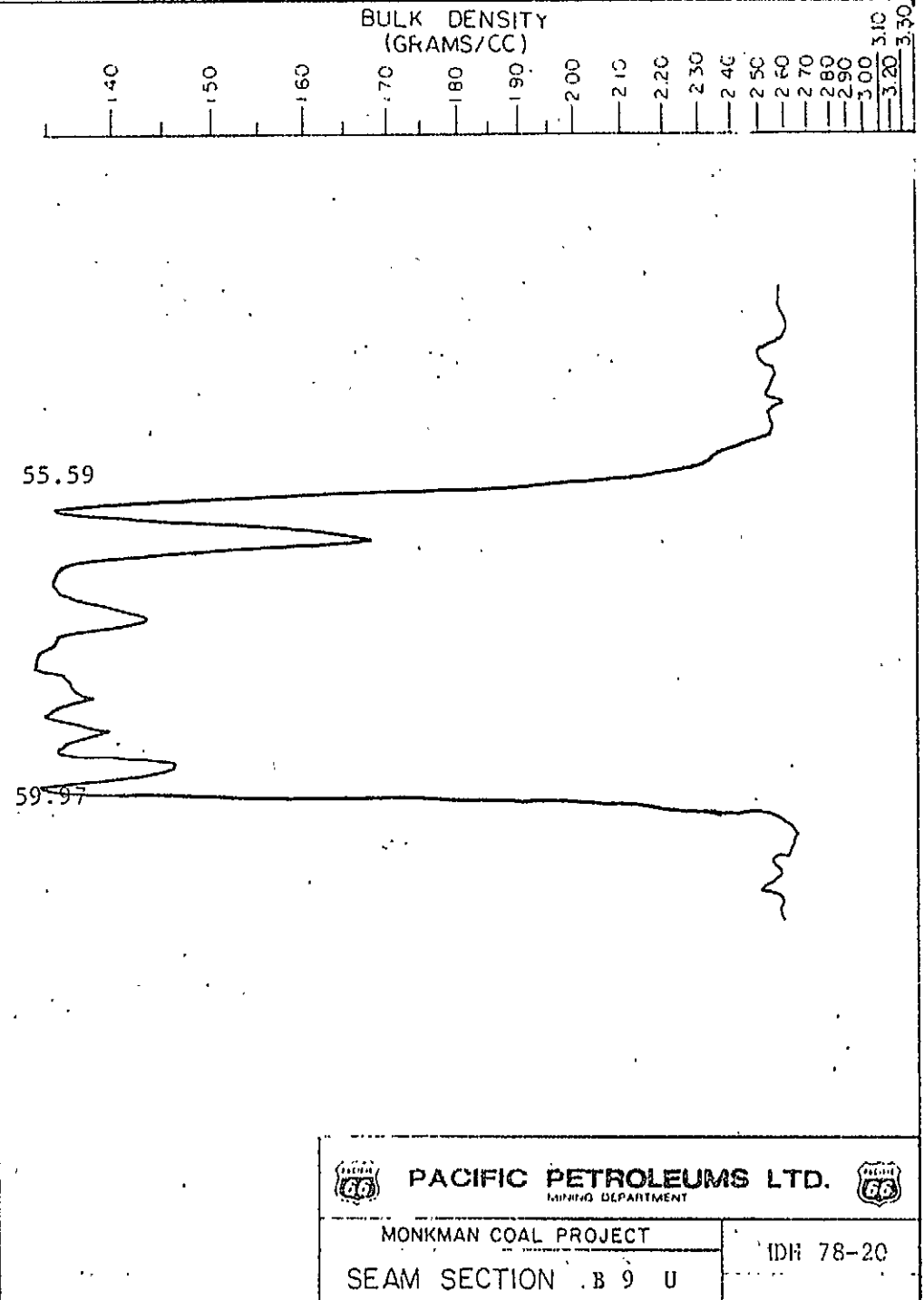
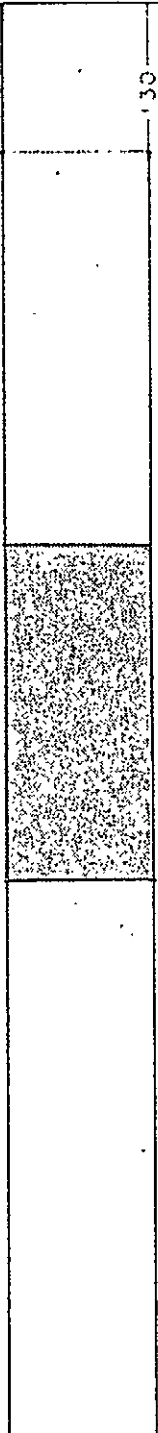
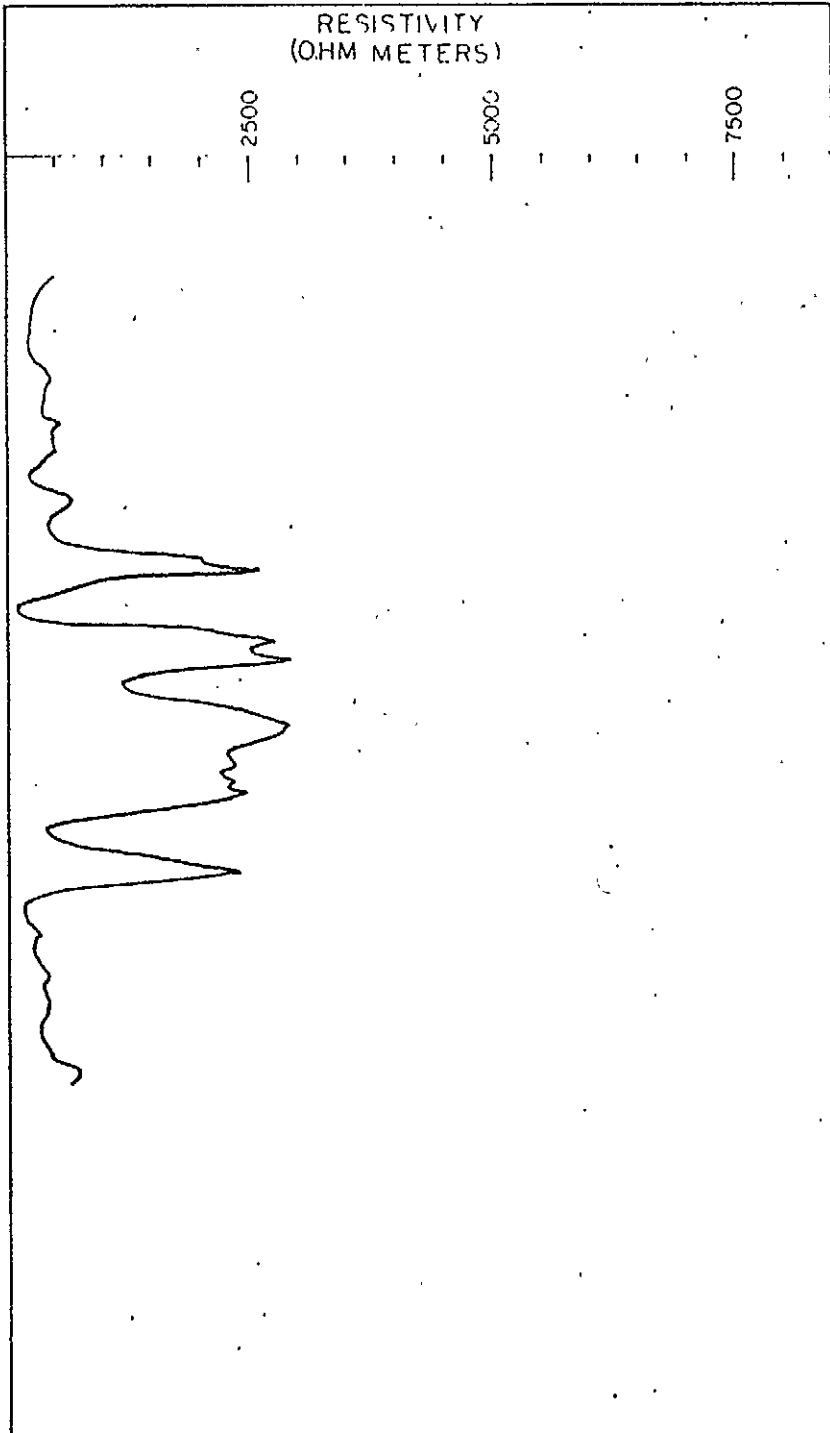
PACIFIC PETROLEUMS LTD.





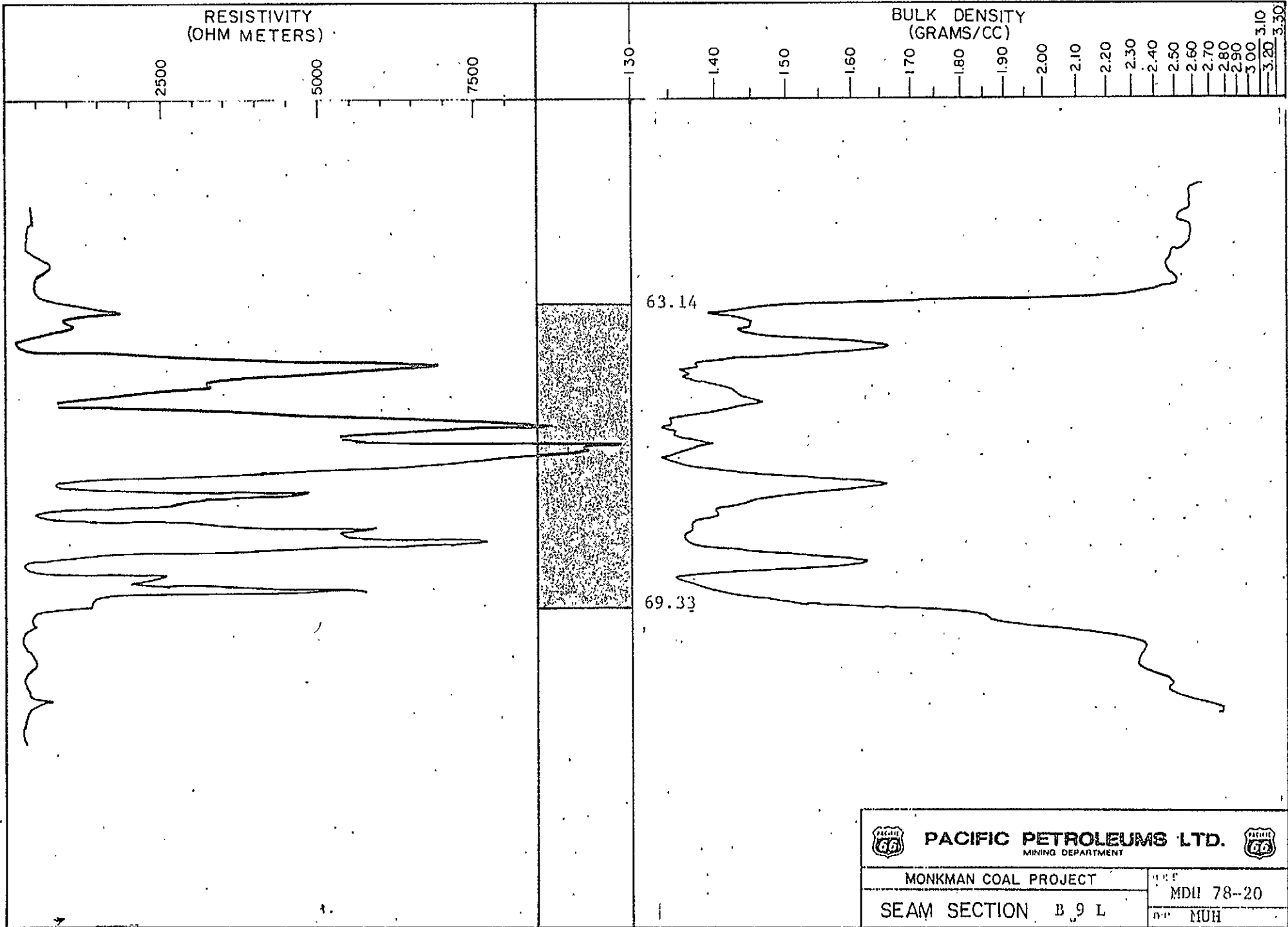
MINING DEPARTMENT

MONKMAN COAL PROJECT
SEAM SECTION B 9

MUH 78-18
Approx. 1.5



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		IDR 78-20
SEAM SECTION . B 9 U		



RESISTIVITY.
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30



32.90

33.97



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

MUH 78-20

SEAM SECTION B 10

or MUH

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

310

320

330

7.65

8.06



PACIFIC PETROLEUMS LTD.
SUPPLY DEPARTMENT

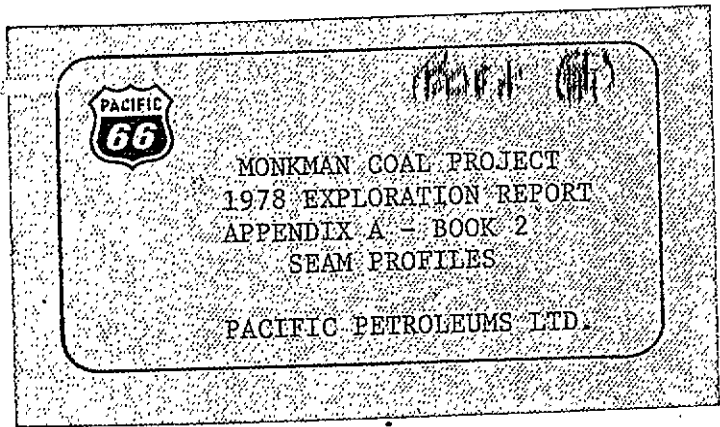


MONKMAN COAL PROJECT

MUH 78-20

SEAM SECTION B 11

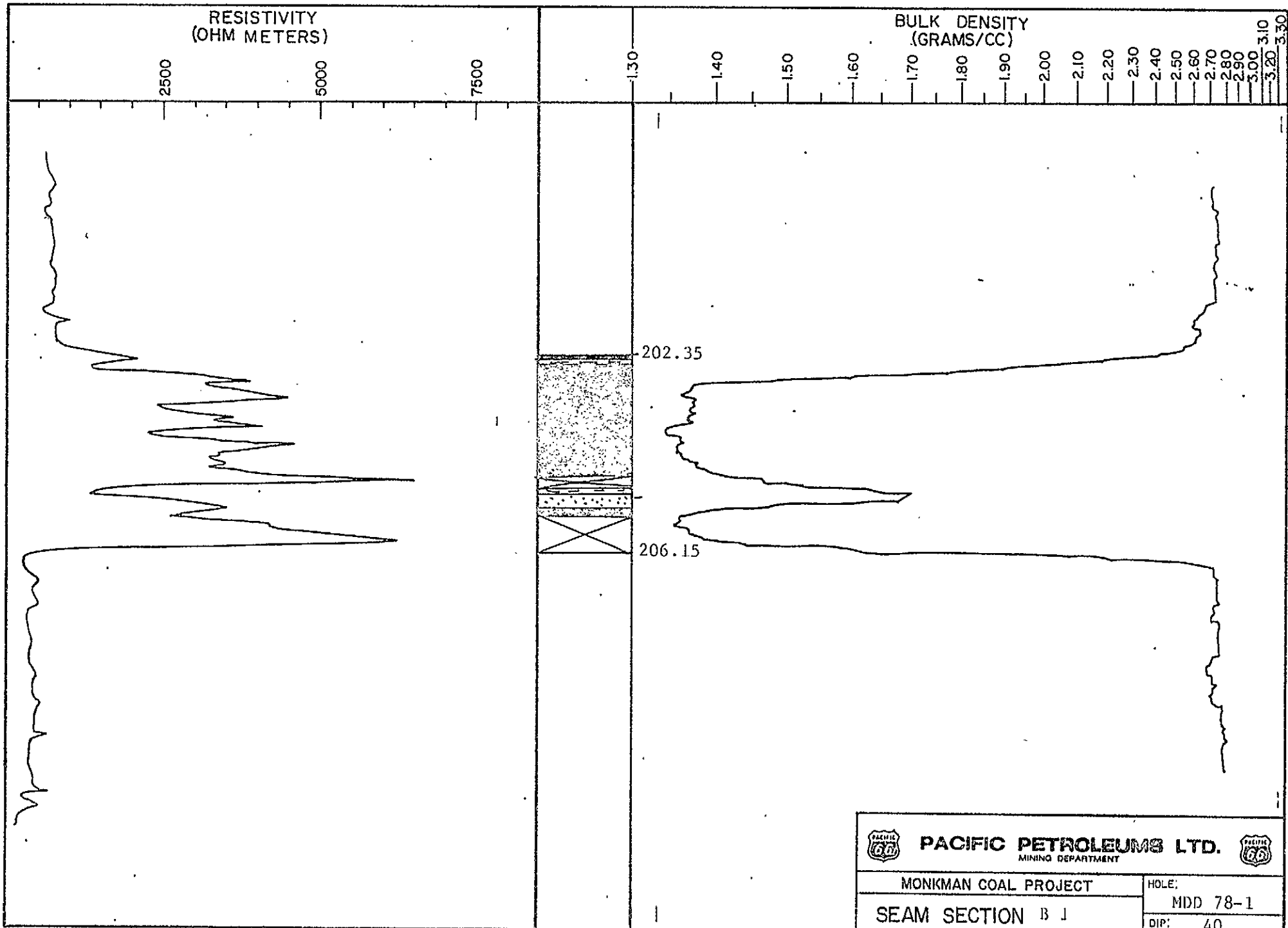
PR - MONKMAN-BELCOURT '78(5)A
COAL SEAM DATA 1978





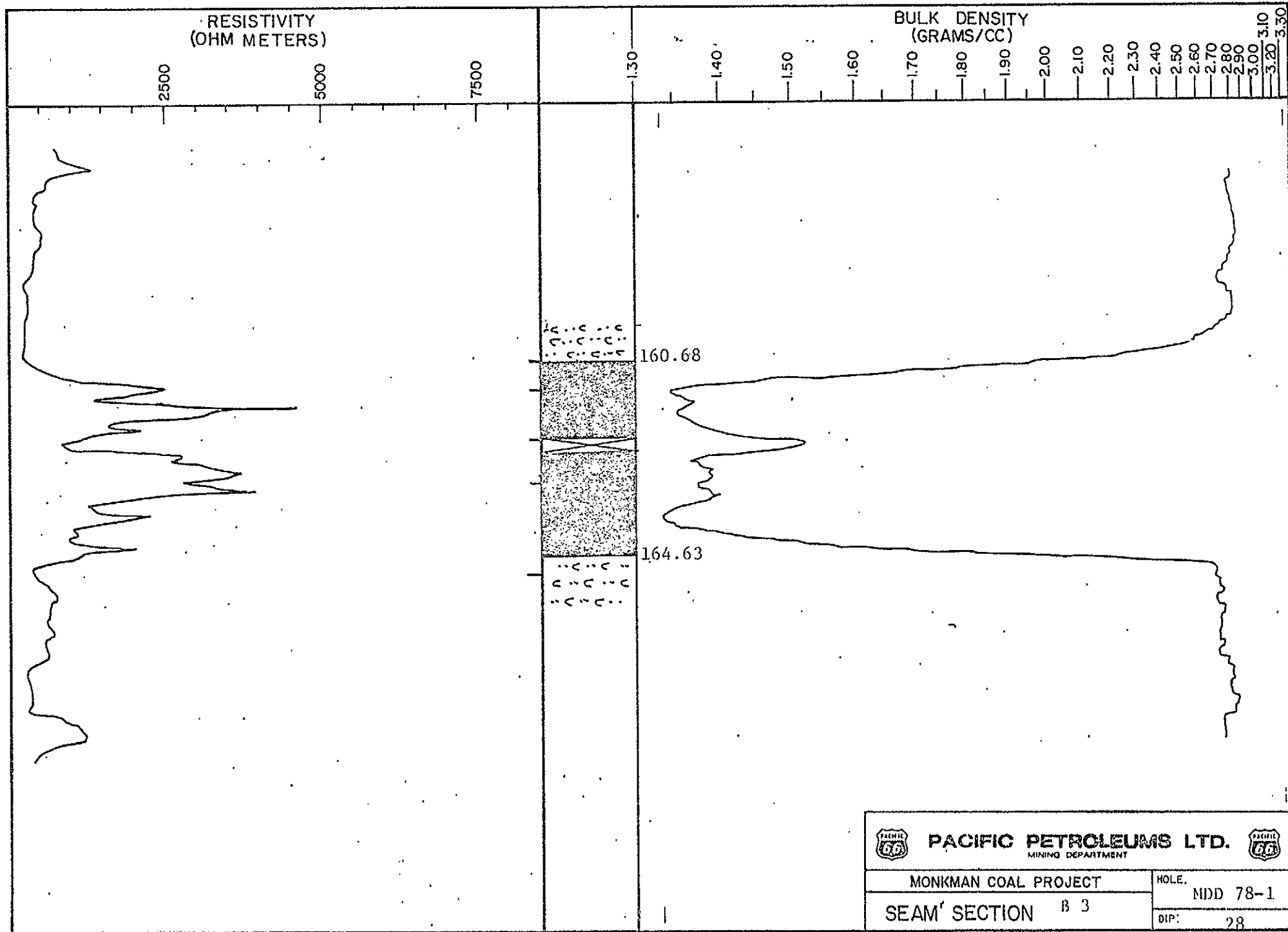
OPEN FILE



**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

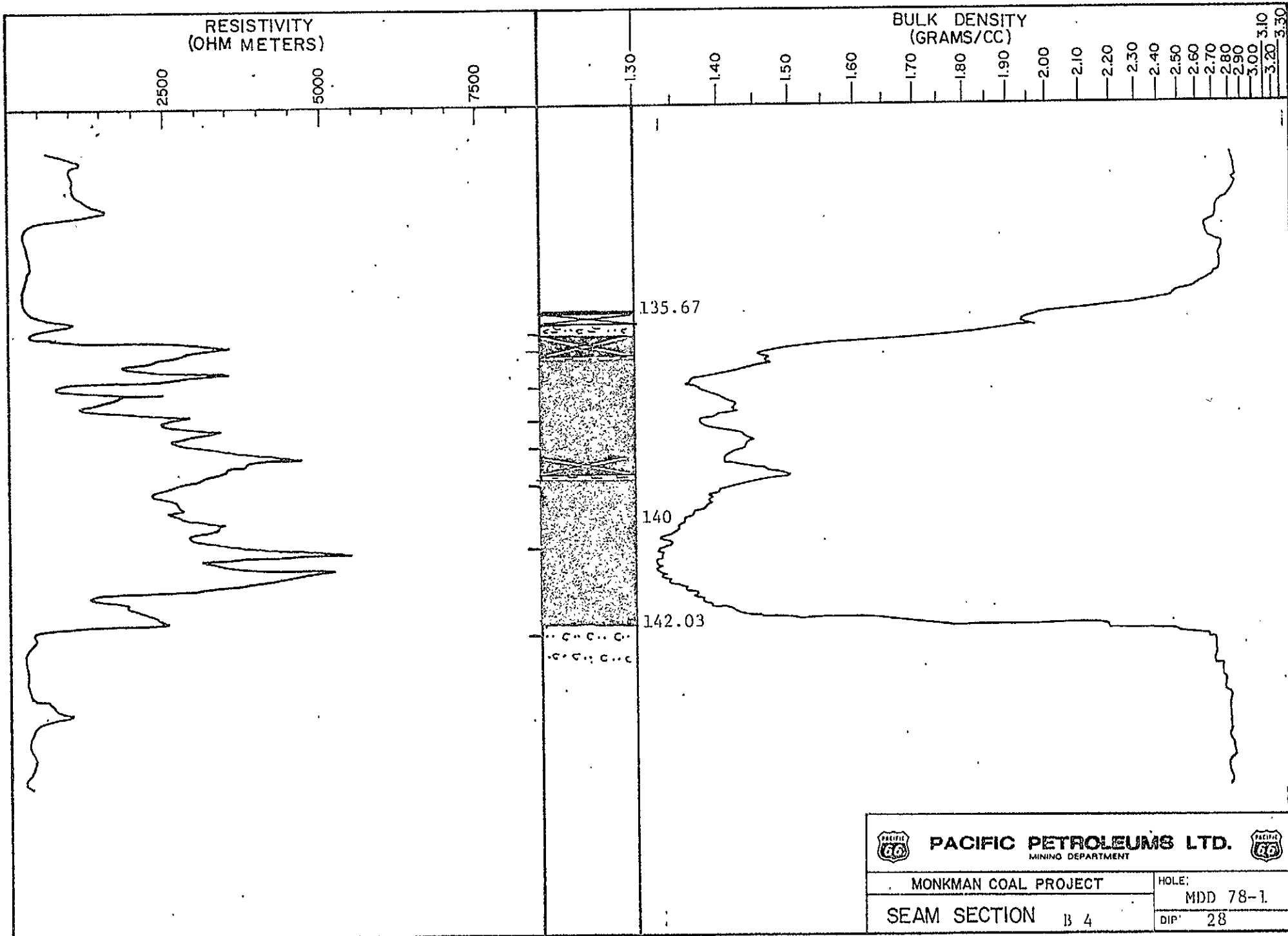
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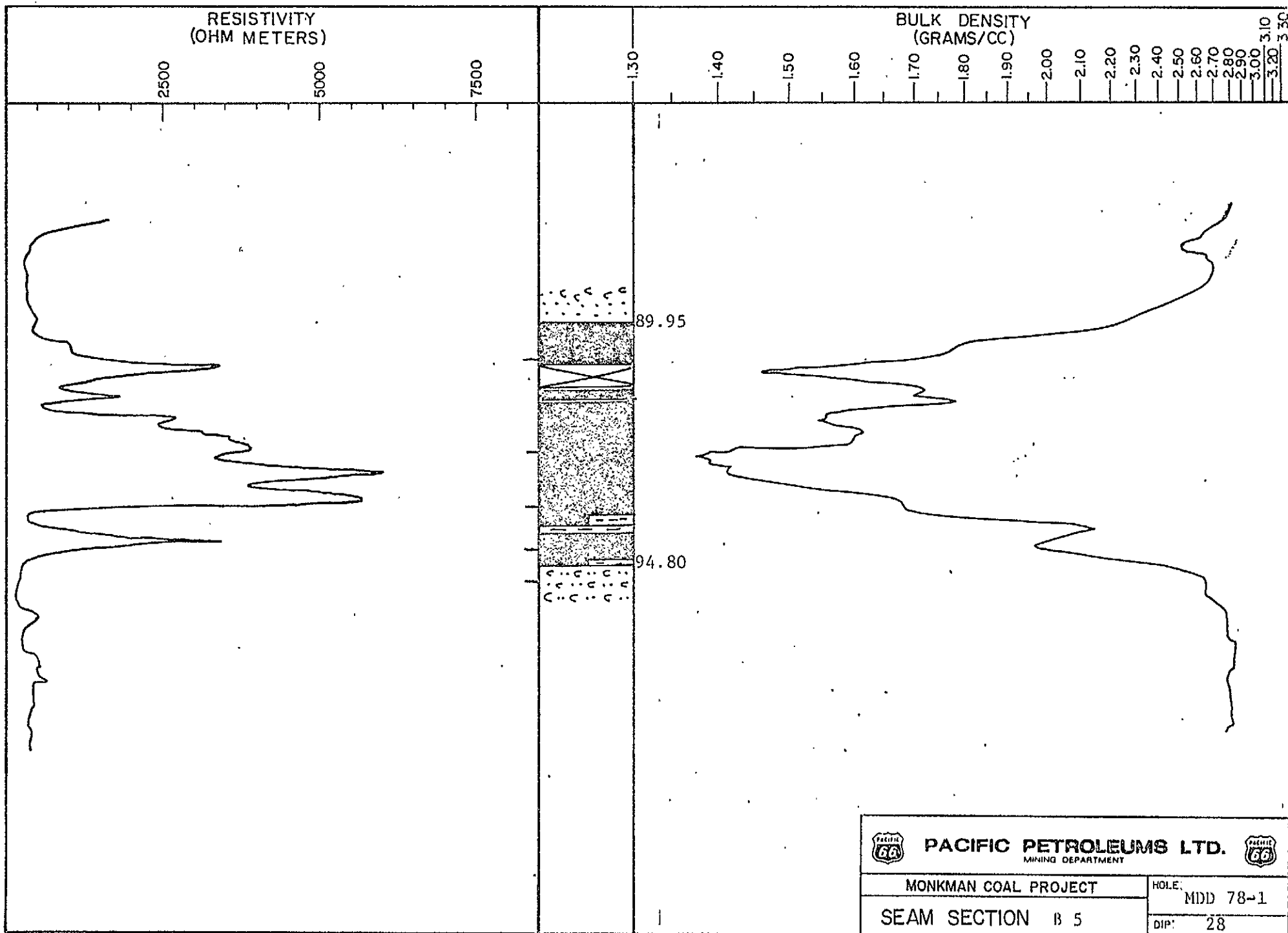
 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	HOLE: MDD 78-1
SEAM SECTION B J	DIP: 40





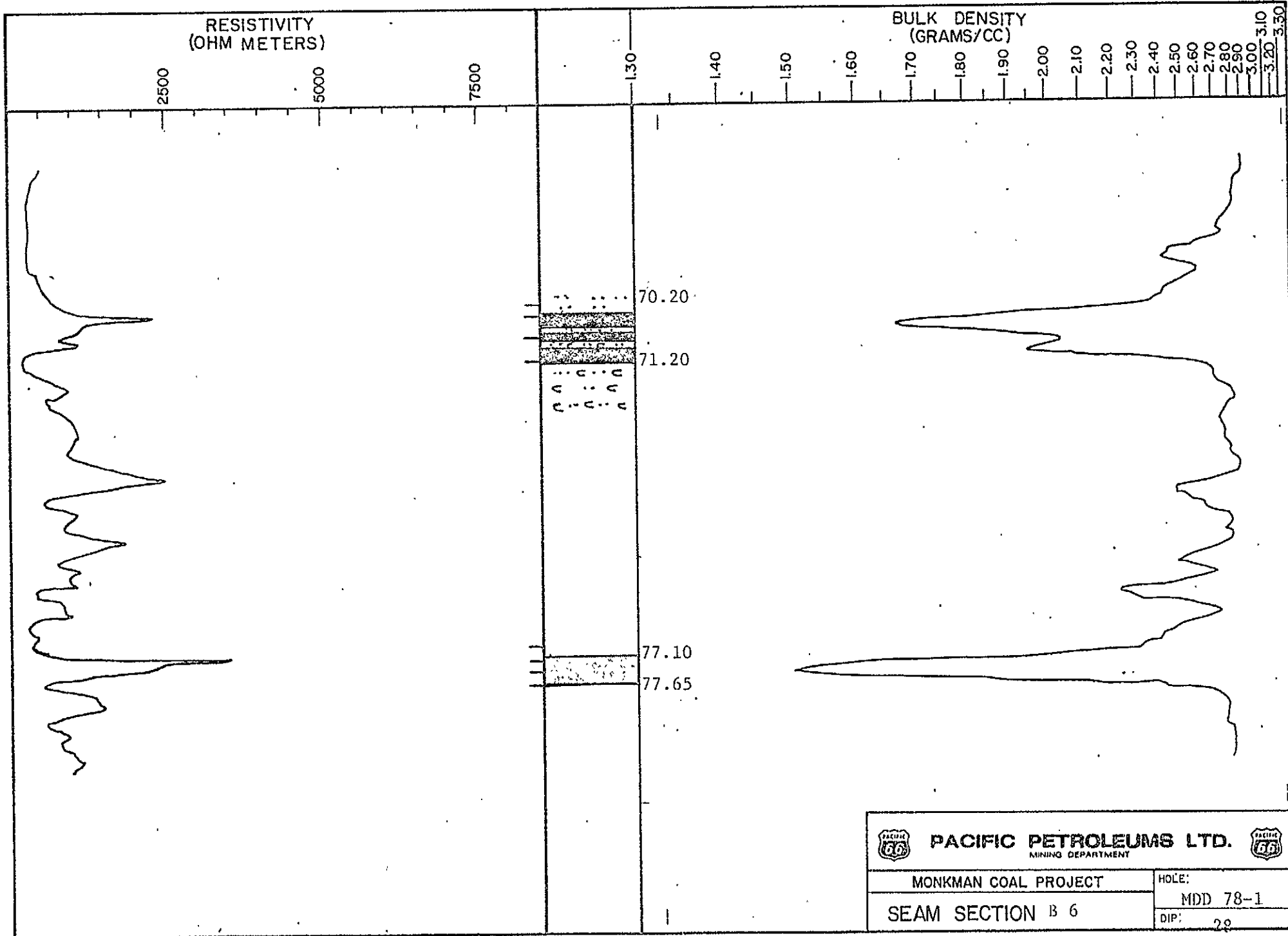
 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B 3	HOLE: MIDD 78-1
	DIP: 28

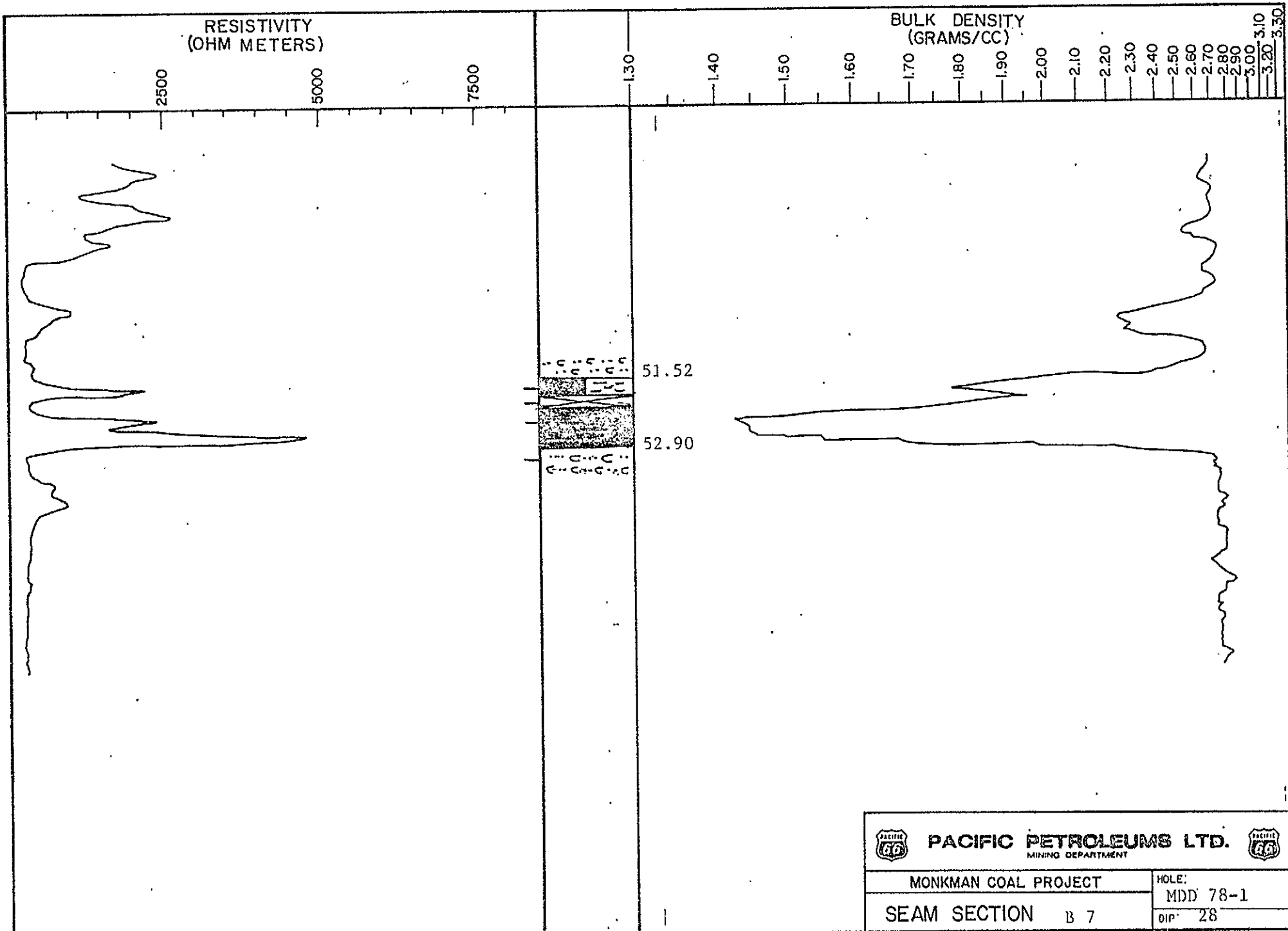




 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	HOLE: MDD 78-1.
SEAM SECTION B 4	DIP' 28



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>		
MONKMAN COAL PROJECT		HOLE: MDD 78-1
SEAM SECTION B 5		DIP: 28





 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B 7	
HOLE:	
MDD 78-1	
DIP: 28	

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00



3.02

3.03

291.13

299.21

HC HC HC HC
CH CH CH CH
HC HC
C H

 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	HOLE MDD 78-2
SEAM SECTION B 1(L)	SEAM DIP 22

RESISTIVITY.
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

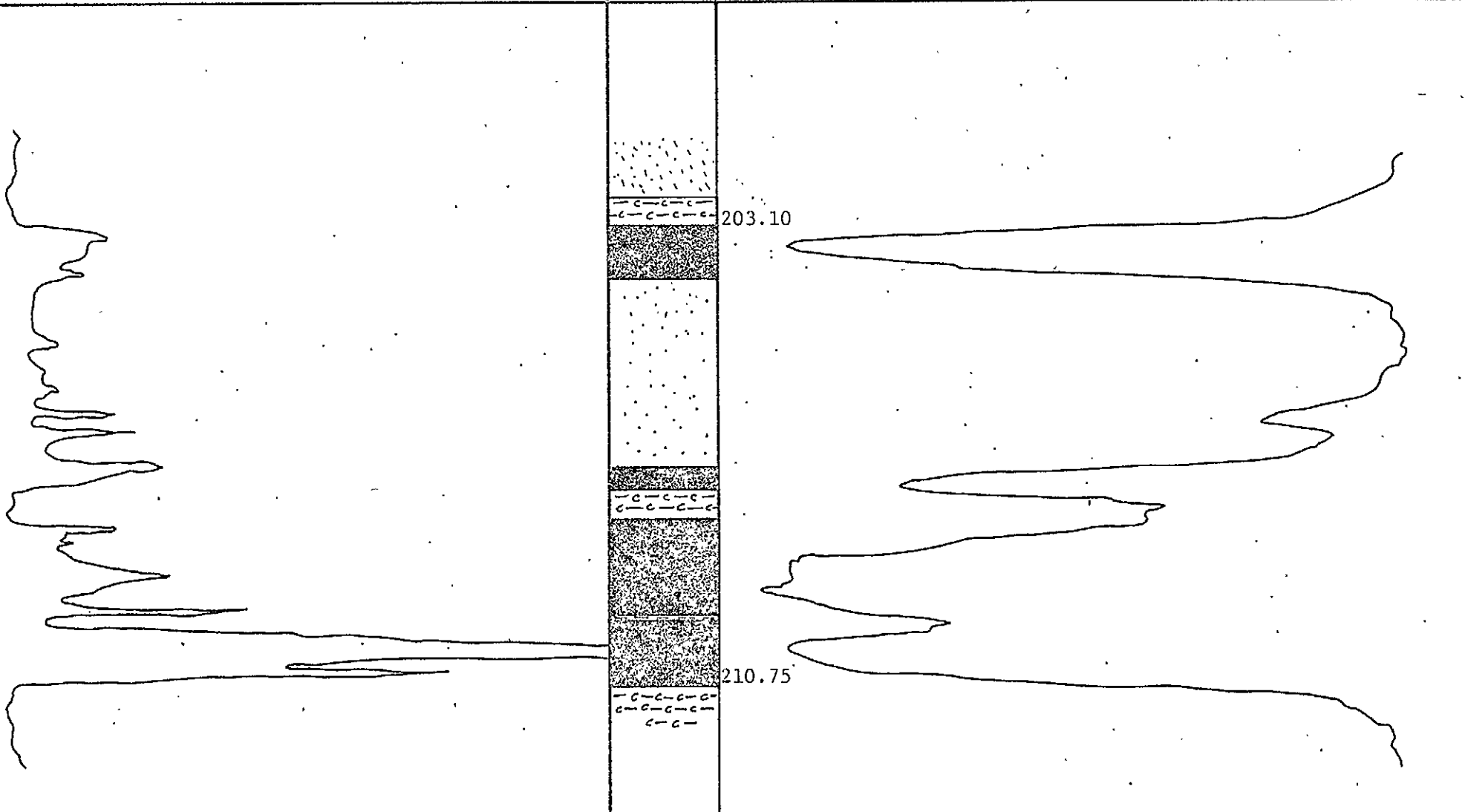
2.90

3.00

3.01



3.02

3.03



203.10

210.75

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MDD 78-2
SEAM SECTION B 1 (U)	SPAM
	DIP 22

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.01



3.02

3.03

Continued from preceding sheet



183.67

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE/IDD 78-2.
SEAM SECTION B 3	SEAM
	DIP 23

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.01

3.02

3.03

6.00000
..00000000

169.11

Continued on following sheet



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE MDT 78-2

SEAM SECTION B 3

SEAM
DIP 23

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

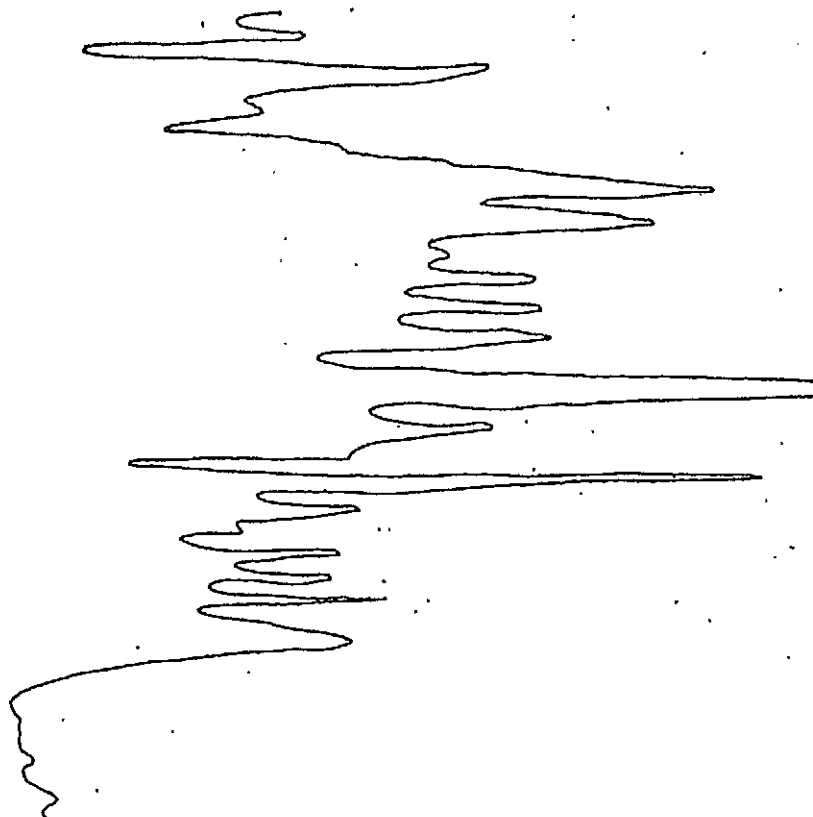
2.90

3.00



3.02

3.03

Continued on following sheet



158.63

 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	HOLE/IDD 78-2
SEAM SECTION B 4	SEAM
	DIP 25

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

140.06

Continued on following sheet



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

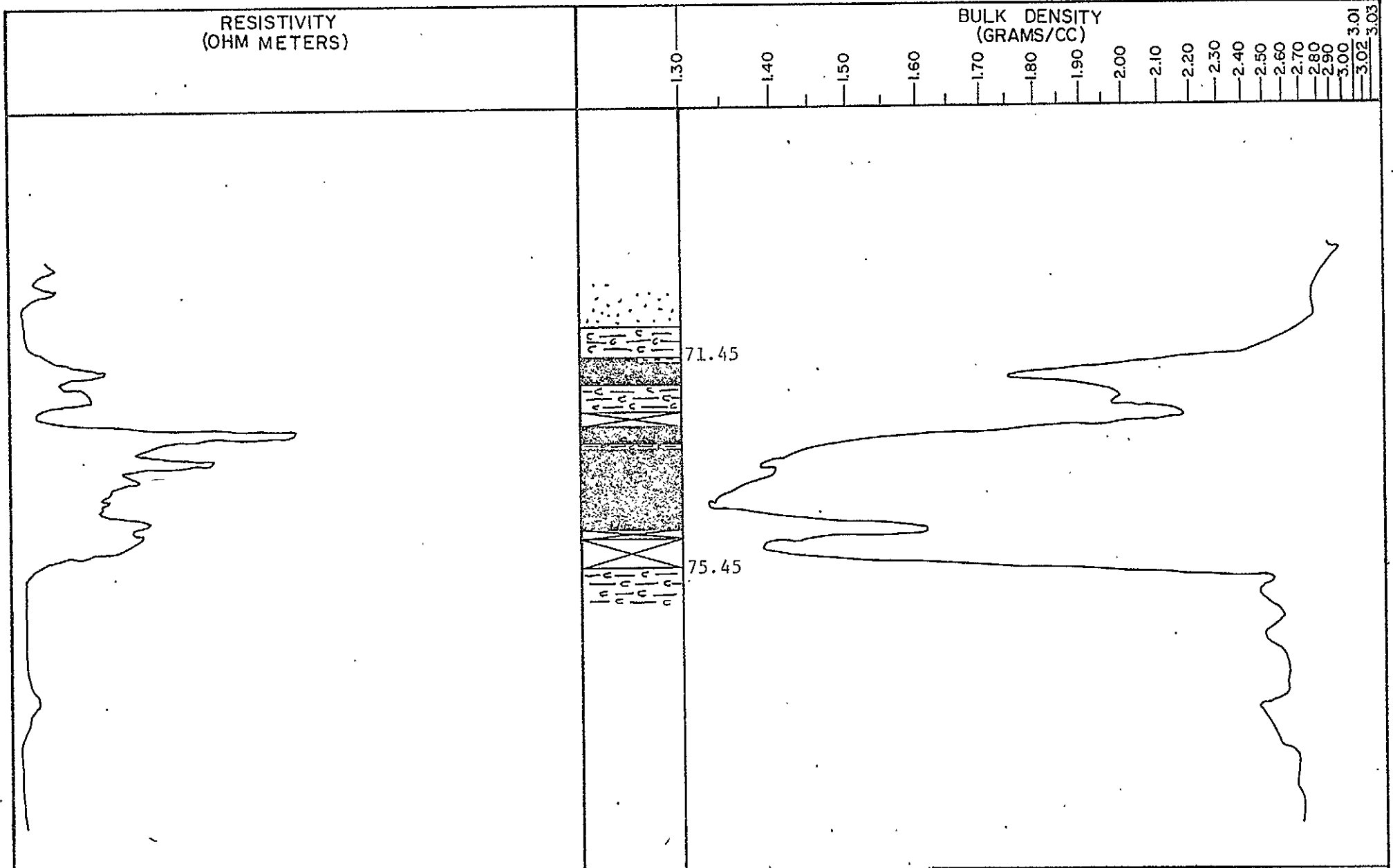




MONKMAN COAL PROJECT

MDD 78-2

SEAM SECTION 64

25



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MDD 78-2
SEAM SECTION B 5	SEAM DIP 38

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.01

3.02

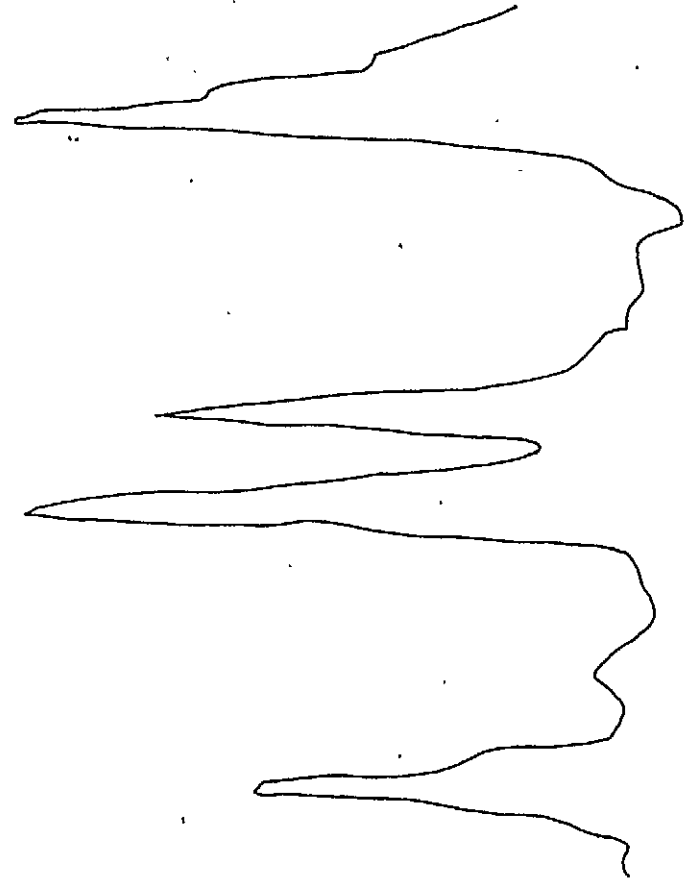
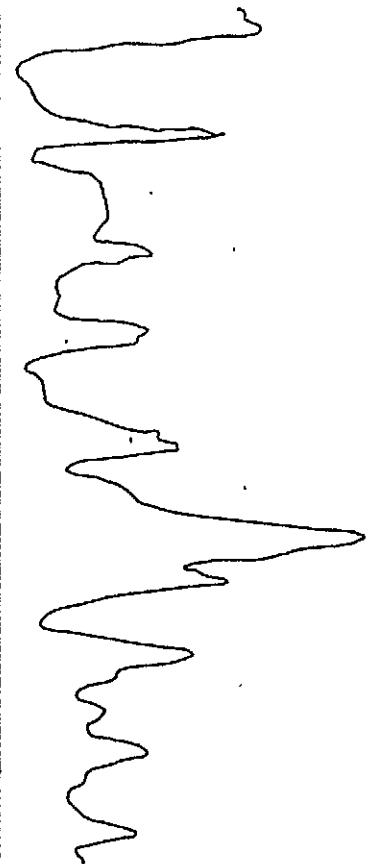
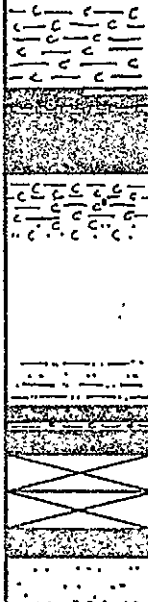
3.03



39.46

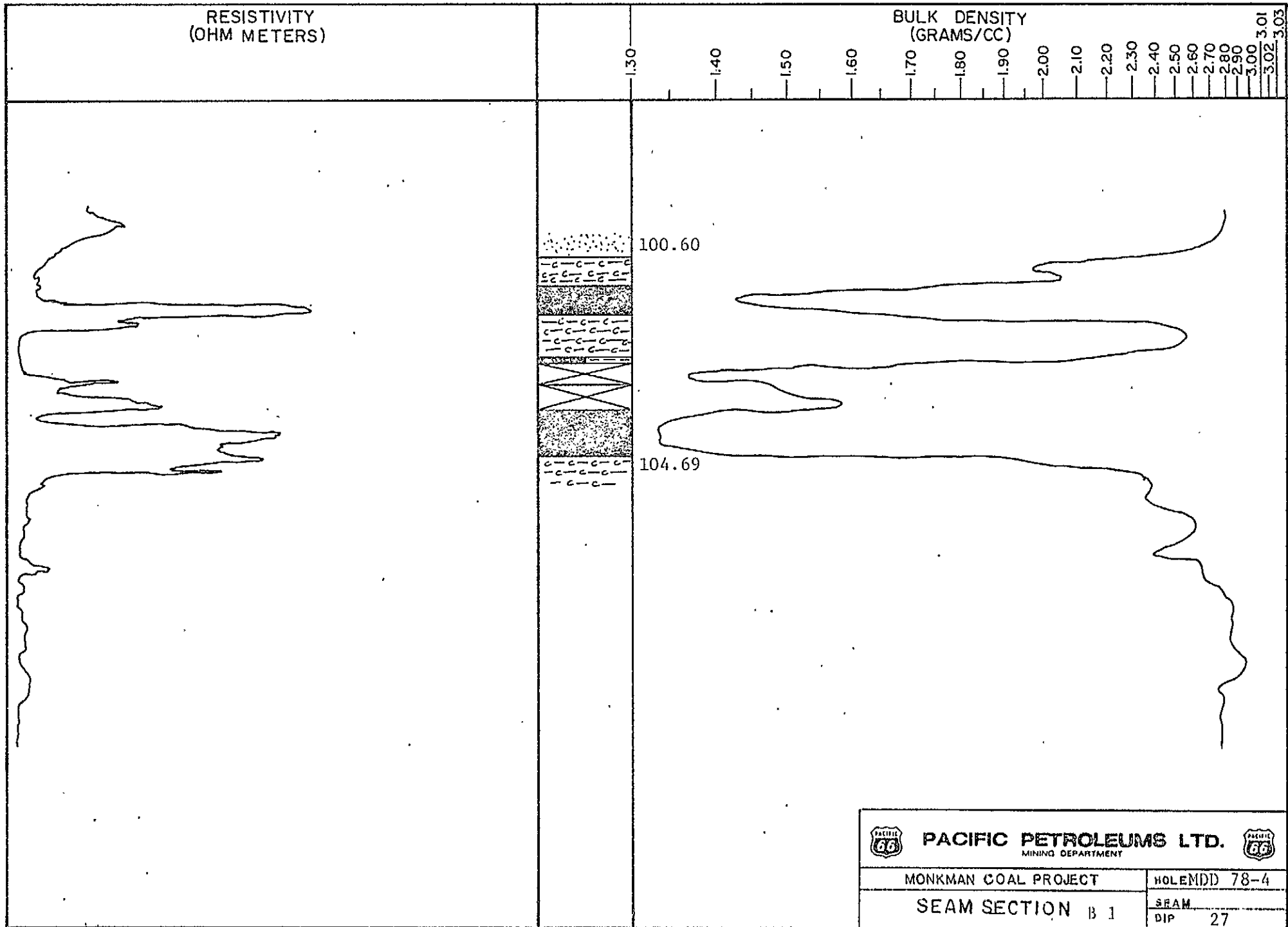
40.52



43.59

45.52



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MDD 78-2
SEAM SECTION B 6	SEAM DIP 20



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	HOLE/MD 78-4
SEAM SECTION B 1	SEAM DIP 27

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

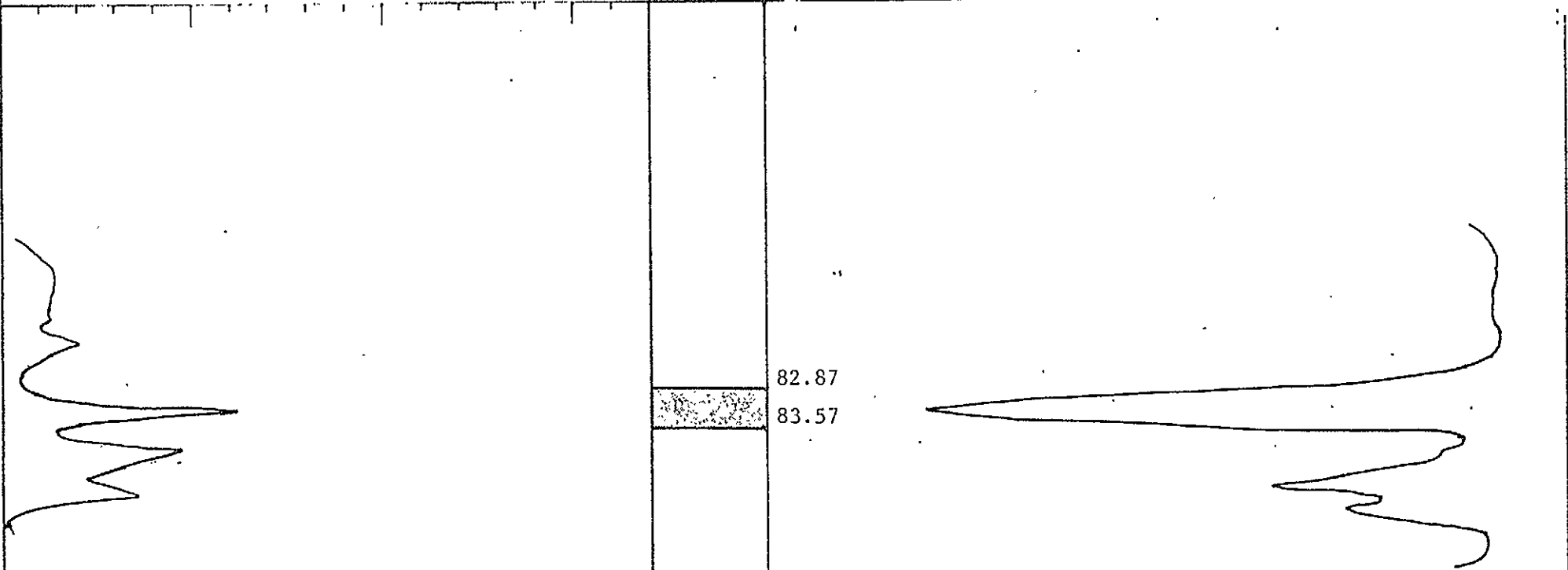
2.90

3.00

3.10

3.20

3.30



82.87

83.57



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

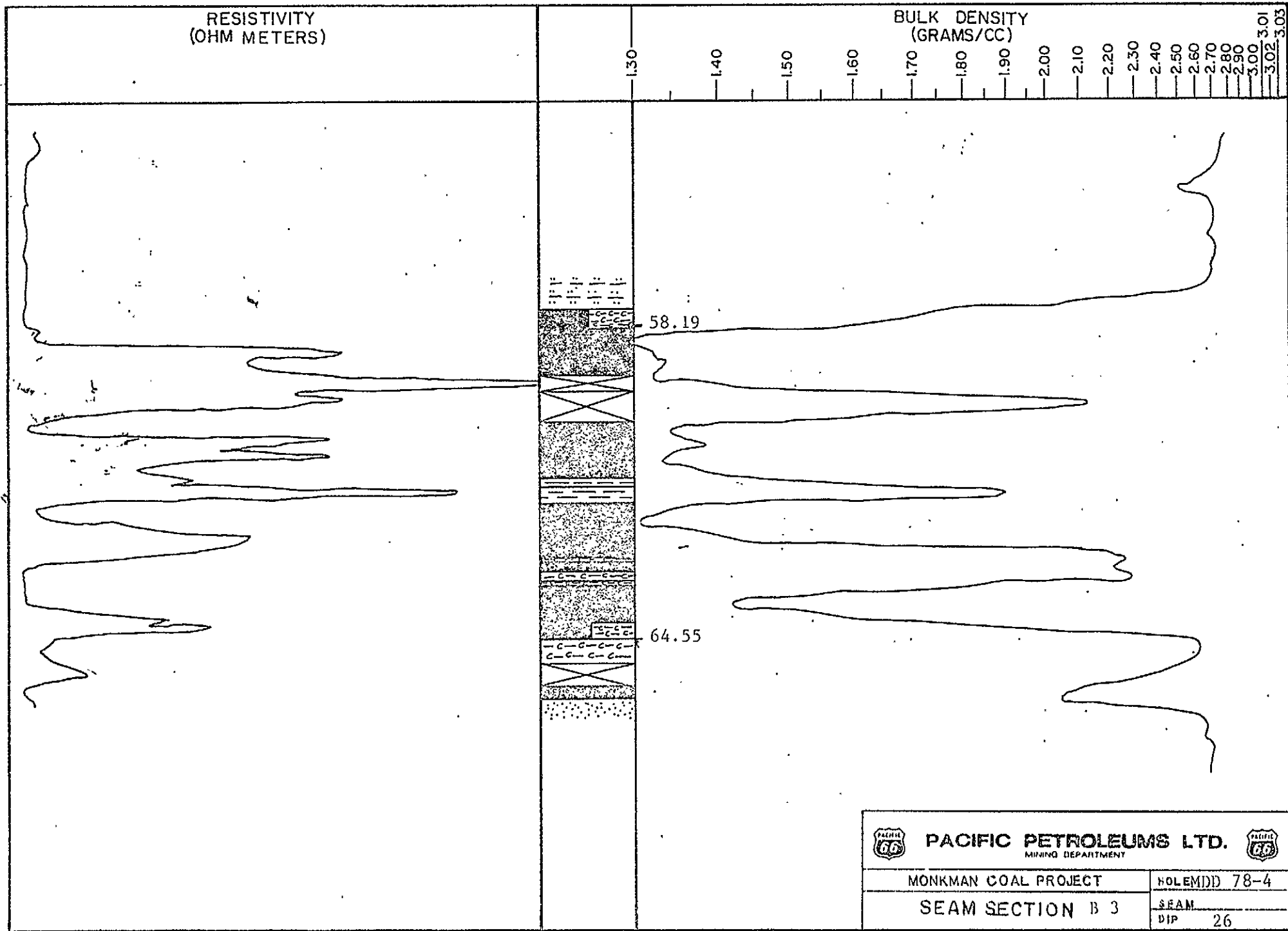




MONKMAN COAL PROJECT

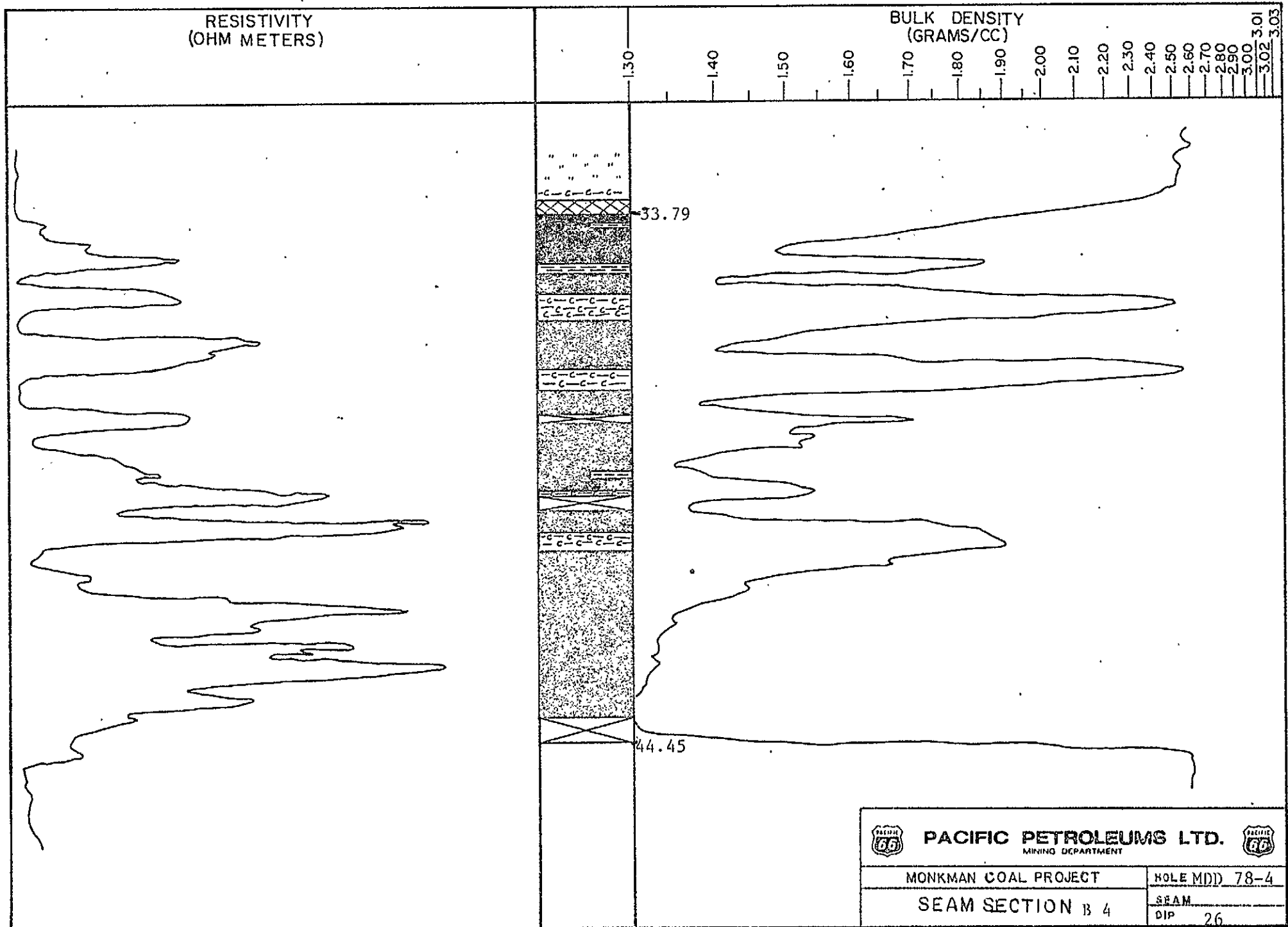
MDD 78-4



SEAM SECTION B 2

28



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE# DD 78-4
SEAM SECTION B 3	SEAM DIP 26



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MDD 78-4
SEAM SECTION B 4		SEAM
		DIP 26

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

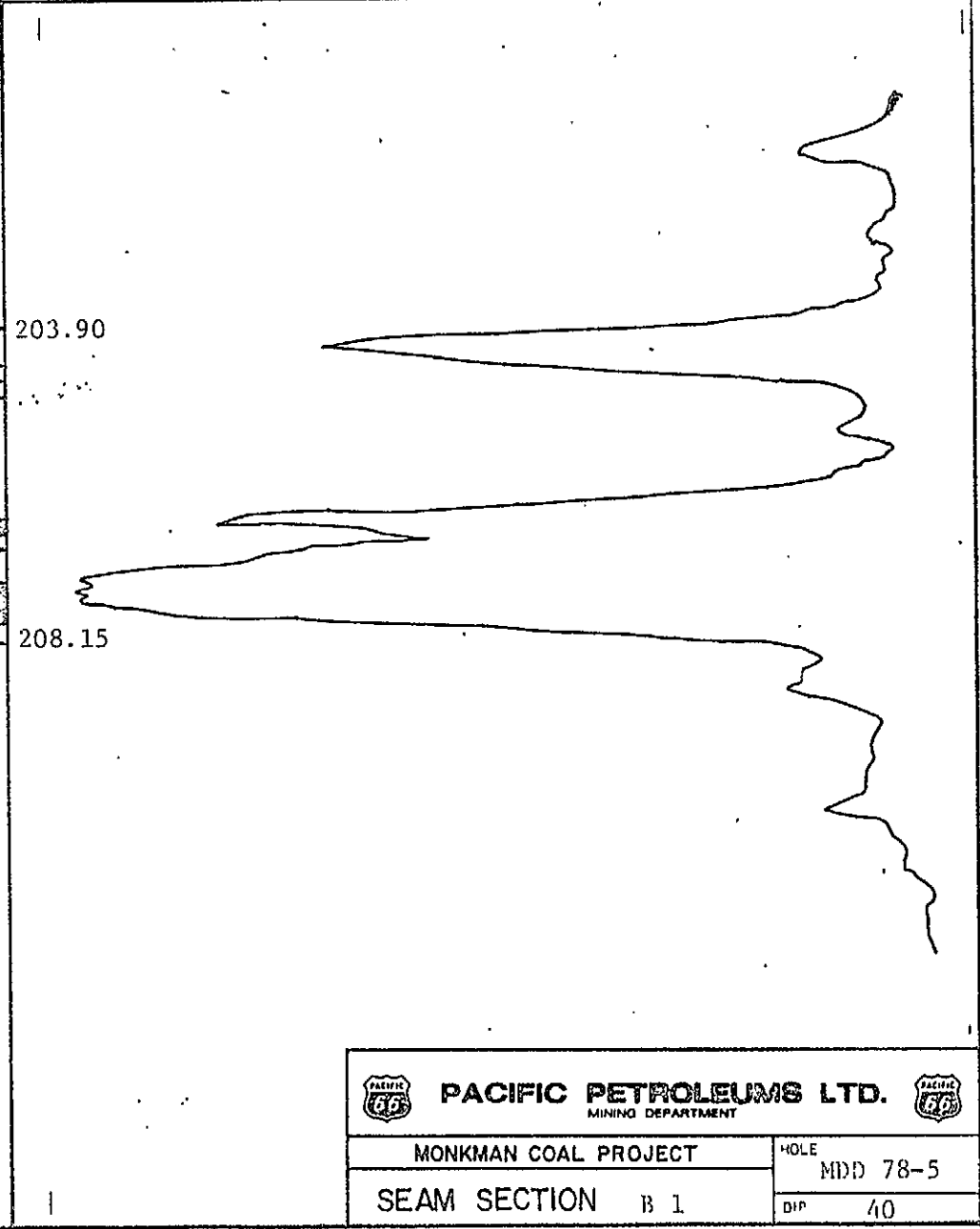
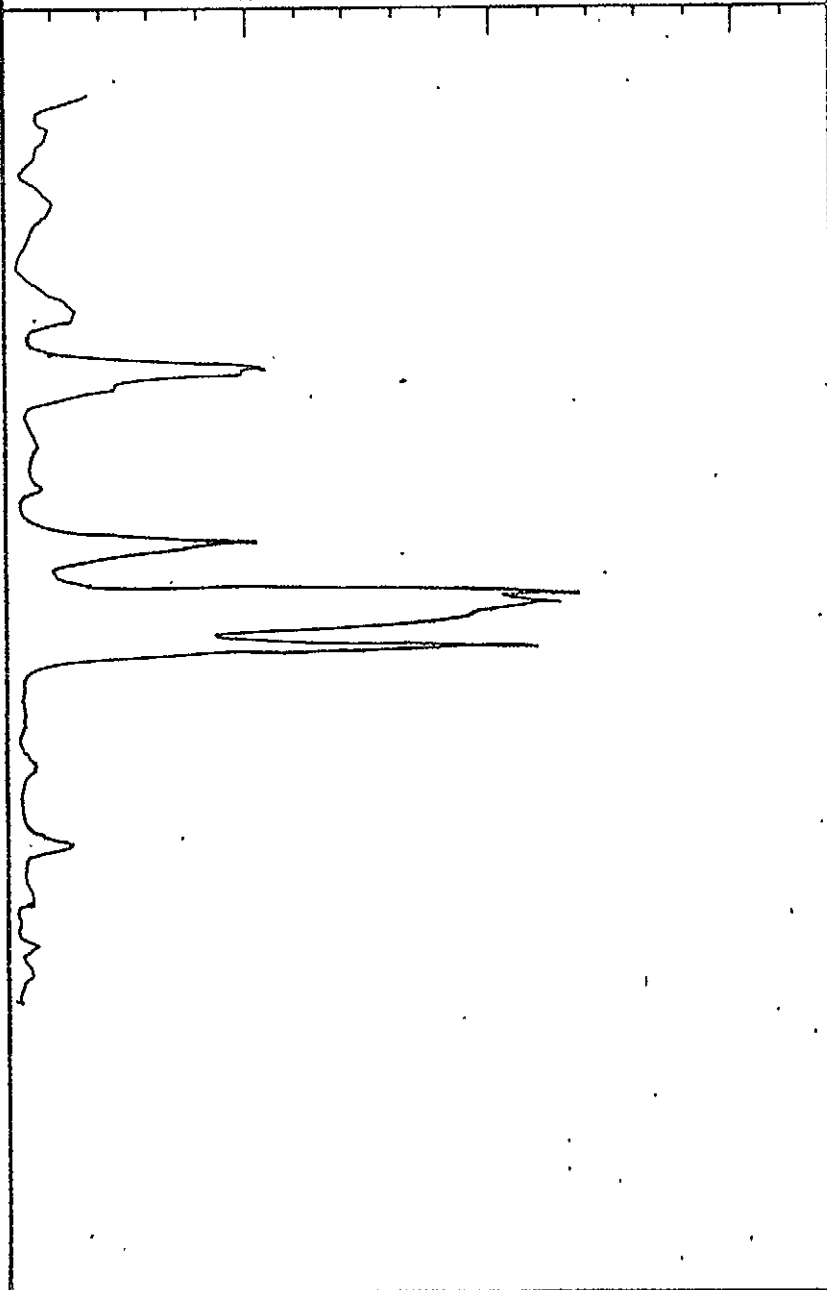
2.90



3.00

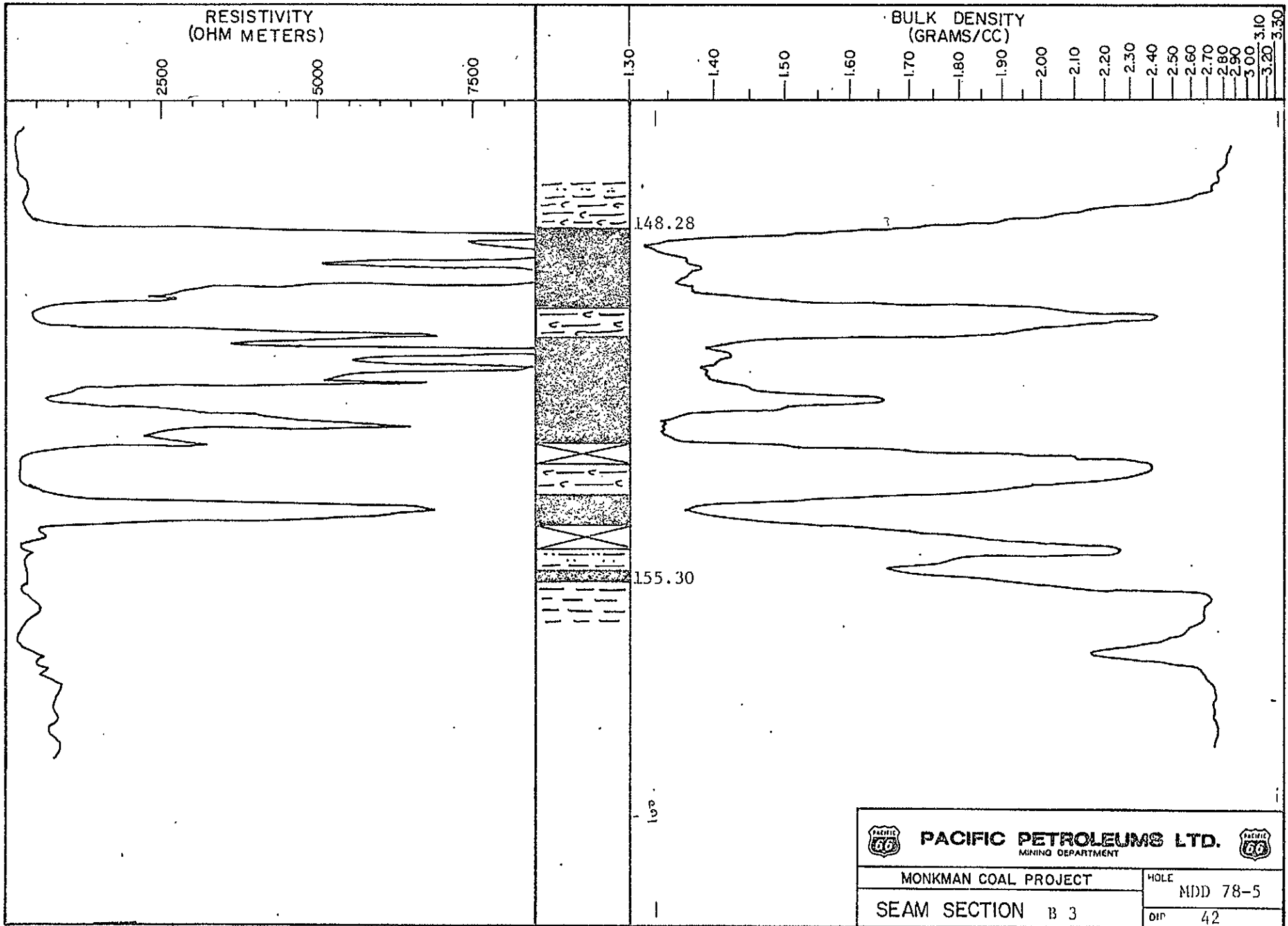
3.10



3.20

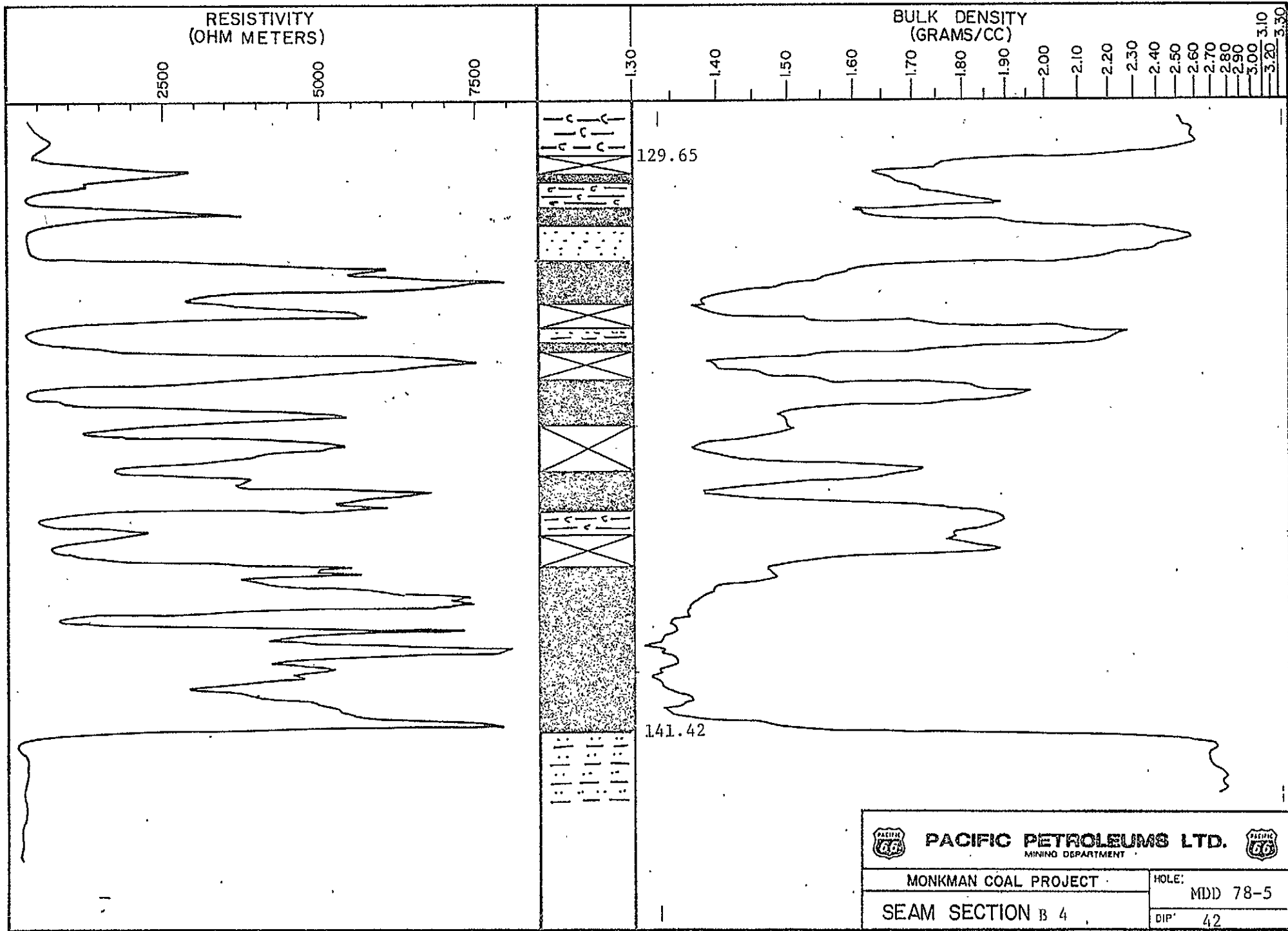
3.30





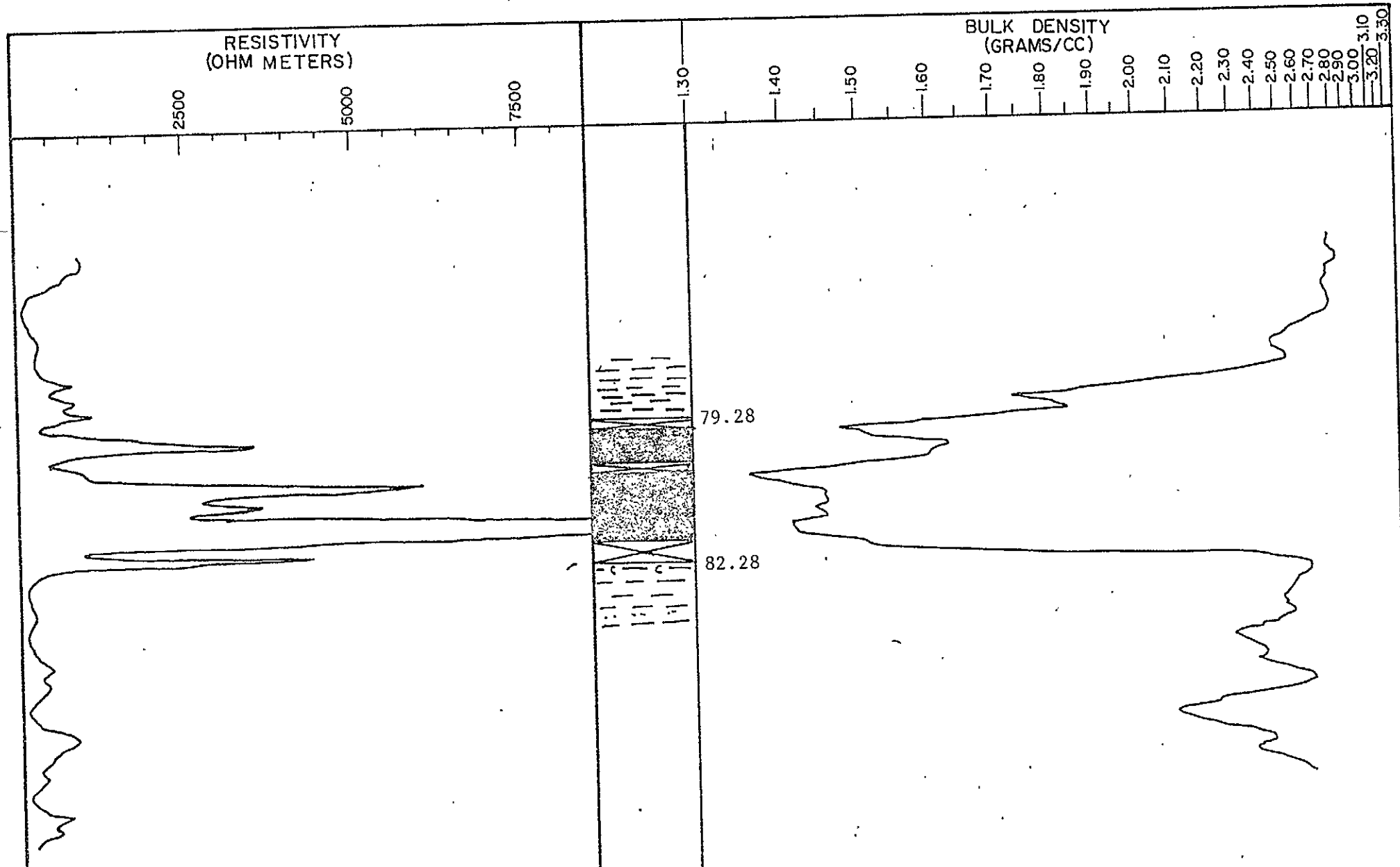
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT 	
MONKMAN COAL PROJECT	HOLE MDD 78-5
SEAM SECTION B 1	DIP 40





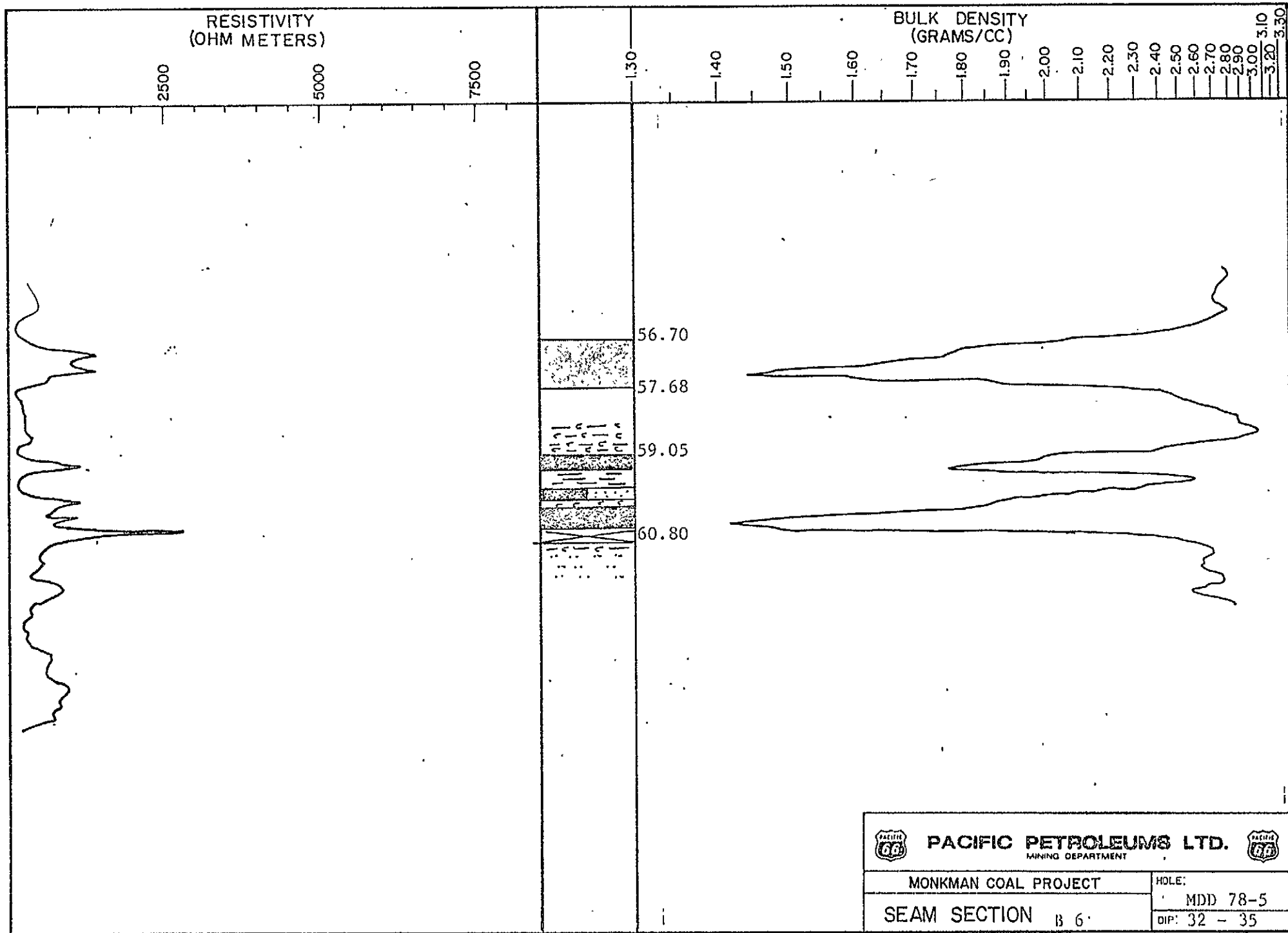
 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	HOLE MDD 78-5
SEAM SECTION B 3	DIP 42

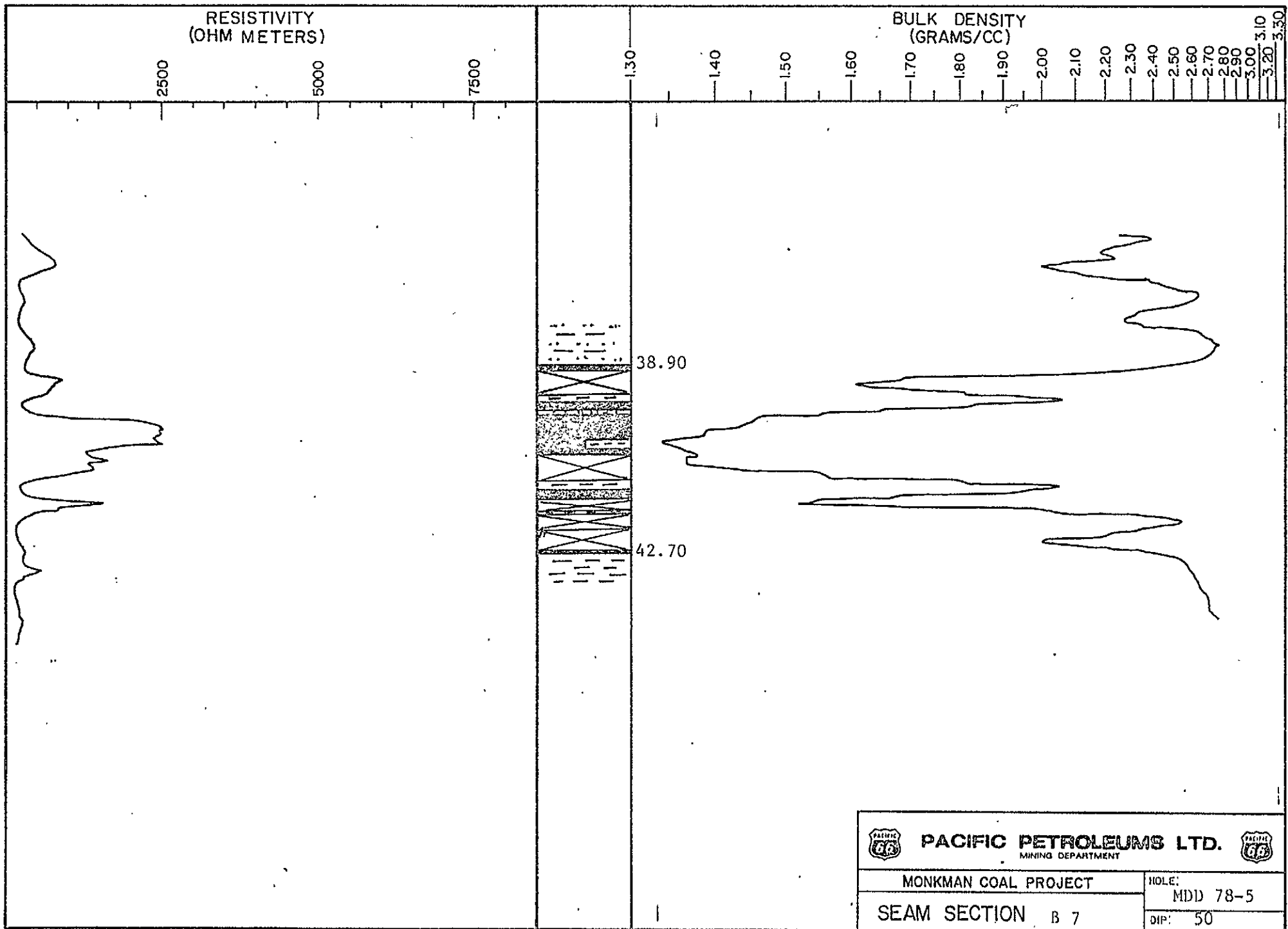




 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	HOLE: MDD 78-5
SEAM SECTION B 4	DIP' 42

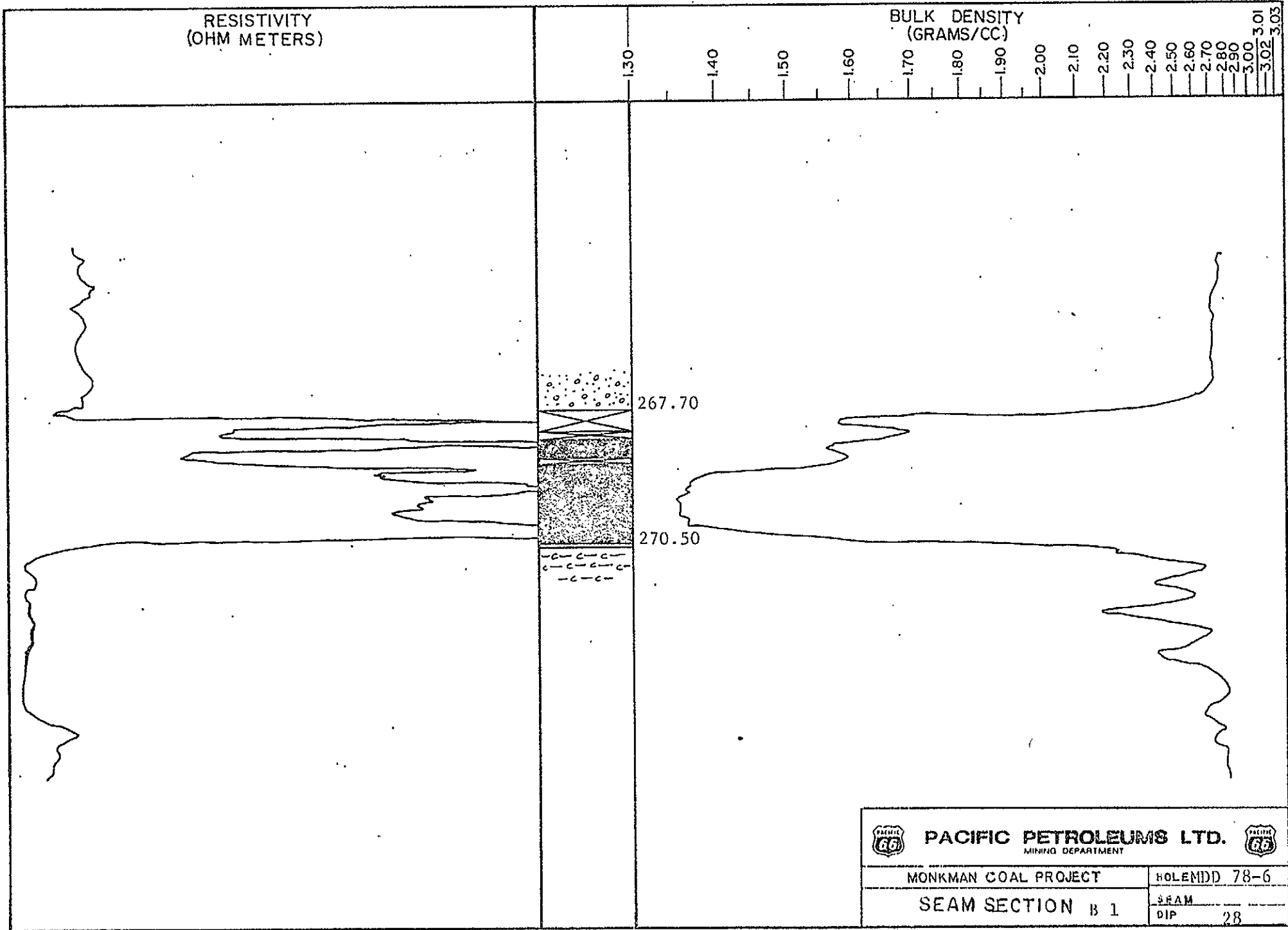




 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B 5	
HOLE. MDD 78-5	
DIP: 33	





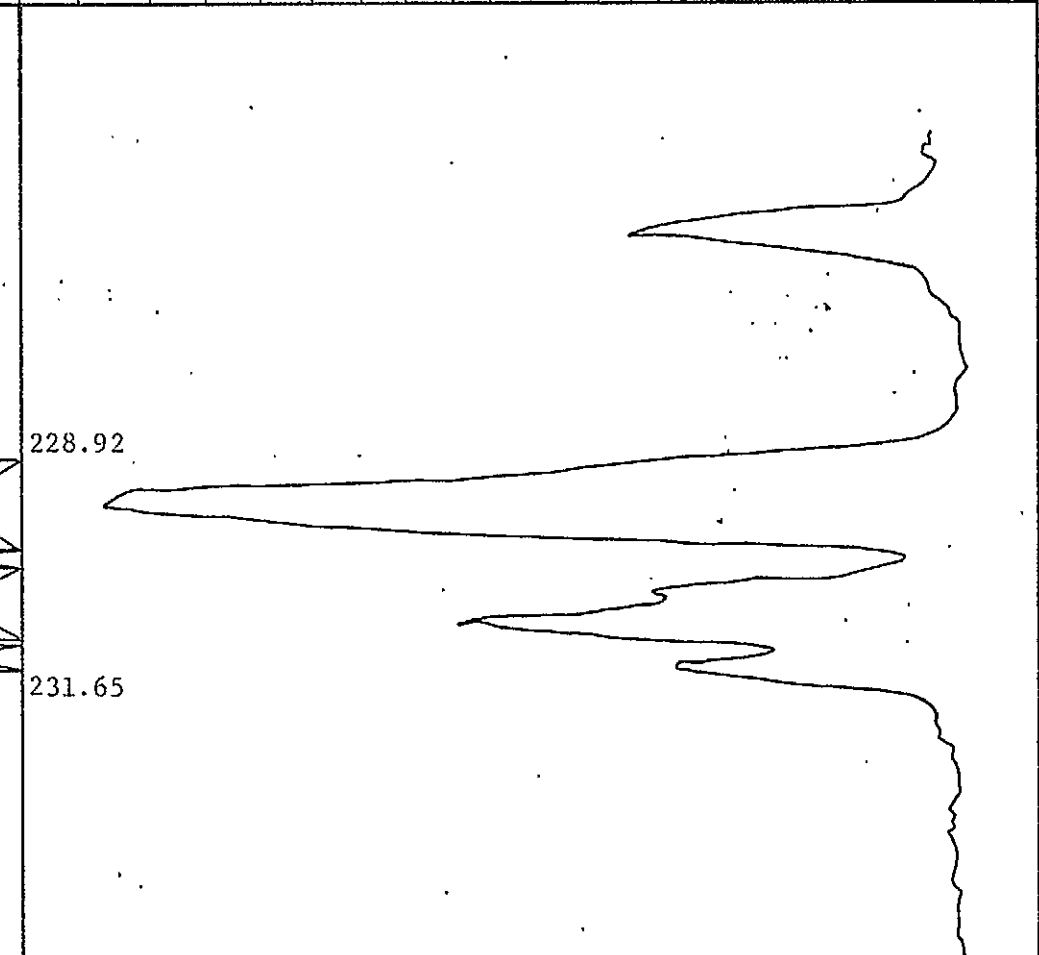
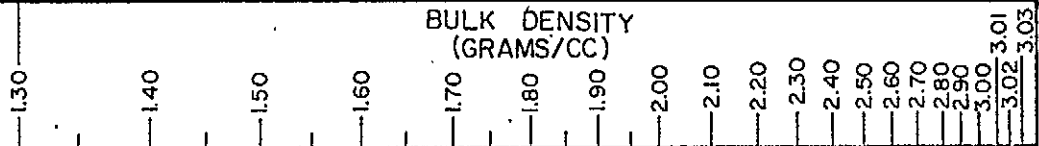
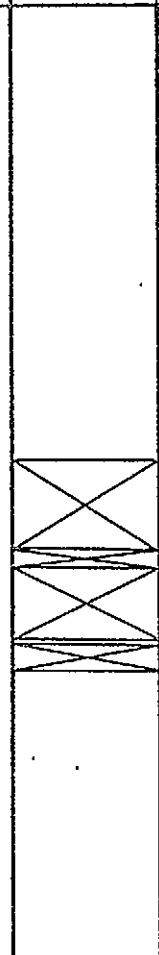
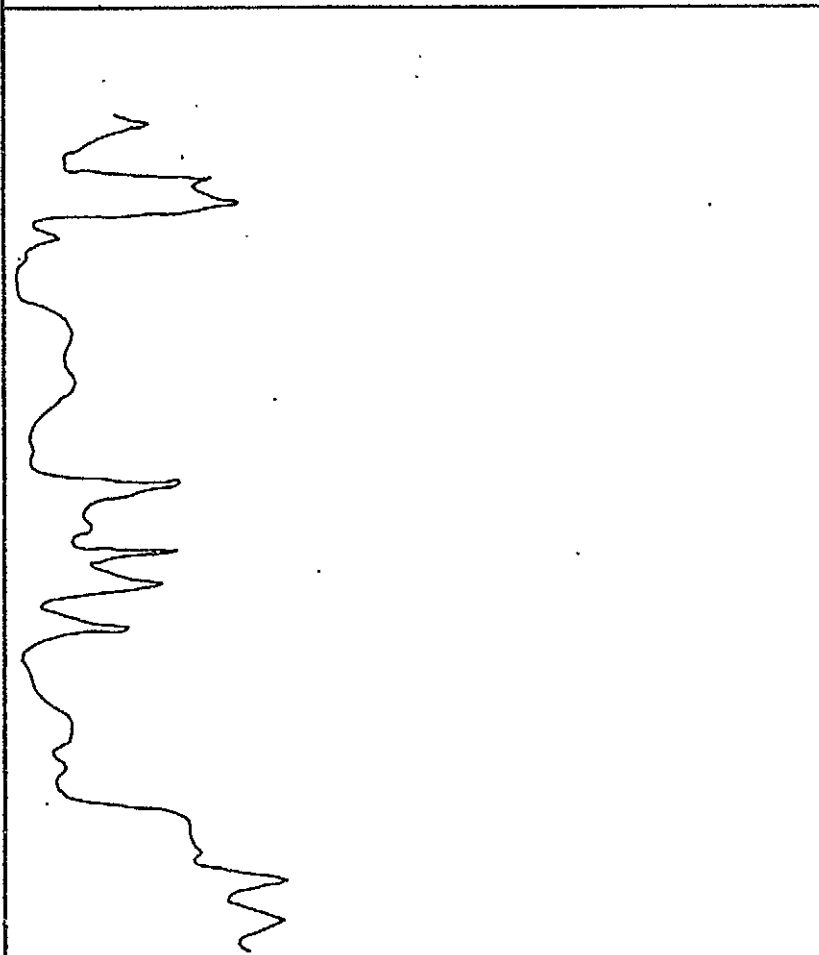
 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE: MDD 78-5
SEAM SECTION B 7	DIP: 50





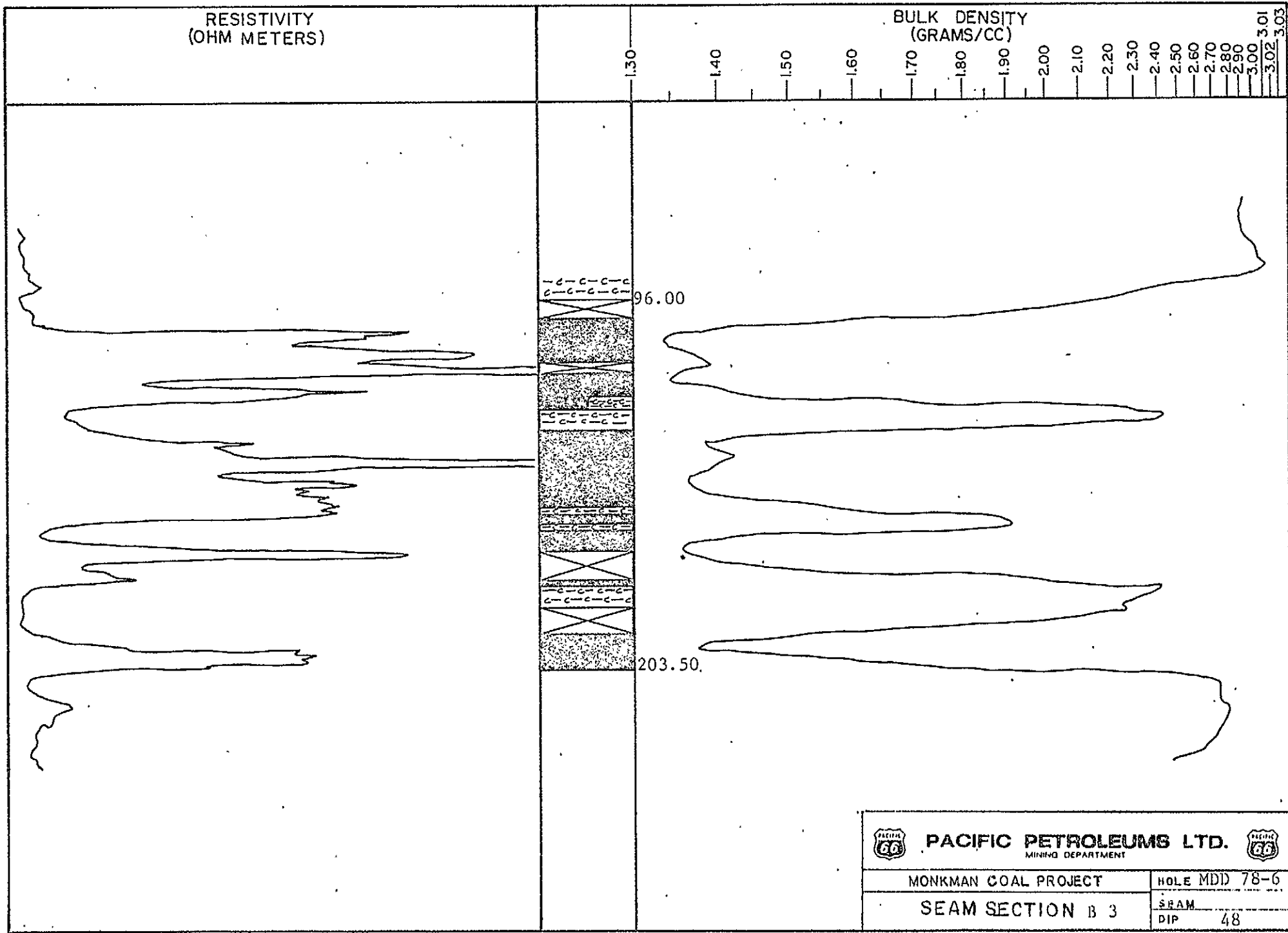
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLEMIDD 78-6
SEAM SECTION B 1		SRAM DIP 28



RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MDD 7.8-6.
SEAM SECTION B 2	SEAM DIP 42



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT 	
MONKMAN COAL PROJECT	HOLE MDD 78-6
SEAM SECTION B 3	SEAM DIP 48

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

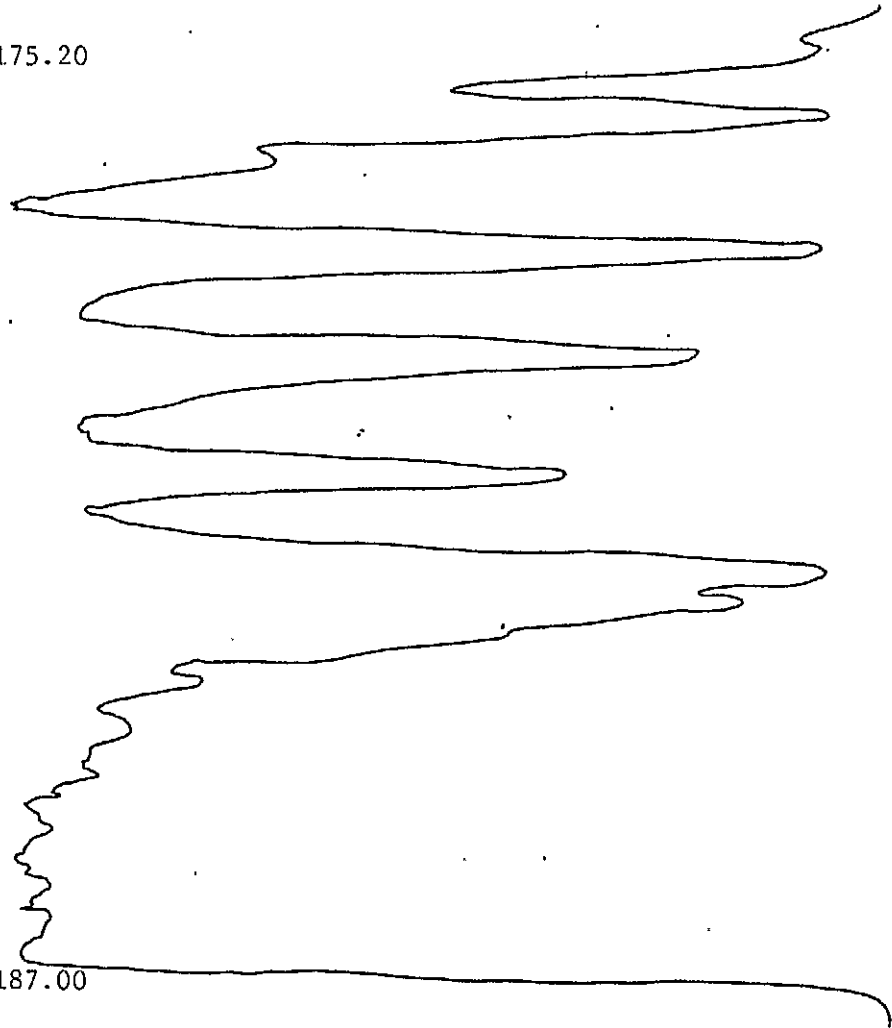
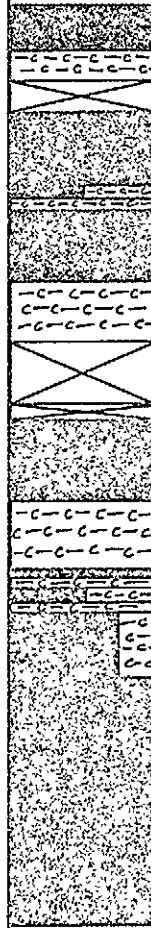
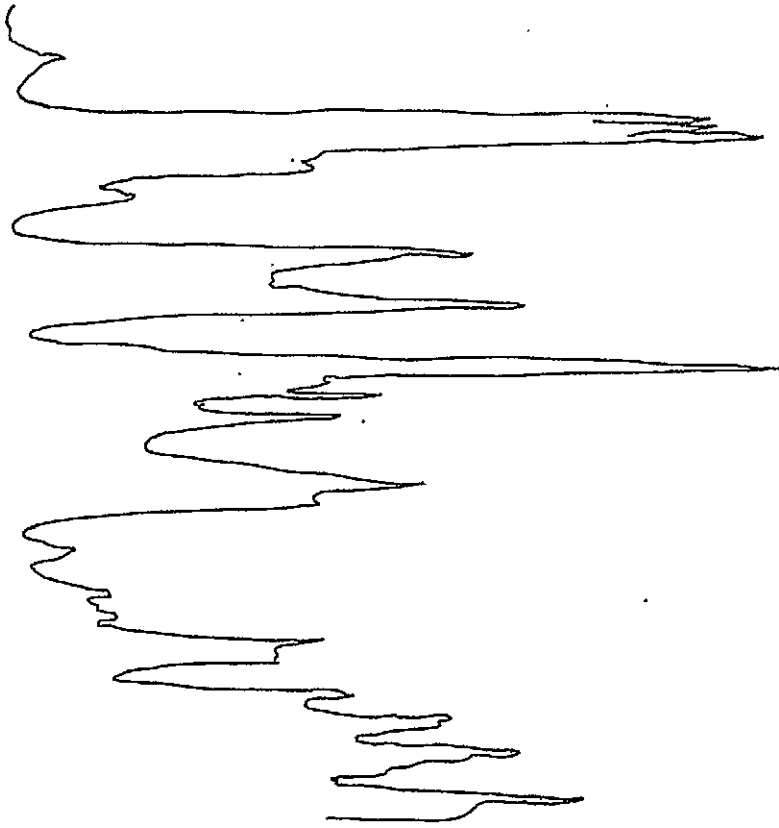
3.01

3.02

3.03

175.20

187.00



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE MDD 78-6

SEAM SECTION B 4

SEAM
DIP 45

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

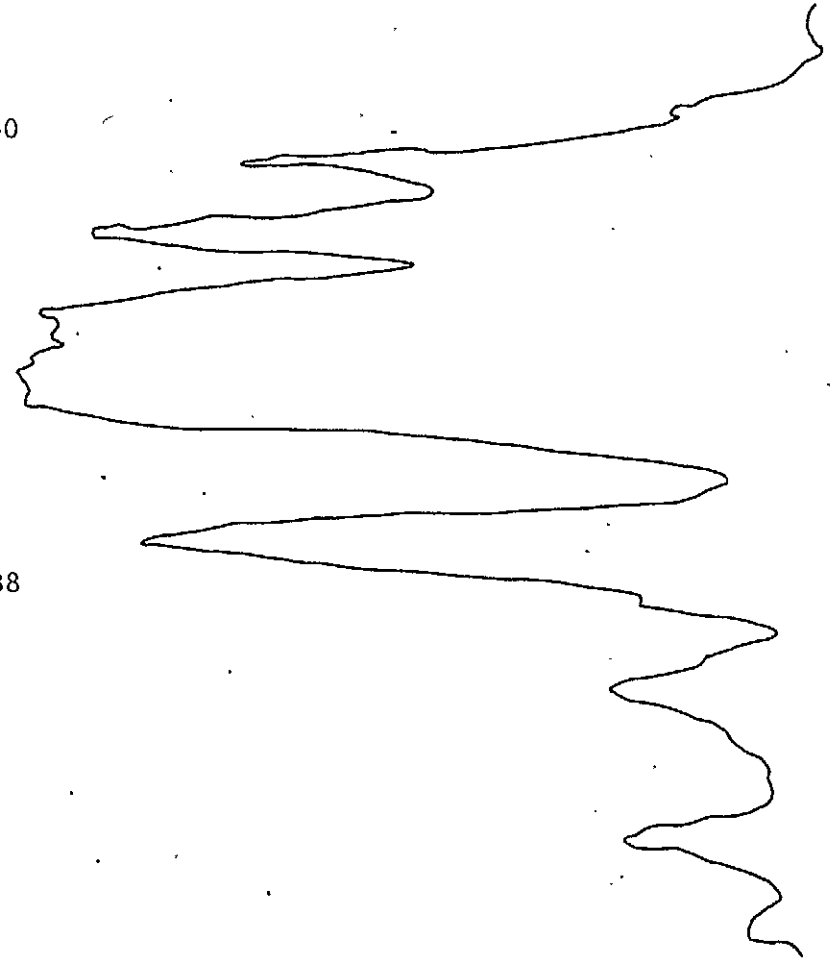
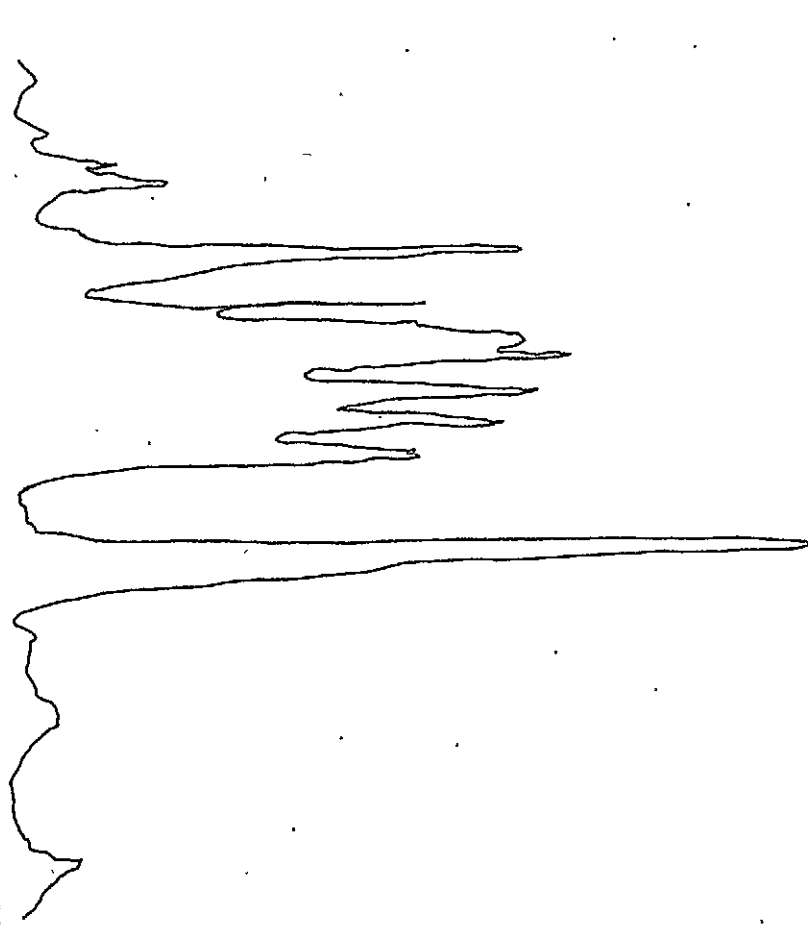
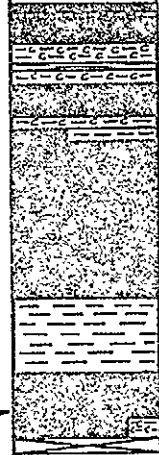
3.01



3.02

3.03

115.50

121.38



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MDD 78-6
SEAM SECTION B 5	SEAM
	DIP 48

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

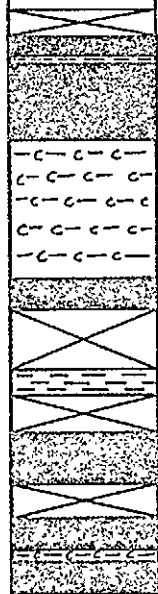
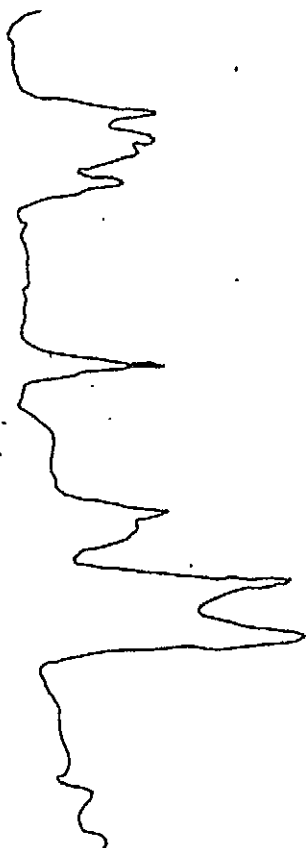
2.80

2.90

3.00

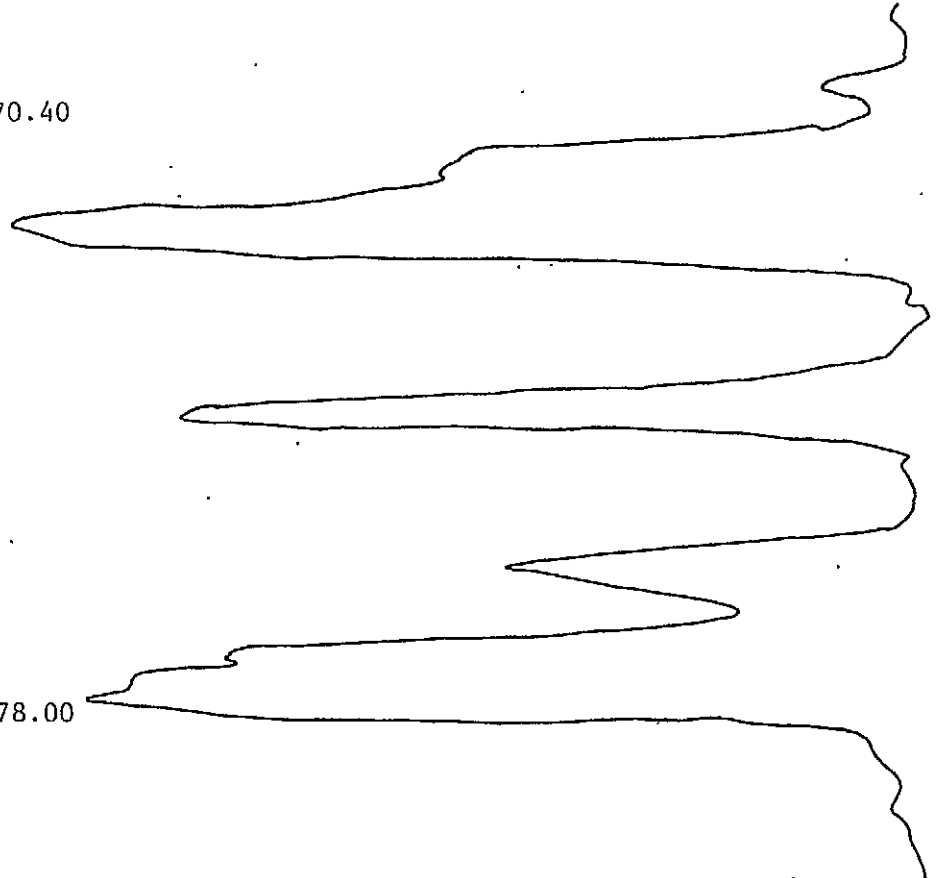
3.01

3.03



70.40

78.00



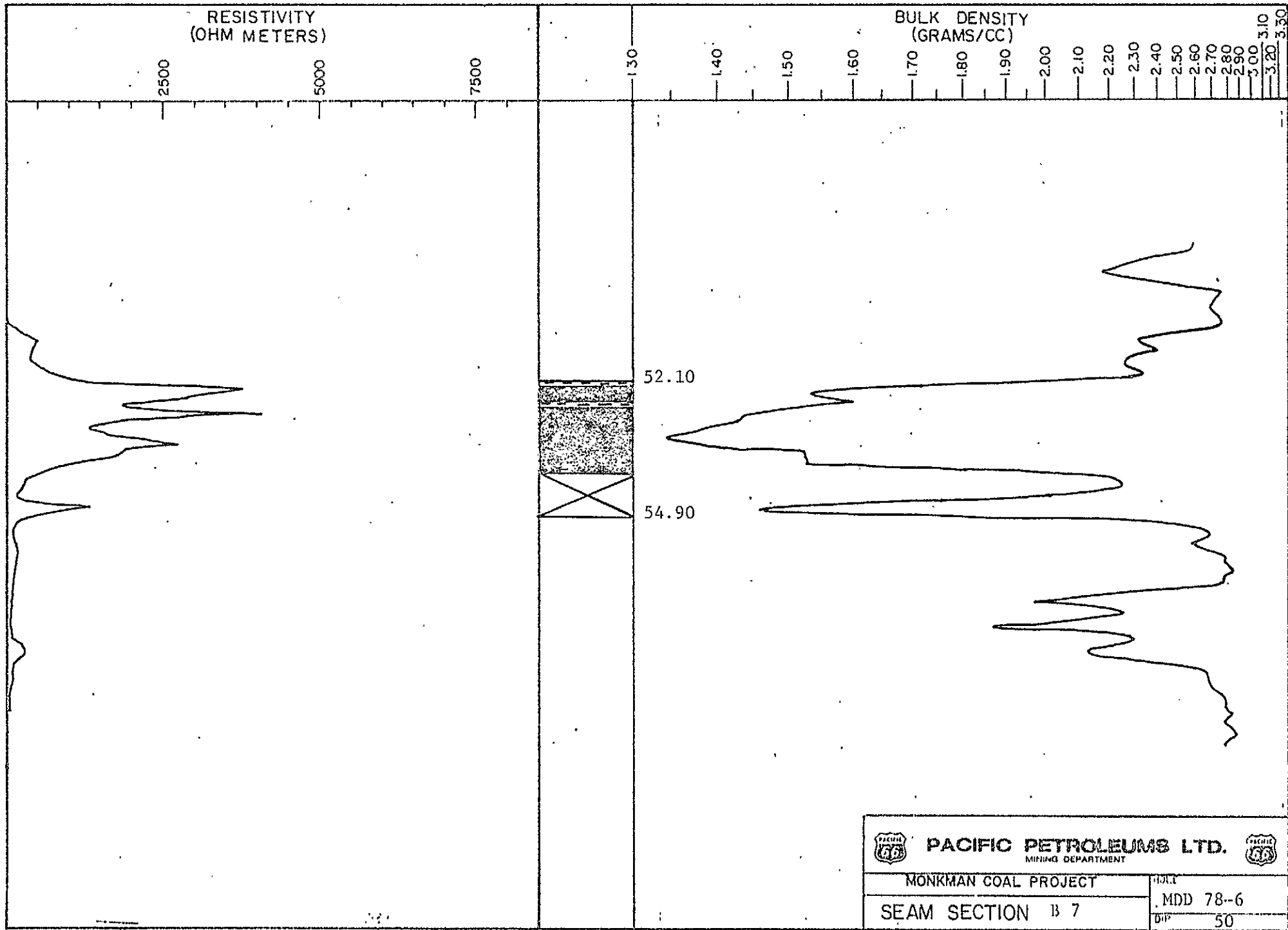
 **PACIFIC PETROLEUMS LTD.** 
MINING DEPARTMENT



MONKMAN COAL PROJECT

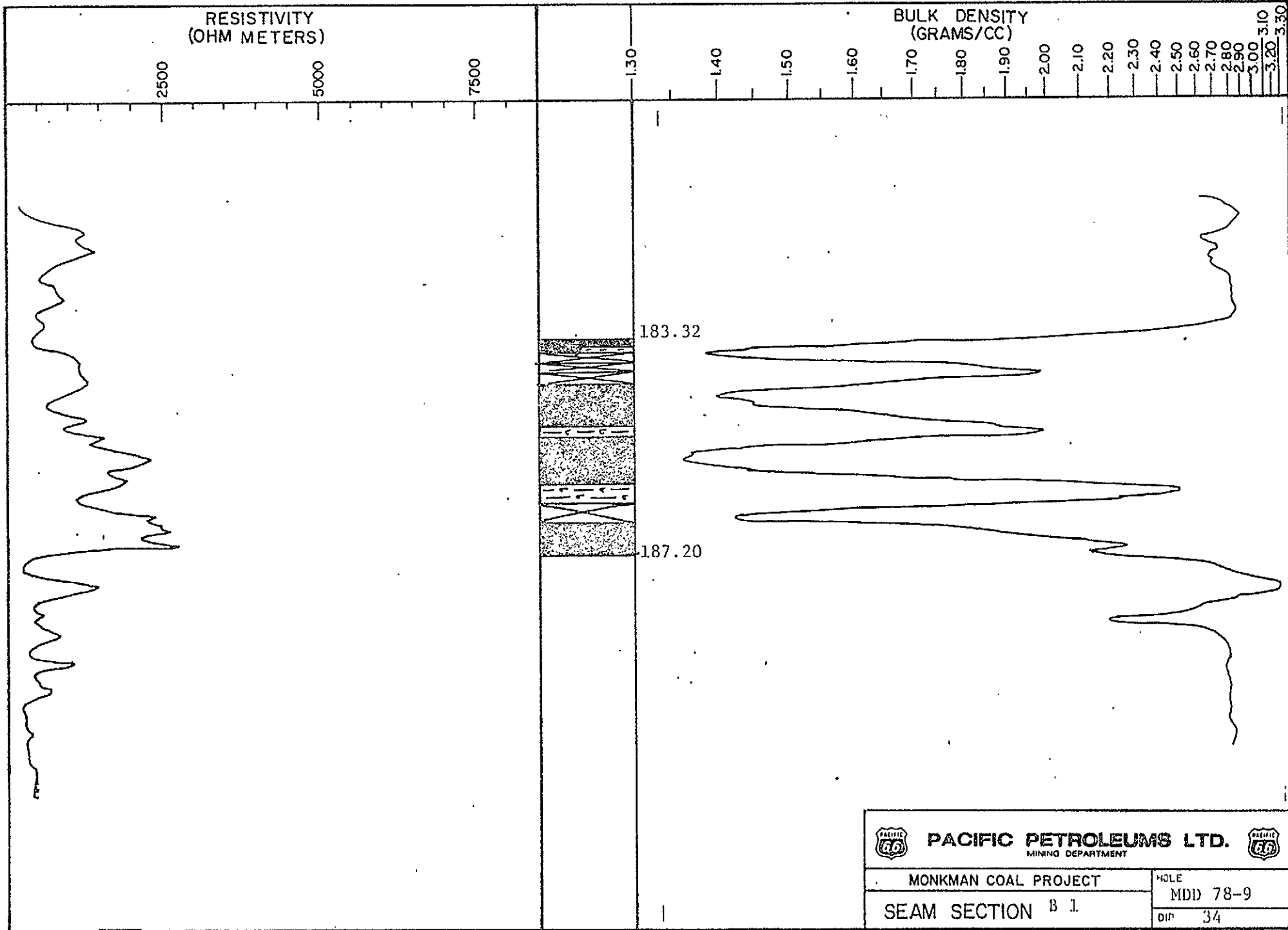
HOLE MDD 78-6

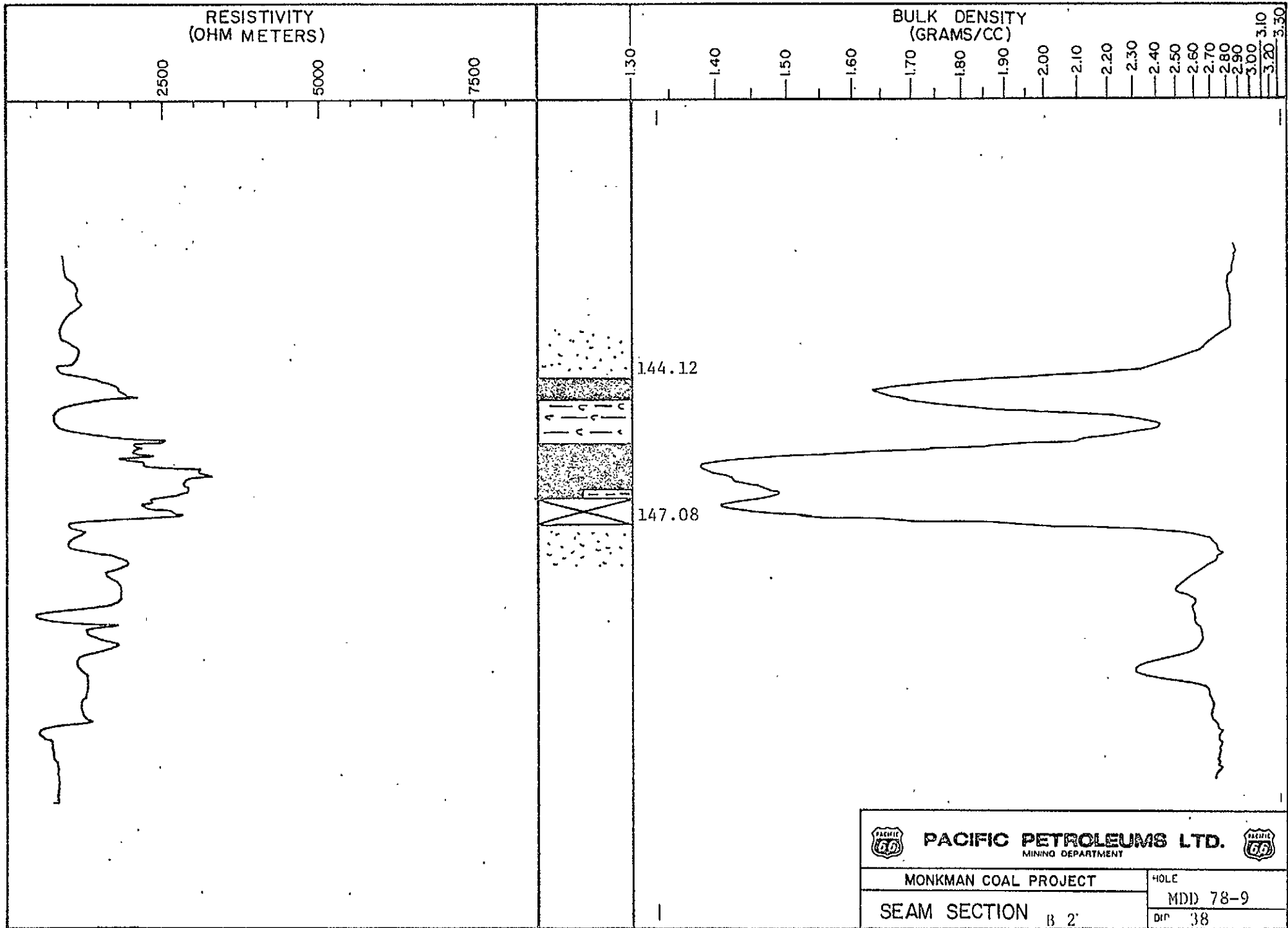
SEAM SECTION B 6

SEAM
DIP 50



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B 7	HOLE MDD 78-6
	DIP 50





RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00



3.10

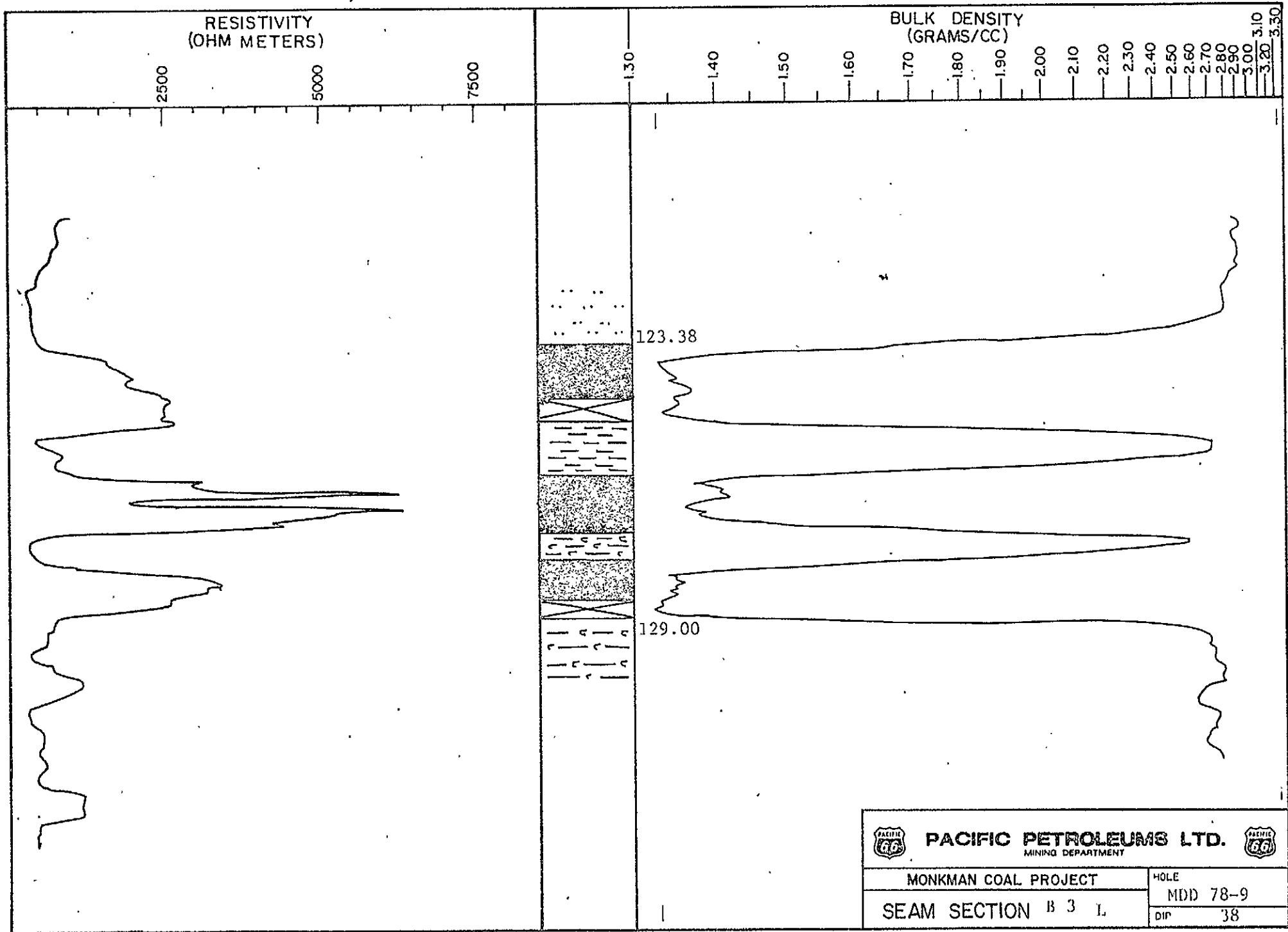
3.20



3.30

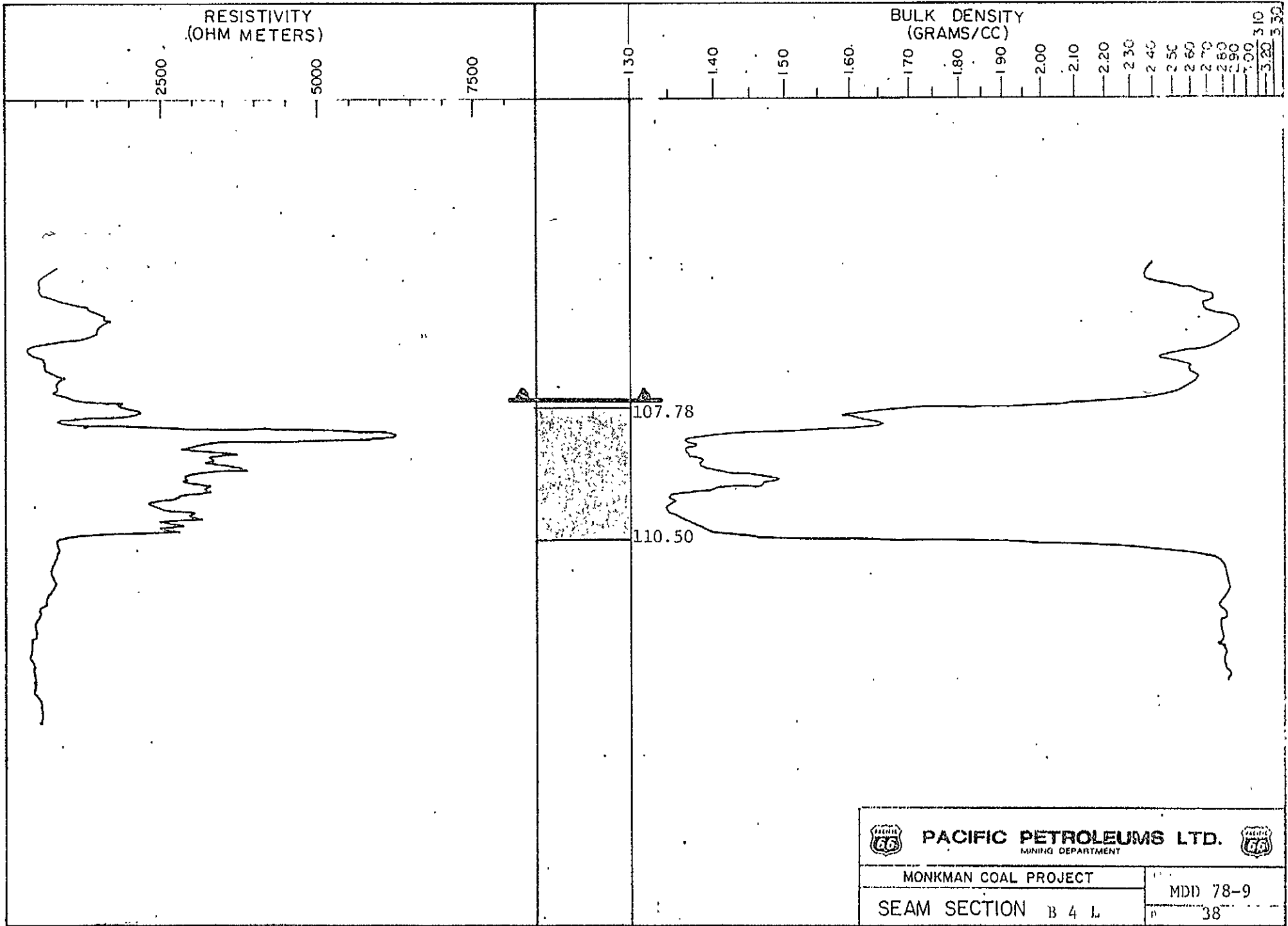
144.12



147.08

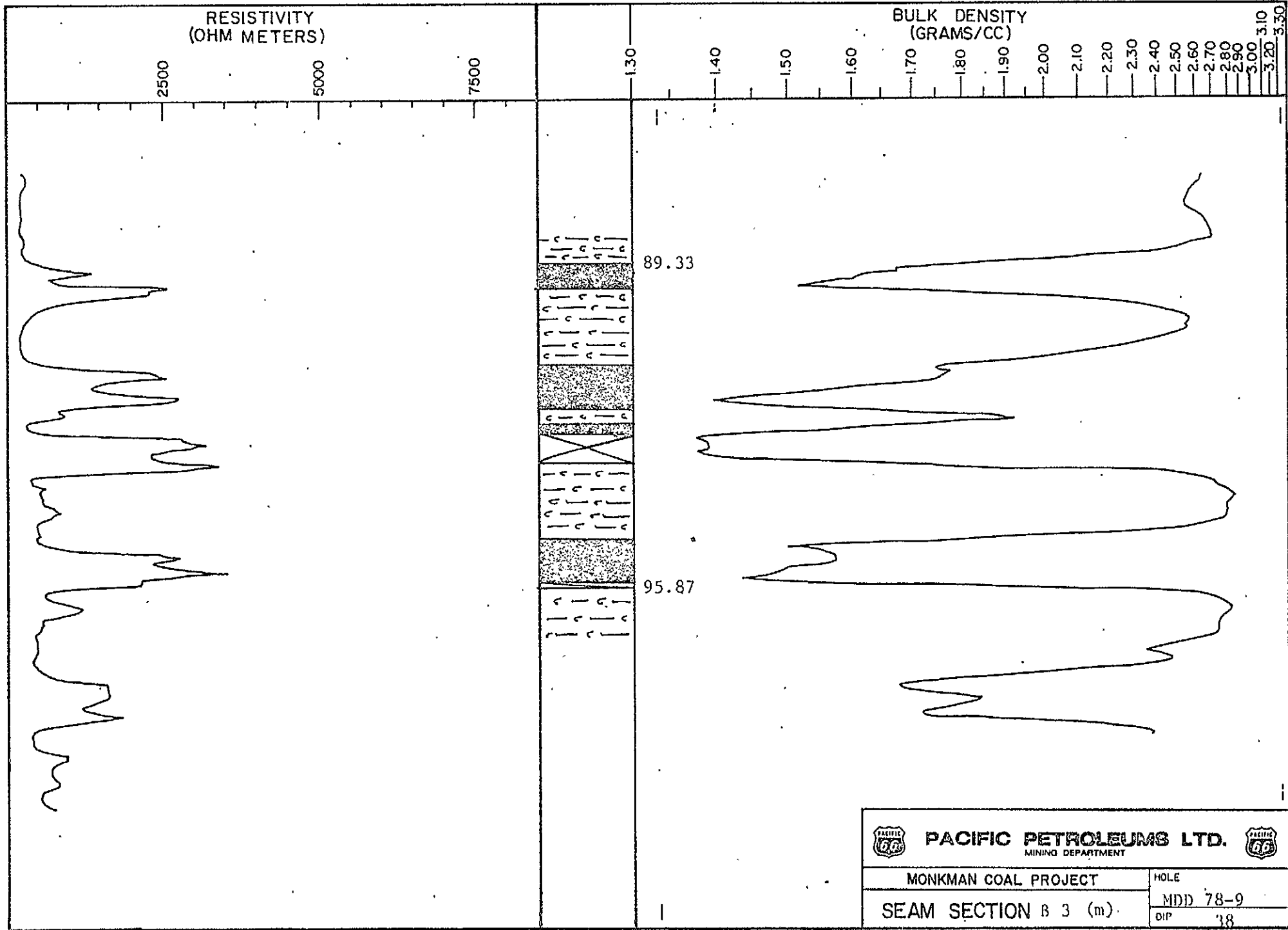
 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B 2'	
<small>HOLE</small> MDD 78-9	<small>DIP</small> 38



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MDD 78-9
SEAM SECTION B 3 L		DIP 38



 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 4 L	MDD 78-9
	38



RESISTIVITY
(OHM METERS)



2500 5000 7500

BULK DENSITY
(GRAMS/CC)

1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30

89.33

95.87

 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 3 (m)	
HOLE MDD 78-9 DIP 38	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

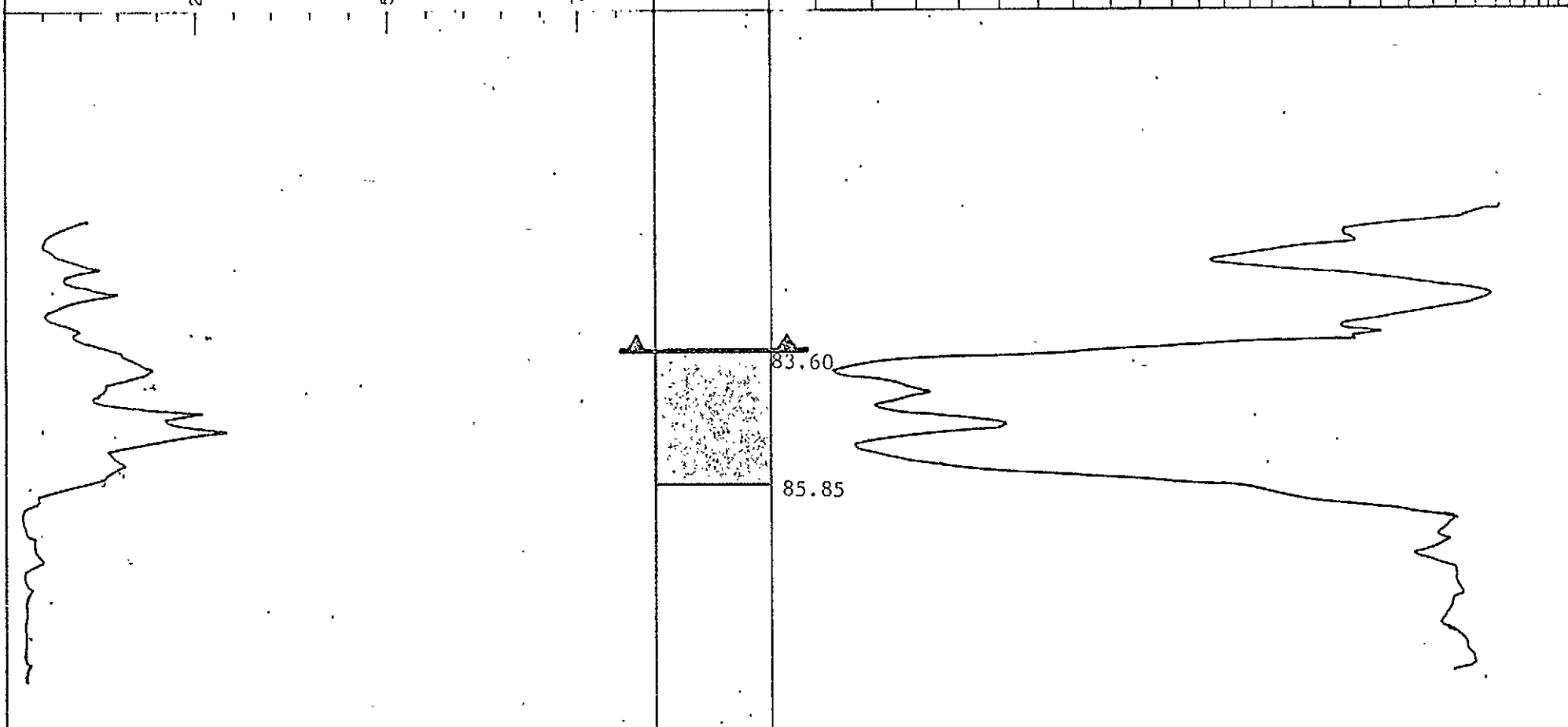
2.90

3.00

3.10

3.20

3.30



83.60

85.85



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

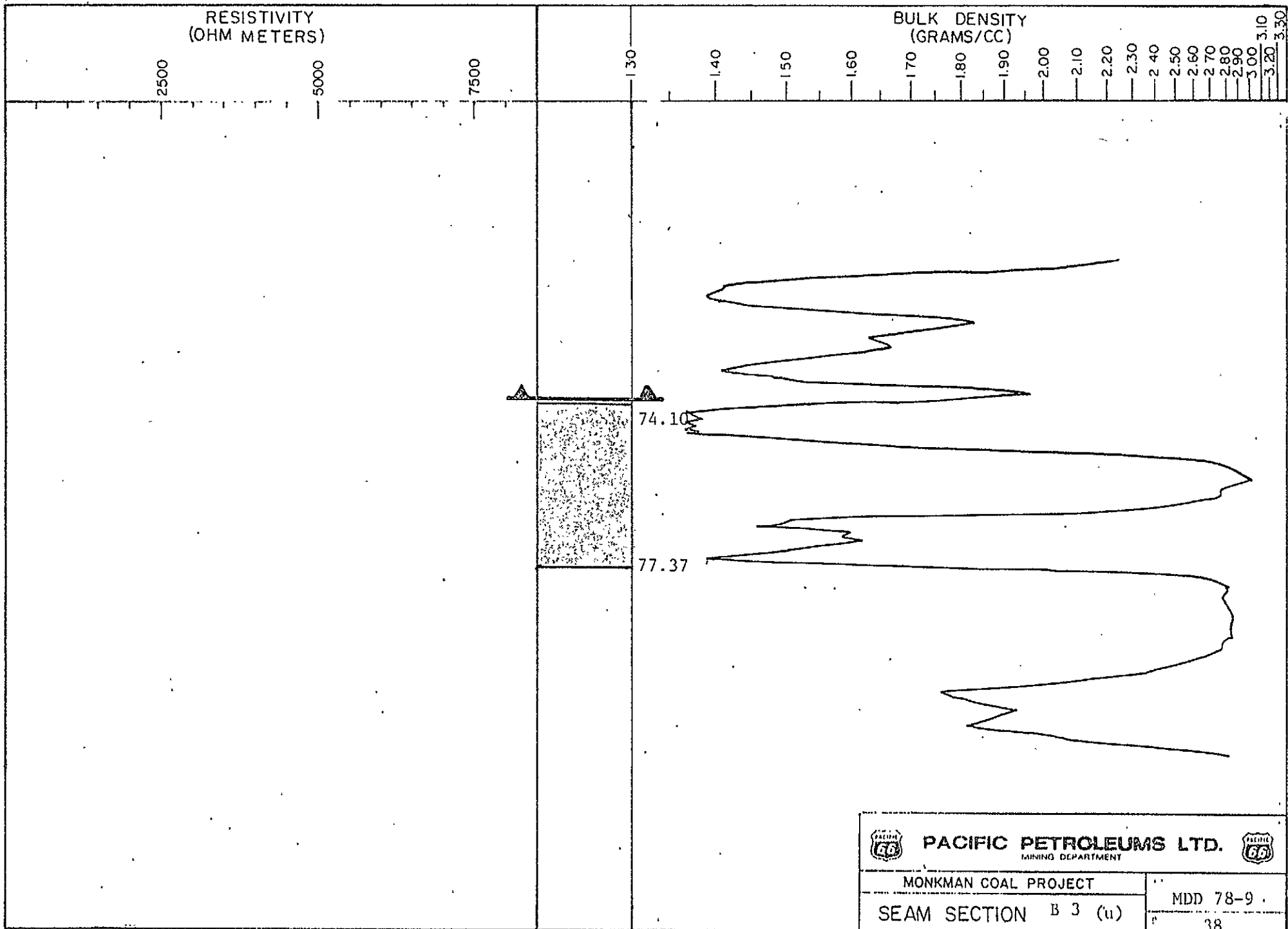




MONKMAN COAL PROJECT

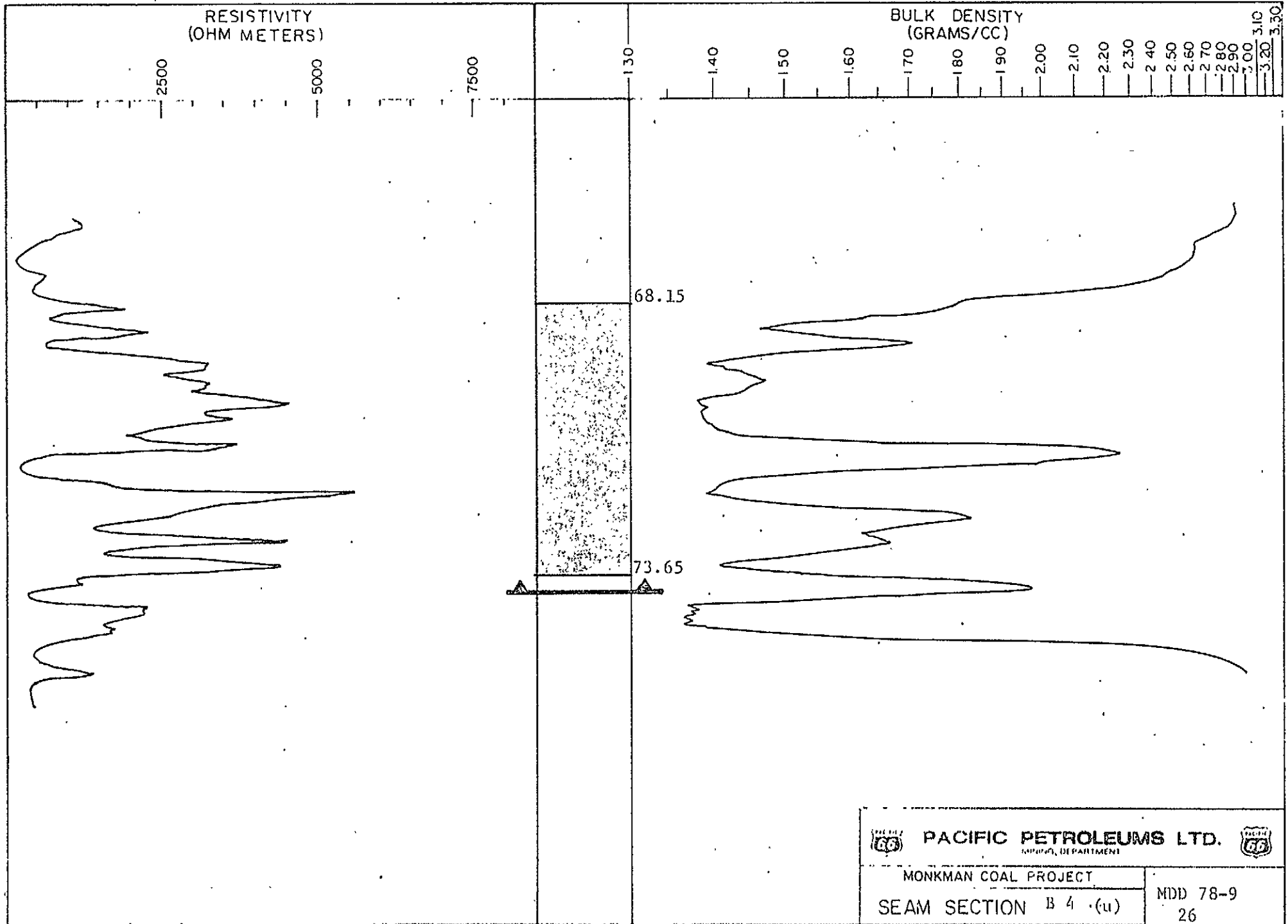
SEAM SECTION B 4 (nr)

MDD 78-9

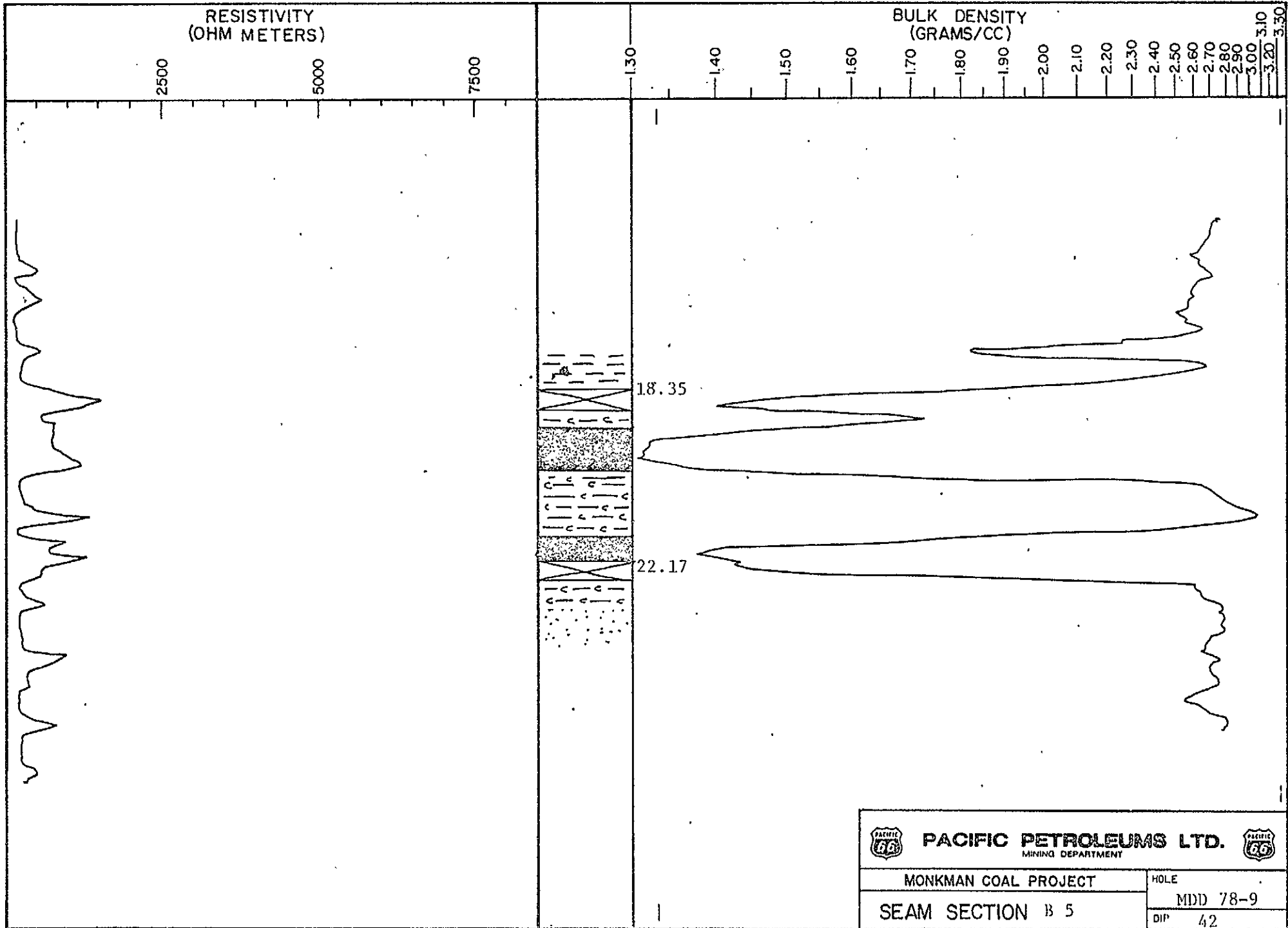
26





 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MDD 78-9
SEAM SECTION B 3 (u)		38



PACIFIC PETROLEUMS LTD. <small>ALBERTA, DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B 4 (u)	MDD 78-9 26



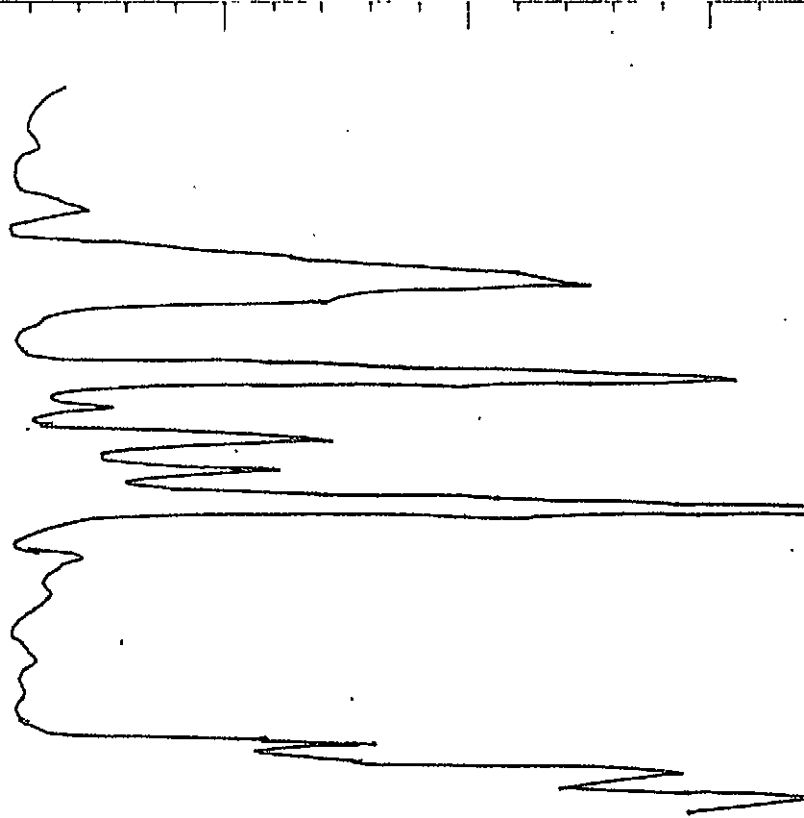
 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE
SEAM SECTION B 5	MDD 78-9
	DIP 42

RESISTIVITY
(OHM METERS)

2500

5000

7500



130

135.47

144.17

BULK DENSITY
(GRAMS/CC)

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION 'B' 4

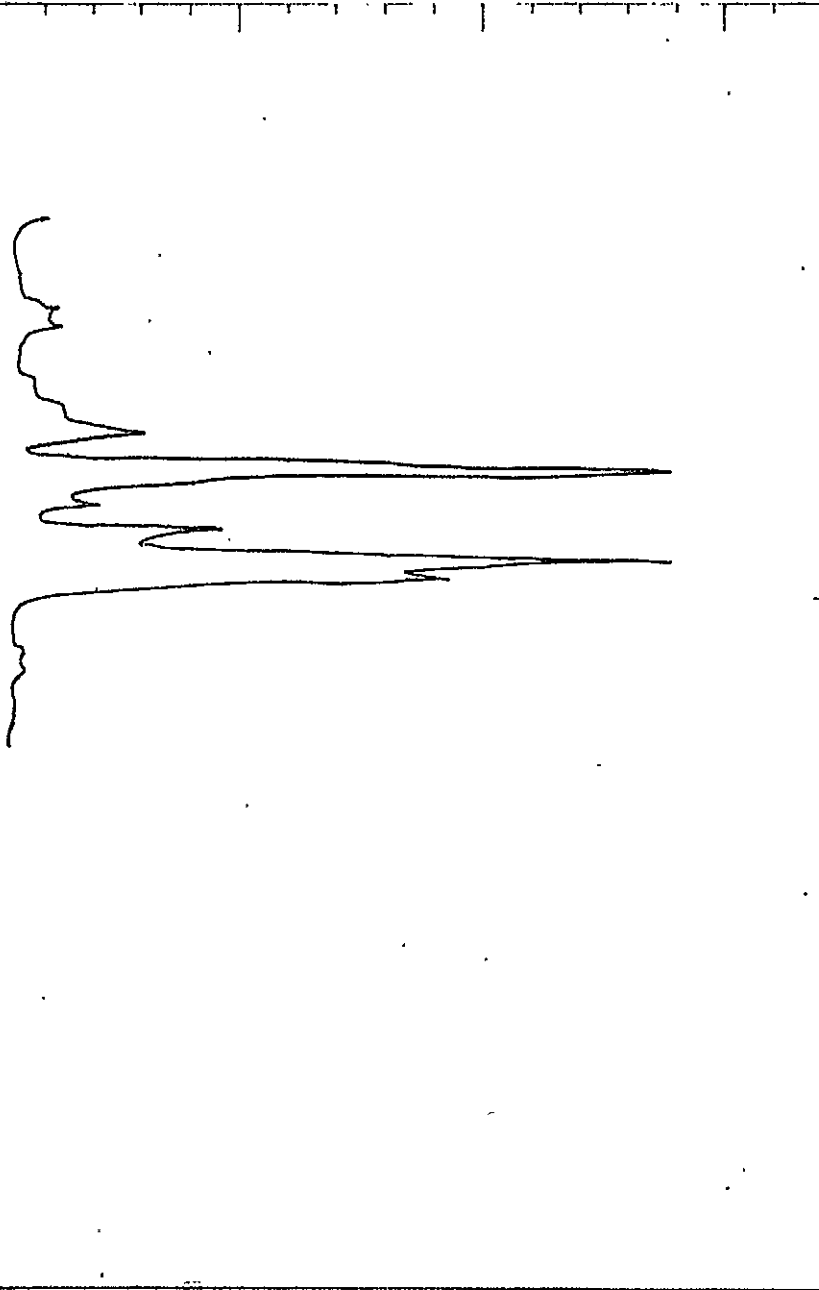
11.1
MDD 78-10
D 28

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

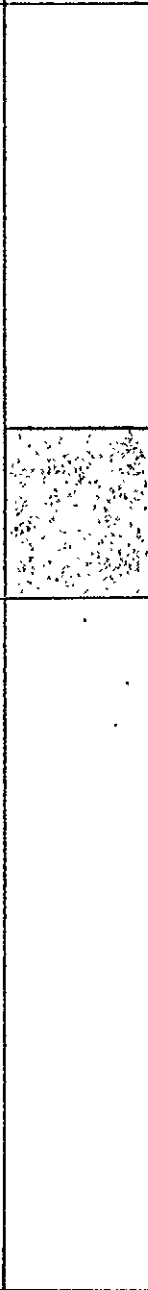
2.90

3.00

3.10

3.20

3.30



95.30

97.54



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

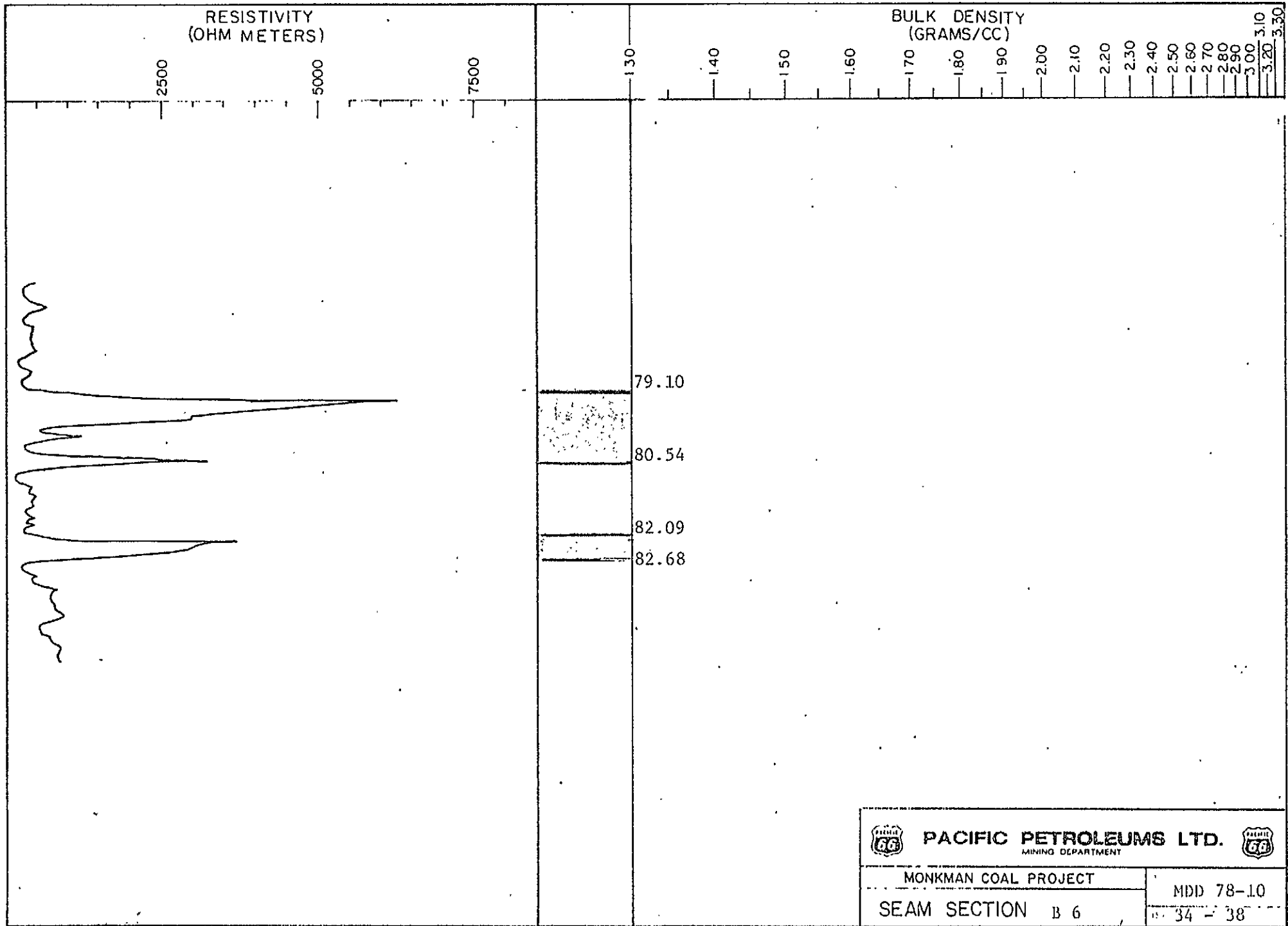




MONKMAN COAL PROJECT

SEAM SECTION B 5

MDD-78-10

PH 28



 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 6	MDD 78-10 34 - 38

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

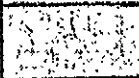
2.70

2.80

2.90

3.00

3.10
3.20
3.30



65.54

66.53



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 7

MIDD 78-10

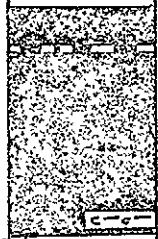
34

RESISTIVITY
(OHM METERS)

2500
5000
7500

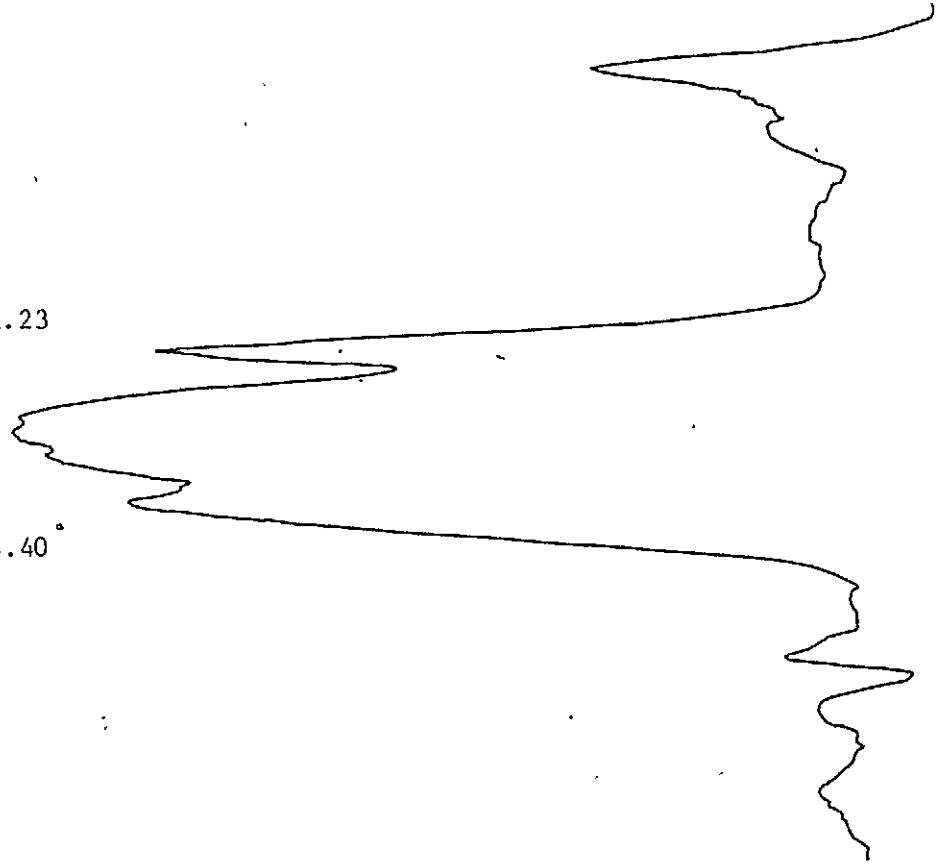
BULK DENSITY
(GRAMS/CC)

1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30



11.23

14.40



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

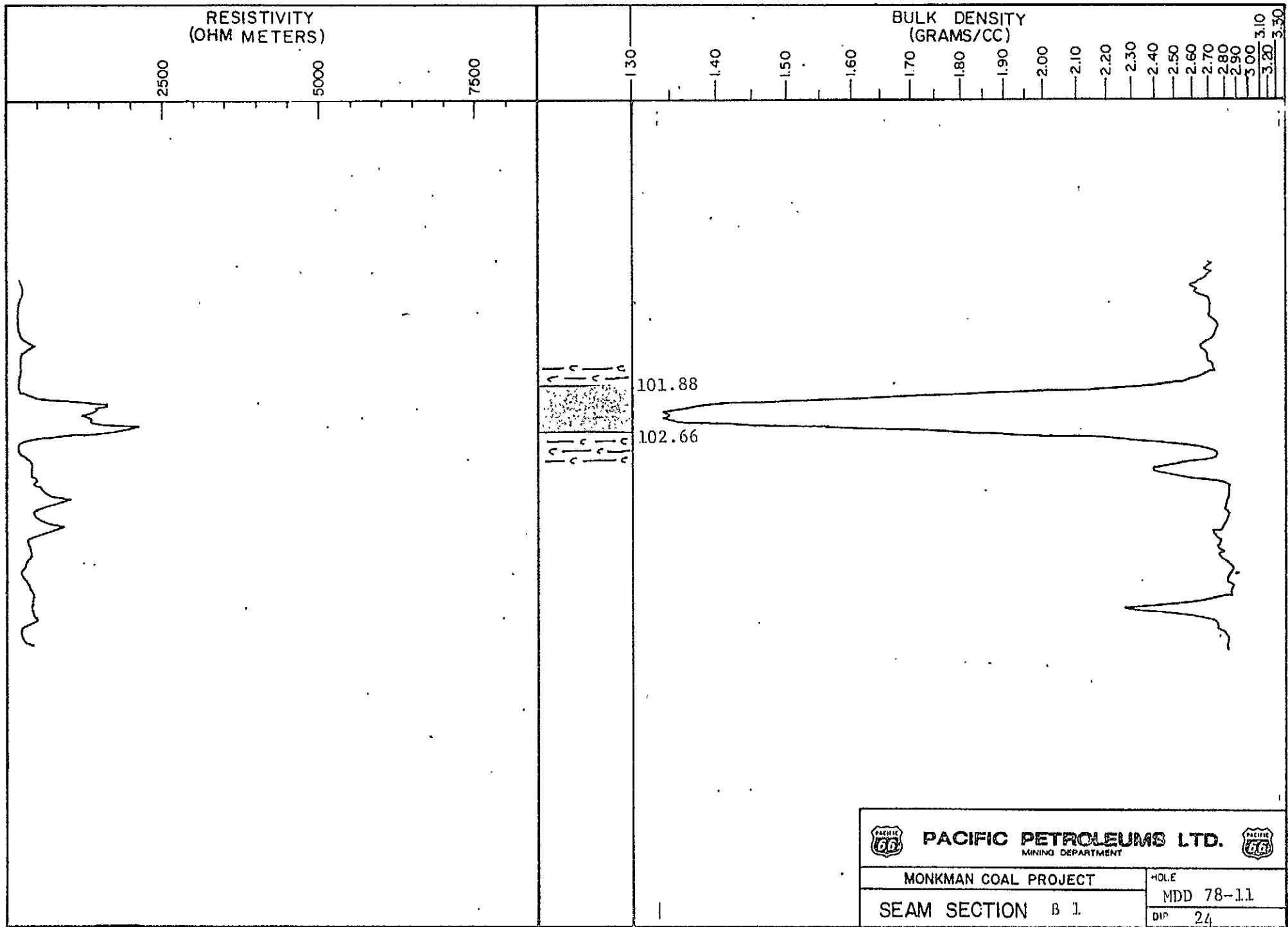


MONKMAN COAL PROJECT

HOLE
MDD 78-10

SEAM SECTION B 9

DIP 29



RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

44.23

47.80



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MDD 78-11

SEAM SECTION B 3

DIP 18

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

22.90

32.50



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE

SEAM SECTION B 4

MDD 78-11

DIP

18

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

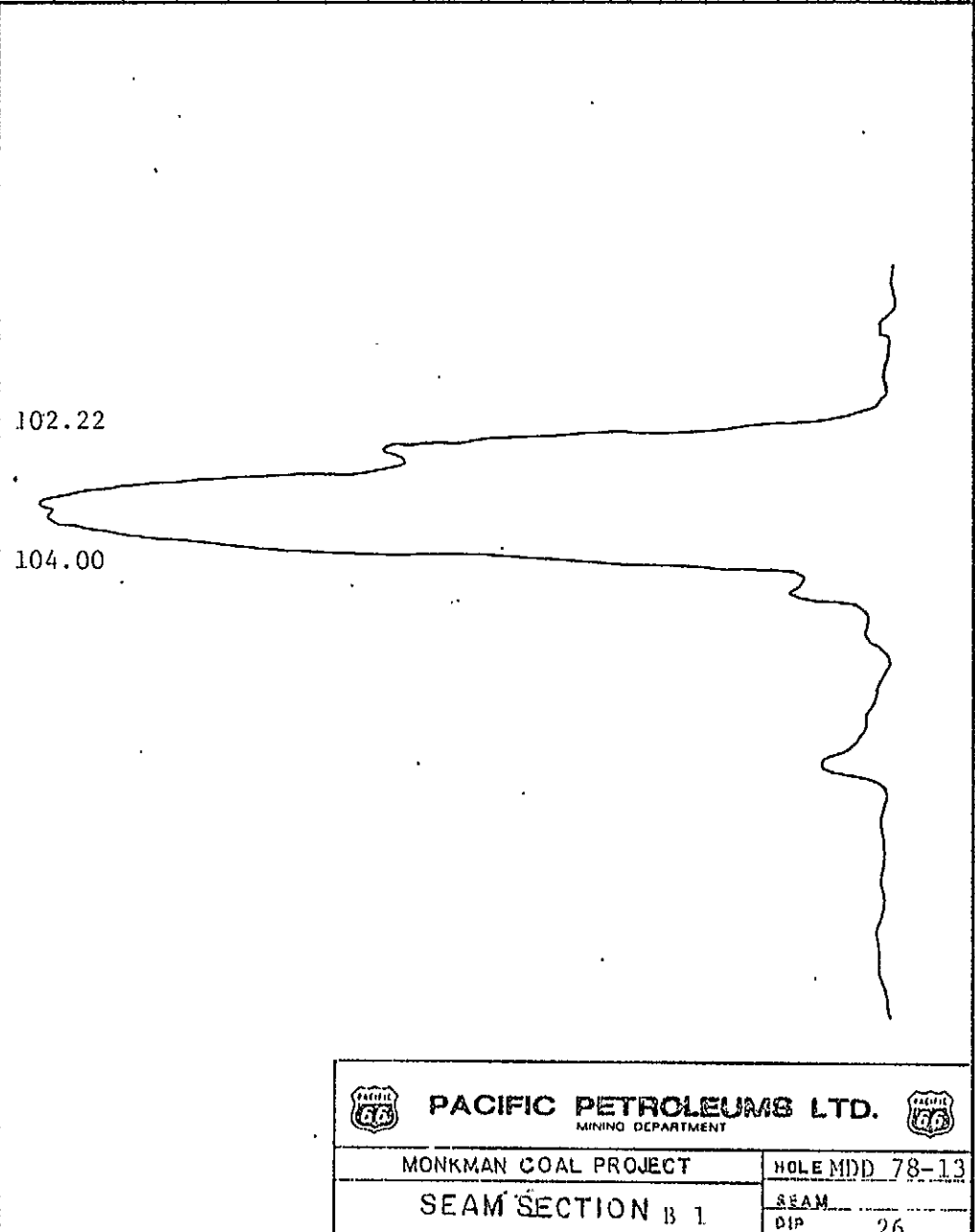
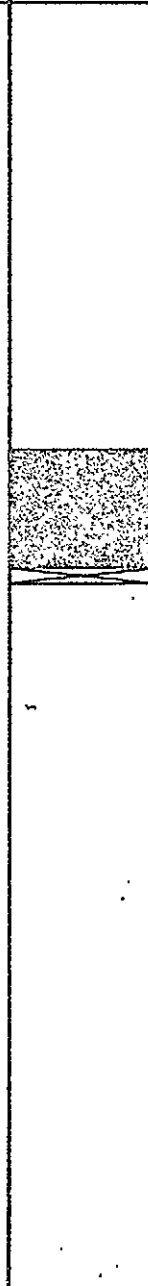
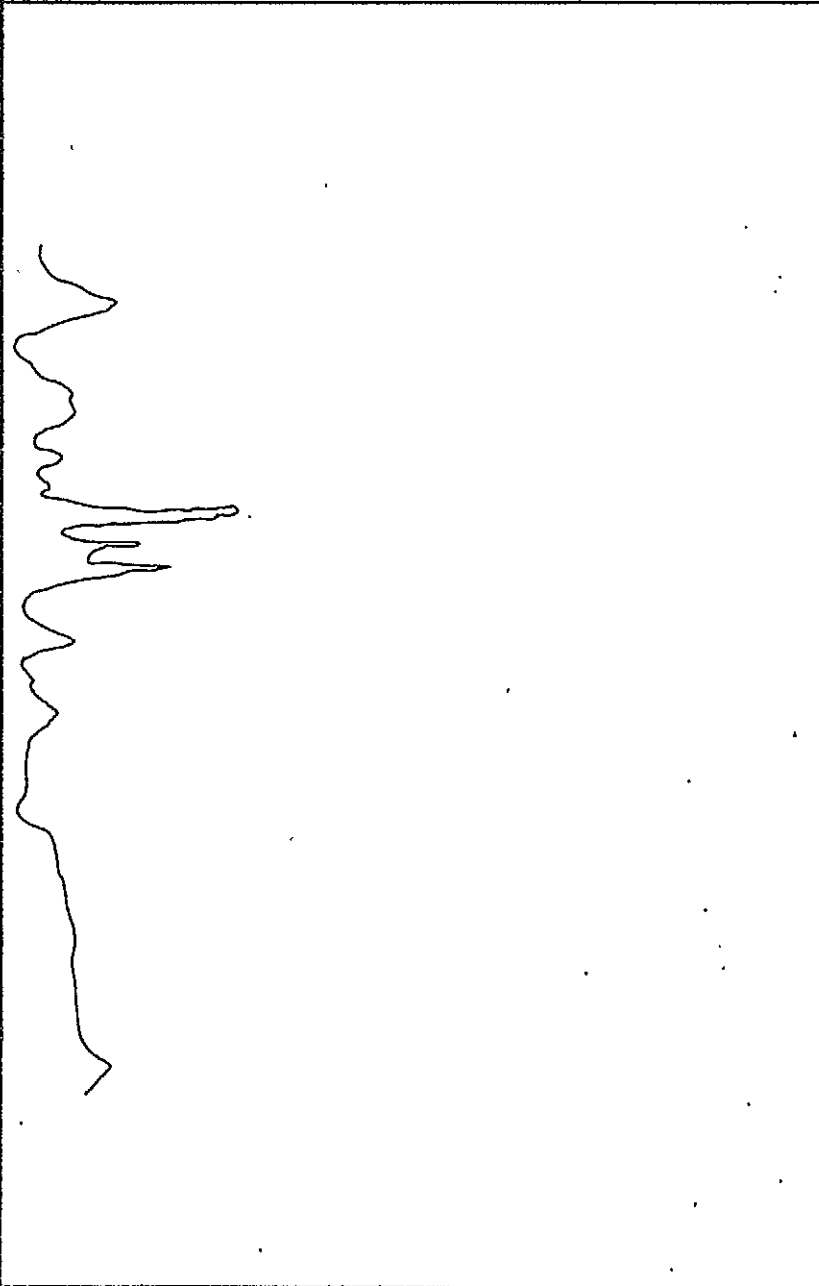
2.90

3.00

3.01

3.02

3.03



102.22

104.00



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE MDD 78-13

SEAM SECTION B 1

SEAM

DIP

26

RESISTIVITY
(OHM METERS)

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

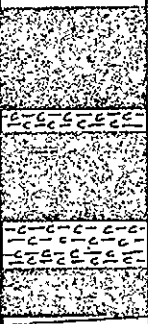
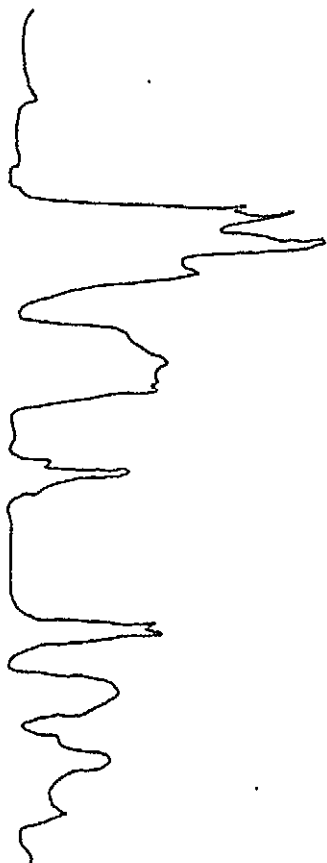
2.80

2.90

3.00

3.01

3.03



46.85

50.90



PACIFIC PETROLEUMS LTD.



MINING DEPARTMENT

MONKMAN COAL PROJECT

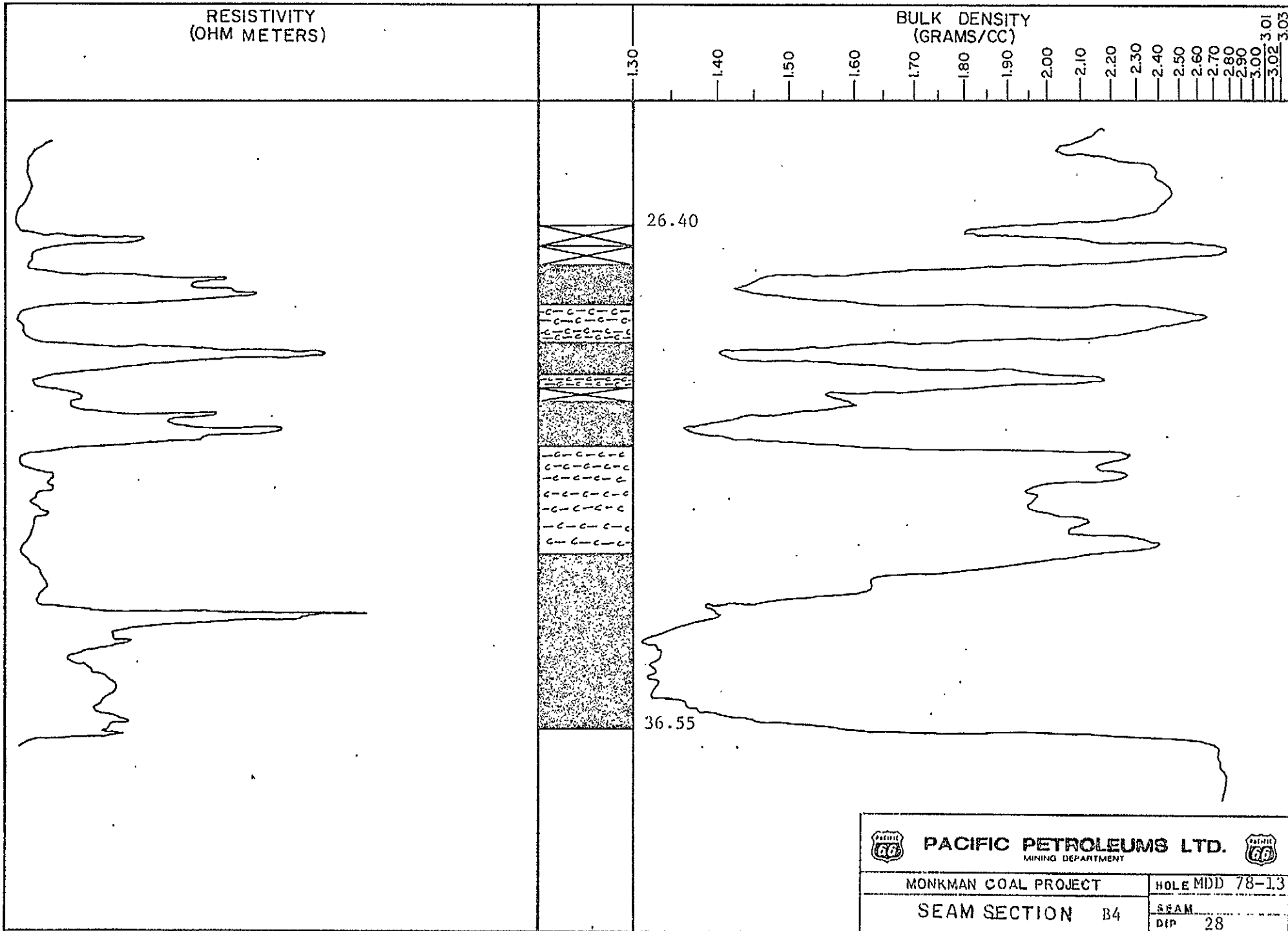
HOLE MDD 78-13

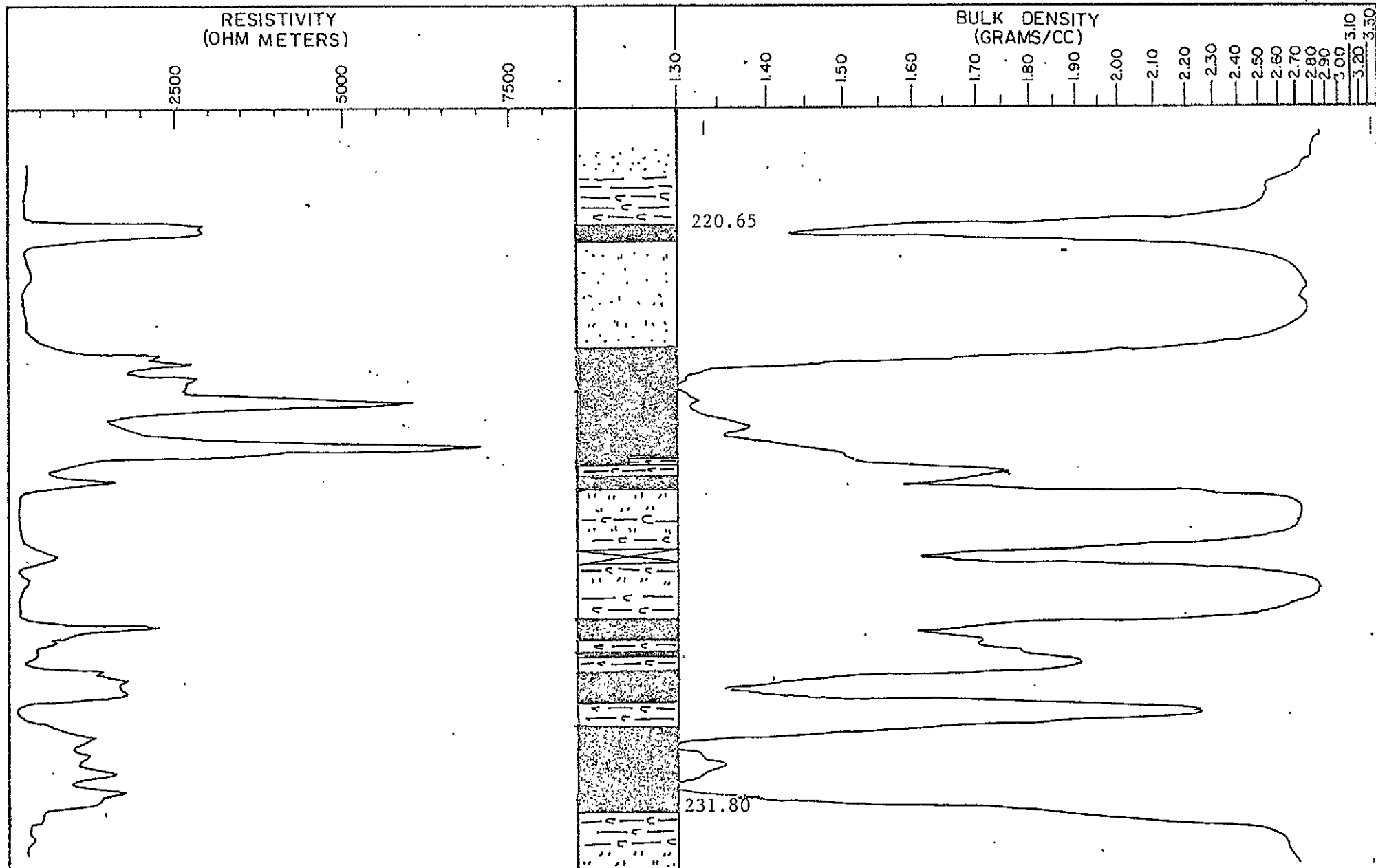
SEAM SECTION B3



SEAM

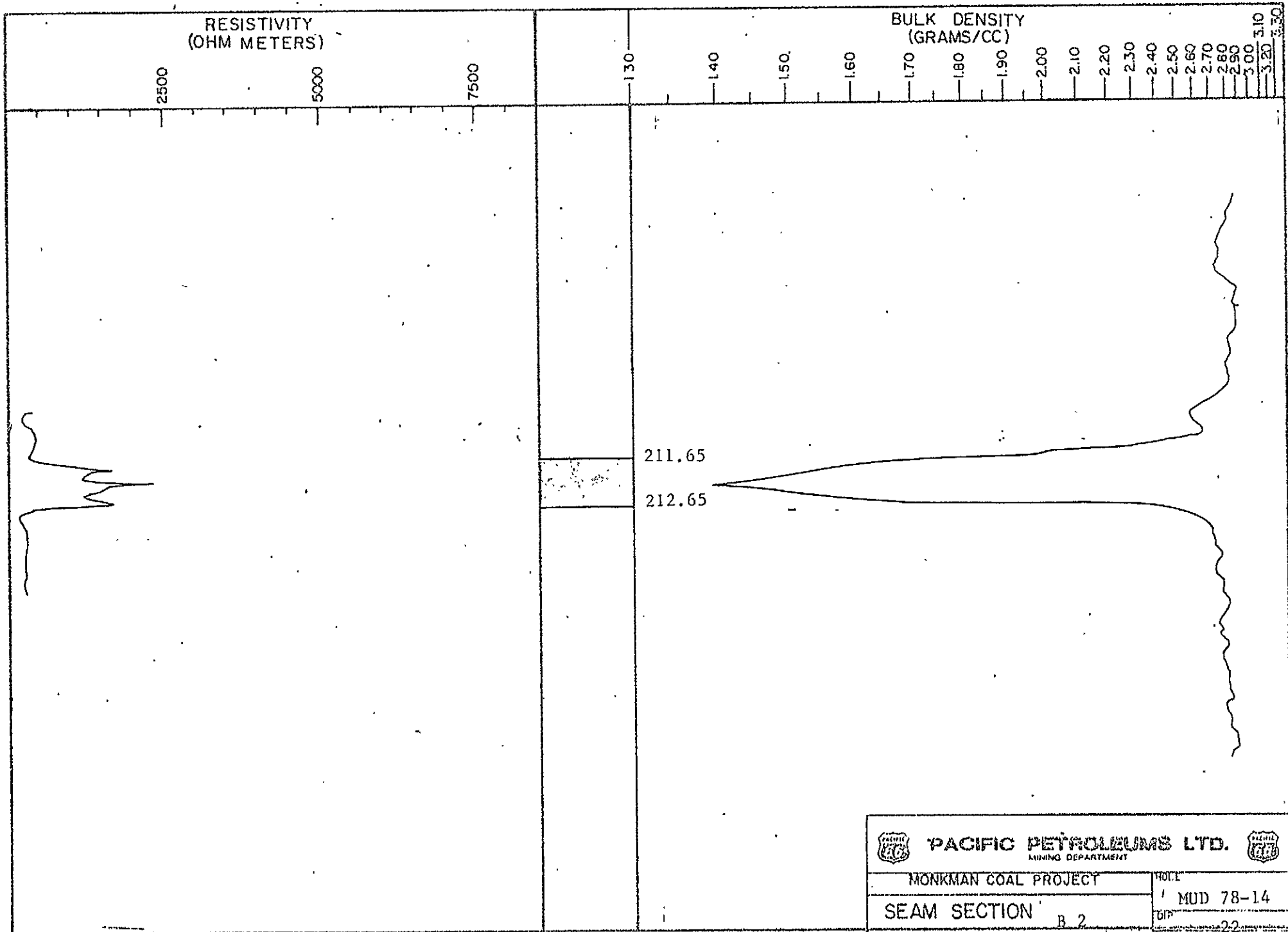
DIP



32





 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B I		MUD 78-14
		DIP 23



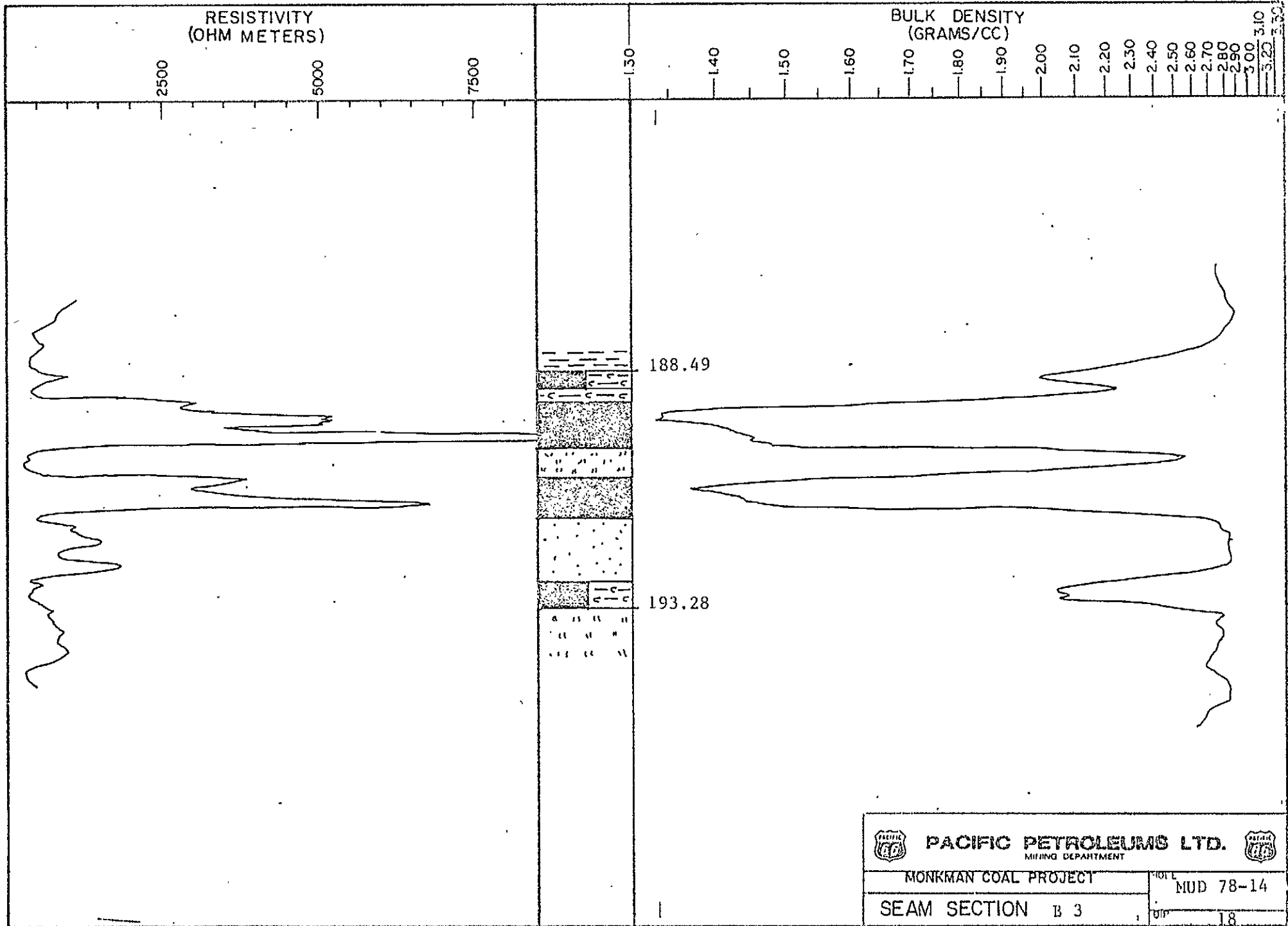
 **PACIFIC PETROLEUMS LTD.** 
MINING DEPARTMENT



MONKMAN COAL PROJECT

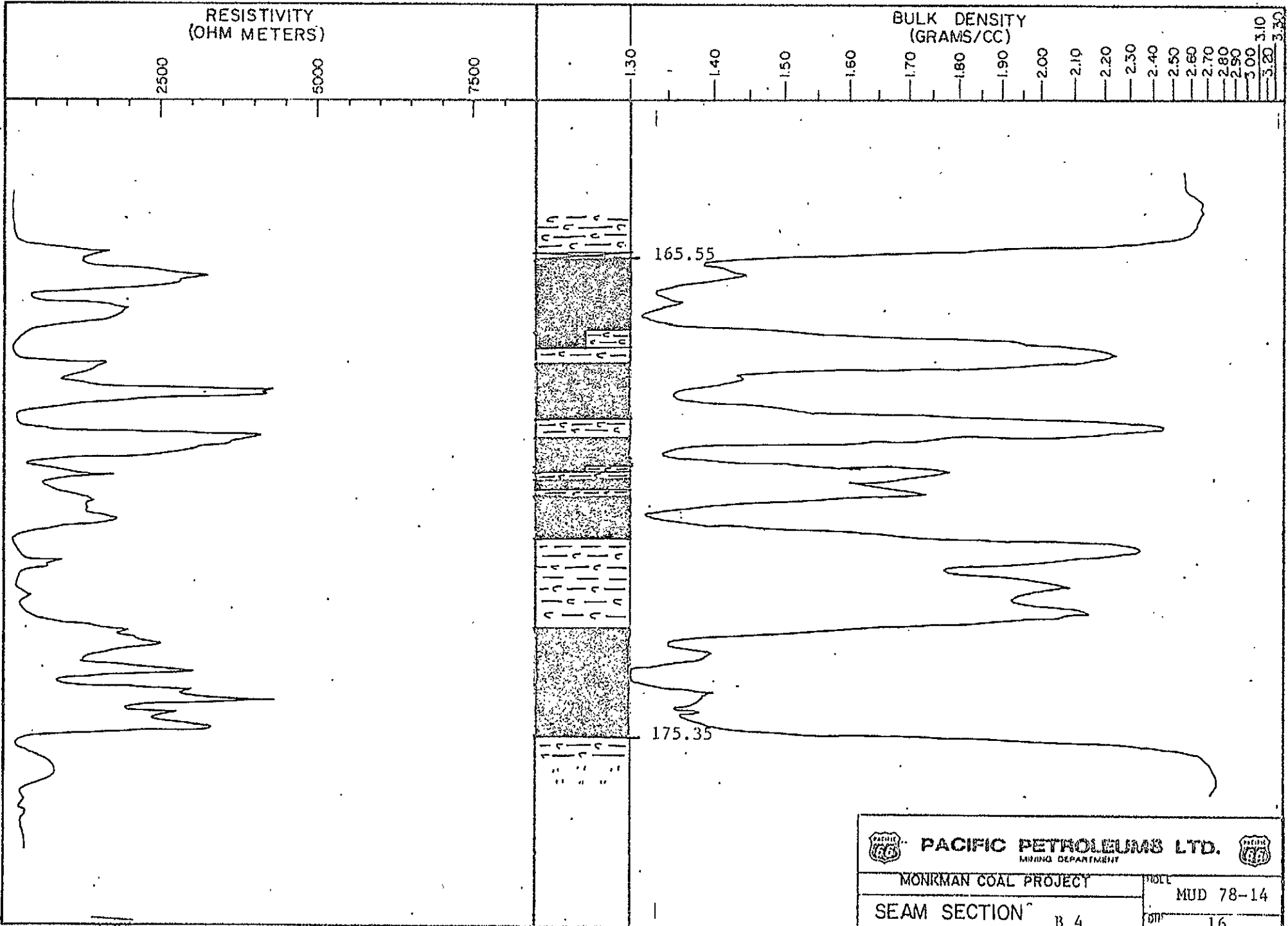
SEAM SECTION B 2



HOLE

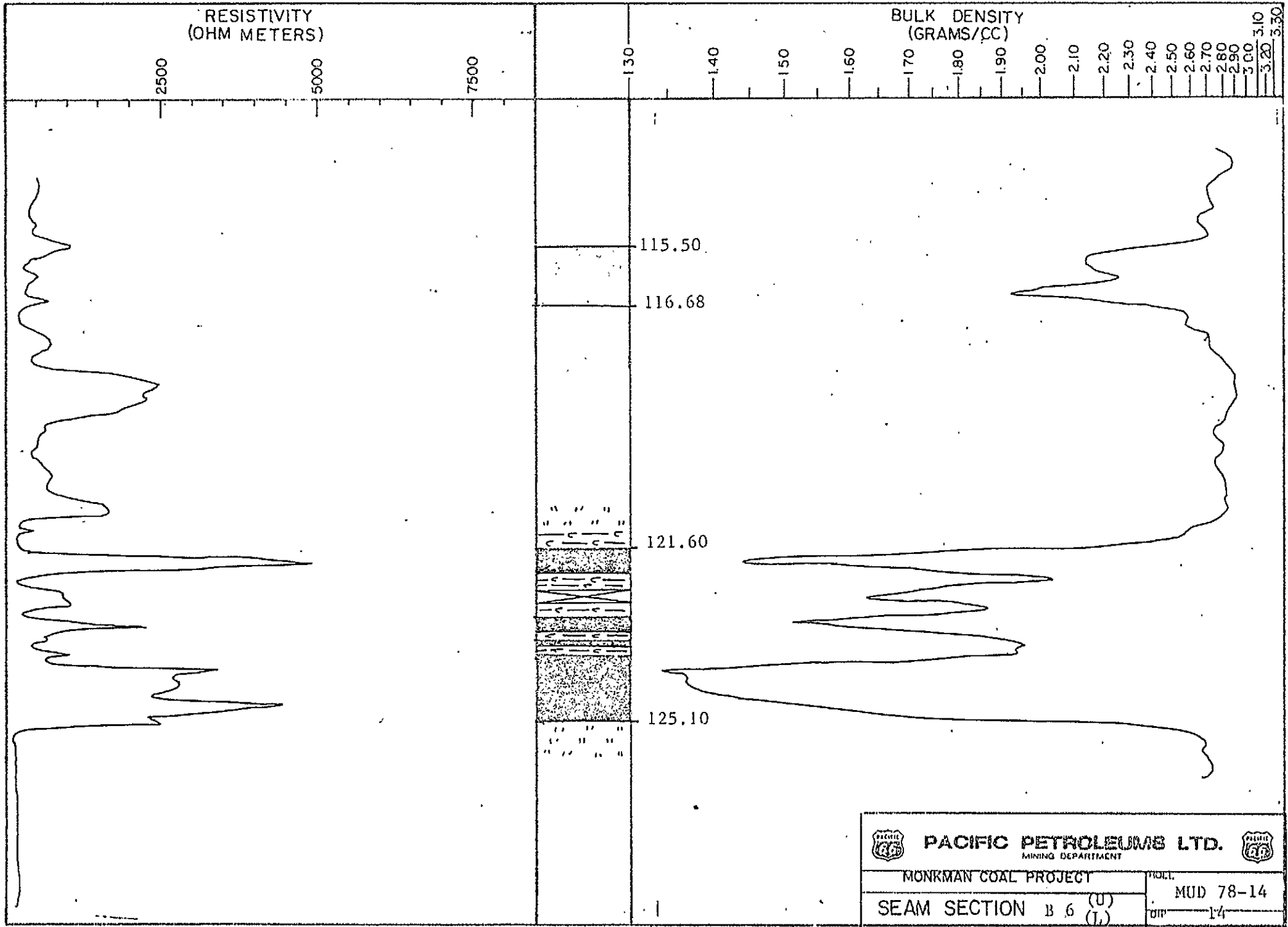
MUD 78-14





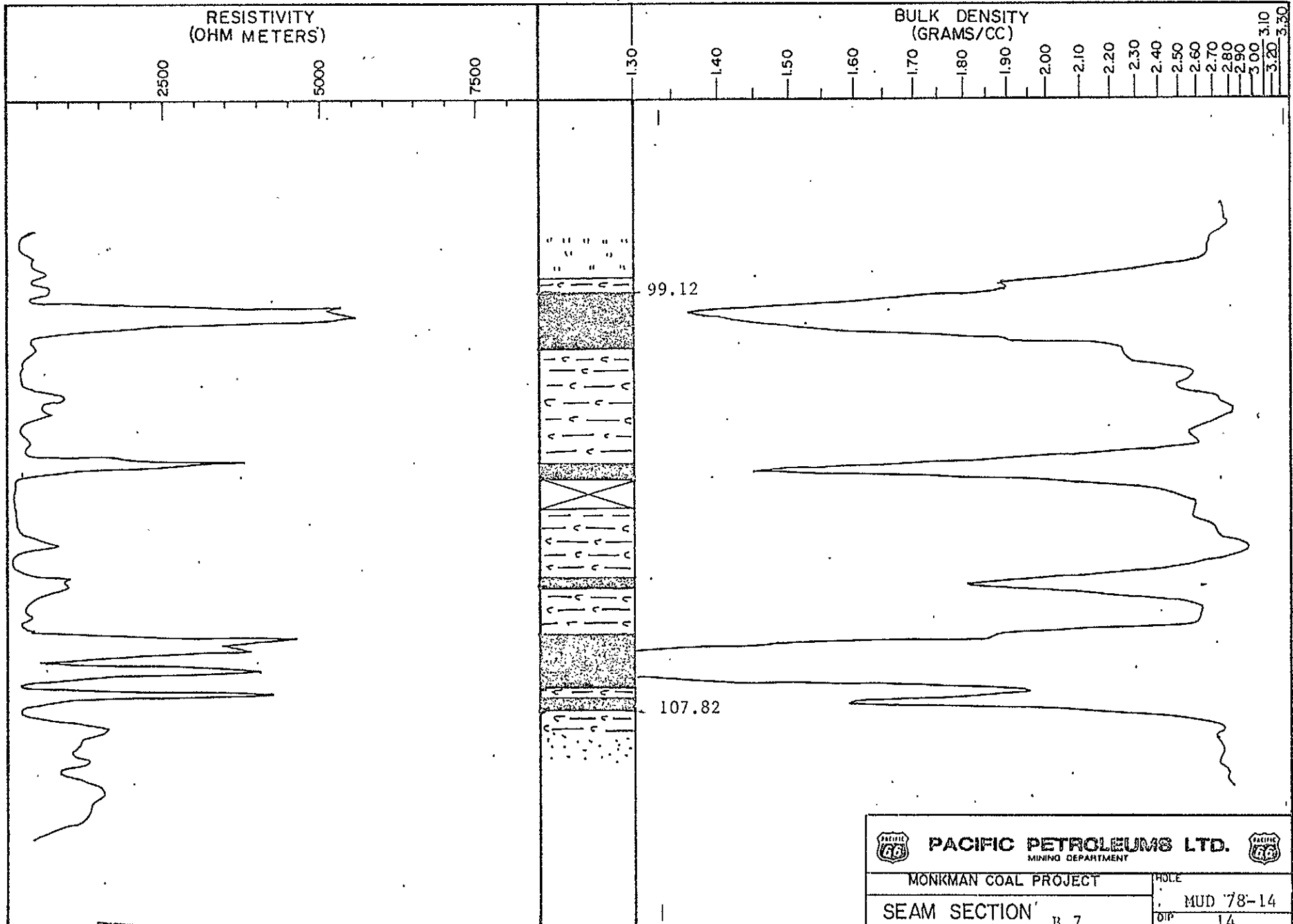
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MONKMAN COAL PROJECT	
SEAM SECTION B 3	HOLE MUD 78-14
	DIP 18





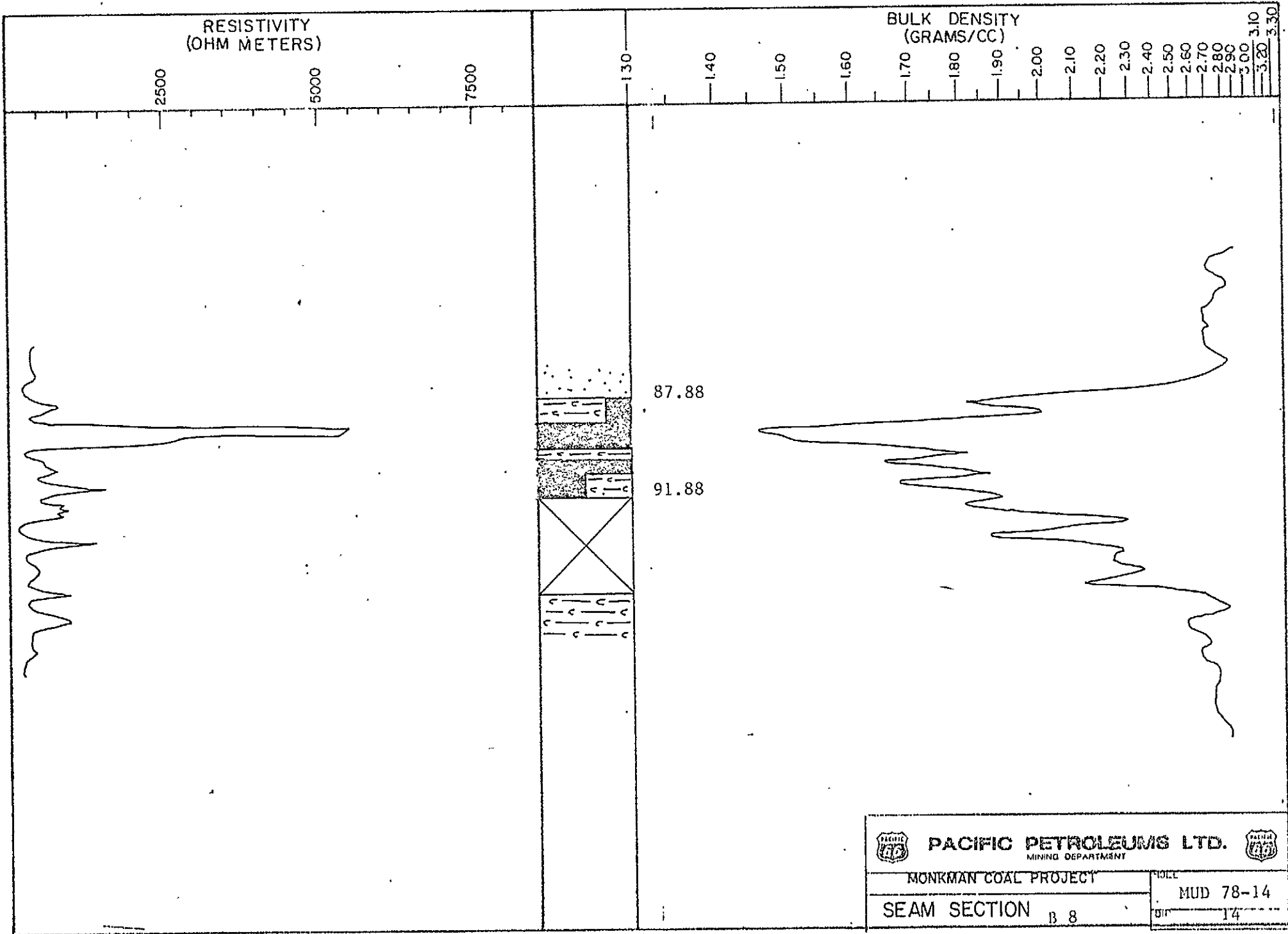
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONRMAN COAL PROJECT		HOLE
SEAM SECTION B 4		MUD 78-14
		DATE

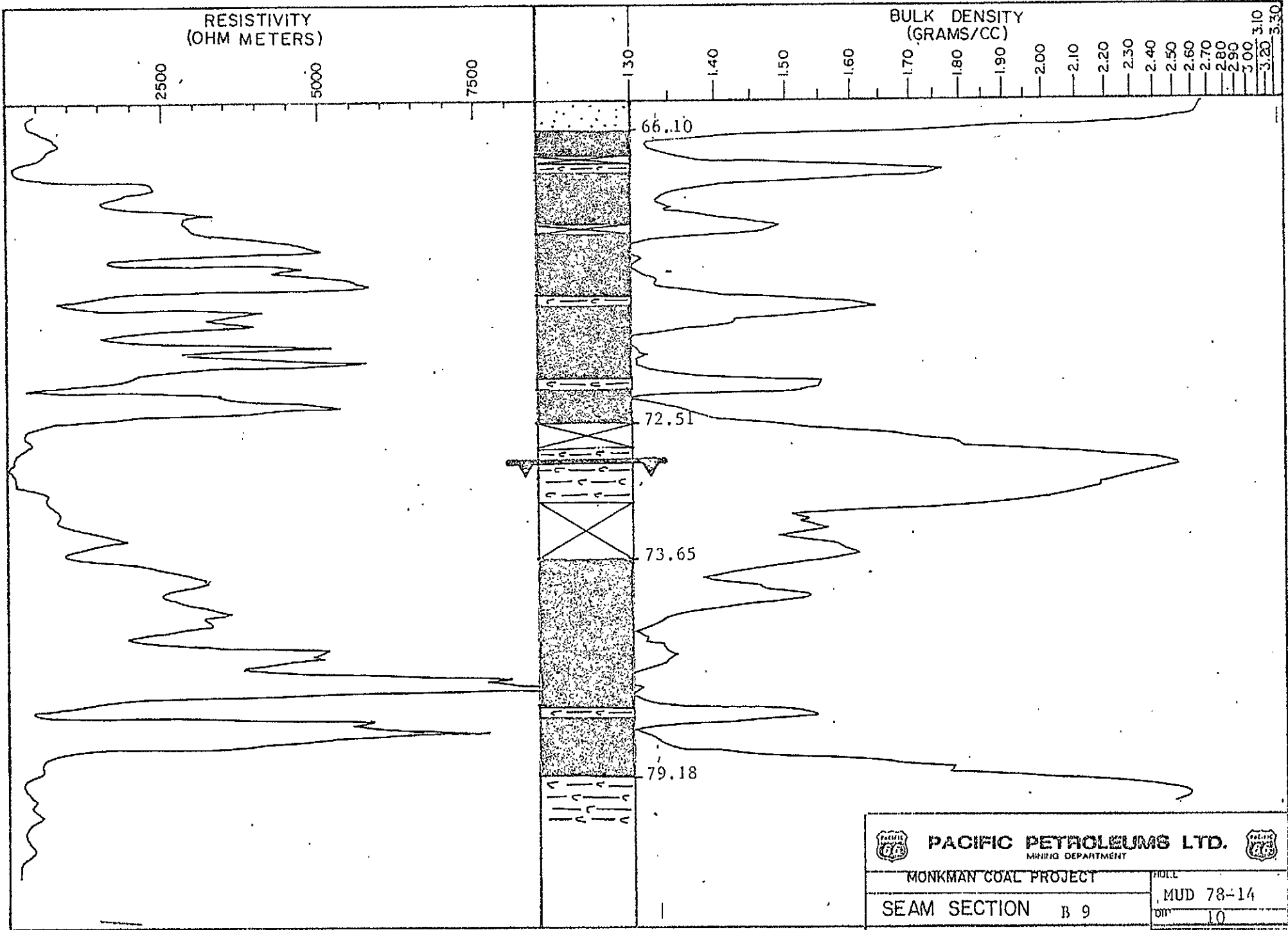




 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 6 (U)	HOLE: MUD 78-14
(L)	DIP: 14



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B 7	
HOLE	MUD '78-14
DIP	14





 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B 9		MUD 78-14
		DIAM 10

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

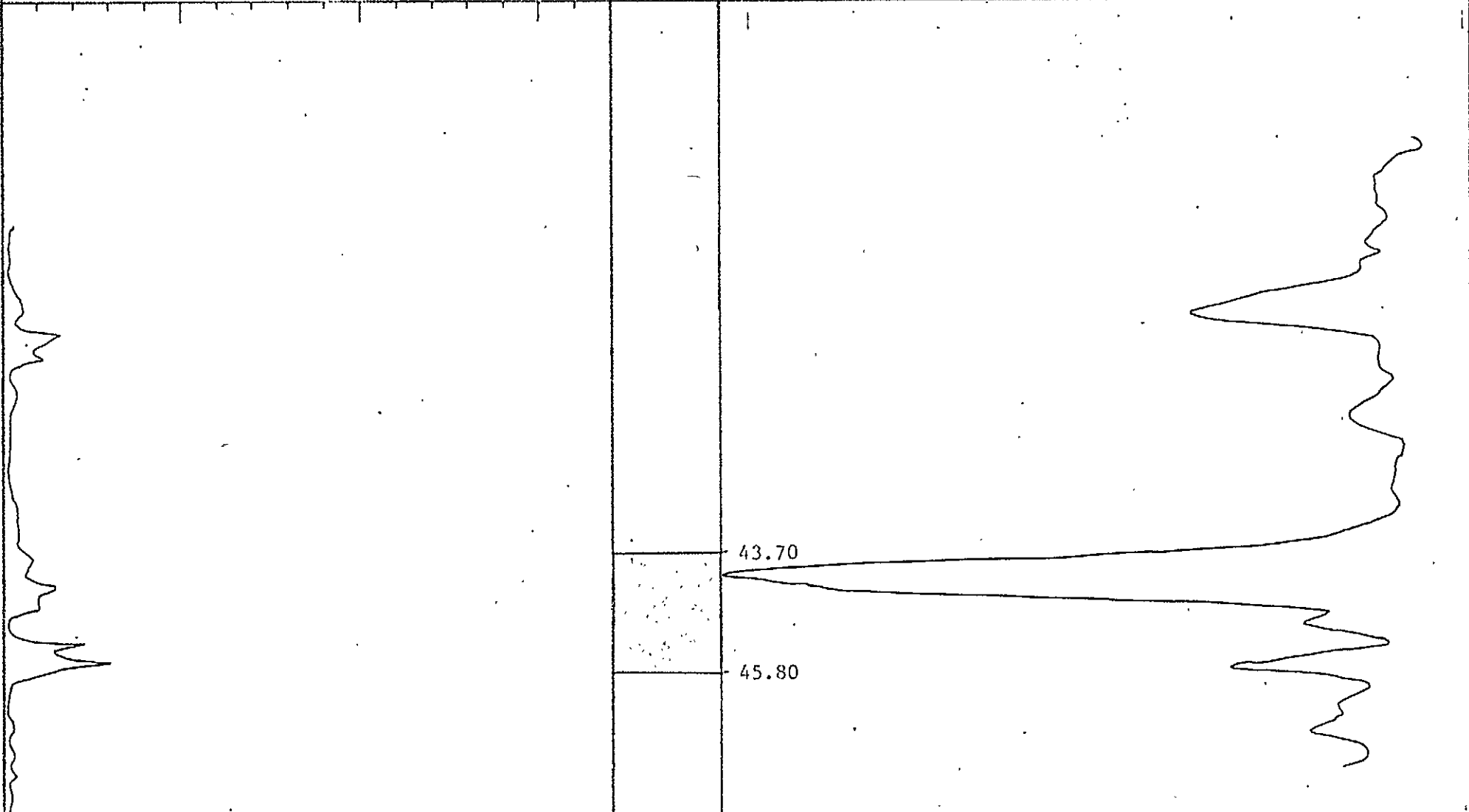
2.90

3.00

3.10

3.20

3.30



43.70

45.80



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT	
SEAM SECTION B' 10	

DATE	MUD-78-14
TIME	08

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

17.60

19.38



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 11

MUD 78-14

10

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00



3.10

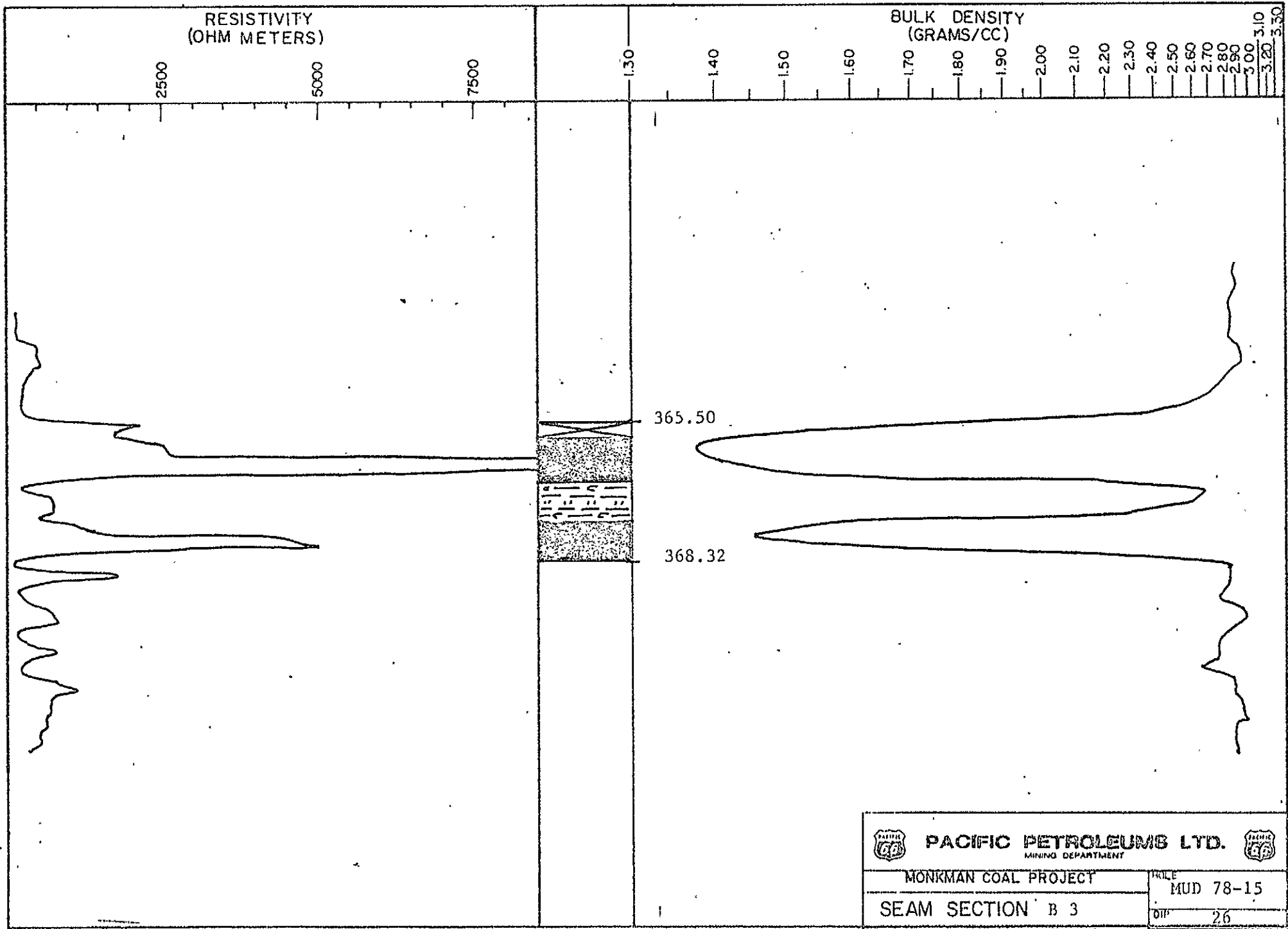
3.20

3.30

6.45

8.12

 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B 12	
HOLE	78-14
DIP	10



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

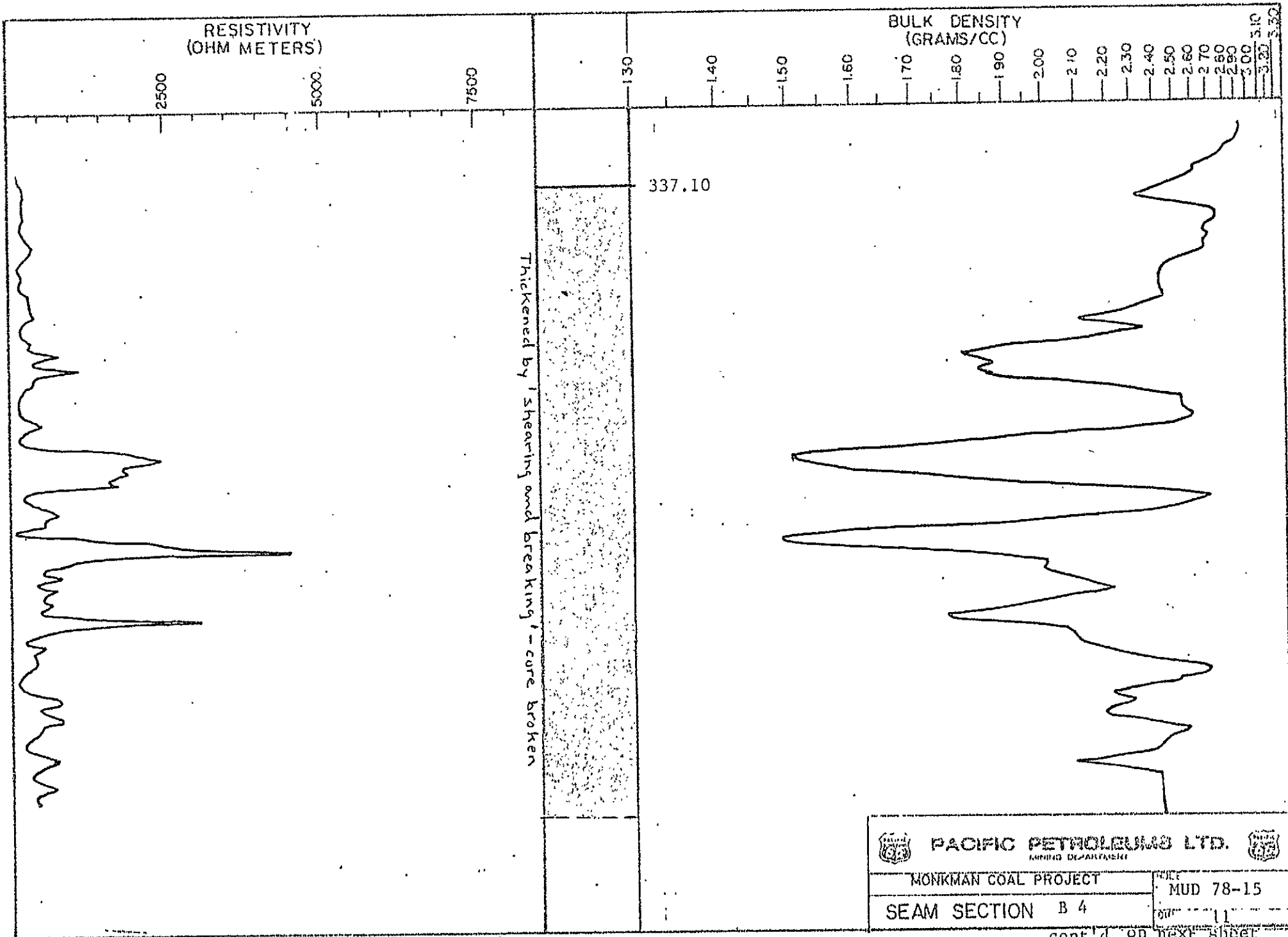


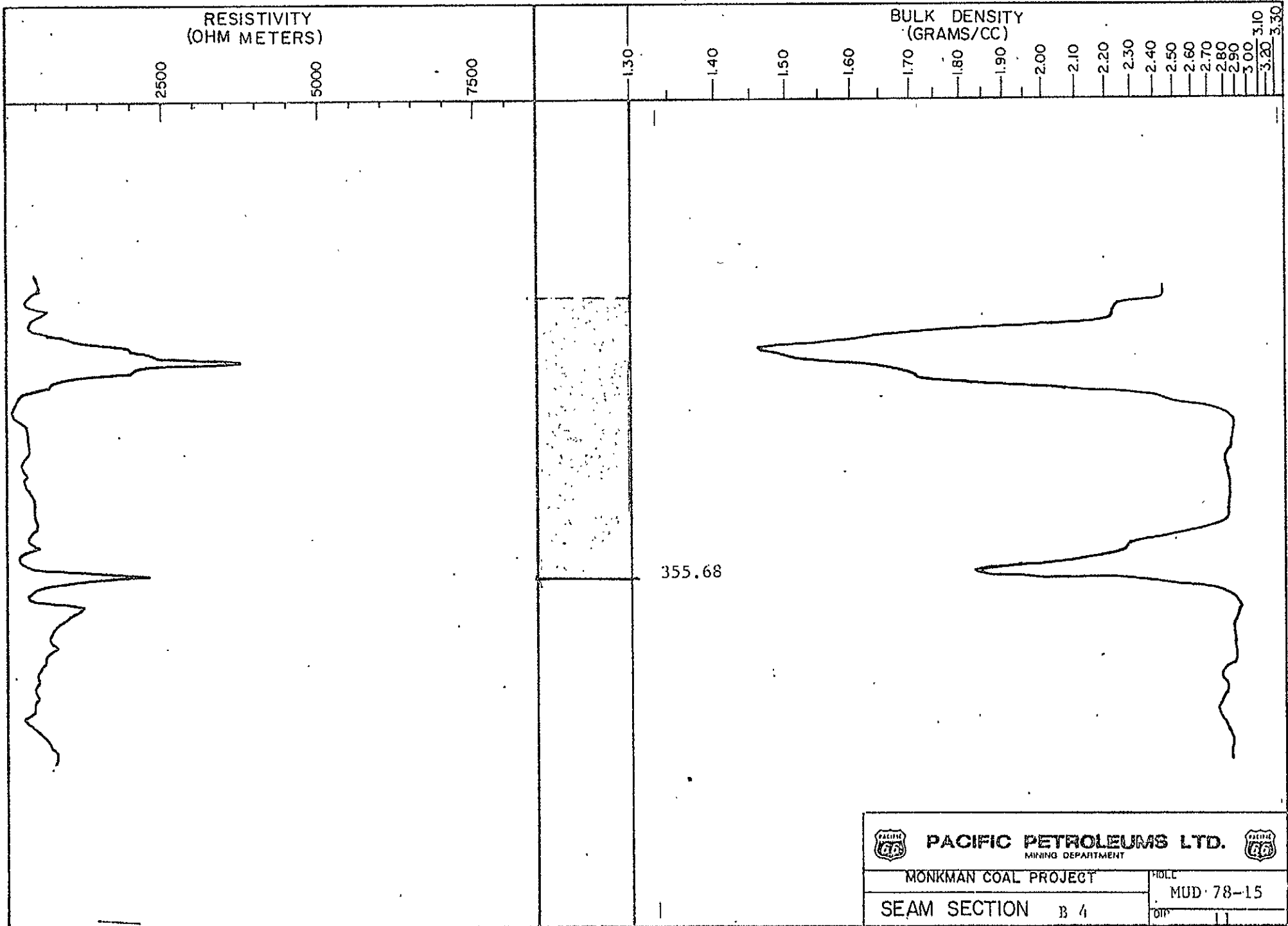
MONKMAN COAL PROJECT



FILE
MUD 78-15

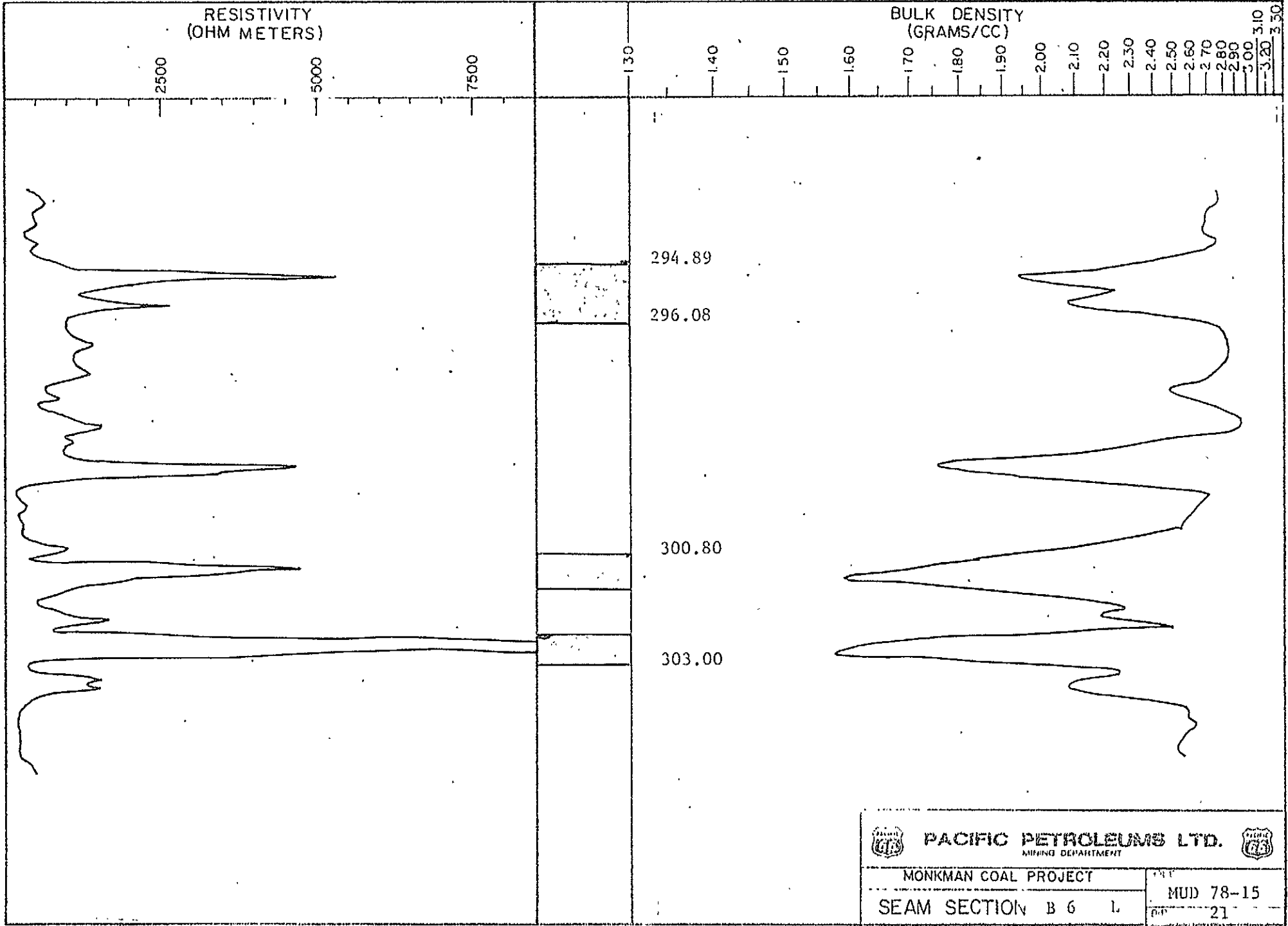
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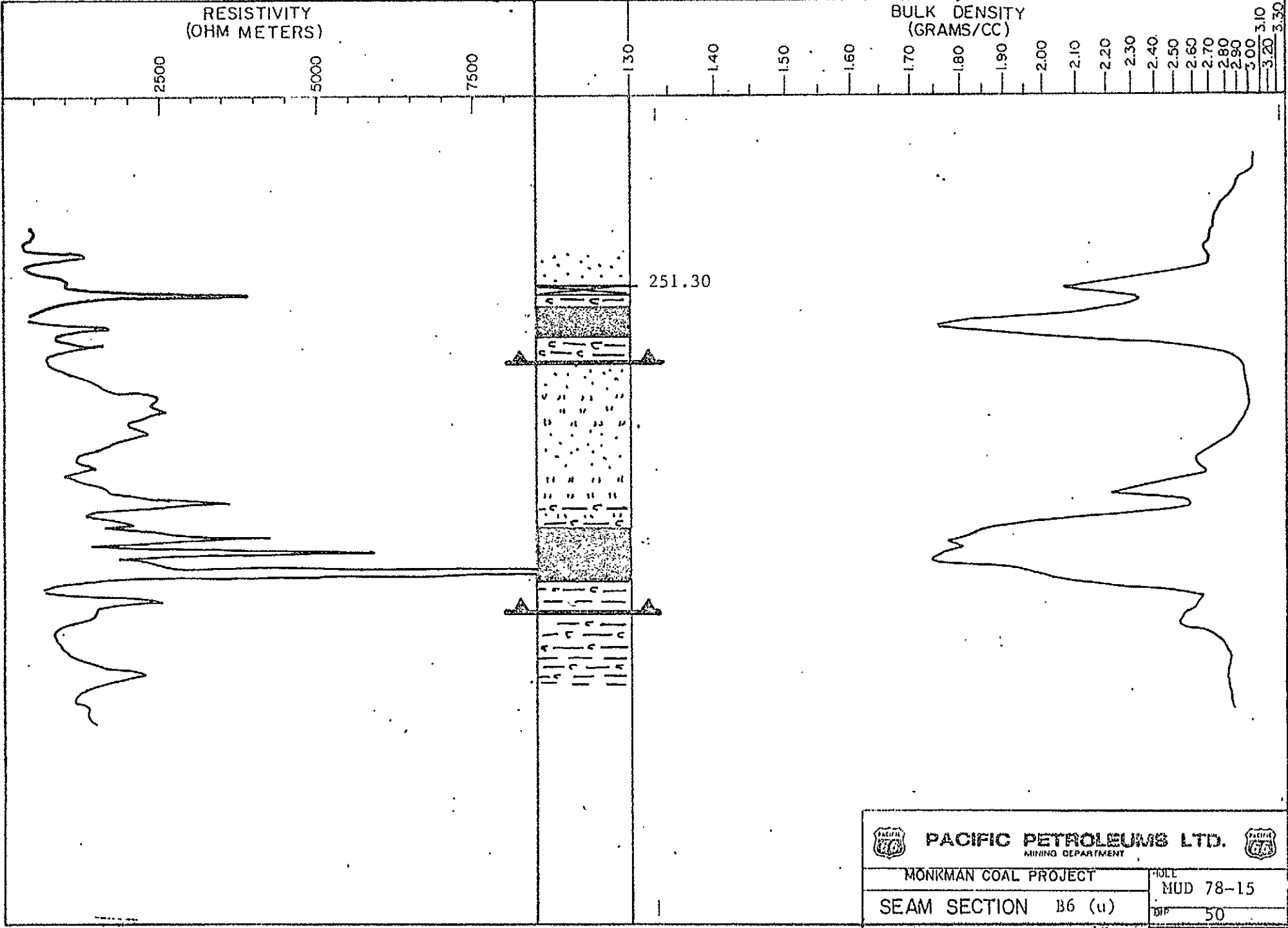
DIP
26







 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 4	
HOLE	MUD 78-15
DATE	11





 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B6 (u)	HOLE MUD 78-15
	DIP 50

cont'd next page

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

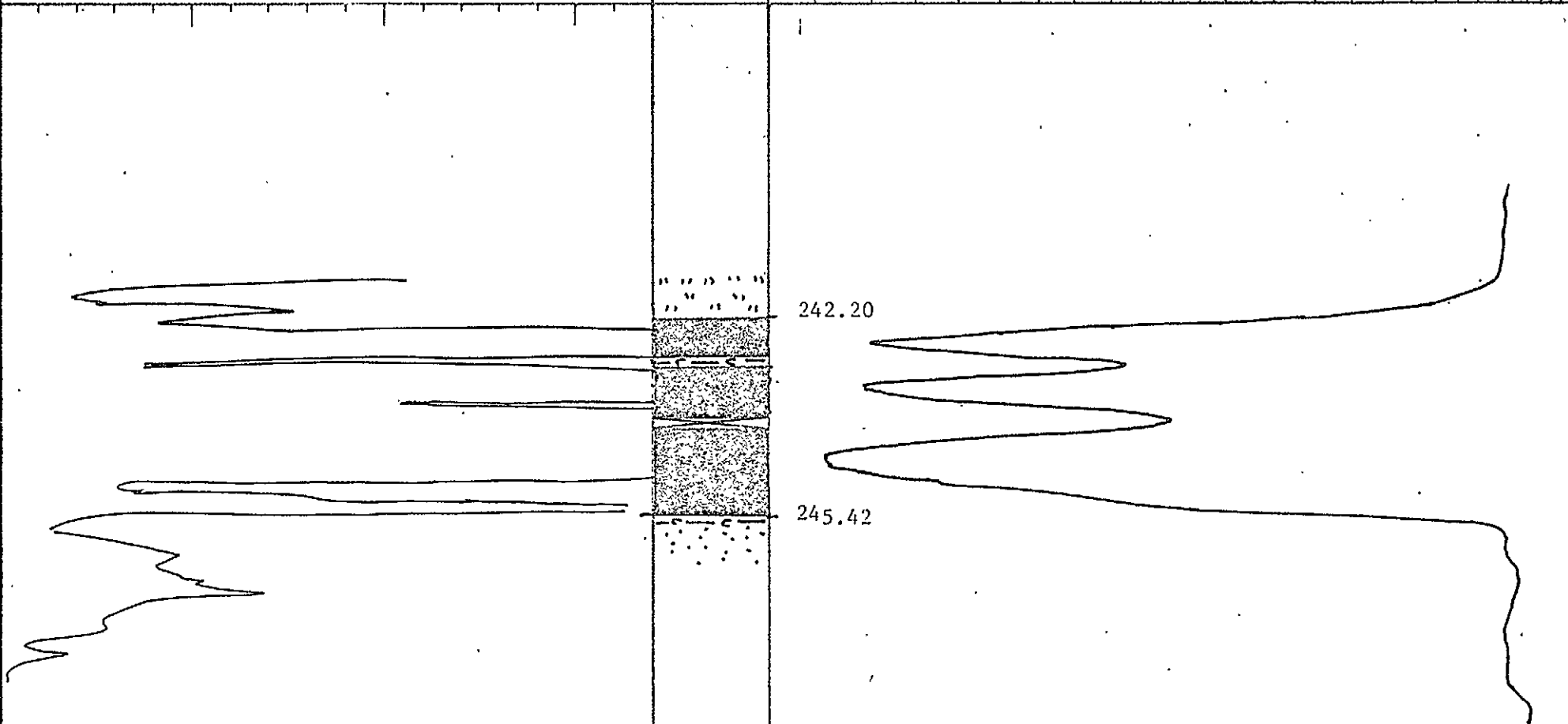
2.90

3.00

3.10

3.20

3.30



242.20

245.42



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 7 U

DATE

MUD 78-15

DRILL

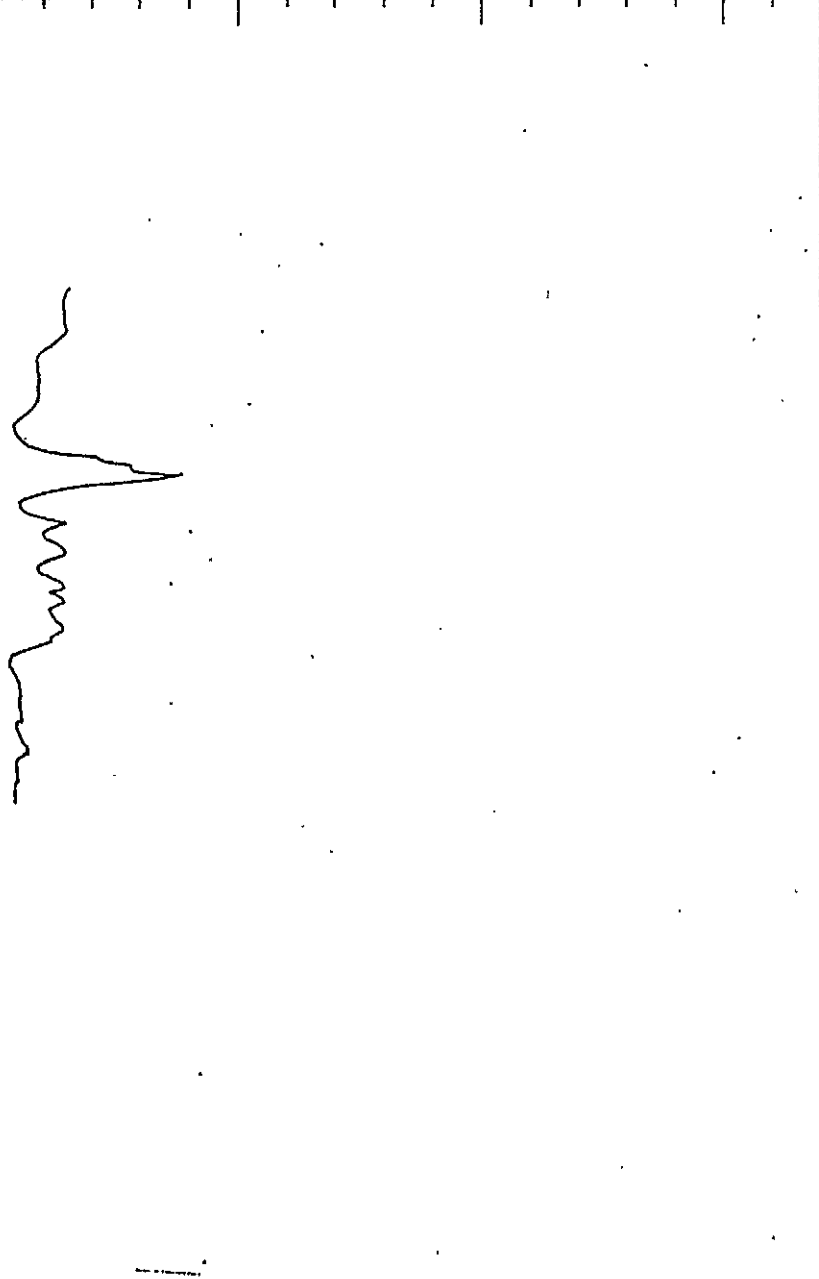
13

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

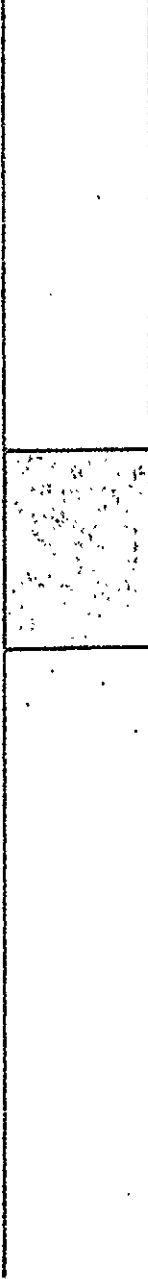
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3.00

3.10

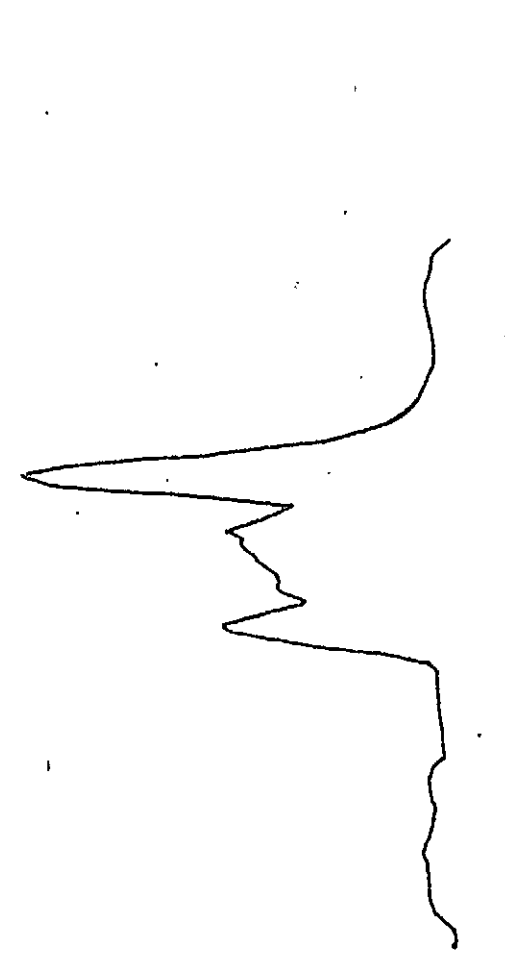
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3.30



211.42

214.00

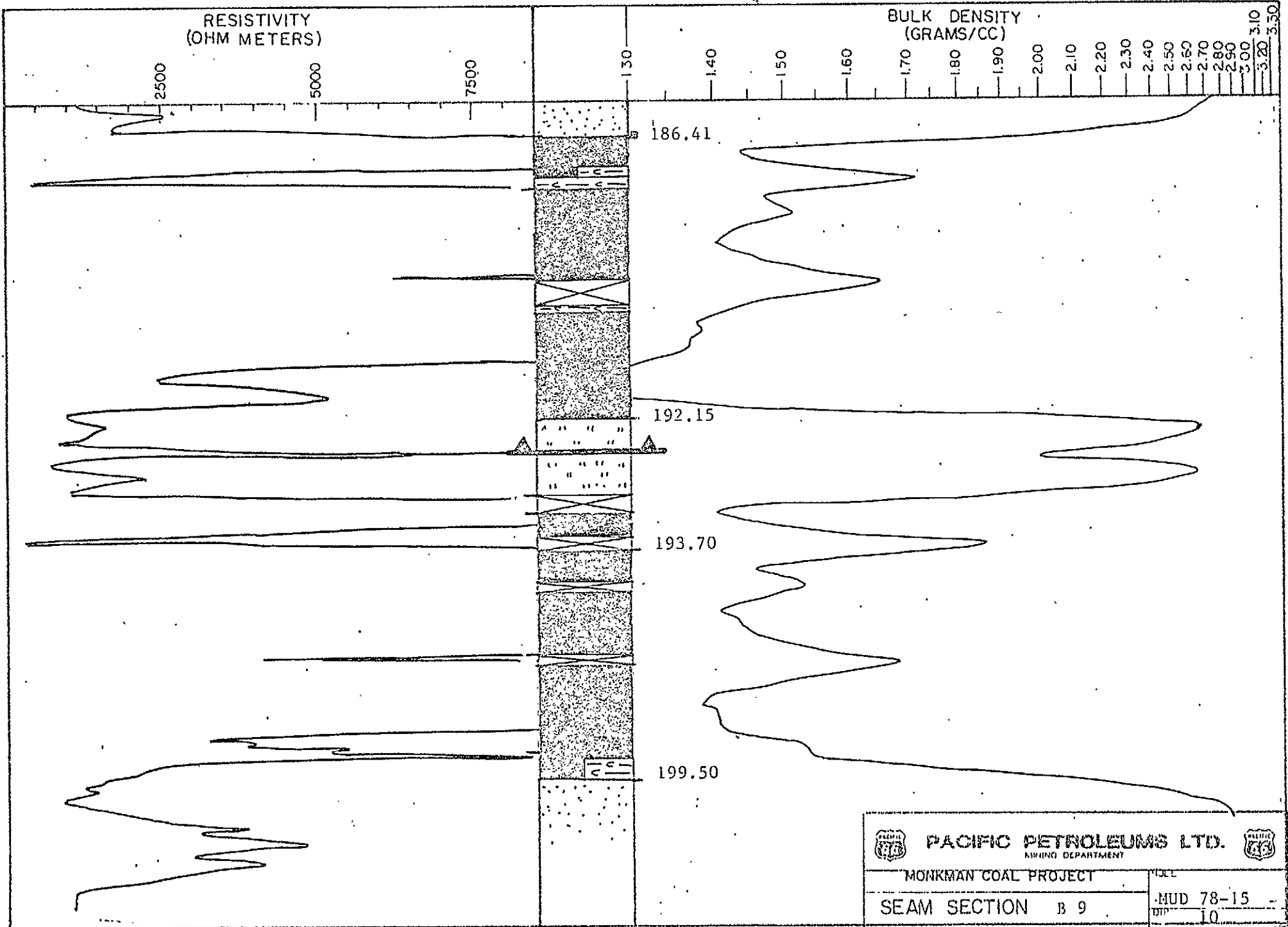




PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

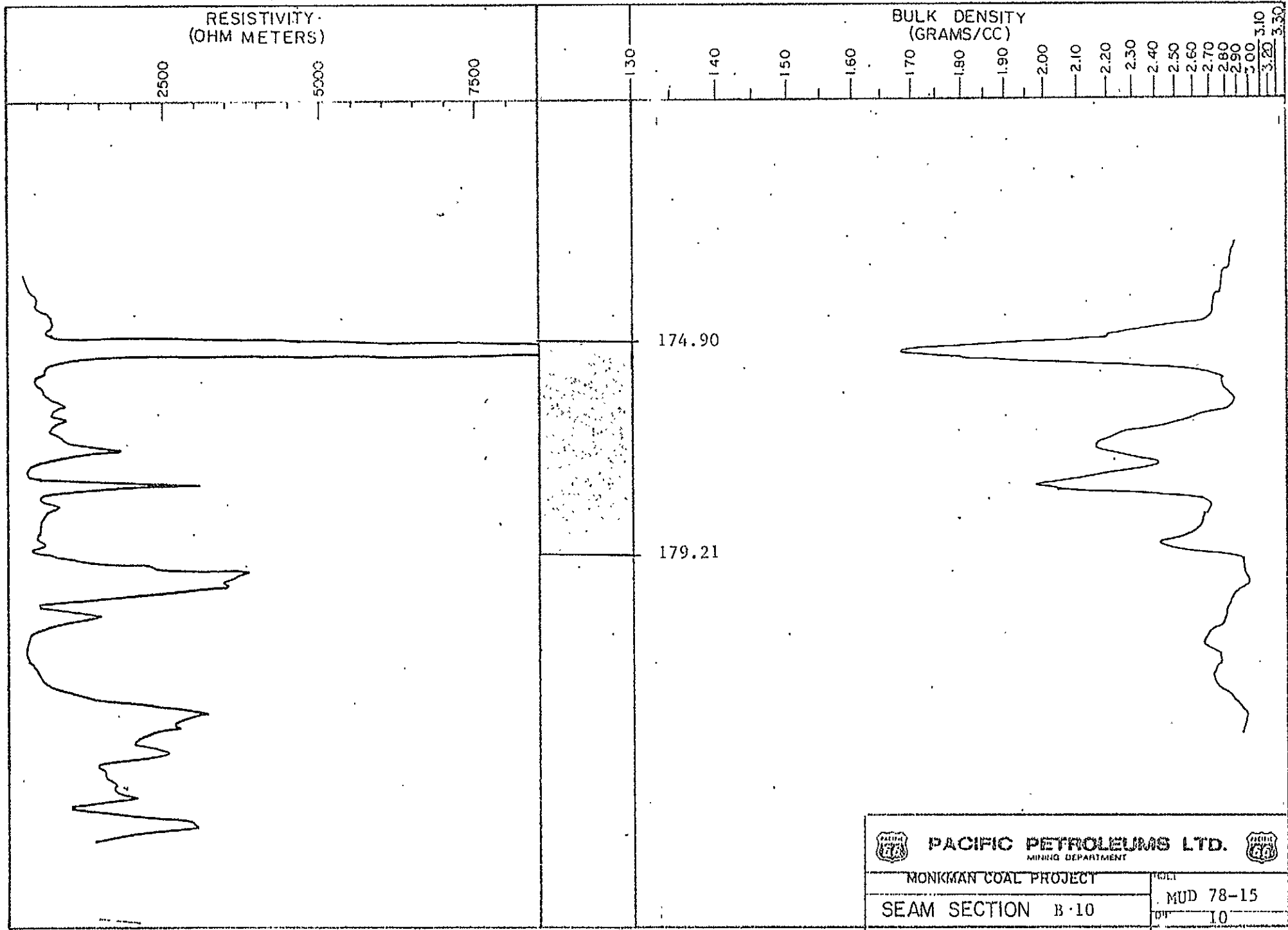




MONKMAN COAL PROJECT
SEAM SECTION B 8

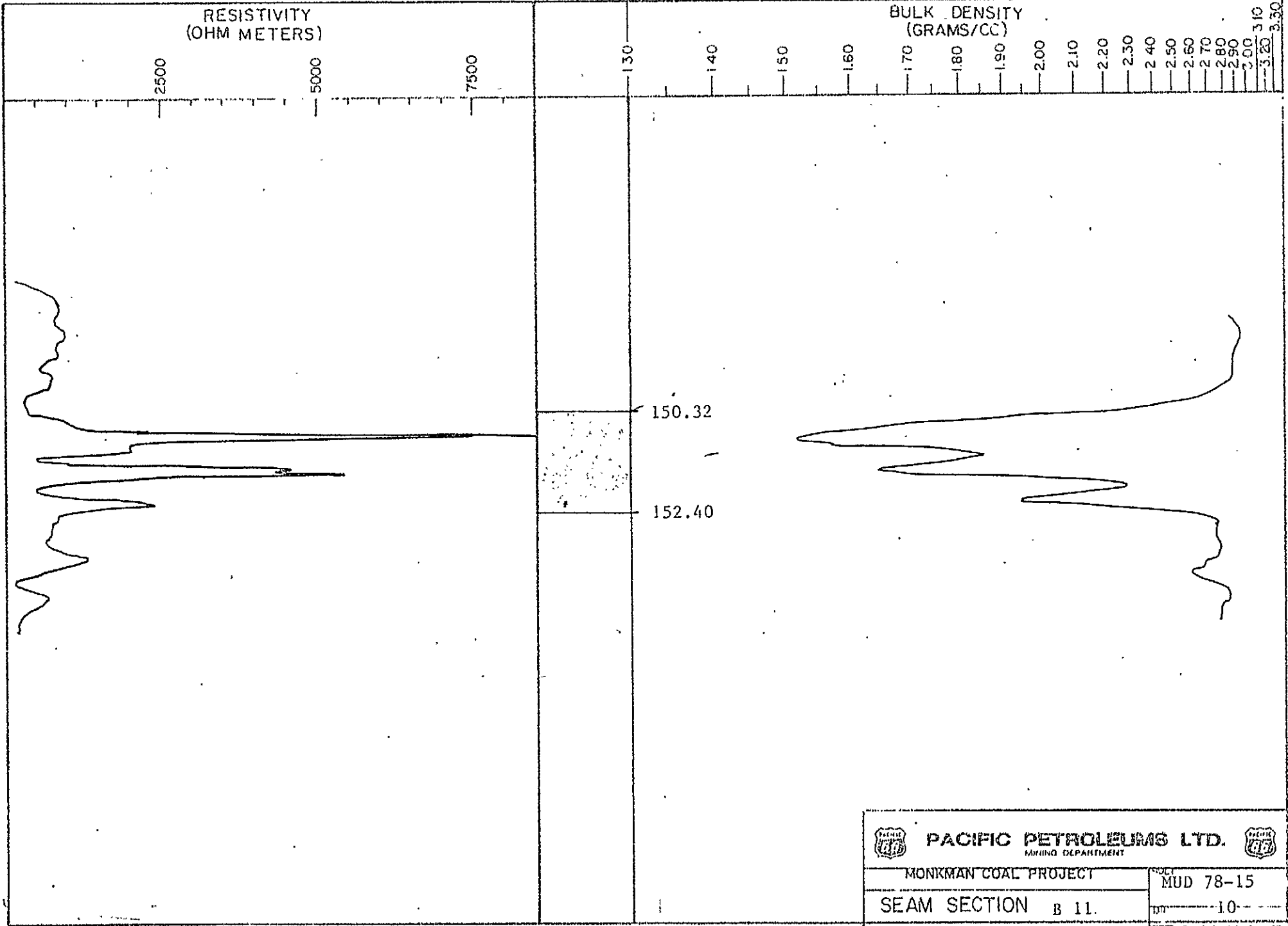
WELL: MUD-78-15
DIP: 13





 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B 9	MUD 78-15	
	DTP 10	



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B-10	MUD 78-15
	10



 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 11.	
MUD 78-15 10	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

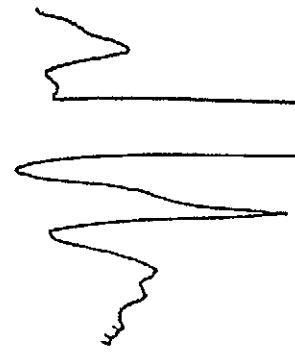
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3.00

3.10

3.20

3.30



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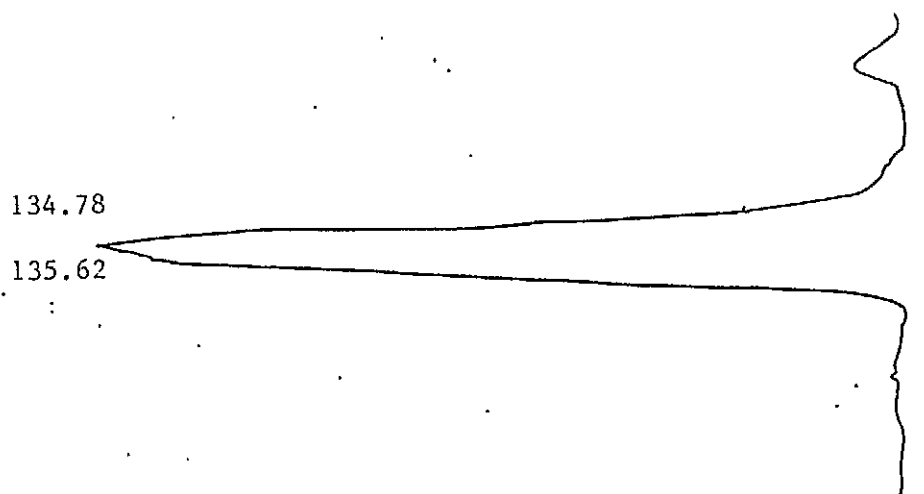
" " "

- - -

< <

134.78

135.62



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

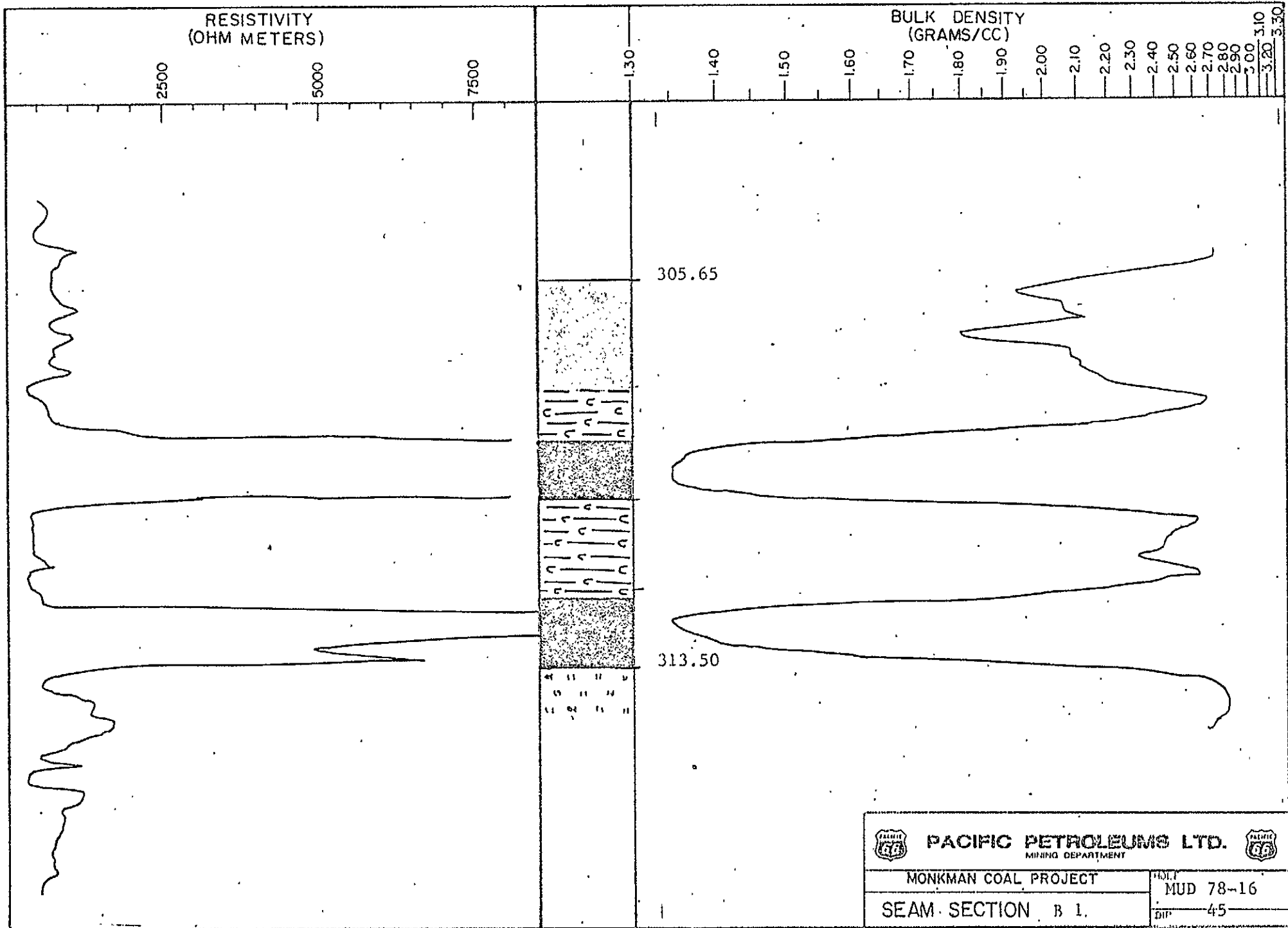




MONKMAN COAL PROJECT

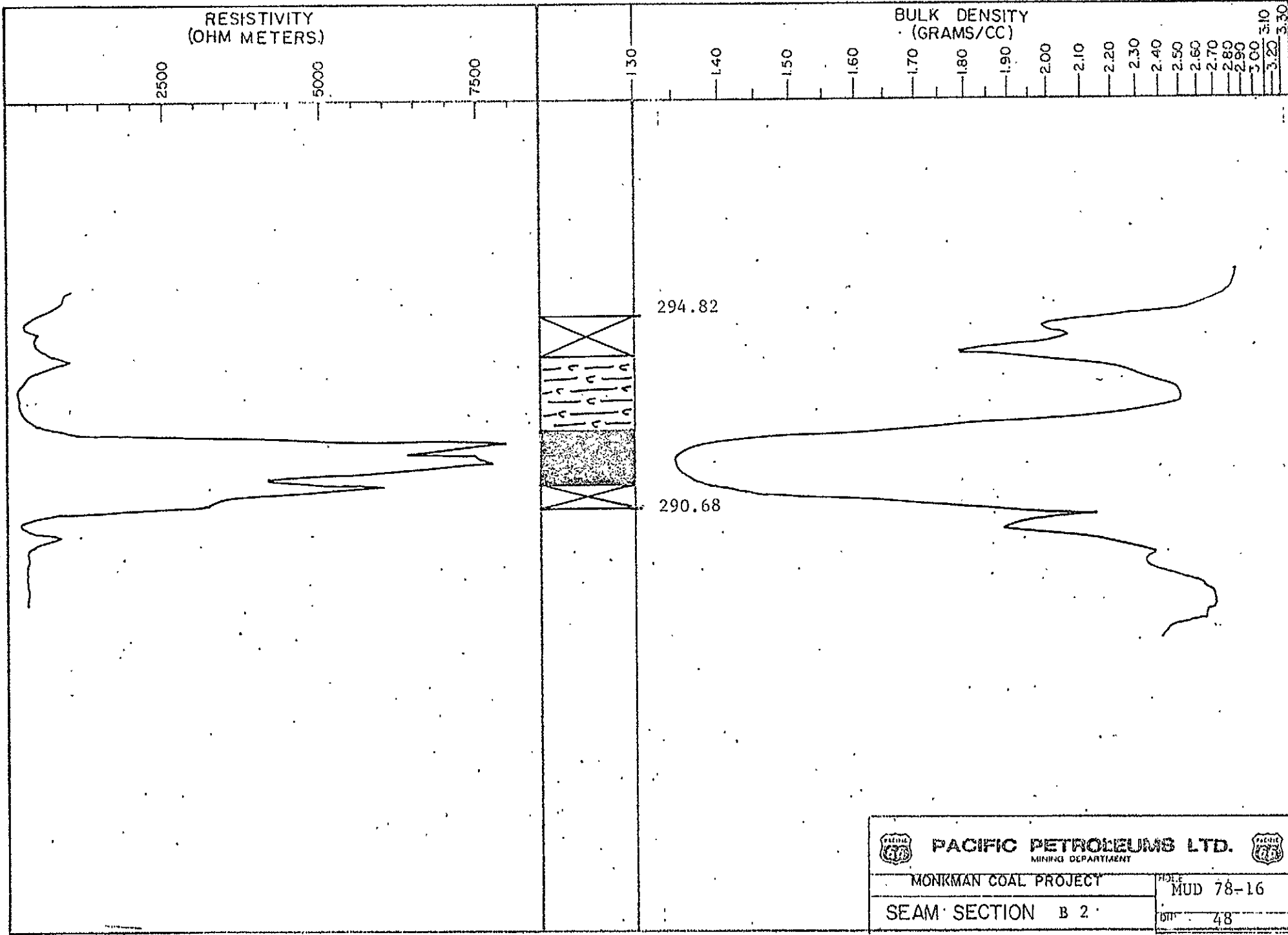
SEAM SECTION B 12



ROLL
MUD 78-15.

DIP
10



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MUD 78-16
SEAM SECTION B 1.		DIP 45



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MUD 78-16
SEAM SECTION B 2		DIP 48

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

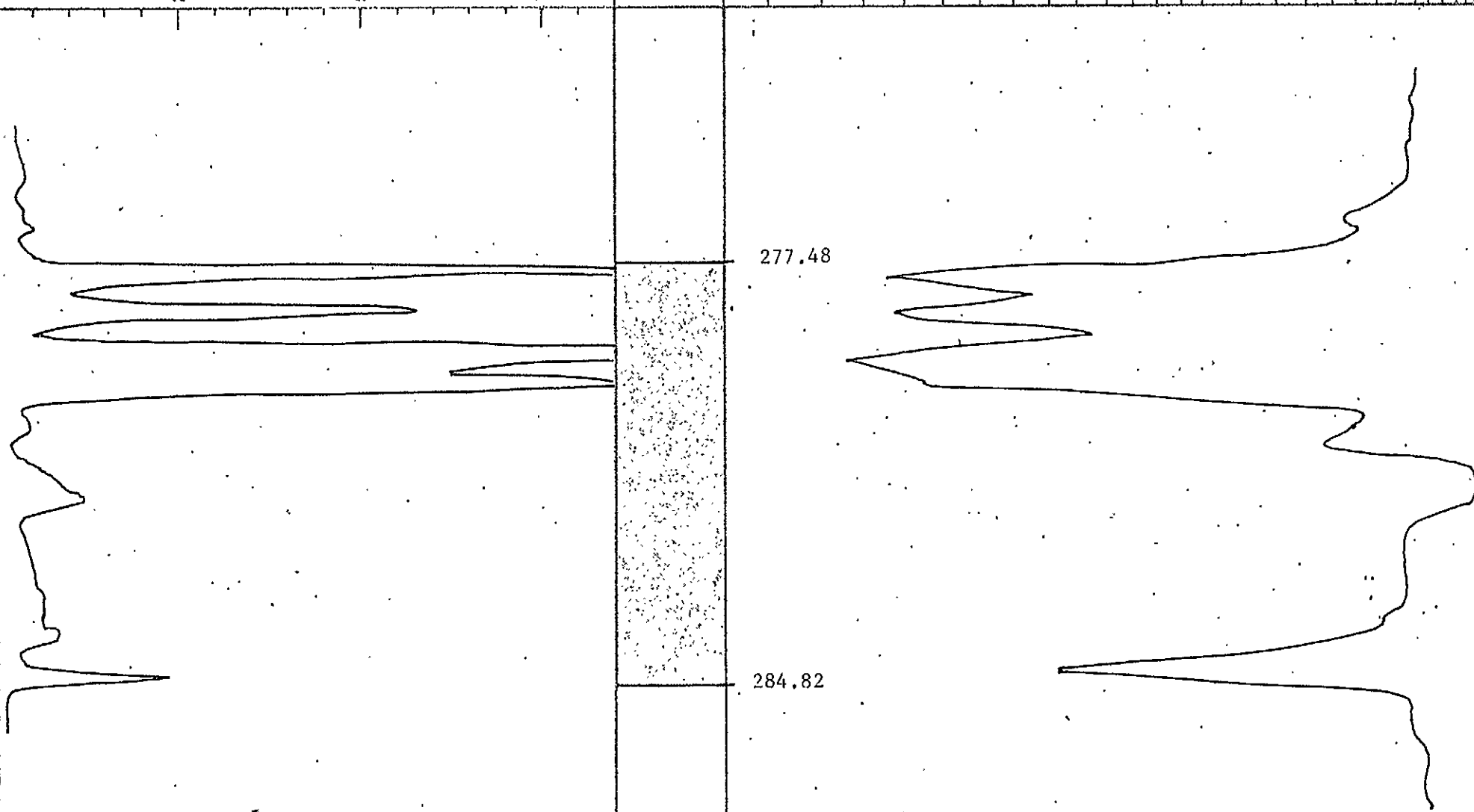
2.90

3.00

3.10



3.20

3.30



277.48

284.82

 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT 	
MONKMAN COAL PROJECT	
SEAM SECTION	B. 3. L.
MUD 78-16	
56	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

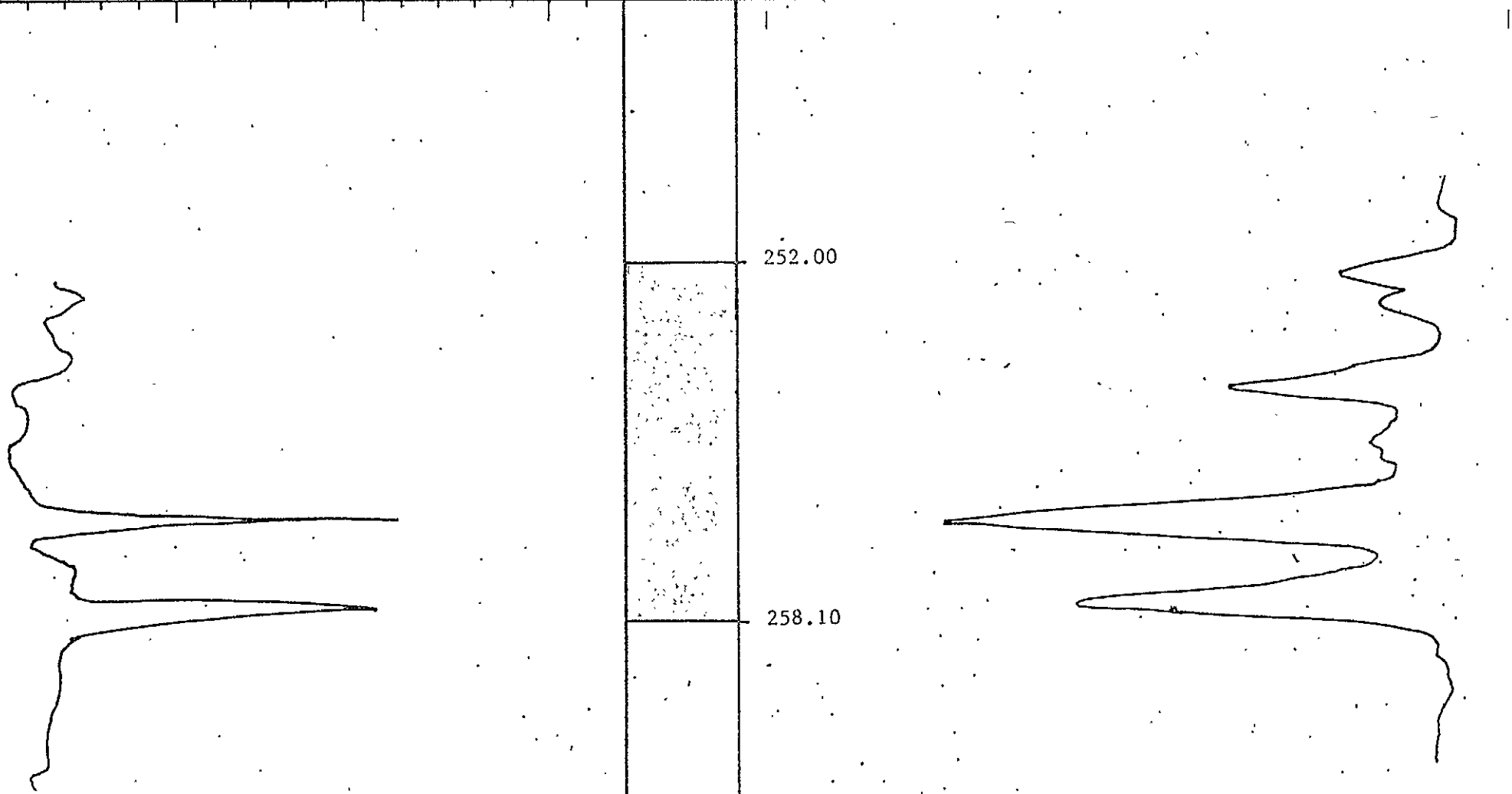
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3.00

3.10

3.20

3.30



252.00

258.10



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

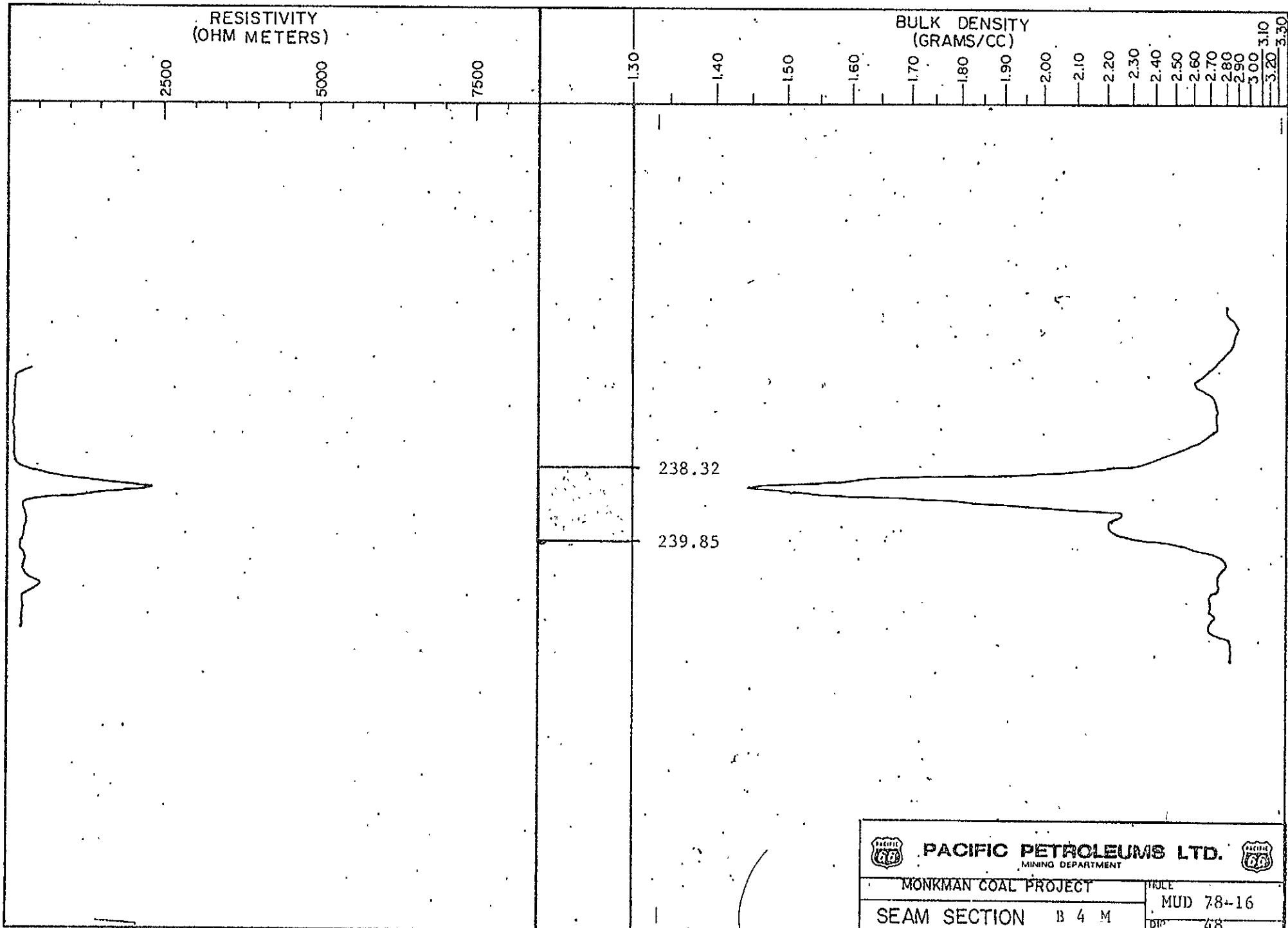




MONKMAN COAL PROJECT

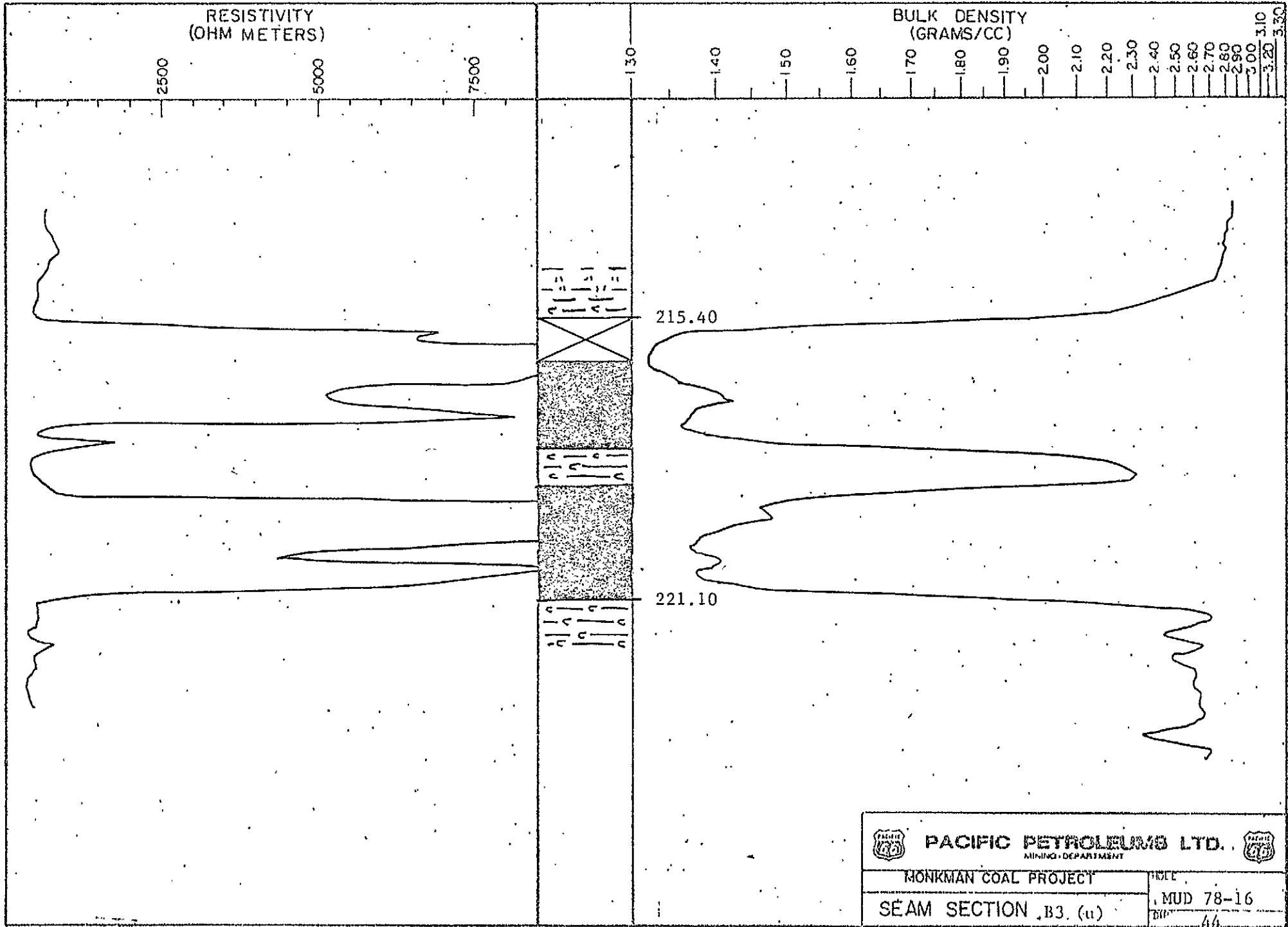
HOLE
MUD 78-16



SEAM SECTION B 4 L

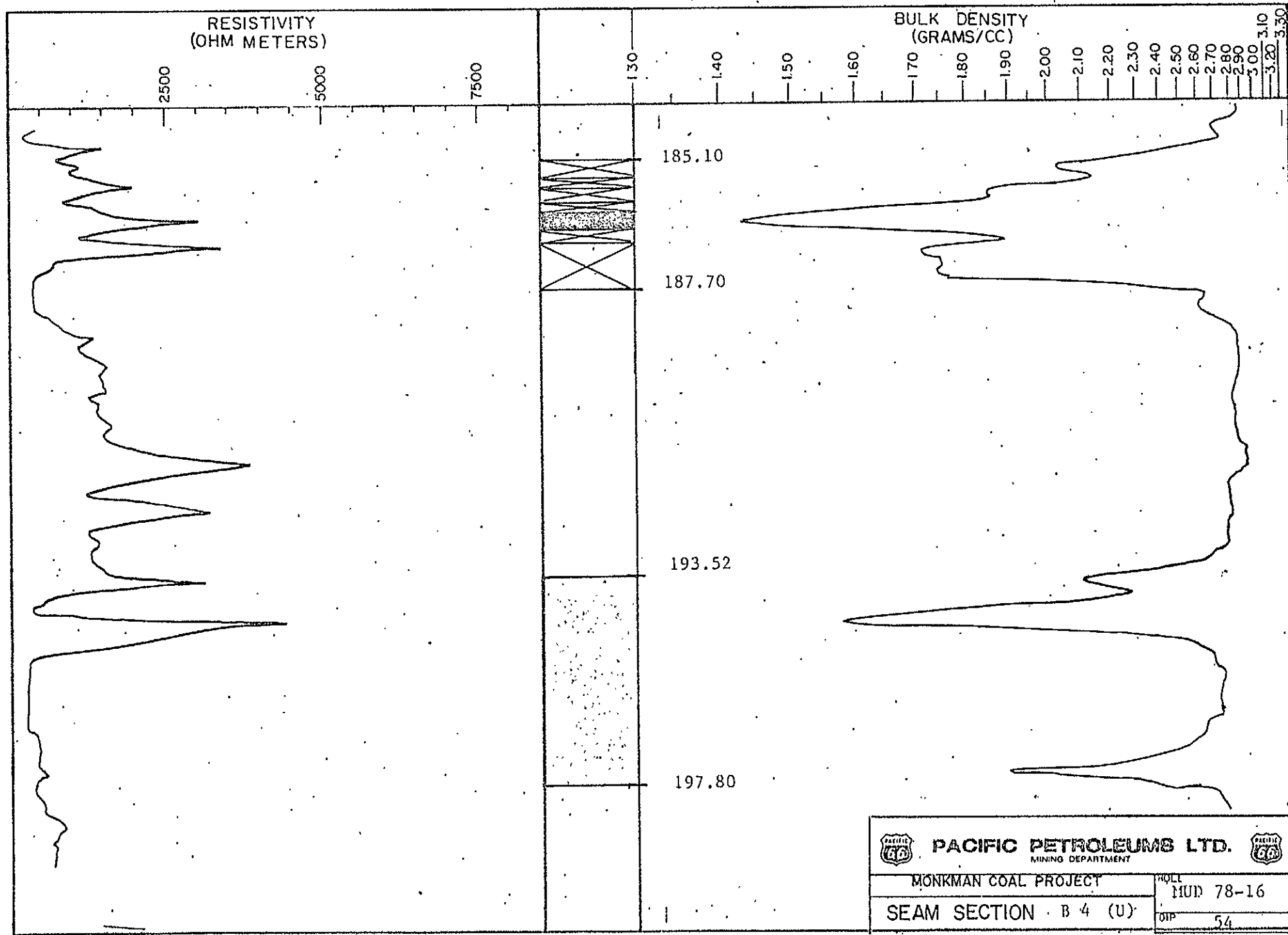
DATE
48





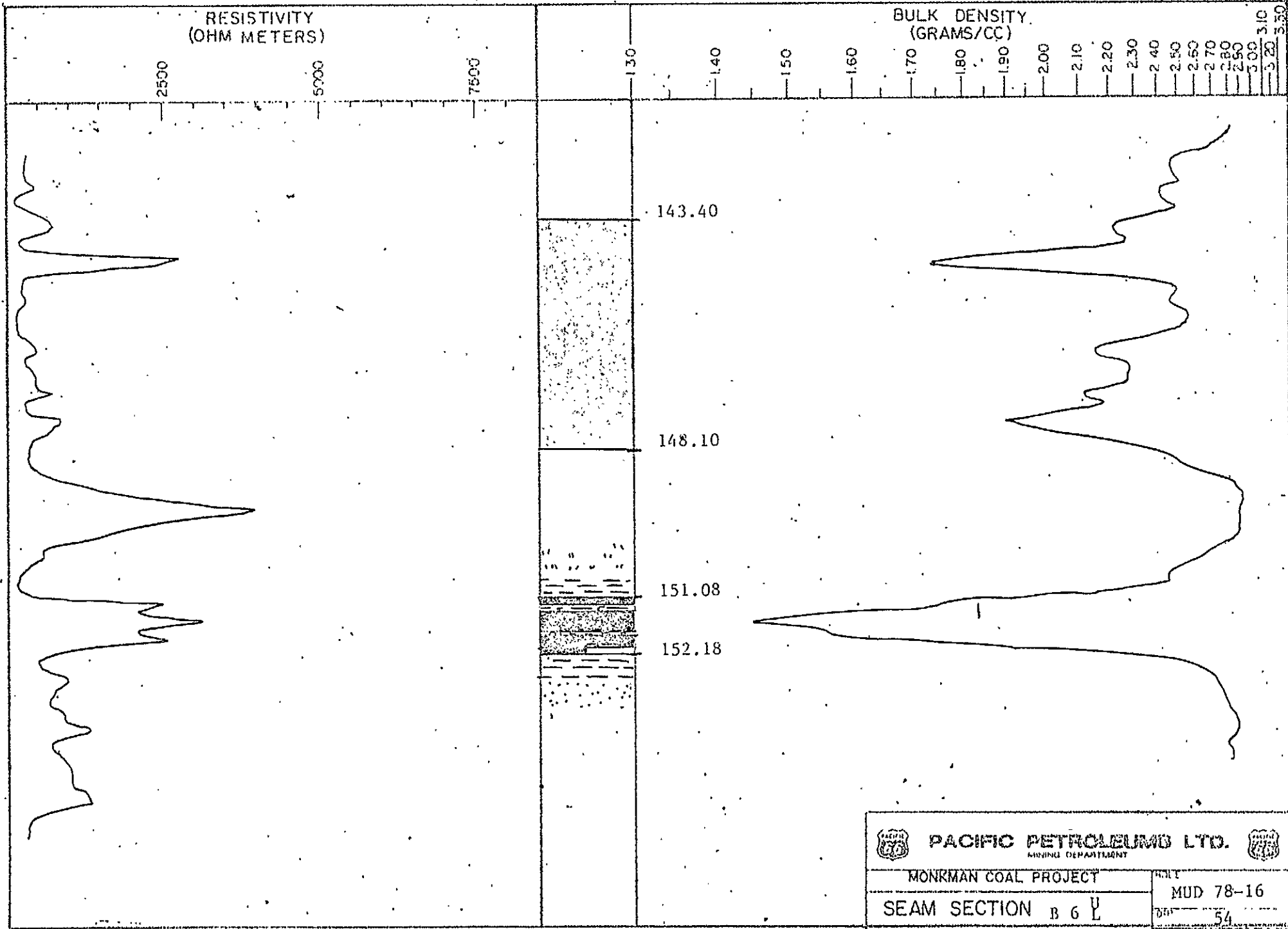
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		TITLE
SEAM SECTION B 4 M		MUD 78-16
		DIP 48





 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		WELL
SEAM SECTION B3. (u)		MUD 78-16
		DATE



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MUD 78-16
SEAM SECTION · B 4 (U)		DIP 54




PACIFIC PETROLEUM LTD.

 MINING DEPARTMENT
 MONKMAN COAL PROJECT
 SEAM SECTION B 6 U
 MUD 78-16
 54

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

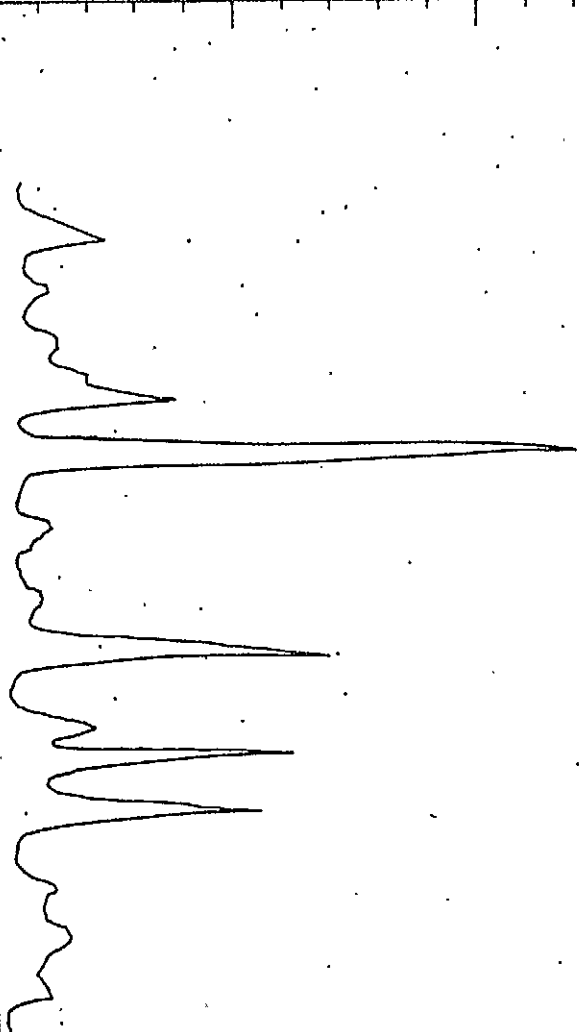
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3.00

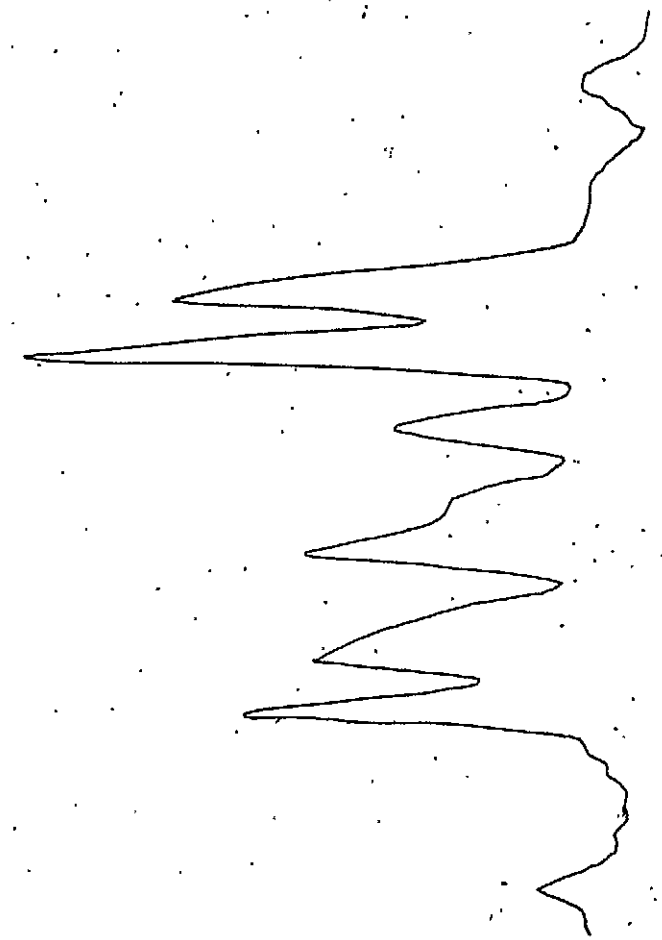
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3.20



119.21

125.28

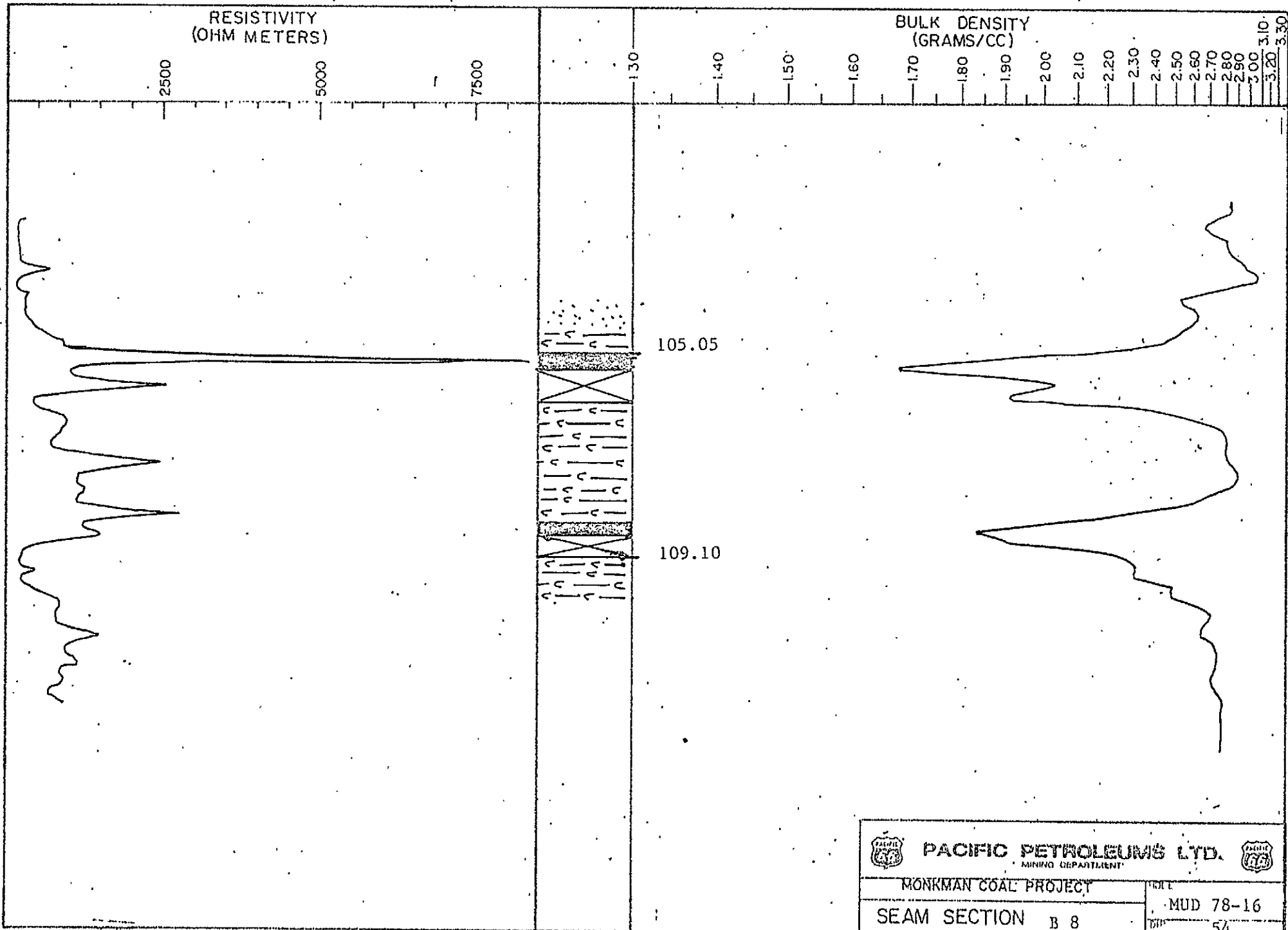




PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

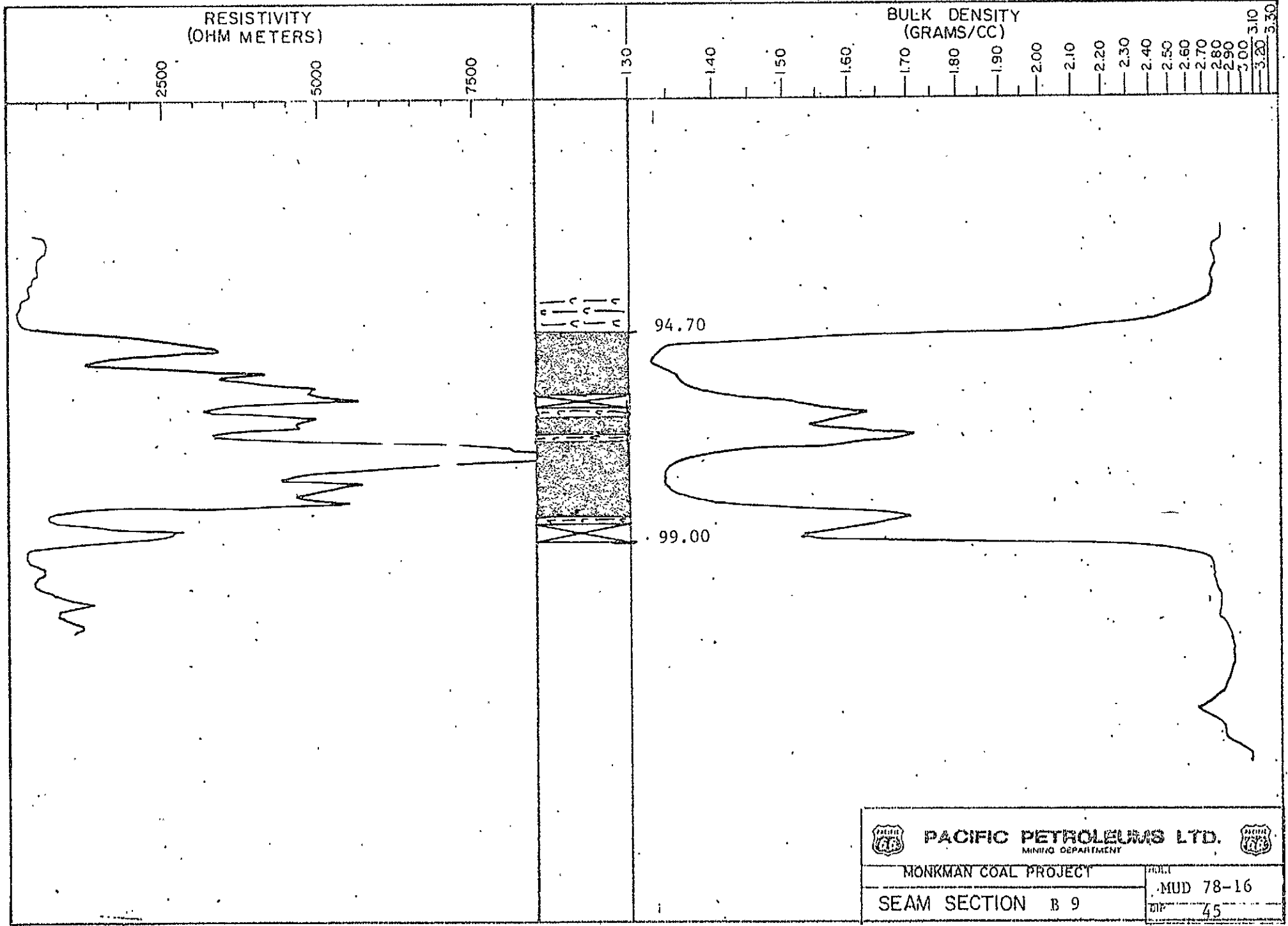




MONKMAN COAL PROJECT
SEAM SECTION B 7

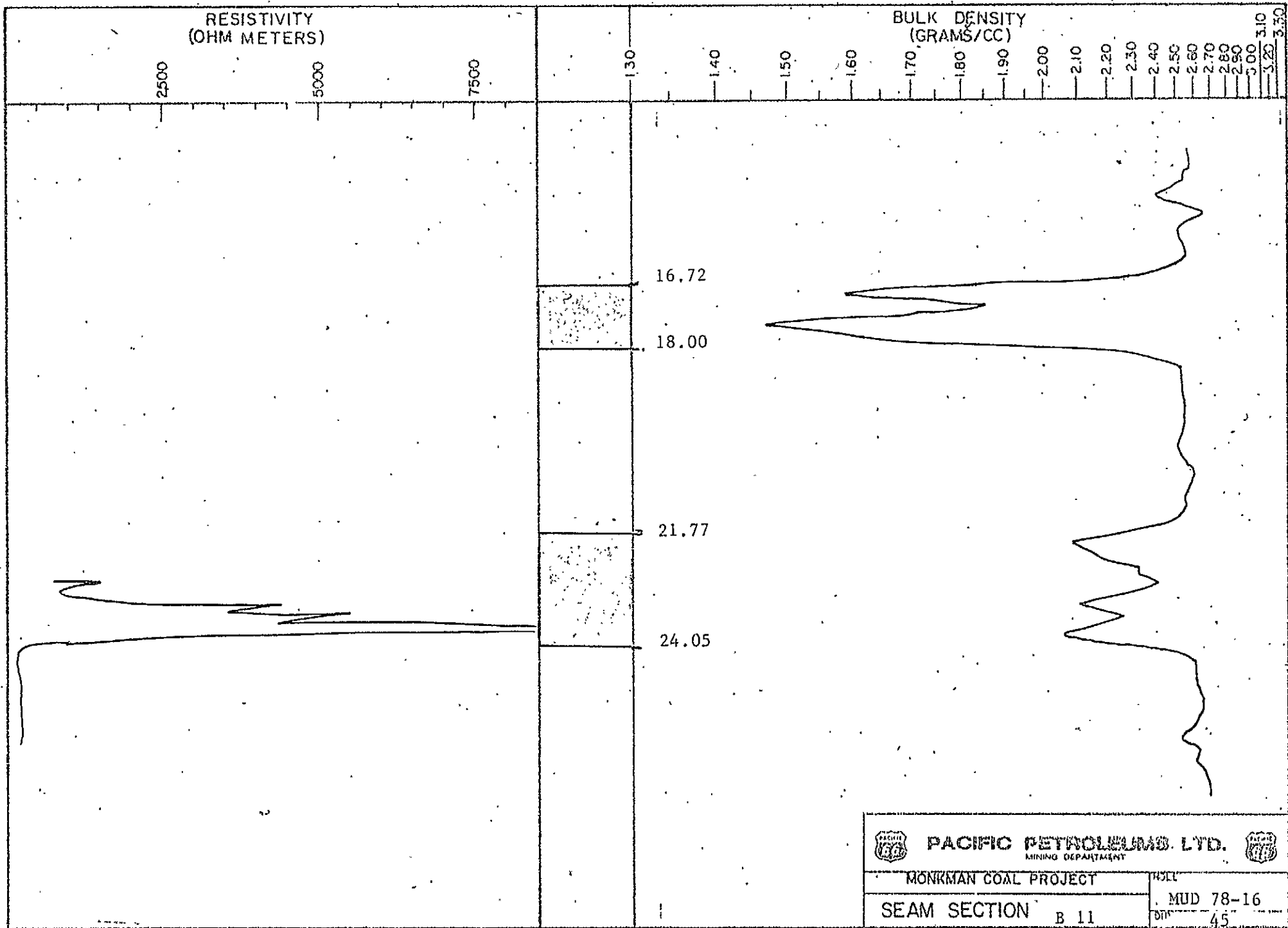
MUD 78-16
51





 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B 8		MUD 78-16
		PAGE 54



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MUD 78-16
SEAM SECTION B 9		DIP 45




PACIFIC PETROLEUMS. LTD.

 MINING DEPARTMENT
 MONKMAN COAL PROJECT
 SEAM SECTION B 11
 MUD 78-16
 45

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

11.55

12.39



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

WELL
MUD 78-16

SEAM SECTION B 12

DIP 31

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

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2.40

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2.60

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2.80

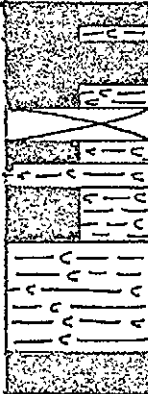
2.90

3.00

3.10

3.20

3.30



429.35

434.42



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

1011

SEAM SECTION B 5

MUD 78-17

14

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

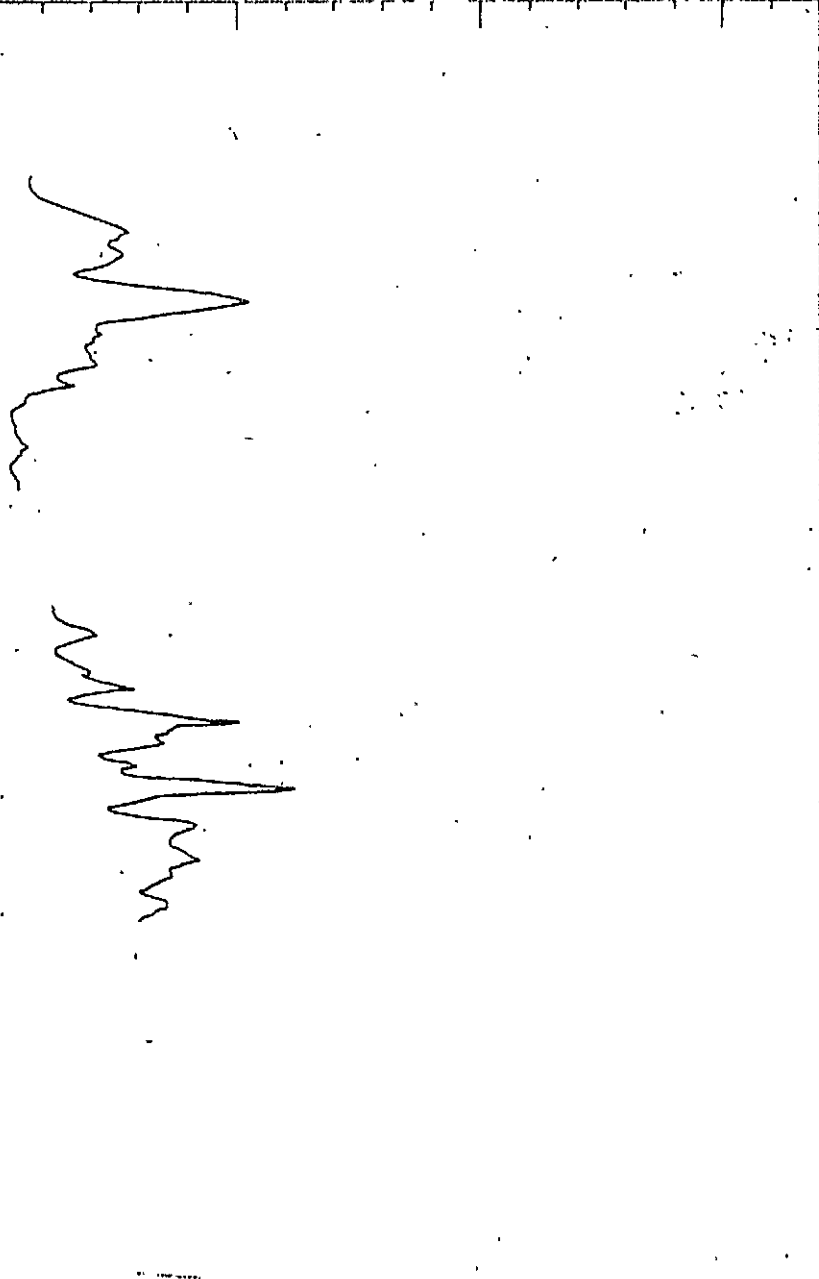
2.90

3.00

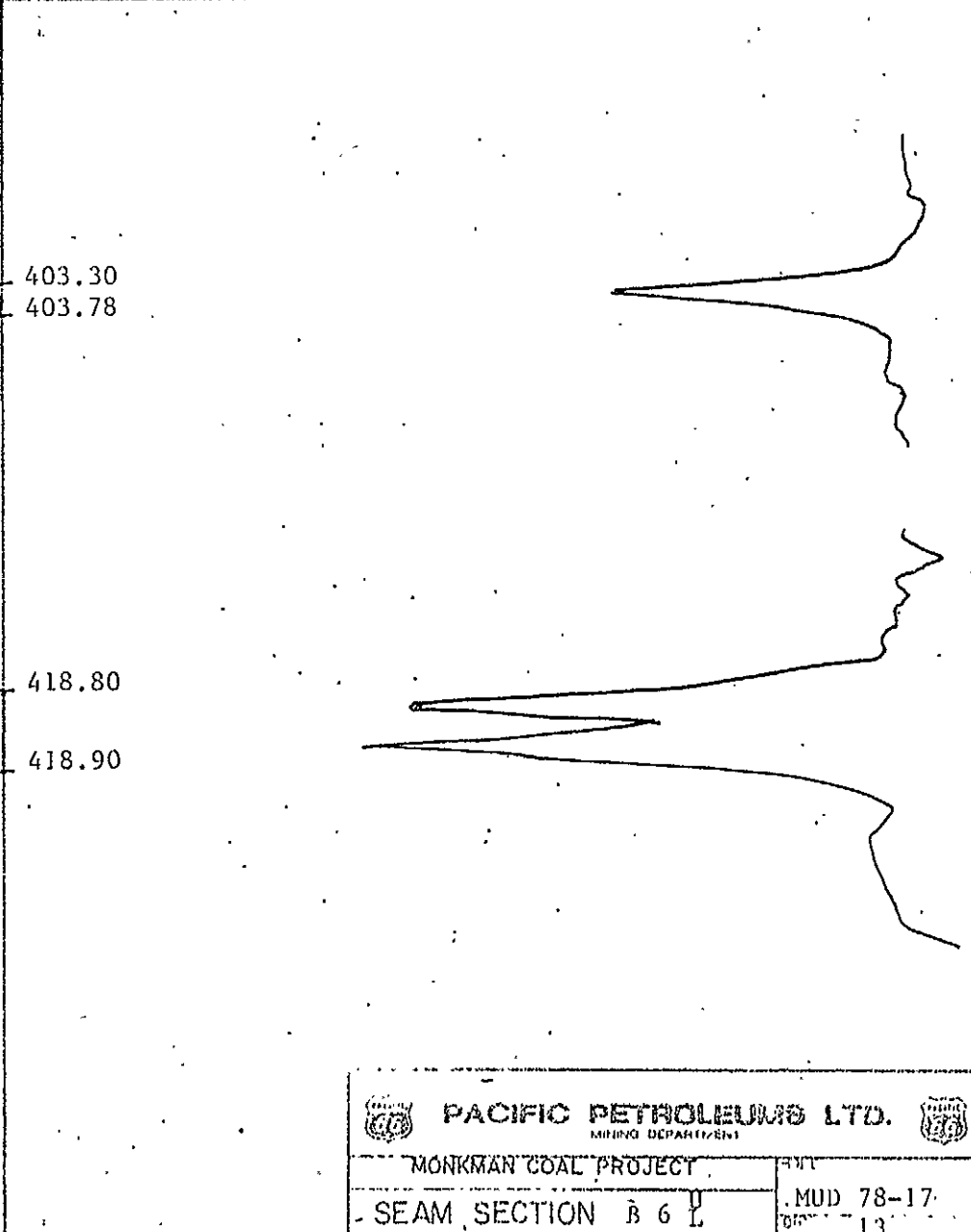
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

3.20

3.30



403.30
403.78
418.80
418.90



 PACIFIC PETROLEUMS LTD. <small>Mining Department</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 6 L	MUD 78-17
	13

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

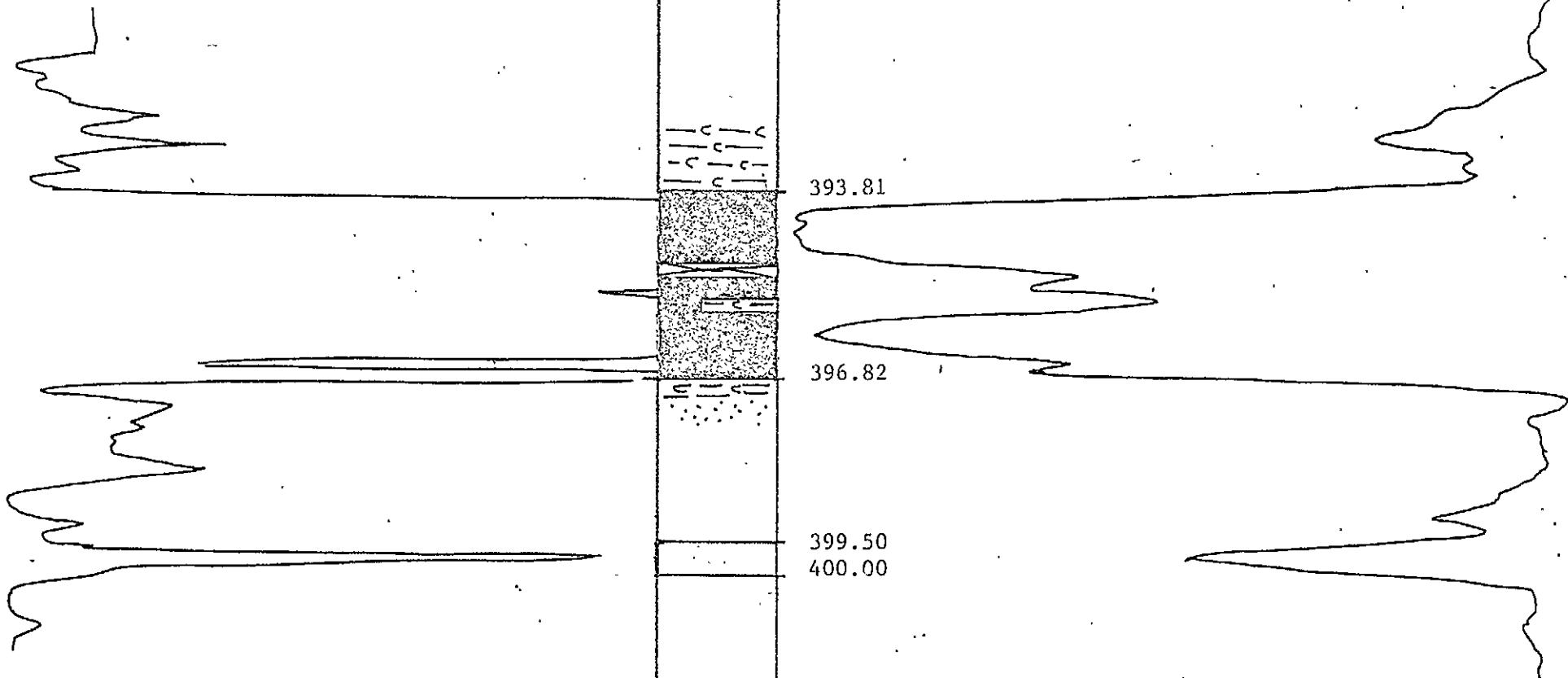
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3.00

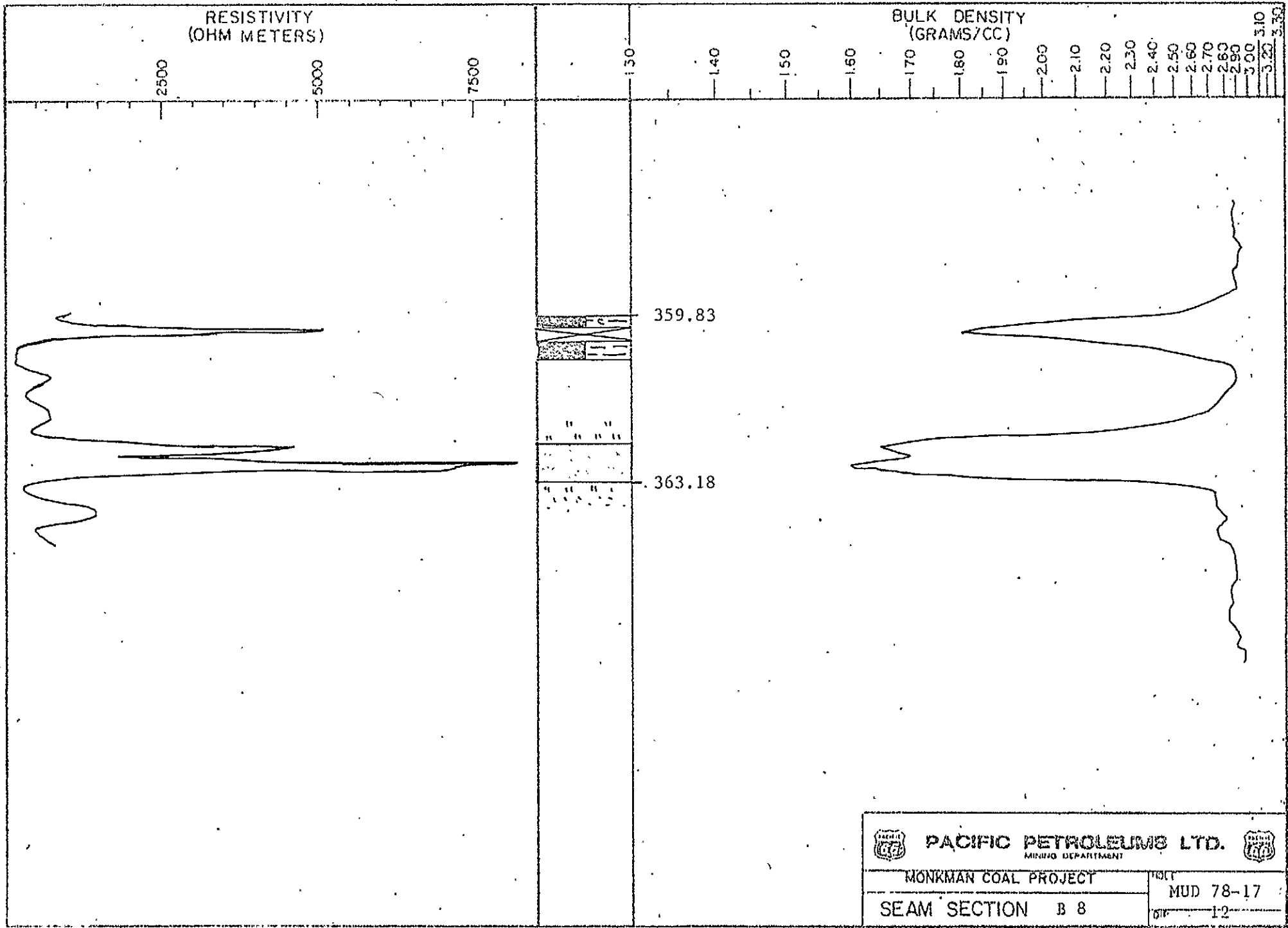
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3.20

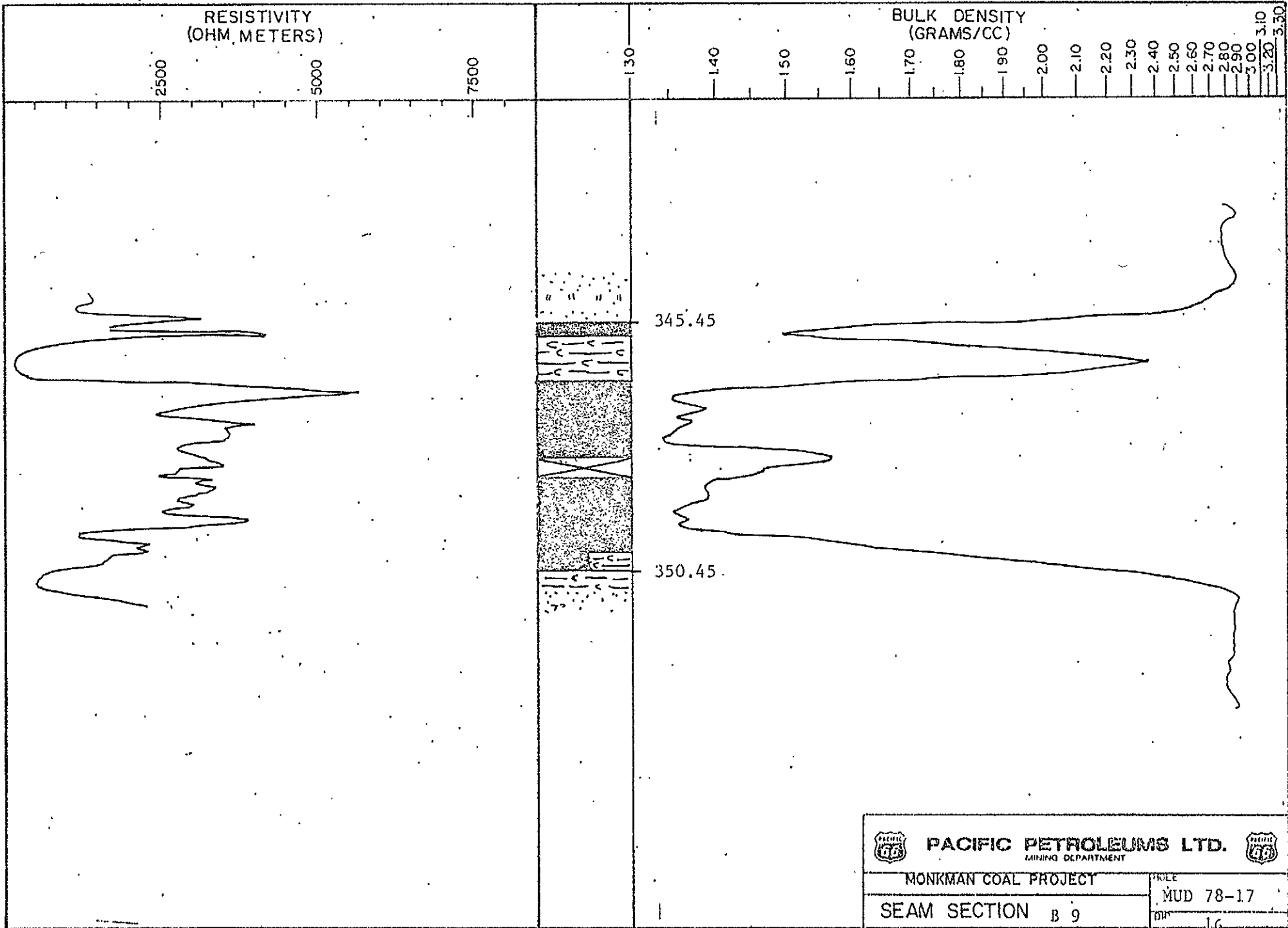
3.30





 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B 7	HOLE MUD 78-17 DIP 12



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B 8	MUD 78-17
	12



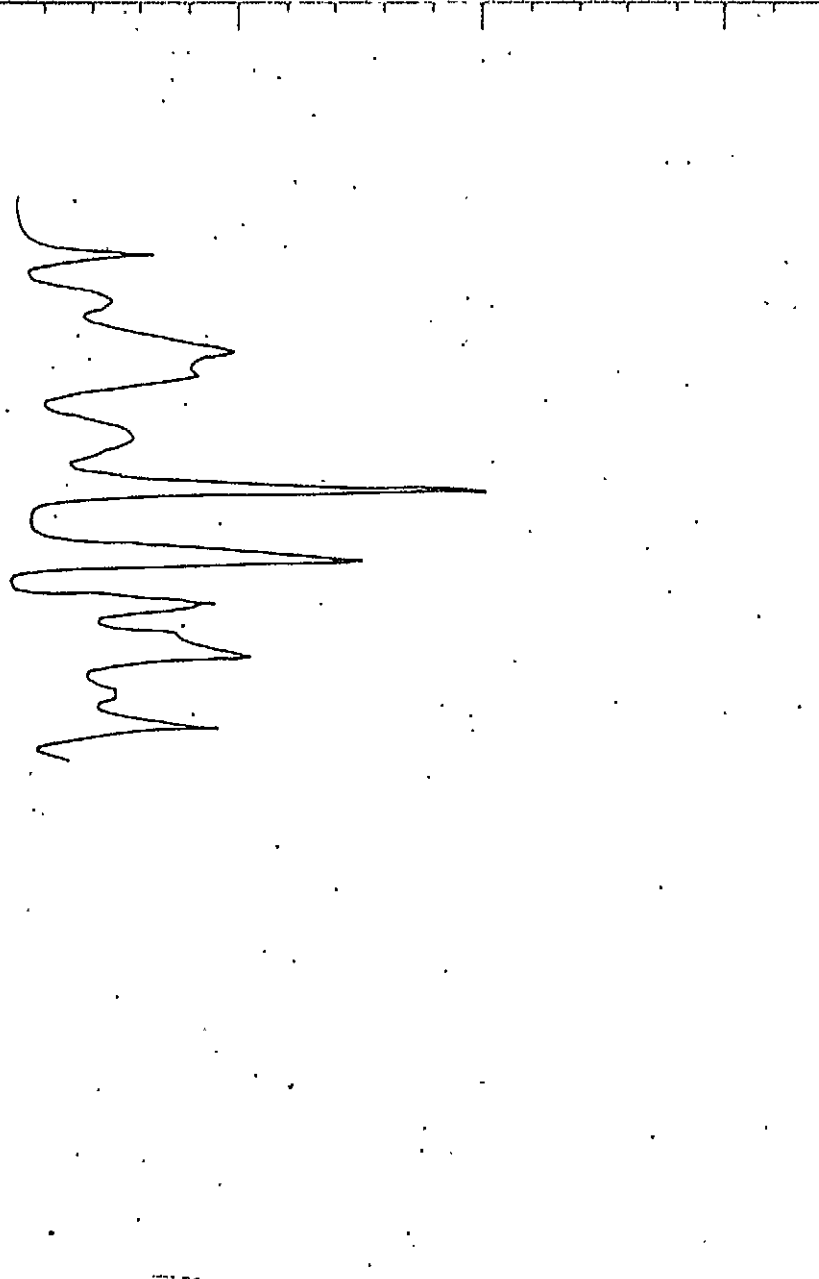
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		WELL
SEAM SECTION B 9		MUD 78-17
		DATE 16

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

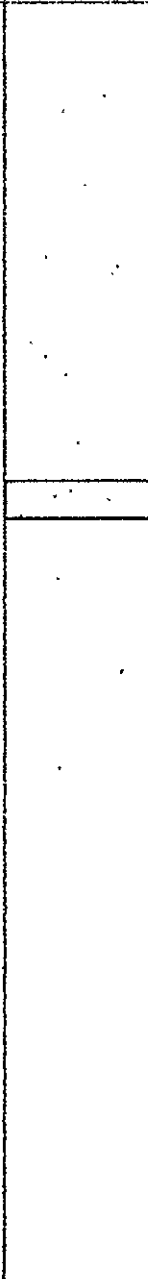
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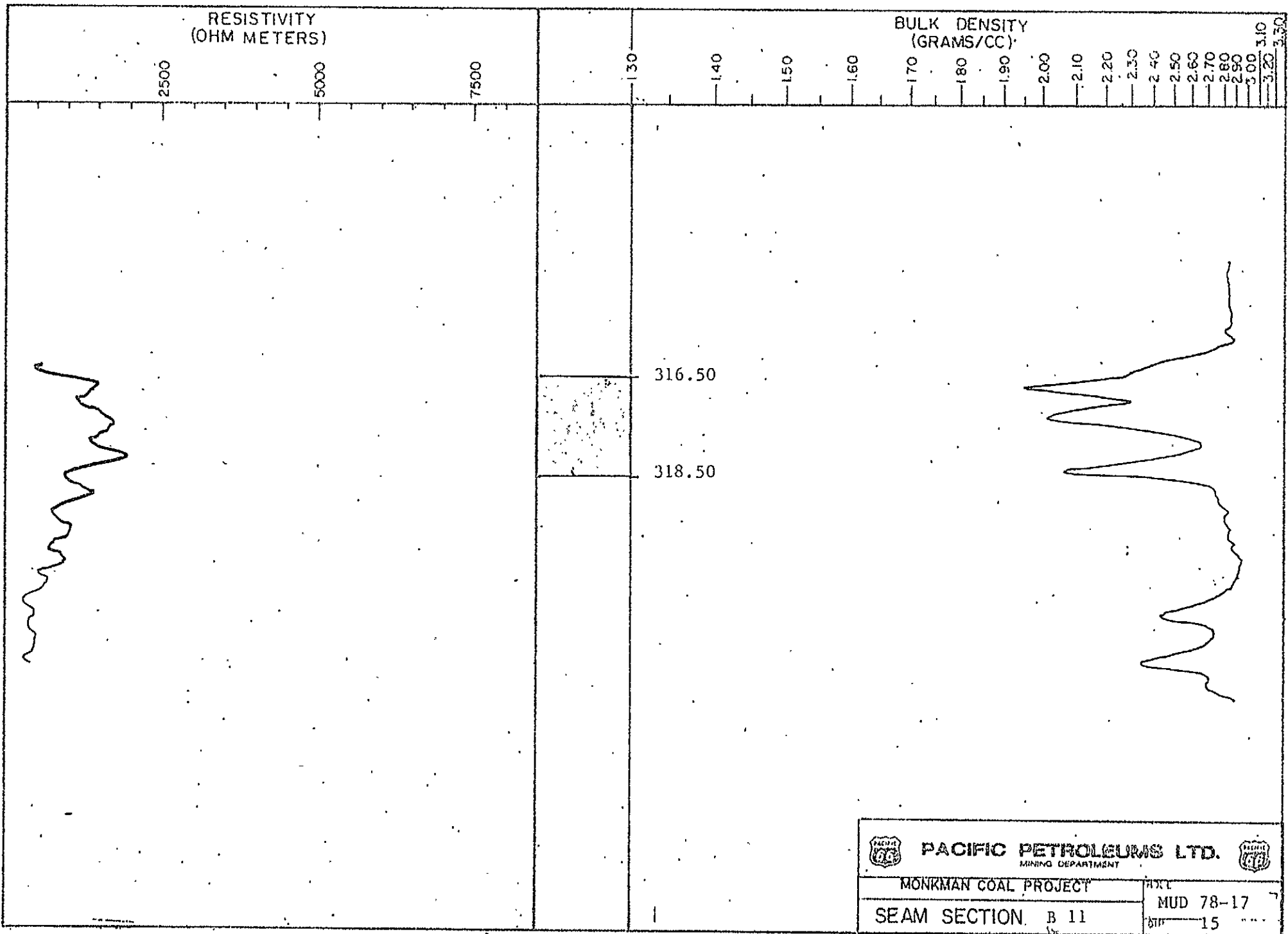
3.20



3.30



331.60
332.75

MONKMAN COAL PROJECT	TRILL MUD 78-17
SEAM SECTION B 10	16



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MUD 78-17
SEAM SECTION B 11		STD 15

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

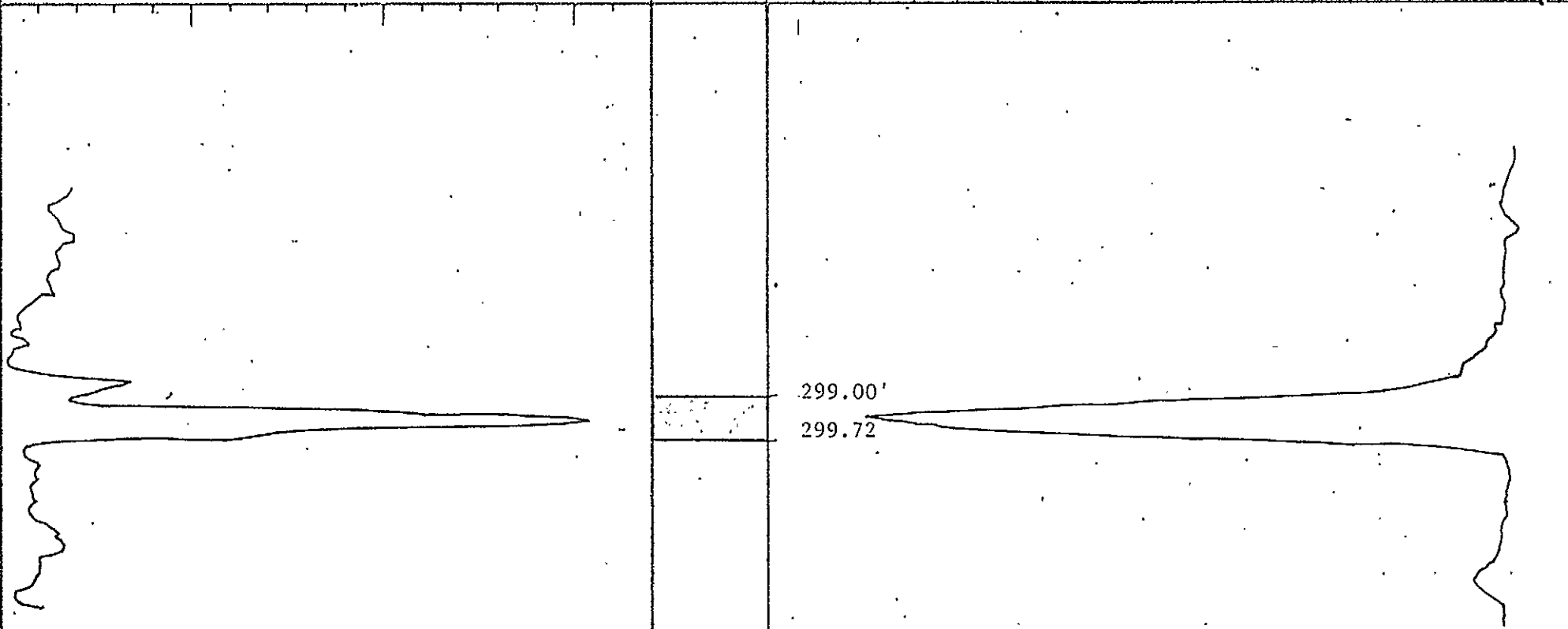
2.90

3.00

3.10

3.20

3.30



299.00'

299.72'



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

MUD 78-17

SEAM SECTION B 12

12

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

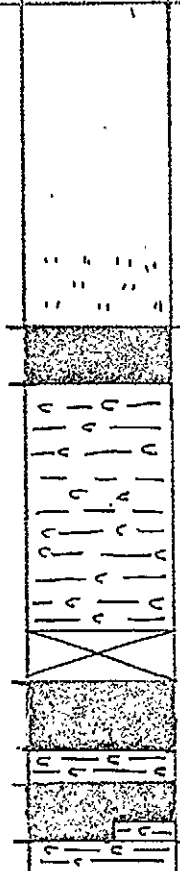
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3.00

3.10

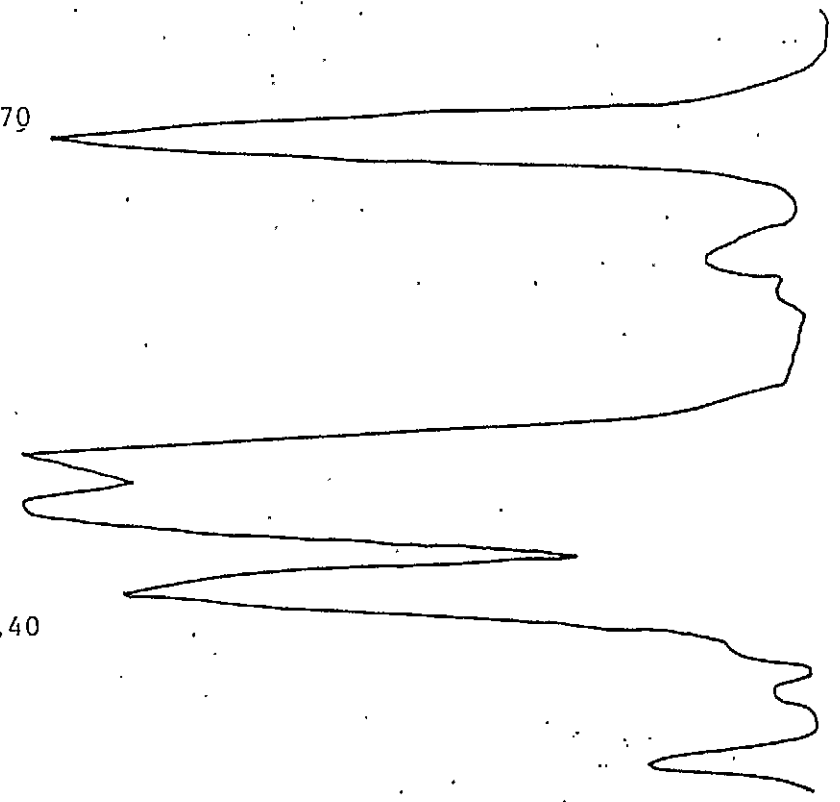
3.20

3.30



331.70

338.40



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

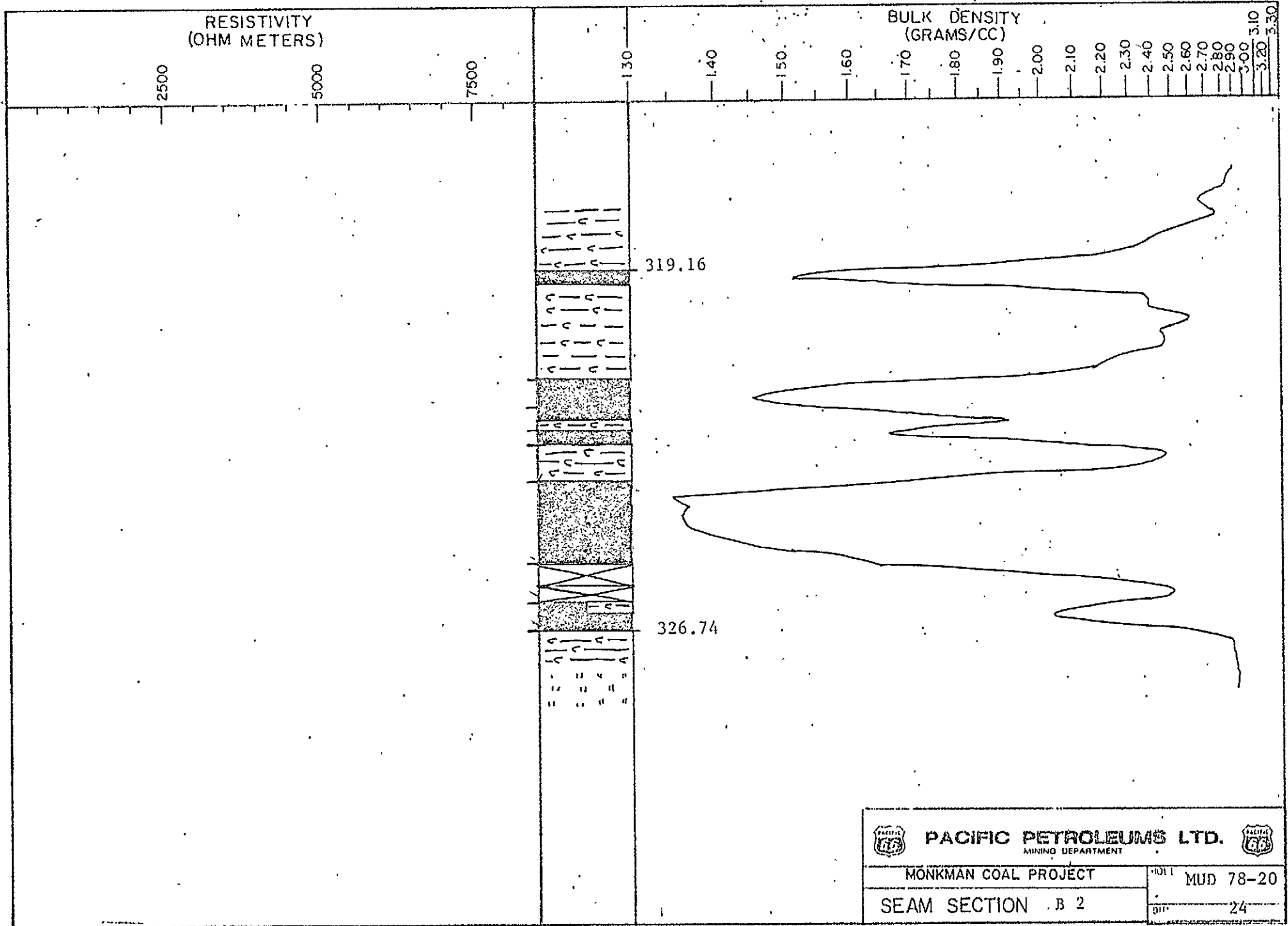




MONKMAN COAL PROJECT

HOLE MUD 78-20

SEAM SECTION B 1

DIP 24



 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B 2	
NO. 1	MUD 78-20
DATE	24

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

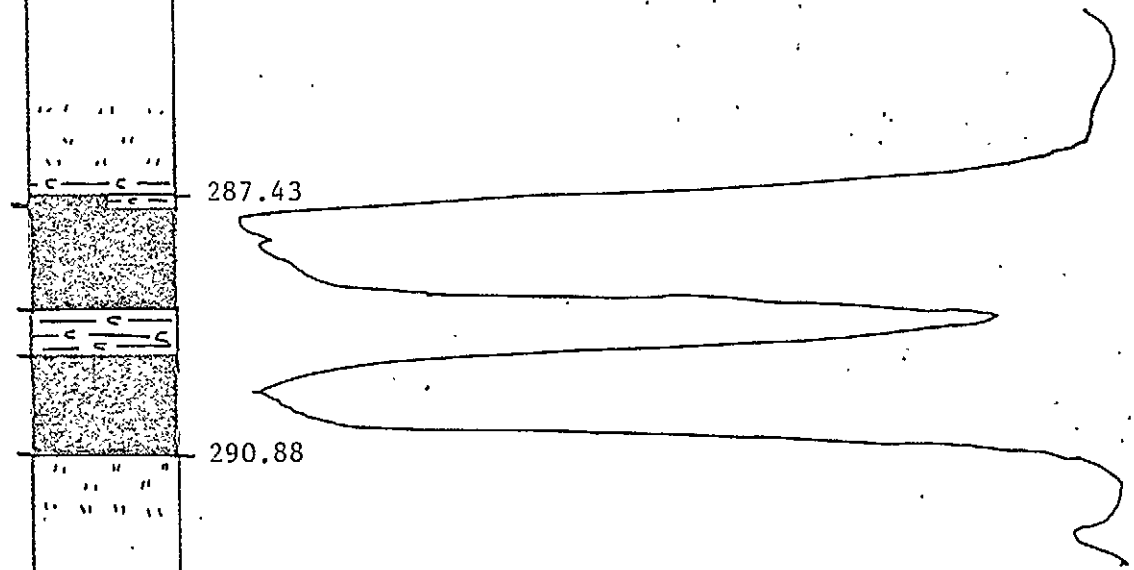
2.90

3.00

3.10



3.20

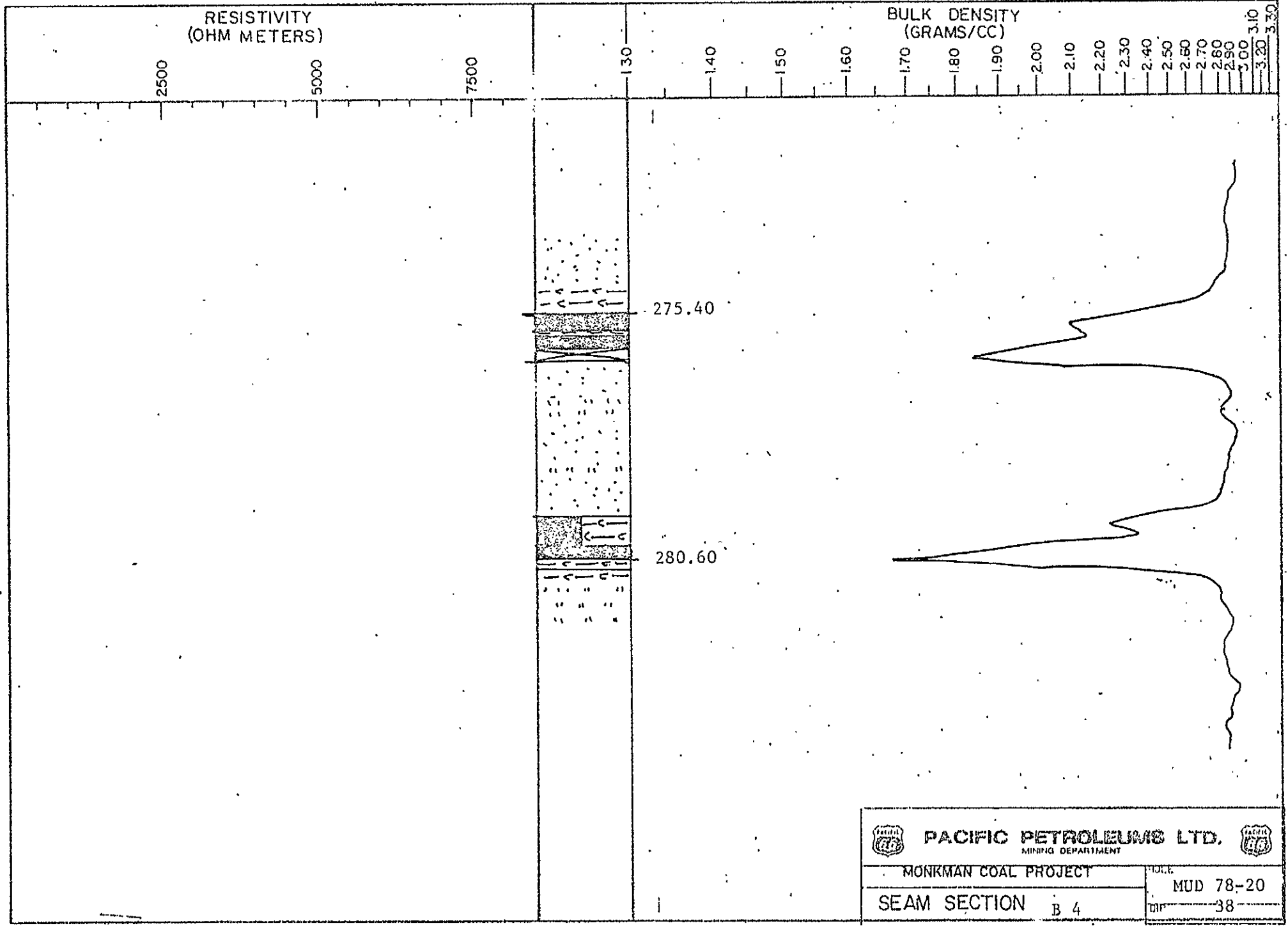
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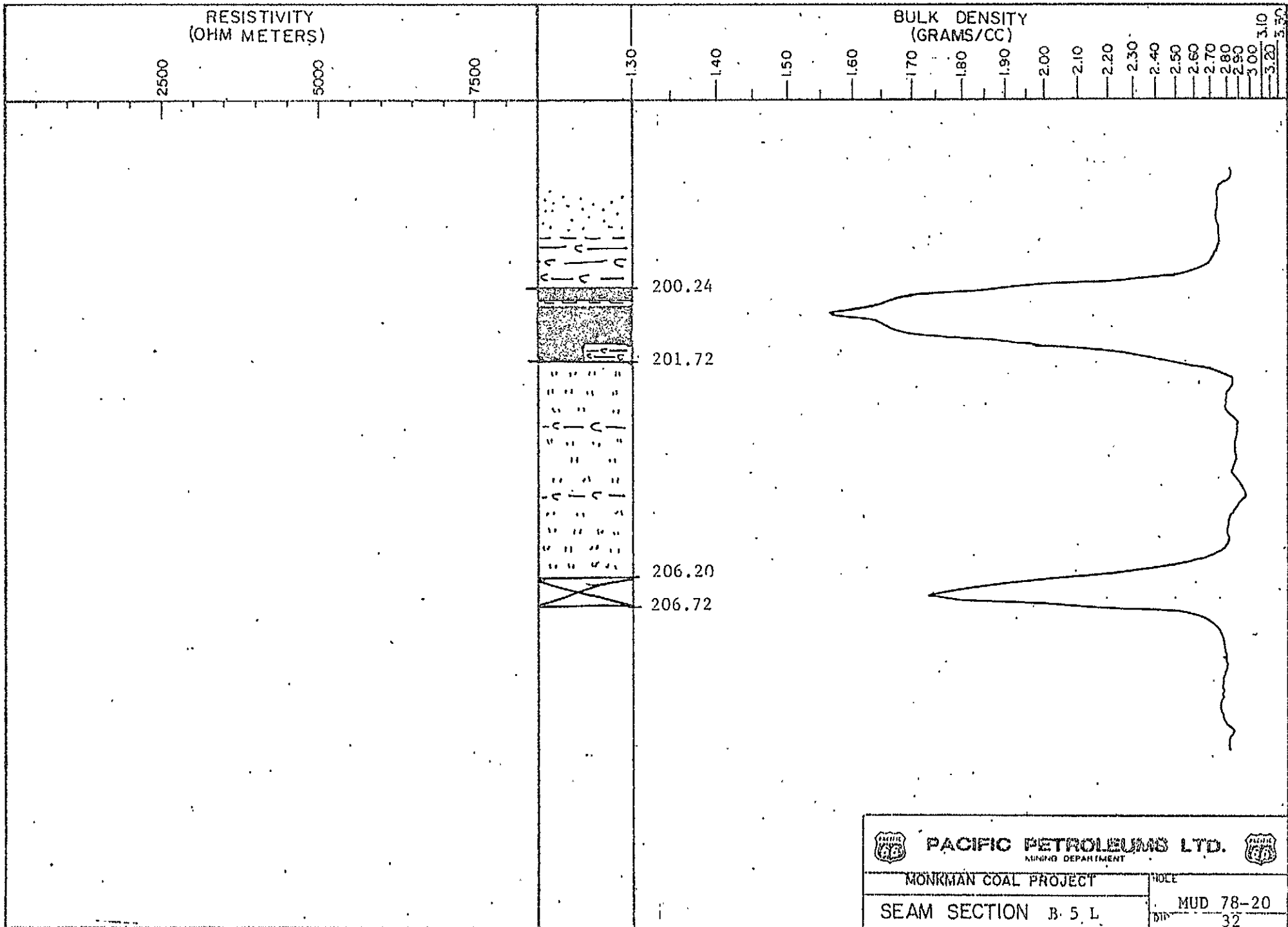
287.43

290.88

 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT 	
MONKMAN COAL PROJECT	MUD 78-20
SEAM SECTION B 3	32



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		NO. MUD 78-20
SEAM SECTION B 4		DATE 38



(CENTIMETERS)

2500

5000

7500

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

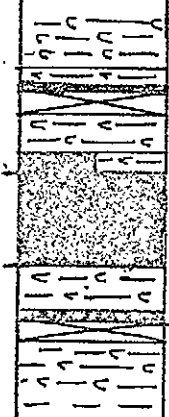
2.90

3.00

3.10

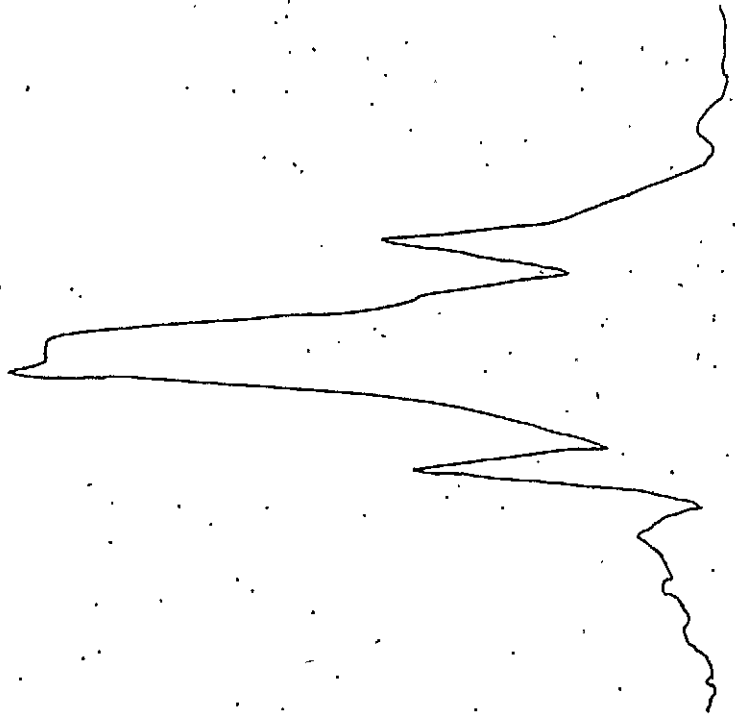
3.20



(GRAMS/CC)

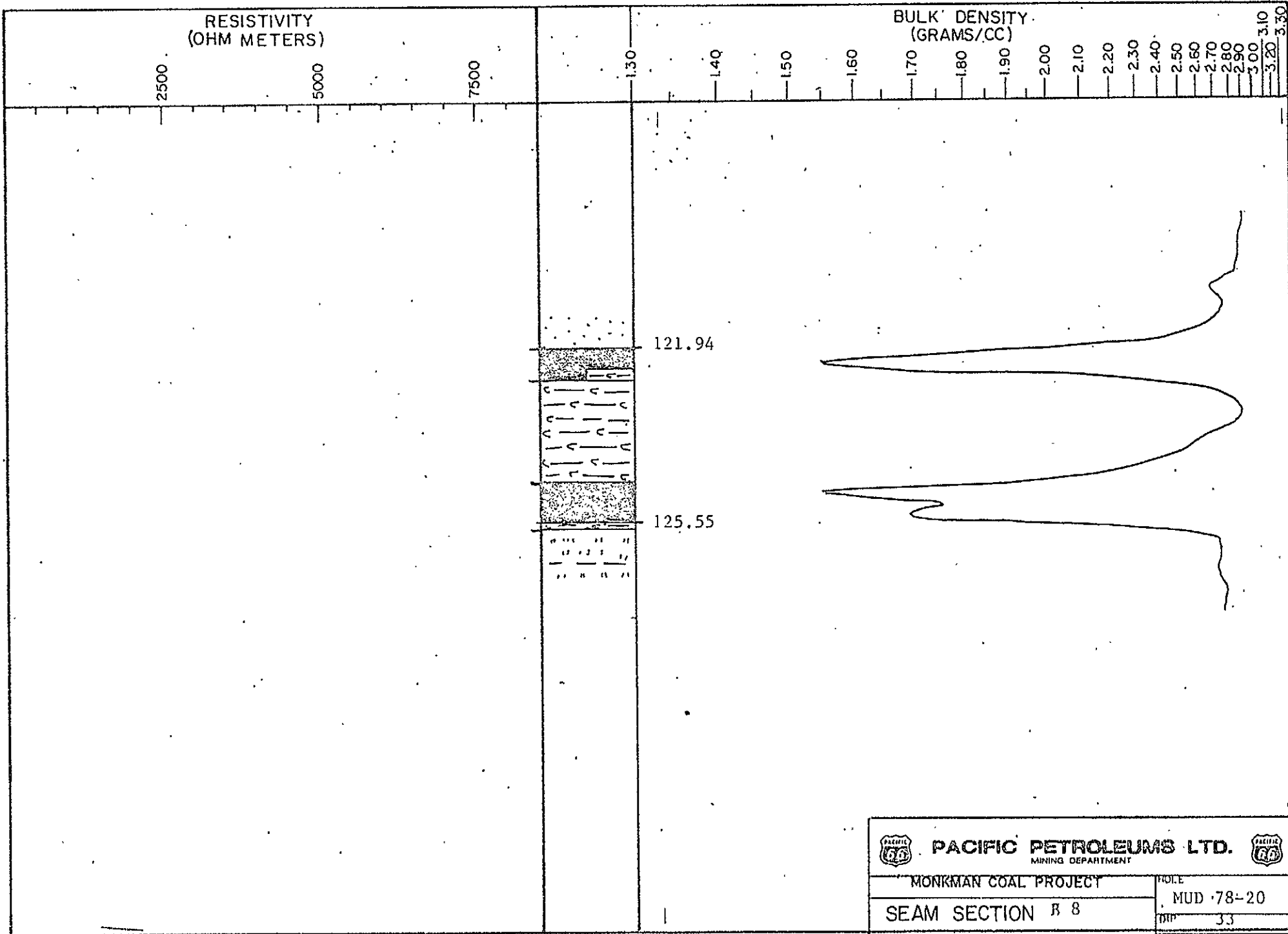




188.35

191.90



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B 5 U		MUD 78-20
		DIP 32



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MUD 78-20
SEAM SECTION B 8		DIP 33

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

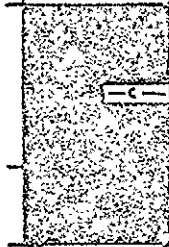
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3.00

3.10

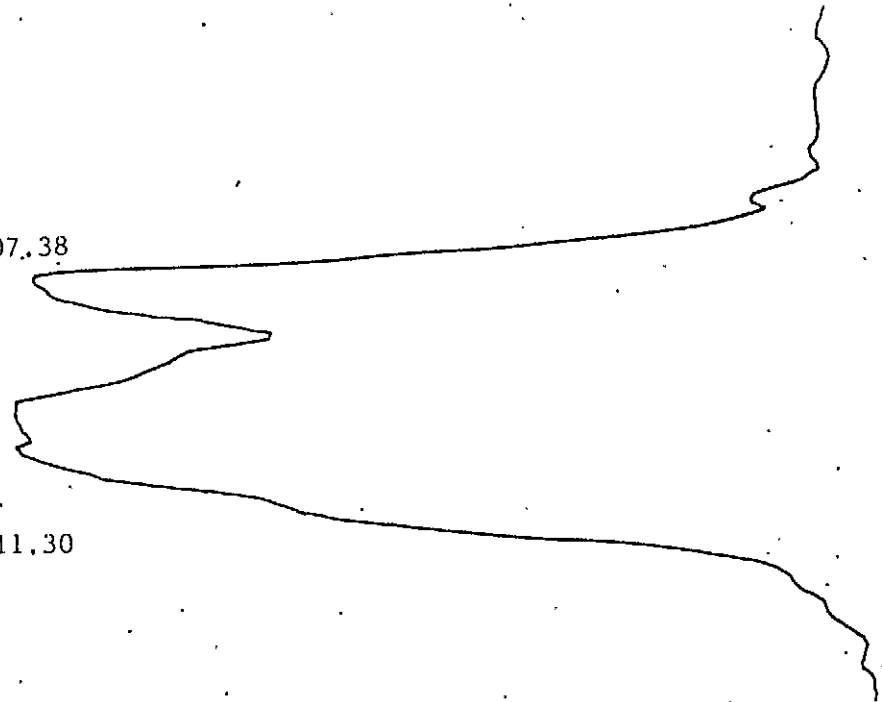
3.20

3.30



107.38

111.30



PACIFIC PETROLEUMS LTD.



MINING DEPARTMENT

MONKMAN COAL PROJECT

HOLE
MUD 78-20

SEAM SECTION B 9

DIP 33

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

76.00

76.90

89.00

90.78



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE MUD 78-20

SEAM SECTION B 10 L

DIP 28

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

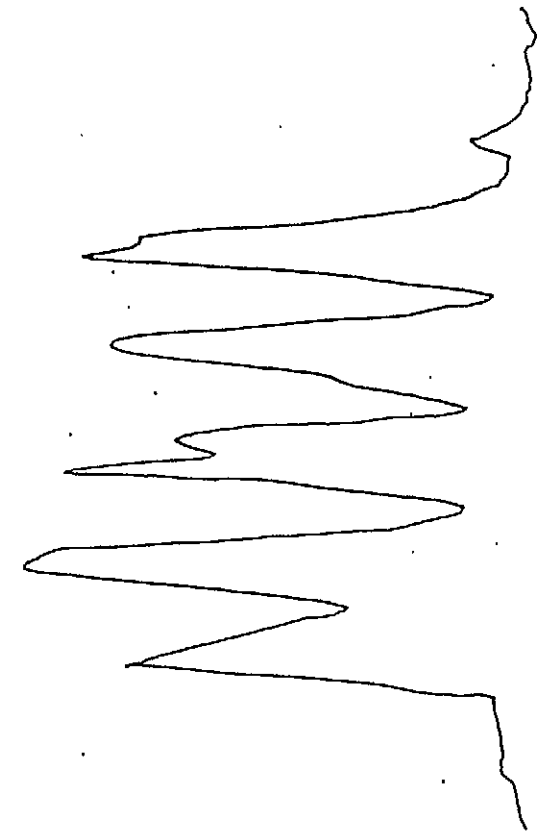
3.20

3.30



51.72

57.72



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B 11

HOLE
MUD-78-20

DIP 35

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

32.50

33.90



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

DATE

MUD 78-20

SEAM SECTION B 12

DIP

35

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

140

150

160

170

180

190

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

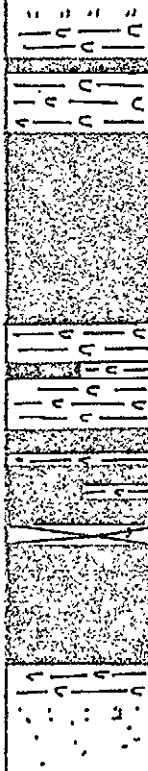
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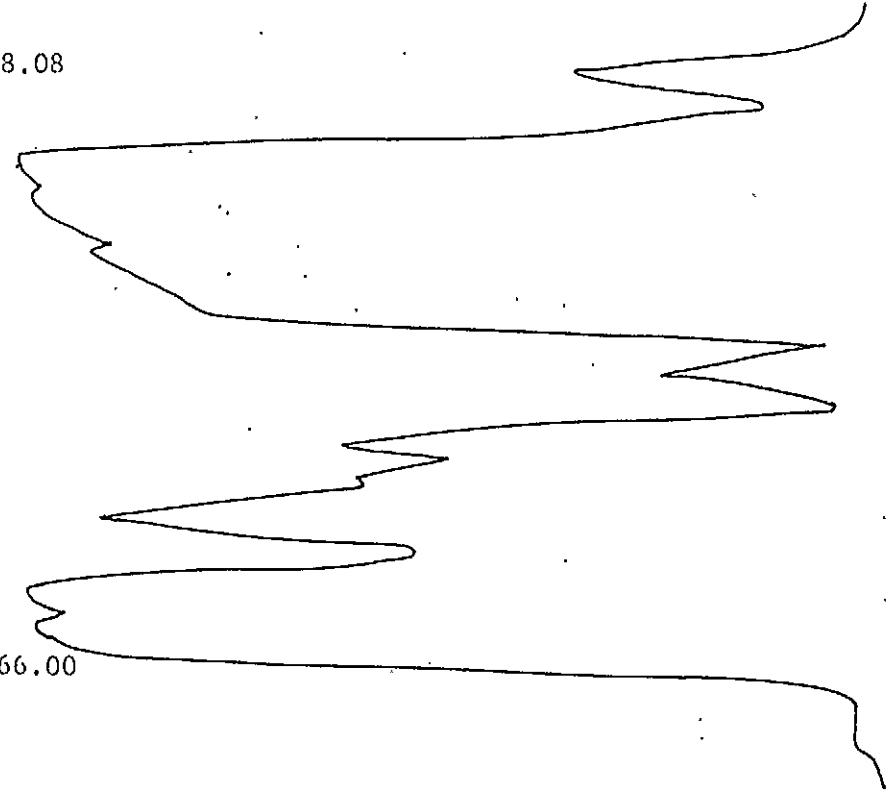
3.20

3.30



258.08

266.00



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B 1

MUD 78-21
17

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

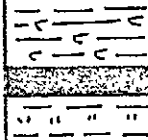
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3.00

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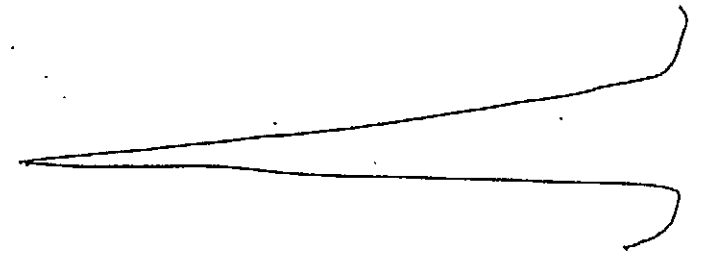
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3.30



256.52

256.83



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

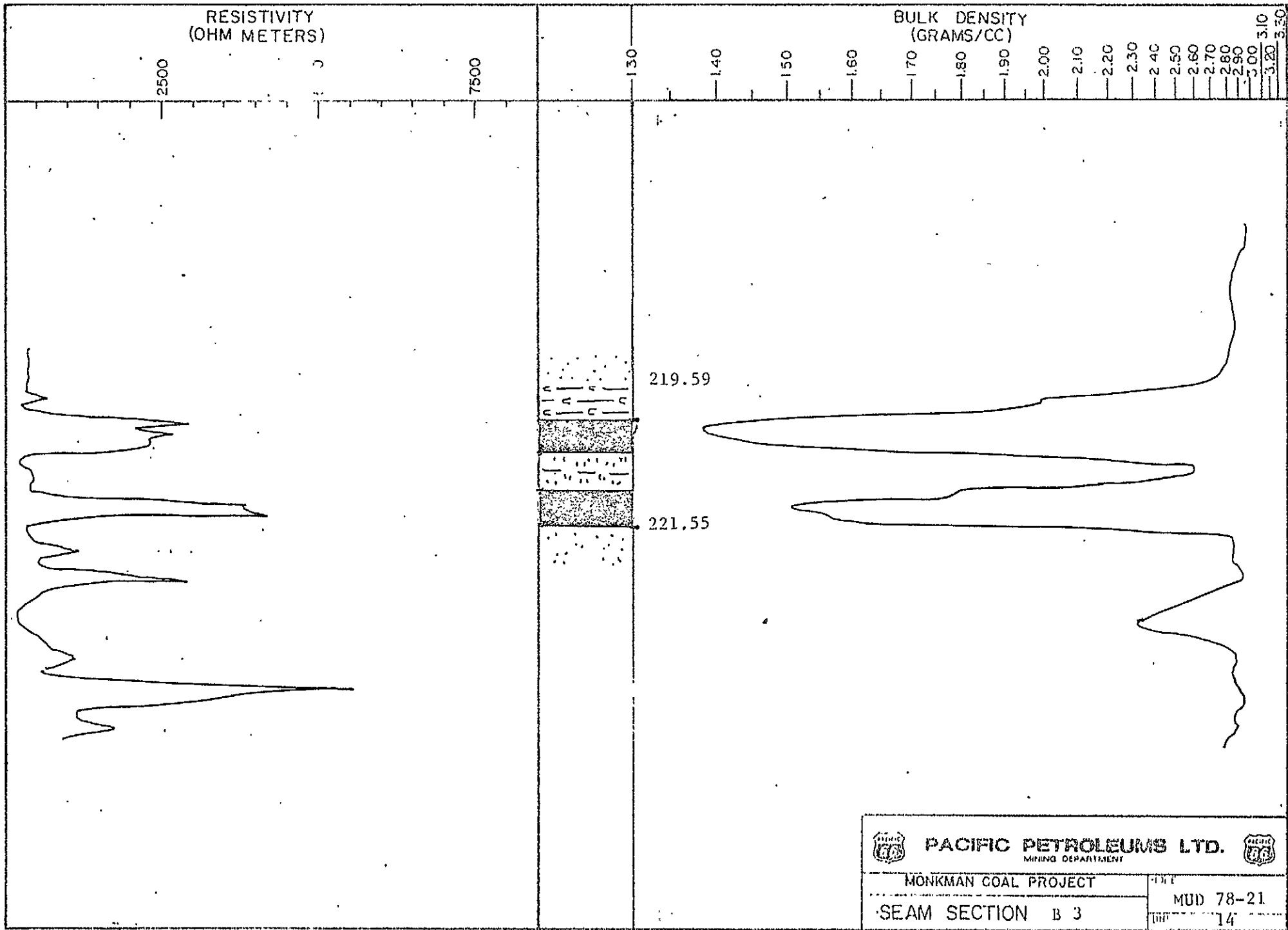


MONKMAN COAL PROJECT

MUD 78-21

SEAM SECTION B 2

DIP 15



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

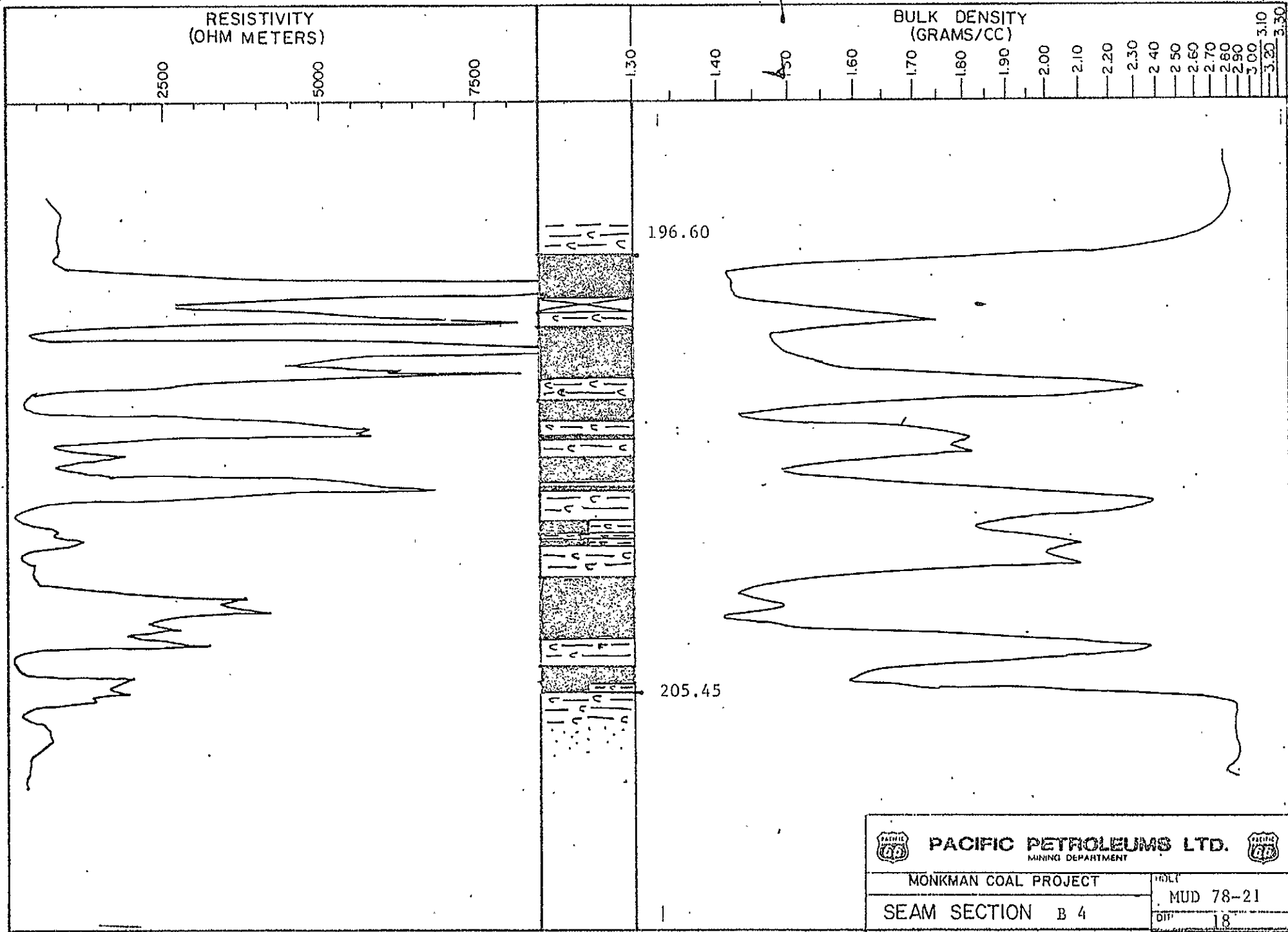




MONKMAN COAL PROJECT

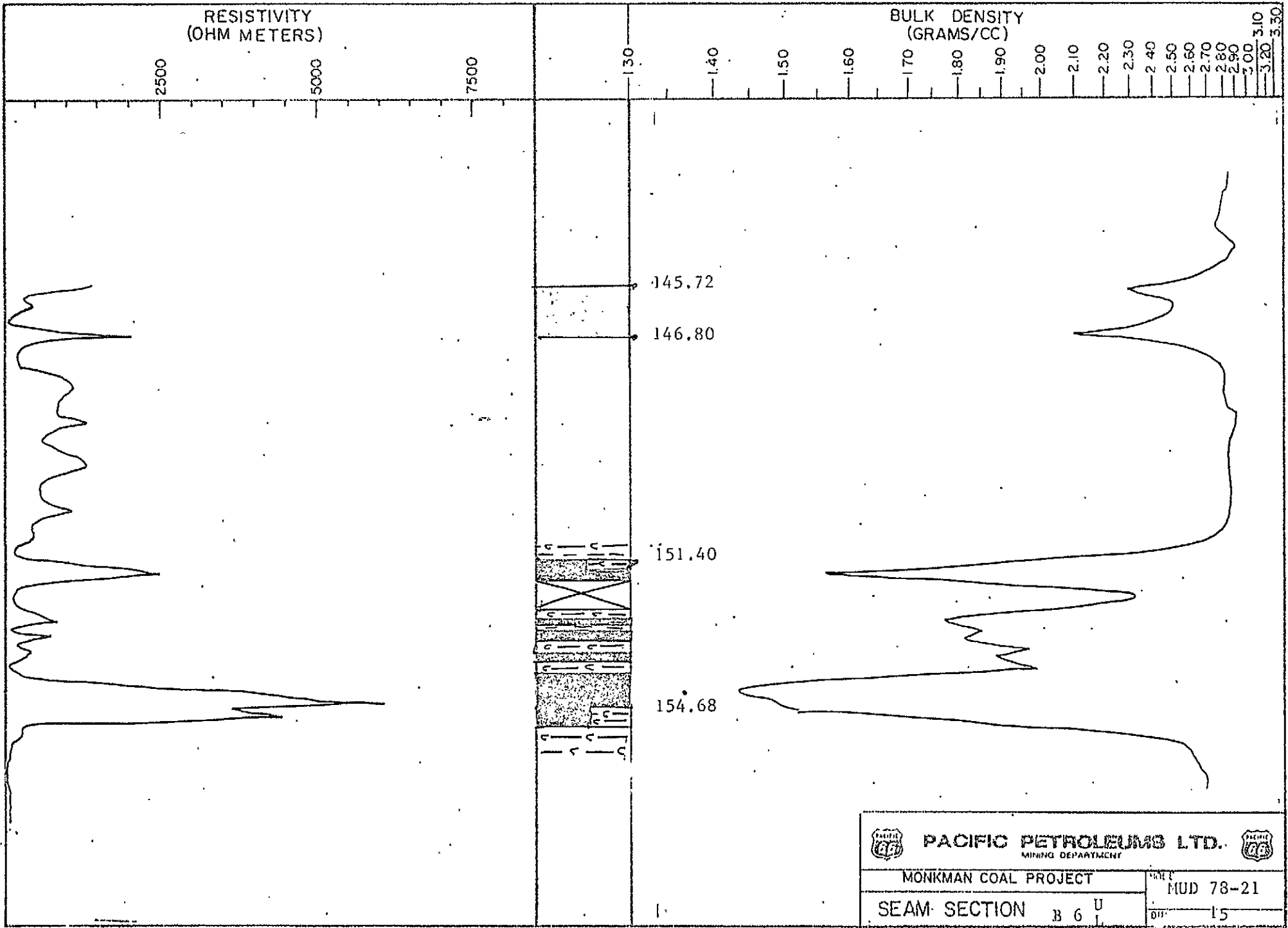
SEAM SECTION B 3



MUD 78-21

14



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B 4	
<small>PROJECT</small> MUD 78-21	<small>DATE</small> 18



 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION	B 6 U
MUD 78-21	
15	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

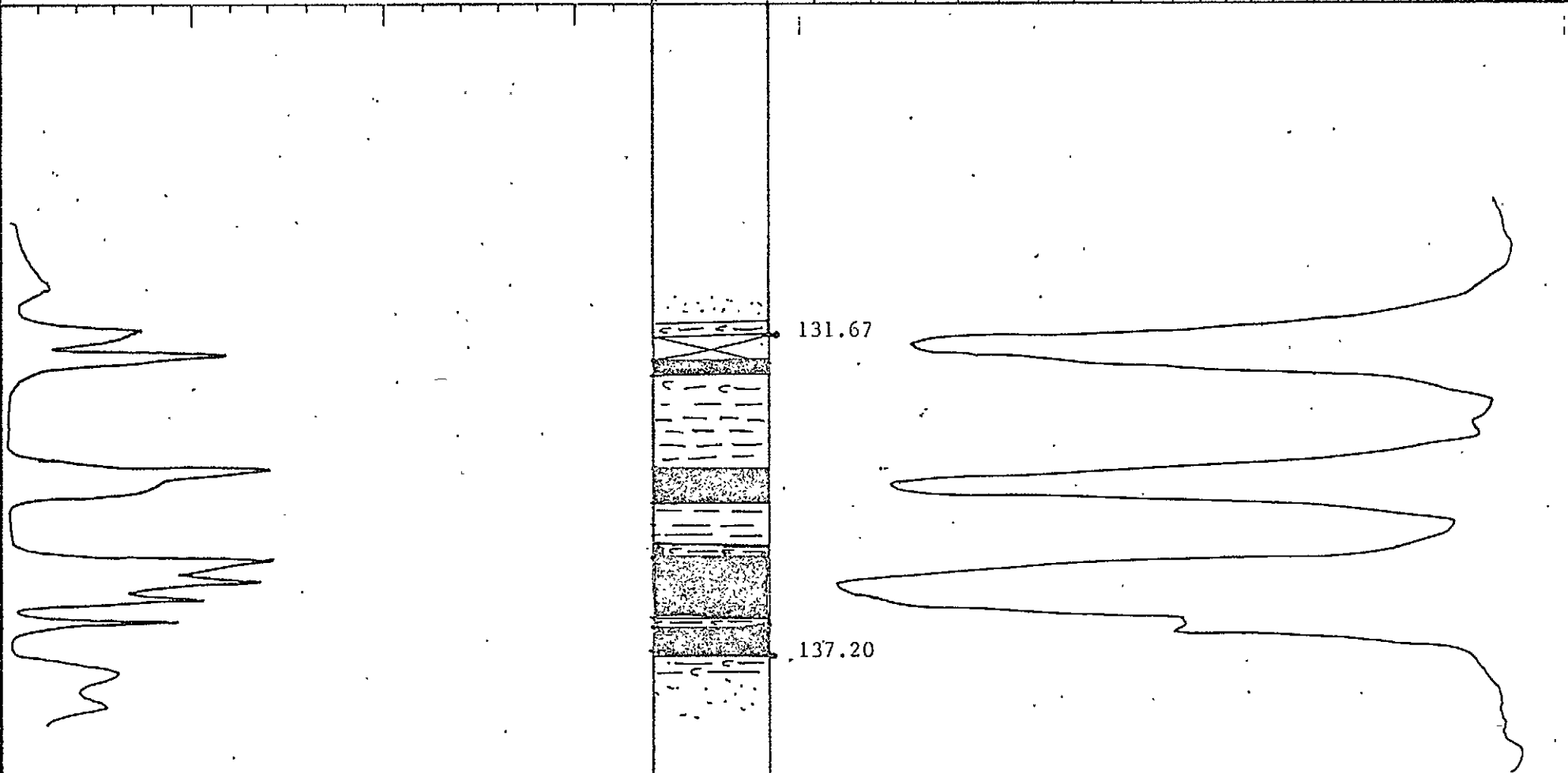
2.90

3.00

3.10

3.20

3.30



131.67

137.20



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



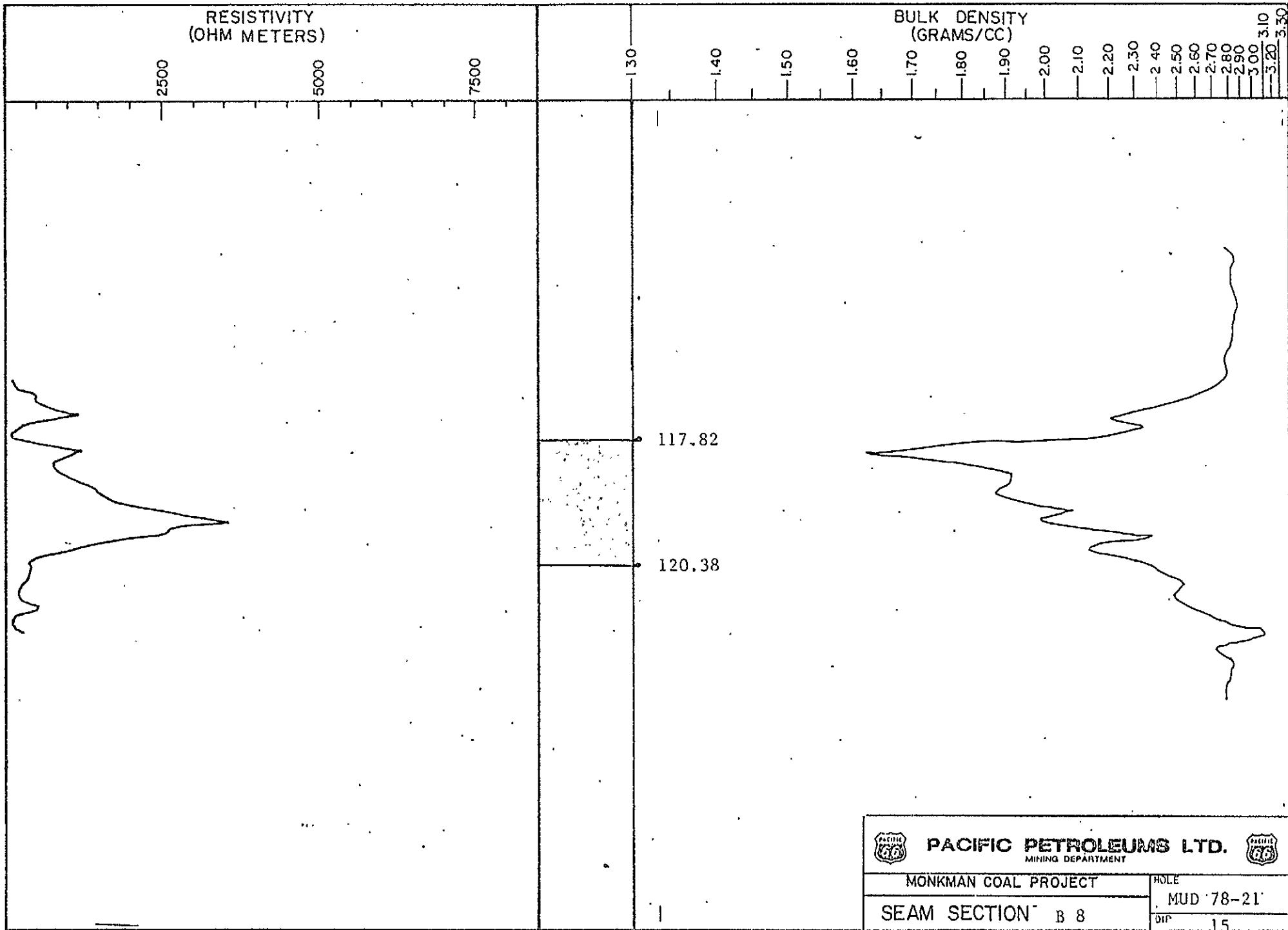
MONKMAN COAL PROJECT



HOLE

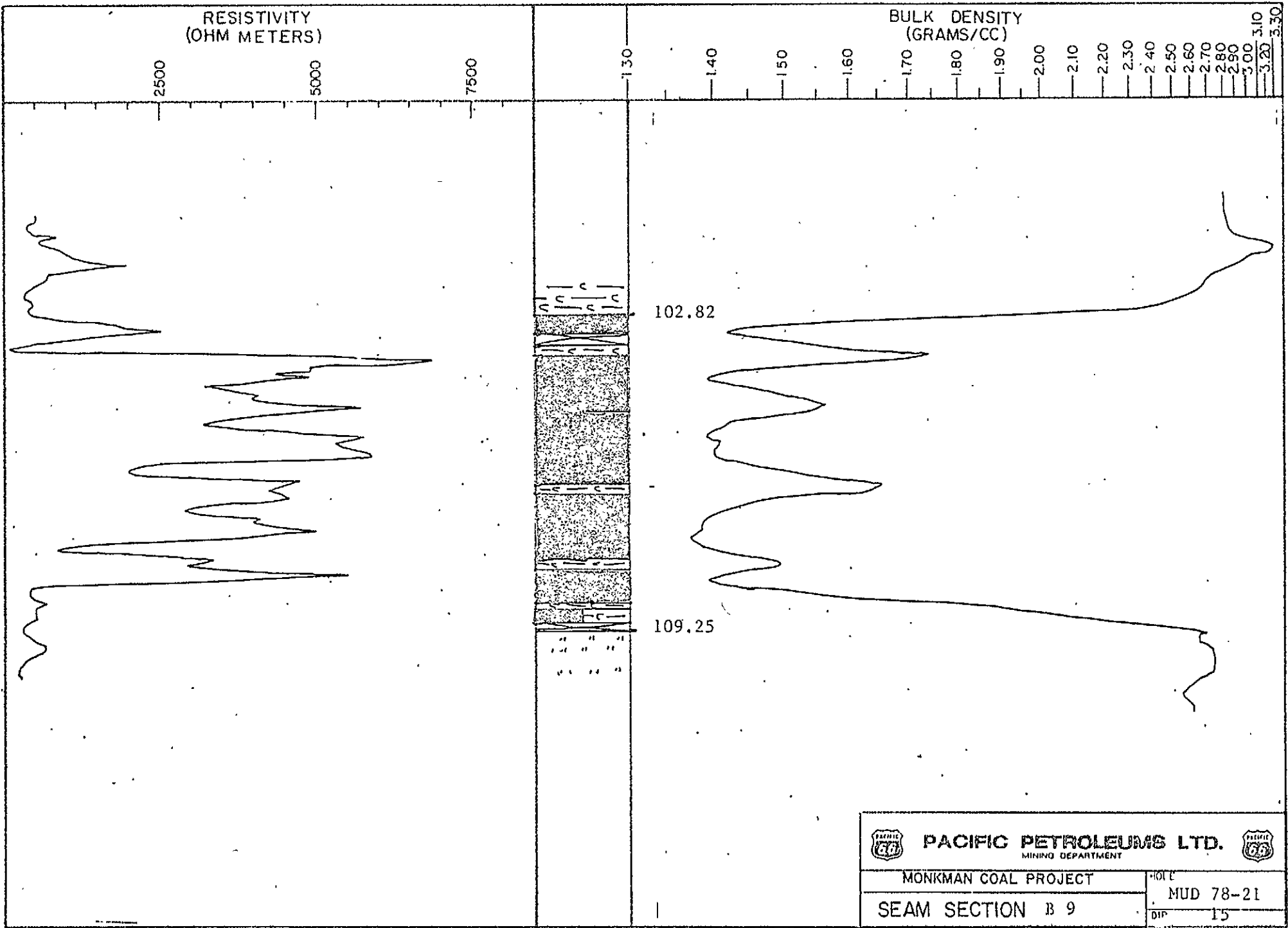
SEAM SECTION B 7



MUD 78-21

CIP 15



 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	
SEAM SECTION B 8	
HOLE MUD '78-21'	
DIP 15	



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION B 9		MUD 78-21
		DIP 15

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

77.40

78.10



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE
MUD 78-21

SEAM SECTION B 10

DIP 15

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

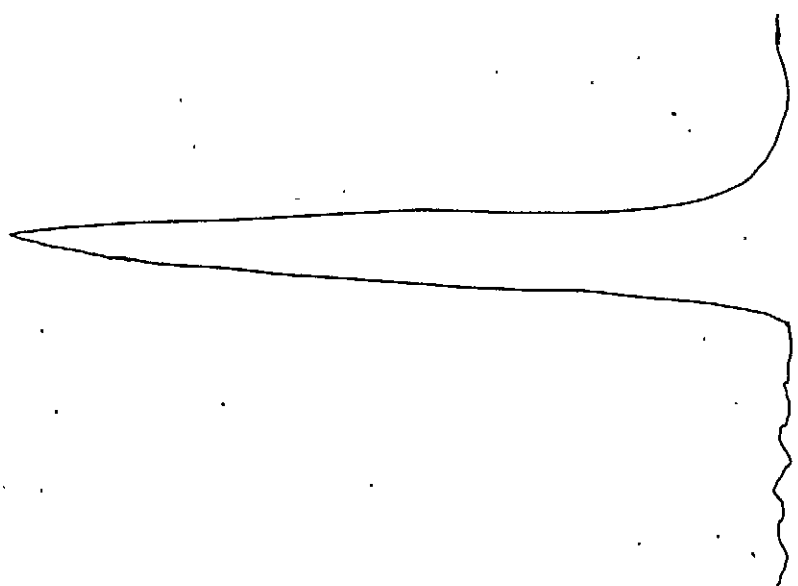
3.10

3.20

3.30

49.70

50.80



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

MUD 78-21

SEAM SECTION B 11

15

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

42.75

45.18



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE

MUD 78-21

SEAM SECTION B 12

DIP

23

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

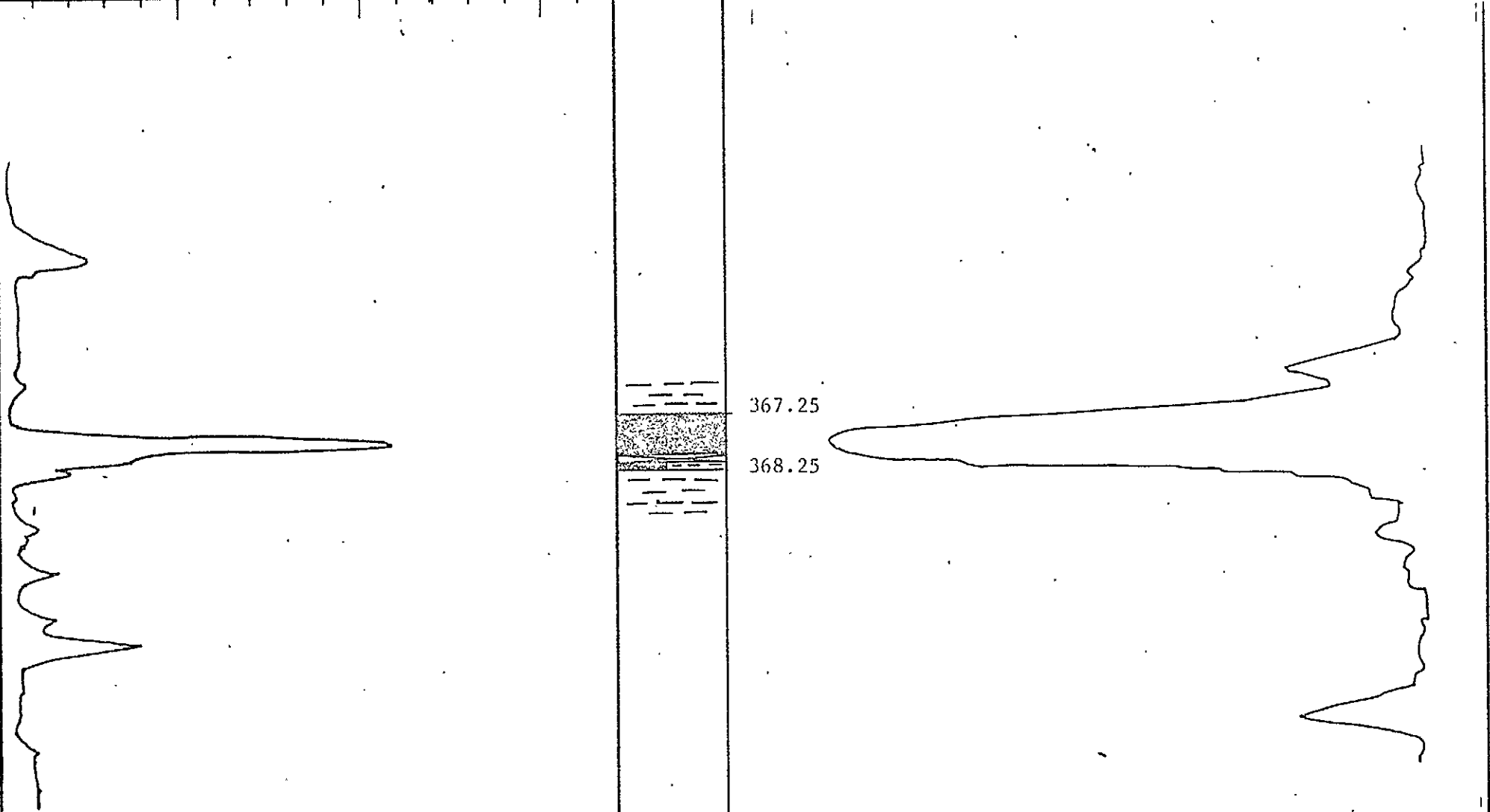
2.90

3.00

3.10

3.20

3.30



367.25

368.25



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

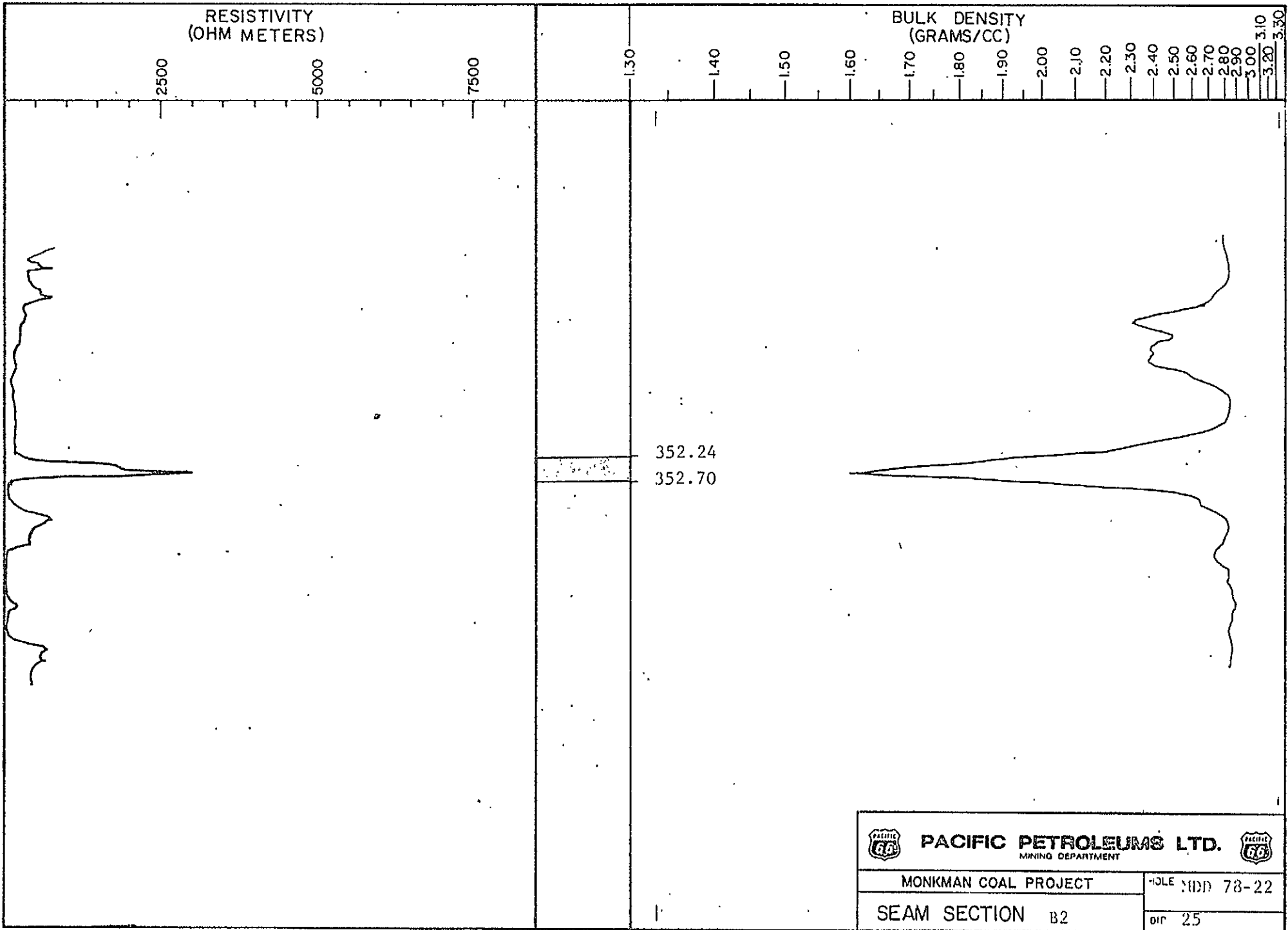


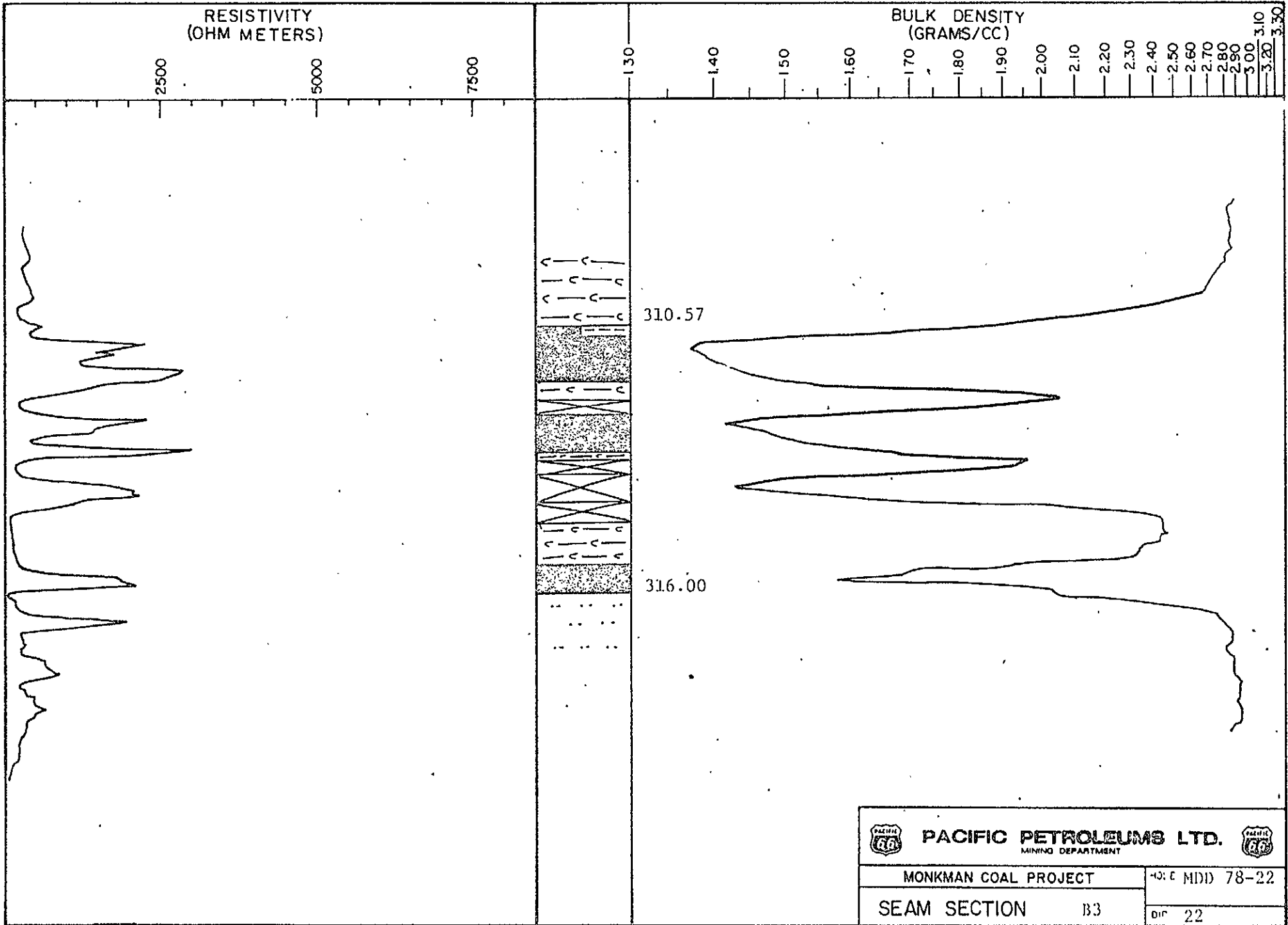
MONKMAN COAL PROJECT



HOLE MDD 78-22

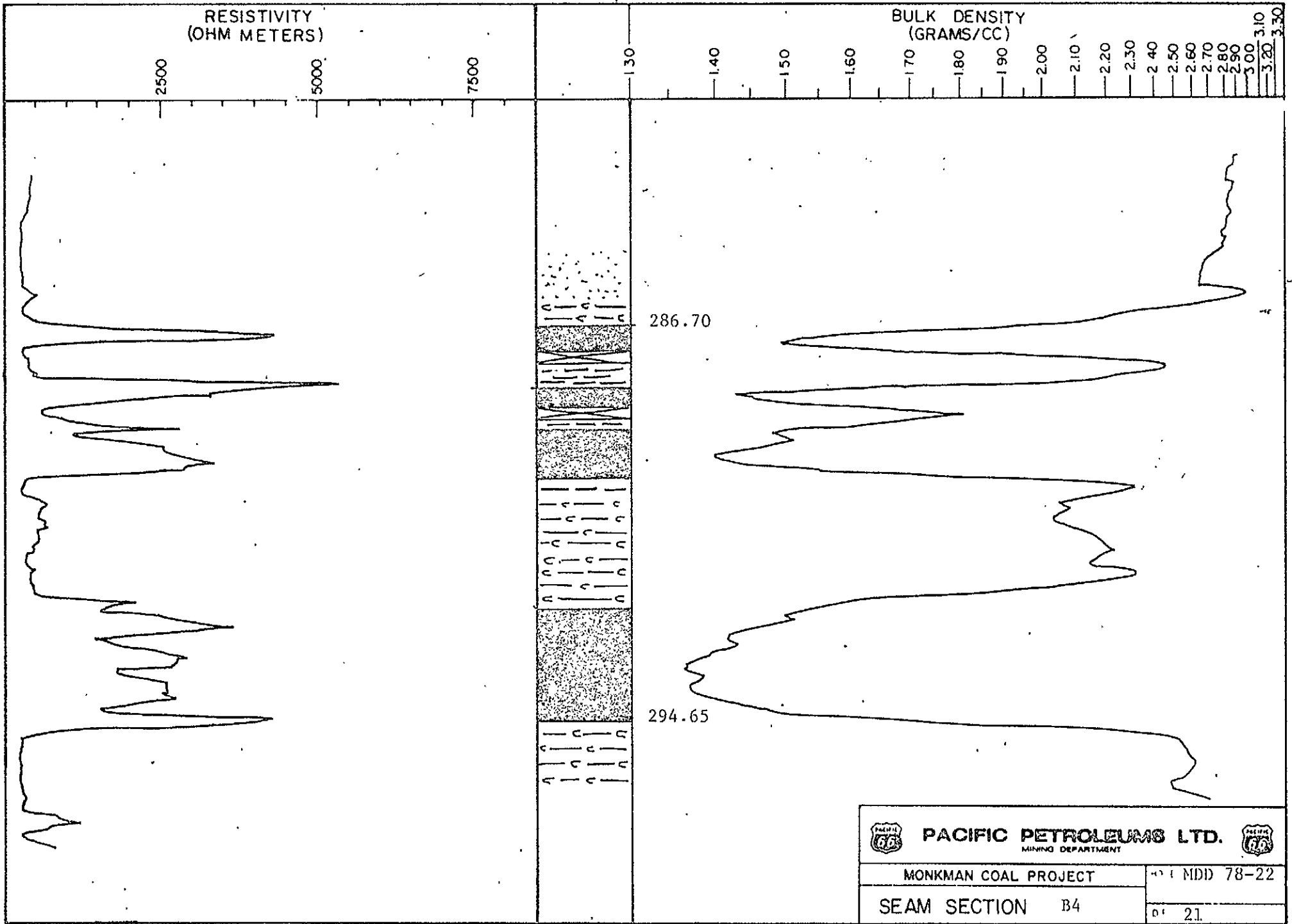
SEAM SECTION B1



DIP 23

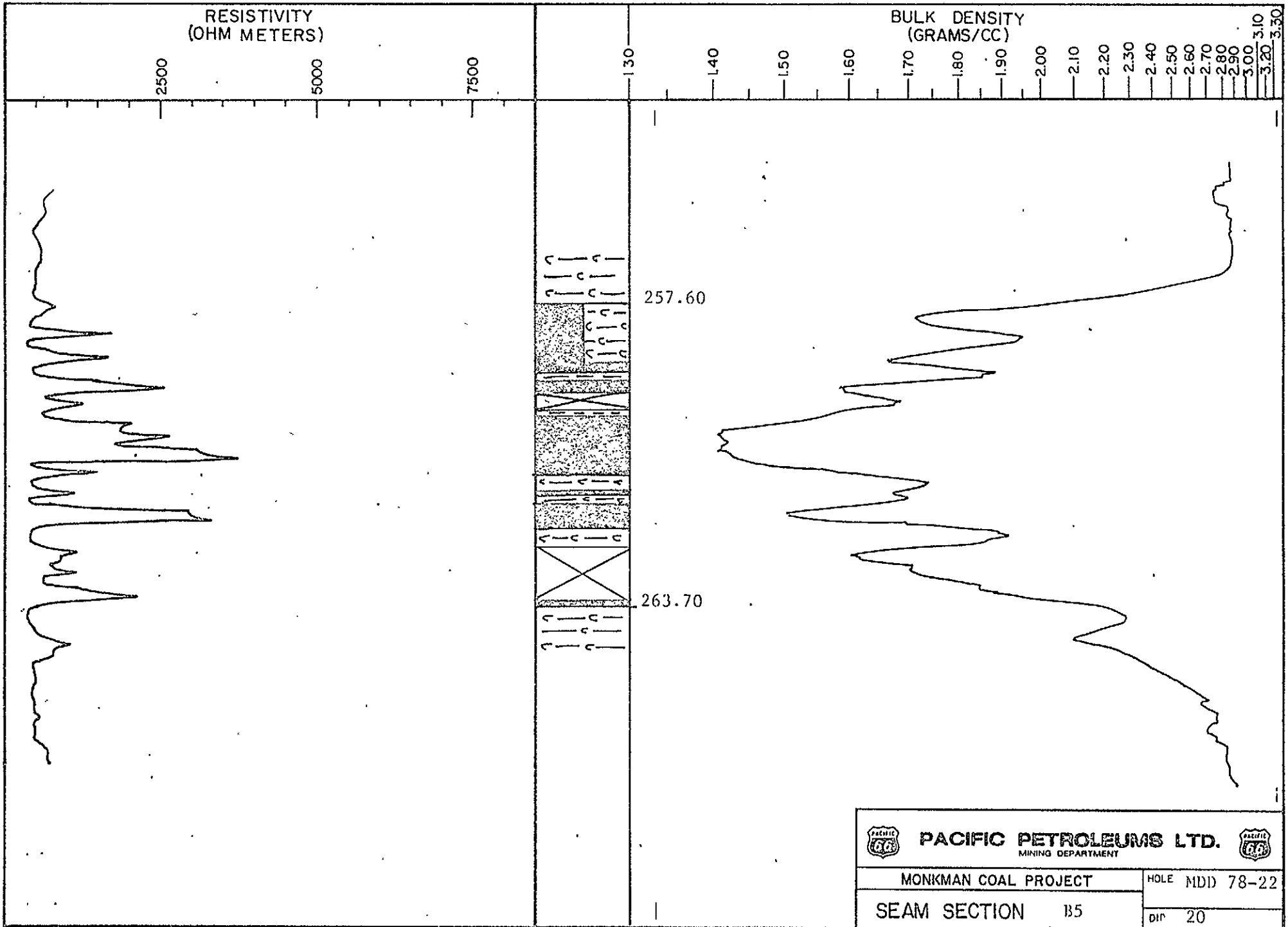




 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		NO: E MDD 78-22
SEAM SECTION	B3	DIP 22



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	MDD 78-22
SEAM SECTION B4	21



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE MDI) 78-22

SEAM SECTION B5

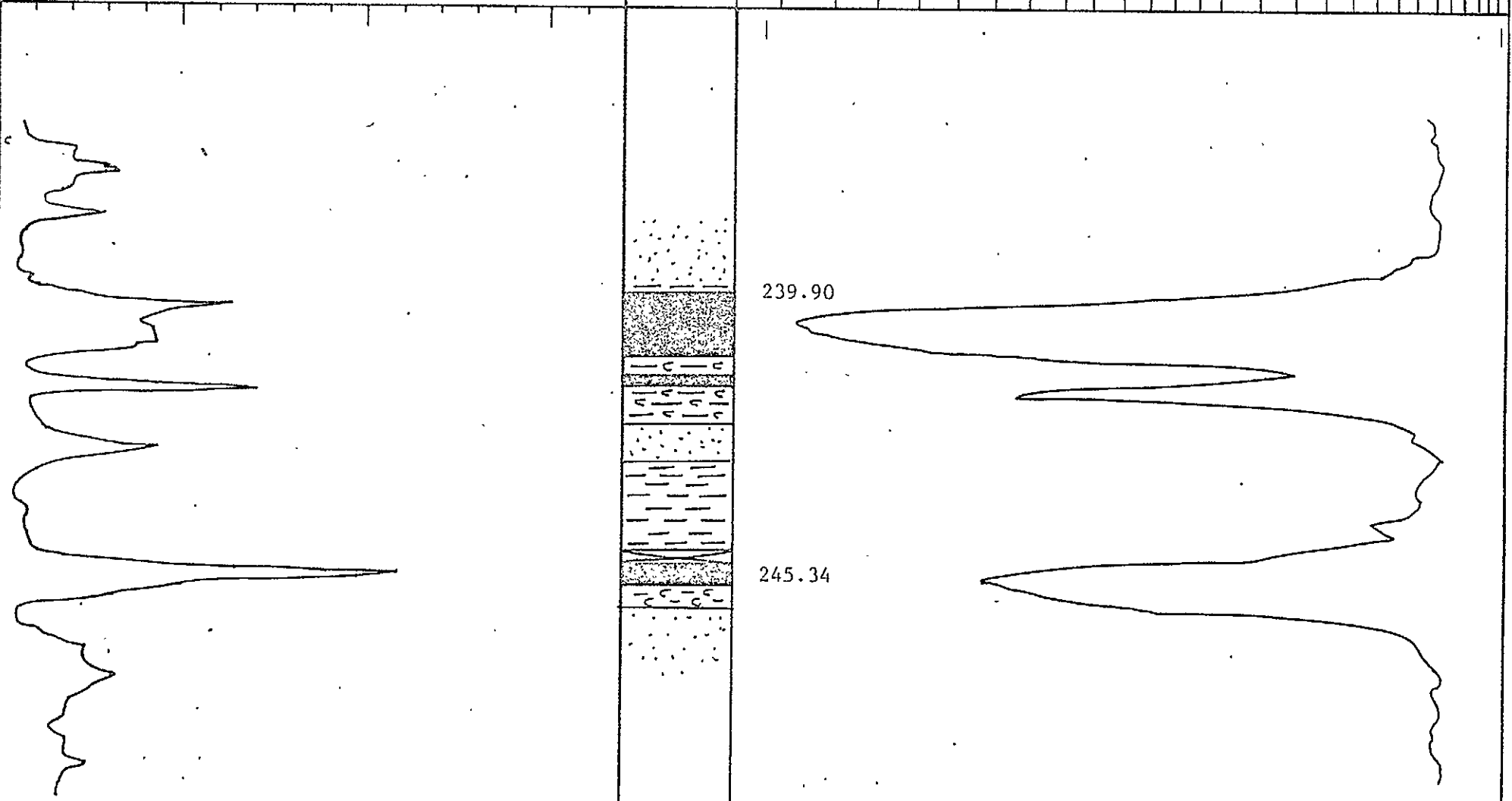
DIP 20

RESISTIVITY
(OHM METERS)

2500
5000
7500

BULK DENSITY
(GRAMS/CC)

1.30
1.40
1.50
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
2.40
2.50
2.60
2.70
2.80
2.90
3.00
3.10
3.20
3.30



239.90

245.34



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT		HOLE MDD 78-22
SEAM SECTION B6	DIP 21	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

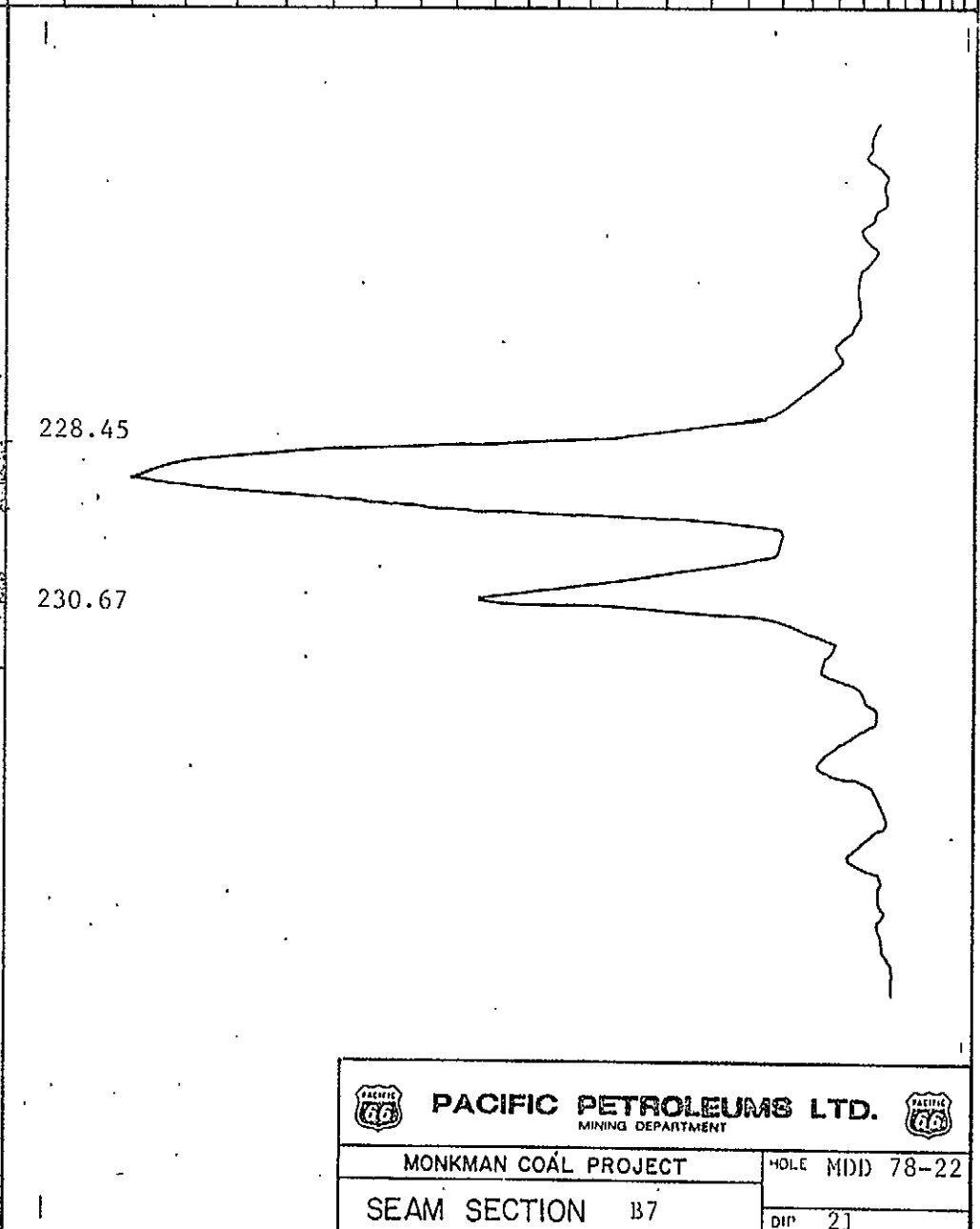
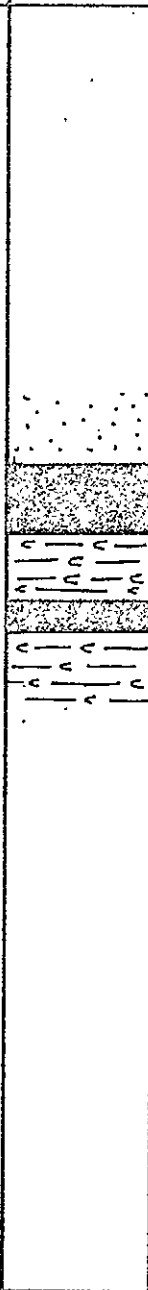
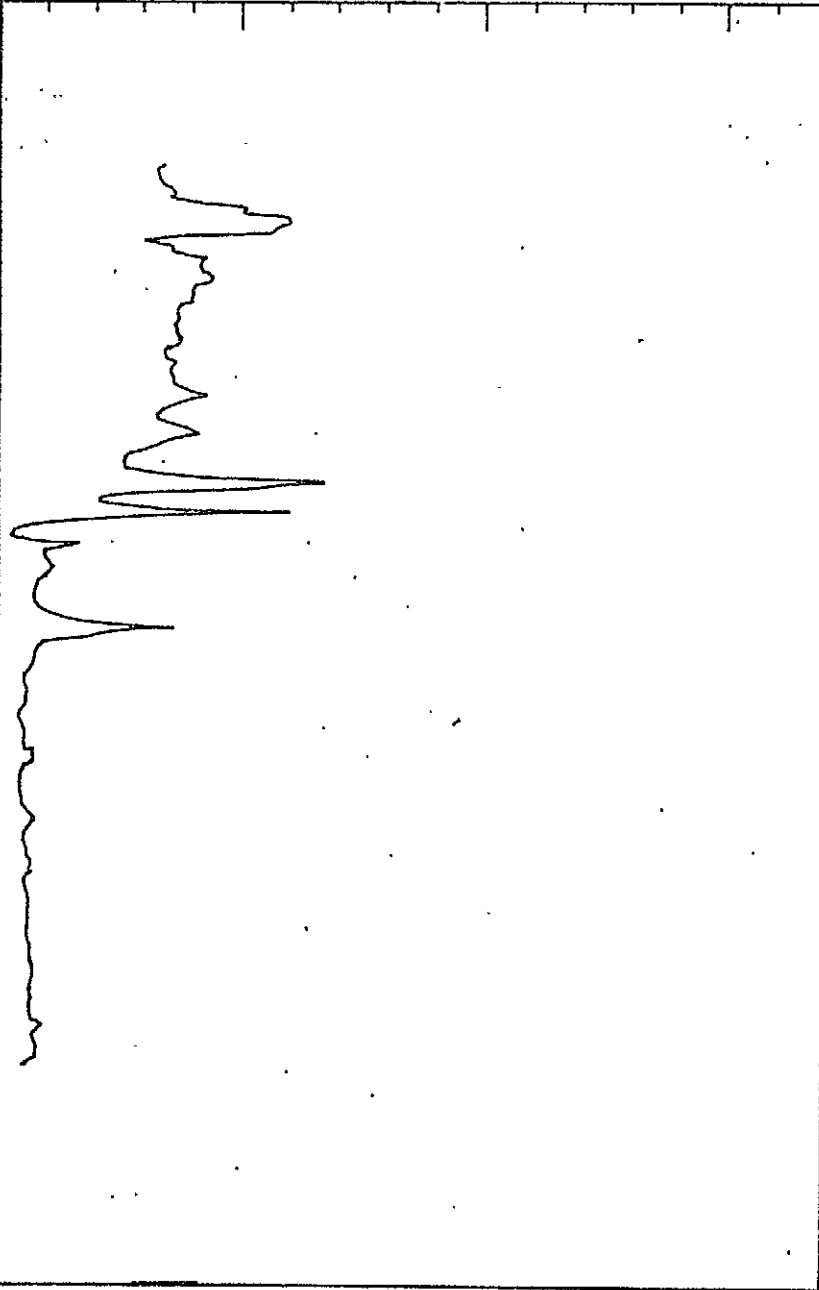
2.90



3.00

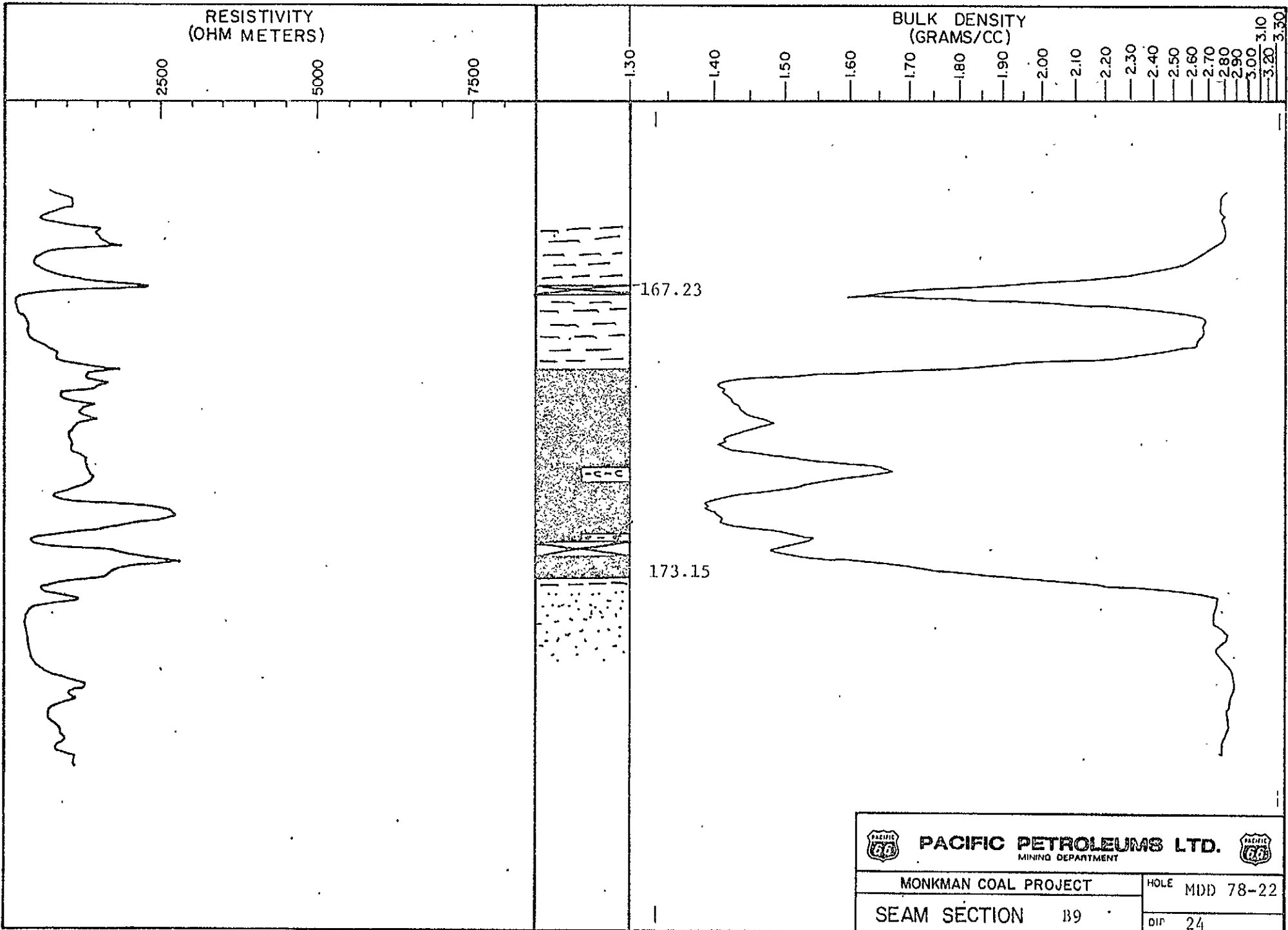
3.10



3.20

3.30



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B7	
HOLE	MDD 78-22
DIP	21



 PACIFIC PETROLEUMS LTD. 	
MINING DEPARTMENT	
MONKMAN COAL PROJECT	HOLE MIDD 78-22
SEAM SECTION B9	DIP 24

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

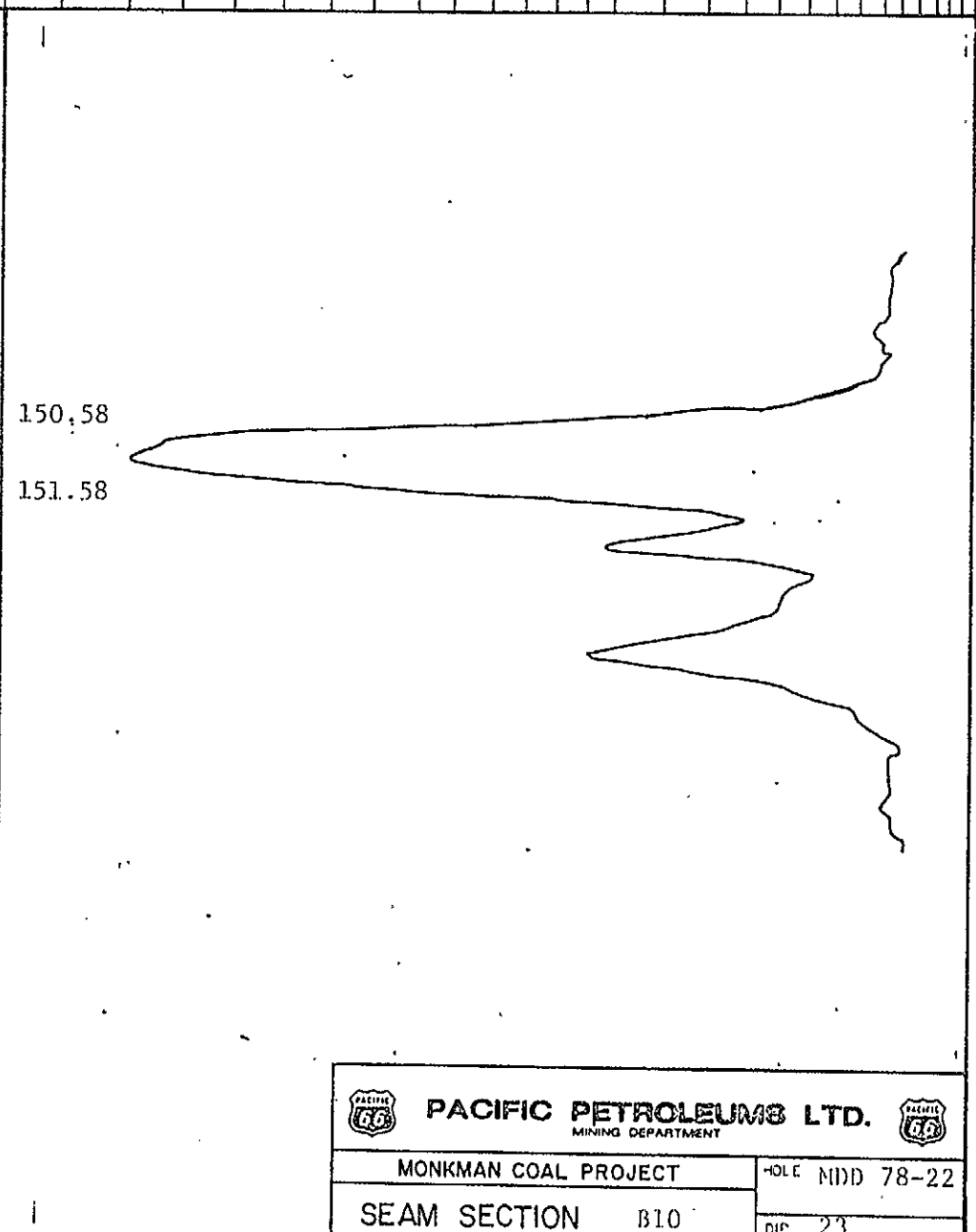
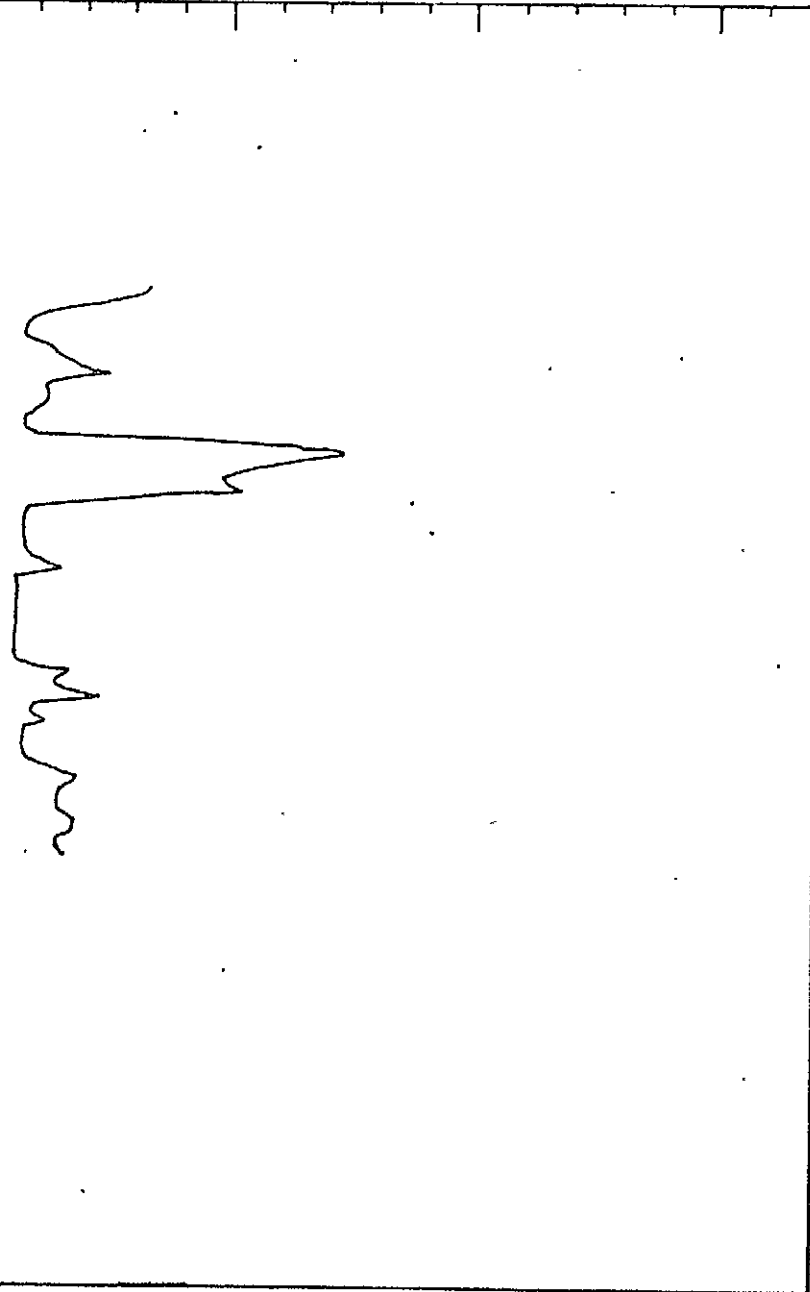
2.90



3.00

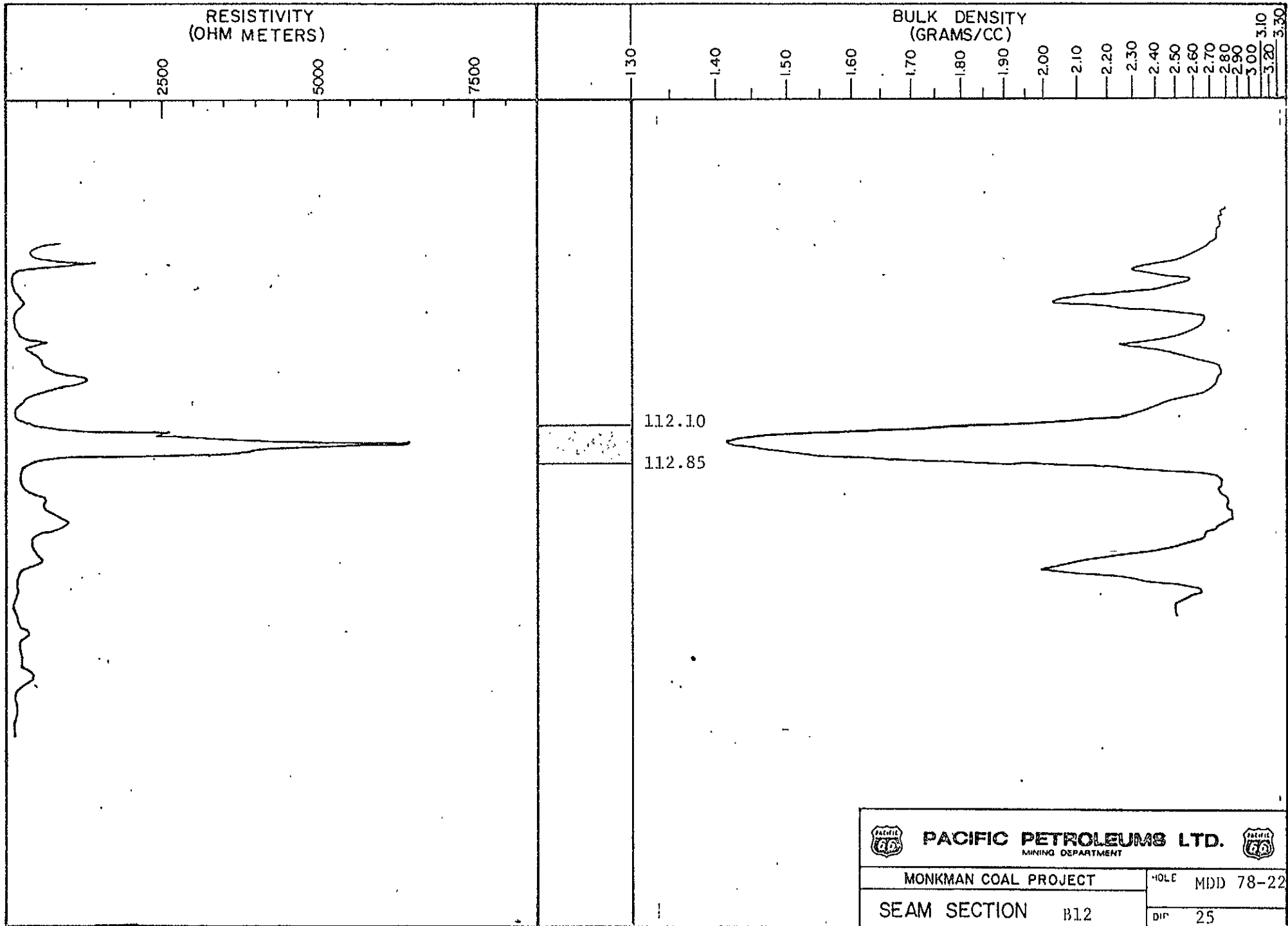
3.10



3.20

3.30



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	HOLE NIDD 78-22
SEAM SECTION B10	DIP 23



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MDD 78-22
SEAM SECTION B12		DIP 25

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

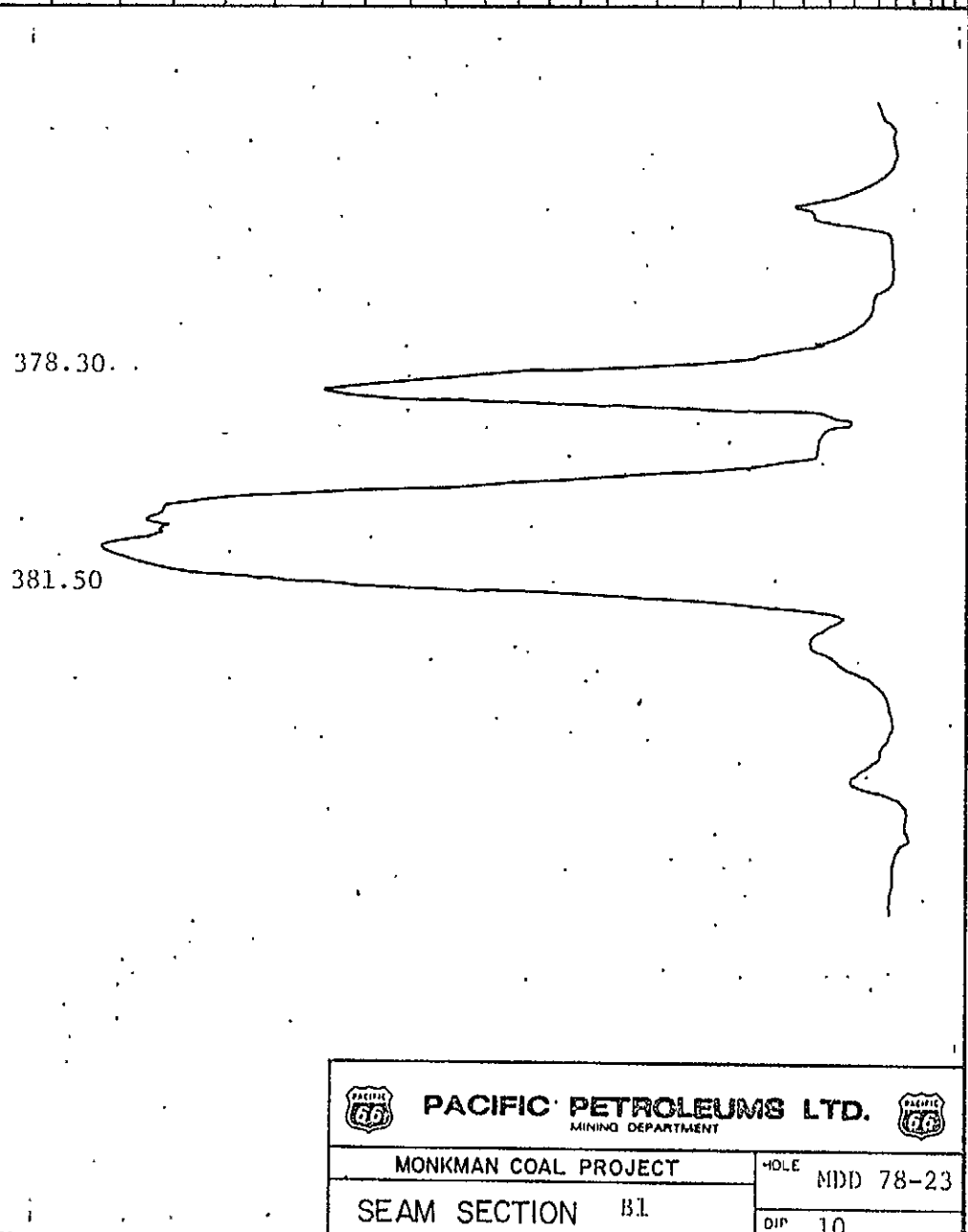
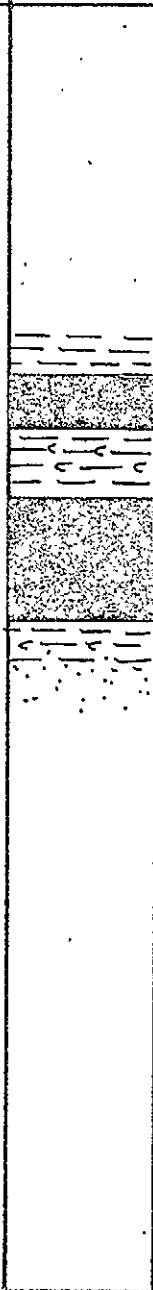
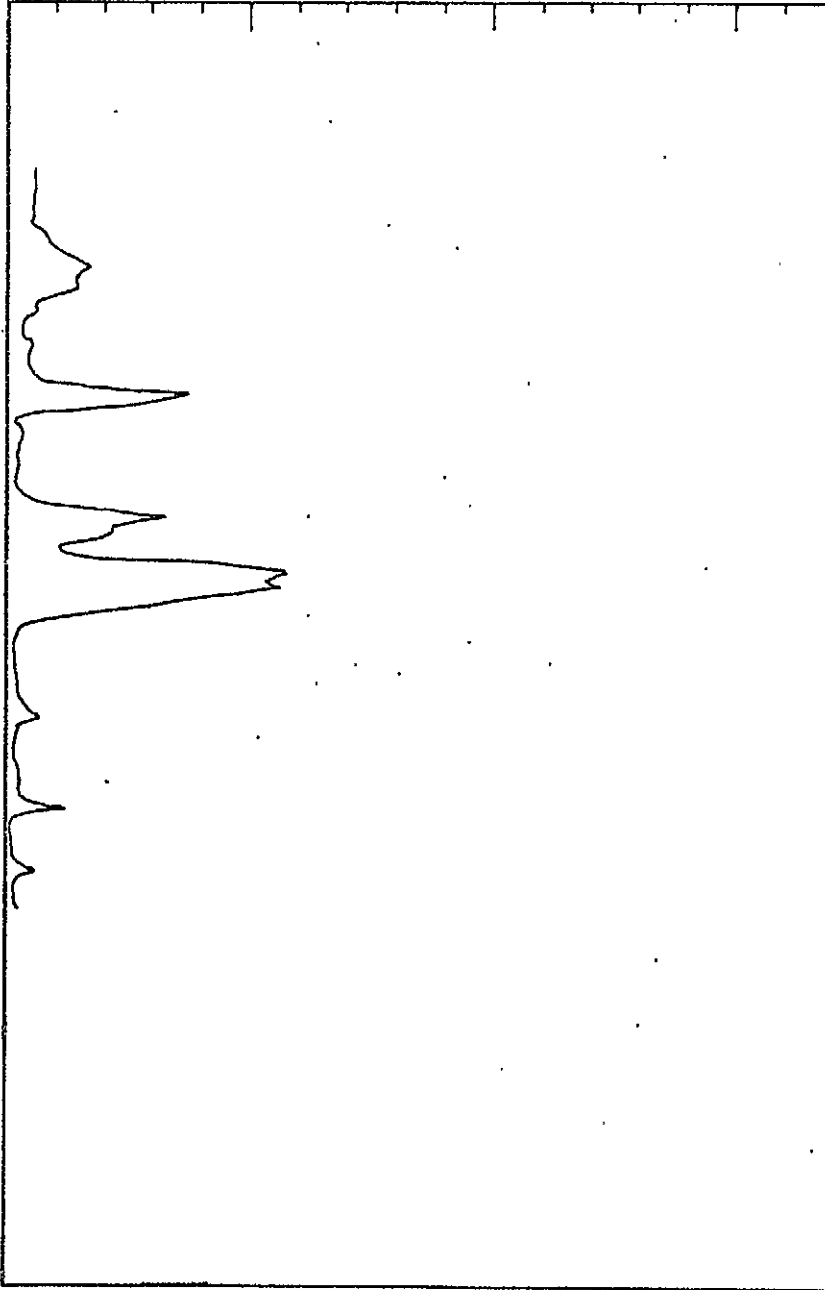
2.90

3.00

3.10

3.20

3.30



378.30

381.50



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT

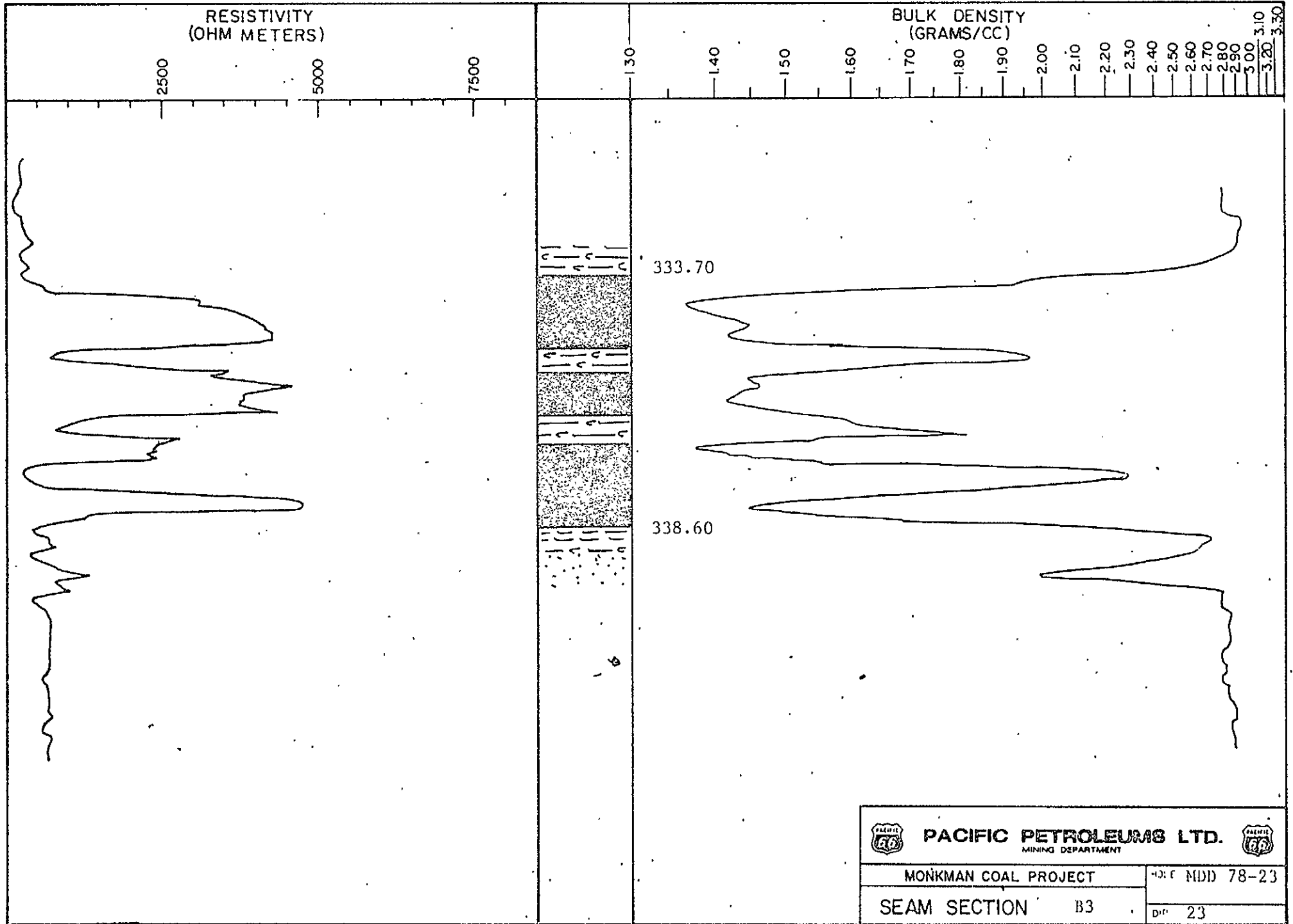


MONKMAN COAL PROJECT

HOLE MIDD 78-23

SEAM SECTION B.L.

DIP 10



RESISTIVITY
(OHM METERS)



2500 5000 7500

BULK DENSITY
(GRAMS/CC)

1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30

333.70

338.60

 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	NO. OF MDD 78-23
SEAM SECTION B3	DIP 23

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

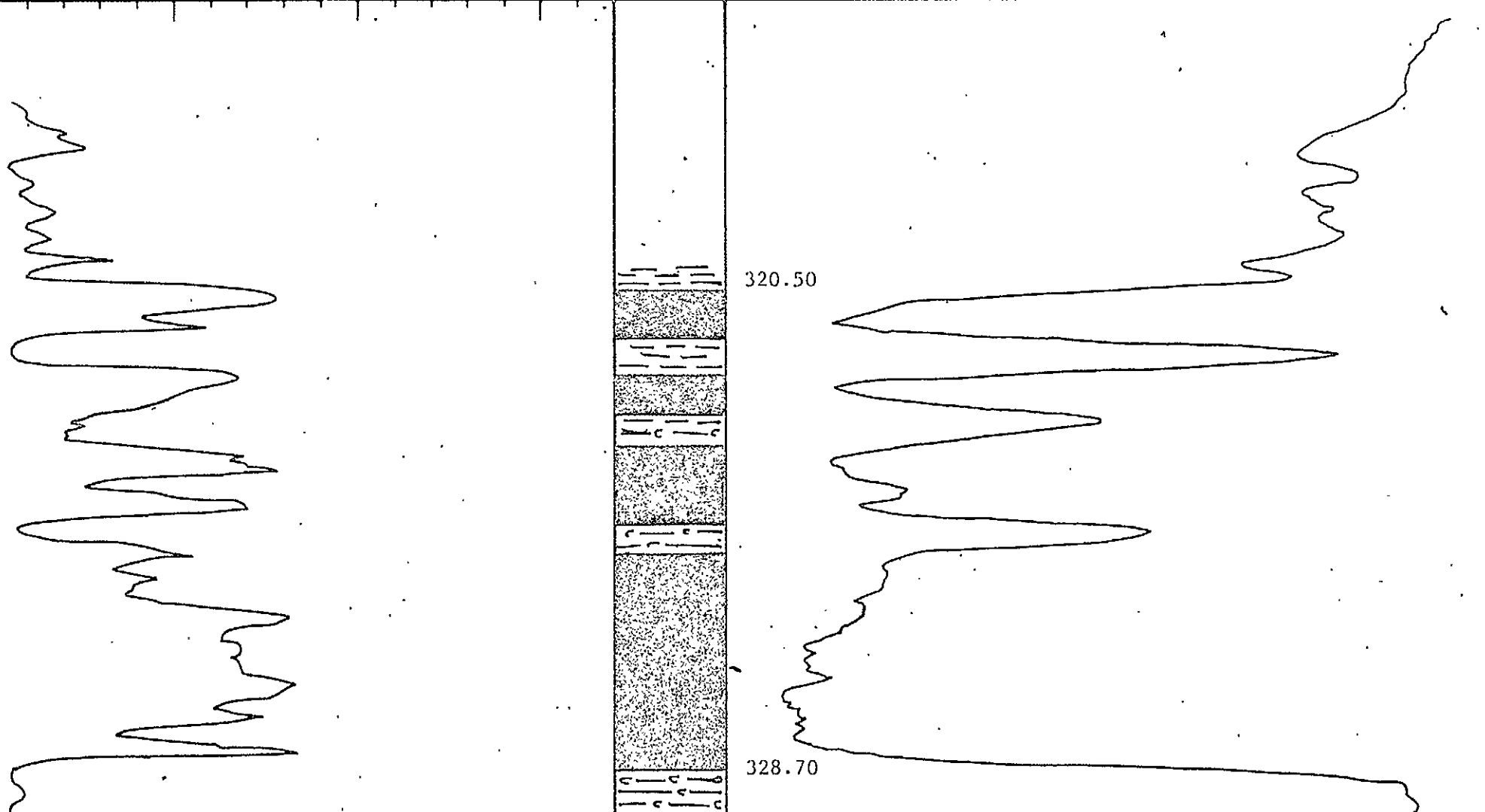
2.90



3.00

3.10

3.20

3.30



 PACIFIC PETROLEUMS LTD.  MINING DEPARTMENT	
MONKMAN COAL PROJECT	REF MDD 78-23
SEAM SECTION B4	DIV 23

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

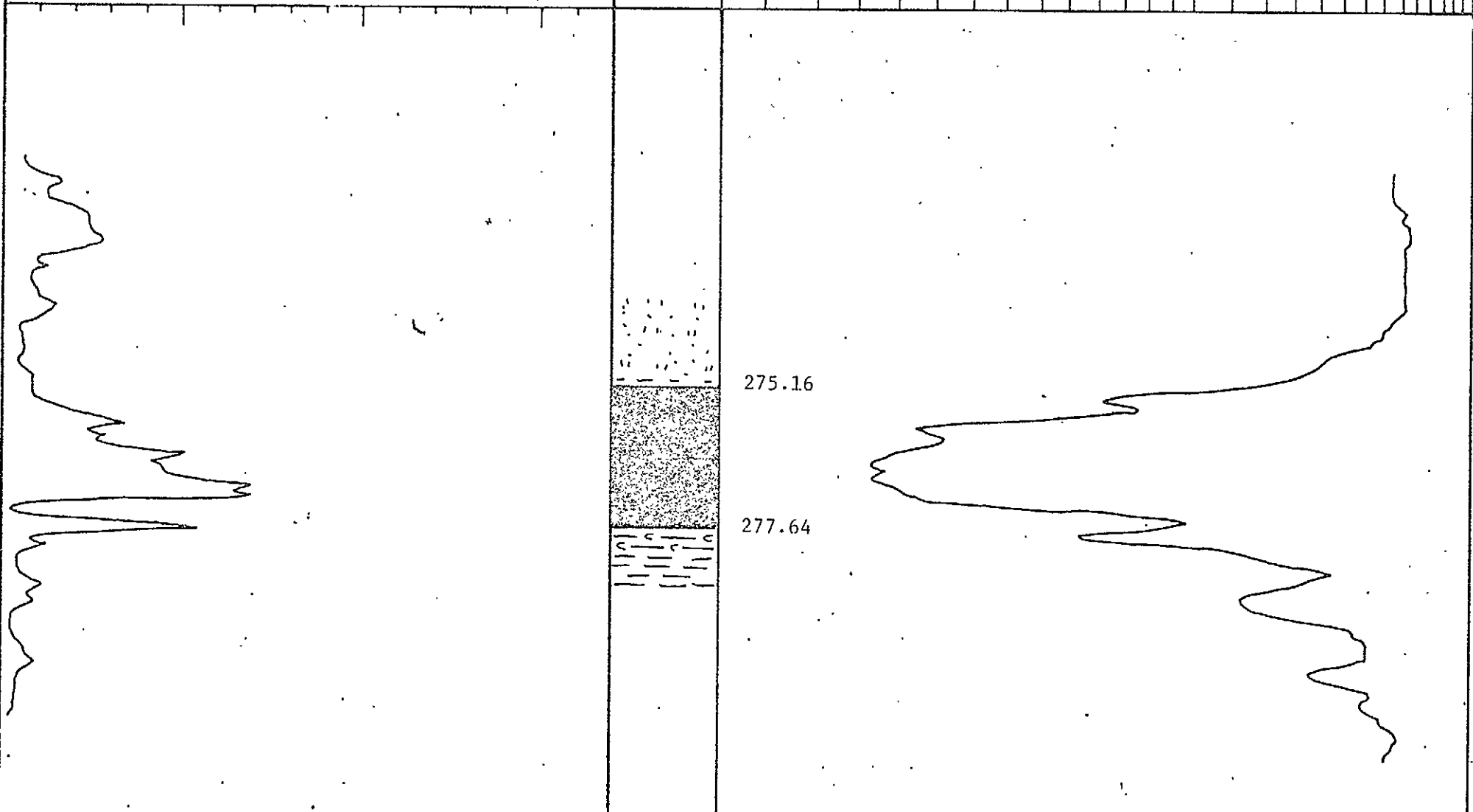
2.90

3.00

3.10

3.20

3.30



275.16

277.64



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

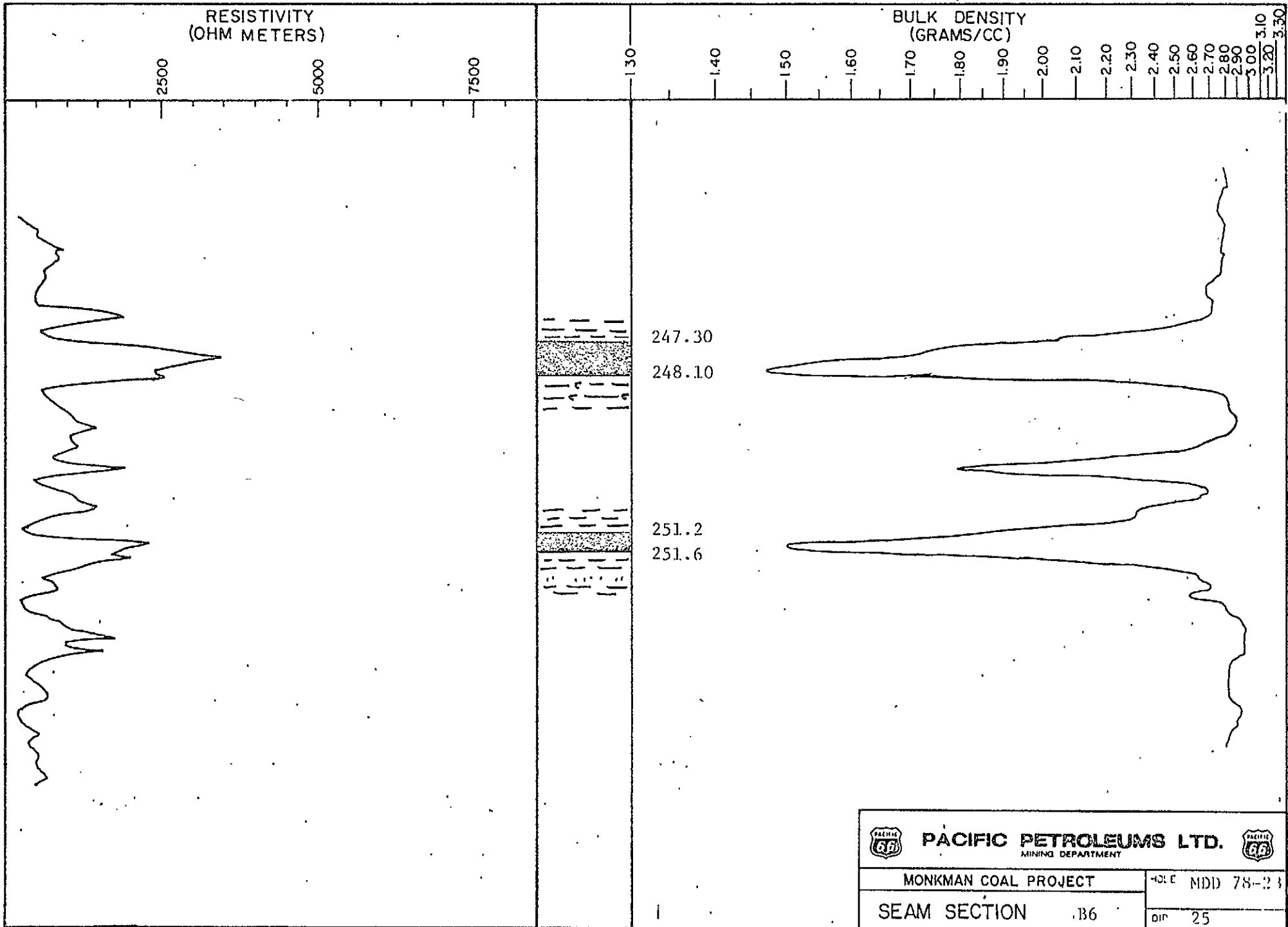




MONKMAN COAL PROJECT

NO. MDJ 78-23

SEAM SECTION B5

DIP: 25



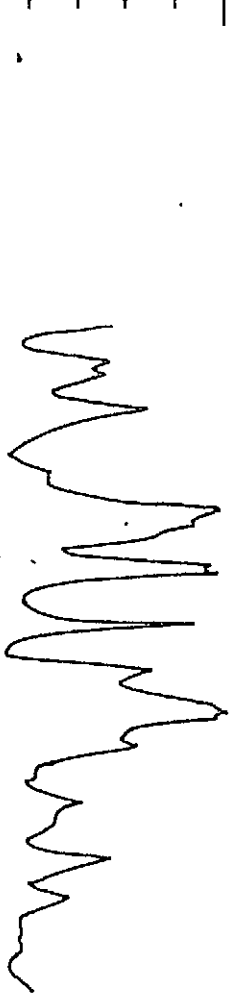
 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 		
MONKMAN COAL PROJECT		HOLE MDD 78-23
SEAM SECTION .B6		DIP 25

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

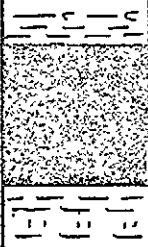
2.90

3.00

3.10

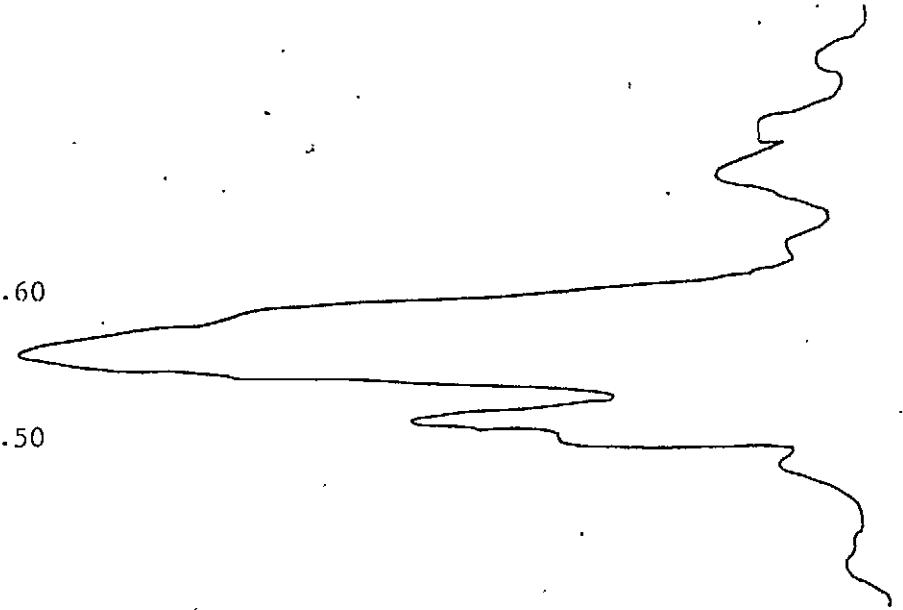
3.20

3.30



238.60

240.50



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

MDD 78-23

SEAM SECTION 187

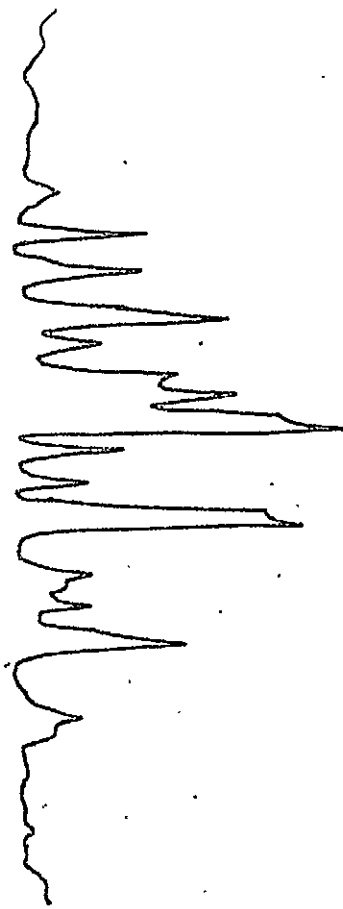
19

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

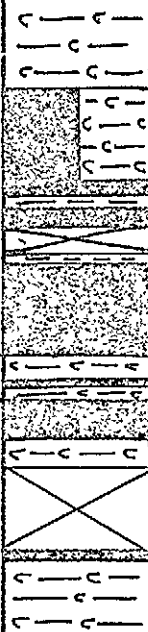
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3.00

3.10

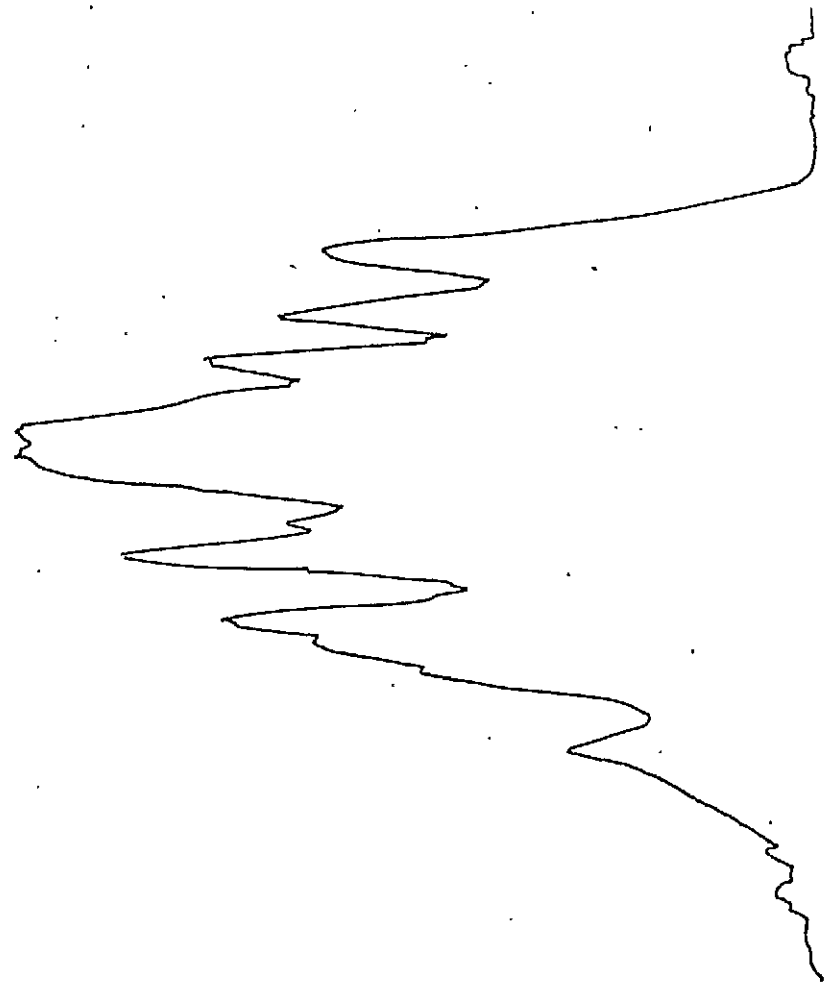
3.20

3.30



257.60

263.70



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B5

HOLE MDD 78-22
DIP 20

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

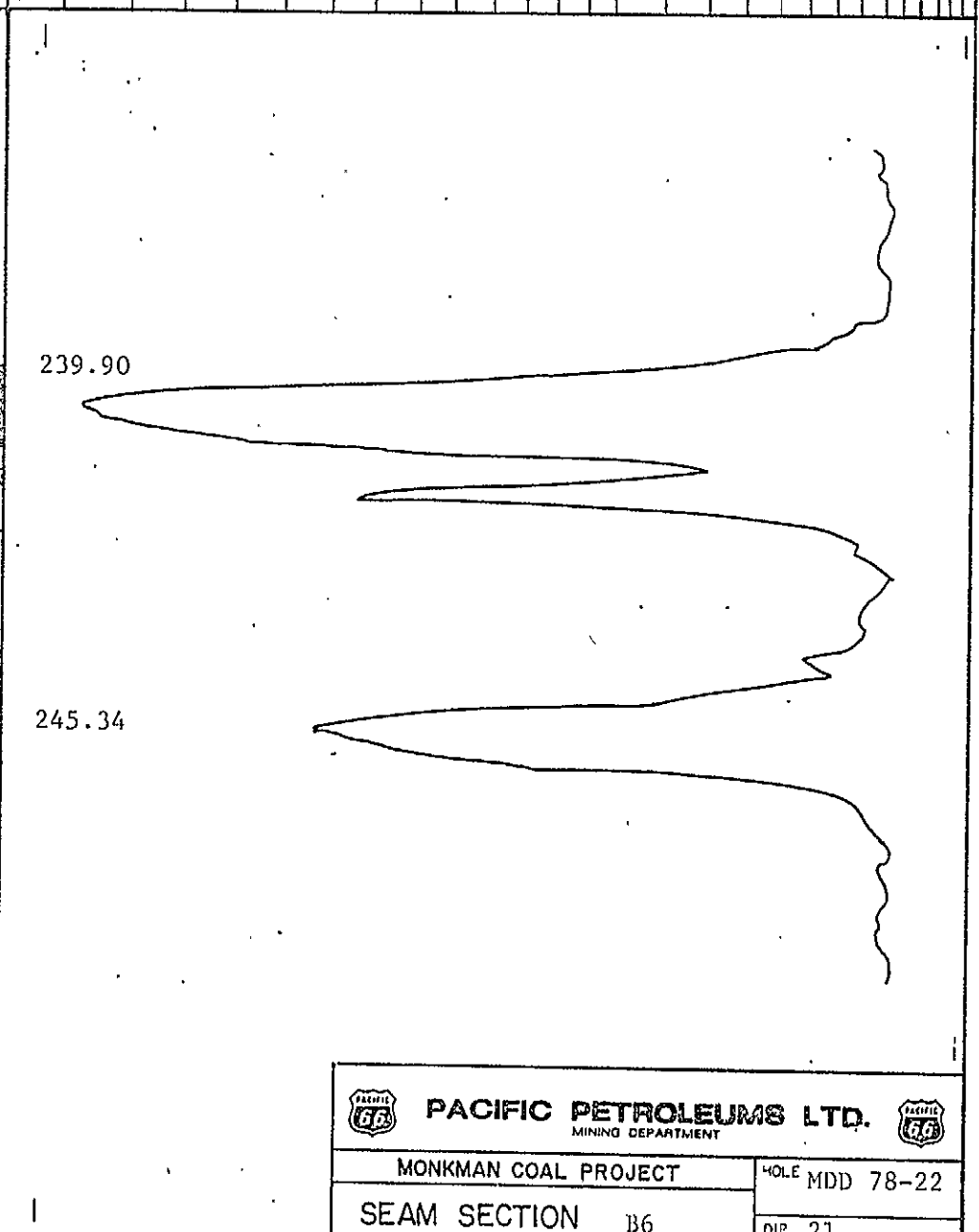
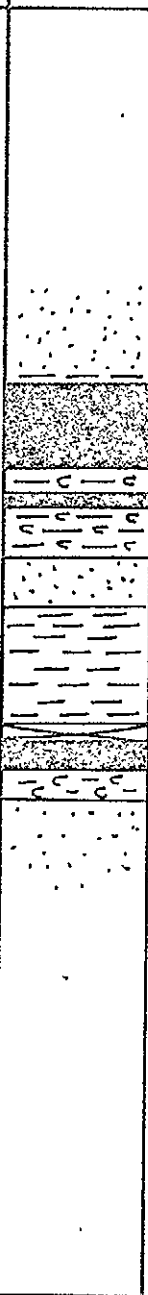
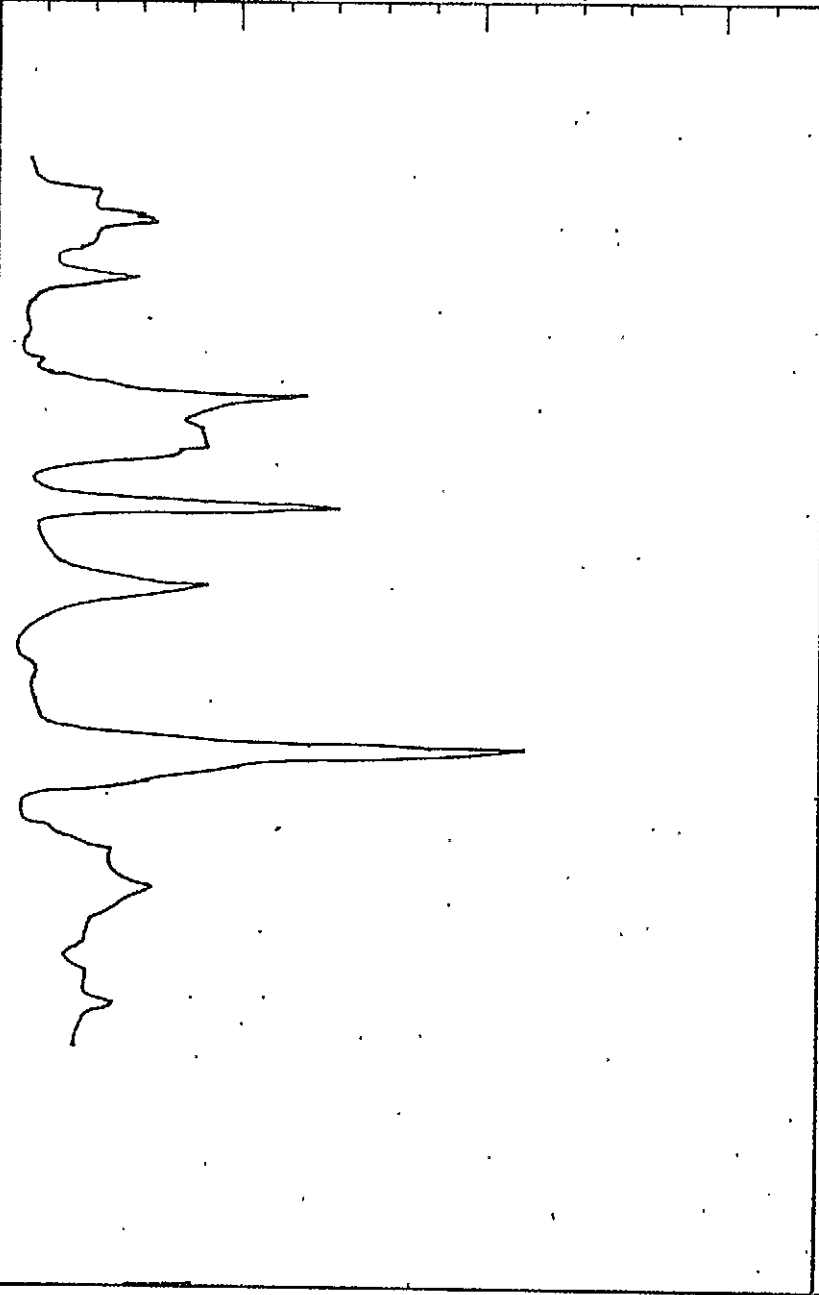
2.90

3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT	
SEAM SECTION	B6

HOLE	MDD 78-22
DIP	21

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

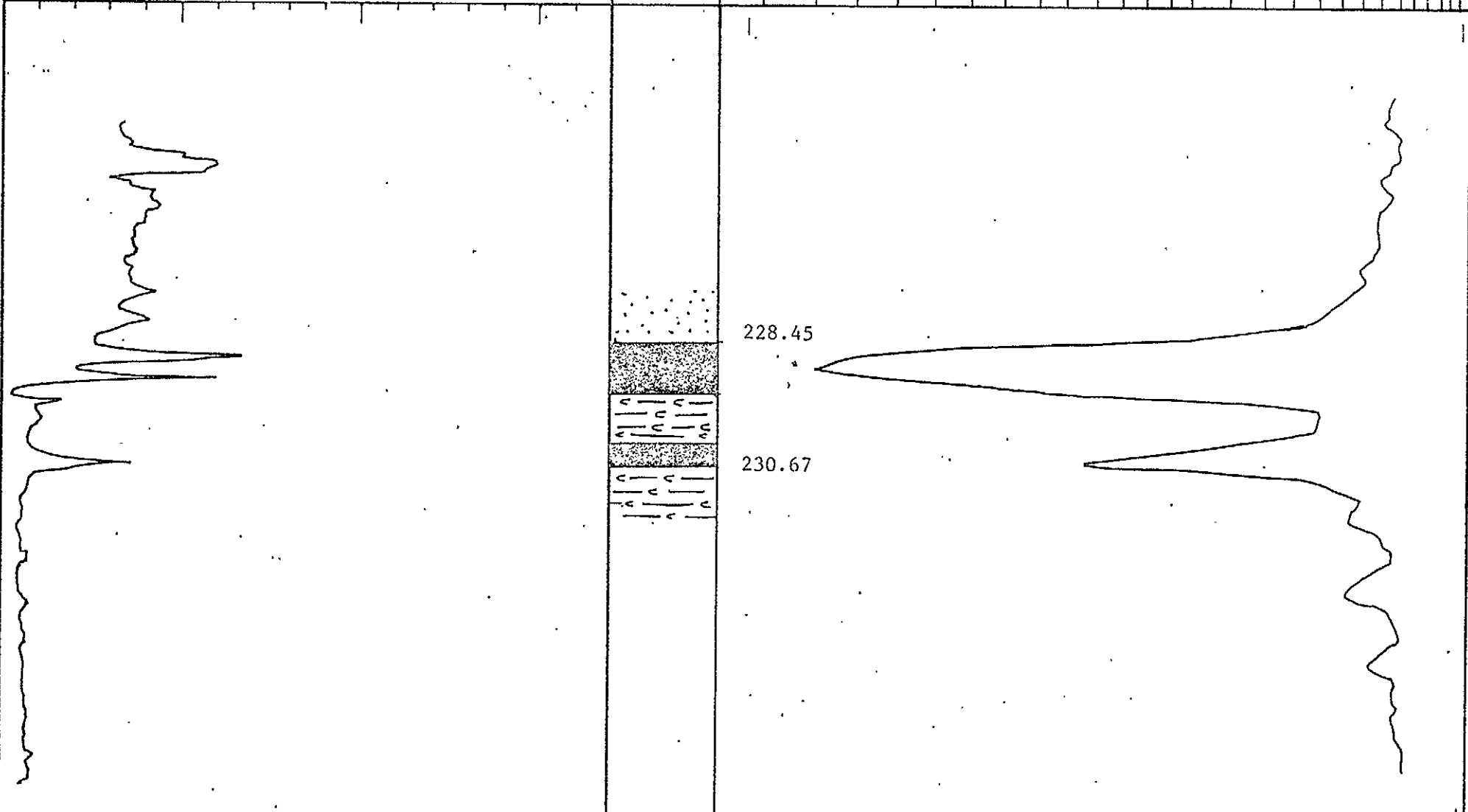
2.90

3.00

3.10

3.20

3.30



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE MIDD 78-22

SEAM SECTION B7

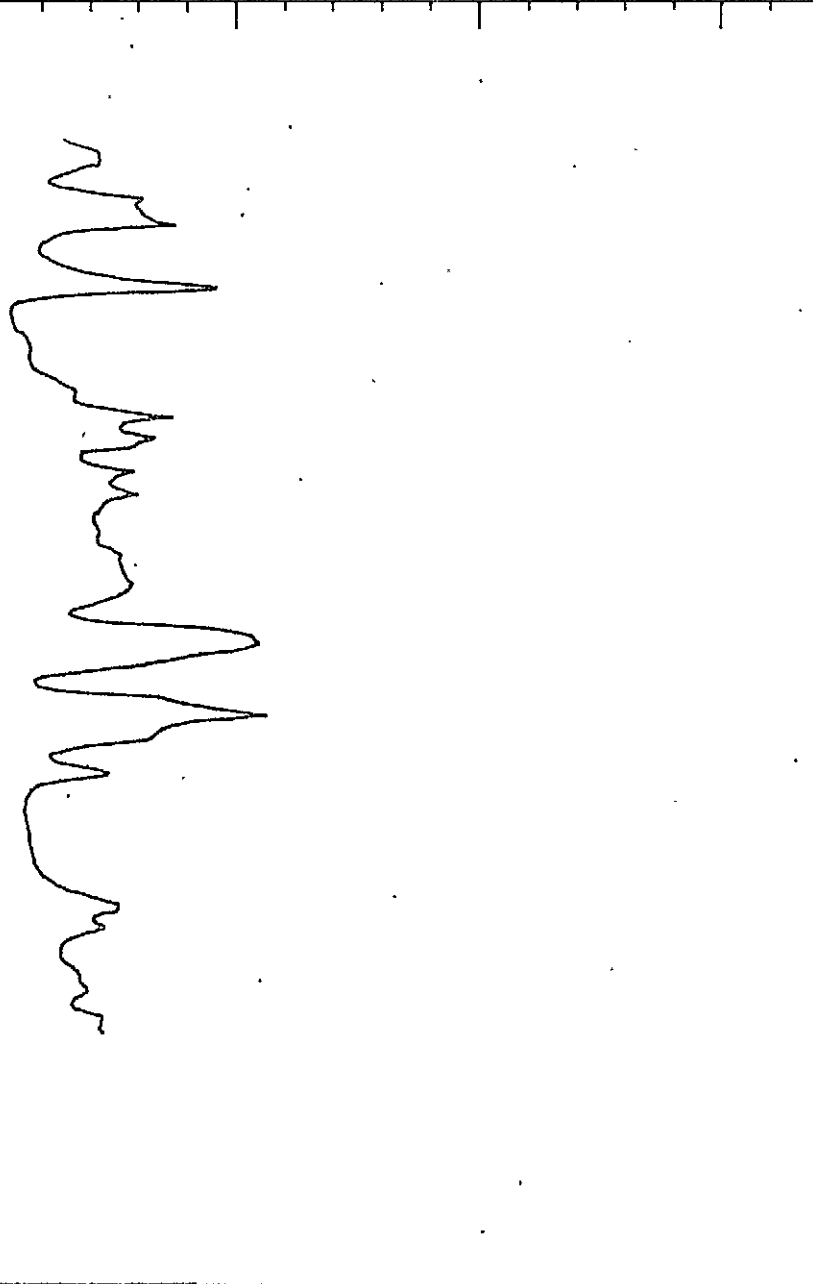
DIP 21

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

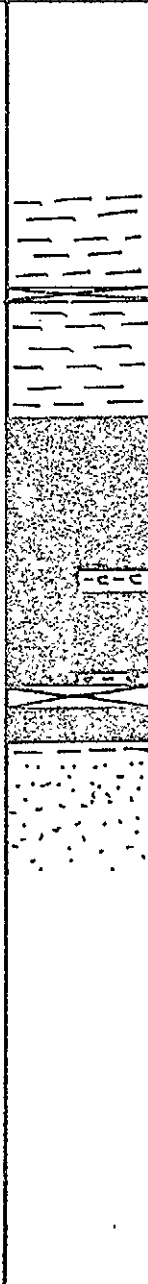
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3.00

3.10

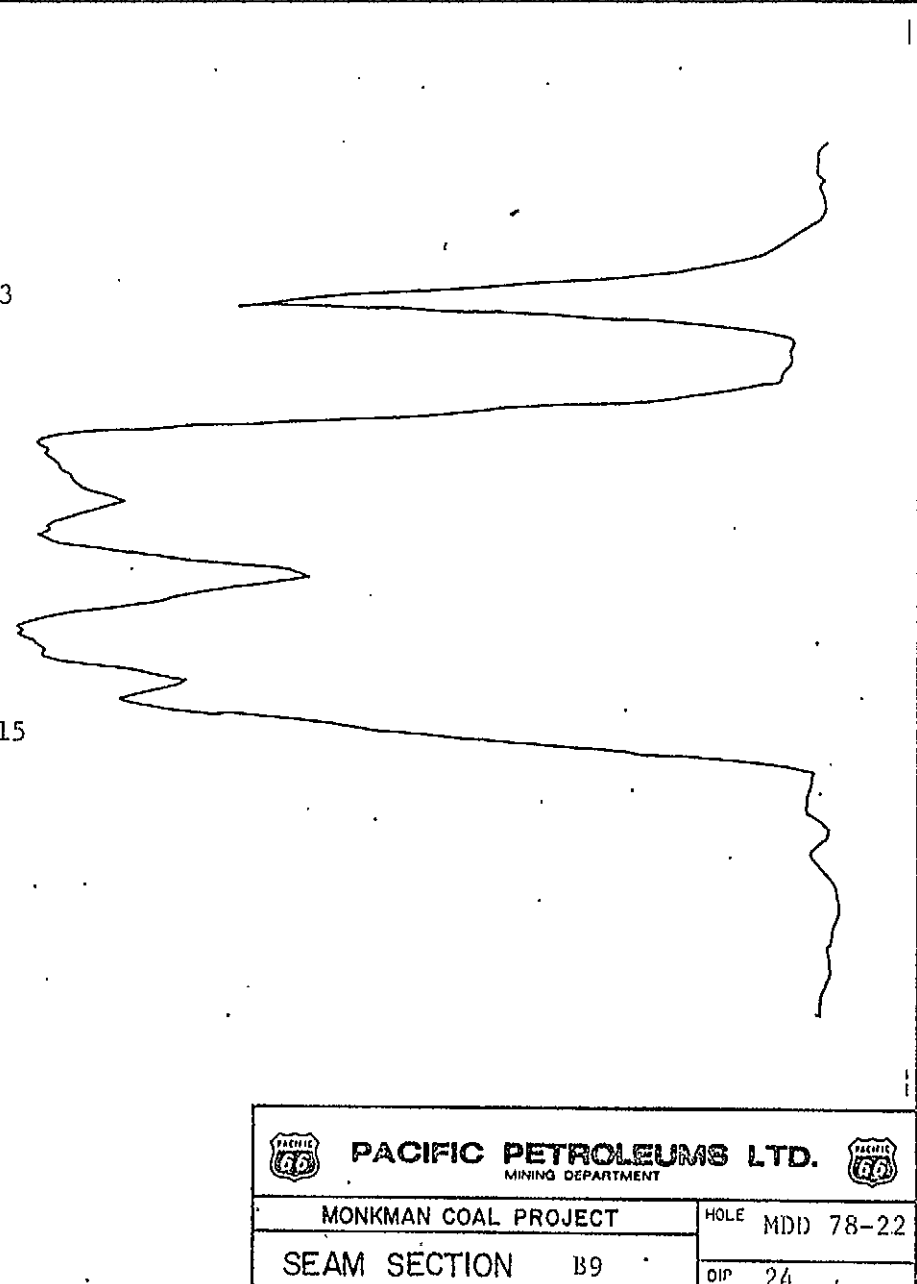
3.20

3.30



167.23

173.15



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE MDD 78-22

SEAM SECTION B9

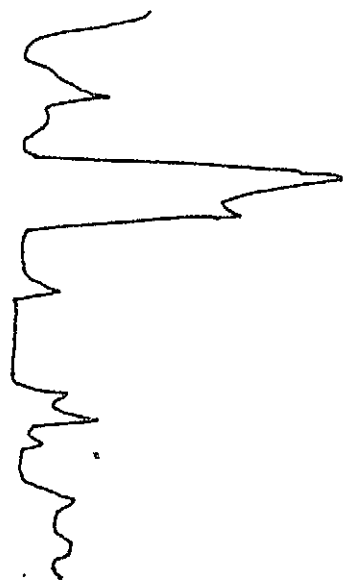
DIP 24

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

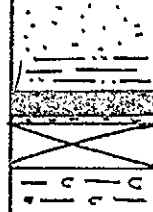
2.90

3.00

3.10

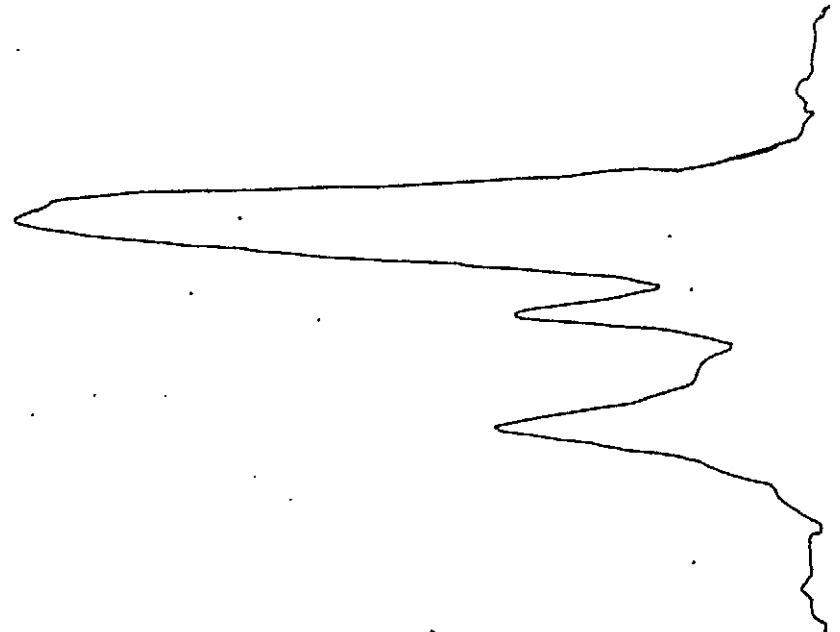
3.20

3.30



150.58

151.58



PACIFIC PETROLEUMS LTD.



MINING DEPARTMENT

MONKMAN COAL PROJECT

HOLE MDD 78-22

SEAM SECTION B10

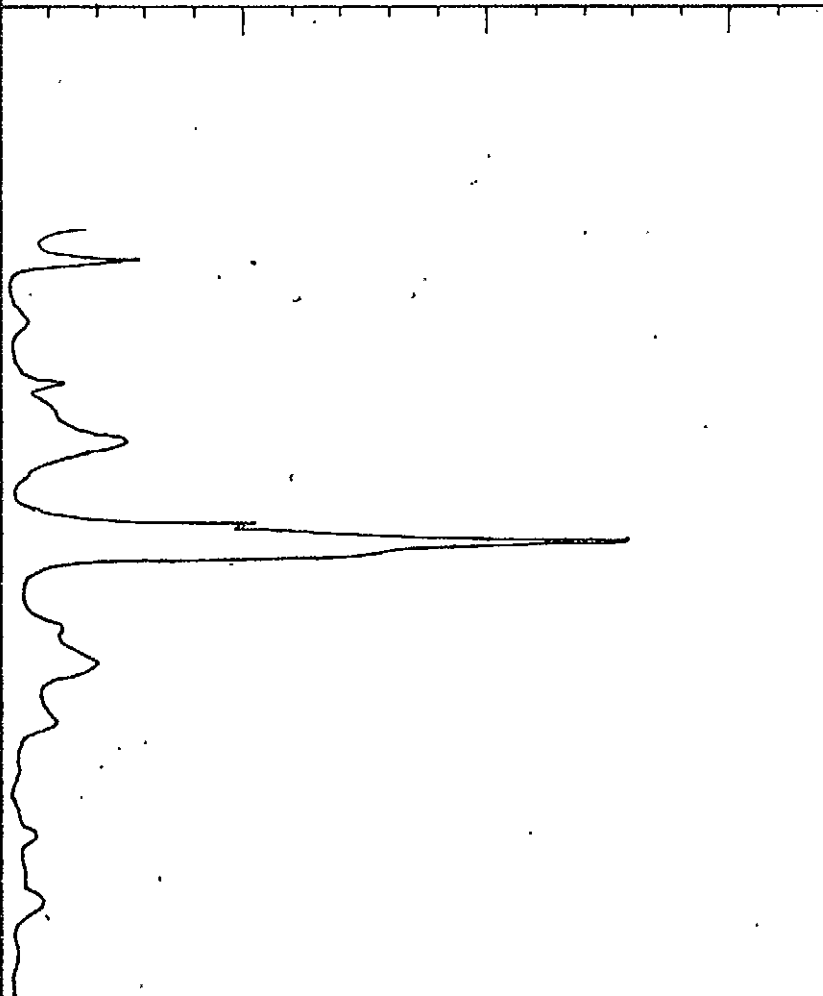
DIP 23

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

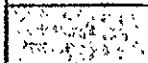
2.90

3.00

3.10

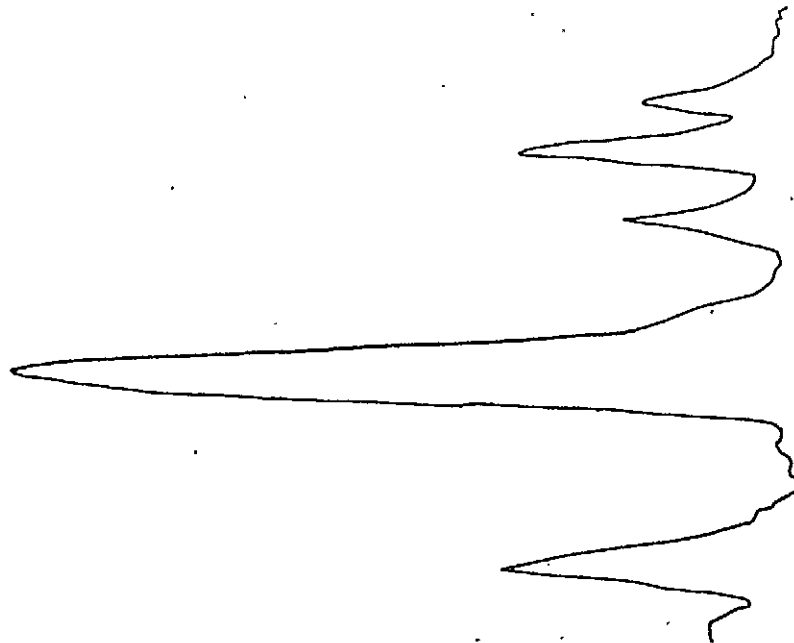
3.20

3.30



112.10

112.85



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE MDD 78-22

SEAM SECTION B12

DIP 25

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

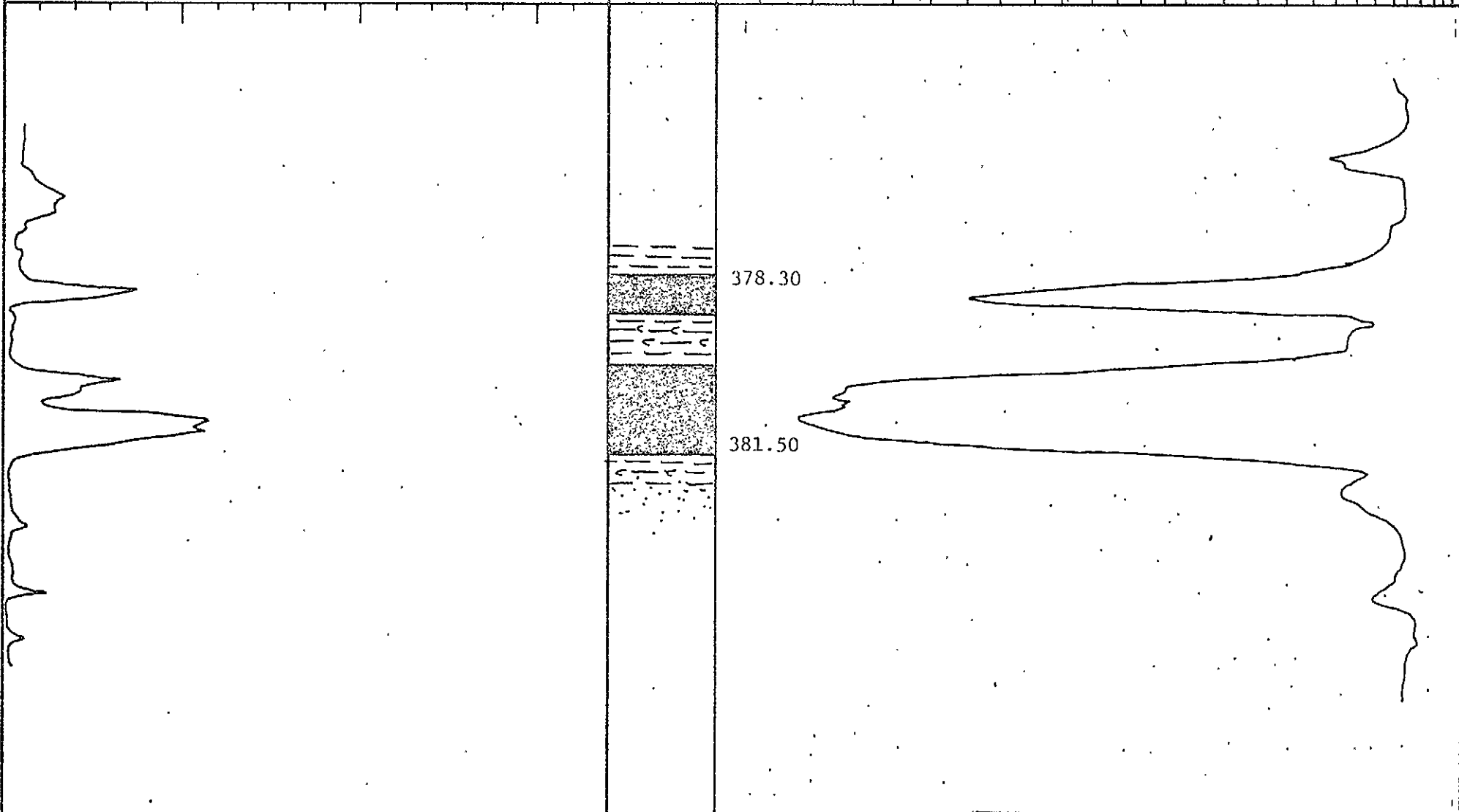
2.90

3.00

3.10



3.20

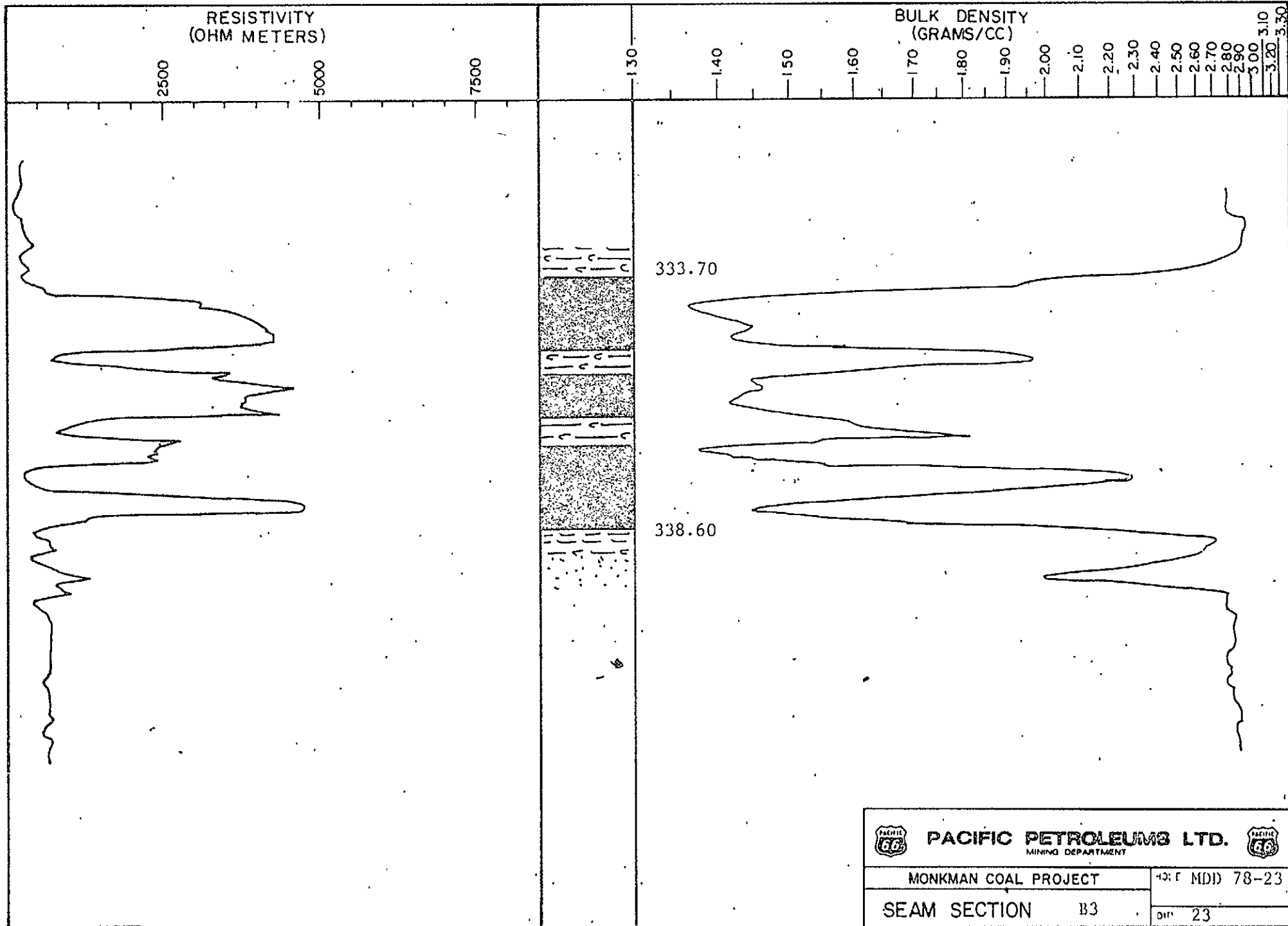
3.30





378.30

381.50

 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B1	HOLE MIDD 78-23
	DIP 1.0



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	MDI 78-23
SEAM SECTION B3	23

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

130

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

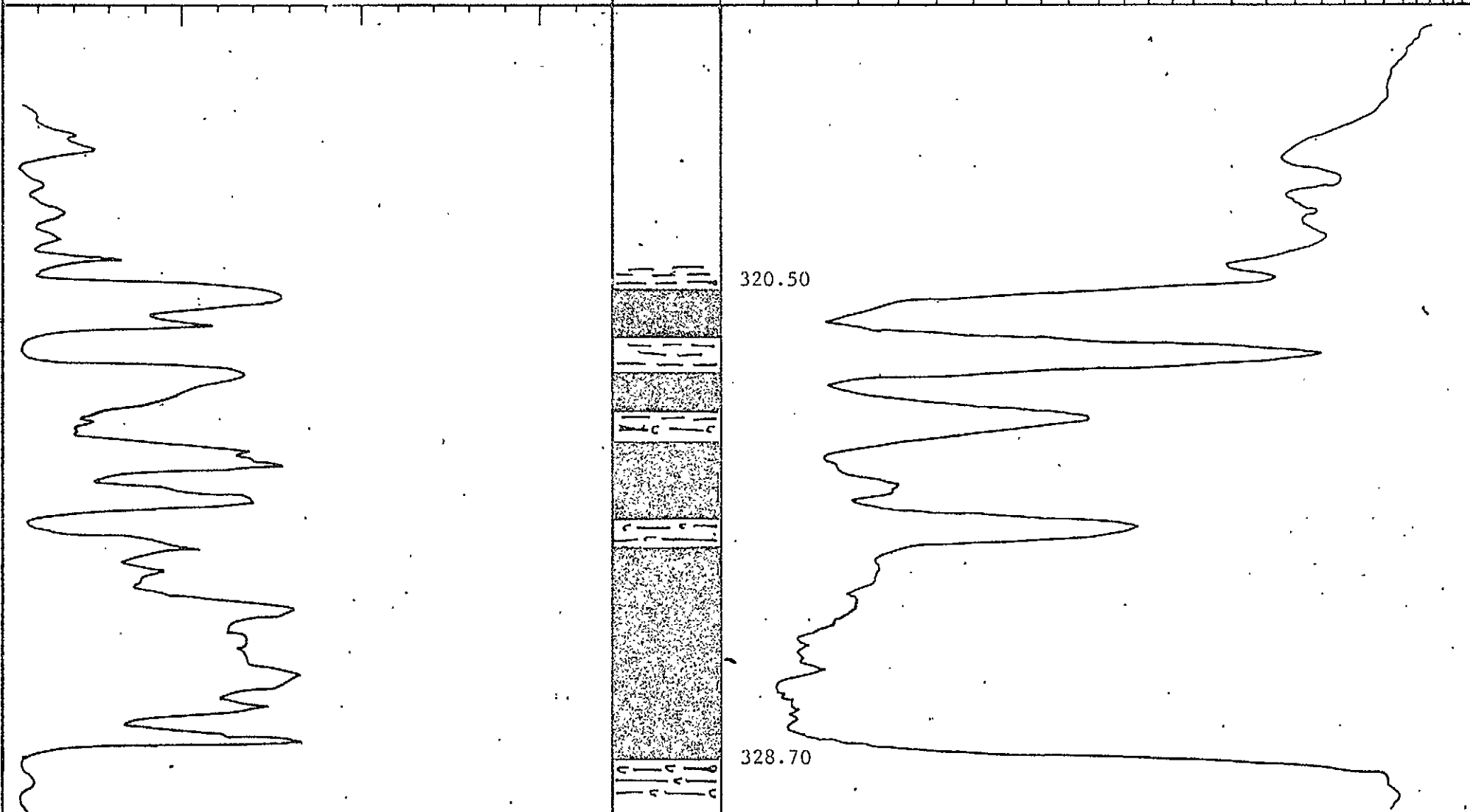
2.90

3.00

3.10

3.20

3.30



320.50

328.70



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

LOG MDD 78-23

SEAM SECTION B4

DIP 23

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

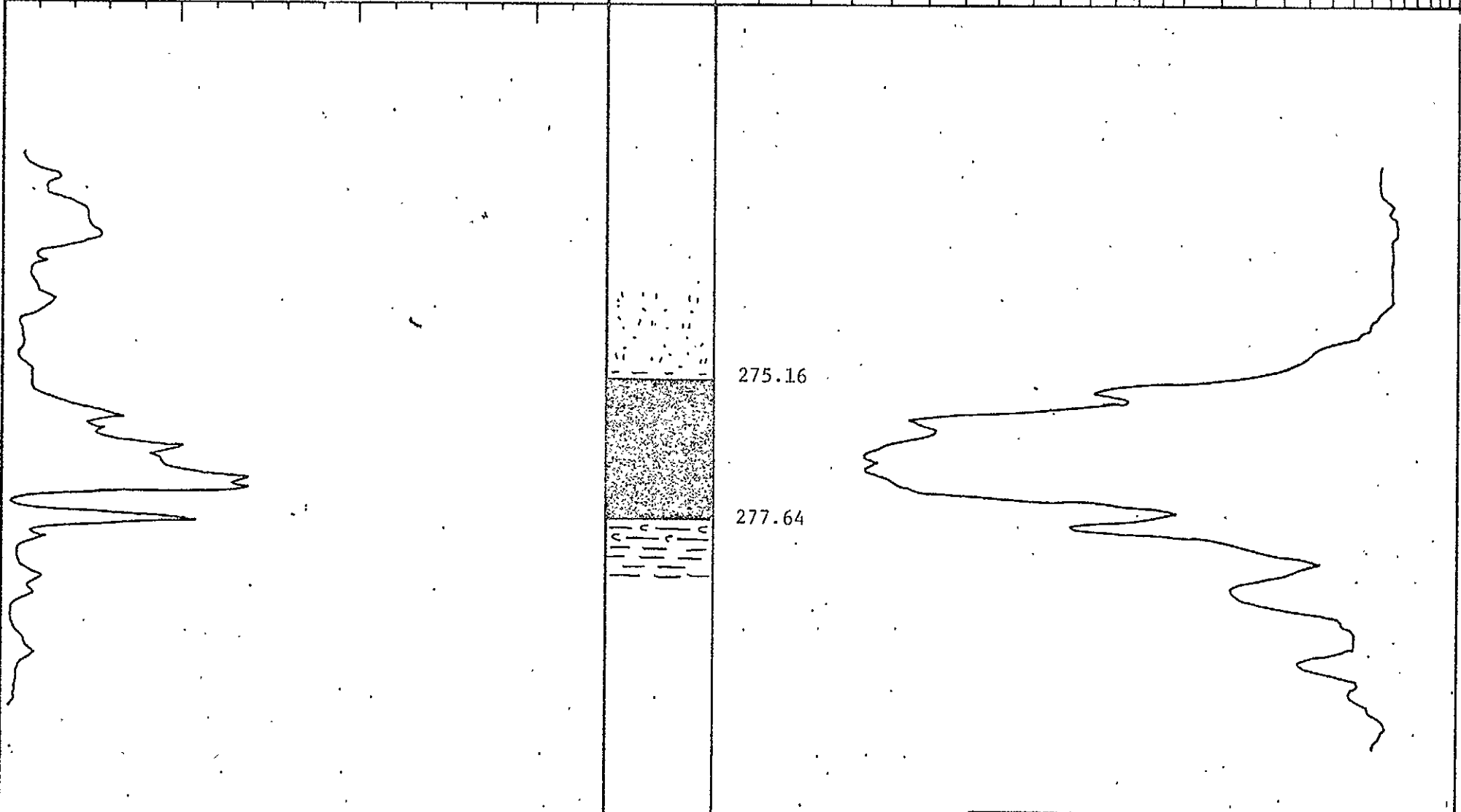
2.90

3.00

3.10

3.20

3.30



275.16

277.64



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

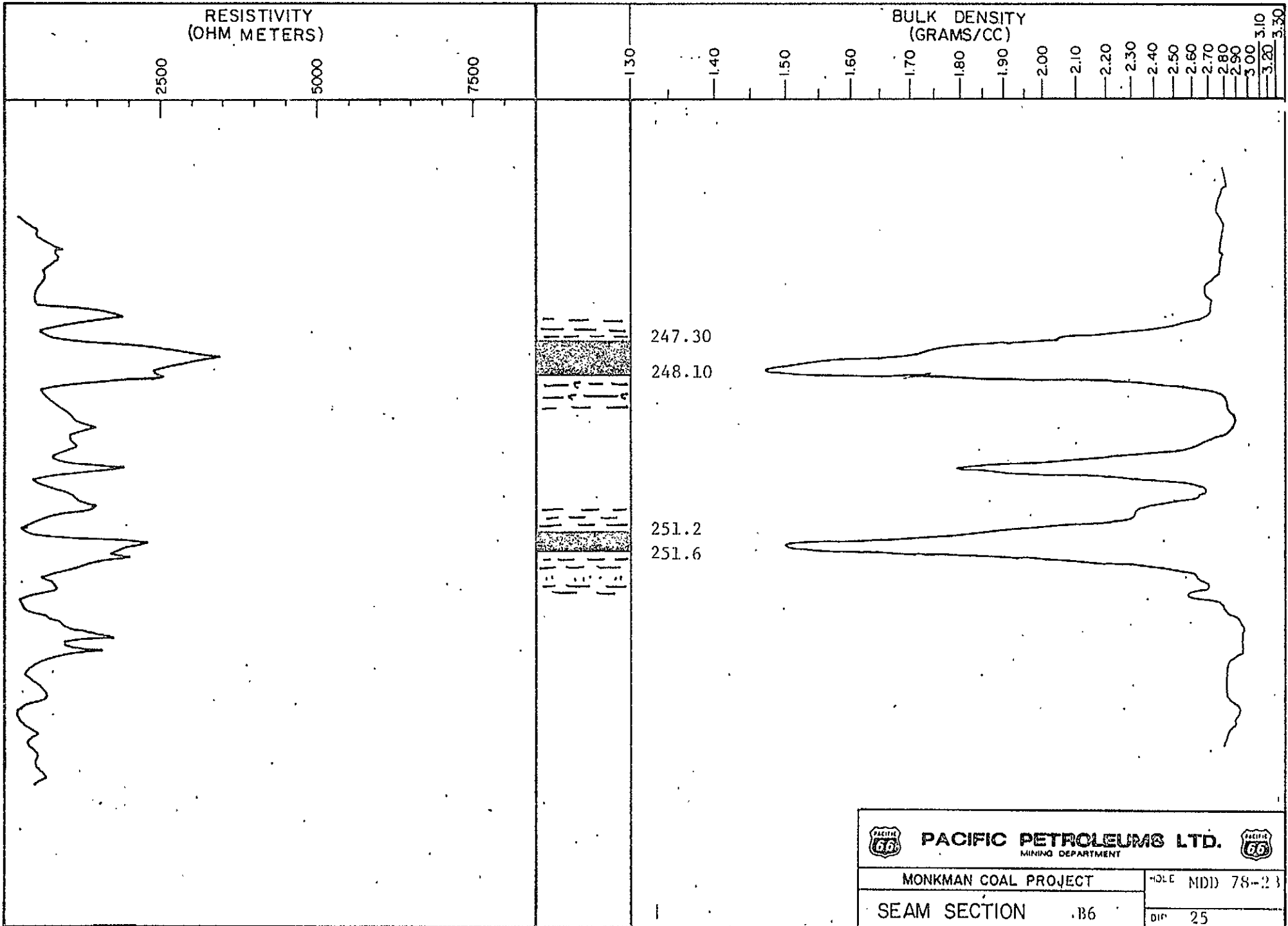


MONKMAN COAL PROJECT

NO. MDD 78-23

SEAM SECTION B5

DR. 25



PACIFIC PETROLEUMS LTD.



MINING DEPARTMENT

MONKMAN COAL PROJECT

HOLE MDD 78-23

SEAM SECTION B6

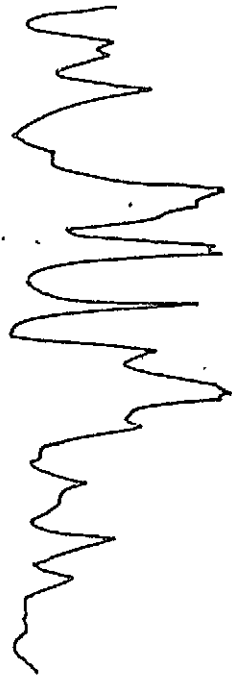
DIP 25

RESISTIVITY
(OHM METERS)

2500

5000

7500



130

140

150

160

BULK DENSITY
(GRAMS/CC)

170

180

190

200

210

220

230

240

250

260

270

280

290

300

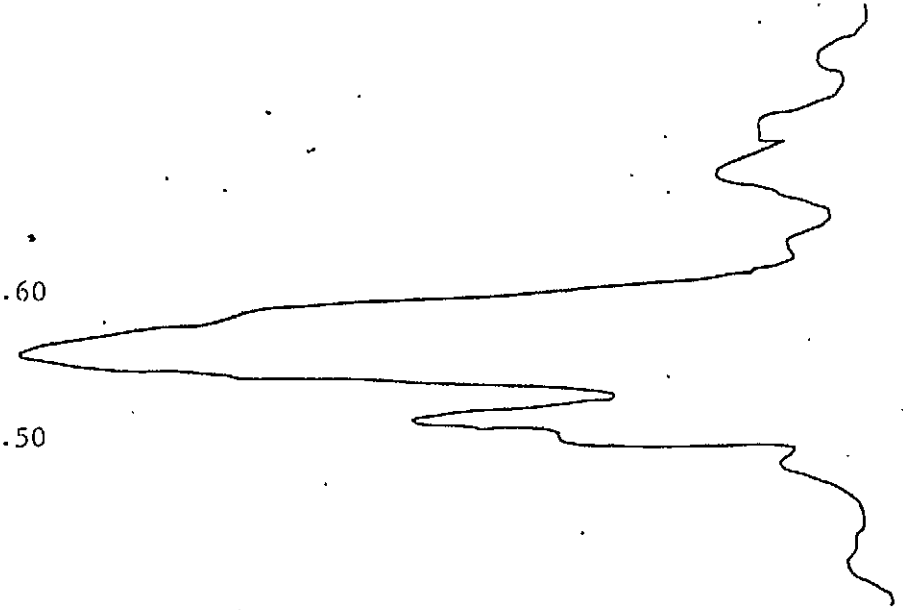
310

320

330

238.60

240.50



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT

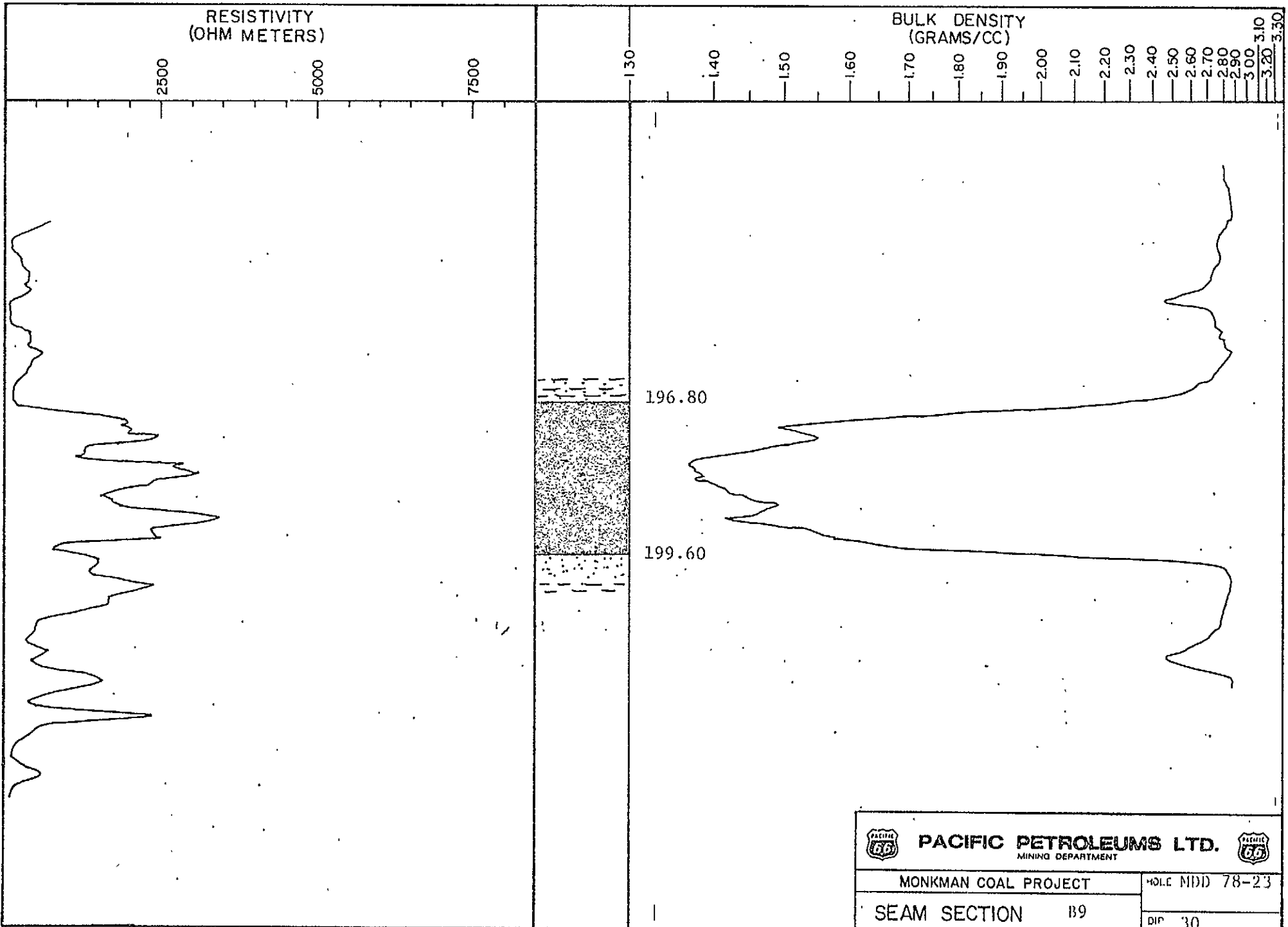


MONKMAN COAL PROJECT

MDD 78-23

SEAM SECTION 137

19



RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

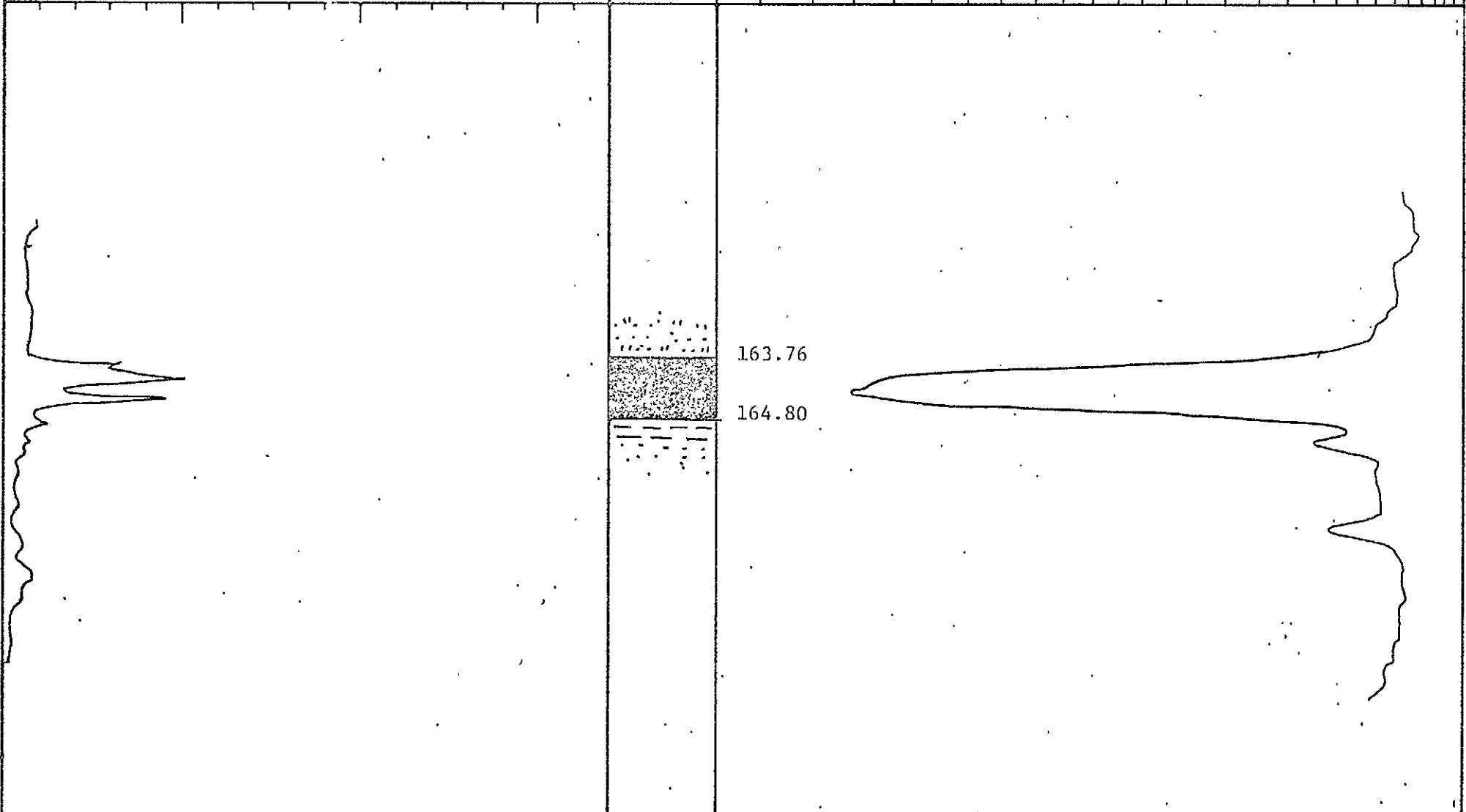
2.90

3.00

3.10

3.20

3.30



163.76

164.80



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



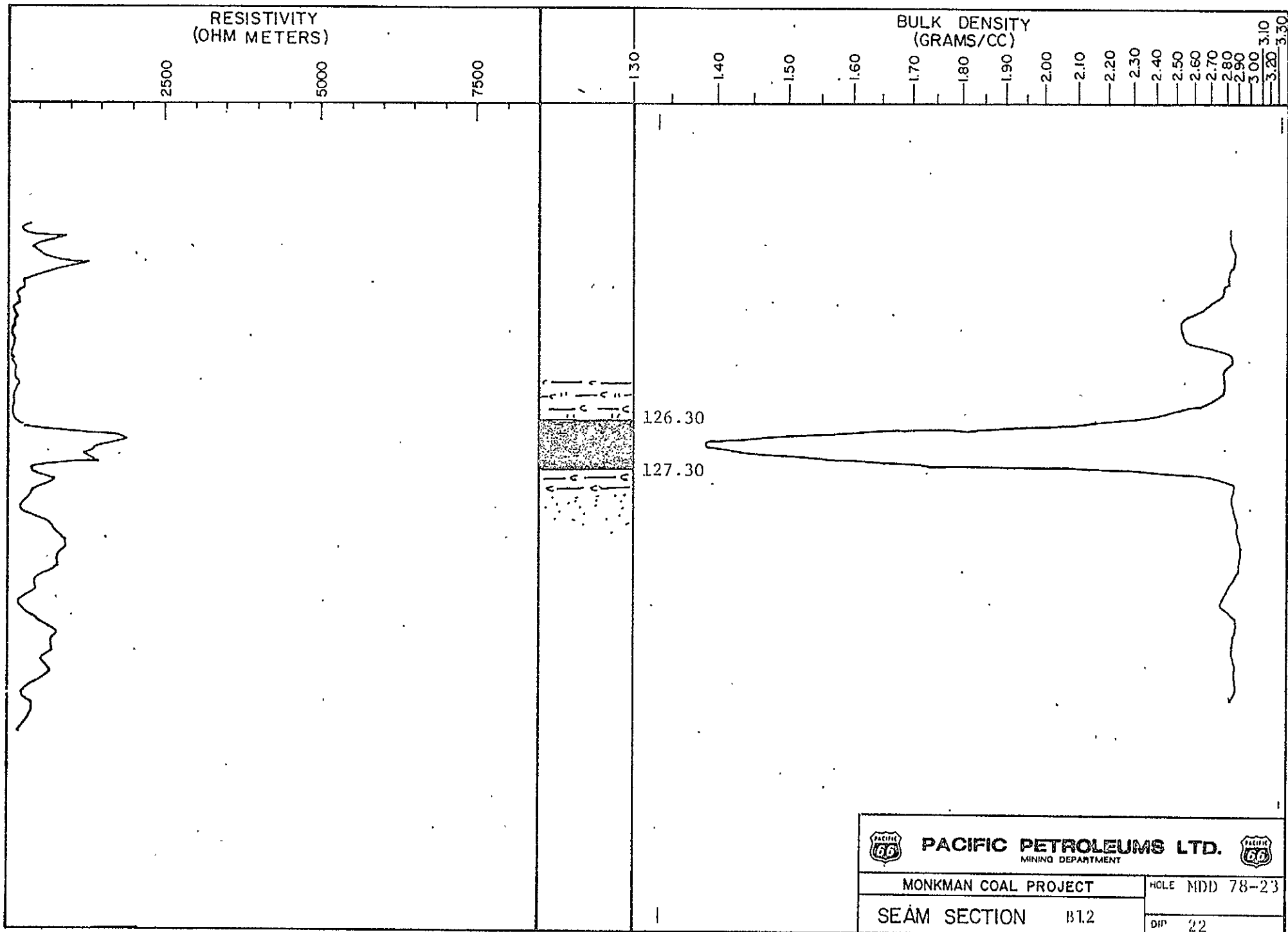
MONKMAN COAL PROJECT



HOLE NDD 78-23

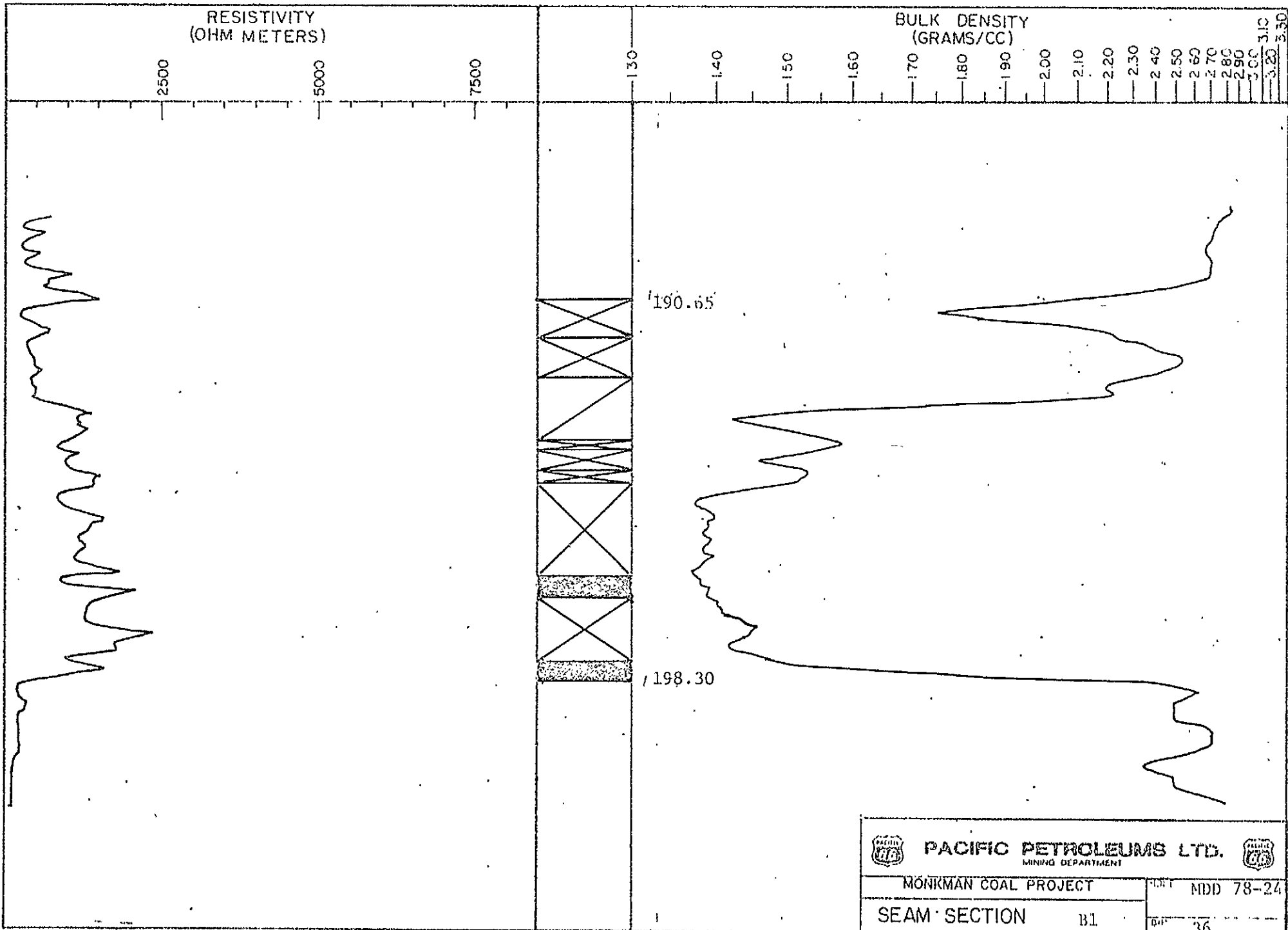
SEAM SECTION



B.1.1

DIP 22



 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 		
MONKMAN COAL PROJECT		HOLE NDD 78-23
SEAM SECTION B1.2		DIP 22



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MDD 78-24
SEAM SECTION B.1		36

RESISTIVITY
(OHM METERS)

2500

5000

7500

130

BULK DENSITY
(GRAMS/CC)

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

310

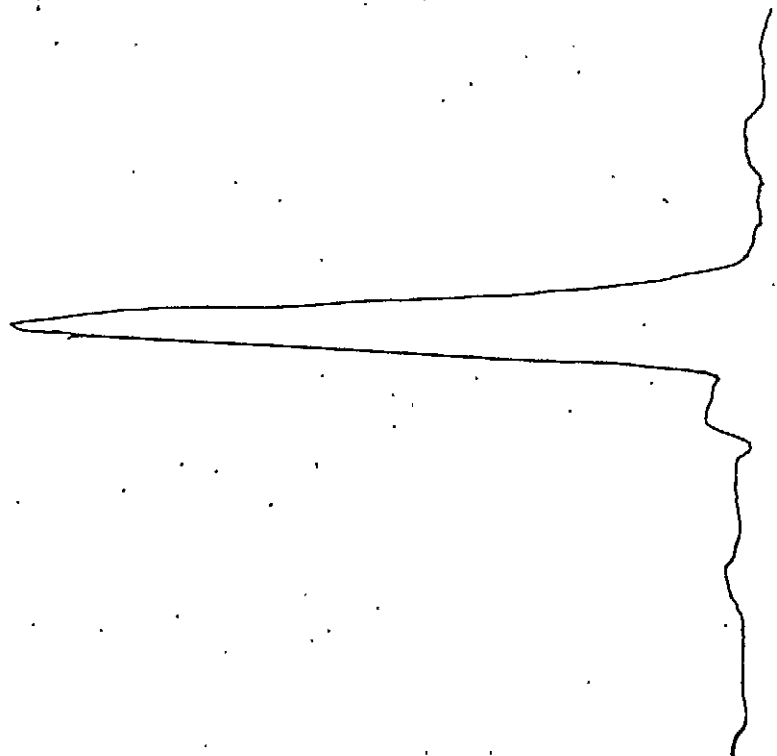
320

330



167.77

168.52



PACIFIC PETROLEUMS LTD.

MINING DEPARTMENT

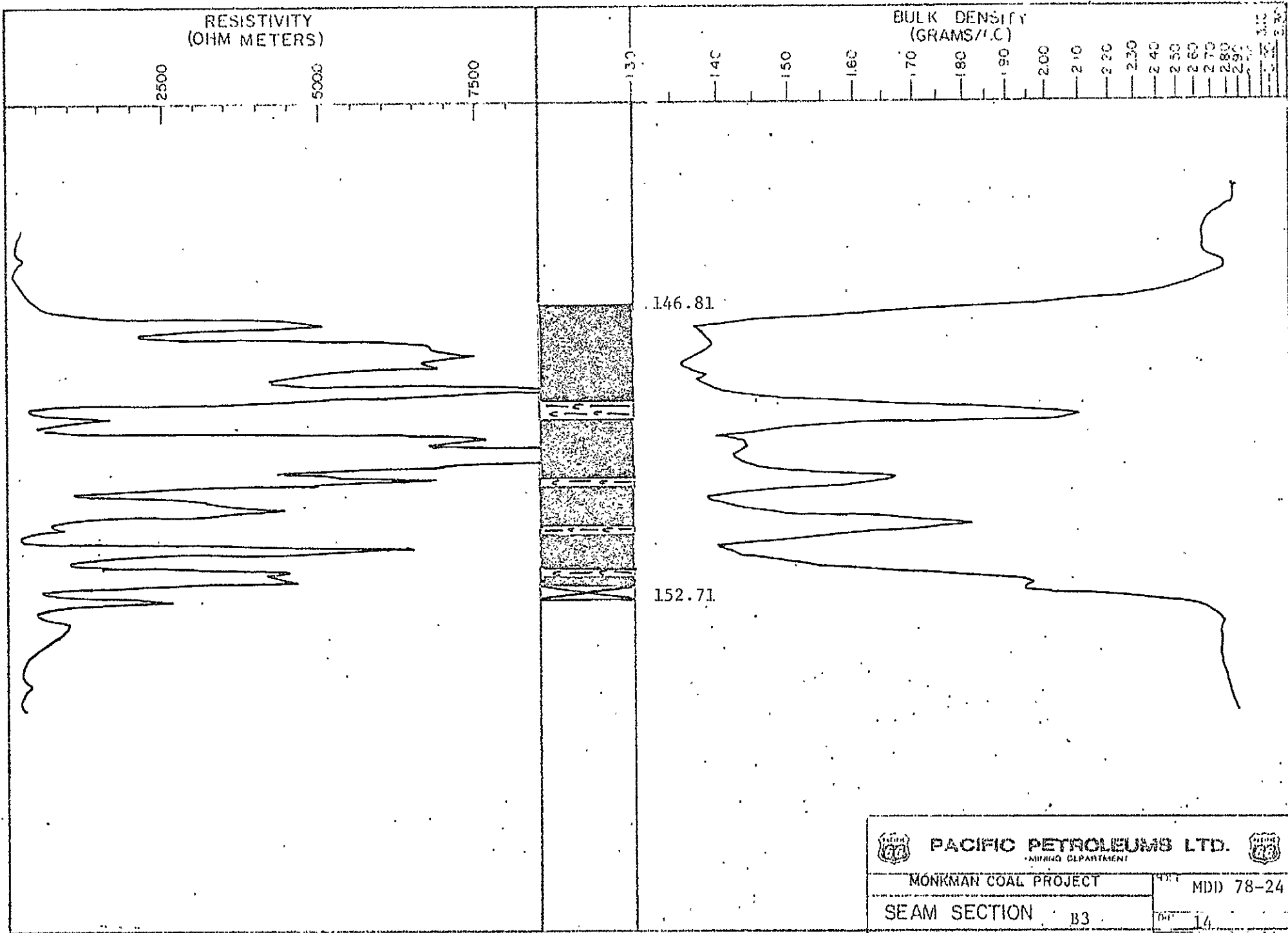




MONKMAN COAL PROJECT

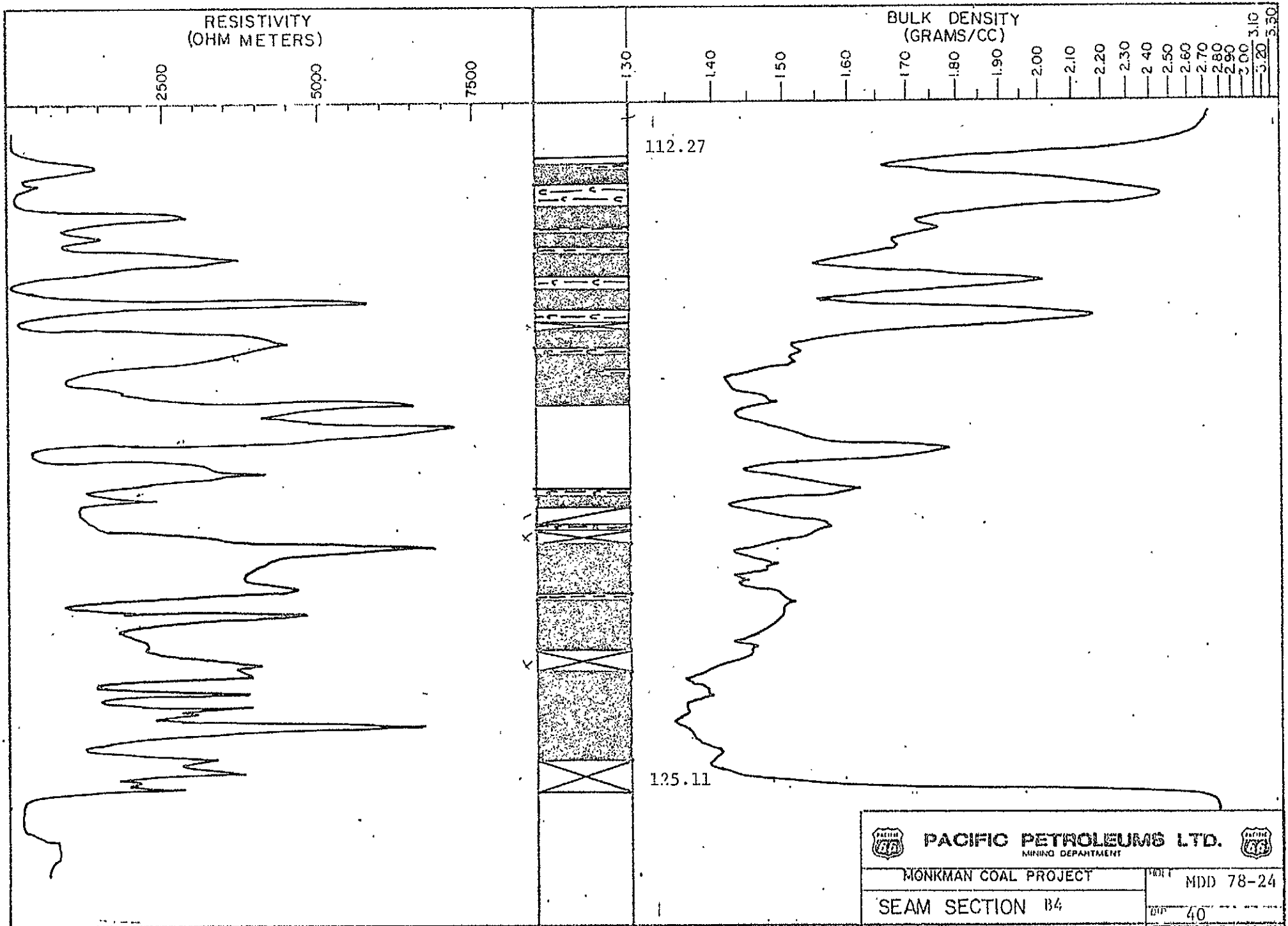
MND 78-24



SEAM SECTION B2

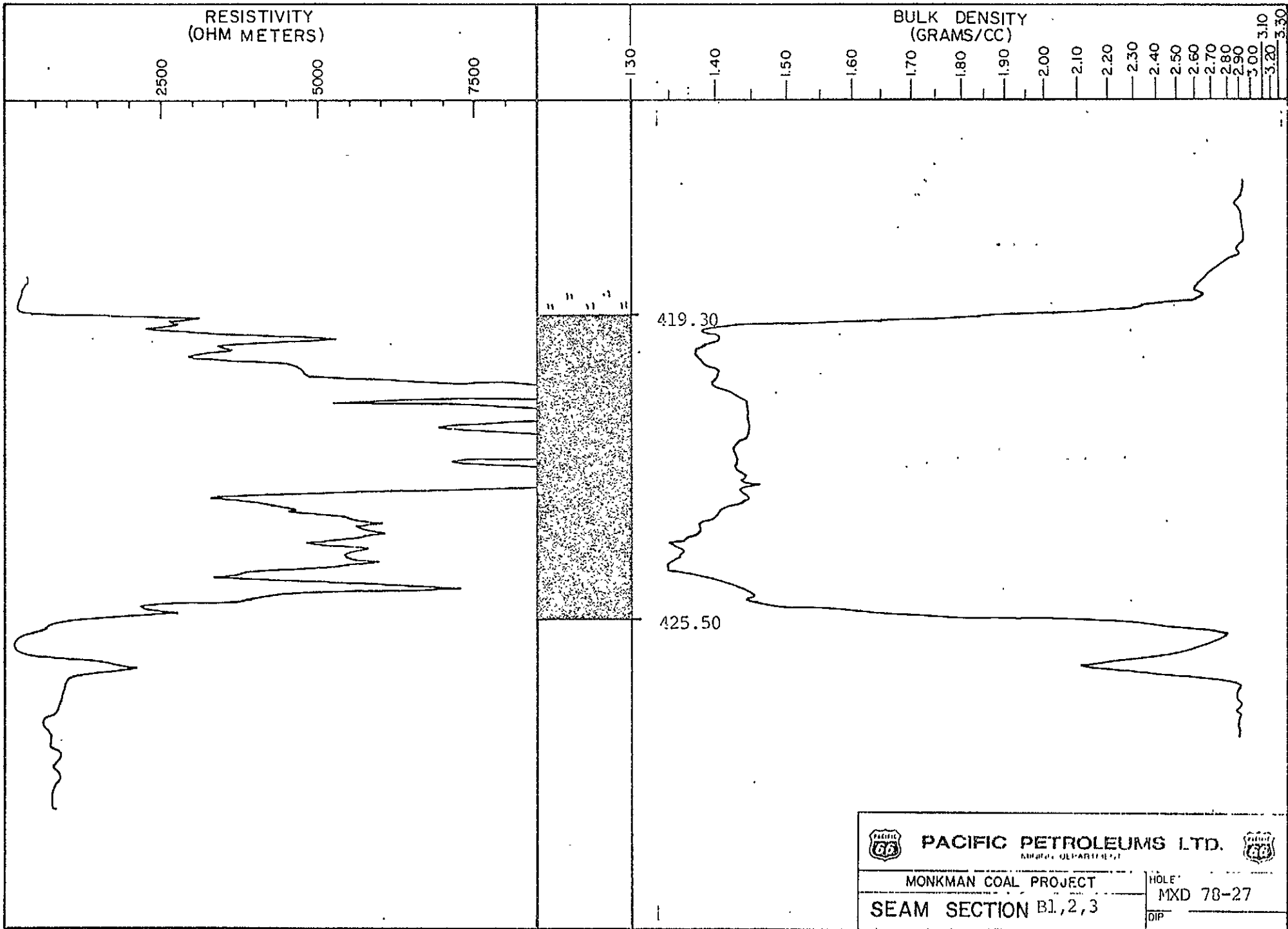
14





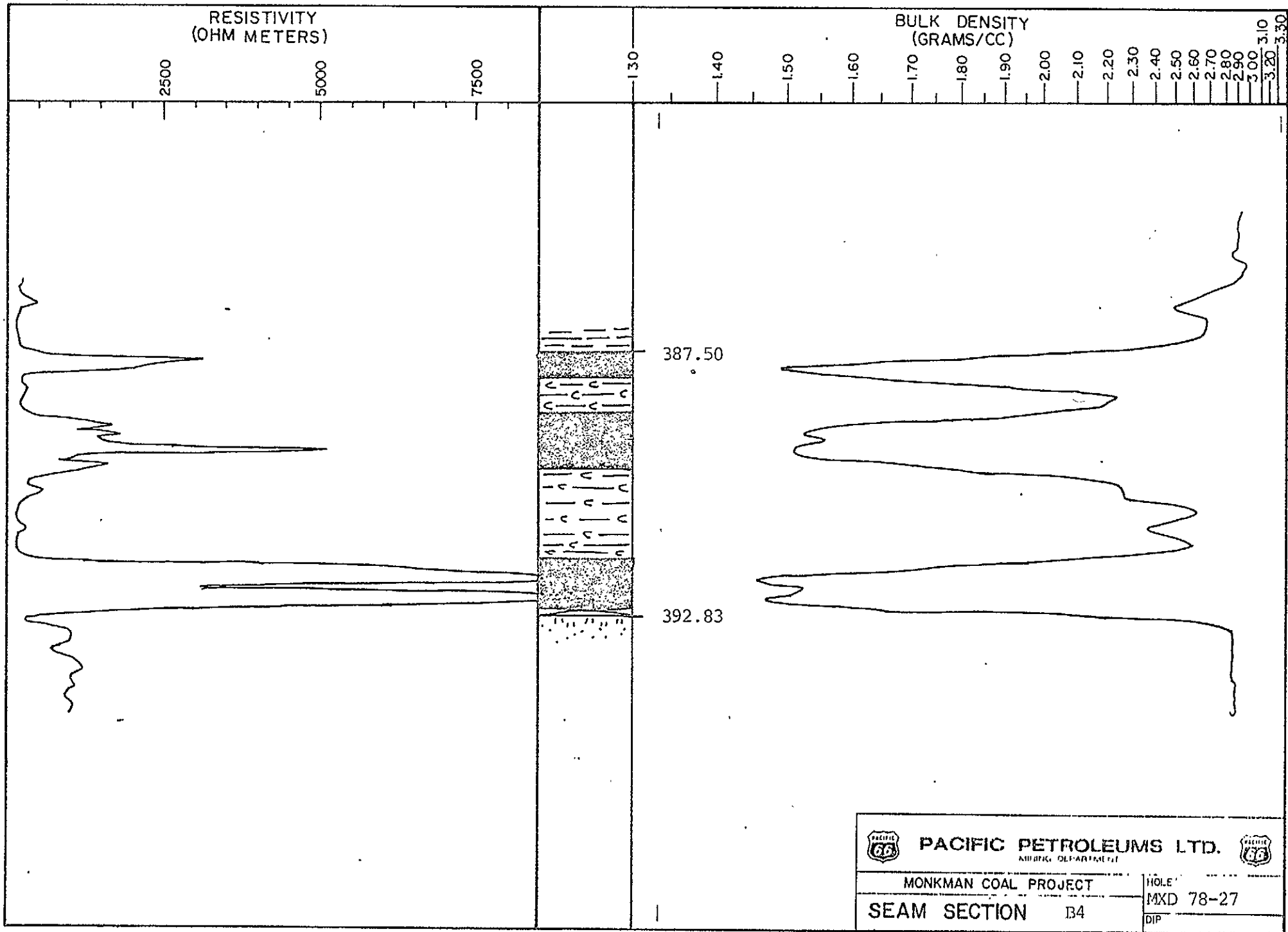
 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MDD 78-24
SEAM SECTION	B3	14





 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		MDD 78-24
SEAM SECTION B4		40



 PACIFIC PETROLEUMS LTD. <small>MEMBER OF THE ARMOCO GROUP</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B1, 2, 3	
HOLE MXD 78-27	
DIP	



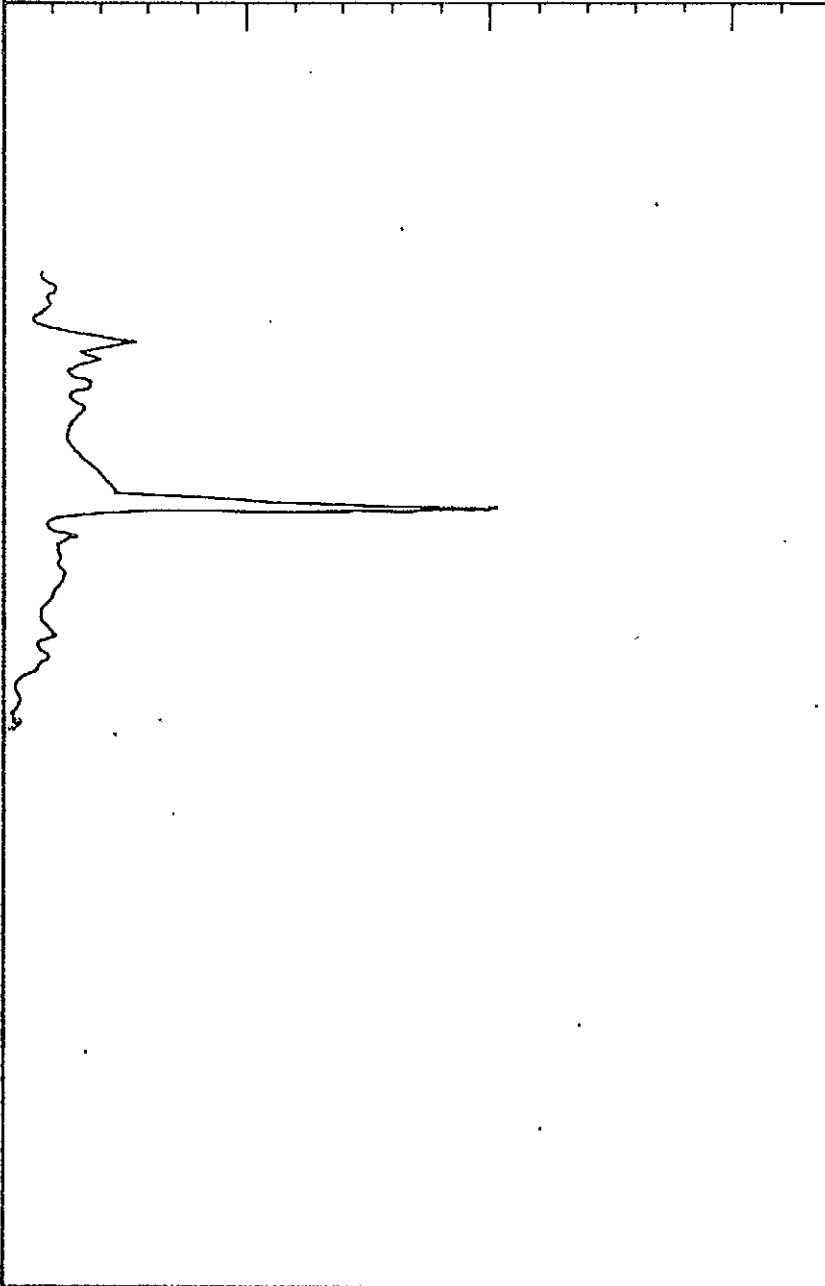
 PACIFIC PETROLEUMS LTD. <small>AN IRVING COMPANY</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B4	HOLE MXD 78-27
	DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500



BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

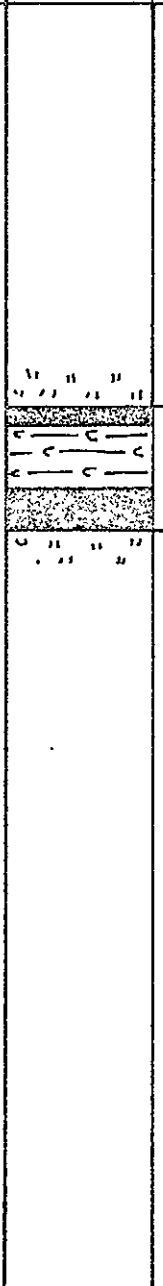
2.90

3.00

3.10

3.20

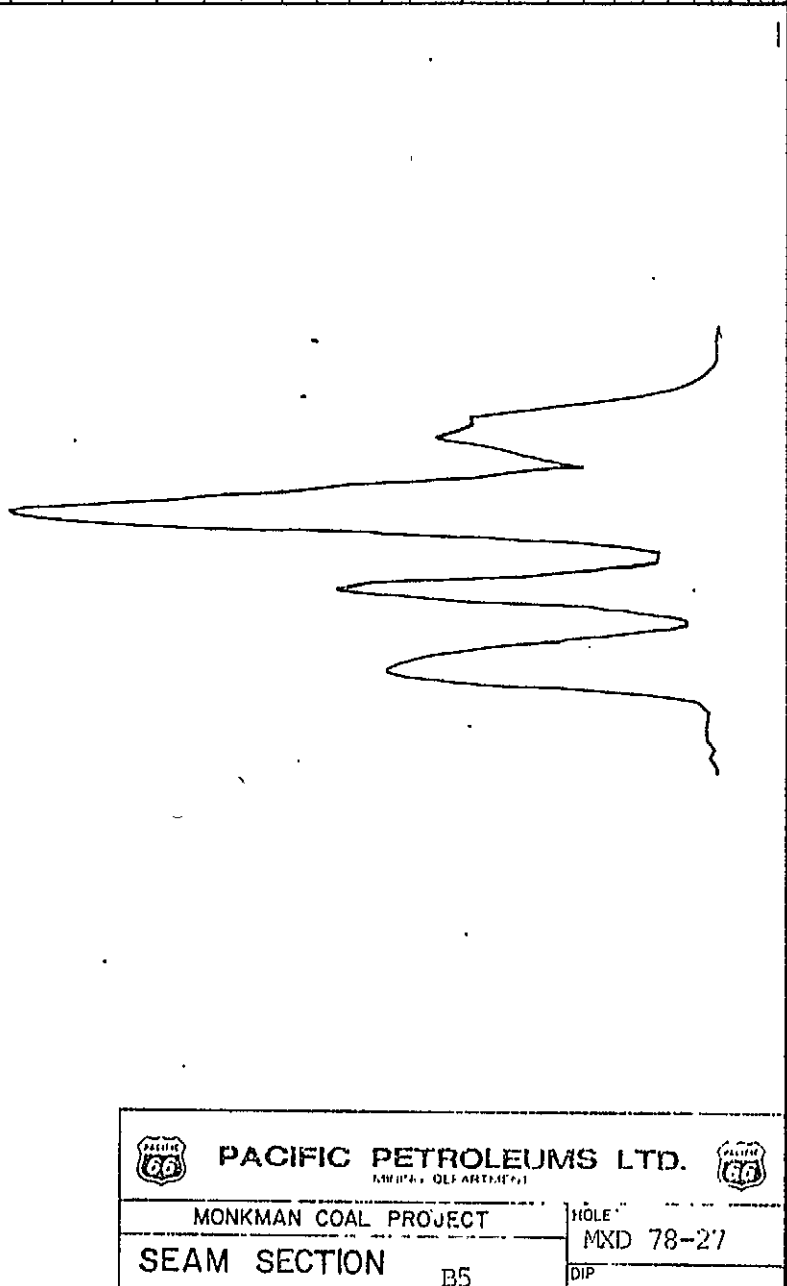
3.30



323.75

325.30

1



PACIFIC PETROLEUMS LTD.



MONKMAN COAL PROJECT

HOLE:
MXD 78-27

SEAM SECTION

B5

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

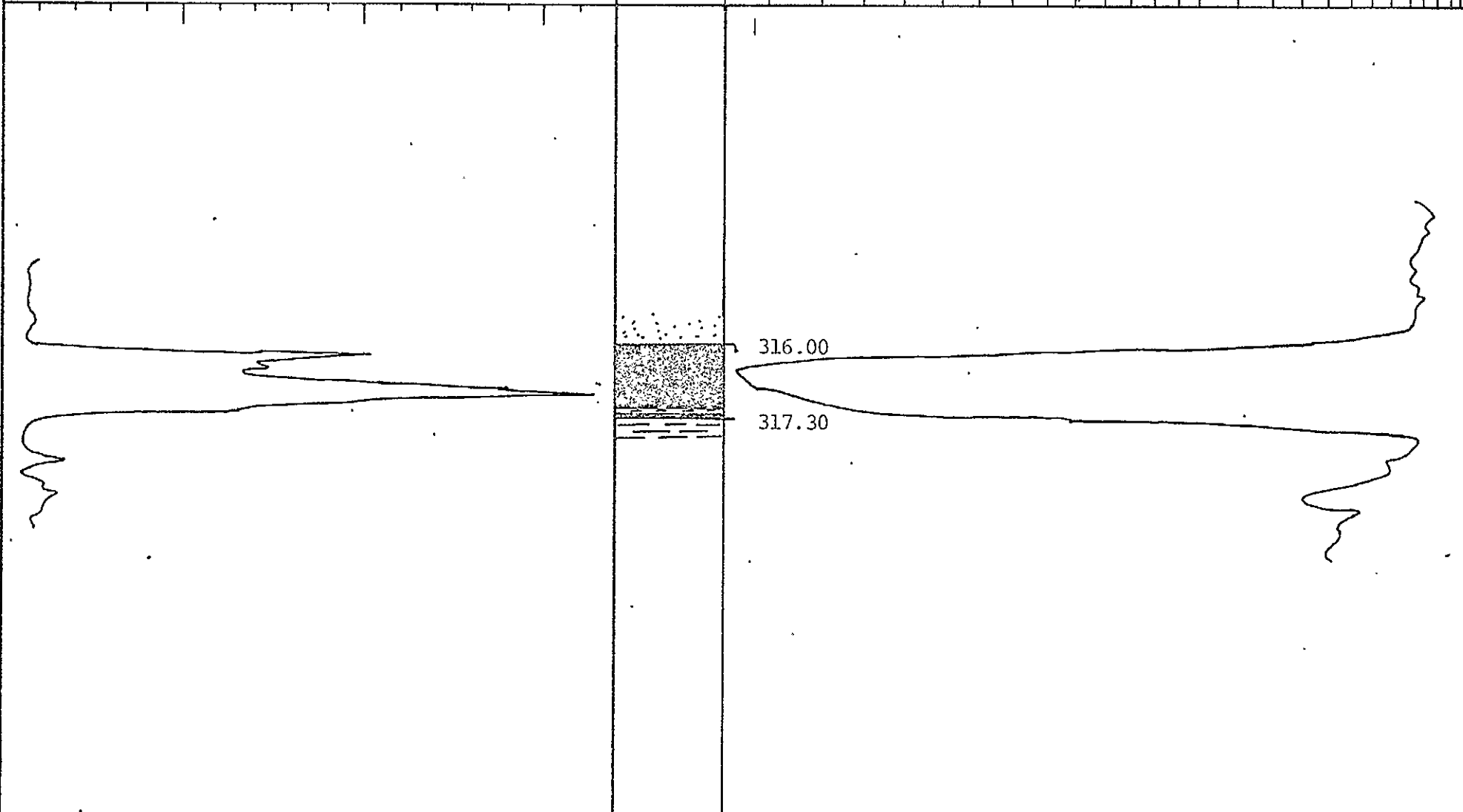
2.90

3.00

3.10

3.20

3.30



316.00

317.30

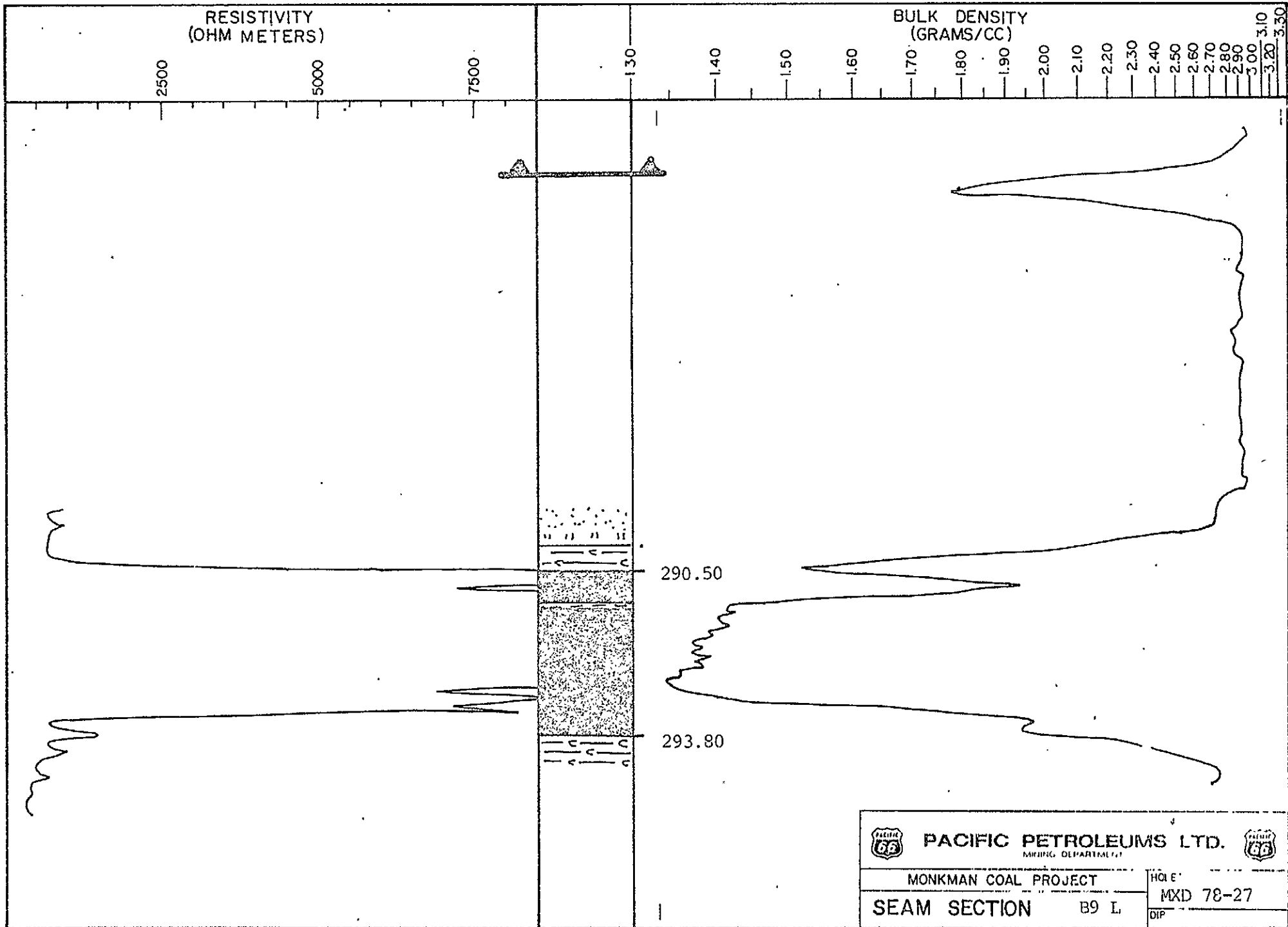




PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B6

HOLE
MXD 78-27
DIP



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE
SEAM SECTION		MXD 78-27
B9 L		DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

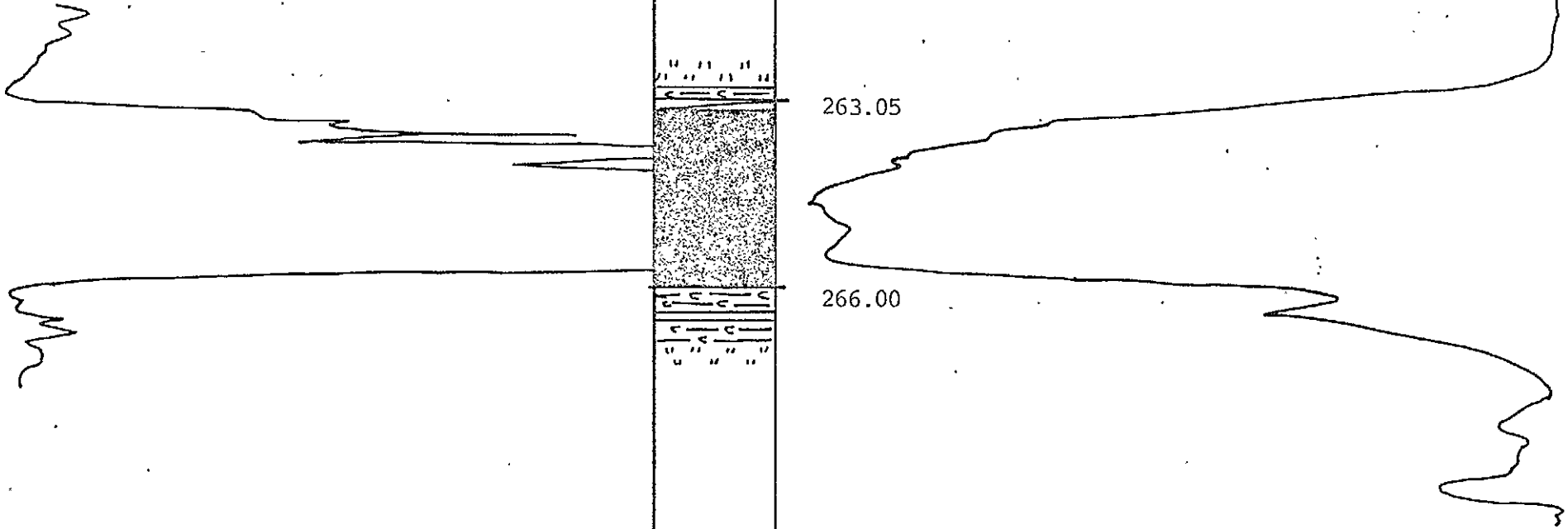
2.90



3.00

3.10

3.20

3.30



 PACIFIC PETROLEUMS LTD.  <small>MEMBER OF ARMOCO</small>	
MONKMAN COAL PROJECT	
SEAM SECTION	B9u
HOLE MXD 73-27	
DIP	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

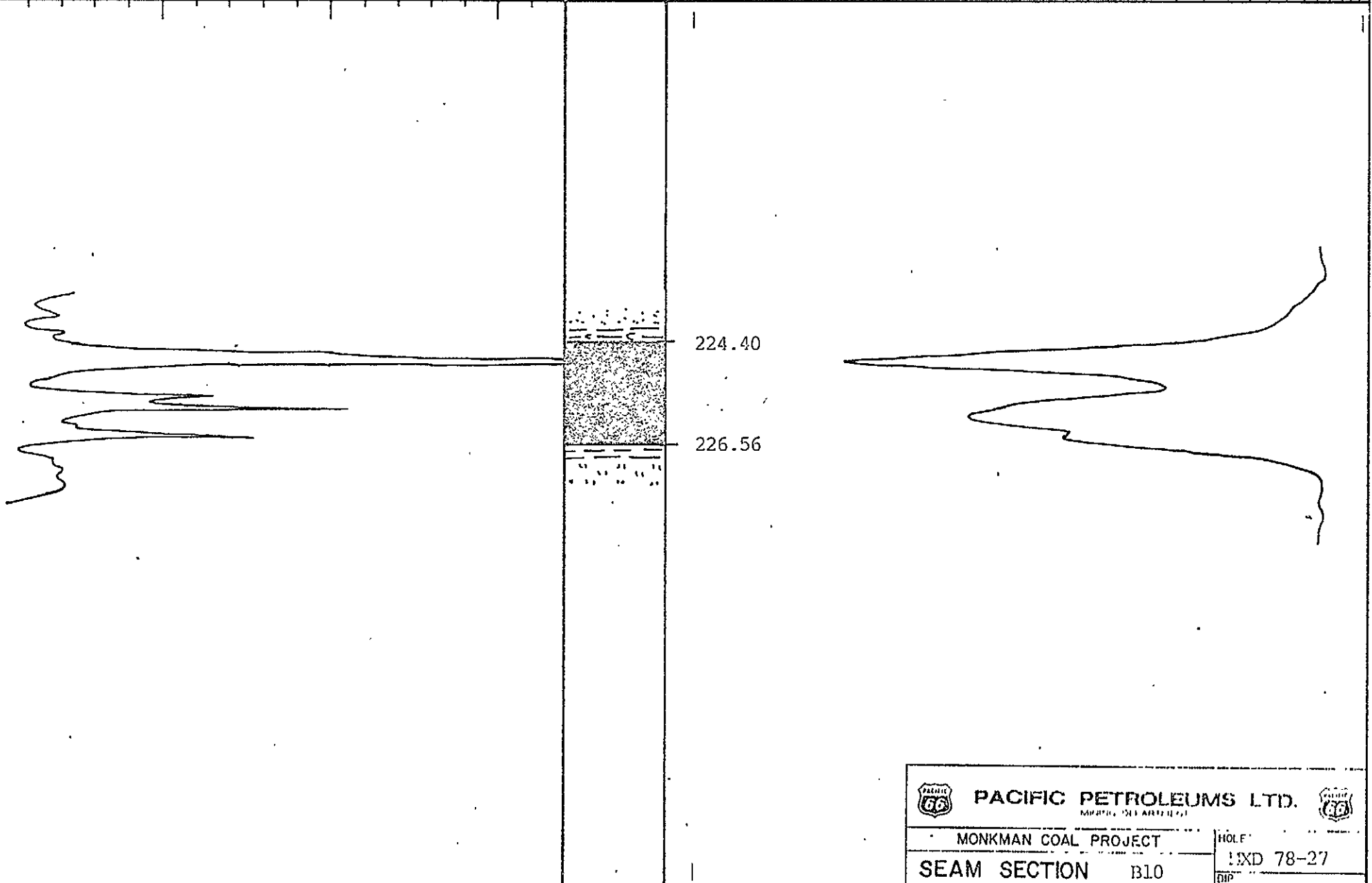
2.90



3.00

3.10

3.20

3.30



 PACIFIC PETROLEUMS LTD. <small>MEMBER OF ARCO INC.</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION	B10
HOLE 15XD 78-27	
DIP	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

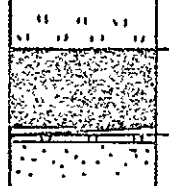
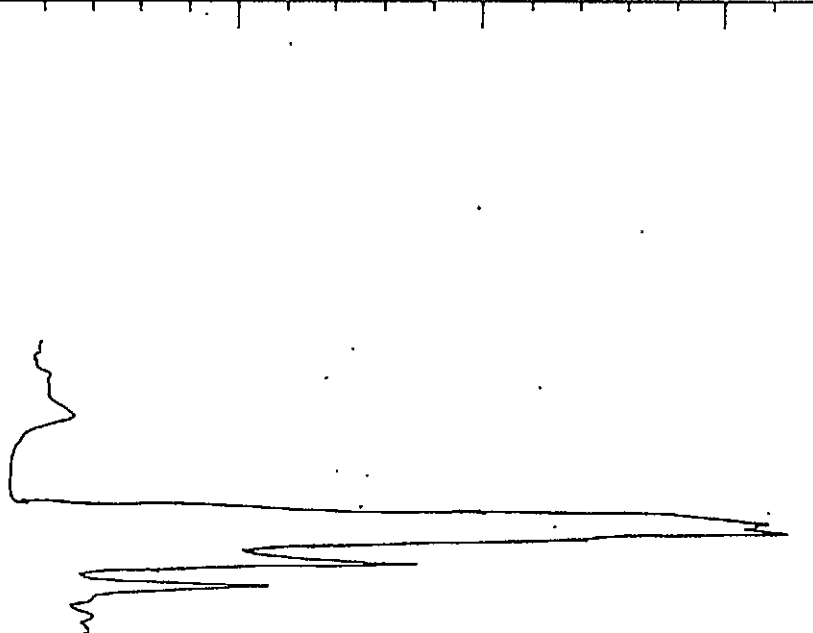
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3.00

3.10

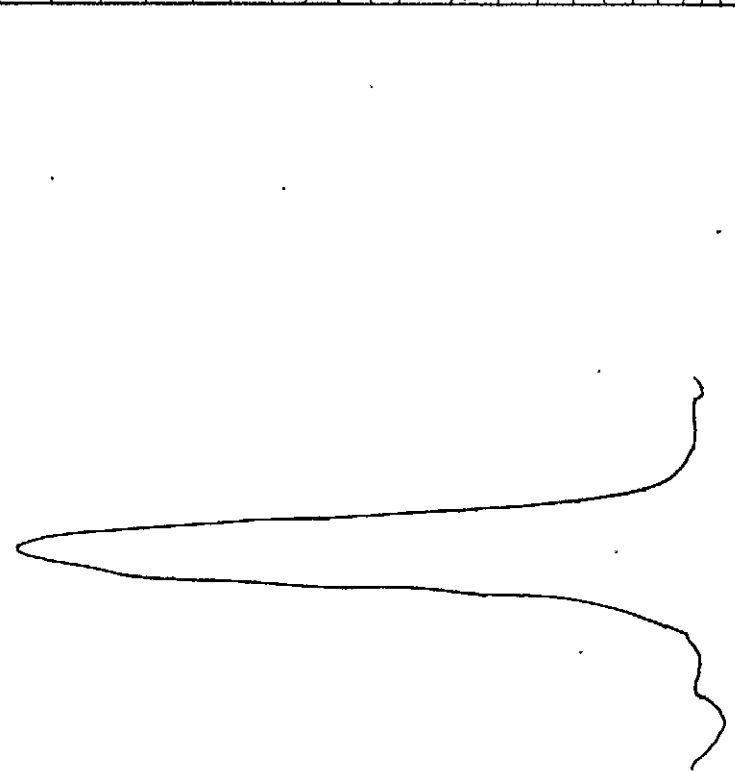
3.20

3.30



218.60

219.60



PACIFIC PETROLEUMS LTD.
CORPORATED IN CANADA



MONKMAN COAL PROJECT

HOLE:
MXD 78-27

SEAM SECTION B.1.1

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

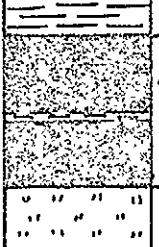
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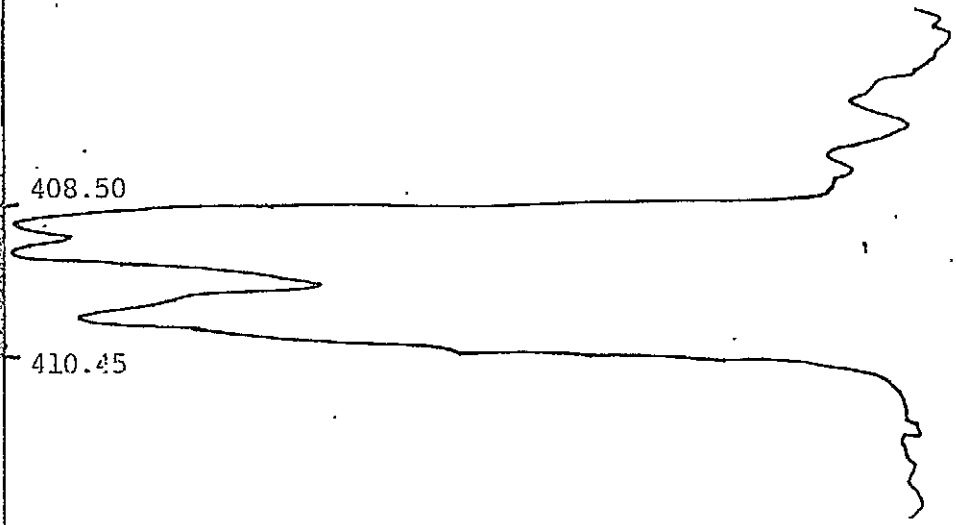
3.20

3.30



408.50

410.45



PACIFIC PETROLEUMS LTD.

MEMBER OF PACIFIC PETROLEUM GROUP



MONKMAN COAL PROJECT

SEAM SECTION B1,2,3

HOLE#

MBD 78-28

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

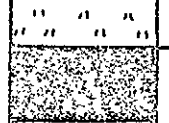
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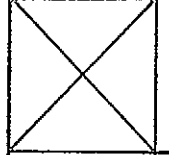
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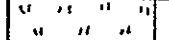
3.30



397.55



400.50



PACIFIC PETROLEUMS LTD.



MONKMAN COAL PROJECT

SEAM SECTION B4

HOLE
MIBD 78-28

DIP

RESISTIVITY
(OHM METERS).

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

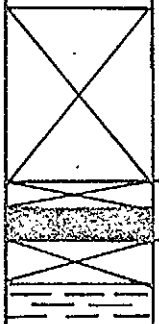
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3.00

3.10

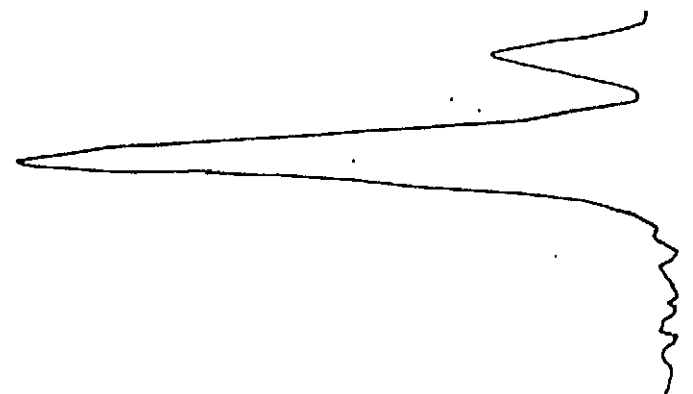
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3.30



332.45

333.20

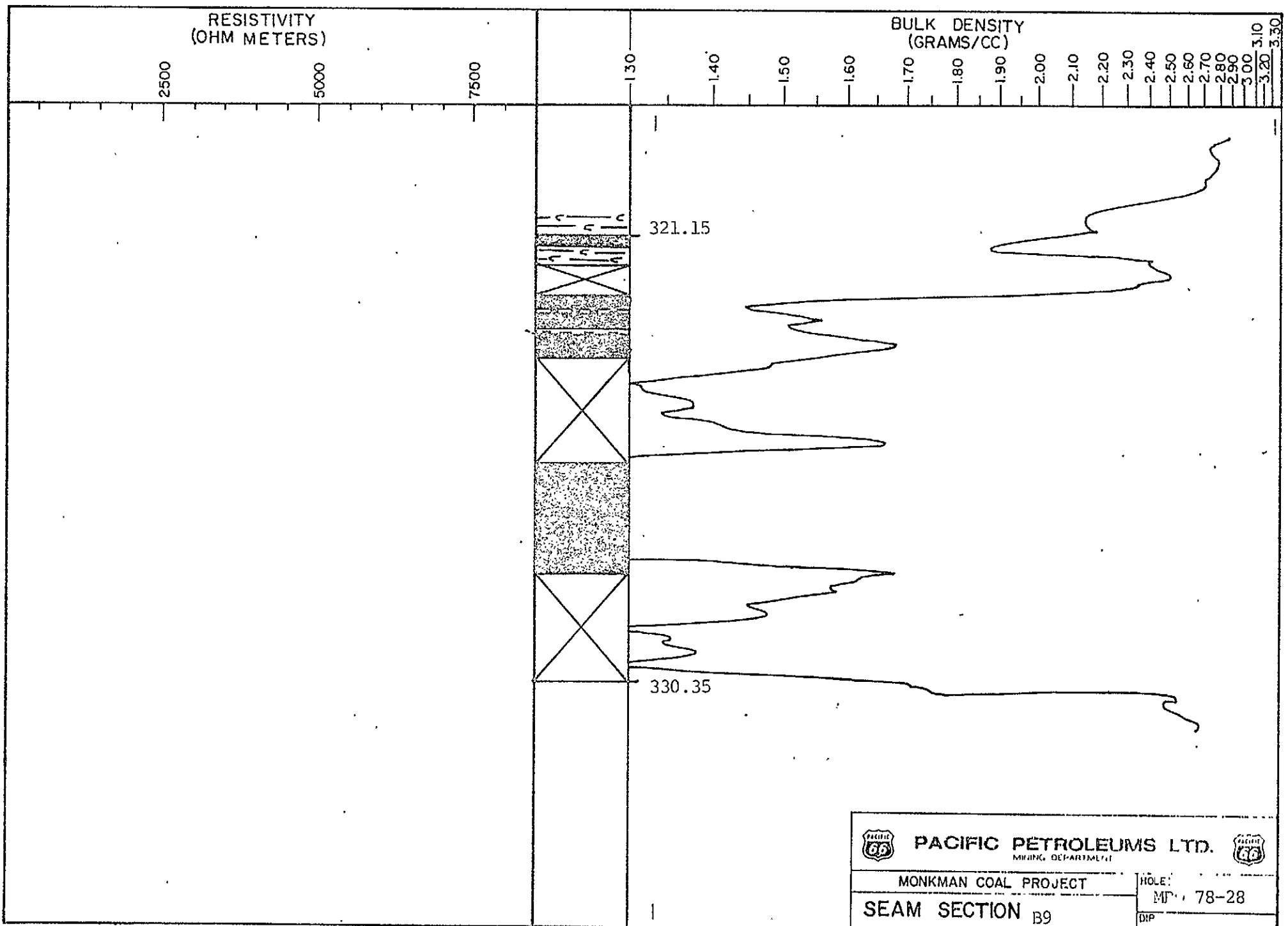




PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT
SEAM SECTION B7

HOLE
MIBD 78-28
DIP



 PACIFIC PETROLEUMS LTD. <small>MINING DEPARTMENT</small> 	
MONKMAN COAL PROJECT	
SEAM SECTION B9	
HOLE: MF 78-28	
DIP	

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

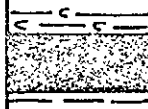
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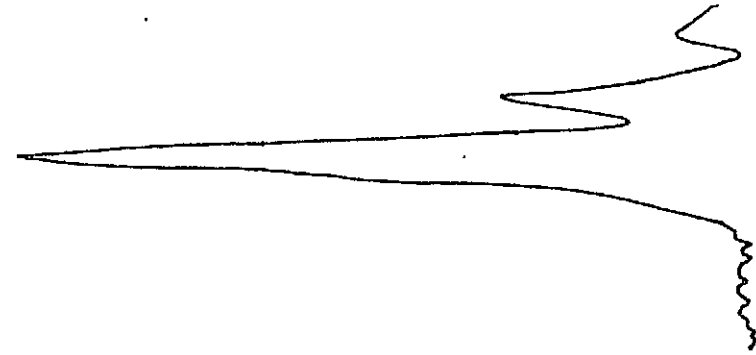
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3.30



297.85

298.60



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

HOLE:

MBI. 78-28

SEAM SECTION

B10

DIP:

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

2.90

3.00

3.10

3.20

3.30

293.90

295.10



PACIFIC PETROLEUMS LTD.
MINING DEPARTMENT



MONKMAN COAL PROJECT

SEAM SECTION B.1.1

HOLE
MBD 78-28

DIP

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

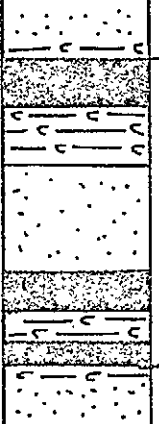
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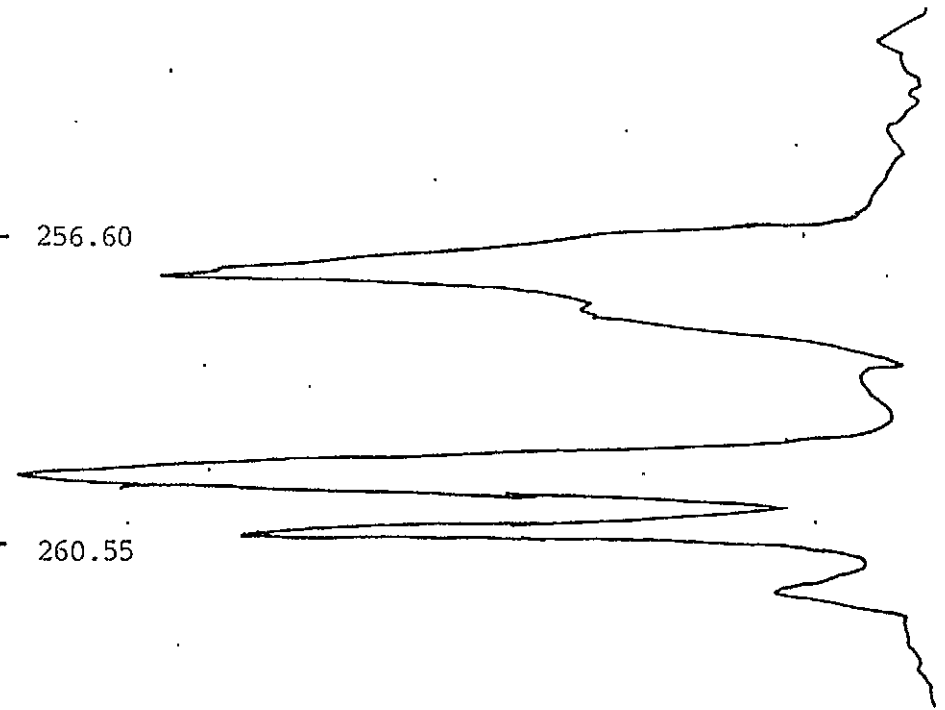
3.20



3.30



256.60

260.55



	PACIFIC PETROLEUMS LTD. <small>MINE AND DEPARTMENT</small>	
MONKMAN COAL PROJECT		HOLE: MBD 78-28
SEAM SECTION B.1.2		DIP:

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

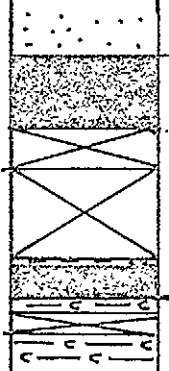
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3.20



3.30

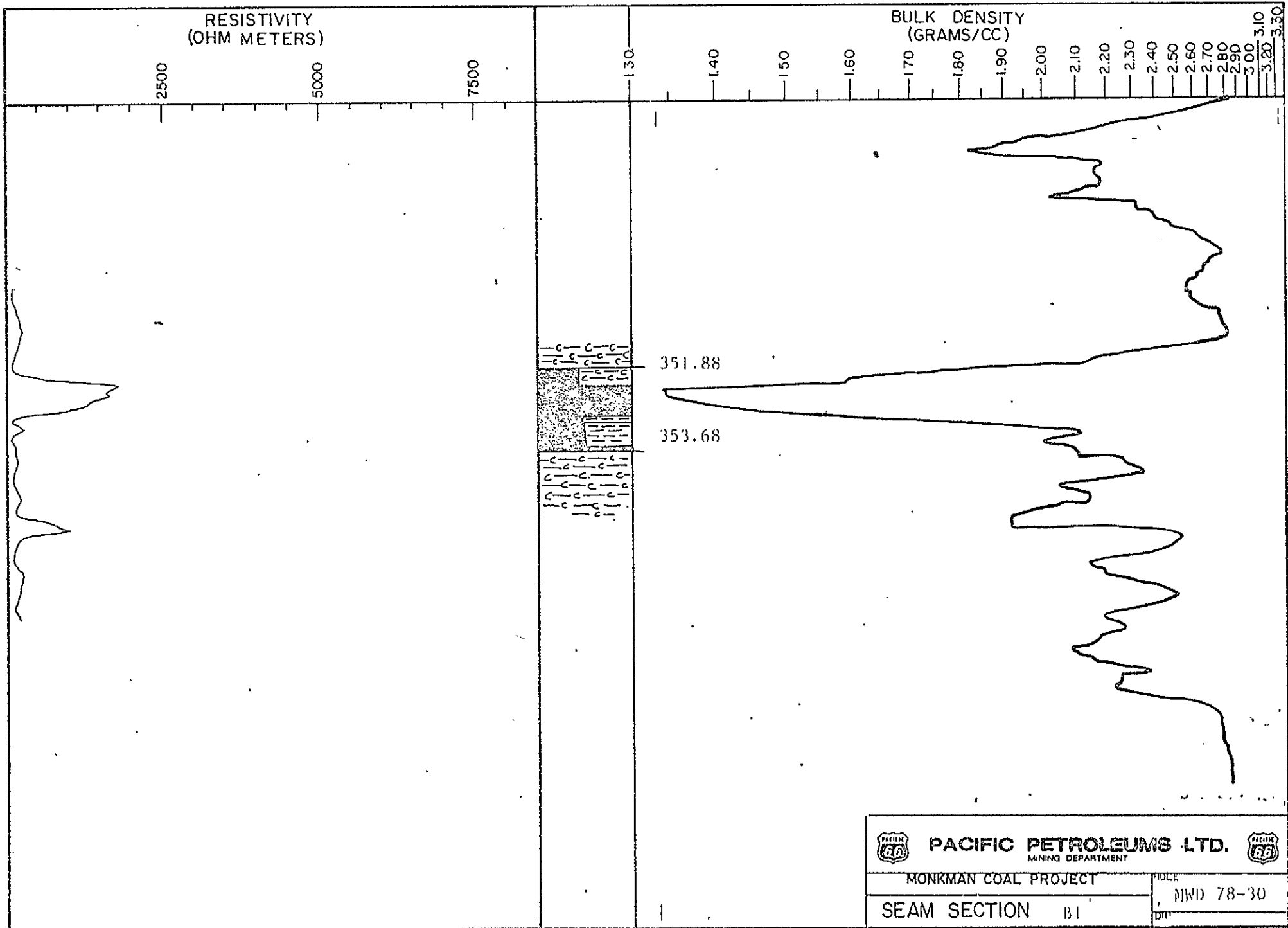




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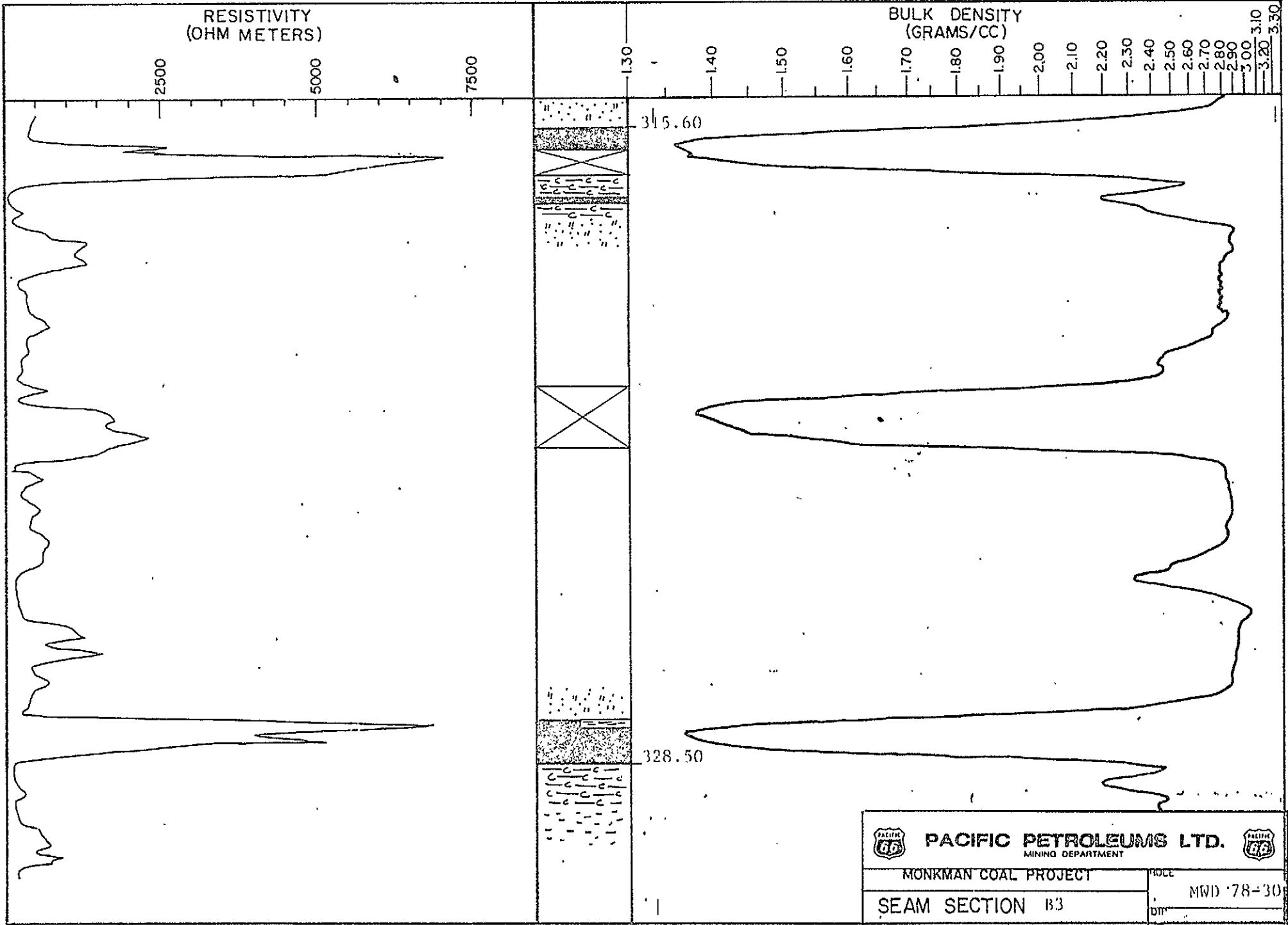
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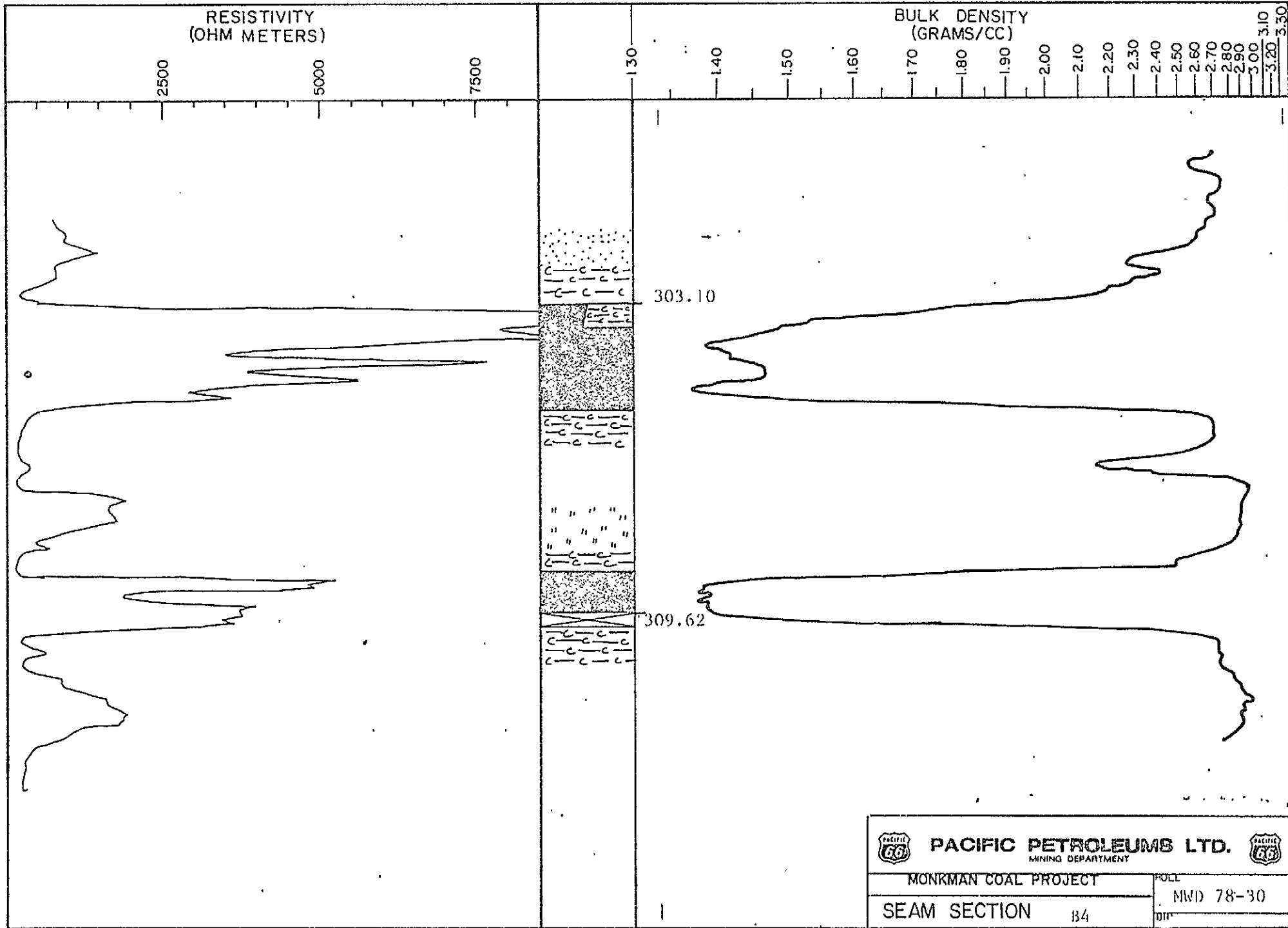
 PACIFIC PETROLEUMS LTD.  <small>MEMBER OF ARTELCO</small>	
MONKMAN COAL PROJECT	
SEAM SECTION	HOLE MBD 78-28
B13	DIP





 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION	B1
FILE:	
MWD 78-30	
DATE:	



 PACIFIC PETROLEUMS LTD. 	
<small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION B3	
<small>NO. 100</small>	MWD 78-30
<small>DATE</small>	



 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		HOLE MWD 78-30
SEAM SECTION	B4	DIT

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

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2.20

2.30

2.40

2.50

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2.70

2.80

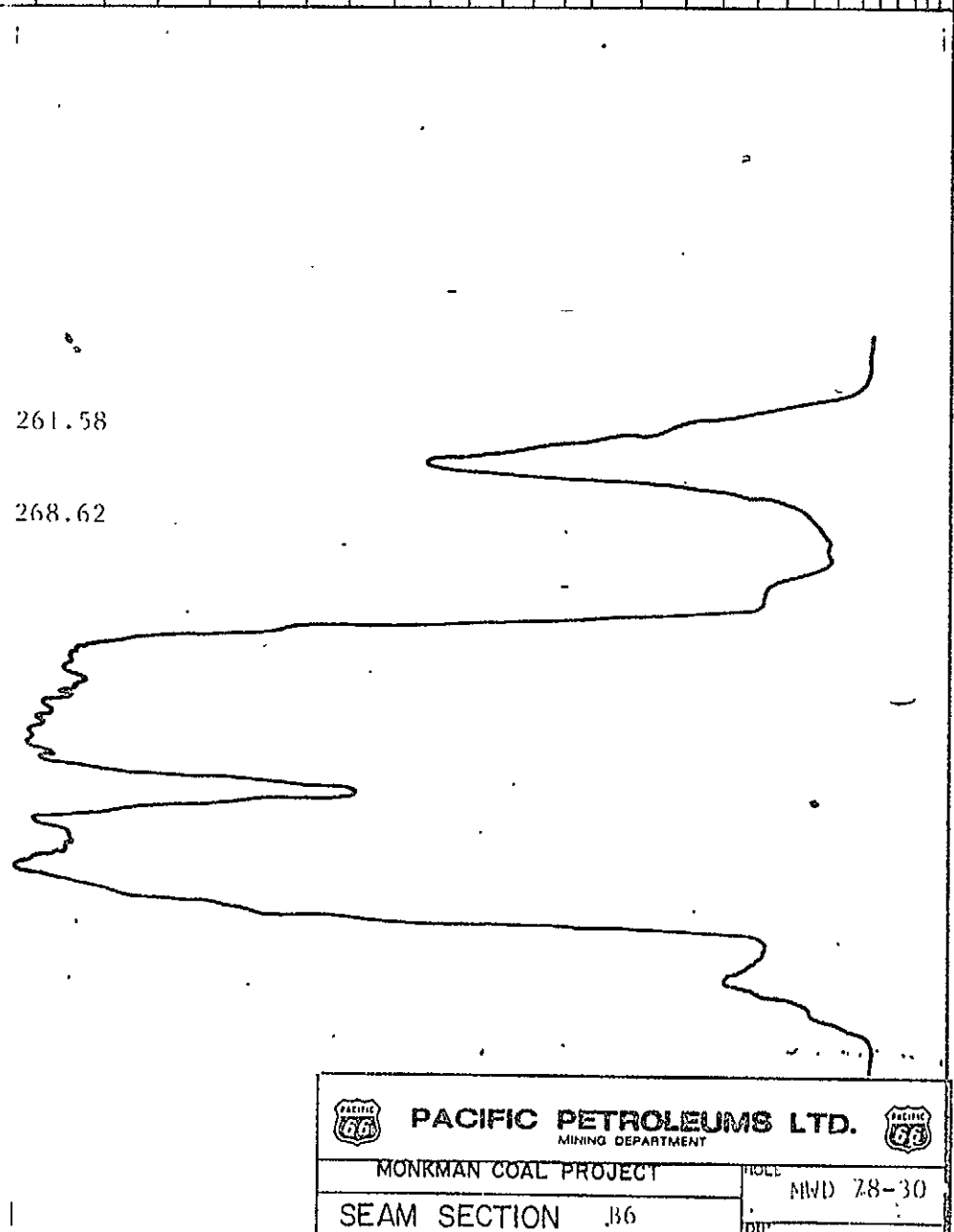
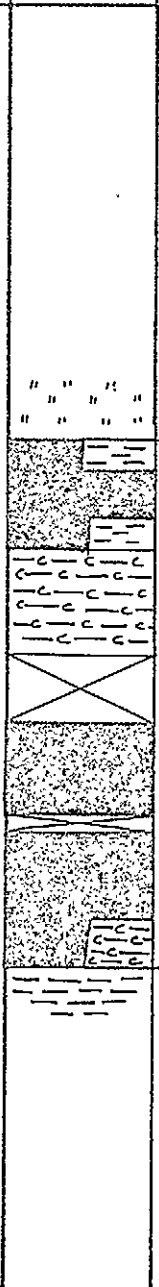
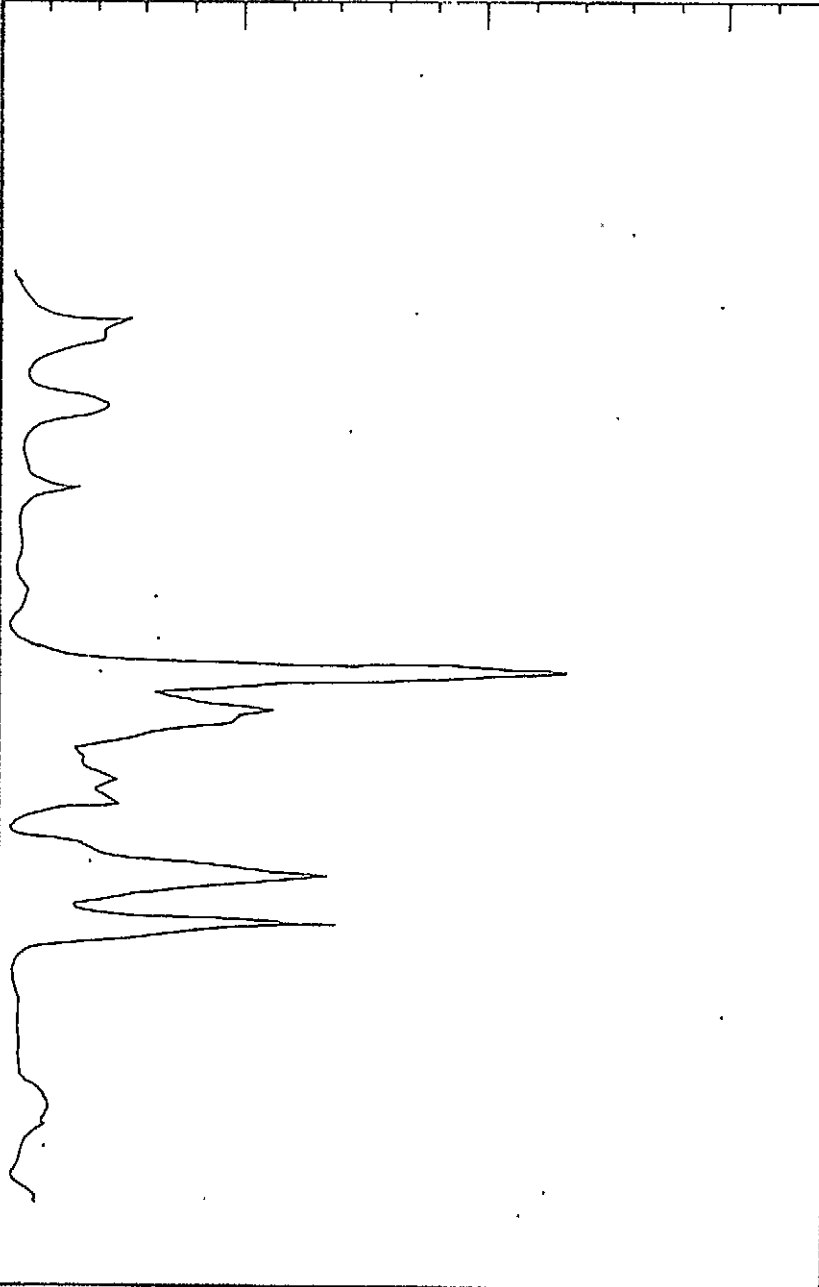
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3.00

3.10



3.20

3.30



261.58

268.62

 PACIFIC PETROLEUMS LTD. MINING DEPARTMENT		
MONKMAN COAL PROJECT		WELL
SEAM SECTION 36		NWD 78-30
		DIT

RESISTIVITY
(OHM METERS)

2500

5000

7500

BULK DENSITY
(GRAMS/CC)

1.30

1.40

1.50

1.60

1.70

1.80

1.90

2.00

2.10

2.20

2.30

2.40

2.50

2.60

2.70

2.80

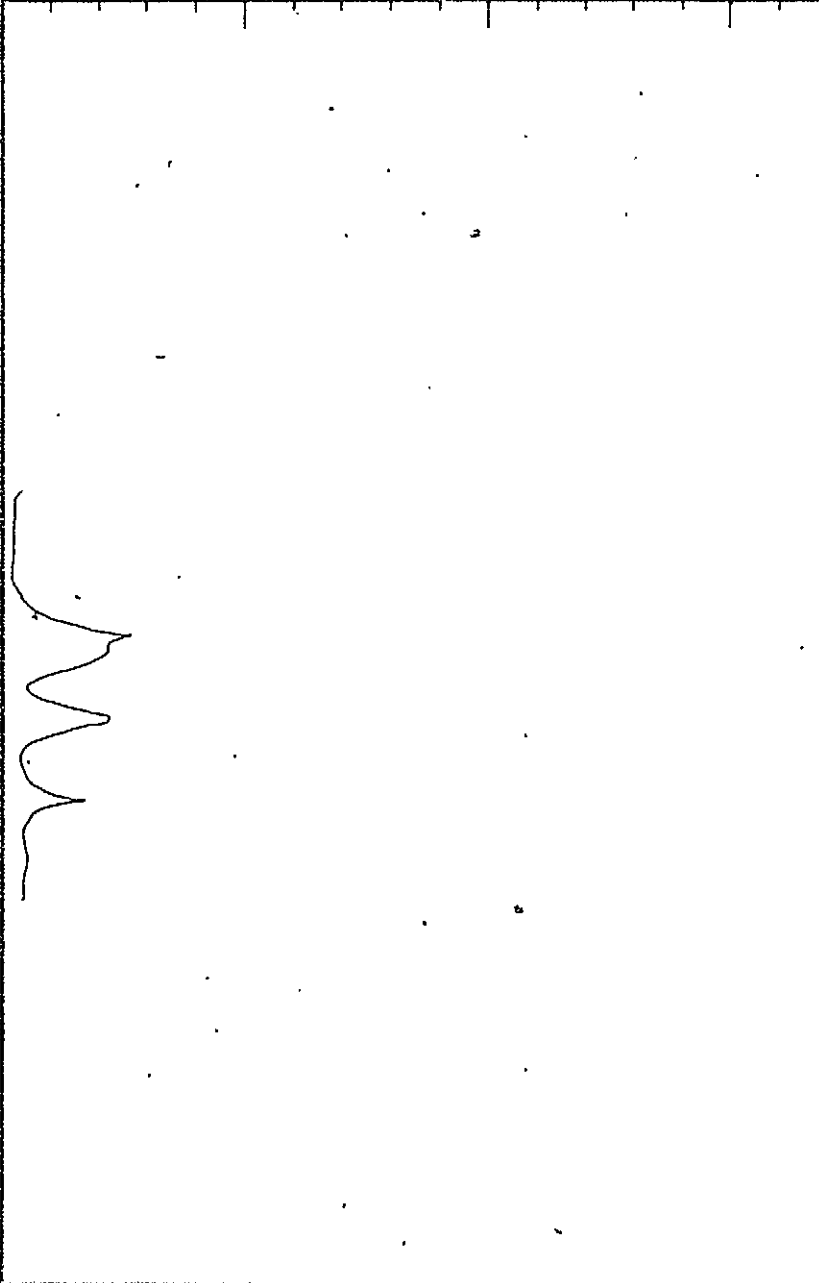
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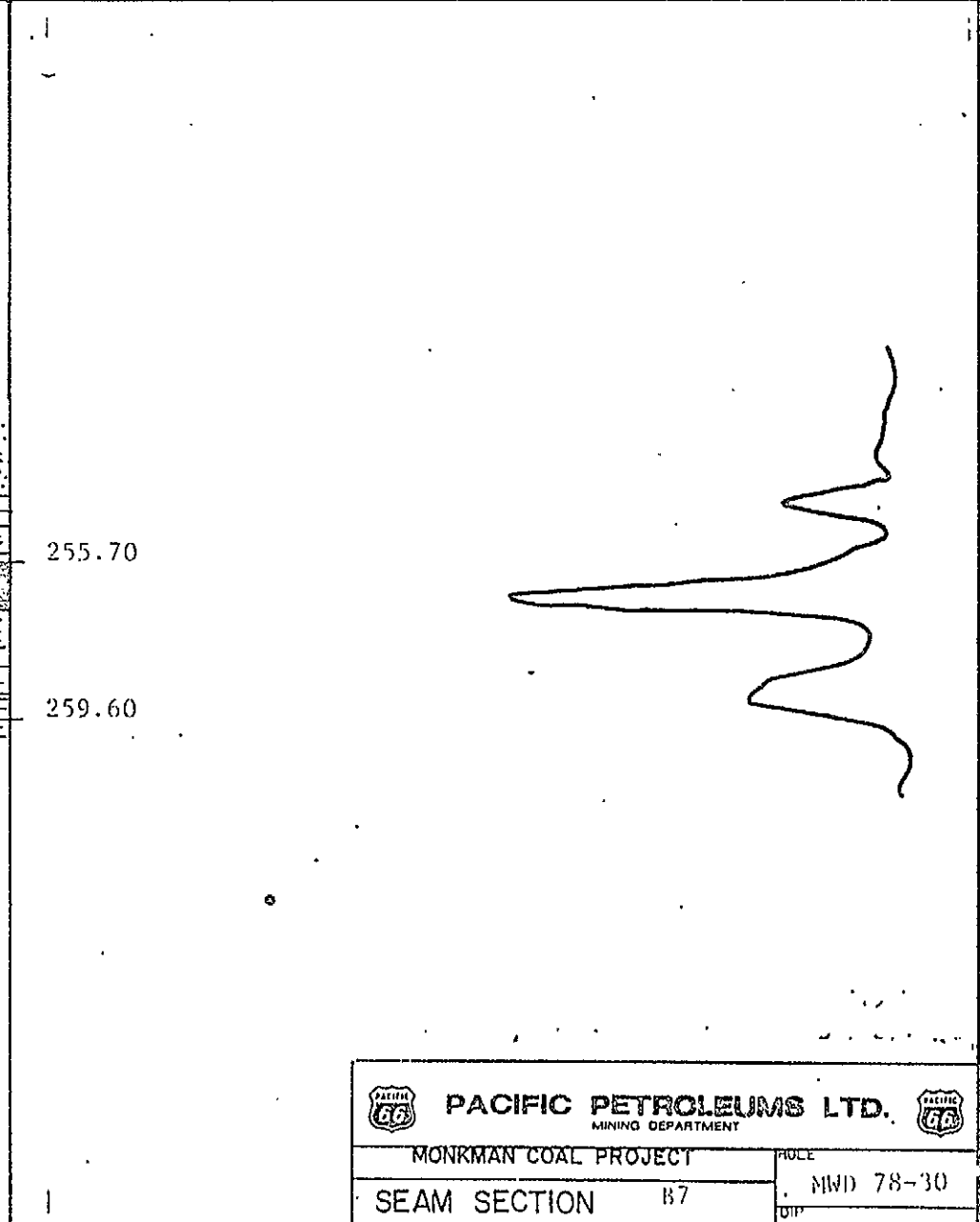
3.20



3.30



255.70

259.60



 PACIFIC PETROLEUMS LTD.  <small>MINING DEPARTMENT</small>	
MONKMAN COAL PROJECT	
SEAM SECTION	B7
HOLE MWD 78-30	
DIP	