FORDING RIVER OPERATIONS

SUMMARY REPORT

1977 COAL RESERVE DEVELOPMENT PROGRAM

Janaury 27, 1978

K-FORDING RIVER 77(1)A.

Submitted by: D. L. Johnston, P. Eng.,
Mine Manager,
Fording River Operations

Prepared by: P. M. Daignault,
Senior Mine Geologist,
Fording River Operations

Coal License Owners and Numbers

Can Pac Minerals Limited:	314-334, 336-340, 342-344, 348, 353, 355-364, 510, 511, 554-560. Total 24,325 acres.
Fording Coal Limited:	801-804, 943, 944, 964. Total 2,765 acres.
Cominco Limited:	539, 541, 543, 545, 547, 549, 551, 553. Total 3,200 acres.

Coal Lease Owner and Numbers

Can Pac Minerals Limited:	Coal Lease Nos. 1 & 2. Total 8,050 acres.

N.T.S. 82J2W, J7W

V APPENDIXES ----------

1. Technical Reports ----------
   (a) Coking characteristics of Coal Samples from seams 12 & 13 - CANMET ----------
   (b) Test Results of Coal Samples (Fording Nos. 12 & 13 Seams) - Nippon Kokan K.K. and Kobe Steel Co. Ltd. ----------
   (c) Washability Results on Seams 12 & 13 - Birtley Engineering (Canada) Ltd. -------
   (d) Petrographic Analyses on D.D.H. 445, 449, 643, - Cascade Coal Petrography Ltd. ----
2. Geological Reports ----------
   (a) West Turnbull - W.H. Shaw ----------
   (b) Turnbull Total - W.H. Shaw ----------
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REFER TO CONFIDENTIAL COAL ANALYSIS FILE

Note: This report is comprised of three volumes:

Volume 1: Sections I, II, III, IV.

Volume 2: Sections V - Appendixes 1 & 2

Volume 3: Sections V - Appendixes 3, 4, 5, 6, (Government copy only)

LIST OF ILLUSTRATIONS

(included in separate envelope)

FORDING RIVER OPERATIONS

SUMMARY REPORT

1977 EXPLORATION AND DEVELOPMENT PROGRAM

I. INTRODUCTION

An extensive drilling plan was undertaken in 1977 as part of Fording's continuing Coal Reserve Development program. With the exception of two rotary holes drilled in the Elk Valley, all work was done within a three mile radius of the plant site. Sixty percent of the work was to upgrade geological information in areas for which there is already a preliminary pit design; forty percent was outside of present geological reserve boundaries. The bulk of the drilling was done by contractors during the period April 26 to October 6; fill-in drilling by the Geology Department's B-50 Mobile rotary drill continued to year-end. This report covers results of the above exploration program at Fording Coal Limited and forms the basis for work credits claimed for the Coal License work requirements under the Coal Act (1974), specifically Sections 19, 21, 23.

II. SUMMARY

One hundred and forty-six holes were completed and 68,053 feet drilled; included is footage for incompleted holes. Seven thousand and sixty feet of the drilled footage was in seven H.Q. diamond core holes, 56,033 feet in one hundred and nineteen 4 7/8" diameter rotary holes with centre return sampling of intersected coal seams, and 4,960 feet in twenty 3 7/8" rotary holes using single wall pipe. Coal analysis was done for all significant seam intersections at Fording's Process Plant laboratory. Coal seam samples, taken at two foot intervals, were analysed for % Ash and F.S.I. values. Weighted seam composites were tested for Proximate Analysis, plus F.S.I. and % Sulphur. Washability tests were done on the cored seam samples and petrographic analyses completed on selected cleaned composite coal samples from the core holes. One adit on each of seams 12 and 13 were driven in the Taylor Pit area of Eagle Mountain. A bulk sample of unoxidized coal was subjected to washability tests and coking tests. Pre-logging of drill access roads was completed on Castle and Lake Mountains prior to drilling operations.

Tonto Drilling Limited contracted the core drilling and G. J. Ackles Limited supplied water to the diamond drill rigs on Eagle Mountain. S.D.S. Drilling Limited were the contractors for the centre-return rotary drilling with the following equipment: one track mounted (Nodwell FN 110 carrier) Gardner-Denver 1000 H. D. drill (Air Compressor: 600 c.f.m. @ 125 p.s.i.); one truck - mounted (Kenworth Tandem) Sanderson T.H. 70 drill with top drive (Air Compressor: 570 c.f.m. @ 250 p.s.i.); one truck mounted

(International) Gardner-Denver 1700 drill (Air Compressor: 570 c.f.m. @ 250 p.s.i.). Carriers for the dual wall drill pipe were a tracked F.N. 800 Nodwell carrier and two Kenworth Tandems for the respective drill rigs. Hollowink Contracting Limited of Fernie provided a D-7 crawler dozer and operator for preparation of drill access roads and drill sites. Jamesfield Construction Limited of Cranbrook provided a D-6 and a D-8 crawler dozer for similar work. All exploration holes were logged either by Roke Enterprises of Calgary using a gamma ray - neutron log combination, or by Geology Department personnel using a Widco logging unit to give a gamma ray log only. Birtley Engineering Limited of Calgary did the washability test work on the bulk adit samples. Adits were driven by W. Fuchs of Coleman, Alberta. Coking tests on the washed adit samples were conducted by CANMET laboratories in Ottawa as well as several Japanese companies. Cascade Coal Petrography Limited of Calgary completed the petrographic analyses on washed composite coal seam samples from selected diamond drill cores. Fording geologists and summer students mapped the various rock outcrops and seam exposures; staff surveyors provided the necessary mapping control and location of drill holes. Two temporarily employed geological students did the geological and structural logging of diamond drill cores; all cores were colour photographed.

Summary statements of work done and the results obtained are included for the various areas, plus detailed geological reports by staff geologists for particular areas. Also included are radiation logs, diamond drill and rotary hole geological logs, diamond drill core structural logs, technical reports on petrographic, washability and coking analyses, together with plans and representative sections and a general geological map showing the location of drill holes, roads and adits.

III. INDIVIDUAL AREA PROGRAMS AND RESULTS

A. Eagle Mountain: Taylor Pit Area

A total of 3,950 feet in four H.Q. size diamond drill core holes were drilled in the Taylor Pit area between sections 492,000 N and 493,000 N. These holes (D.D.H.'s 445, 448, 449, and 461) were part of the diamond drilling program proposed in 1976 and terminated before final completion due to adverse winter weather conditions. Structure, stratigraphy and coal quality and thicknesses were as indicated by previous drill results. Washability tests were done on all major coal seams. Petrographic analysis were completed on washed composite samples of coal seams intersected in diamond drill holes #445 and #449.

Piezometers were installed in diamond drill holes 445, 449, and 461 and water pressures were monitored at particular horizons. In addition to the standard geological log, all cores were structurally logged in detail. The foregoing data provided vital information required for slope stability analysis of the proposed Taylor Pit highwall.

Two adits, for a total of 230 feet, were driven to obtain samples of unoxidized coal from seams 12 and 13; washability and coking tests were completed on these samples.

References: (i) Appendix 1 - Technical Reports

(ii) Illustration No. 4 - Geological Section 492,000N: West Face Eagle Mountain

(iii) Illustration No. 5 - Test Adits in Eagle Mountian

Cost of Eagle Mountain Program: $150,287

B. Clode Pit Extension

Thirty - two centre return rotary holes for a total of 10,951 feet were drilled in Clode Pit to penetrate normal 7, 5, and 4 seams and repeated segments of these seams within a thrust fault zone. This was follow-up work of the 1975 Clode Pit drilling program. A greater number of holes than those originally planned, were drilled due to the structural complexity of the thrusted area and the need for accurately

defined seam "cut-offs" for mine design. New proven reserves of 2.6×10^6 L.T.R.C. resulted from re-design of the pit based on this drilling; this is equivalent to approximately one years Clode Pit production at current rates. The Major Thrust Fault defines the lower limit of economic extraction of coal seams in Clode Pit.

References: (i) Illustration No. 6 - 1977 Clode Pit Development Drilling

(ii) Illustration No. 7 - Clode Pit Section Nos. 5 & 6

Cost of Clode Pit program $166,205

C. TURNBULL MOUNTAIN

Thirty-seven dual wall centre return and single wall rotary holes (17,976 feet) were drilled in the south western area of Turnbull Mountain. This work was the continuation of the 1975-76 program to provide essential information on seam locations, thicknesses and coal quality. Geo-technical tests were done on the diamond drill holes and the core was structurally logged to obtain essential data for ground stability studies. Petrographic analysis were done on coal seams intersected in diamond drill hole #643. All available outcrops were covered as part of the field mapping program. The information provided by the above programs is required for the designing of open-pits in the area (Turnbull Total and West Turnbull Pits) and for the long term planning of spoil areas. Details of work done and the results obtained are presented in the appended geological reports.

References: (i) Appendix 2(a) - Geological Report: West Turnbull

(ii) Appendix 2(b) - Geological Report: Turnbull Total

(iii) Appendix 1(d) - Petrographic Analyses on D.D.H. 445, 449, and 643.

Cost of Turnbull program $327,005

D. CASTLE MOUNTAIN

A total of fourteen rotary drill holes (8,590 feet) were completed to test for favourable mining areas in projected field zones on Castle Mountain. In conjunction with field mapping, essential data was collected relative to structure,

stratigraphy, seam correlation, coal thicknesses and quality. Limited exploration work has been done on Castle. The 1977 program results, combined with previous work, have provided a frame work within which future exploration programs can be developed. Details of the 1977 work done and interpretation of results are presented in the appended geological report.

Reference: Appendix 2(c) - Geological Report: Castle Mountain

Cost of Castle Mountain program $162,713

E. GREENHILLS AREA

A total of 18,644 feet were drilled in thirty-four centre-return dual wall rotary holes and twelve single wall 3 7/8" rotary holes.

The originally proposed program of twenty-five centre return rotary holes was designed to improve seam definition in planned truck-shovel pits that involves mining seams "F" to "H" and to test for the location of stratigraphically higher seams at selected locations. All of these holes (RH 1050-1074 inclusive) were completed of which twenty holes (10,723 feet) were drilled by contractor using dual wall centre return drill pipe and the remaining five holes (1195 feet) by the Geology Departments B-50 mobile drill using single wall pipe. Collected data correlated well for those holes designed to increase the confidence level of present geological information in areas of planned Truck/ Shovel pits. Eleven holes (R.H. 1050-1054, 1063-1068) were collared sufficiently high in the stratigraphic section to intersect "I" seam. Three of these holes (R.H. 1050-1052) were specifically designed to check the location and correlation of seams above "I". A multiple coal seam horizon ("J") exists from 100-200 feet above "I" seam with individual seam thicknesses up to nineteen feet. Seam "K", intersected in rotary holes 1051 and 1052 appears to be located 150-200 feet stratigraphically above the "J" seam horizon and averages sixteen feet in thickness. Coal quality for "K" seam in rotary hole 1051 is similar to the average coal quality analysis of 15 seam on Eagle Mountain. The large stratigraphic interval intersected above "K" seam which is virtually non-coal bearing (500 feet in R.H. 1050), in conjunction with the limited coal quality data, suggests that "K" seam is the Greenhills corelative of 15 seam. Additional data is required to prove or disprove this assumption.

References: (i) Illustration No. 8 - Greenhills Upper Seams Area: Geology Map

References: (ii) Illustration No. 9 - Greenhills Upper Seams Area: Longitudinal Section

Twenty-one rotary holes (R.H. 1075-1084, 1045-1047, 1095-1102) were drilled in the Burnt Ridge area of Greenhills between Sections 479, 500N and 482,000N; 5128 feet in fourteen dual wall 4 7/8" rotary holes and 1598 feet in seven single wall 3 7/8" rotary holes. This work provided sufficient additional data to design further Truck/Shovel and dragline cuts involving seams D, E, and F south of the present mining area, and an additional 1.3×10^6 L.T.R.C. were added to proven reserves. Coal quality data is similar to that as indicated by previous drilling. The Burnt Ridge area shows typical steepening of the coal seams as they approach the vicinity of the Erickson Fault. High angle reverse faults are common.

References: (i) Illustration No. 10 - Greenhills South: Burnt Ridge Extended Area

(ii) Illustration No. 11 - Greenhills Section 480,500 N

(iii) Illustration No. 12 - Greenhills Section 482,000 N

Cost of Greenhills program $143,174

F. LAKE MOUNTAIN

Eight centre return rotary holes (4,150 feet) were completed to augment seam information based on sparse preliminary drilling done in 1970. To minimize environmental damage and reclamation efforts the path of access roads were logged prior to drilling activities. Details of work completed, data accumulated and interpretation of results are contained in the appended geological report.

References: Appendix 2(d) - Geological Report: Lake Mountain

Cost of Lake Mountain program $57,275

G. ELK VALLEY

Two centre return rotary holes (EV-7 & EV-8) were completed in the Britt Creek- Osborne Creek area of the Elk Valley to test for the coal bearing portion of the Kootenay Formation in this region. Rotary hole EV-7, collared adjacent to the Britt Creek sub-station of the Kan-Elk Power Line, penetrated 140 feet of overburden before reaching bed rock. The hole had to be stopped at 523 feet as the compressor could no longer unload the hole due to the large volume of water

encountered. Seven separate coal seams from 3 feet to 12 feet (averaging 6 feet) were intersected. Positive correlation with seams on the east limb of the Greenhills syncline is not possible by comparing radiation logs; however, coal quality data suggests that the seams occur within the upper part of the coal bearing sequence.

Rotary hole EV-8, collared on the Kan-Elk Power Line road approximately 8000 feet north of EV-7, reached bedrock at 44 feet. This hole was stopped at 514 feet due to high water volumes after penetrating a sequence of Kootenay mudstones, siltstones, and sandstones. The few traces of impure coal intersected suggest that the hole was drilled above the coal bearing section of the Kootenay Formation.

Reference: Illustration No. 3 - 1977 Exploration and Development
General Geology Map - Elk Valley

Cost of the Elk Valley program $39,385

Submitted by:

D. L. Johnston, P. Eng.
Mine Manager

Prepared by:

P. M. Daignault
Senior Mine Geologist

:sja

IV VALUATION OF WORK

A. SUMMARIES

1. TOTAL EXPENDITURES PER TYPES OF WORK

Drilling	Dozer Work	Radiation Logs	Washibility & Assay	Geological Supervision & Mapping
$802,832.41	$56,354.76	$54,986.65	$15,127.21	$7,229.32

Adit Mining	Misc. Equip. & Supplies	Topographic Maps	Camp Costs	Truck Rentals
$15,378.52	$10,033.50	$6,985.00	$67,204.15	$9,911.33

TOTAL EXPENDITURES $1,046,042.80

2. PRORATED EXPENDITURES PER INDIVIDUAL LICENSES

C.L.	344	$ 6,224.96
C.L.	340	$ 57,274.57
C.L.	356	$ 11,622.36
C.L.	359	$ 23,244.68
C.L.	360	$127,845.74
C.L.	539	$ 19,692.52
C.L.	541	$ 19,692.52
Total		$265,597.35

VALUATION OF WORK: COST STATEMENT
(Sec. 27, B.C. Reg. 436/75)

ON-PROPERTY COSTS: For period from January 1 to December 31, 19 77

1. OPERATOR'S FEES, SALARIES, AND WAGES:

	Average Number of Employees	Average Rate	Average Number of Days	Amount
Professional and technical				
Machine operators and support				
Miners				
Other Fording Personnel				$7,229.32

Total operator's costs $ 7,229.32

2. CONTRACTORS AND CONSULTANTS:

Name	Service	Contract Amount
Refer to attached List of "Contractors and Consultants"		$935,700.67

Total contractor and consultant costs $ $935,700.67

3. EQUIPMENT AND INSTRUMENTS USED: Owned ____ Rented ____

Type	Rented From	Amount
Bore hole Survey tool	Sperry-Sun of Canada Limited	$3,494.41
Compressor	Airpro Equipment Limited	$ 862.76
Air Fan	Nelson Machinery Company Ltd.	$ 231.62

Total equipment and instrument rentals $ 4,588.79

4. FIELD CAMP COSTS:

		Amount
Food	Cal Van Canus Catering Services Limited	$67,204.15
Accommodation		
Fuel		
Other		

Total field camp costs $ 67,204.15

5. SAMPLING, ANALYSIS, AND TESTING:

Service	Performed by	Amount
Washability & Analysis	Birtley Engineering	
Note: See "Contractors & Consultants ($15,608.95)		

Totals, samplings, analysis, and testing $

6. SUPPLIES AND MATERIALS COSTS:

		Amount
Process supplies	poly bags, wire ties, tags, etc.	$ 4,023.81
Operating and maintenance supplies	truck repairs, insurance	$ 6,053.53
Office and technical supplies	and repairs to Widco Machine	$ 966.02
Other supplies and materials	Drill casing & supplies and repairs to equipment.	$10,365.24

Total, supplies and materials $ 21,408.60

7. TRANSPORTATION COSTS (Ground transportation details):

Vehicles	Owner	Rental Rate	Amount
3 - 3/4 ton 4x4's	Rentway Canada Limited		$9,911.33

Air support details:

Aircraft Type	Owner	Charter

Total transportation costs $ 9,911.33

8. RECLAMATION WORK:

$

9. TRAVEL EXPENDITURES (operator's costs only):

Number of Personnel	Number of Trips	Amount

Total travel expenditures $

Total costs $ 1,046,042.80

(Secs. 28 and 29, B.C. Reg. 436/75)

OFF-PROPERTY COSTS: Period from ..... to ....., 19.....

	Amount
(*a*) Logistics and field support	$
(*b*) Technical and feasibility studies	
(*c*) Preparation of reports	
(*d*) Supplies and services	
(*e*) Mobilization and demobilization of equipment	
(*f*) Travelling expenses (Itemize)	

Total $

Supporting Cost Statements Attached

	Amount
Refer to attached "Supporting Cost Statement and Invoice List".	

Total supporting costs $

SUMMARY

On-property costs	$ 1,046,042.80
Off-property costs	$
Total costs	$ 1,046,042.80

Statement of costs verified by

(Date) (Signature and position)

ATTACHMENT TO "VALUATION OF WORK: COST STATMENT"

2. CONTRACTORS AND CONSULTANTS

NAME & ADDRESS	SERVICE	CONTRACT AMOUNT
- Roke Oil Enterprises Ltd., 516 Moraine Road, N. E., Clagary, Alberta T2A 2P2	Radiation Logging	$ 54,986.65
- SDS Drilling Limited, 4636 - 1 Street, S. E., Calgary, Alberta T2G 2L3	Drilling Contractor	$644,481.08
- Tonto Drilling Company, 1215 West 7th Avenue, Vancouver, B. C. V6H 1B7	Drilling Contractor	$144,673.97
- Hollowink Contracting Ltd., Box 1274, Fernie, B. C. VOB 1MO	Bulldozer Rental	$ 40,745.81
- Jamesfield Construction Ltd., 1321 Spruce Drive, Cranbrook, B. C. V1C 2L6	Bulldozer Rental	$ 15,608.95
- G. J. Ackels Limited, Fernie, B. C. VOB 1MO	Water Haulage	$ 3,750.00
- Birtley Engineering (Canada) Ltd., 5112 - 3 Street, S. E., Calgary, Alberta T2H 1J6	Sample Processing	$ 15,127.21
- Walter Fuchs, Box 897, Coleman, Alberta	Adit Mining	$ 9,342.00
- McElhanney Surveying and Engineering Limited, # 200 - 1200 West Pender, Vancouver, B. C. V6E 2T3	Topographic Maps	$ 6,985.00

ATTACHMENT TO "SUPPORTING COST STATEMENTS"

Roke Oil Enterprises Limited	$ 54,986.65
Tonto Drilling Company	$ 144,673.97
SDS Drilling Limited	$ 644,481.08
Hollowink Contracting Limited	$ 40,745.81
Jamesfield Construction Limited	$ 15,608.95
Ackels, G. J.	$ 3,750.00
Rentway Canada Limited	$ 9,911.33
Widco (Canada) Sales and Services Limited	$ 448.83
Cominco	$ 743.35
Kits Camera	$ 131.24
Advance Plastics	$ 705.15
Nelson Daily News	$ 209.72
Simplex Burcraft Industries	$ 78.55
Sperry Sun of Canada Limited	$ 3,494.41
Russel Steel Limited	$ 4,995.84
Elk Valley Building Supply Limited	$ 95.10
Airpro Equipment Limited	$ 862.76
Bossio Engineering Heavy Hauling	$ 113.75
Birtley Engineering (Canada) Limited	$ 15,127.21
Fuch, Walter	$ 9,342.00
Double K Builders Supply	$ 86.94
McElhanney Surveying	$ 6,985.00
Nelson Machinery Company Limited	$ 231.62
Lloyd Bag Company Limited	$ 147.90
Grand and Toy	$ 100.45
Twister Pipe	$ 873.33
BCI Limited	$ 111.47
Atlas Copco	$ 56.23
Department of Mines and Resources	$ 13.25
Conmet Deparment Supply and Services	$ 8.00
CIL	$ 1,489.72
Explosives Limited	$ 96.19
Cal - Van Canus Catering Services Limited	$ 67,204.15
Coles Insurance	$ 3,300.00
TOTAL	$1,031,209.90

INVOICE LIST

COMPANY	INVOICE NOS.
Ackels, G. J. Limited	1057
Airpro Equipment Limited	ER 1199, ER 1233, MO 6009.
Bossio Heavy Hauling	1375
Birtley Engineering (Canada) Ltd.	0866, 0880.
Fuchs, Walter	1
Jamesfield Construction Limited	50, 51, 48, 61, 69, 60, 62, 38.
Hollowink Construction Limited	221, 261, 247, 292, 278, 308, 344, 308, 316, 315, 341.
Double K Builders Supply	56055
McElhanney Surveying and Engineering Limited.	9020583
Nelson Machinery Company Limited	11302, 11571.
Roke Oil Enterprises Limited	1116, 1115, 1107, 1124, 1111, 1119, 1138, 1143, 1147, 1165, 1172, 1184, 1189, 1195, 1134, 1131.
Rentway Canada Limited	48097, 49851, 49852, 51805, 51814, 53706, 53714, 53705, 55820, 55821, 55829, 57815, 57816, 57824, 59781, 59766, 61963.
SDS Drilling Limited	0018, 0028, 0031, 0020, 0030, 0029, 0019, 0016, 0002, 00299, 0001, 000298, 000297, 0043, 0044, 0048, 0045, 0046, 0052, 0051, 0049, 0067, 0068, 0074, 0071, 0073, 0075, 0076, 0077, 0072, 0089, 0087, 0090, 0118, 0119, 0117, 0116, 0015, 0120, 0086, 0121, 0099.
Sperry Sun of Canada Limited	CO 7442, CO 7224, CO 7364, C) 7562.
Tonto Drilling Company	4131C, 4134C, 4138C.
Widco Canada Sales and Services Ltd.	1349, 1335.
Lloyd Bay Company Limited	759
Grand and Toy	40-639395, 40-58075, 40-58062.
Kits Camera	4867
Elk Valley Building Supply	C-7483
Simplex Burcraft	09
Twister Pipe	34094
Russel Steel	0409941
Nelson Daily News	2916, 2574
British Columbia Industries Ltd.	19789, 86935

Invoices List con't.

Atlas Copco	38433
Supply and Services	326536-6
Department of Energy, Mines, and Resources	3021122
Explosives Limited	20740, 21019
Canadian Industries Limited	073-81662, 073-81657, 073-81664, 073,81455.
Coles Insurance Agencies	39634, 39693
Advance Plastics	4197, 006232

COST REFERENCE NO.

Cal-Van Canus Catering Services Limited

1 - 19 inclusive

Expense Account

Cominco - 1, 2, 3, 4.

B - CAPITAL COST CODE LISTINGS

MONTH	DIAMOND DRILLING FOOTAGE RATE ----100	DIAMOND DRILLING DAY WORK & SUPPLIES ----100	ROTARY DRILLING FOOTAGE RATE ----150	ROTARY DRILLING DAY WORK & SUPPLIES ----150	BULLDOZER WORK ----200	GEOL. SUPERVISION ----300	SURVEYING ----400	TRUCK RENTALS ----500	ASSAYS ----600	MISC. EQUIPMENT (CASING, SAMPLE BAGS etc.) ----700	RADIATION LOGS ----800
	$ 20,603.09 TONTO INV # 41310	$ 41.42 SERVICES OPERATOR			$ - 881.20 1976 CHARGE CREDIT	$ 1,729.72 STAFF CJR	$ 50.00	$ 528.75		$ 940.00 TONTO INV # 41310	$ 1,550.00 1976 CHARGE
		$ 3,750.00 ACKELS INV # 1057								$ - 78.74 CREDIT TONTO	
								$ 646.07			
	$ 21,638.33 TONTO INV # 41340				$ 2,807.54 HOLLOWINK INV. #247					$ 68.47 FUEL	$ 1,219.00 ROKE INV # 1107
										$ 1,860.00 CAL-VAN TONTO R&B	
										$ 67.50	$ 832.00 ROKE INV # 1115
	$ 32,310.35 TONTO INV # 41380				$ 2,122.10 HOLLOWINK INV # 261					$ 2,130.00 CAL-VAN TONTO R&B	
										$ 3,093.09 TONTO INV # 41340	$ 910.00 ROKE INV # 1116
										$ 1,578.75 HOLLOWINK INV # 26	
										$ 535.00 HIRPOO INV # ER 1199	$ 757.75 ROKE INV # 1119
										$ 72.76 NELSO MACH # 11302	
										$ 128.40 NELSO MACH # 11571	$ 564.00 TONTO INV # 41380

MONTH	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER WORK	GEOL. SUPERVISION	SURVEYING	TRUCK RENTALS	ASSAYS	MISC. EQUIPMENT (CASING, SAMPLE BAGS etc.)	RADIATION LOGS
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES							
	-----100		-----150		-----200	-----300	-----400	-----500	-----600	-----700	-----800
										$ 9,342.00 FUCHS	
										$ 7,601.54 TONTO INV # 4138C	
										$ 240.00 CAL-VAN FUCHS	
										$ - 235.60 CREDIT R&B	
										$ 120.38 FC 6141	
										$ 95.10	
										$ 11.54	
										$ 5.11	
										$ 53.73	
										$ 2.50	
										$ 186.04	
										$ 15.00	
										$ 2.00 SUPPLIES	
										$ 171.20	
										$ 24.99 FC 31572	
										$ 356.21 SPERRY SUN	

P 3070 --- EAGLE MT. BLOCK II EXT. 1977 COAL RESERVE DEVELOPMENT PROGRAM

MONTH	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER WORK	GEOL. SUPERVISION	SURVEYING	TRUCK RENTALS	ASSAYS	MISC. EQUIPMENT (CASING, SAMPLE BAGS etc.)	RADIATION LOGS
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES							
	-----100		-----150		-----200	-----300	-----400	-----500	-----600	-----700	-----800
										$ 576.73 #81070	
										$ 8.40	
										$ 23.70	
										$ 3.15	
										$ 10.02	
										$ 1.24	
										$ 228.85 SUPPLIES (04)	
										$ 605.19 CIL	
										$ 489.99 CON. INDUST LTD.	
										$ 394.54 F-07-027	
										$ 103.55 WAREHOUSE	
										$ 179.91 MILLER & BROWN	
										$ 301.00 COST COLLECTION JULY	
										$ - 269.80 R&B PAYMENT TONTO	

P 3270 --- EAGLE MT. BLOCK II EXT. 1977 COAL RESERVE DEVELOPMENT PROGRAM

MONTH	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER WORK	GEOL. SUPERVISION	SURVEYING	TRUCK RENTALS	ASSAYS	MISC. EQUIPMENT (CASING, SAMPLE BAGS etc.)	RADIATION LOGS
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES							
	-----100		-----150		-----200	-----300	-----400	-----500	-----600	-----700	-----800
										$ 45.39	
										$ 272.85 CHG. 58229	
										$ 5.40 AIRPRO. #M06009	
										$ 322.36 AIRPRO #BR1233	
										$ 1,470.00 CAL-VAN FUCHS R&B	
										$ 7,563.60 BIRTLEY #0866	
										$ 325.00 SPERRY SUN #07442	
										$ 909.58 HOLLOWINK INV. #278	
										$ 7563.61 BIRTLEY #0880	
										$ 25.96 NELSON'S FC6046	
										$ 120.38 JOHNSON BROS.	
										44.59 KIKI & SONS	

P 3070 --- EAGLE MT. BLOCK II EXT. 1977 COAL RESERVE DEVELOPMENT PROGRAM

DRILLING CONTRACTOR	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER WORK	GEOL. SUPERVISION	SURVEYING	TRUCK RENTALS	ASSAYS	MISC. EQUIPMENT (CASING, SAMPLE BAGS etc.)	RADIATION LOGS
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES							
	------100		------150		-----200	-----300	-----400	-----500	-----600	-----700	-----800
										$ 568.68 MILLAR & BROWN	
										$ — 54.25 CAL-VAN CREDIT	
										$ — 140.60	
										$ 327.43 W. H. SHAW EXPENSE ACC.	
										$ 655.06 CHARGE FROM 9B229	
										$ 447.51	
										$ 15.76	
										$ 576.73	
										$ 695.50 COST COLLECTION AUG.	
										$ 3 300.00 COLES INSURANCE	
										$ 890.00 HOPE FREIGHT	
										$ 347.75 SPERRY SUN	
										$ 66.88 KIMI & SONS	

P 2070 --- EAGLE MT. BLOCK II EXT. 1977 COAL RESERVE DEVELOPMENT PROGRAM

HOLE	CASED DRILLING		ROTARY DRILLING		BULLDOZER WORK	GEOL. SUPERVISION	SURVEYING	TRUCK RENTALS	ASSAYS	MISC. EQUIPMENT (CASING, SAMPLE BAGS etc.)	RADIATION LOGS
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES							
	----100		----150		----200	----300	----400	----500	----600	----700	----800
										$ 51.01 CHARGE FROM 58229	
										$ 40.57 COST COLLECTION OCT.	
										$ 1,120.36 RENTWAY	
										$ 345.75 SPERRY SUN	
										$ 15.66 ATLAS COPCO	
										$ 764.60 RENTWAY.	
TOTAL	$ 74,551.77	$ 3,791.42			$ 4,048.44	$ 1,729.72	$ 50.00	$ 528.75		$ 59,754.08	$ 5,832.75

$ 150,256.93 GRAND TOTAL

DE SOTO --- EAGLE MT. BLOCK II EXT. 1977 COAL RESERVE DEVELOPMENT PROGRAM

MONTH	DRILLING W077 301 FOOTAGE RATE	DRILLING W077 301 DAY WORK	RADIATION LOGS W 077 302	ASSAYS W 077303	GEOLOGICAL SUPERVISION W 077 304	MISCELLANEOUS SERVICES W 077 305
	$ 15,136.90 SDS INV. # 0002		$ 1,111.00 ROKE INV. # 1107			$ 692.38 SDS INV. # 000297
	$ 2,268.70 SDS INV # 0001 & 000299		$ 2,222.25 ROKE INV. # 1111			$ 1,965.00 CAL-VAN SDS R & B
	$ 3,500.00 SDS INV. # 000298		$ 1,393.00 ROKE INV. # 1116			$ 2,637.00 CAL-VAN SDS R & B
	$ 14,992.70 SDS INV. # 0019		$ 976.50 ROKE INV. # 1119		$ 863.29 COST COLLECTION	$ - 248.90 R & B SDS PAYMENT
	$ 27,406.30 SDS INV. # 0031	$ 353.62 COST COLLECTION				$ - 554.49 R & B SDS PAYMENT (-334.10 & -220.39)
	$ 15,229.90 SDS INV. # 0020		$ 580.00 SDS INV. # 0031			$ 1,740.00 CAL-VAN SDS R & B
	$ 19,645.00 SDS INV. # 0043	$ 229.61 COST COLLECTION (1080, 1976 1 & 21.20)				$ 3,050.00 CAL-VAN SDS R & B
	$ 9,102.00 SDS INV. # 0044		$ 1,572.00 ROKE INV. # 1124			$ 467.50 HOLLOWINK INV # 278
	$ 10,426.00 SDS INV. # 0074	$ 7.64 COST COLLECTION (1.80 & 5.84)	$ 1,845.50 ROKE INV. # 1147			$ 1,672.00 CAL-VAN SDS R & B
	$ 7,343.50 SDS INV. # 0075		$ 282.00 ROKE INV. # 1165			$ - 380.00 COST COLLECTION
	$ 7,650.10 SDS INV. # 0118					$ - 205.20 COST COLLECTION
	$ 11,356.40 SDS INV. # 0120					$ 1.74 COST COLLECTION
	$ - 618.80 SDS CREDIT					$ 93.13 COST COLLECTION.

3/10/17 CLODE PIT AREA 1977 DRILLING PROGRAM

	DRILLING W077 301		RADIATION LOGS	ASSAYS	GEOLOGICAL SUPERVISION	MISCELLANEOUS SERVICES	
	FOOTAGE RATE	DAY WORK	W 077 302	W 077 303	W 077 304	W 077 305	
TOTAL	$ 143,438.40	$ 590.87	$ 10,382.25		$ 863.29	$ 10,930.16	$ 166,204.97

GRAND TOTAL

3H00 17 CLODE PIT AREA 1977 DRILLING PROGRAM

MONTH	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER RENTAL	GEOL. SUPERVISION & CORE LOGGING	SURVEYING	TRUCK RENTAL	ASSAYS & WASHABILITY TESTS (CORE)	MISC. EQUIPMENT, SUPPLIES & SERVICES	RADIATION LOGS	GEOTECHNICAL CONSULTANT SERVICES (PIEZOMETER INSTALLATIONS)
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES	----- 200	-----300	----- 400	-----500	----- 600	-----700	----- 800	----- 900
	----- 150		------100									
	$ 23,049.36 TONTO INV.# 4131C		$ 1,360.00		$ 1,348.98 HOLLOWINK INV.# 221	$ 849.33				$ 59.55 COST COLLECTION	$ 2,590.00 ROKE INV# 1107	$ 86.54 DOUBLEK BUILDERS CEMENT INV# 560SS
	$ 31,402.13 TONTO INV# 4134C		$ 10.50 $ 108.80 MISC.		$ 9,123.04 HOLLOWINK INV.# 247	$ 3,058.47				$ 273.00 CORE BOXS CARPENTERS & PHOTOGRAPHY	$ 3,157.00 ROKE INV# 1111	$ 893.00 TONTO INV# 4131C
	$ 517.00 TONTO INV # 4138C		$ 1,090.60 SDS INV.# 0002		$ 2,287.93 HOLLOWINK INV.# 261	$ 93.20				$ 53.04 REPAIR & SUPPLIES	$ 4,031.75 ROKE INV # 1116	$ 470.00 TONTO INV.# 4134C
			$ 37,951.20 SDS INV# 0001 & 000299		$ 175.00 JAMES FIELD INV# 50	$ 25.09				$ 53.19 W.H. SHAW EXPENSE ACC.	$ 282.00 TONTO INV.# 4134C	$ 141.00 TONTO INV # 4138C
			$ - 291.90 SDS PAYMENT		$ 100.51 COST COLLECTION	$ 93.00				$ 291.90 S.D.S INV.# 000297	$ 400.00 SDS INV.# 0015	
			$ 18,708.20 SDS INV # 0019		$ 69.31 COST COLLECTION	$ 845.33				$ 142.66 COMINCO	$ 593.25 ROKE INV. # 1131	
			$ 25,796.00 SDS INV.# 0018		$ 196.19 JAMES FIELD # 62					$ 157.76 COST COLLECTION	$ 637.50 ROKE INV.# 1134	
			$ 16,307.50 SDS INV.# 28		$ 675.00 HOLLOWINK INV. # 315					$ - 181.42 CREDIT	$ 1,706.80 ROKE INV.# 1138	
			$ 11,891.85 SDS INV.# 20		$ 487.00 HOLLOWINK INV. #315					$ 1,860.00 CAL-VAN SDS R&B	$ 563.25 ROKE INV # 1143	
			$ 5,515.89 SDS INV.# 0043		$ 975.00 HOLLOWINK INV.# 344					$ 1,965.00 CAL-VAN SDS R&B	$ 2,991.95 ROKE INV # 1147	
			$ 5,692.63 SDS INV.# 0044		$ 78.00 JAMES FIELD R&B					$ 164.00 CARPENTERS	$ 189.00 ROKE INV.# 1189	
			$ 9,065.00 SDS INV.# 48							$ 69.44 REPAIRS		

P 3460--- TURNBULL MT. AREA

1977 COAL RESERVE DEVELOPMENT PROGRAM

MONTH	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER RENTAL	GEOL. SUPERVISION & CORE LOGGING	SURVEYING	TRUCK RENTAL	ASSAYS & WASHABILITY TESTS (CORE)	MISC. EQUIPMENT, SUPPLIES & SERVICES	RADIATION LOGS	GEOTECHNICAL CONSULTANT SERVICES (PIEZOMETER INSTALLATION)
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES								
	-----150		-----100		-----200	-----300	-----400	-----500	-----600	-----700	-----800	-----900
				# 1,290.00 SDS INV. # 49						# 10.54 REPAIRS		
				# 35,241.40 SDS INV. # 0047						# 6.50 REPAIRS		
				# 11,457.00 SDS INV. # 0074						# 375.23		
				# 3,557.15 SDS INV. # 0075						# 417.00 SDS INV. # 0016		
				# 5,039.50 SDS INV. # 0089						# 2,130.00 CAL-VAN TONTO R&B		
				# 1,877.00 SDS INV. # 0017						# 6,030.00 CAN-VAN SDS R&B		
				# 8,154.10 SDS INV. # 0120						# 1,247.82 TONTO INV. # 4134C		
				# - 490.45 SDS PAYMENT						# 77.00 WIDCO INV. # 1349		
										# 2,897.28 CAL-VAN SDS R&B		
										# - 248.90		
										# - 235.60		
										# 356.20 SPERRY SUN		

MONTH	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER RENTAL	GEOL. SUPERVISION & CORE LOGGING	SURVEYING	TRUCK RENTAL	ASSAYS & WASHABILITY TESTS (CORE)	MISC. EQUIPMENT, SUPPLIES & SERVICES	RADIATION LOGS	GEOTECHNICAL CONSULTANT SERVICES (PIEZOMETER INSTALLATIONS)
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES								
	-----150		-----100		-----200	-----300	-----400	-----500	-----600	-----700	-----800	-----900
										$ 497.92 CASING RUSSEL STEEL		
										$ 3,270.00 CAL-VAN TONTO R&B		
										$ 59.56 FC 5035		
										$ 39.28 FC 6036		
										$ 17.08		
										$ 40.00		
										$ 190.73 FC 5034		
										$ 133.63 FC 6014		
										$ 8.46 SUPPLIES		
										$ 68.78 H. HECK EXPENSE ACC.		
										$ 52.94 S. SISKA EXPENSE ACC.		
										$ 1,500.00 CAL-VAN		

MONTH	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER RENTAL	GEOL. SUPERVISION & CORE LOGGING	SURVEYING	TRUCK RENTAL	ASSAYS & WASHABILITY TESTS (CORE)	MISC. EQUIPMENT, SUPPLIES & SERVICES	RADIATION LOGS	GEOTECHNICAL CONSULTANT SERVICES (PIEZOMETER INSTALLATIONS)
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES								
	-----150		-----100		-----200	-----300	-----400	-----500	-----600	-----700	-----800	-----900
										$ 1,750.00 CAL-VAN		
										$ 77.00 FC C674		
										$ 104.86 6607238		
										$ 19.93		
										$ - 414.20		
										$ - 763.65		
										$ - 190.00		
										$ - 269.80 R&B PAYMENTS TONTO & SDS		
										$ 34.60 S. SISKA EXPENSE ACC.		
										$ 3,768.00 CAL-VAN SDS R&B		
										$ 360.00 CAL-VAN SDS R&B		
										$ 325.00 SPERRY SUN INV. #07442		
										$ 380.00 CAL-VAN SDS R&B		
										$ 487.52 CAL-VAN SDS R&B		

P 8450--- TURNBULL MT. AREA

1977 COAL RESERVE DEVELOPMENT PROGRAM

MONTH	DIAMOND DRILLING		ROTARY DRILLING		BULLDOZER RENTAL	GEOL. SUPERVISION & CORE LOGGING	SURVEYING	TRUCK RENTAL	ASSAYS & WASHABILITY TESTS (CORE)	MISC. EQUIPMENT, SUPPLIES & SERVICES	RADIATION LOGS	GEOTECHNICAL CONSULTANT SERVICES (PIEZOMETER INSTALLATION)
	FOOTAGE RATE	DAY WORK & SUPPLIES	FOOTAGE RATE	DAY WORK & SUPPLIES								
	-----150		-----100		----- 200	-----300	----- 400	----- 500	----- 600	-----700	-----800	-----900
										$ - 364.80		
										$ - 323.00		
										- 209.00		
										$ - 190.00		
										$ 99.05		
										$ 695.50		
										$ 93.13 COST COLLECTION AUG - SEPT.		
										$ 347.15 SPERRY SUN		
										$ - 49.80 SDS PAYMENT R&B		
										$ 1,568.00 CAL-VAN SDS R&B		
										$ - 49.80 SDS PAYMENT R&B		
										$ 347.75 SPERRY SUN		
TOTAL	$ 54,948.49		$ 201,331.57		$ 15,515.96	$ 4,968.42				$ 31,486.31	$ 17,142.50	$ 1,590.84
											$ 327,004.59 GRAND TOTAL	

P 5440--- TURNBULL MT. AREA

1977 COAL RESERVE DEVELOPMENT PROGRAM

MONTH	DRILLING		BULLDOZER	BACK-HOE	GEOLOGICAL	SURVEYING	TRUCK	ASSAYS	MISC.	RADIATION	
	FOOTAGE RATE	DAY WORK	WORK	WORK	MAPPING, SUPERVISION		RENTALS		EQUIPMENT (CASING, SAMPLE BAGS etc.)	LOGS	
	-----100		-----200	-----250	-----300	-----400	-----500	-----600	-----700	-----800	
	$ 3,500.00 SDS INV # 000298		$ 2,237.00 HOLLOWINK #261				$ - 364.56 CREDIT ON RENTWAY VEHICLE 98200		$ 3,702.08 CAL-VAN SDS R&B	$ 879.00 ROKE # 1131	
	$ 32.97 FORDING OPERATOR		$ 2,198.00 JAMES FIELD #48				$ 231.87		$ 1,248.96	$ 547.75 ROKE # 1134	
	$ 8,495.50 SDS INV # 0051		$ 27.18 COST COLLECTION				$ 412.26		$ 19.63	$ 1,374.80 ROKE # 1143	
	$ 6,374.00 SDS INV # 0068		$ 7,730.75 JAMES FIELD #51				$ 331.58		$ 8.53	$ 1,860.35 ROKE # 1147	
	$ 15,280.00 * SDS # 0073		$ 4,611.61 HOLLOWINK #278				$ 355.26		$ 95.37 COST COLLECTION	$ 696.50 ROKE INV # 1165	* CHARGED TO 1976 COST CODE P328
	$ 2,807.00 * SDS # 0074		$ 46.21				$ 365.76		$ 82.84 FC 6041	$ 1,316.75 ROKE # 1172	
	$ 6,193.00 **		$ 80.41 COST COLLECTION AUG				$ 468.52 AUG COST COLLECTION		$ 83.41 FC 6106	$ 1,181.50 ROKE # 1184	** CHARGED TO 1976 COST CODE P329
			$ 400.88 JAMES FIELD #60				$ - 21.59 COST COLLECTION CREDIT FOR 98200		$ 6.00		
	$ 2,591.00		$ 396.00 JAMES FIELD #65				$ 544.52 COST COLLECTION OCT.		$ 135.60		
			$ 52.00 JAMES FIELD R&B				$ 456.56 COST COLLECTION NOV.		$ 1.54 REPAIR & SUPPLIES		
	$ 17,652.10 SDS # 0072								$ 5,760.00 CAL-VAN SDS R&B		
	$ 23,128.00 SDS # 0072								$ 4,132.00 CAL-VAN SDS R&B		
									$ 2,332.00 CAL-VAN SDS R&B		
									$ 93.13 COST COLLECTION SEPT		

P5410--- CASTLE MT. 1977 EXPLORATION PROGRAM

MONTH	DRILLING		BULLDOZER	BACK-HOE	GEOLOGICAL	SURVEYING	TRUCK	ASSAYS	MISC.	RADIATION	
	FOOTAGE RATE	DAY WORK	WORK	WORK	MAPPING, SUPERVISION		RENTALS		EQUIPMENT (CASING, SAMPLE BAGS etc.)	LOGS	
	-----100		-----200	-----250	-----300	-----400	-----500	-----600	-----700	-----800	
		$ — 520.00 SDS #0072 ADJUSTMENT.							$ 29.47		
		$ 26,054.00 SDS #0087							934.46		
		$ 671.49 SDS #0096							157.98		
		$ 4,546.18 SDS #0115							101.86		
									$ — 543.40		
									$ — 505.40		
									$ — 414.20		
									$ 99.05 COST COLLECTION AUG.		
									$ — 323.70 SDS PAYMENT R & B		
									63.75 R. KRISHAN EXPENSE ACC.		
									$ 57.01 COST COLLECTION OCT.		
TOTAL		$ 116,806.54		$ 17,780.04			$ 2,820.58		$ 17,448.97	$ 7,856.65	$ 162,712.78 GRAND TOTAL

PEMO--- CASTLE MT. 1977 EXPLORATION PROGRAM

MONTH	DRILLING		BULLDOZER WORK	GEOL. SUPERVISION	SURVEYING	TRUCK RENTALS	ASSAYS	MISC. EQUIPMENT (CASING, SAMPLE BAGS etc.)	RADIATION LOGS
	FOOTAGE RATE	DAY WORK							
	-----100		-----200	-----300	-----400	-----500	-----600	-----700	-----800
	$3,500.00 SDS INV. # 0002298 $43,708.00 SDS INV. # 0030 $16,595.00 SDS INV. # 0029		$782.00 JAMES FIELD, INV. # 38 $485.27 HOLLOWINK INV. # 247 $5,023.75 HOLLOWINK INV. # 261	$481.18		$-364.56 CREDIT ON RENTWAY VEHICLE 98200 $231.87 $412.36 $331.57 $355.26 $365.76		$420.25 $1,248.96 $19.64 $8.54 $80.00 $95.36	$1,898.75 $270.75 ROKE INV. # 1115 $3,607.75 ROKE INV. # 1119
	$26,806.50 SDS INV. # 0046 $9,255.00 SDS INV. # 0045 $5,465.60 SDS INV. # 0052 $3,782.25 SDS INV. # 0071		$2,401.28 JAMES FIELD R&B			$468.63 COST COLLECTION AUG. $-21.58 COST COLLECTION SEPT. CREDIT ON 98200 $544.51 COST COLLECTION OCT. $496.96 COST COLLECTION NOV.		$753.00 CAL-VAN SDS R&B. $1,448.64 CAL-VAN SDS R&B $4,500.00 CAL-VAN SDS R&B $4,440.00 CAL-VAN SDS R&B $-95.45 SDS PAYMENT R&B $-570.01 SDS PAYMENT R&B $-535.60 COST COLLECTION AUG. $-140.60 COST COLLECTION AUG.	$2,897.50 ROKE INV. # 1124 $1,526.00 ROKE INV. # 1131

PEACE -- GREENHILLS UPPER SEAMS 1977 COAL RESERVE DEVELOPMENT PROGRAM

MONTH	DRILLING		BULLDOZER	GEOL.	SURVEYING	TRUCK	ASSAYS	MISC.	RADIATION	
	FOOTAGE RATE	DAY WORK	WORK	SUPERVISION		RENTALS		EQUIPMENT (CASING, SAMPLE BAGS etc.)	LOGS	
	-----100		-----200	-----300	-----400	-----500	-----600	-----700	-----800	
								$ 104.86 COST COLLECTION SEPT.		
								$ 93.14 COST COLLECTION SEPT.		
TOTAL	$ 109,112.35		$ 8,692.30	$ 481.18		$ 2,820.68		$ 11,866.73	$ 10,200.75	$ 143,173.99 GRAND TOTAL

PASCO --- GREENHILLS UPPER SEAMS 1977 COAL RESERVE DEVELOPMENT PROGRAM

MONTH	ROTARY DRILLING WØ 79 101		DOZER RENTAL	RADIATION LOGS	LOGGING ACCESS ROADS	MISCELLANEOUS	
	FOOTAGE RATE	DAY WORK	WØ 79 102	WØ 79 103	WØ 79 104	WØ 79 105	
	$ 10,641.70 SDS INV. # 0076		$ 1,266.67 HOLLOWINK INV. # 278	$ 595.75 ROKE INV. # 1147		$ 113.75 BOSSIO INV. #1375	
	$ 23,198.50 SDS INV. # 0089		$ 1,296.25 HOLLOWINK INV. # 292	$ 2,818.25 ROKE INV. # 1165		$ 1,552.00 CAL-VAN SDS R&B	
	$ 1,812.00 SDS INV. # 0119		$ 1,094.85 FIELD INV. # 61	$ 433.75 ROKE INV. # 1184		$ 990.00 CAL-VAN SDS R&B	
	$ 10,155.00 SDS INV. # 0116		$ 116.50 COST COLLECTION LABOUR - AUG.			$ - 190.00 COST COLLECTION	
			$ 1,170.00 HOLLOWINK INV. # 315			$ 387.80 CAL-VAN SDS R&B	
			$ 104.00 JAMES FIELD R&B			$ - 136.95 COST COLLECTION	
						$ - 145.25 SDS PAYMENT R&B	
TOTAL	$ 45,807.20		$ 5,048.27	$ 3,847.75		$ 2,571.35	$ 57,274.57 GRAND TOTAL

P 3420 700 LAKE MT. 1977 DRILLING PROGRAM

P. 1 of 1
SCALE: 1"

MONTH	DRILLING		BULLDOZER	GEOL.	SURVEYING	TRUCK	ASSAYS	MISC.	RADIATION	TOPGRAPHIC	
	FOOTAGE RATE	DAY WORK	WORK	SUPERVISION & MAPPING		RENTALS		EQUIPMENT (CASING, SAMPLE BAGS etc.)	LOGS	MAPS	
	-----100		-----200	-----300		-----500		-----600	-----800	-----900	
	$ 4563.00 SDS INV # 0084		$ 821.25 HOLLOWINK INV # 308					$ 886.40 CAL-VAN SDS R&B	$ 1550.00 ROKE INV # 1195	$ 6985.00 MCELHANNEY SURVEY & ENG. LTD.	
	$ 14409.00 SDS INV # 0093		$ 132.84 HOLLOWINK INV # 316					$ 380.00 CAL-VAN SDS R&B			
	$ 450.00 SDS INV # 0121		$ 675.00 HOLLOWINK INV # 315					$ 775.60 CAL-VAN SDS R&B			
			$ 243.75 HOLLOWINK INV # 341					- $ 160.00 SAMPLE BAGS SDS PAYMENT			
								- $ 49.80 R&B SDS PAYMENT			
								- $ 332.00 R&B SDS PAYMENT			
TOTAL	$ 19,477.00		$ 1872.84					$ 1500.20	$ 1550.00	$ 6985.00	$ 30,385.04 GRAND TOTAL

P 3430--- ELK VALLEY 1977 EXPLORATION PROGRAM

SCALE

CONFIDENTIAL

FORDING RIVER OPERATIONS

SUMMARY REPORT

1977 COAL RESERVE DEVELOPMENT PROGRAM

Janaury 27, 1978

K-FORDING RIVER 77(1)4.

Submitted by: D. L. Johnston, P. Eng.,
Mine Manager,
Fording River Operations

Prepared by: P. M. Daignault,
Senior Mine Geologist,
Fording River Operations

Coal License Owners and Numbers

Can Pac Minerals Limited: 314-334, 336-340, 342-344, 348, 353, 355-364, 510, 511, 554-560.
Total 24,325 acres.

Fording Coal Limited: 801-804, 943, 944, 964.
Total 2,765 acres.

Cominco Limited: 539, 541, 543, 545, 547, 549, 551, 553.
Total 3,200 acres.

Coal Lease Owner and Numbers

Can Pac Minerals Limited: Coal Lease Nos. 1 & 2.
Total 8,050 acres.

N.T.S. 82J2W JZW

APPENDIX 1 (a)

Energy, Mines and Resources Canada
Energie, Mines et Ressources Canada

CANMET
Canada Centre for Mineral and Energy Technology
Centre canadien de la technologie des minéraux et de l'énergie

AN INVESTIGATION OF THE COKING CHARACTERISTICS OF COAL SAMPLES FROM SEAM 12 AND SEAM 13 FROM THE ELK RIVER BASIN, CROWS NEST AREA, BRITISH COLUMBIA, SUBMITTED BY FORDING COAL LIMITED

PROJECT 03-3-1/3-10

Job No. 3127R
(Preliminary Report)

J.G. JORGENSEN, W. GARDINER, T.A. LLOYD AND J.C. BOTHAM
COAL RESOURCE AND PROCESSING LABORATORY

OCTOBER 1977

This report relates essentially to the samples as received.

ENERGY RESEARCH PROGRAM
ENERGY RESEARCH LABORATORIES
REPORT ERP/ERL (CF) 77-87 (TR)

CONFIDENTIAL

AN INVESTIGATION OF THE COKING CHARACTERISTICS OF COAL SAMPLES FROM SEAM 12 AND SEAM 13 FROM THE ELK RIVER BASIN, CROWS NEST AREA BRITISH COLUMBIA, SUBMITTED BY FORDING COAL LIMITED

Project 03-3-1/3-10

by

J.G. Jorgensen*, W. Gardiner*, T.A. Lloyd* and J.C. Botham**

INTRODUCTION

This report deals with an investigation of the coking characteristics of cleaned coal samples taken from Seam 12 and Seam 13 located in the Elk River Basin, Crows Nest Area of British Columbia. The project was initiated by W.S. Wilson, Manager Marketing, Fording Coal Limited, Calgary, Alberta. The covering letter is included in Appendix I.

The scope of the investigation comprises technical-scale carbonization tests in the 12-inch movable-wall coke oven and related analyses and tests relevant to a basic understanding of the quality of the coal from Seam 12 and Seam 13.

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*Heads, Petrography Section, Carbonization Operations, and Coal Treatment & Rheological Section, respectively, **Manager, Coal Resource and Processing Laboratory, Energy Research Laboratories, Canada Centre for Mineral and Energy Technology, Department of Energy, Mines and Resources, Ottawa, Canada.

The relevant target conditions for testing the samples under review were as follows:

Coal pulverization	- 80% minus 1/8 inch (nominal)
Oven bulk density	- 51 lb/ft^3 (dry basis)
Flue temperature	- initial 1650°F, electrically heated at rate of 35°F/hr to maximum of 1950°F
Coking time	- coking deemed complete when centre temperature reached 1850°F and coke pushed 1/2 hr after reaching this temperature

All cokes discharged from the oven are dropped from a height of 10 feet to simulate handling of the coke in commercial practice. The cokes are dried prior to screening and testing.

The chemical analyses and coal and coke testing conform as closely as possible to ASTM test methods. Standard test method designations, other than chemical analysis, are given in the references. The analytical and test data are presented in Tables 1 to 5. A plot of the potential stability factors derived from petrographic analysis is shown in Figure 1 and a plot of the relationship between reflectance and fluidity (MOF diagram) appears in Figure 2.

TABLE 1 Chemical Analyses of Component Coals

Identification		
Laboratory Number	3066-77	3067-77
Description	J-6528 Seam 12 Adit 18	J-6529 Seam 13 Adit 17
Classification		
Rank (ASTM)	mvb	mvb
International System	534	533
Specific Volatile Index	174	180
Carbon (dmmfb) %	87.1	87.6
Proximate Analysis (db)		
Ash %	7.4	8.3
Volatile Matter %	26.3	25.9
Fixed Carbon %	66.3	65.8
Gross Calorific Value (db)		
Btu per pound	14060	14050
Ultimate Analysis (db)		
Carbon %	80.0	79.5
Hydrogen %	4.7	4.8
Sulphur %	0.78	0.55
Nitrogen %	1.6	1.6
Ash %	7.4	8.3
Oxygen (by difference) %	5.5	5.2
Ash Analysis (db)		
SiO_2 %	53.7	59.1
Al_2O_3 %	30.2	29.0
Fe_2O_3 %	6.2	6.2
TiO_2 %	1.5	1.6
P_2O_5 %	3.0	1.2
CaO %	2.6	1.0
MgO %	0.5	0.6
SO_3 %	-	-
Na_2O %	0.1	0.1
K_2O %	1.2	1.5

TABLE 2 Physical Tests and Fusibility of Ash of Component Coals

Identification				
Laboratory Number			3066-77	3067-77
Description			J-6528 Seam 12 Adit 18	J-6529 Seam 13 Adit 17
Coal Pulverization				
Sieve Analysis				
Passing	Retained On			
	1/4 in.	%	0.5	0.6
1/4 in.	1/8 in.	%	12.1	15.5
1/8 in.	1/16 in.	%	19.4	23.3
1/16 in.	1/32 in.	%	18.4	21.5
1/32 in.	.....	%	49.6	39.1
Total Passing	1/8 in.	%	87.4	83.9
Grindability				
Hardgrove Index				
Fusibility of Ash				
Initial Deformation Temp. ...		°F	2700+	2700+
Softening Temp. Spherical ...		°F	2700+	2700+
Softening Temp. Hemispherical		°F	2700+	2700+
Fluid Temp.		°F	2700+	2700+

TABLE 3 Thermal Rheological Properties of Component Coals

Identification		
Laboratory Number	3066-77	3067-77
Description	J-6528 Seam 12 Adit 18	J-6529 Seam 13 Adit 17
Linear Expansion		
Bd. 52 lb/ft^3 at 2% moisture...%	+4.3	+2.8
Gieseler Plasticity		
Start .....°C	434	422
Fusion Temp. .....°C	451	435
Max. Fluid Temp. .....°C	457	459
Final Fluid Temp. .....°C	478	483
Solidification Temp. .....°C	487	488
Melting Range .....°C	44	61
Max. Fluidity .....dd/m	8.3	213
Torque .....g.in.	40	40
Dilatation		
Ti - Softening Temp. .....°C	385	375
Tii - Max. Contraction Temp. °C	443	432
Tiii - Max. Dilatation Temp. °C	478	462
Contraction .....%	28	25
Dilatation .....%	8	114
Free Swelling Index		
F.S.I.	7½	8

TABLE 4 Petrographic Analysis of Component Coals

Identification		
Laboratory Number.....	3066-77	3067-77
Description.....	Seam 12 Adit 18	Seam 13 Adit 17
Distribution of Vitrinite Types		
V-6.....%		
V-7.....%		
V-8.....%		
V-9.....%	2.2	3.8
V-10.....%	36.9	62.0
V-11.....%	31.7	10.7
V-12.....%	2.9	
V-13.....%		
V-14.....%		
V-15.....%		
V-16.....%		
V-17.....%		
V-18.....%		
Reactive Components		
Total Vitrinite.....%	73.7	76.5
Reactive Semi-fusinite (1/3)...%	3.9	3.6
Exinite.....%	0.7	2.0
Total.....%	78.3	82.1
Inert Components		
Inert Semi-fusinite (2/3).....%	7.9	7.1
Micrinite.....%	2.7	2.0
Fusinite.....%	6.9	4.1
Mineral Matter.....%	4.2	4.7
Total.....%	21.7	17.9
Petrographic Indices		
Mean Reflectance.....%	1.09-	1.05-
Balance Index.....	0.81	0.60
Strength Index.....	4.15	3.82
Stability Index.....	57.2	50.0

Test Identification Number.....	580	581	582	583
Data of Test.....	20 Sept. 1977	21 Sept. 1977	26 Sept. 1977	27 Sept. 1977
Laboratory Number.....				
Description.....	Seam 12 100%	Seam 12 100%	Seam 13 100%	Seam 13 100%
CARBONIZATION DATA				
Net Weight of Charge (wet).....lb	560.0	560.0	560.0	554.7
Moisture in Charge.....%	3.2	3.1	3.1	3.1
ASTM Bulk Density (wet).....lb/ft^3	49.5	48.5	48.8	48.8
Oven Bulk Density (db).....lb/ft^3	51.0	51.0	51.0	50.6
CARBONIZATION RESULTS				
Gross Coking Time.....hr:min	10:20	10:15	10:00	10:00
Maximum Wall Pressure.....lb/in^2	1.76	2.16	1.54	1.50
Coke Yield Actual.....%	73.9	74.9	75.5	75.6
Mean Coke size.....in	1.85	1.86	2.03	2.00
Apparent Specific Gravity.....	0.91	0.9¢	0.88	0.89
Screen Analysis of Coke (cumulative percentage retained on)				
3 inch sieve.....	2.2	3.5	4.7	5.2
2 inch sieve.....	33.0	36.4	45.6	45.9
1 1/2 inch sieve.....	74.5	71.5	82.0	79.2
1 inch sieve.....	93.9	92.9	95.0	94.9
3/4 inch sieve.....	96.1	95.0	96.3	96.3
1/2 inch sieve.....	96.8	96.1	97.1	97.2
Percentage -1/2 inch (breeze).....	3.2	3.9	2.9	2.8
Tumbler Test (ASTM)				
Stability Factor.....	54.9	54.6	51.5	52.3
Hardness Factor.....	69.2	68.9	64.2	64.6

Japanese Drum Test (JIS) (cumulative percentage retained on)

	*	**	*	**	*	**	*	**
50 mm sieve.....	9.2	0.8	10.4	1.9	8.3	0.7	6.7	0.0
25 mm sieve.....	88.2	70.9	88.5	70.6	88.9	73.4	88.2	70.7
15 mm sieve.....	93.9	83.1	94.1	82.6	93.7	81.6	94.0	82.1

(*30 revs ** 150 revs)

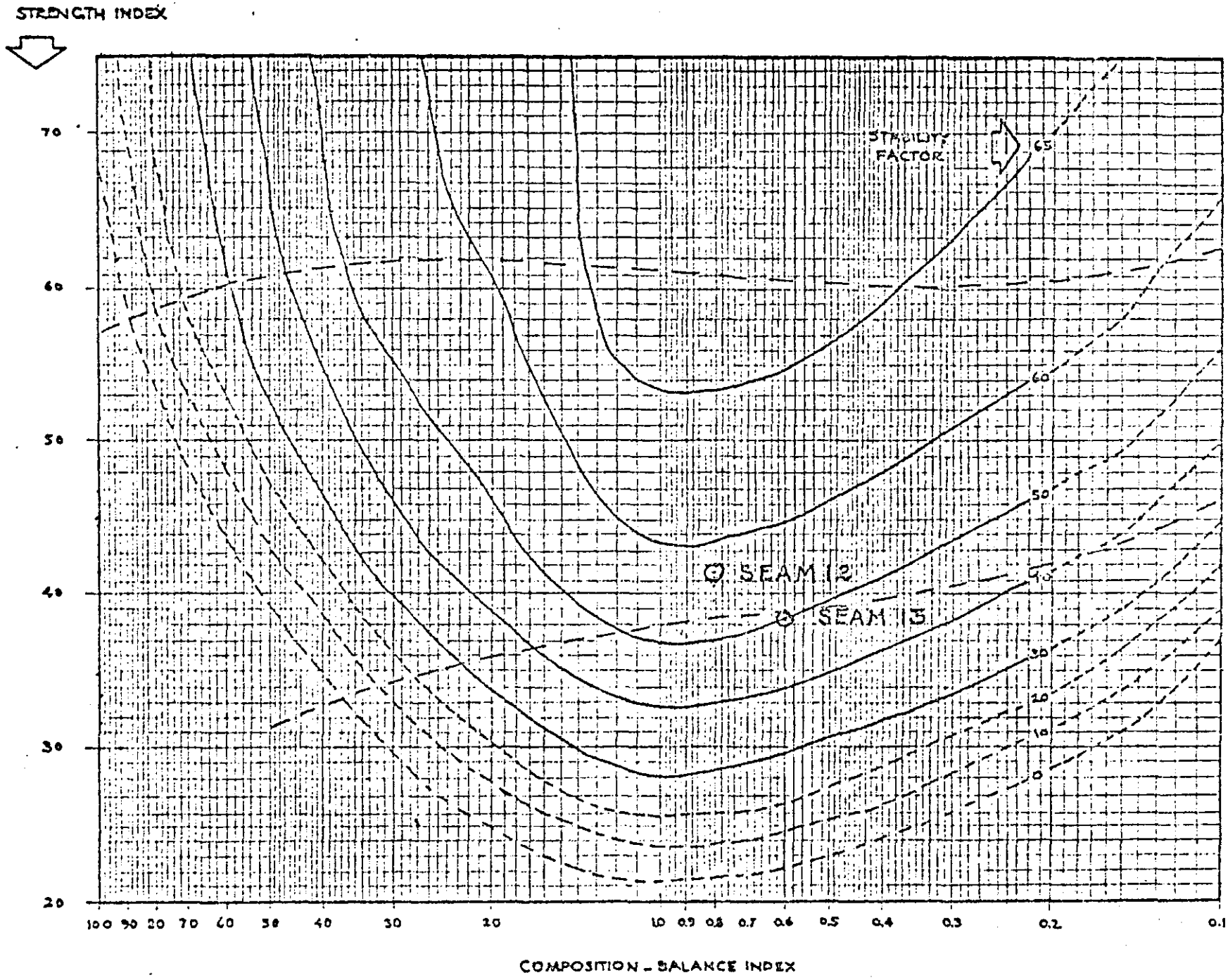
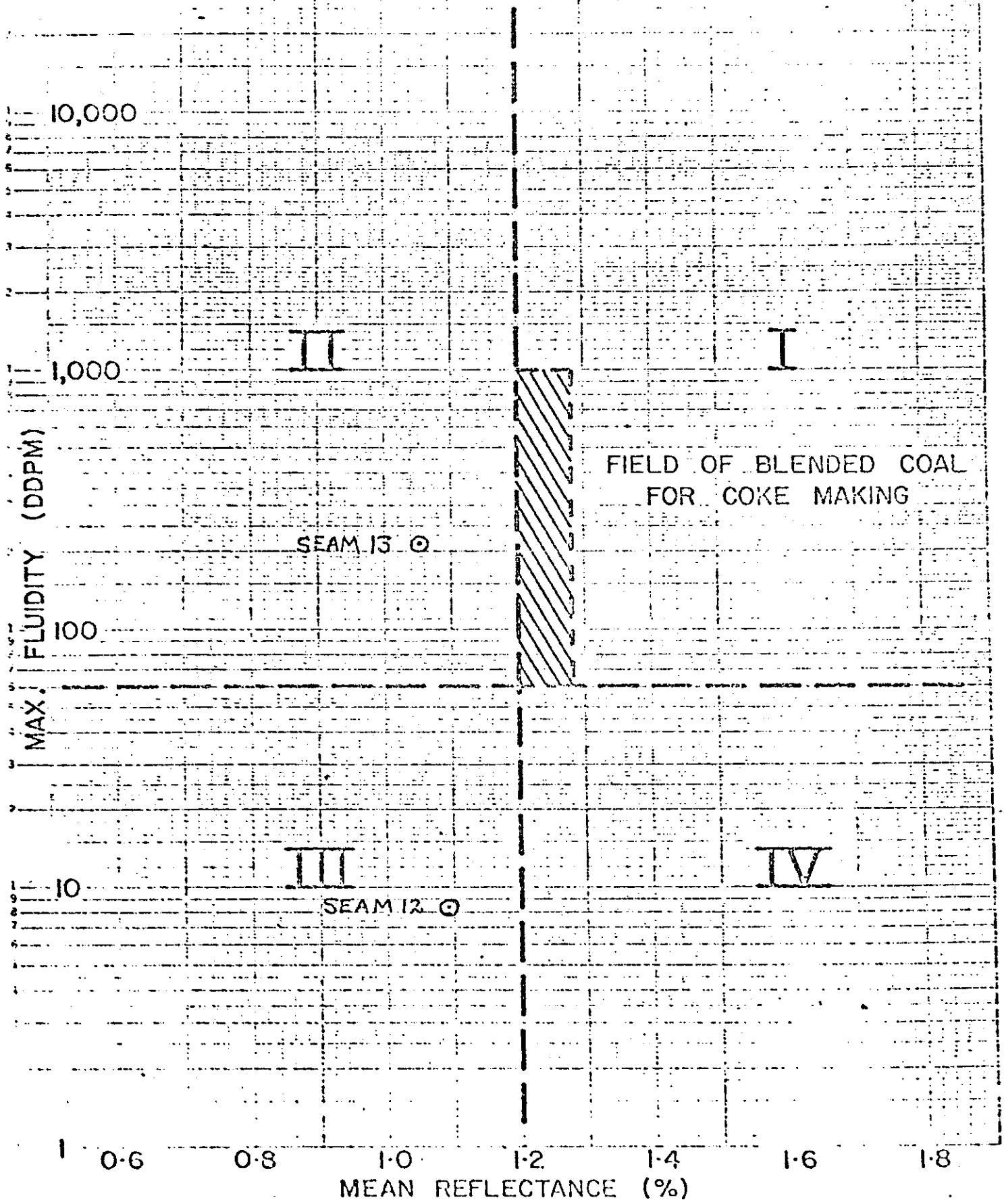


Figure 1. Plot of Potential Stability Factors of Component Coals Calculated from Petrographic Data.

Figure 2. RELATIONSHIP BETWEEN MAX. FLUIDITY AND MEAN REFLECTANCE.



ACKNOWLEDGEMENT

Acknowledgements are due to W.J. Montgomery and staff, Solid Fuels Analysis and Standardization Section, for the chemical analyses associated with the investigation.

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APPENDIX 1

Letter dated July 7, 1977 from W.S. Wilson, Manager, Marketing, Fording Coal Limited, Calgary, Alberta.

205 Ninth Avenue S.E., Calgary, Alberta T2G 0R4
(403) 264-1663

CanPac
Minerals Limited

William S. Wilson
Manager, Marketing

July 7, 1977.

Mr. J.C. Botham,
Manager Fuels Research Centre,
Energy, Mines and Resources Canada,
Canada Centre for Mineral
and Energy Technology,
555 Booth Street,
Ottawa, Ontario
K1A 0G1

Dear Jack;

To confirm our telephone conversation today on bulk samples of Seams 13 and 12 Fording Coal, the first of these samples consisting of at least 6 drums will be shipped from Calgary August 5th and the second bulk sample no later than August 19th. As we have a commitment to discuss Fording's expansion based on these seams with the Japanese Mills in late September we require the evaluation of coking properties as quickly as possible.

On each seam we require duplicate 12 inch moveable wall oven tests using 100% of each seam. We may subject to your results and advice require oven tests using seam 12 and 13 blended with reference coal. On each seam we also require the following work.

1. Classification
2. Proximate Analysis
3. Calorific Value
4. Ultimate Analysis
5. Ash Analysis
6. Grindability
7. Fusibility of Ash
8. Sole Heat Oven Test
9. Gieseler Plasticity
10. Dilatation
11. Coke Button
12. Full Petrographic Analysis

/...2

We will keep in mind your advice to ship the coal in sealed drums with plastic liners and refrain from having the samples too wet as it will slow down your work. The samples will be dispatched by the fastest method available to Ottawa.

I would appreciate your conformation of this program and estimate of the cost.

Yours sincerely,

Bill

W.S. Wilson
Manager Marketing

WSW/cr

cc: P.J.U.
P.M.D.
L.R.L.

Memorandum

For Use Within The Company Only

To P. Daignault (Use Title if Possible) Date November 2, 1977

From Bill Shaw (Use Title if Possible) File No.

Subject WEST TURNBULL GEOLOGICAL REPORT Reference

Part of the 1976 and 1977 Turnbull exploration programs were carried out to better define the "repeat seams" (R7u, R7, R5, R4, R2, R1) in the proposed Turnbull West Pit area.

The geology was mapped by traversing all linear topographic features such as stream courses and ridges. Due to the low relief and gentle slopes, more than 80% of the West Turnbull area is covered by alluvium and pleistocene deposits. Little trenching information could be obtained as a result of these deposits. Structural and stratigraphic data was mainly derived from chip samples from bore hole drilling and gamma-neutron geo-logging.

Structurally the pit area is located on the Turnbull anticline. The westerly dipping major thrust is stratigraphically present throughout the area.

The stratigraphy is characterized by interbedded siltstones and mudstones that occur above the major thrust as well as above R5 seam. R5 seam is underlain by inter-bedded siltstones and sandstones which grades to sandstone near R4 seam.

Structure

The West Turnbull structure is characterized by two structural domains; (1) the easterly dipping beds above the major thrust and (2) the Turnbull anticline below the major thrust (figures 2, 3).

The structural features can be summarized as follows:

(1) The major thrust is flat lying to the east of departure 77,000E and dips up to 26°W, to the west of 77,000E. The major thrust passes upward through the bedding over its entire length. The horizontal displacement in this area is approximately 1600 feet. (taken from sections) The rock units adjacent to the fault plane can be locally disturbed, but are usually free of any major distortion.

(2) A series of small, closely spaced thrust faults which are located immediately above the major thrust may be concordant with a later kinematic pattern. These faults appear to terminate at length along bedding surfaces where there is no stratigraphic separation.

(3) The general strike and dip of the bedding above the thrust is 315°, with an easterly dip from 8° to 25°. The bedding does not appear to be interrupted by thrusting above the 5800 feet elevation.

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Signed

APPENDIX 1 (b)

27 Oct 1977

Test Results Of Coal Samples

(Fording No. 12 . 13 Seam)

Compiled by Nippon kokan K.K.

Kobe Steel Co, Ltd.

1. Proximate Analysis, Total Sulphur, CSN and Caloritic Value

	Seam	T.M.	I.M	Ash	V.M.	F.C.	T.S	CSN	Cal	
Nippon Steel Corp.	No. 12		2.2	7.0	25.7	65.1	0.76	8½		
	No. 13		1.8	8.0	27.2	63.0	0.56	9		
Nippon Kokan K.K.	No. 12			7.3	26.4	66.3	0.80	7½	7894	
	No. 13			8.2	27.6	64.2	0.59	8½	7868	
Kawasaki Steel Corp.	No. 12	8.3		7.2	26.0	66.8	0.75	8		
	No. 13	5.8		8.1	27.2	64.7	0.55	8½		
Sumitomo Metal I. Ltd.	No. 12		1.6	7.7	25.1	65.6	0.74	7½		
	No. 13		1.4	9.0	26.6	63.0	0.54	8		
Kobe Steel Co. Ltd.	No. 12		1.95	7.3	26.1	66.6	0.75	6½		
	No. 13		1.70	8.7	27.2	64.1	0.58	7		
Nisshin Steel Co. Ltd.	No. 12			7.7	26.3	66.0	0.78	8		
	No. 13			7.8	27.6	64.6	0.57	8½		

Hard Grove Index

	Seam	
Nisshin	No. 12	117
	No. 13	86

2. Ultmate Analysis

	Seam	C	H	N	燃焼性 S	O
Nippon Steel	No. 12	81.20	4.75	1.56	0.75	4.58
	No. 13	80.26	4.91	1.45	0.55	4.68

3. Phosphorus Contents

	Seam	IN Ash	IN Coal
Nippon Kokan	No. 12	1.095	
	No. 13	0.435	
Kobe	No. 12		
	No. 13		
Nisshin	No. 12	1.234	0.095
	No. 13	0.425	0.033

4. Size Distribution and Analysis

	Seam		10	6	3	1.5	1.0	0.6	0.3	-0.3	Ave.
Kawasaki	No. 12	Weight	14.3	13.7	16.7	18.5	9.4	4.9	7.2	15.3	(4.98 mm)
		Ash	6.8	6.6	6.2	6.1	6.4	7.2	9.4	10.8	7.3
		V. M.	25.2	25.7	26.2	26.3	26.7	26.2	25.6	25.8	26.0
		C. S. N.	7	7½	7½	8	8½	8	8	6½	
	No. 13	Weight	6.2	17.1	22.4	19.8	6.5	9.9	7.7	10.4	(4.12 mm)
		Ash	9.9	9.2	7.2	6.5	6.6	7.3	9.9	11.5	8.2
		V. M.	25.2	26.4	27.6	28.2	27.8	27.8	26.8	26.4	27.2
		C. S. N.	7	8	8½	8½	8½	8½	8½	8½	

	Seam		+ 15 m/m	10	5	2.88	1.41	0.59	0.297	-0.297	
Sumitomo	No. 12	Weight		5.5	19.2	13.2	17.4	17.7	8.4	18.6	
	No. 13	Weight		5.2	17.7	15.0	19.9	20.1	8.4	13.7	

	Seam		+ 25m/m	9.52	4.0	3.0	2.0	1.0	0.15	-0.15	Ave.
Kobe	No. 12	Weight		9.0	22.9	7.1	9.7	15.5	25.5	10.3	
		Ash		7.8	6.5	6.2	6.1	6.5	8.2	11.0	7.5
		V. M.		25.1	25.9	26.3	26.4	26.5	26.6	25.8	26.2
		C.S.N		4½	G2½	7	7	7	7½	G2½	
	No. 13	Weight		9.2	22.1	7.9	11.4	17.6	24.2	7.6	
		Ash		10.2	8.2	7.0	6.5	6.2	8.7	13.5	8.3
		V.M.		24.9	27.6	28.1	28.3	28.4	27.6	26.5	27.5
		C.S.N.		G2½	G2½	G2½	7½	8	8	G2½	

	Seam		+ 15m/m	6	3	-3					
Nisshin	No. 12	Weight	3.1	22.3	15.0	59.6					
	No. 13	Weight	3.7	20.6	15.6	60.1					

	Seam	X. I.	Y. I.
Kobe	No. 12	14	14
	No. 13	14	20

5. Gieseler Plastometer

	Seam	Temperature				Max Fluidity
		Softening	Max Fluidity	Resolidification	Range	(Log MF)
Nippon Steel	No. 12	446	479	497	51	5 (0.70)
	No. 13	437	472	503	66	141 (2.15)
Nippon Kokan	No. 12	430	467	484	54	17
	No. 13	420	464	495	75	308
Kawasaki	No. 12	427	462	478	51	7
	No. 13	413	456	482	69	342
Sumitomo	No. 12	423	459	483	60	10
	No. 13	414	456	486	72	257
Kobe	No. 12	432	462	485	53	8
	No. 13	420	464	492	72	264
Nisshin	No 12	417	454	486	69	6
	No. 13	410	451	483	73	117

5 Dilatometer

	Seam	Temperature			Max Contraction(%)	Max Dilatation(%)
		Softening	Max Contraction	Max Dilatation		
Nippon Steel	No. 12	377	437	470	26	-3
	No. 13	357	417	468	28	80
Kawasaki	No. 12	392	442	476	22	22
	No. 13	382	432	496	23	121
Sumitomo	No. 12	390	439	468	30	10
	No. 13	379	427	475	26.6	113.3
Kobe	No. 12	392	443	476	28	15
	No. 13	379	429	481	28	109
Nisshin	No. 12	390	460	495	32	10
	No. 13	378	437	475	37	66

7. Petorographic Analysis

	Seam	Maceral And Reflectance									CBI	SI	Vitrinoid Type											
		Vit	Exi	S-F	Fusi	Scl Mic	M-M	T.R.	T.I	Ro			7	8	9	10	11	12	13	14	15			
Nippon Steel	No. 12																							
	No. 13																							
Nippon KoKan	No. 12	80.0	0.5	7.0	4.4	3.6	3.7	82.8	17.2	1.17						16	48	32	4					
	No. 13	85.8	1.4	4.4	2.6	1.7	4.1	88.7	11.3	1.13						32	56	12						
Kawasaki	No. 12																							
	No. 13																							
Sumitomo	No. 12	82.0	1.3	5.4	2.4	5.4	3.5	85.1	14.9	1.09					4	55	35	5	1					
	No. 13	82.8	1.9	5.2	1.4	4.7	4.0	86.4	13.6	1.06					17	57	25	1	0					
Kobe	No. 12	83.0	0.4	6.3	2.8	4.2	3.3	85.5	14.5	1.19						100	38.3	50.0	1.7					
	No. 13	87.1	0	3.6	2.5	2.9	3.9	88.3	11.7	1.15						21.2	56.3	22.5						
Nisshin	No. 12	78.8	0.6	5.8	4.4	6.9	3.5	81.3	18.7	1.20							37.0	10.2	1.6					
	No. 13	78.1	0.9	7.2	3.2	7.1	3.5	81.4	18.6	1.16				3.1	0	4.7	48.4	21.9						

8. Coking Property

			Nippon Steel								Nippon Kokan						Kawasaki			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
JIS DRUM	30 R	15	94.2	94.0				88.3	87.2		91.5	92.3	90.7	91.6	91.3		93.4	93.6		
		25									85.2	87.0	84.6	86.6	86.3		88.1	89.6		
		38																		
		50									14.4	10.2	14.8	18.9	23.6					
	150 R	15			84.2	84.2	84.4				76.2	76.4	73.9	75.2	75.7					
		25									65.4	70.2	64.8	67.3	67.5					
		38																		
		50									1.7	2.0	4.4	6.2	6.6					
Tumbler		6															65.9	62.7		
		25															58.0	54.2		
		Fording 12	100			10		30			100			20			100			
		Fording 13		100			10		30			100			20			100		
		Itmann			5	5	5													
	G1	Penn Poca											10	10	10					
	G2	Pittston			15	15	15						15	15	15					
		Masco			10	10	10													
	G3	Balmer			20	20	20													
	G3	Fording			10								20							
	G1	Smoky			5	5	5													
	G1	Peak Downs											10	10	10					
	G2	Moura			10	10	10													
	G2	Goonyella											10	10	10					
	G1	Newdell			10	10	10						23	23	23					
		Oyubari			10	10	10													
		Ashibetu			5	5	5	70	70											
		Yutoku											10	10	10					
		Oil Coke											2	2	2					

			Sumitomo							Kobe					Nisshin					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
JIS DRUM	30 R	15	92.6	93.9	91.2	89.0	85.4	92.6		94.4	94.2	90.8	92.9		91.8	92.6	89.5	92.0		
		25	88.8	89.4	79.2	74.2	82.0	89.2		91.2	89.8	70.9	85.5							
		38	74.4	68.3	51.4	41.6	72.1	74.0												
		50	42.2	37.0	20.9	13.4	39.4	46.2		36.2	31.8	12.2	17.3		31.9	38.3	22.2	31.1		
	150 R	15	80.4	81.5	77.2	75.6	64.7	80.5		84.0	82.6	76.4	81.0		79.5	79.6	76.7	79.6		
		25								78.4	75.8	44.4	67.5							
		38																		
		50								15.4	10.0	1.3	2.0		12.4	9.3	4.4	10.6		
Tumpler		6		63.5	56.1	67.2	60.4	64.2												
		25		58.2	52.1	43.7	44.1	58.9												
		Fording 12	100		40		55			100		30			100		40			
		Fording 13		100		40		55			100		30			100		40		
		Cerro					25	25												
		Newdell										70	70				60	60		
		AKabira			60	60	20	20												

APPENDIX 1 (c)

BIRTLEY ENGINEERING (CANADA) LTD.

Subsidiary of Great West Steel Industries Ltd.

505 - 50th AVE. S.E. CALGARY, ALBERTA T2G 2B4 PHONE 403 - 253-8273

A REPORT TO FORDING COAL LTD. ON THE WASHABILITY AND PILOT PLANT WASHING RESULTS OF BULK SAMPLES FROM ADIT# 18, SEAM# 12 AND ADIT# 17, SEAM# 13.

August, 1977

Submitted by:

BIRTLEY ENGINEERING (CANADA) LTD.
Coal Science & Minerals Testing Div.

Frank J. Horvat
Manager

Report No. CS-0107

BIRTLEY ENGINEERING (CANADA) LTD.

Subsidiary of Great West Steel Industries Ltd.

505 - 50th AVE. S.E. CALGARY, ALBERTA T2G 2B4 PHONE 403 - 253-8273

A REPORT TO FORDING COAL LTD. ON THE WASHABILITY AND PILOT PLANT WASHING RESULTS OF BULK SAMPLES FROM ADIT# 18, SEAM# 12 AND ADIT# 17, SEAM# 13.

INTRODUCTION:

The bulk samples were delivered, in 45 gallon steel drums, in late July and early August, 1977 to the Coal Science and Minerals Testing plant site in Calgary, Alberta .

Each bulk sample was processed according to the accompanying procedural flowsheets. The pilot plant circuitry was modified so that the water cyclone circuit was bypassed; thus the raw 28M x 0 slimes were cut directly on the .25mm sieve bend, the overflow being the 28M x 65 product and the sieve bend underflow proceeding to the froth flotation circuit.

This was necessary to produce a clean coal with an ash content as high as was practical considering the ash of the heavy media product could not be elevated beyond the levels achieved. A comparison of the heavy media reject and froth tails of both seams indicates optimum recovery of clean coal.

It is apparent that a clean coal ash level of 9.5 - 9.9% would be an impractical target for the two seams as it would necessitate a Heavy Media separation in excess of the effective and practical plant operating separating gravity of 1.60.

The work flowsheet (Figure 3) outlines the procedure for the washability program with the analyses tabulated in the first part of the results accompanied by the computer data sheets and classical washability curves.

The plant flowsheet (Figure 1) and the plant analytical flowsheet (Figure 2) supported by a brief resume of the plant operation clarify the treatment of the bulk wash sample and the preparation and packaging of the clean coal product.

The plant balance sheets P. 18 & 30 summarize schematically the results of the plant work with each circuit performance detailed on respective forms.

The clean coal analysis, its makeup and disposition finalise the report.

PILOT PLANT WASHING

Figure 1 is the flowsheet of the Coal Science & Minerals Testing pilot plant. Raw coal is dumped by a front end loader into a hopper at ground level, which has a heavy 2" square screen installed to ensure that the bucket elevator receiving the feed does not handle oversize material. The 2" oversize coal is crushed manually to pass the 2" screen, but "rock" is collected in barrels and reported as shale of the heavy media circuit. The bucket elevator discharges the minus 2" feed at a rate of 5 to 7 metric tons per hour into a rotary 3/4" screen of the third deck. The 3/4" oversize falls via a chute into a 5" x 8" jaw crusher where it is crushed to minus 3/4" and is recycled through the feed system. The 3/4" x 0 screen underflow is washed with water onto a 28 mesh sieve bend and slot screen for desliming.

The 3/4" x 28 mesh coal is the feed to the 14" DSM Heavy Media cone on the seond deck. The slurry of coal and correct medium is pumped to the cyclone from the mixing tube at a pressure of 9 to 10 psi. The overflow and underflow products are discharged onto a common, but split 28 mesh slot screen preceded by a 28 mesh sieve bend where the magnetite is washed off into the correct and dilute medium tanks directly below. Additional clean spray water and baffles across the clean coal stream ensure that a minimum of magnetite is retained on the clean coal product. The clean coal and shale are collected in barrels by means of individual chutes for weighing.

The dilute medium is pumped to a thickening cone on the third deck from where it is fed to a 30" magnetic separator. The recovered magnetite is sluiced back to the correct medium tank. The specific gravity of the medium is monitored manually, using a density meter, and adjusted for loss by adding cyclone grade magnetite directly to the correct medium tank.

The 28 mesh x 0 coal collected in the slimes tank ground level, is pumped to the thickening cone on the third deck. From this point it can be fed directly to the froth circuit, or as is usual, to the two-stage water-only cyclone system.

Coal to the 6" DSM water-only primary cyclone is pumped at a pulp density of 10% to 20% from the cyclone feed rank at a pressure of 20 psi, and a flow rate of 85 Imperial gallons per minute. A mechancially adjustable vortex finder facilitates settings for a desired ash content. The primary cyclone underflow with make-up water is fed to a similarily adjustable secondary 4" unit. The overflow is directed back to the primary cyclone feed tank with the underflow being the waste product.

The waste product is routed to the static thickener while the primary underflow is fed by gravity to a rapped 0.25 mm sieve bend. The seive bend is the water-only cyclone product at approximately 65 mesh oversize, and directed to the Eimco disc filter for dewatering.

The sieve bend underflow passes by gravity to the thickening cyclone feed tank, from where it is pumped to the 20° - 8" cyclone. This thickening cone serves a dual purpose: 1) it removes undesireable -325 mesh slimes from the flotation feed, 2) it provides a feed of proper density (15% - 25% solids) to the froth cells. The overflow with the -325 mesh slimes flows to the static thickener.

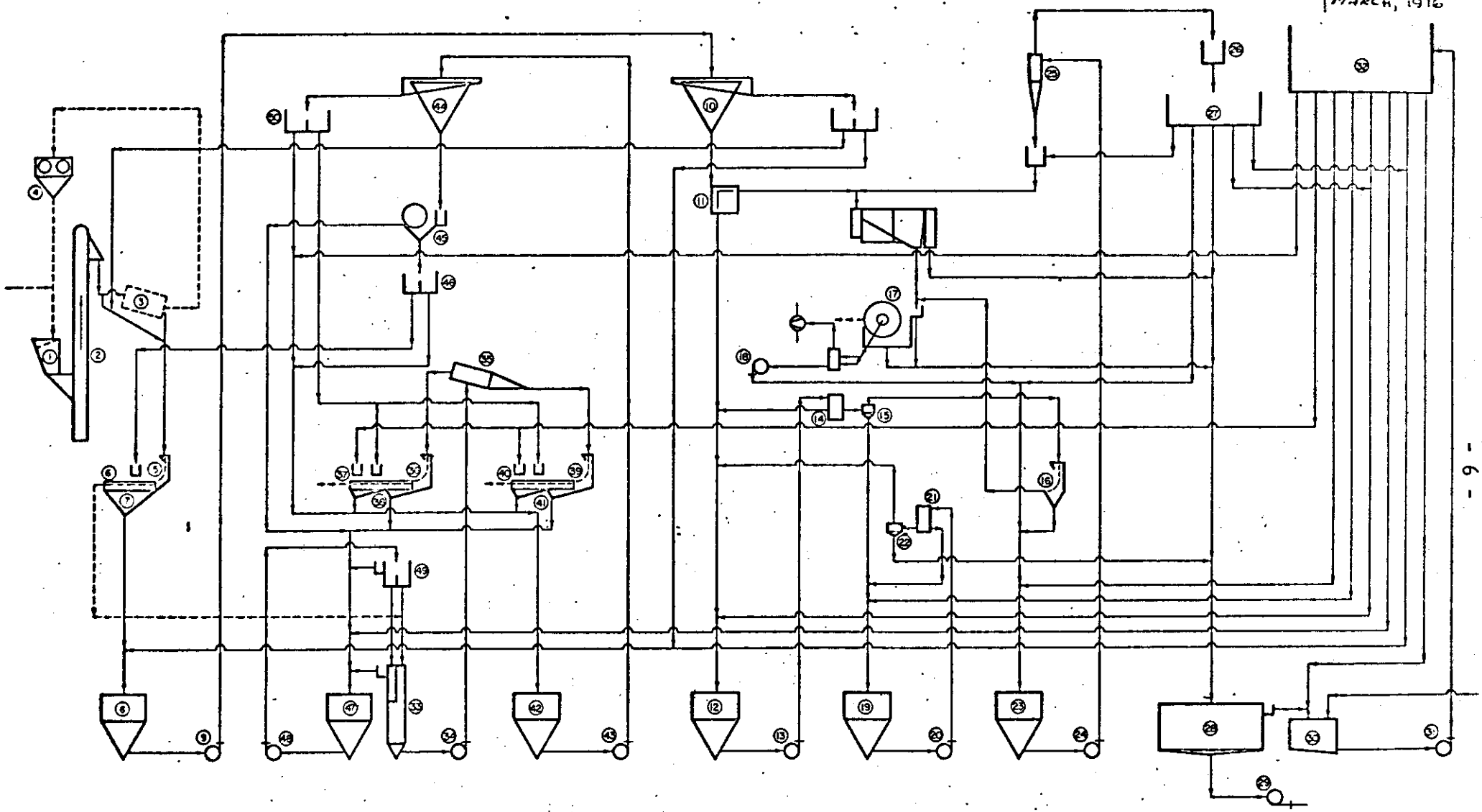
The flotation circuit consists of two (2) Birtley-Humboldt Multi-Wobble Cells in series. Since these cells were installed on September 12th, 1976, there appears to be a marked improvement in tailings ash contents, indicating excellent recovery of froth product. A rotary reagent feeder introduces 4:1 Kerosene:Methylisobutylcarbinol into the circuit at the feed entry point for better conditioning.

The tailings join the water-only cyclone underflow and thickener cone overflow to form the thickener tails. The froth enters the Eimco disc filter and is dewatered along with the sieve bend overflow to form the filter cake or fines product. This and the heavy media clean coal are combined to form the clean coal product or clean mix.

Each circuit is sampled for feed, product and waste in addition to the 0.25 mm sieve bend overflow and underflow, filter cake, thickening cyclone overflow and underflow and analysed for ash content. The primary water-only cyclone overflow product is screened at 65 mesh as the plus 65 mesh figure is used to calculate the yield of the water-only cyclone circuit.

The heavy media clean coal is "drained" of extraneous moisture before being combined and homogenized with the partially dried filter cake. This partial drying is accomplished by spreading the fines product on a pad, heated electrically at 20°C, and reducing the moisture content from 22 - 28% to less than 12%.

MARCH, 1976



1. Feed Bin
2. Elevator
3. Rotary Screen
4. Jaw Crusher
5. Sieve Bend
6. Desliming Screen
7. Underflow Collector
8. 26M-0 Raw Coal Collection Tank
9. Pump
10. Setting Cone
11. Diverter
12. Primary Water Only Cyclone Feed Tank
13. Pump
14. Distributor
15. Primary Water Only Cyclone
16. Sieve Bend
17. Vacuum Filter
18. Filtrate Water Pump
19. Secondary Water Only Cyclone Feed Tank
20. Pump
21. Distributor
22. Secondary Water Only Cyclone
23. Thickening Cyclone Feed Tank
24. Pump
25. Thickening Cyclone
26. Overflow Distributor
27. Head Box
28. Thickener
29. Waste Disposal Pump
30. Clarified Water Collection Tank
31. Clarified Water Pump
32. Clarified Water Head Box
33. Cyclone Feed Tank
34. Pump
35. D.S.M. Cyclone
36. Sieve Bend
37. C.C. Drain and Rinse Screen
38. Underflow Collector
39. Sieve Bend
40. Discard Drain and Rinse Screen
41. Underflow Collector
42. Dilute Medium Tank
43. Pump
44. Setting Cone
45. Magnetic Separator
46. Splitter Box
47. Correct Medium Tank
48. Pump
49. Distribution Box
50. Splitter Box

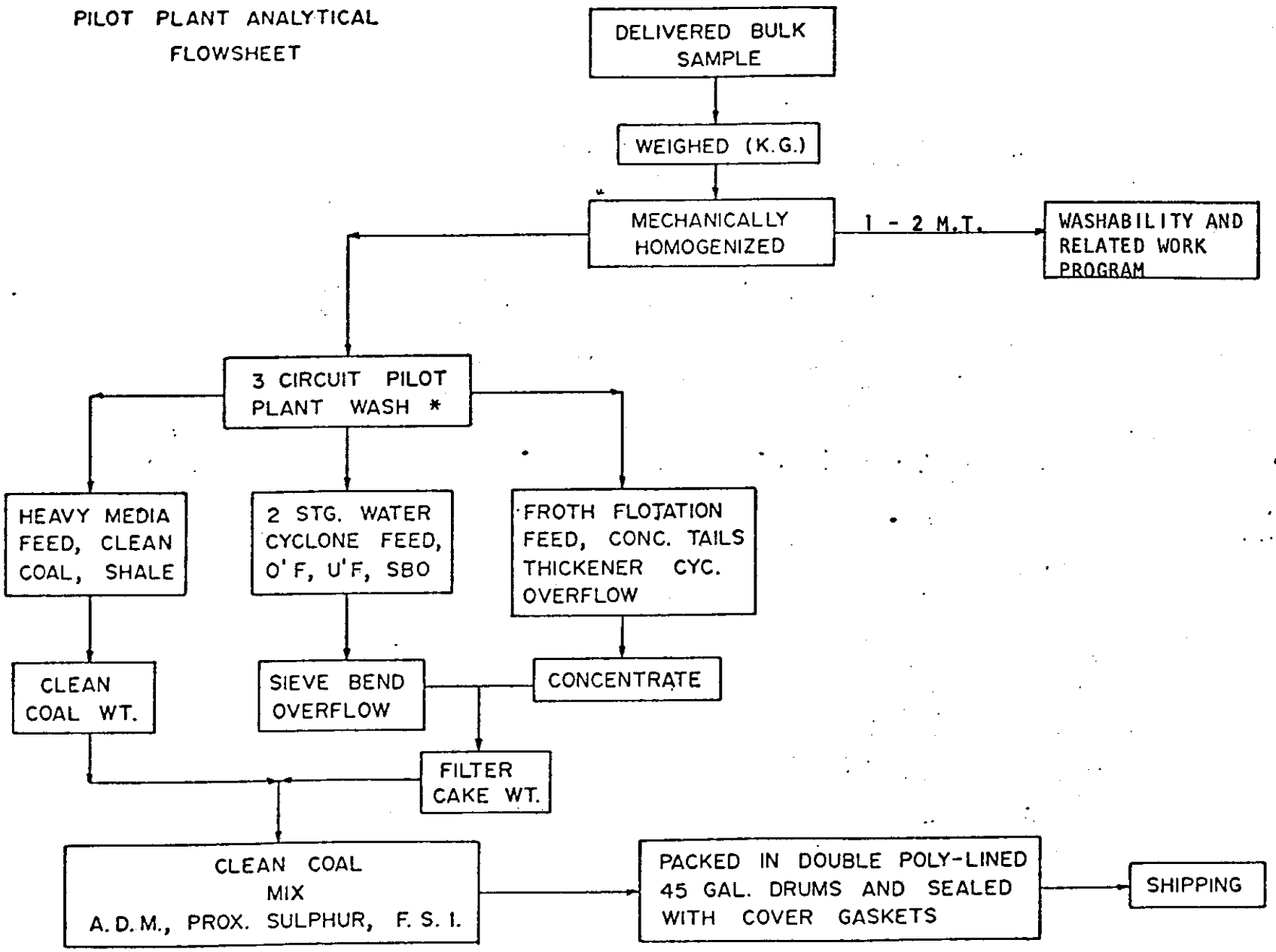
FIGURE 1

TEST PLANT FLOWSHEET

COAL SCIENCE & MINERALS TESTING

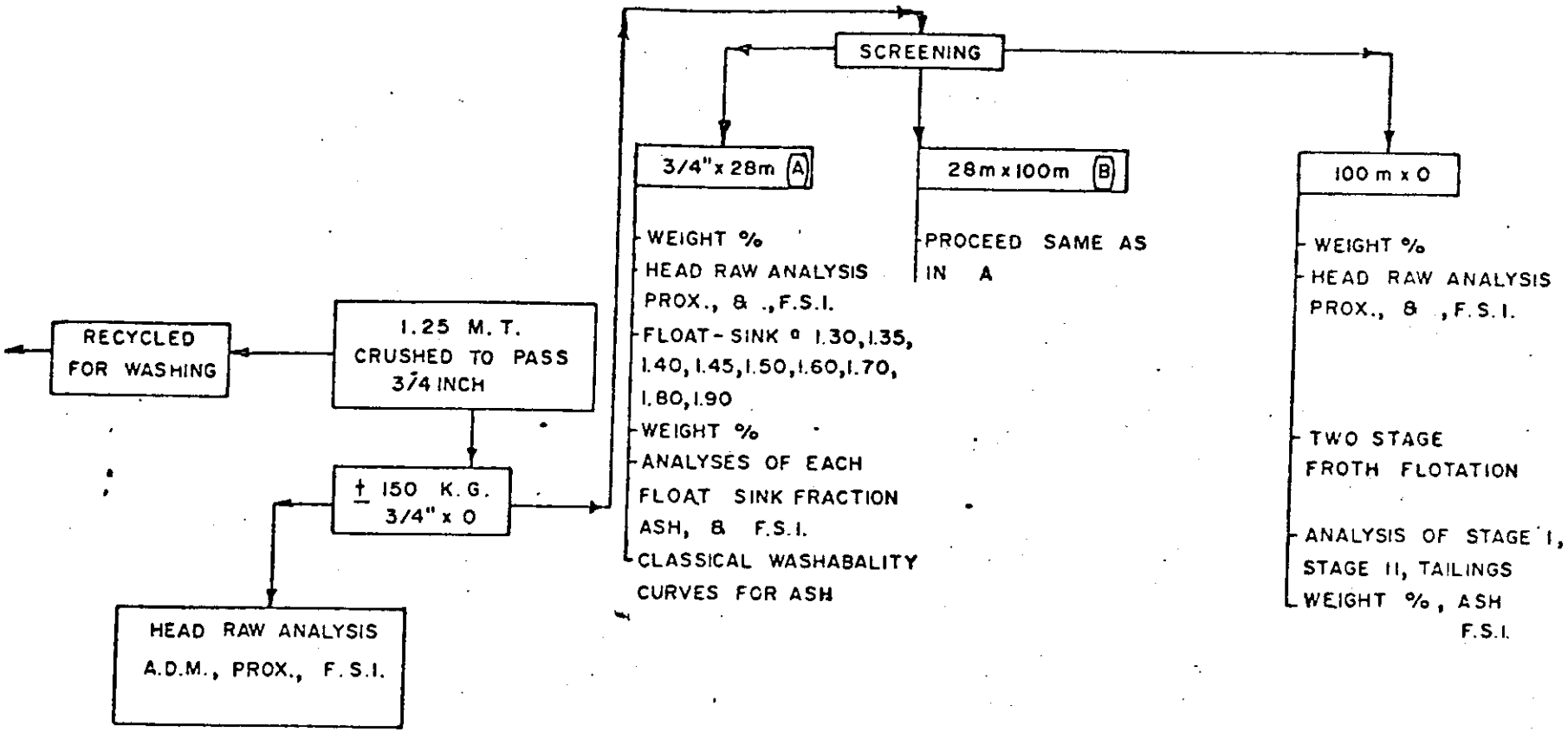
DIV OF BIRTLEY ENGINEERING (CANADA) LTD. CALGARY, ALTA

TYPICAL
PILOT PLANT ANALYTICAL
FLOWSHEET



* ALL PLANT SAMPLES ANALYSED FOR ASH AND F.S.I.

FIGURE 2



BIRTLEY ENGINEERING

Title: WASHABILITY WORK FLOWSHEET

Client: FORDING COAL LIMITED

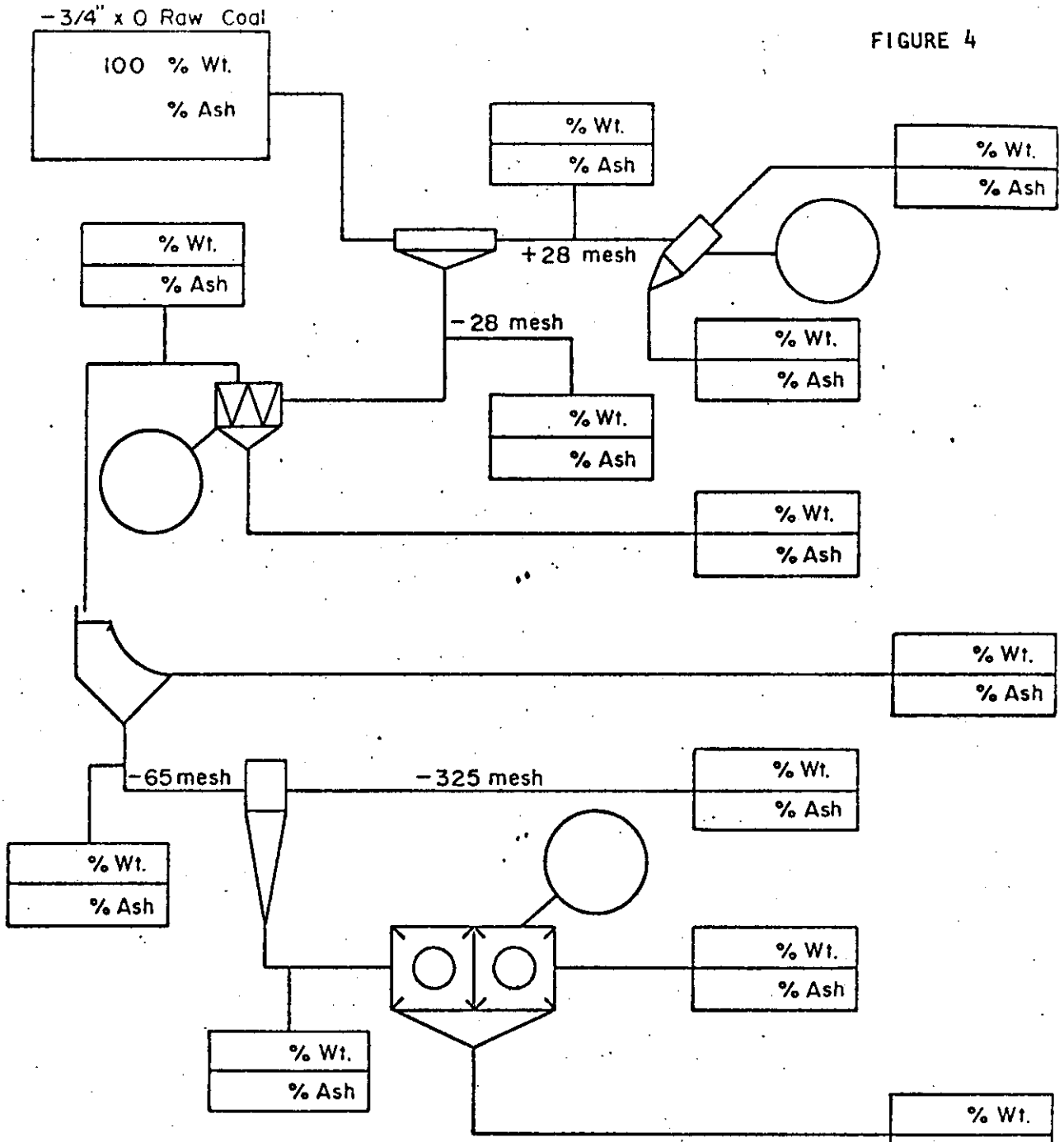
Date

Project:

Drawn

FIGURE 3

FIGURE 4



OVERALL YIELD =

LEGEND:

CIRCUIT YIELD %

Wt. *WEIGHT %*

Ash *ASH CONTENT (AIR DRIED)*

BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
TYPICAL PLANT BALANCE SHEET	
	Drawn

COAL SCIENCE & MINERALS TESTING DIVISION

SPECIAL PROCEDURES FOR HANDLING OF BULK SAMPLES

HEAD RAW PREPARATION

The order of preference for delivery bulk samples is: 1) bulk truck loads. 2) poly-lined jute bags or re-enforced plastic bags. 3) barrels. The coal is dumped onto a steel mixing plate (32' x 60') and subjected to a preliminary mixing by means of a small front end loader and placed in a conical heap in the centre of the plate. (The bucket capacity is about 1 1/2 drums of coal).

Four (4) sampling points (quandrants) are selected along the perimeter of this central pile identified for clarity as Sites #1, #2, #3, #4, (see attached sketch) from which is withdrawn successive bucket loads of coal and placed in "quarter" conical piles relative to the sampling sites. However, to minimize the possibility of bias, on the second sampling pass, coal withdrawn from Site #1 is placed in pile #2, coal withdrawn from Site #2 is placed in pile #3 and so on until the central pile has been transferred into the 4 quartered piles.

Now the coal from the quartered piles is returned to the central location by taking bucket loads successively from piles A, B, C and D to reform the central conical heap. Four (4) sampling sites are relocated and the whole procedure is repeated three (3) more times after which a head raw sample is extracted, by taking small increments from each of the "quartered" piles of such quantity that four (4) increments will fill two (2) - 45 gallon drums using a portable loading hopper. This hopper is designed in such a way that two (2) barrels are filled simultaneously by means of a splite chute. The quantity of sample extracted is dependent on the top size of the coal and must conform to ASTM specifications for sampling of coal.

CLEAN COAL PREPARATION (Clean Mix)

After a preliminary moisture reduction of the heavy media clean coal and the fines filter cake to the desired levels, the products are homogenized as follows:-

The heavy media clean coal is spread in a thin layer on the meticulously clean mixing plate. The filter cake is "seeded" over the surface of the coarse coal by means of the front end loader. This total mass is subjected to a preliminary mixing routine and a central conical heap formed.

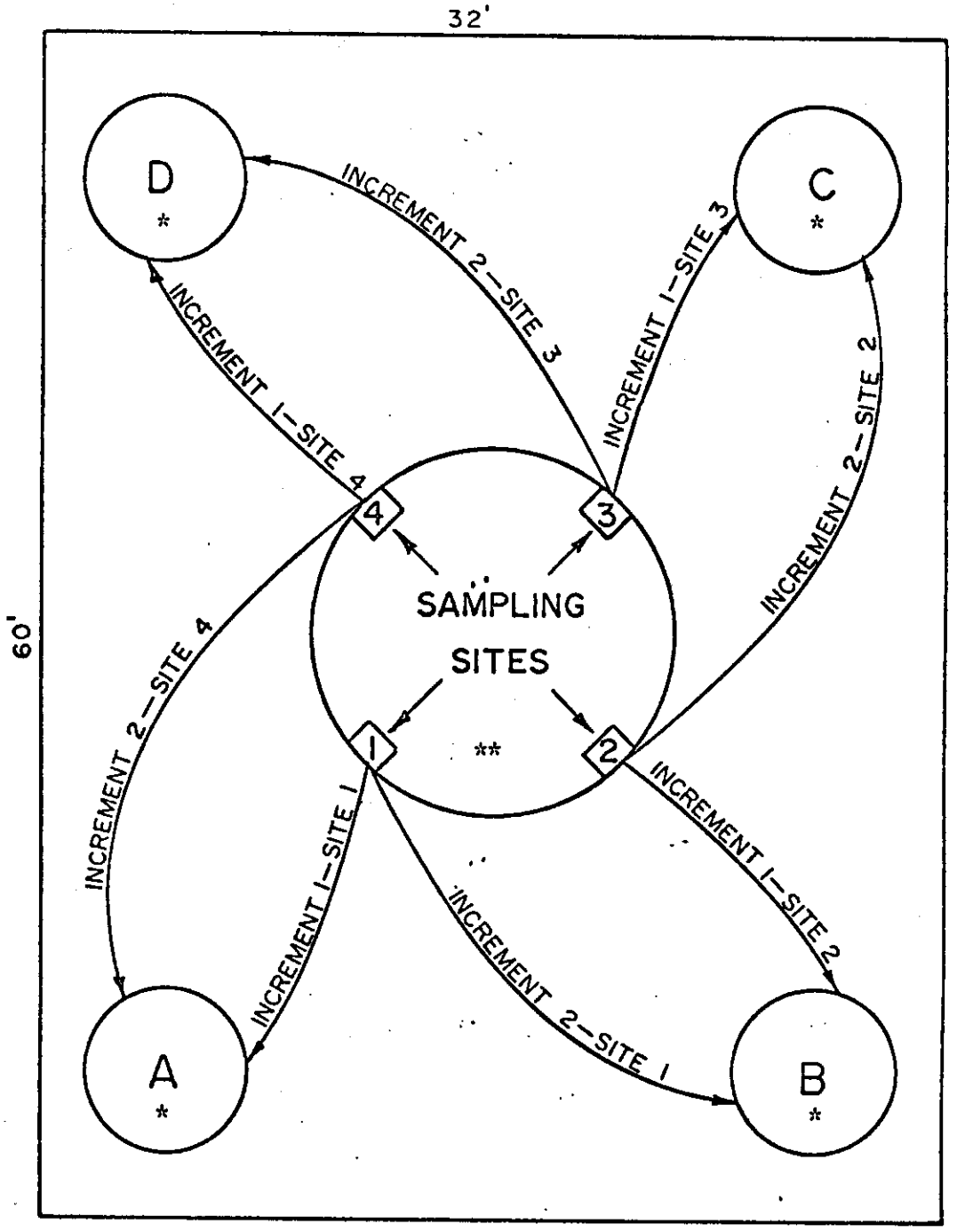
From this point on the procedures outlined for homogenizing the raw coal are strictly followed.

From the final four (4) quarters, double poly lined barrels are filled by exactly the same procedure as outlined for the raw coal sample extraction. The coal is tamped into the barrels so that each barrel contains about 180 kg including moisture.

During the barrel filling procedure, a minimum of 60 increments are taken from the bucket load quantities with a small square mouth shovel. Each increment is of such quantity that a minimum of 100 kg of coal are retained for analytical purposes.

Finally the plastic liners are tied off and an identifying tag affixed inside the drum. The lid, with a gasket, is firmly attached to seal the barrel and the barrel is stencilled as to contents and destination.

SCHEMATIC OF RAW AND CLEAN COAL HOMOGENIZATION



* "Quarter" Piles ** Central Pile

Continue moving increments until all of the central pile is transferred to the "Quarter" piles A,B,C, and D, i.e. increment 3, site 1 to C, increment 3, site 2 to D, increment 3, site 3 to A, increment 3, site 4 to B etc.

WASHABILITY AND PILOT PLANT WASHING RESULTS

ADIT# 18, SEAM# 12

LAB. NO.: 9286/87

CLIENT: FORDING COAL LTD.

SAMPLE: ADIT 18, SEAM 12

LAB. NO.: 9287

August, 1977

SIZE AND RAW ANALYSES								
SIZE FRACTION	WT. %	ASH %	R.M. %	V.M. %	F.C. %	F.S.I.	CUMULATIVE	
							WT. %	ASH %
3/4" x 28M	76.7	11.6	2.1	24.4	61.9	5 1/2	76.7	11.6
28M x 100M	13.9	10.3	1.0	25.2	63.5	7 1/2	90.6	11.4
100M x 0	9.4	9.8	1.1	25.3	63.8	7	100.0	11.3
HEAD RAW	100.0	10.6	1.2	24.9	63.3	6 1/2	adl% = 2.6	

WT.% +3/4" = 19.1 - crushed to pass 3/4"

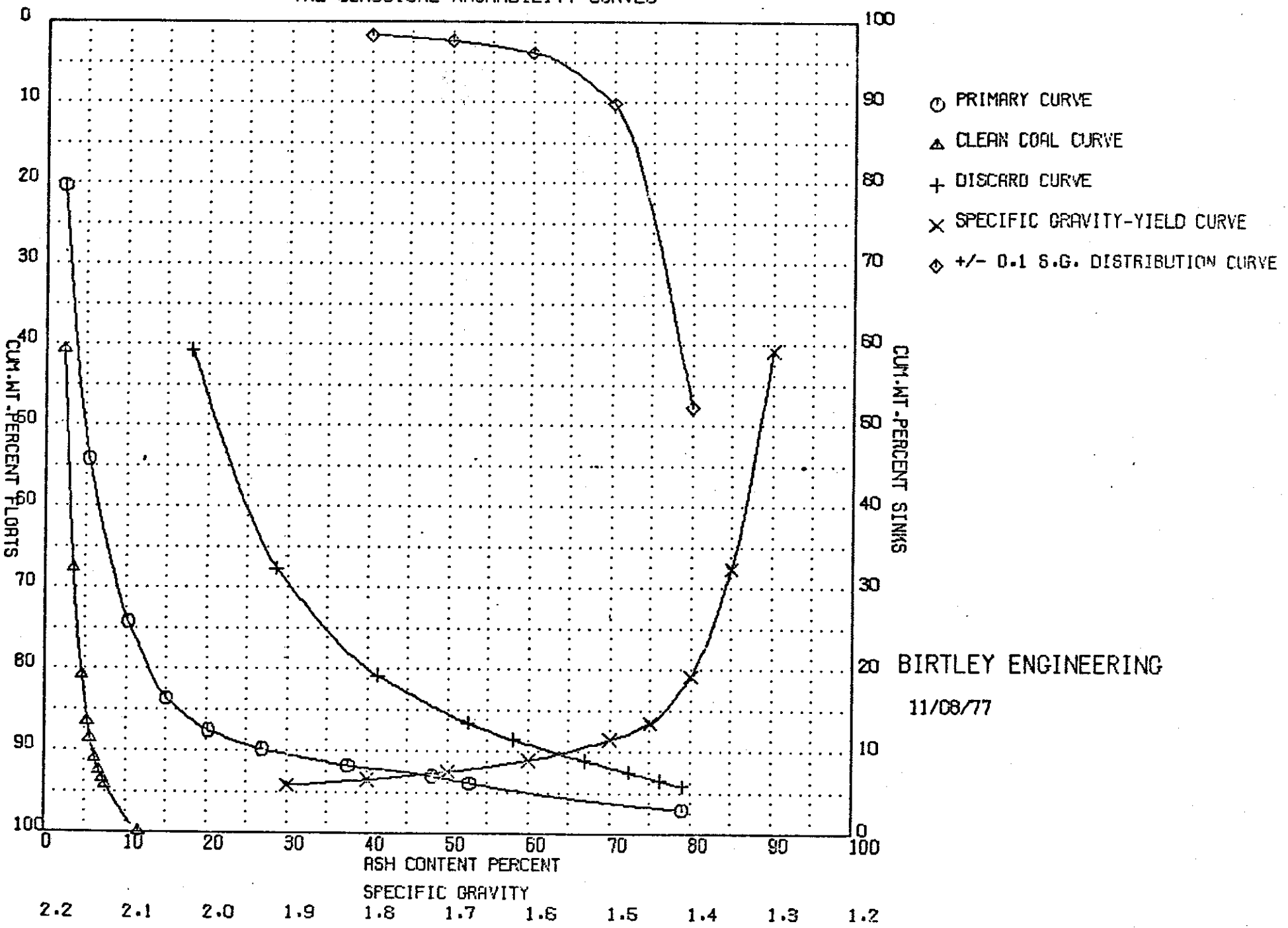
SINK-FLOAT ANALYSES											
S. G. FRACTION	3/4" x 28M					28M x 100M					
	WT. %	ASH %	F.S.I.	CUMULATIVE		WT. %	ASH %	F.S.I.	CUMULATIVE		
				WT. %	ASH %				WT. %	ASH %	
- 1.30	40.8	2.2	8 1/2	40.8	2.2	53.0	1.8	8 1/2	53.0	1.8	
1.30 - 1.35	26.9	5.3	6	67.7	3.4	19.2	4.9	7 1/2	72.2	2.6	
1.35 - 1.40	13.2	10.2	3 1/2	80.9	4.5	6.9	11.7	5	79.1	3.4	
1.40 - 1.45	5.7	15.0	2	86.6	5.2	6.3	14.9	3	85.4	4.3	
1.45 - 1.50	2.0	20.2	2	88.6	5.6	3.3	21.3	2 1/2	88.7	4.9	
1.50 - 1.60	2.5	26.9	2	91.1	6.1	3.5	28.7	1 1/2	92.2	5.8	
1.60 - 1.70	1.4	37.6	1 1/2	92.5	6.6	2.3	38.8	1	94.5	6.6	
1.70 - 1.80	1.0	48.1	1	93.5	7.1	1.4	47.8	1	95.9	7.2	
1.80 - 1.90	0.7	52.7	1	94.2	7.4	1.3	54.2	1/2	97.2	7.8	
+ 1.90	5.8	79.0	N.A.	100.0	11.6	2.8	78.4	N.A.	100.0	9.8	

FROTH FLOTATION TESTS						
SIZE FRACTION	100M x 0					PARAMETERS
	WT. %	ASH %	F.S.I.	CUMULATIVE		
				WT. %	ASH %	
STAGE I	62.8	5.8	8	62.8	5.8	Pulp Density = 10% Dosage = 0.48#/Ton Reagent = 4:1 = K:MIBC Conditioning Time = 1 Minute Stage I & II - 1st & 2nd Froth Conc. @ 1st & 2nd Min.
STAGE II	6.3	9.9	7 1/2	69.1	6.2	
TAILS	30.9	18.3	3 1/2	100.0	9.9	

N.A. = non agglomerating

FORDING COAL LTD ADIT 18 SEAM 12 LAB NO 9287 3/4 X 28M

THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING

11/08/77

--DIRECT-- --CUM FLOATS-- --CUM SINKS-- +-0.1 DISTR

S.G.	WT%	ASH%	WT% CUM ASH	WT% CUM ASHTT	STOP WT%	ASH%	ASH%	WT%	ASH%	S.G.	WT%
1	2	3	4	5	6	7	8	9	10	11	12
1.30	43.80	2.20	.00	.90	43.90	2.20	10.66	56.20	18.01	1.30	0.00
1.35	26.90	5.30	1.43	2.32	67.70	3.43	0.24	32.30	28.60	1.40	47.80
1.40	13.20	10.20	1.35	3.67	80.90	4.54	7.89	19.10	41.31	1.50	10.20
1.45	5.70	15.00	.26	4.52	86.60	5.22	7.03	13.40	52.50	1.60	3.90
1.50	3.00	20.20	.40	4.93	89.60	5.56	6.63	11.40	58.16	1.70	2.40
1.60	3.50	26.90	.67	5.60	91.10	6.15	5.96	8.90	66.95	1.90	1.70
1.70	1.40	37.60	.53	6.13	92.50	6.62	5.43	7.50	72.43	1.96	0.00
1.80	1.00	43.10	.43	6.61	93.50	7.07	4.95	6.50	76.17	2.00	0.00
1.40	.70	52.70	.37	6.98	94.20	7.41	4.58	5.80	79.00	2.10	0.00
9.99	5.80	79.00	4.58	11.56	100.00	11.56	0.00	.00	0.00	2.20	0.00

BARTLEY ENGINEERING

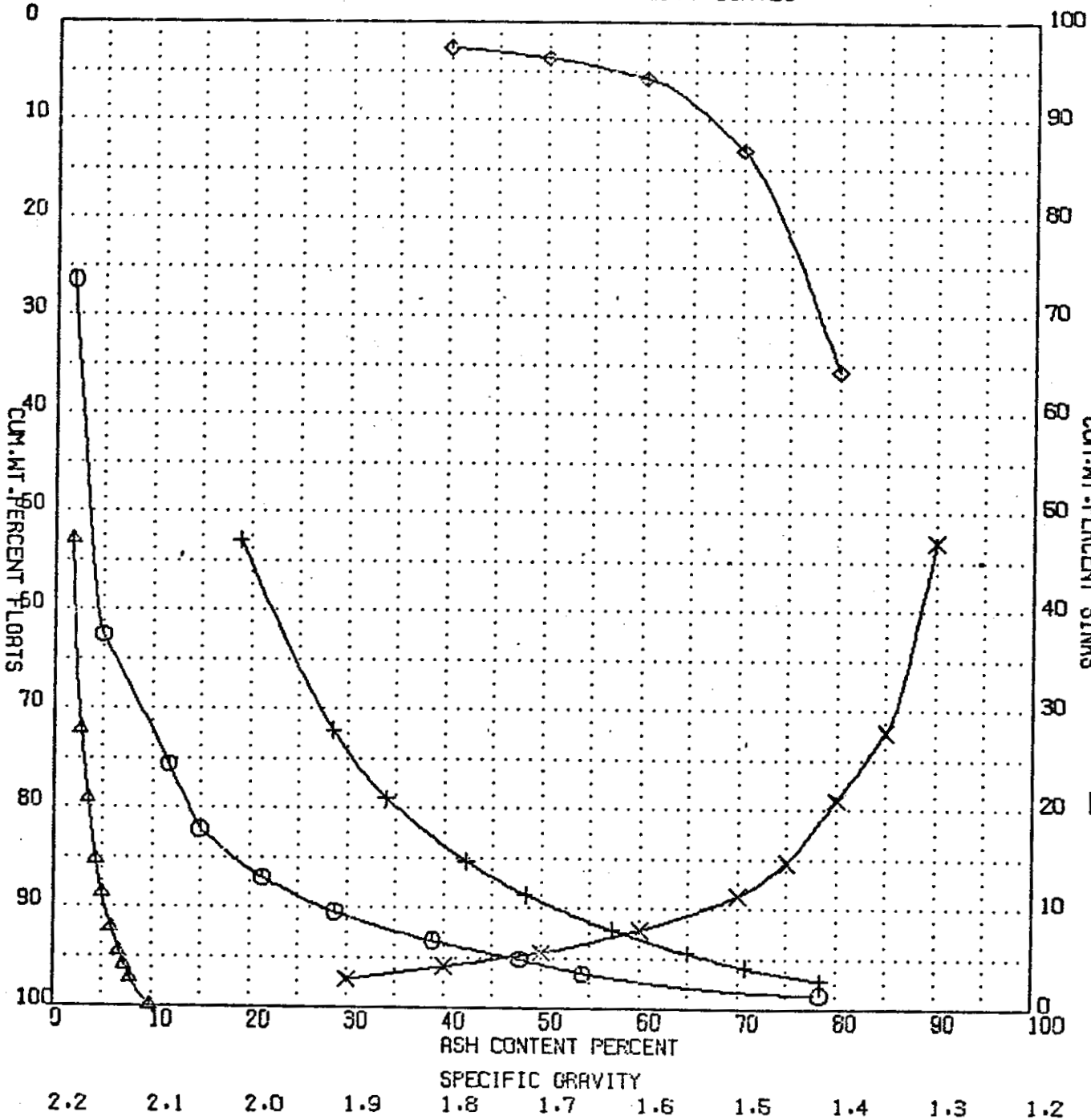
11/08/77

.4	15.9	.4	11.8	3.6	11.3	2.0	11.2	4.0	10.4
1.1	9.2	.7	6.5	5.7	6.5	3.0	6.5	6.0	15.1
2.0	5.1	.9	3.8	8.3	3.8	4.0	3.9	8.0	10.2
3.0	3.3	1.0	2.7	10.5	2.7	5.0	2.7	10.0	10.5
4.0	2.5	1.1	2.3	11.4	2.3	6.0	2.3	12.0	10.7
5.4	2.0	1.2	1.8	13.4	1.8	7.0	1.8	0.0	0.0
7.5	1.4	1.3	1.5	14.5	1.5	10.0	1.5	0.0	0.0
9.6	1.4	1.4	1.3	15.2	1.3	12.0	1.3	0.0	0.0
10.5	1.2	1.5	1.2	15.8	1.2	14.0	1.2	0.0	0.0
15.8	.6	2.3	.0	0.0	.0	175.8	.0	0.0	0.0

PASS 1 10153
PASS 2 10 18
PASS 3 9131
PASS 4 9126
PASS 5 5 90

FORDING COAL LTD ADIT 18 SEAM 12 LAB NO 9287 28M X 100M

THE CLASSICAL WASHABILITY CURVES



- PRIMARY CURVE
- CLEAN COAL CURVE
- DISCARD CURVE
- SPECIFIC GRAVITY-YIELD CURVE
- +/- 0.1 S.G. DISTRIBUTION CURVE

BIRTLEY ENGINEERING

11/08/77

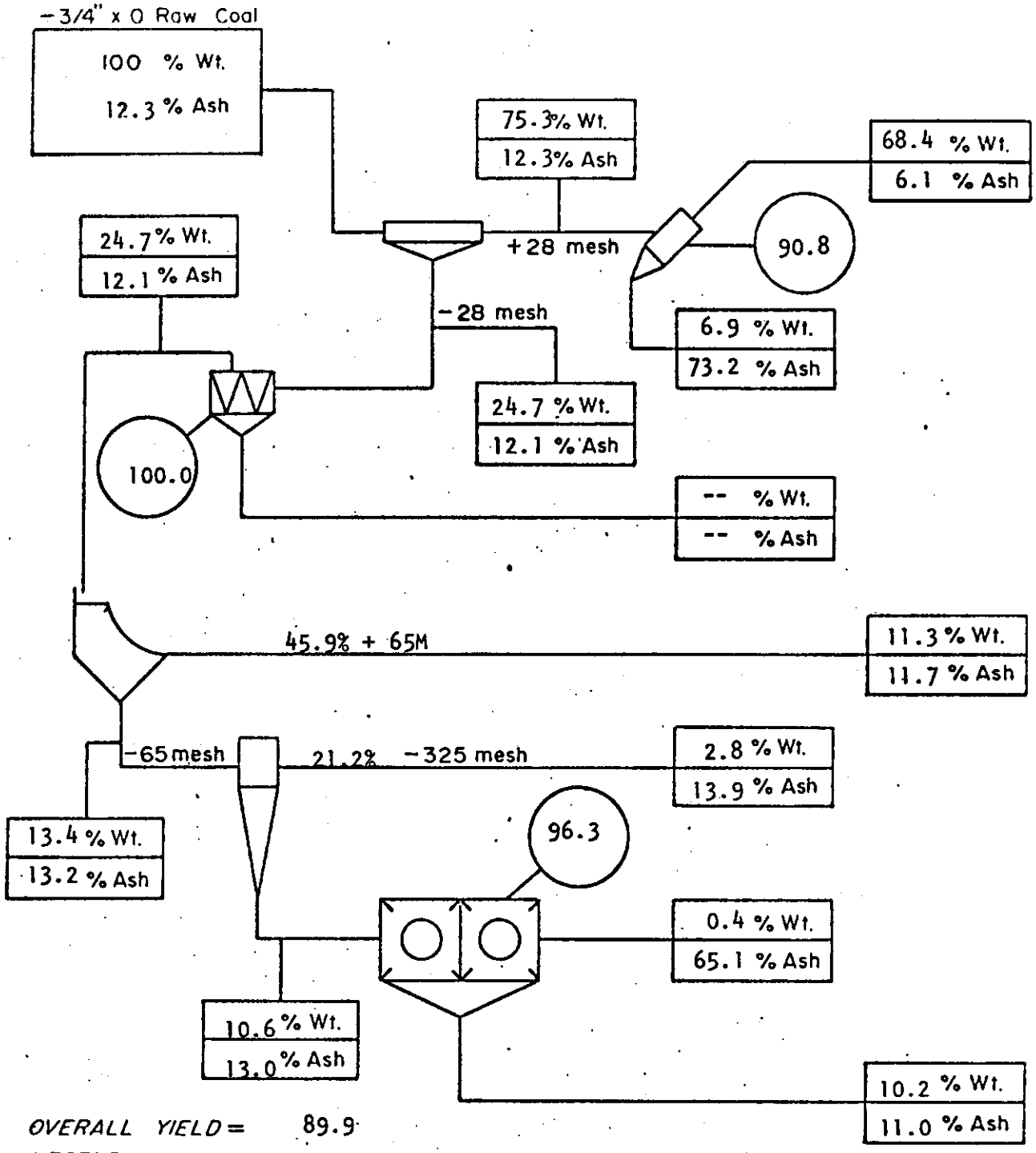
--DIRECT--			--CUM FLOATS--			--CUM SINKS--			+-1.1 DISTR		
S.G.	WT%	ASH%	WT%	CUM WT% ASH IT	ASH IT	WT%	SINK WT ASH%	ASH%	WT%	ASH%	S.G.	WT%
1	2	3	4	5	6	7	8	9	10	11	12	
1.30	53.60	1.80	.05	.05	53.00	1.80	5.86	47.50	18.84	1.30	0.00	
1.35	18.20	4.00	.24	1.89	72.20	2.62	7.91	52.00	28.47	1.40	35.70	
1.40	4.90	11.70	.21	2.70	79.10	3.42	7.11	30.00	34.01	1.50	13.10	
1.45	4.30	14.00	.24	3.64	85.40	4.26	6.17	14.40	42.25	1.60	5.80	
1.50	3.30	21.30	.70	4.34	88.70	4.00	5.47	11.50	48.37	1.70	3.70	
1.60	3.50	29.70	1.00	5.35	92.20	5.00	4.46	7.00	57.20	1.80	2.70	
1.70	2.30	32.80	.69	6.24	94.50	6.60	3.57	5.50	64.09	1.90	0.00	
1.80	1.40	47.80	.67	6.91	95.90	3.21	2.90	4.70	70.73	2.00	0.00	
1.90	1.30	54.20	.70	7.61	97.20	7.33	2.20	2.90	78.40	2.10	0.00	
0.00	2.80	78.40	2.21	9.81	100.00	0.81	0.00	.50	0.00	2.20	0.00	

BIRTLEY ENGINEERING

11/08/77

.4	14.7	.4	9.4	3.6	9.4	2.0	6.4	4.0	12.0
1.0	7.5	.5	5.6	5.7	5.6	3.0	5.6	6.0	17.4
2.3	4.0	.7	4.3	6.9	4.2	4.0	4.2	8.0	15.8
3.0	3.5	.9	2.9	8.6	2.9	5.0	3.9	10.0	10.3
4.3	2.6	1.0	2.3	9.7	2.3	6.0	3.3	12.0	10.5
5.7	1.9	1.2	1.6	11.4	1.6	9.0	1.6	0.0	0.0
7.8	1.7	1.3	1.1	13.5	1.1	10.0	1.1	0.0	0.0
9.6	1.0	1.4	.8	14.1	.8	12.3	.9	0.0	0.0
10.3	.7	1.6	.6	15.7	.6	14.0	.6	0.0	0.0
15.7	.3	2.0	.0	0.0	.0	175.8	.0	0.0	0.0

PASS 1 10153
PASS 2 10 16
PASS 3 9119
PASS 4 9120
PASS 5 5 80



OVERALL YIELD = 89.9

LEGEND:

○ *CIRCUIT YIELD %*

Wt.
Ash

WEIGHT %

ASH CONTENT (AIR DRIED)

BIRTLEY ENGINEERING (CANADA) LTD.

Title PLANT BALANCE FLOWSHEET PILOT PLANT WASH - ADIT 18, SEAM 12 BULK FORDING COAL LTD. LAB. NO. 9286	Date August 4, 1977 Drawn

BIRTLEY ENGINEERING (CANADA) LTD.

Coal Science & Minerals Testing Div.

FORDING COAL LTD.

BULK WASHING DATA*

ADIT 18 SEAM " 12 LAB. NO. 9286

DELIVERY DATE July 29, 1977 DATE OF WASH August 3, 1977

Raw Coal Analysis: ADM 2.6 ASH% 10.6 FSI 6 1/2

Delivered Bulk Weight 4.628 Metric Tons

Washed Weight 4.200 " Metric Tons

* All weight and analyses are on Air Dried Basis unless otherwise indicated.

FORDING COAL LTD.

BULK WASHING DATA

HEAVY MEDIUM CIRCUIT

ADIT/SEAM NO. 18/12 LAB. NO. 9286

1. S. G. of Separation 1.63
2. Feed Ash Content 12.3 % F.S.I. 7
3. Clean Coal Estimated Weight 2.851 M.T.
4. Clean Coal Analysis - Ash 6.1 % F.S.I. 8
5. Reject Estimated Weight 0.310 M.T.
6. Reject Analysis - Ash 73.2 % F.S.I. 1/2
7. Estimated 3/4" x 28M in Circuit 3.161 M.T. 75.3 Wt.%
8. Yield Clean Coal (Weighted): 90.2 %
9. Yield Clean Coal (Calculated Ash Balance) - 90.8 %

FORDING COAL LTD.

BULK WASHING DATA

WATER-ONLY CYCLONE CIRCUIT **

ADIT/SEAM NO. 18/12 LAB. NO. 9286

1. Vortex Finder Clearance(VCF) _____ CM _____ INCHES

2. Feed Pressure _____ KG/CM^2 _____ P.S.I.

3. Feed Rate _____ $M^3/HR.$ _____ I.G./Min.

4. Feed Pulp Density _____ g/l. _____ Solids W/V

5. Sample Analysis

	SCREEN SIZE	WT.%	ASH%	F.S.I.	CUM. WT.%	CUM. ASH%	HEAD ASH%	HEAD FSI
FEED							12.1	7 1/2
O'FLOW	+65 Mesh	45.9	12.3	7	45.9	12.3	12.1	7 1/2
	65M x 0	54.1	12.0	7 1/2	100.0	12.1		
U'FLOW							---	
S.B.O.							11.7	7 1/2
T.C.O.*							13.9	4

6. Yield - Total W.O. Cyclone Circuit = 100.0

7. Estimated Yield of 28 x 65 Mesh Coal = 45.9
(as % of 28 Mesh x 0 Feed)

8. Estimated 28M x 0 in circuit
(Plant Feed - HM Products) 1.039 MT 24.7 %

* Thickener Cyclone Overflow

** Water Cyclone system bypassed. 28M x 0 coal directed to sieve bend.

FORDING COAL LTD.

BULK WASHING DATA

FROTH FLOTATION CIRCUIT

ADIT/SEAM NO. 18/12 LAB. NO. 9286

1. Reagents: Kerosene:Methylisobutylcarbinol (MIBC)

2. Feed Pulp Density 100 - 140g/l 10 - 14 % Solids W/V

3. Sample Analysis:-

	ASH	F.S.I.
FEED	14.9	7
CONC.	11.0	7 1/2
TAILS	65.1	1 1/2

4. Impeller Type - Birtley-Humboldt Multi-Wobble.

5. Yield Calculated (Ash Balance) 92.8 %

6. Filter Cake (Sieve Bend O'Flow & Flotation Conc.)
Wt. Recovered 0.665 M.T.

7. Filter Cake - Ash% 11.2 F.S.I. 7 1/2

FORDING COAL LTD.

BULK WASHING DATA

ADIT/SEAM 18/12 LAB. NO. 9286 DATE OF WASH August 3, 1977

a) Raw Coal

Delivered Weight	= 4.628	M.T.
Ash %	= 12.3	10.6 ?
F.S.I.	= 6 1/2	
Estimated Washed Wt.	= 4.200	M.T.

b) Heavy Media Circuit

Estimated Proportion of +28 Mesh in Feed 75.3

Effective S.G. = 1.63

Raw Feed	12.3	% Ash	7	F.S.I.
Clean Coal	6.1	% Ash	8	F.S.I.
Reject	73.2	% Ash	1/2	F.S.I.
Calculated Yield	90.8			
Weighed Yield	90.2			

c) Water-Only Cyclone Circuit

Raw Feed	12.1	% Ash	7 1/2	F.S.I.
Overflow	12.1	% Ash	7 1/2	F.S.I.
Underflow	---	% Ash	---	F.S.I.
Calculated Yield	100.0			
% of +65M in O/F	45.9			
Sieve Bend Overflow	11.7	% Ash	7 1/2	F.S.I.

d) Froth Flotation Circuit

Raw Feed	14.9	% Ash	7	F.S.I.
Concentrates	11.0	% Ash	7 1/2	F.S.I.
Tails	65.1	% Ash	1 1/2	F.S.I.
Calculated Yield	92.8%			

FORDING COAL LTD.

BULK WASHING DATA

BULK WASHING SUMMARY (Cont.)

ADIT 18 Seam 12 LAB. NO. 9286

e) Clean Coal Mix Analyses

(i) Proximate

ADM% 7.6 RM% 2.0 ASH% 7.2 VM% 25.5 FC% 65.3 S% 0.69 FSI 7 1/2

f) Clean Coal Mix Make-Up

H. M. CLEAN COAL	FINES FILTER CAKE	CLEAN COAL MIX		SHIPPED		IN STOCK	
M.T.	M.T.	BBLS.	M.T.	BBLS.	M.T.	BBLS.	M.T.
2.851	0.665		3.516				

WASHABILITY AND PILOT PLANT WASHING RESULTS

ADIT# 17, SEAM# 13

LAB. NO.: 9240/50

CLIENT: FORDING COAL LTD.

SAMPLE: ADIT/SEAM 17/13

LAB. NO.: 9250 July, 1977

SIZE AND RAW ANALYSES								
SIZE FRACTION	WT. %	ASH %	R.M. %	V.M. %	F.C. %	F.S.I.	CUMULATIVE WT. %	CUMULATIVE ASH %
3/4" x 28M	79.9	25.3	1.4	22.7	50.6	7	79.9	25.3
28M x 100M	13.6	12.9	2.4	25.7	59.0	8 1/2	93.5	23.5
100M x 0	6.5	12.6	2.7	25.7	59.0	8 1/2	100.0	22.8
HEAD RAW	100.0	23.3	2.0	23.2	51.5	7	adl% = 2.4	

SINK-FLOAT ANALYSES										
S. G. FRACTION	3/4" x 28M					28M x 100M				
	WT. %	ASH %	F.S.I.	CUMULATIVE WT. %	CUMULATIVE ASH %	WT. %	ASH %	F.S.I.	CUMULATIVE WT. %	CUMULATIVE ASH %
- 1.30	41.6	2.3	9	41.6	2.3	65.4	2.1	9	65.4	2.1
1.30 - 1.35	15.6	7.3	7 1/2	57.2	3.7	8.4	6.3	8 1/2	73.8	2.6
1.35 - 1.40	6.4	12.2	5	63.6	4.5	4.5	12.7	5 1/2	73.8	3.2
1.40 - 1.45	4.5	18.5	4	68.1	5.4	3.7	17.9	5	82.0	3.8
1.45 - 1.50	1.8	23.5	4	69.9	5.9	2.6	22.0	4 1/2	84.6	4.4
1.50 - 1.60	3.6	31.7	3 1/2	73.5	7.2	3.8	29.5	3	88.4	5.5
1.60 - 1.70	2.9	41.0	2	76.4	8.5	2.8	39.6	1 1/2	91.2	6.5
1.70 - 1.80	2.6	49.8	1 1/2	79.0	9.8	2.0	48.3	1	93.2	7.4
1.80 - 1.90	2.6	56.8	1	81.6	11.3	1.0	58.2	1	94.2	7.9
+ 1.90	18.4	82.8	N.A.	100.0	24.5	5.8	79.1	N.A.	100.0	12.1

FROTH FLOTATION TESTS						
SIZE FRACTION	100M x 0					PARAMETERS
	WT. %	ASH %	F.S.I.	CUMULATIVE WT. %	CUMULATIVE ASH %	
STAGE I	63.3	5.4	9	63.3	5.4	Pulp Density = 10% Dosage = 0.48#/Ton Reagent = 4:1 = K:MIBC Conditioning Time = 1 Minute Stage I & II - 1st & 2nd Froth Conc. @ 1st & 2nd Min.
STAGE II	8.9	9.7	8	72.2	5.9	
TAILS	27.8	30.7	5 1/2	100.0	12.8	

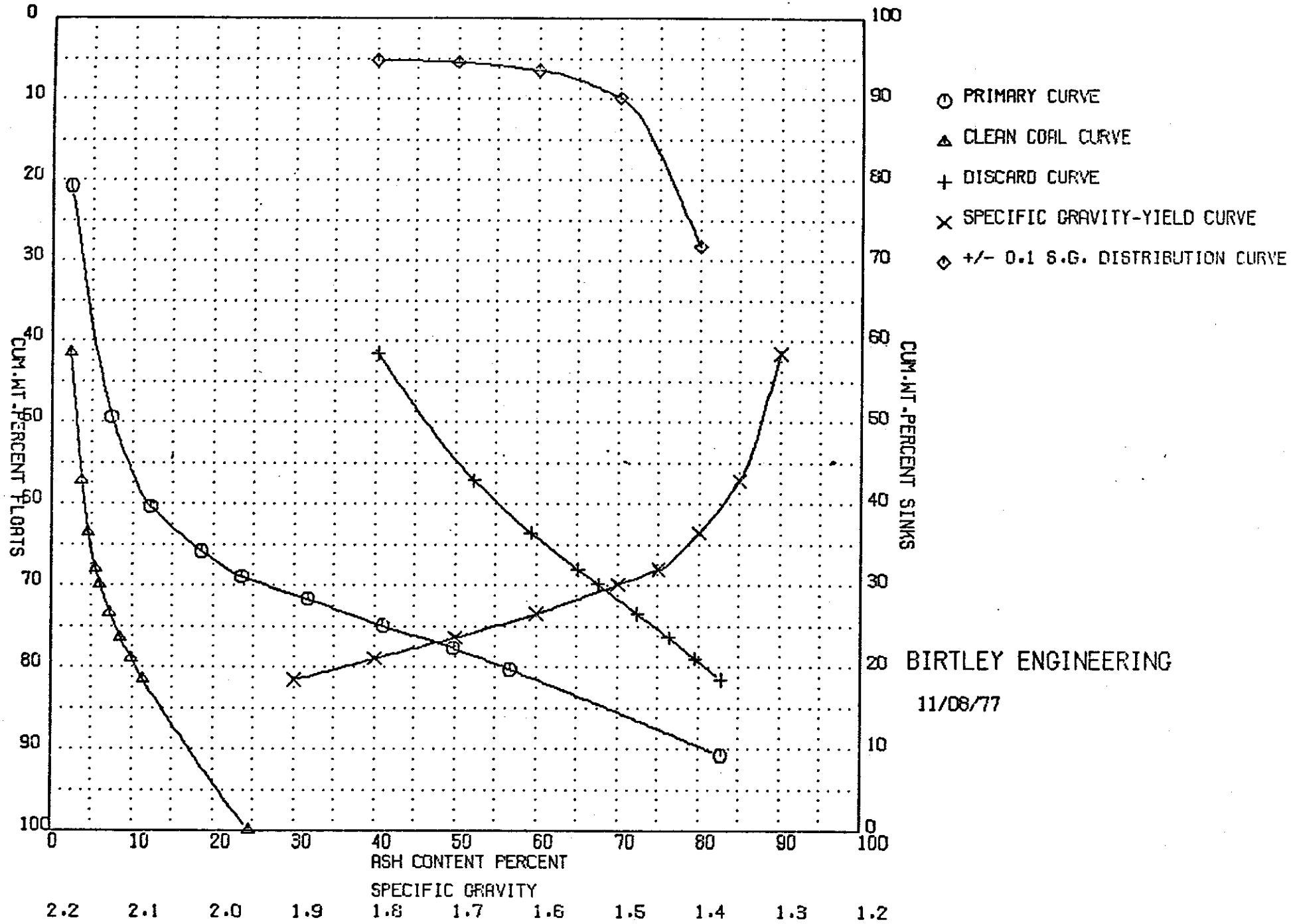
N.A. = non agglomerating

Birtley Engineering

Subsidiary of Great West Steel Industries

FORDING COAL LTD ADIT/SEAM 17/13 LAB 9250 3/4 X 28M

THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING

11/08/77

--PROJECT-- --CUM FLOATS-- --CUM SINKS-- +-1.1 DISTR

	WT>	CUM WT>				STUK WT					
S.G.	WT>	ASH>	ASH IT	ASHTT	WT>	ASH>	ASH>	WT>	ASH>	S.G.	WT>
1	2	3	4	5	6	7	8	9	10	11	12
1.30	41.60	2.30	.06	.06	41.60	2.30	23.51	58.40	40.26	1.30	0.00
1.45	15.60	7.30	1.14	2.10	57.20	3.66	22.37	42.80	52.27	1.40	28.30
1.40	4.40	12.20	.28	2.88	63.60	4.52	21.59	36.40	59.32	1.51	9.90
1.45	4.50	13.50	.23	3.71	68.10	5.45	20.76	31.90	65.09	1.60	6.50
1.50	1.30	23.50	.42	4.13	69.40	5.01	20.34	30.50	67.56	1.70	5.50
1.60	2.60	31.70	1.14	5.27	73.50	7.17	19.20	26.60	72.44	1.90	5.20
1.70	2.90	41.00	1.19	6.46	76.40	9.45	18.01	23.60	76.30	1.90	0.00
1.80	2.60	49.80	1.29	7.76	79.00	9.83	16.71	21.30	79.53	2.00	0.00
1.90	2.00	56.90	1.48	9.23	81.60	11.32	15.24	18.40	82.50	2.10	0.00
9.99	18.40	92.00	15.24	24.47	100.00	24.47	0.00	.00	0.00	2.20	0.00

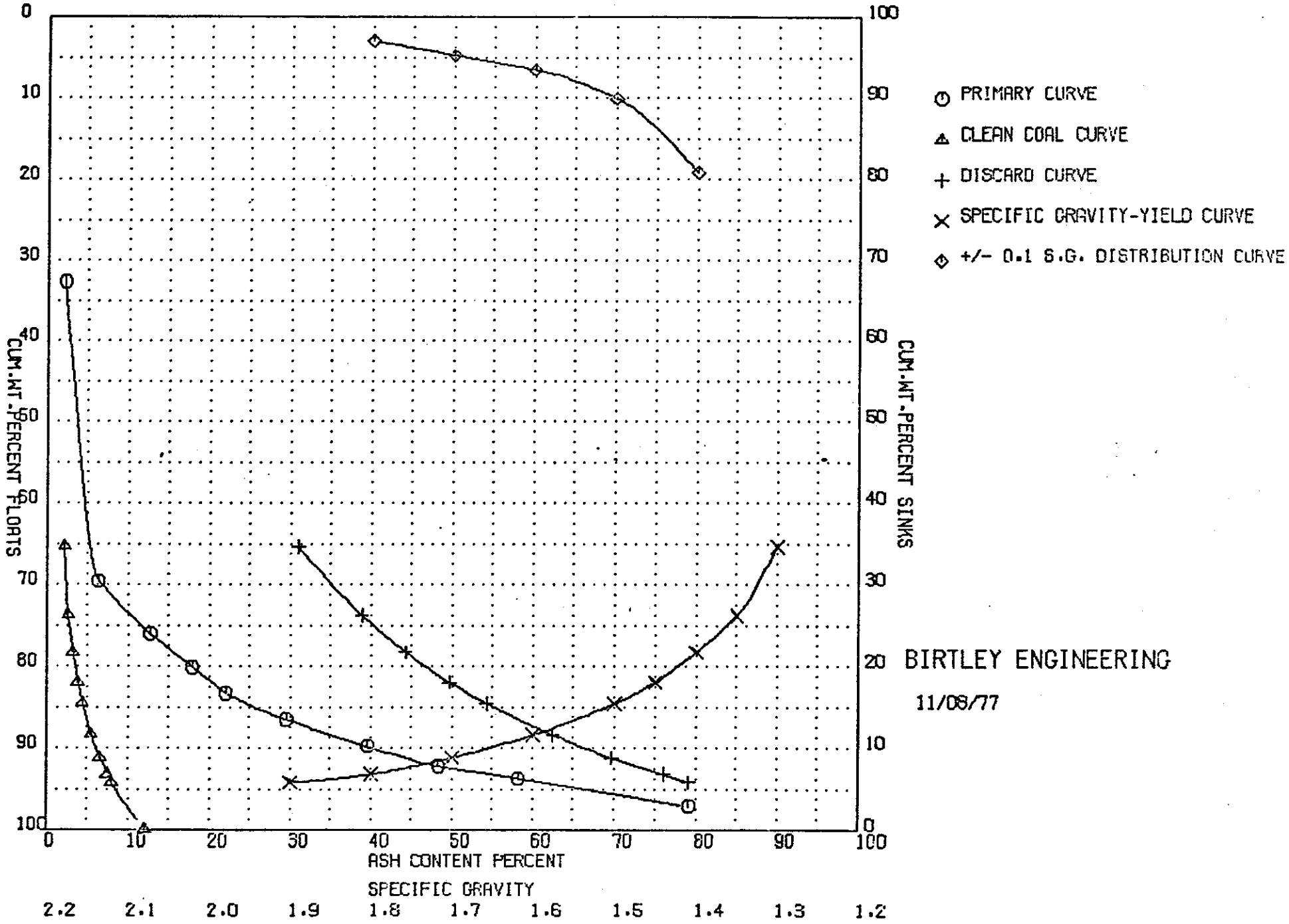
BIRTLEY ENGINEERING
11/08/77

.5	15.9	.5	11.7	8.1	11.7	2.0	11.7	4.0	14.3
1.5	10.1	.7	8.4	10.5	9.6	3.0	9.6	6.0	18.0
2.4	7.0	.9	7.3	11.0	7.3	4.0	7.3	8.0	18.7
3.7	6.9	1.1	6.4	13.0	6.4	5.0	6.4	10.0	10.9
4.7	5.2	1.2	6.0	13.5	6.0	6.0	6.0	12.0	10.0
5.3	5.7	1.4	5.3	14.5	5.3	8.0	5.3	0.0	0.0
8.2	3.0	1.7	4.7	15.3	4.7	10.0	4.7	0.0	0.0
10.0	4.5	2.0	4.2	15.0	4.2	12.0	4.2	0.0	0.0
11.4	3.0	2.3	3.7	16.6	3.7	14.0	3.7	0.0	0.0
16.6	1.0	4.9	.0	0.0	.0	175.8	.0	0.0	0.0

PASS 1 10160
PASS 2 10 44
PASS 3 9 85
PASS 4 9120
PASS 5 5 99

FORDING COAL LTD ADIT/SEAM 17/13 LAB NO 9250 28M X 100M

THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING

11/08/77

--DIRECT-- --CUM FLOATS-- --CUM SINKS-- +-0.1 DISTO

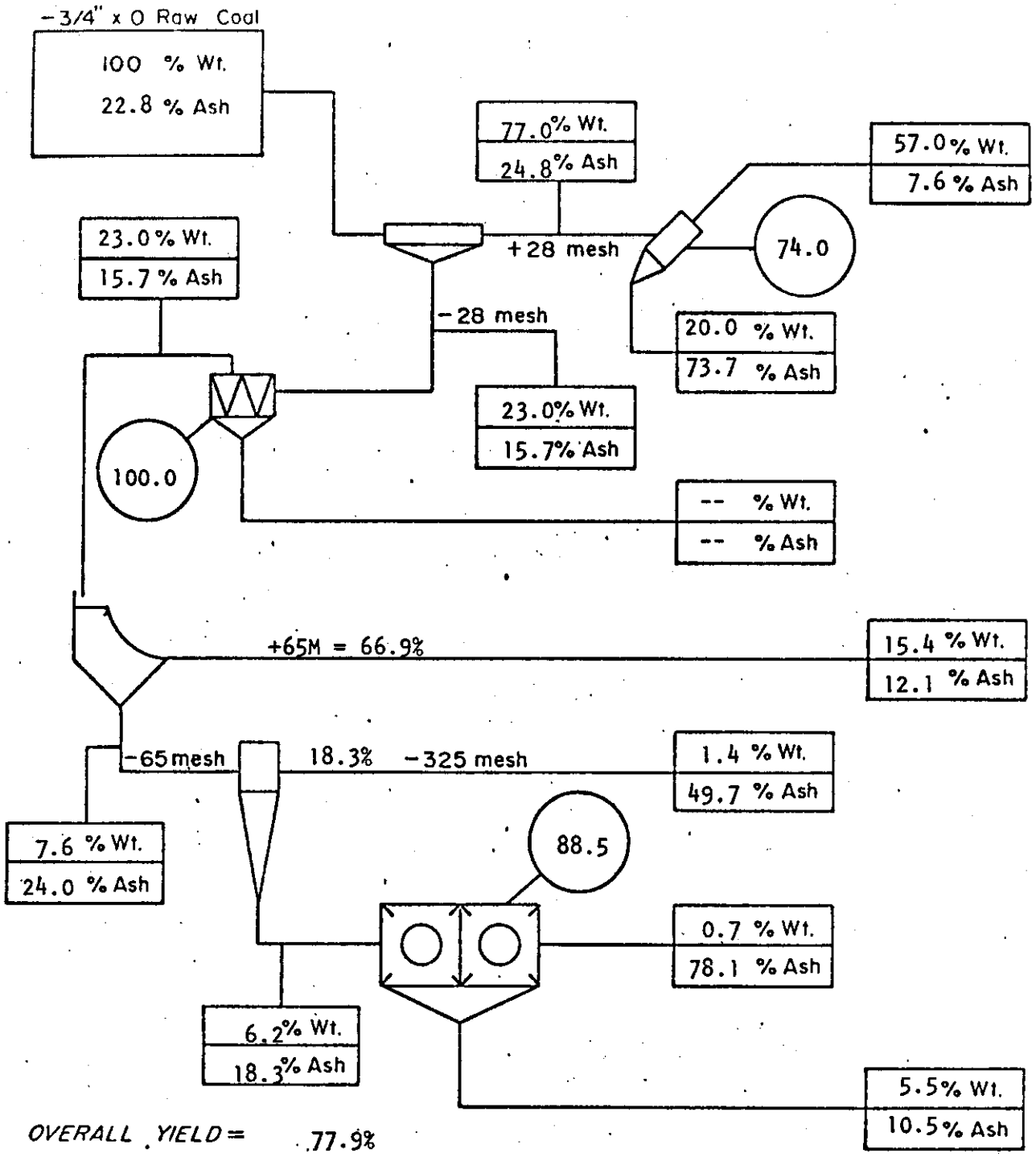
S.G.	WT>	ASH>	ASH WT	ASHT	WT>	ASH>	ASH>	WT>	ASH>	S.G.	WT>
1	2	3	4	5	6	7	8	9	10	11	12
1.30	65.40	2.10	1.37	1.37	65.40	2.10	10.70	34.60	31.03	1.30	0.00
1.35	2.40	6.30	.15	1.90	73.20	2.59	10.17	26.50	34.02	1.40	10.20
1.40	4.50	12.70	.57	2.47	77.30	3.15	9.60	21.30	44.24	1.50	10.10
1.45	3.70	17.00	.66	3.14	82.00	3.82	8.94	18.80	49.65	1.60	6.60
1.50	2.00	22.00	.57	3.71	84.60	4.38	8.37	15.40	54.32	1.70	4.80
1.60	3.80	29.50	1.12	4.83	88.40	5.46	7.24	11.20	62.65	1.80	3.00
1.70	2.90	39.60	1.11	5.94	91.20	6.51	6.14	8.30	69.72	1.90	0.00
1.80	2.00	48.30	.97	6.90	93.20	7.41	5.17	6.00	76.03	2.00	0.00
1.90	1.00	58.20	.58	7.49	94.20	7.05	4.59	5.00	79.10	2.10	0.00
2.00	5.80	79.10	4.59	12.07	100.00	12.07	0.00	.00	0.00	2.20	0.00

RITTLEY ENGINEERING

11/08/77

.4	13.6	.4	6.0	6.2	6.0	2.0	4.0	4.0 16.2
1.3	6.1	.5	5.2	7.0	5.2	3.0	5.2	6.0 18.0
2.5	4.8	.6	4.3	8.0	4.3	4.0	4.3	8.0 18.7
3.6	4.0	.8	3.6	9.0	3.6	5.0	3.6	10.0 19.0
4.4	3.3	.9	3.1	10.0	3.1	6.0	3.1	12.0 19.4
5.0	2.7	1.1	2.3	12.5	2.3	8.0	2.3	0.0 0.0
7.0	2.0	1.3	1.8	13.0	1.8	10.0	1.8	0.0 0.0
9.7	1.6	1.5	1.4	15.2	1.4	12.0	1.4	0.0 0.0
11.6	1.2	1.6	1.2	15.8	1.2	14.0	1.2	0.0 0.0
15.8	.6	2.4	.0	0.0	.0	175.8	.0	0.0 0.0

PASS 1 19163
PASS 2 11 19
PASS 3 4 95
PASS 4 9150
PASS 5 5 80



OVERALL YIELD = 77.9%

LEGEND:

○ *CIRCUIT YIELD %*

Wt. *WEIGHT %*

Ash *ASH CONTENT (AIR DRIED)*

BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
PLANT BALANCE FLOWSHEET PILOT PLANT WASH - ADIT 17, SEAM 13 BULK FORDING COAL LTD. LAB. NO. 9249	July, 1977
	Drawn

BIRTLEY ENGINEERING (CANADA) LTD.

Coal Science & Minerals Testing Div.

FORDING COAL LTD.

BULK WASHING DATA*

ADIT 17 SEAM " 13 LAB. NO. 9249

DELIVERY DATE July 27, 1977 DATE OF WASH July 28, 1977

Raw Coal Analysis: ADM 2.4 ASH% 23.3 FSI 7

Delivered Bulk Weight 5.146 Metric Tons

Washed Weight ** 4.626 " Metric Tons

* All weight and analyses are on Air Dried Basis unless otherwise indicated.

** Does not include +2" oversize which weighed .63 M.T. and simulates breaker plant reject.

FORDING COAL LTD.

BULK WASHING DATA

HEAVY MEDIUM CIRCUIT

ADIT/SEAM NO. 17/13 LAB. NO. 9249

1. S. G. of Separation 1.63
2. Feed Ash Content 24.8 % F.S.I. 6
3. Clean Coal Estimated Weight 2.680 M.T.
4. Clean Coal Analysis - Ash 7.6 % F.S.I. 8
5. Reject Estimated Weight 0.883 M.T.
6. Reject Analysis - Ash 73.7 % F.S.I. 1/2
7. Estimated 3/4" x 28M in Circuit 3.563 M.T. 77.0 Wt.%
8. Yield Clean Coal (Weighted): 75.2 %
9. Yield Clean Coal (Calculated Ash Balance) - 74.0 %

FORDING COAL LTD.

BULK WASHING DATA

WATER-ONLY CYCLONE CIRCUIT **

ADIT/SEAM NO. 17/13 LAB. NO. 9249

1. Vortex Finder Clearance(VCF) _____ CM _____ INCHES

2. Feed Pressure _____ KG/CM^2 _____ P.S.I.

3. Feed Rate _____ $M^3/HR.$ _____ I.G./Min.

4. Feed Pulp Density _____ g/l. _____ Solids W/V

5. Sample Analysis

	SCREEN SIZE	WT.%	ASH%	F.S.I.	CUM. WT.%	CUM. ASH%	HEAD ASH%	HEAD FSI
FEED							15.7	8
O'FLOW	+65 Mesh	66.9	11.9	8	66.9	11.9	15.7	8
	65M x 0	33.1	23.2	8	100.0	15.6		
U'FLOW								
S.B.O.							12.1	8
T.C.O.*							19.7	3

6. Yield - Total W.O. Cyclone Circuit = 100.0%

7. Estimated Yield of 28 x 65 Mesh Coal = 66.9
(as % of 28 Mesh x 0 Feed)

8. Estimated 28M x 0 in circuit
(Plant Feed - HM Products) 1.063 MT 23.0 %

* Thickener Cyclone Overflow

** Water Cyclone Underflow was blocked off, hence total 28M x 0 coal was in effect fed directly to sieve bend.

FORDING COAL LTD.

BULK WASHING DATA

FROTH FLOTATION CIRCUIT

ADIT/SEAM NO. 17/13 LAB. NO. 9249

1. Reagents: Kerosene:Methylisobutylcarbinol (MIBC)

2. Feed Pulp Density 100 - 140 g/l 10 - 14 % Solids W/V

3. Sample Analysis:-

	ASH	F.S.I.
FEED	18.3	8
CONC.	10.5	8 1/2
TAILS	78.1	N.A.

4. Impeller Type - Birtley-Humboldt Multi-Wobble.

5. Yield Calculated (Ash Balance) 88.5 %

6. Filter Cake (Sieve Bend O'Flow & Flotation Conc.)
Wt. Recovered 0.519 M.T.

7. Filter Cake - Ash% 11.7 F.S.I. 8

N.A. = non agglomerating

FORDING COAL LTD.

BULK WASHING DATA

ADIT/SEAM 17/13 LAB. NO. 9249 DATE OF WASH July 28, 1977

a) Raw Coal

Delivered Weight	= 5.146	M.T.
Ash %	= 23.3	
F.S.I.	= 7	
Estimated Washed Wt.	= 4.626	M.T.

b) Heavy Media Circuit

Estimated Proportion of +28 Mesh in Feed 77.0

Effective S.G. = 1.63

Raw Feed	24.8	% Ash	6	F.S.I.
Clean Coal	7.6	% Ash	8	F.S.I.
Reject	73.7	% Ash	1/2	F.S.I.
Calculated Yield	74.0%			
Weighed Yield	75.2%			

c) Water-Only Cyclone Circuit

Raw Feed	15.7	% Ash	8	F.S.I.
Overflow	15.7	% Ash	8	F.S.I.
Underflow	--	% Ash	--	F.S.I.
Calculated Yield	100.0			
% of +65M in O/F	66.9			
Sieve Bend Overflow	12.1	% Ash	8	F.S.I.

d) Froth Flotation Circuit

Raw Feed	18.3	% Ash	8	F.S.I.
Concentrates	10.5	% Ash	8 1/2	F.S.I.
Tails	78.1	% Ash	N.A.	F.S.I.
Calculated Yield	88.5%			

N.A. = non agglomerating

FORDING COAL LTD.

BULK WASHING DATA

BULK WASHING SUMMARY (Cont.)

ADIT 17 Seam 13 LAB. NO. 9249

e) Clean Coal Mix Analyses

(i) Proximate

ADM% 4.0 RM% 0.9 ASH% 8.2 VM% 26.4 FC% 64.5 S% 0.55 FSI 8

f) Clean Coal Mix Make-Up

H. M. CLEAN COAL	FINES FILTER CAKE	CLEAN COAL MIX		SHIPPED		IN STOCK	
M.T.	M.T.	BBLS.	M.T.	BBLS.	M.T.	BBLS.	M.T.
2.680	0.519	19	3.199				

APPENDIX 1 (d)

CASCADE COAL PETROGRAPHY LIMITED

538 CLEVELAND CRES. S.E. CALGARY, ALBERTA T2G 4A9

TELEPHONE: 287-1214 — 287-1215

October 28, 1977

Mr. Peter Daignault,
Fording Coal Ltd.,
Elkford, B.C.
V0B 1H0

Dear Peter;

Enclosed please find the petrographic report on 23 DDH samples submitted to the laboratory.

Since the samples were seam composites @ 9% ash, and I was unable to contact you due to your vacation, I had to , in the interest of accuracy, run 100 reflectance points and 1000 maceral points. To accomplish this , two pellets of each sample were studied. Fully understanding the accuracy that these samples required and the results subsequently being used in Japan, I proceeded with the method outlined above. I trust that this is agreeable to you.

In all cases I have included Macrinite with Micrinite and applied the Schapiro and Grey et al, method of calculating the Coke Stability Factor. Also included in the report are the methods used by Dr. Matsuoka and Dr. Miyazu.

If you have any queries regarding the above please contact me.

I remain

Yours truly

Colin Gange-Harris

per egh

PETROGRAPHIC STUDY

ON

FORDING SAMPLES

DDH- 445,449,643.

28 OCTOBER 1977

CASCADE COAL PETROGRAPHY LIMITED

CONTENTS.

SAMPLE IDENTIFICATION

DDH No.	SEAM	FORDING SAMPLE NO.	CASCADE COAL NO.	DEPTH INTERVAL THICKNESS	SAMPLED FOOTAGE
445	13	13601-602	CCP150-151	63-72.5' (9.5')	8'
445	12	13606-609	CCP152-153	192.5-213.5'(21')	23'
445	11U	13610-611	CCP154-155	226-236.5' (10.5')	11'
445	11	13612-615	CCP156-157	351-360' (9)' 366-369' (3)'	16'
445	9	13618-621	CCP158-159	516.5-534 (17.5')	17'
445	8	13623	CCP164-165	578.5-583.5' (4')	5'
445	7	13526-530	CCP144-145	790-811 (21)'	22.5'
445	5	13531-535	CCP146-147	870-890 (20)'	22'
445	4	13540-544 & 13546	CCP148-149	1107.5-1131.5'(24)' 1135-1139.5' (4.5)'	28'
449	14 LWR.	17179	CCP180-181	197-202' (5)'	6'
449	14 LWR.	17130	CCP166-167	215-222.5'(7.5')	8'
449	13	17135	CCP176-177	347.5-367.5' (20)'	3'
449	12	17136-138	CCP178-179	490-505 (15')	15'
449	11U	17139	CCP160-161	573.5-583' (9.5')	8'
449	11	17140-142	CCP162-163	634-652' (18')	17'
449	9 Part	17144	CCP188-189	772-777' (5')	5'
643	7 Part	13576-577	CCP184-185	18-34.5' (16.5')	10'
643	5	13580-584	CCP170-171	71-94' (23)'	23'
643	4	13588-590	CCP172-173	302.5-321.5' (19')	13'
643	R7U	13599	CCP186-187	395.5-406 (10.5')	6'
643	R7	13551,13593-96	CCP174-175	432.5-453.5' (21')	18'
643	R5	13553-56	CCP168-169	484.5-502.5' (18')	18'
643	R5	13557-562	CCP182-183	516.5-544.5' (28)'	29'

SAMPLE IDENTIFICATION.

DDH #.	FORDING NUMBER.	CASCADE COAL NUMBER.
445	13526/530	CCP 144 - 145
445	13531/35	CCP 146 - 147
445	13540/546	CCP 148 - 149
445	13601/602	CCP 150 - 151
445	13606/609	CCP 152 - 153
445	13610/77	CCP 154 - 155
445	13612/15	CCP 156 - 157
445	13618/621	CCP 158 - 159
449	17139	CCP 160 - 161
449	17140/142	CCP 162 - 163
445	13623	CCP 164 - 165
449	17130	CCP 166 - 167
643	13553/56	CCP 168 - 169
643	13580/584	CCP 170 - 171
643	13588/90	CCP 172 - 173
643	13593/96,13551	CCP 174 - 175
449	17135	CCP 176 - 177
449	17136/38	CCP 178 - 179
449	17179	CCP 180 - 181
643	13557/62	CCP 182 - 183
643	13576/77	CCP 184 - 185
643	13599	CCP 186 - 187
449	17144	CCP 188 - 189.

SAMPLE PREPARATION

SAMPLE RECEPTION

All samples arrived in wooden boxes, enclosed in plastic bottles and labeled as listed on the previous page.

SAMPLE PREPARATION

Each sample was coned and quartered till 8 grams was obtained. This was used for one pellet. The sample was then reconstituted and coned and quartered till an additional 8 grams was obtained. This represented the second pellet. The sample was again reconstituted and coned and quartered till the sample was equally divided. One half of the sample was used for plasticity studies and the remaining half was stored for future use. The two samples were then made into pellets and polished.

METHOD OF ANALYSIS

Reflectance data was obtained by studying 50 points on each pellet, for a total of 100 points per sample. Maceral data was obtained by studying 500 points on each pellet, for a total of 1000 points per sample. The margin of error between the reflectance of samples is in the order of 0.02%. For Maceral analysis the margin of error is in the order of 5%.

Coke stability calculations were obtained using the Schapiro Grey et al method. In all pellets studied, the maceral MACRINITE was included in Micrinite.

The J.I.S. Drum Index is an approximation and is taken from Matsuoka's Balance Index and Strength Index Chart on pages 32, 33, & 34.

Sample 643# 13576/77 was oxidized approximately 40-50%. Reflectance readings were taken only on Vitrinite which was not oxidized. Maceral counts were completed but only to establish the percentage of oxidized material.

Plasticity samples run and recorded no increase over 1 DDPM were the following:-

CCP-184-185
CCP-170-171
CCP-168-169
CCP-150-151.

REFLECTANCE DATA

FORDING NO. DDH#	CCP NO.	SEAM	MEAN MAX REFLECTANCE	VM % (from RO)	V - TYPES V9	V10	V11	V12	V13	V14	V15	V16
445-13526/530	144-145	7	1.2907	25	-	-	5	49	43	3	-	-
445-13531/35	146-147	5	1.3393	23	-	-	2	13	76	7	2	-
445-13540/546	148-149	4	1.4201	21	-	-	-	2	27	63	7	1
445-13601/602	150-151	13	1.0917	29	2	51	45	2	-	-	-	-
445-13606/609	152-153	12	1.122	29	-	29	65	6	-	-	-	-
445-13610/77	154-155	11u	1.1160	29	1	30	57	12	-	-	-	-
445-13612/15	156-157	11	1.158	29	-	15	61	24	-	-	-	-
445-13618/621	158-159	9	1.2479	26	-	13	77	10	-	-	-	-
449-17139	160-161	11u	1.1193	29	-	24	73	3	-	-	-	-
449-17140/142	162-163	11	1.1652	29	-	7	67	26	-	-	-	-
445-13623	164-165	8	1.2694	25	-	3	10	47	39	1	-	-
449-17130	166-167	14l	1.0327	32	25	62	13	-	-	-	-	-
643-13553/56	168-169	R5	1.4171	21	-	-	-	4	30	47	18	1
643-13580/584	170-171	5	1.3739	21	-	-	1	10	56	29	4	-
643-13588/90	172-173	4	1.3293	23	-	-	2	25	57	16	-	-
643-13593/96 13551	174-175	R7	1.3138	24	-	1	3	33	53	10	-	-
449-17135	176-177	13	1.0847	29	1	62	36	1	-	-	-	-
449-17136/38	178-179	12	1.1355	29	2	17	71	10	-	-	-	-
449-17179	180-181	14l	1.0468	29	23	52	24	1	-	-	-	-
643-13557/62	182-183	R5	1.4064	21	-	-	-	4	37	50	9	-
643-13576/77	184-185	7	1.2730	25	-	-	9	59	31	1	-	-
643-13599	186-187	R7u	1.3890	21	-	-	4	3	40	52	1	-
449-17144	188-189	9	1.2458	25	-	5	11	64	20	-	-	-

MACERAL ANALYSIS.

SAMPLE IDENTIFICATION. OCP #	SEAM	VITRINITE	EXINITE	SEMIFUSINITE	MICRINITE	FUSINITE	MINERAL MATTER	REACTIVES %	INERTS %	COMPOSITIONAL BALANCE INDEX	STRENGTH INDEX	CALCULATED STABILITY FACTOR	APPROXIMATE JIS [illegible]
144-145	7	52.27	-	18.23	9.39	13.43	5.68	59.62	40.38	2.40	4.94	50	91
146-147	5	49.29	-	23.64	7.46	15.26	4.36	56.62	43.37	3.01	5.41	49	91
148-149	4	47.95	-	22.06	10.15	15.55	4.28	54.75	45.25	4.01	6.09	46	91
150-151	13	53.52	4.92	16.29	8.77	10.80	5.69	64.19	35.81	1.42	4.02	51	91
152-153	12	53.47	4.61	15.39	10.96	10.00	5.56	63.44	36.55	1.51	4.15	52	91
154-155	11u	64.61	2.37	12.14	4.89	12.71	3.32	69.62	30.37	1.15	4.29	58	92
156-157	11	57.71	2.93	15.53	10.06	9.28	4.49	65.29	34.71	1.46	4.33	53	92
158-159	9	43.51	.04	24.61	12.53	13.98	4.92	52.06	47.94	2.96	4.24	37	91
160-161	11u	61.89	2.12	16.09	7.93	7.49	4.47	68.82	31.18	1.19	4.29	57	92
162-163	11	73.89	.03	12.47	3.46	6.81	3.04	76.60	23.40	0.85	4.52	60	93
164-165	8	57.76	-	17.53	7.43	12.27	4.84	63.50	36.49	1.94	4.95	53	92
166-167	14 L	67.45	5.00	8.21	4.53	8.77	6.04	75.83	24.17	0.79	3.87	53	91
168-169	R5	51.39	-	22.19	6.55	15.98	3.88	57.96	42.04	3.54	6.13	50	91
170-171	5	52.53	-	22.59	6.17	15.82	2.88	58.63	41.36	2.98	5.73	52	91
172-173	4	53.15	-	19.55	9.77	12.44	5.09	59.57	40.42	2.62	5.41	52	91
174-175	R7	49.47	-	18.90	7.91	16.97	6.75	56.67	43.33	2.83	5.14	48	91
176-177	13	61.01	5.84	9.58	5.62	11.12	6.83	71.23	28.76	1.01	4.09	56	92
178-179	12	66.58	2.66	10.33	7.02	7.26	6.13	73.39	26.60	0.97	4.41	60	93
180-181	14 L	60.49	4.98	14.23	7.31	9.09	3.89	69.24	30.75	1.11	3.94	53	92
182-183	R5	46.57	-	27.12	8.47	13.72	4.12	55.87	44.13	3.75	5.89	46	91
184-185	7	NO RESULTS-SAMPLE OXIDIZED.ESTIMATE 40%-50% OF SAMPLE OXIDIZED											
186-187	R7u	49.90	1.58	20.09	10.69	12.28	5.45	58.32	41.68	3.17	5.96	52	91
188-189	9	48.40	.09	22.46	14.27	8.98	4.89	56.68	43.41	2.61	4.43	42	91

ANALYSES FOR DDH- 445

FORDING # / CCP #	SEAM	REFLECTANCE.	MACERAL DATA: VITRINITE	EXINITE	SEMIFUSINITE	MICRINITE	FUSINITE	MINERAL MATTER	STABILITY DATA: REACTIVES %	INERTS %	COMPOSITIONAL BALANCE INDEX	STRENGTH INDEX	STABILITY FACTOR	PLASTICITY DATA. DDPM START @ C	DPM MAXIMUM @ C	DDPM FINAL @ C	TEMPERATURE
13601/602 150-151	13	1.091	53.52	4.92	16.29	8.77	10.80	5.69	64.19	35.81	1.42	4.02	51	NO FLUIDITY OVER 1 in all temp.			
13610/77 154-155	11a	1.1160	64.61	2.37	12.14	4.84	12.71	3.32	69.62	30.37	1.15	4.29	58	1 @427	110 @461	1 @486	59
13606/609 152-153	12	1.1220	53.47	4.61	15.39	10.96	10.00	5.56	63.44	36.55	1.51	4.15	52	1 @426	122 @462	1 @487	61
13612/15 156-157	11	1.158	57.71	2.93	15.53	10.06	9.28	4.49	65.29	34.71	1.46	4.33	53	1 @421	217 @461	1 @490	69
13618/621 158-159	9	1.2478	43.51	0.04	24.61	12.53	13.98	4.92	52.06	47.94	2.96	4.24	37	1 @446	1.7 @458	1 @467	21
13623 164-165	8	1.2694	57.76	-	17.53	7.53	12.27	4.84	63.50	36.49	1.94	4.95	53	1 @429	73.2@461	1 @483	54
13526/530 144-145	7	1.290	52.27	-	18.23	9.39	13.43	5.68	59.62	40.38	2.40	4.94	50	1 @438	12.4@469	1 @483	45
13531/35 146-147	5	1.339	49.29	-	23.64	7.46	15.26	4.36	56.62	43.37	3.01	5.41	49	1 @455	1.9 @469	1 @480	25
13540/546 148-149	4	1.420	47.95	-	22.06	10.15	15.55	4.28	54.75	45.25	4.01	6.09	46	1 @444	2.3 @470	1 @486	42

ANALYSES FOR DDH 449

AMPLE NO:		MACERAL DATA								STABILITY DATA						PLASTICITY DATA			
	SEAM	REFLECTANCE	VITRINITE	EXINITE	SEMIFUSINITE	MICRINITE	FUSINITE	MINERAL MATTER	REACTIVES %	INERTS %	COMPOSITIONAL BALANCE INDEX	STRENGTH INDEX	STABILITY FACTOR	DDPM START @ C	DDPM MAXIMUM @ C		DDPM FINAL @ C	TEMPERATURE RANGE. C
ORDING # CP #																			
.7130 .66-167	14 l.	1.032	67.45	5.00	8.21	4.53	8.77	6.04	75.83	24.17	0.79	3.87	53	1 @414	653	@456	1 @485	71
.7139 .80-181	14 l.	1.0468	60.49	4.98	14.23	7.31	9.09	3.89	69.24	30.75	1.[illegible]	3.94	53	1 @ 415	585	@453	1 @484	69
.7135 .76-177	13	1.0847	61.01	5.84	9.58	5.62	11.12	6.83	71.23	28.76	1.01	4.09	56	1 @ 425	116	@456	1 @477	52
17139 160-161	11u	1.1193	61.89	2.12	16.09	7.93	7.49	4.47	68.82	31.18	1.19	4.24	57	1 @ 421	270	@463	1 @491	70
17136/38 178-179	12	1.1355	66.58	2.66	10.33	7.02	7.26	6.13	73.39	26.60	0.97	4.41	60	1 @ 418	256	@458	1 @487	69
17140/142 162-163	11	1.165	73.89	0.03	12.47	3.46	6.81	3.04	76.60	23.40	0.85	4.52	60	1 @ 424	224	@463	1 @491	67
17144 188-189	9	1.2458	48.40	0.09	22.46	14.27	8.98	4.84	56.68	43.41	2.61	4.43	42	1 @ 452	1.3	@457	1 @469	17

ANALYSES FOR DDH 643.

SAMPLE NO: FORDING # / CCP #	SEAM	REFLECTANCE	MACERAL DATA: VITRINITE	EXINITE	SEMIFUSINITE	MICRINITE	FUSINITE	MINERAL MATTER	STABILITY DATA: REACTIVES %	INERTS %	COMPOSITIONAL BALANCE INDEX	STRENGTH INDEX	STABILITY FACTOR	PLASTICITY DATA: DDPM START @ C	DDPM MAXIMUM @ C	DDPM FINAL @ C	TEMPERATURE RANGE. C.
13576/77 184-185	7	1.2730	NO RESULTS WERE TABULATED DUE TO SAMPLE OXIDATION.											Sample run- no fluidity apparent.			
13593/96, 13551. 174-175	R7	1.3138	49.47	-	18.90	7.91	16.97	6.75	56.67	43.33	2.83	5.14	48	1 @ 435	51.6 @468	1 @493	58
13588/90 172-173	4	1.3293	53.15	-	19.55	9.77	12.44	5.09	59.57	40.42	2.62	5.41	52	1 @ 435	30 @468	1 @490	55
13580/584 170-171	5	1.3739	52.53	-	22.59	6.17	15.82	2.88	58.63	41.36	2.98	5.73	52	Sample run twice-no fluidity			
13599 186-187	R7u	1.3890	49.90	1.58	20.09	10.69	12.28	5.45	58.32	41.68	3.17	5.96	52	1 @ 452	4.0 @480	1 @490	38
13557/62 182-183	R5	1.4064	46.57	-	27.12	8.47	13.72	4.12	55.87	44.13	3.75	5.89	46	1 @ 456	1.4 @468	1 @480	24
13553/56 168-169	R5	1.4171	51.39	-	22.19	6.55	15.98	3.88	57.96	42.04	3.54	6.13	50	Sample run twice-no fluidity.			

REFLECTANCE DATA.

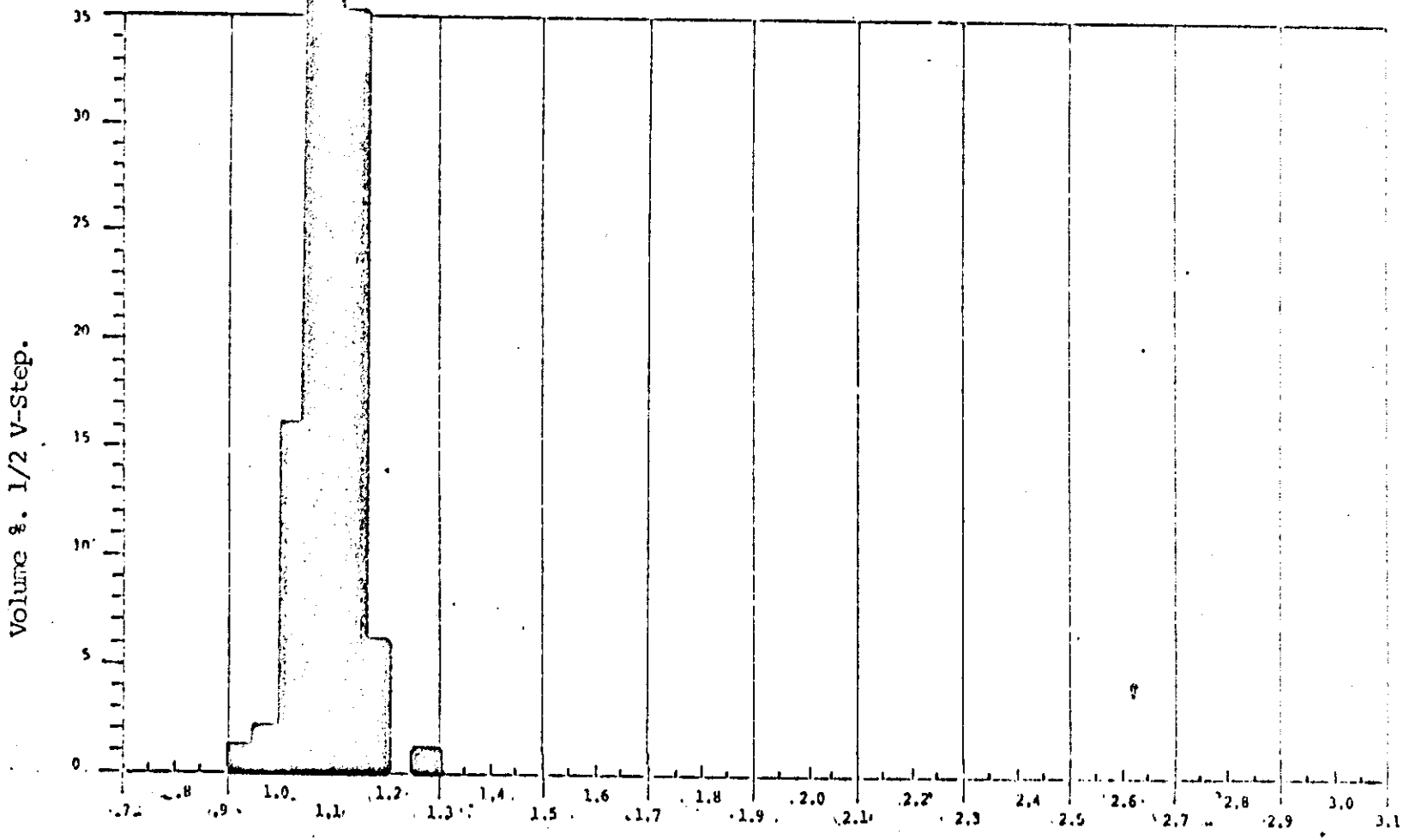
SEAM CORRELATING REFLECTANCE

DDH 445.			DDH 449.			DDH643.		
SEAM	SAMPLE #	R_O	SEAM	SAMPLE #	R_O	SEAM	SAMPLE #	R_O
	-	-	14 l.	17130	1.032		-	-
	-	-	14 l.	17179	1.0468		-	-
13	13601/602	1.091	13	17135	1.0847		-	-
11u	13610/77	1.1160	11u	17139	1.1193		-	-
12	13606/609	1.1220	12	17136/38	1.1355		-	-
11	13612/15	1.158	11	17140/142	1.165		-	-
9	13618/621	1.2478	9	17144	1.2458		-	-
8	13623	1.2694		-	-	7	*13576/77	1.2730
7	13526/530	1.290		-	-	R7	13593.96-13551	1.3138
5	13531/35	1.339		-	-	4	13588/90	1.3293
	-	-		-	-	5	13580/584	1.3739
	-	-		-	-	R7u	13599	1.3890
	-	-		-	-	R5	13557/62	1.4064
4	13540/546	1.420		-	-	R5	13553/56	1.4171

* Denotes sample that is oxidised. Estimate that 40 - 50 % of this sample is in oxidised state.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 150 & 151



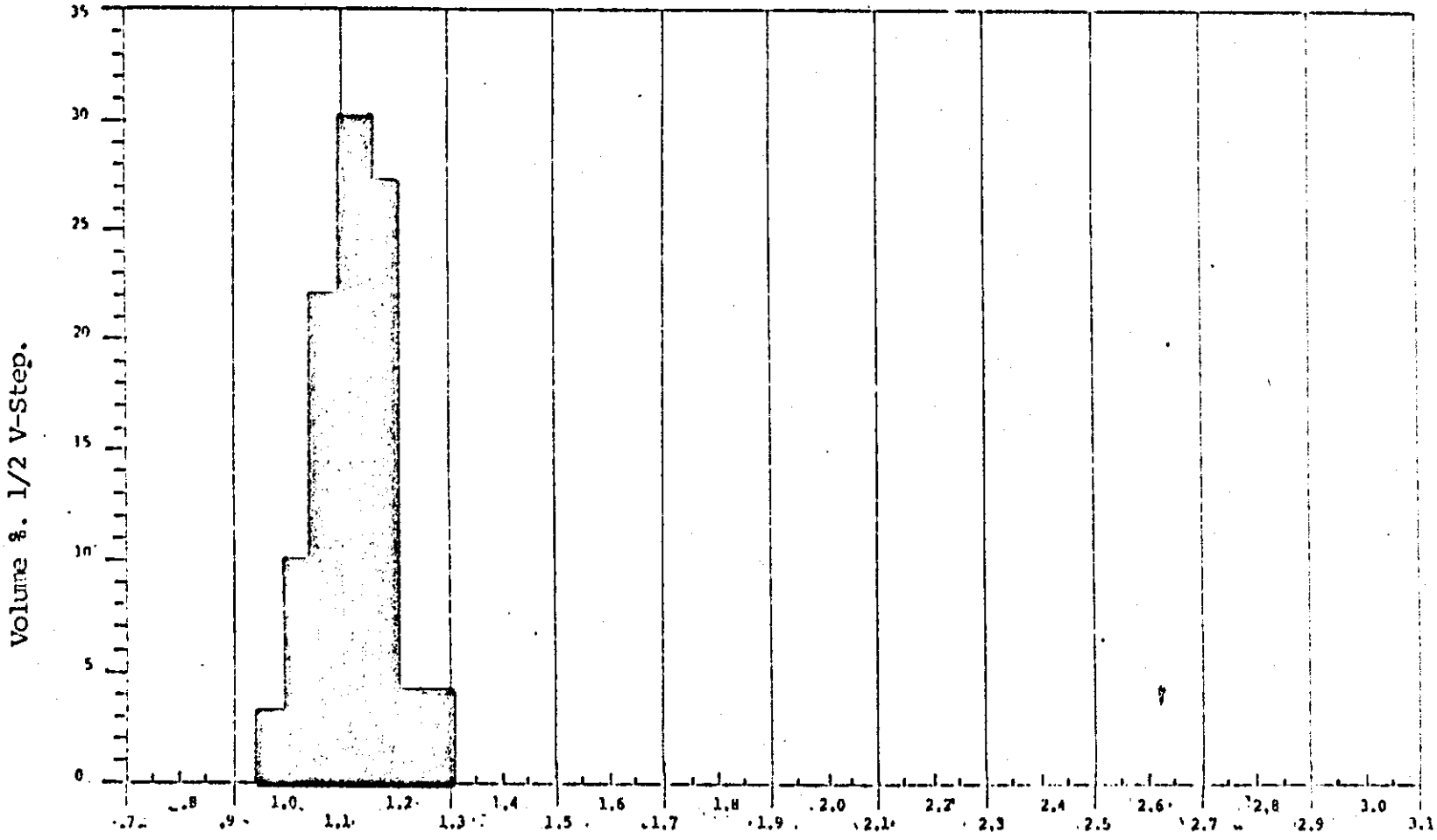
REFLECTANCE 0.05 % INCREMENTS.

DDH 445# 13601 / 602

SEAM-13

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 154 & 155



REFLECTANCE 0.05 % INCREMENTS.

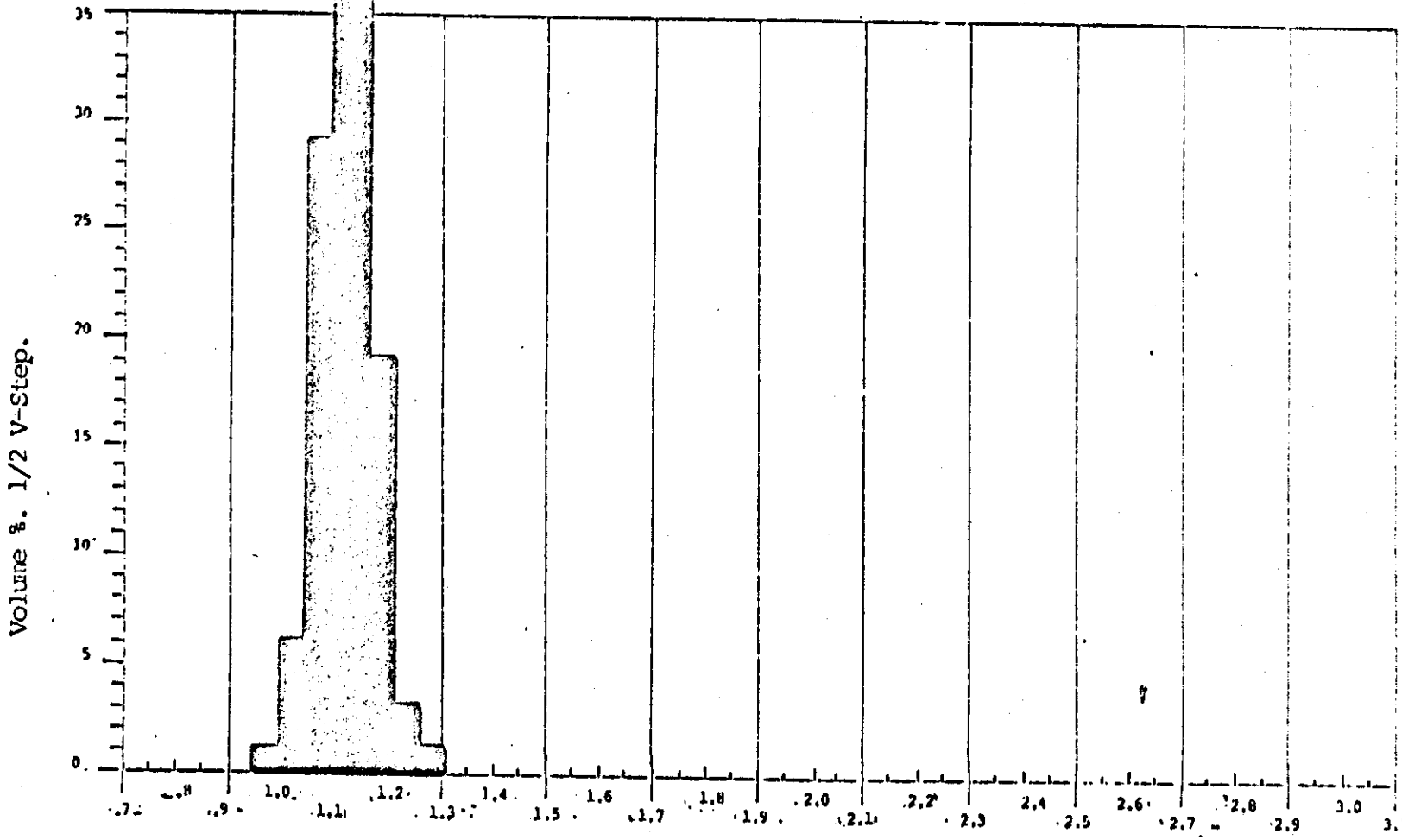
DDH 445 # 13610 / 77

SEAM -IIu

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 152 & 153



REFLECTANCE 0.05 % INCREMENTS.

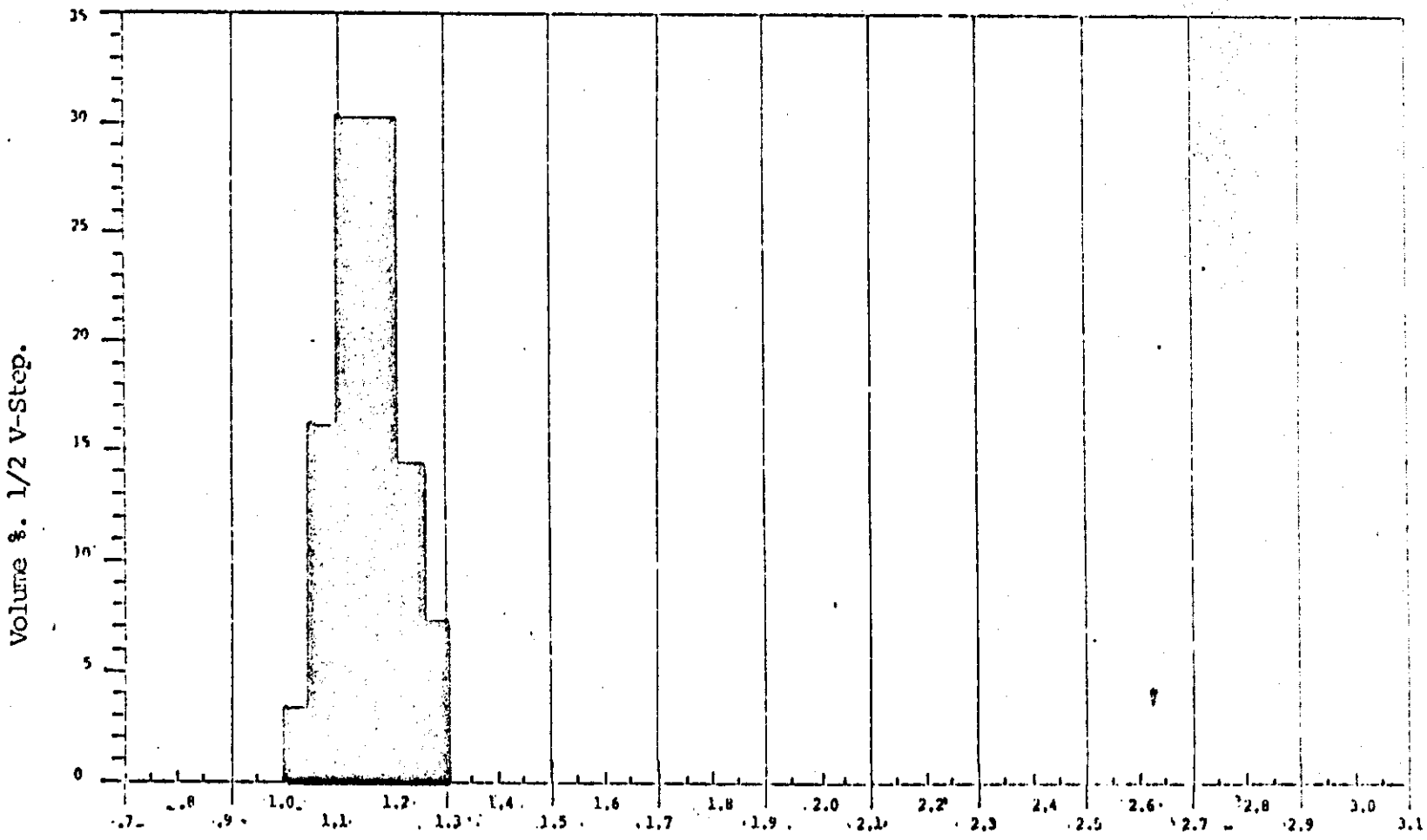
DDH 445 # 13606 / 609

SEAM - 12

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 156 & 157



REFLECTANCE 0.05 % INCREMENTS.

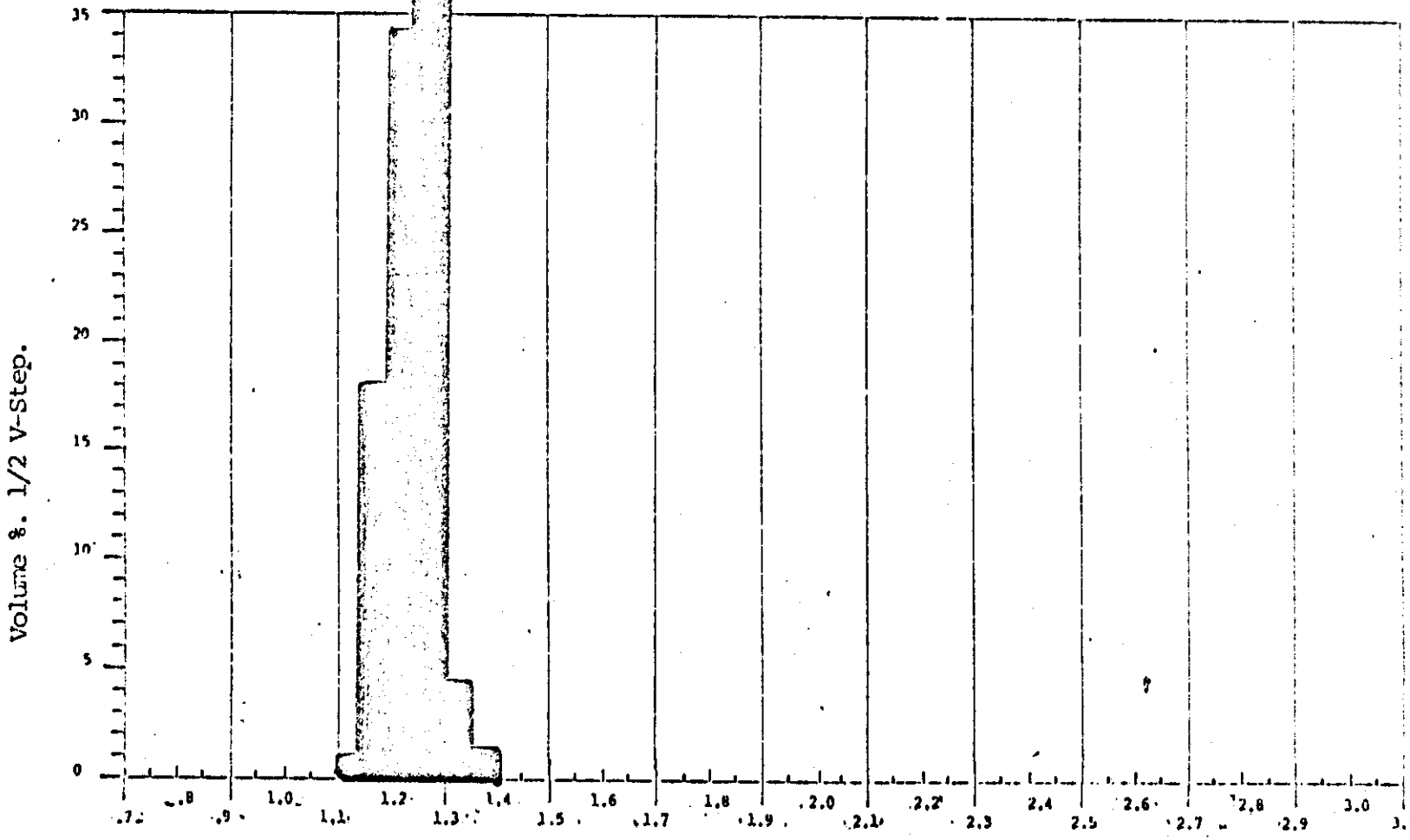
DDH 445 # 13612 / 15

SEAM - II

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP-158 & 159



REFLECTANCE 0.05 % INCREMENTS.

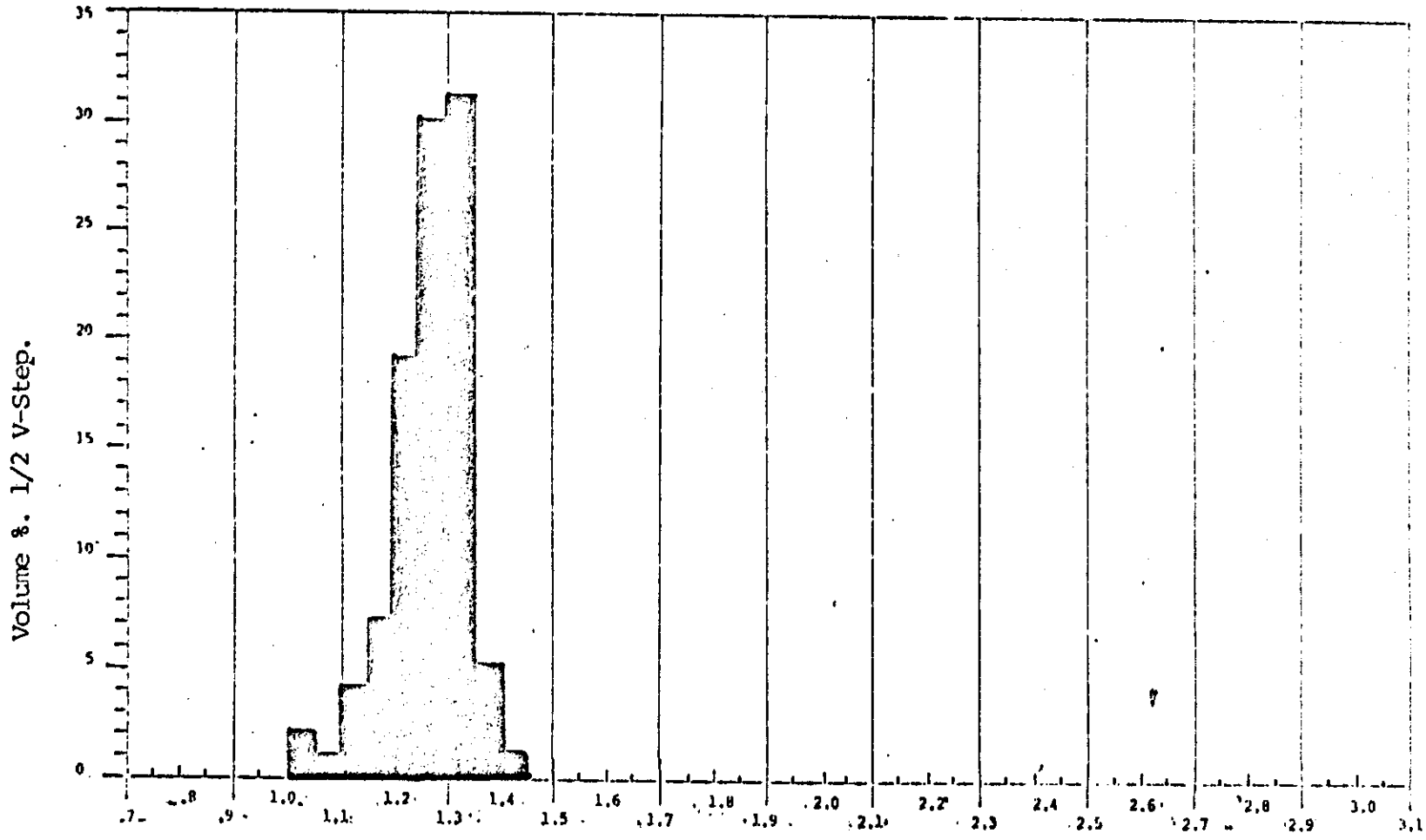
DDH 445 #: 13618 / 621

SEAM-9

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 164 & 165



REFLECTANCE 0.05 % INCREMENTS.

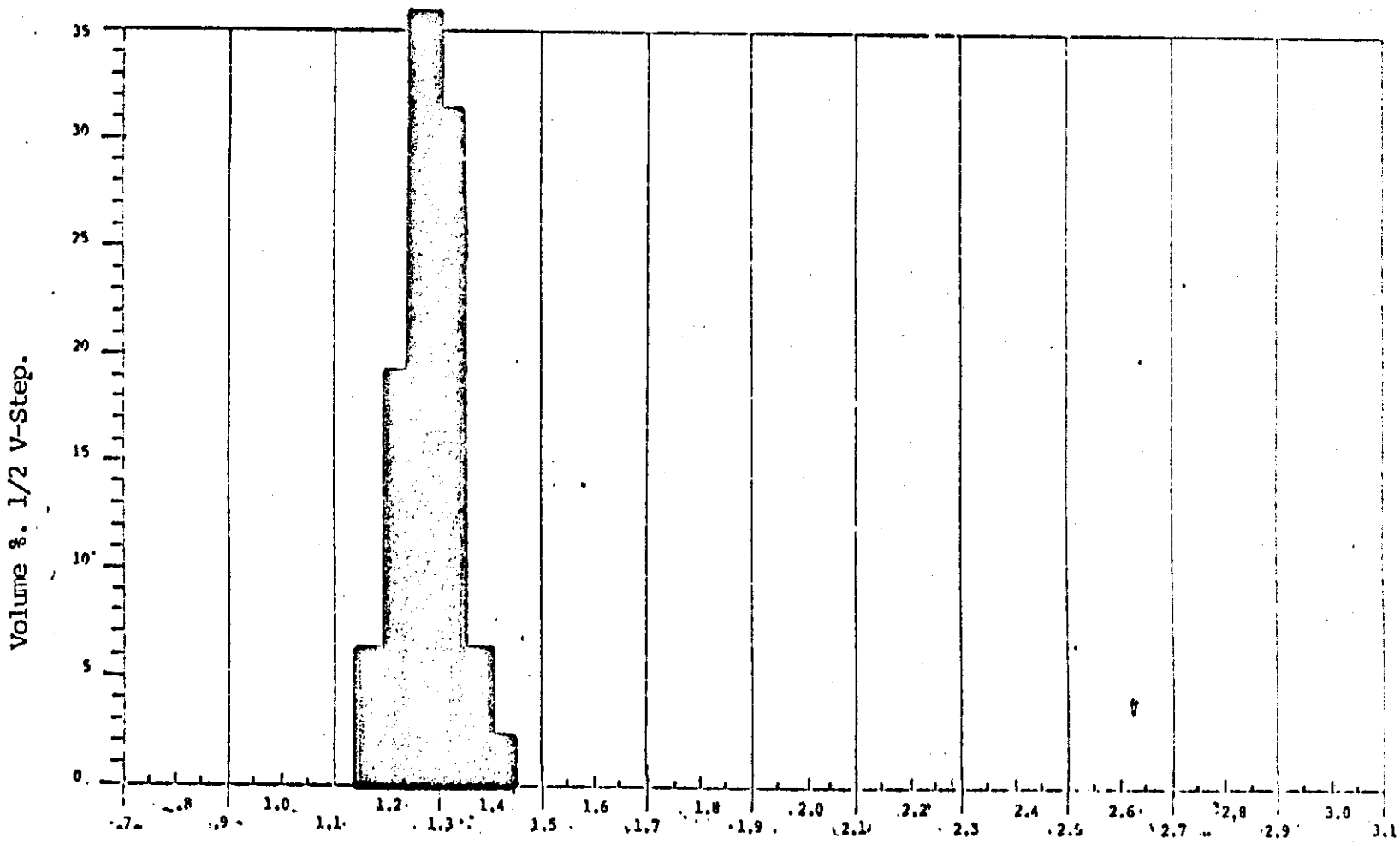
DDH 445 # 13623

SEAM - 8

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 144 & 145



REFLECTANCE 0.05 % INCREMENTS.

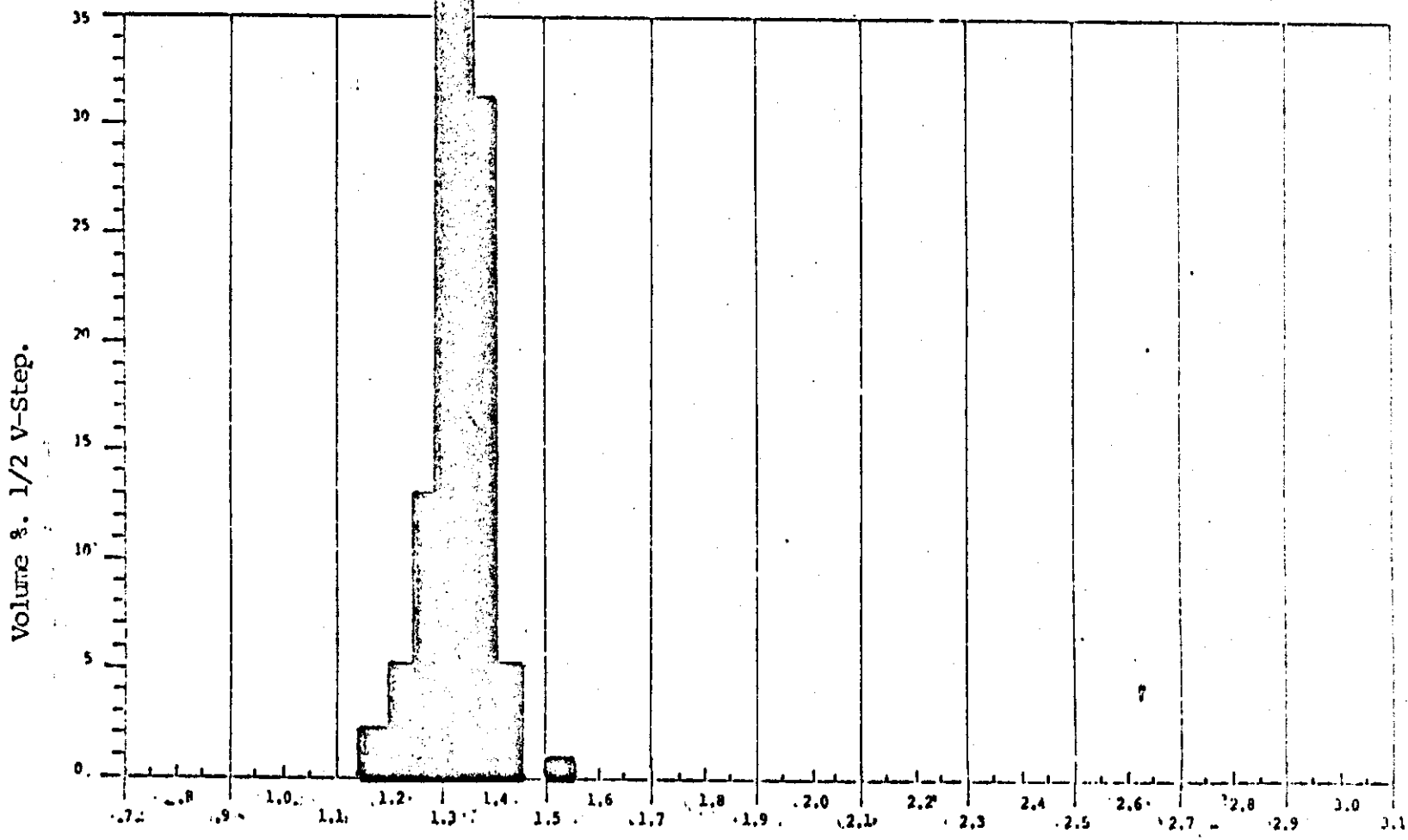
DDH 445 # 13526 / 530

SEAM-7

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP-146 & 147



REFLECTANCE - 0.05 % INCREMENTS.

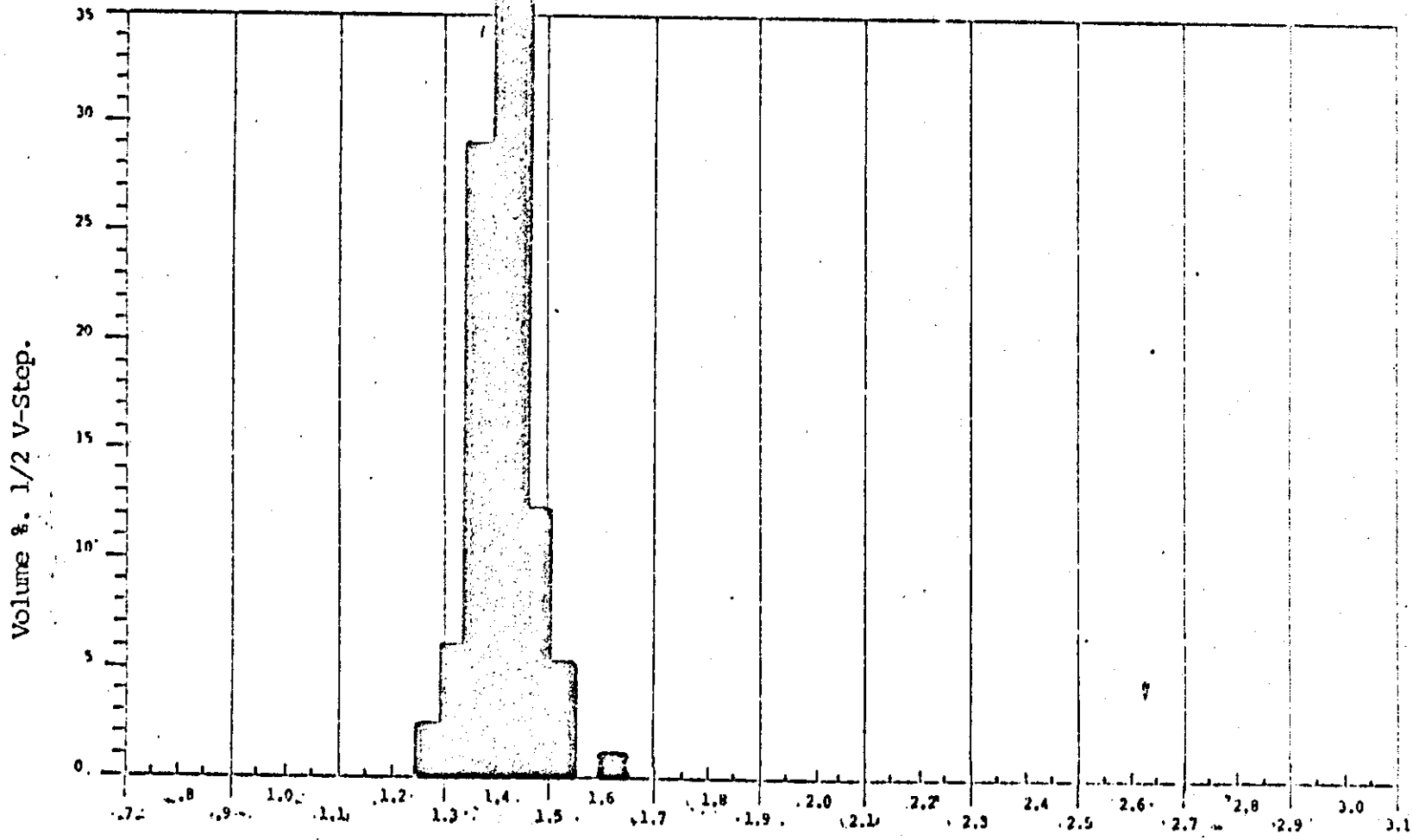
DDH 445 # 13531 / 35

SEAM-5

Cascade Coal Petrography Limited.

RI[illegible]CTANCE HISTOGRAM.

PELLET No:- CCP- 148 & 149



REFLECTANCE 0.05 % INCREMENTS.

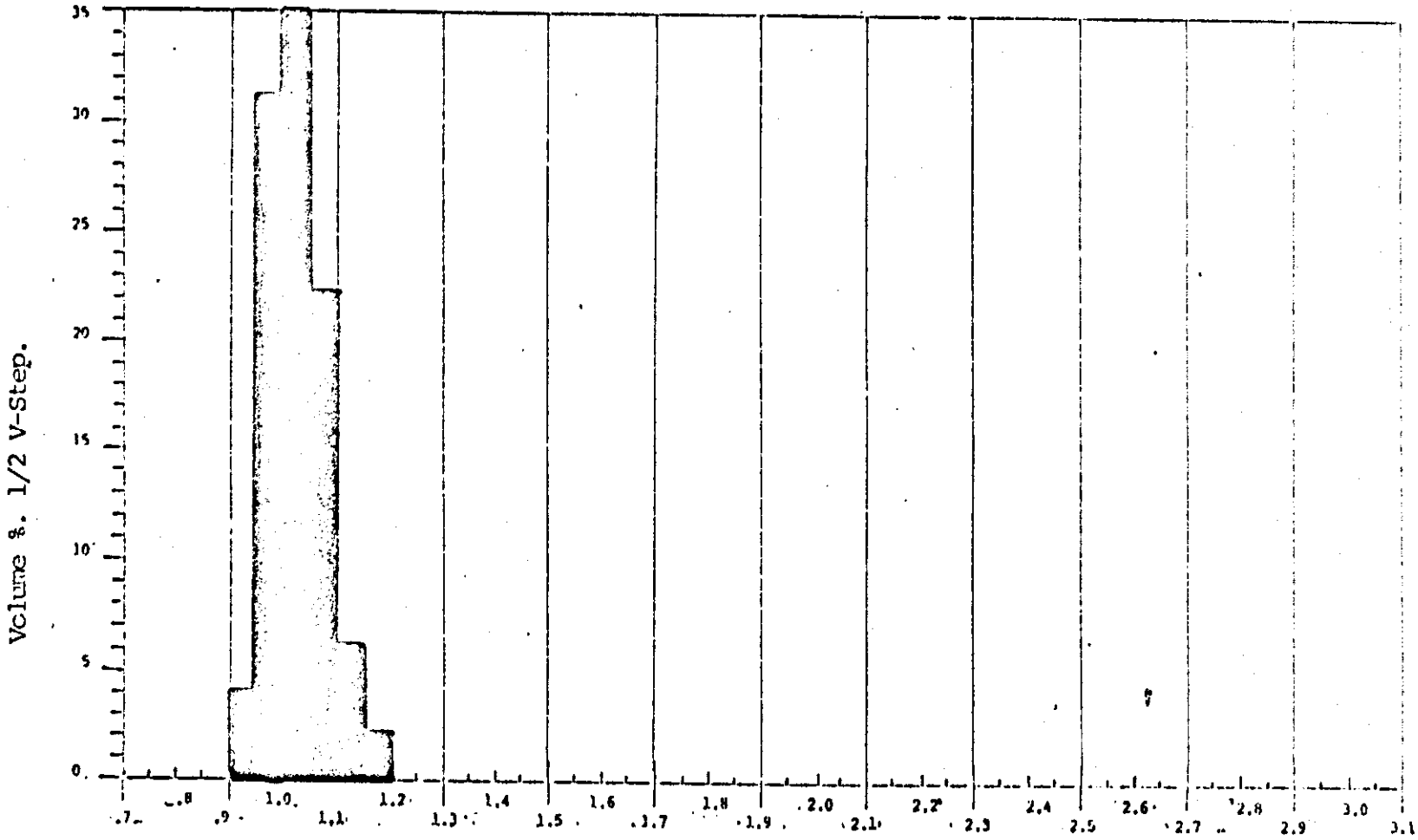
DDH 445 # 13540 / 546

SEAM-4

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 166 & 167



REFLECTANCE 0.05 % INCREMENTS.

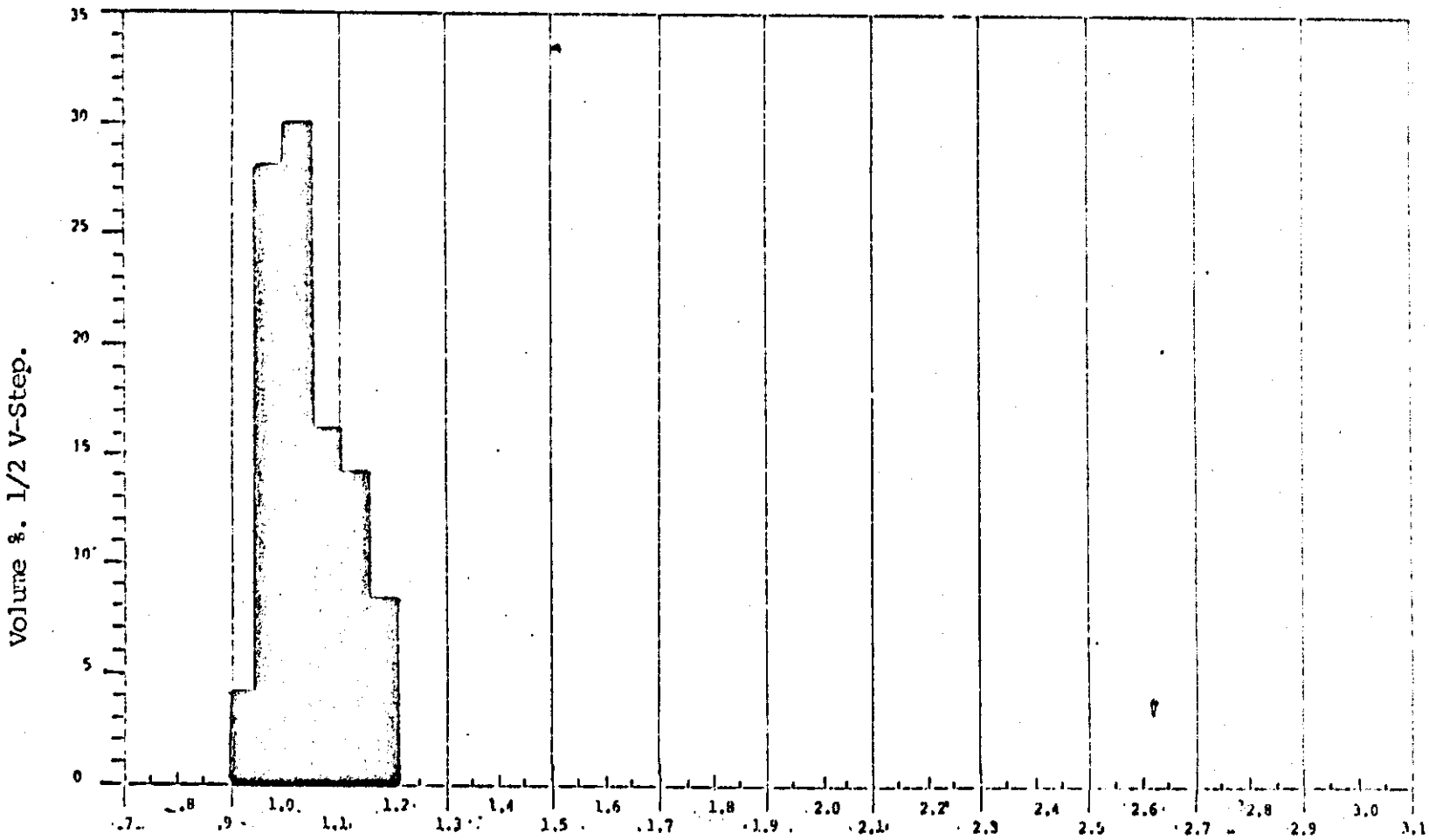
DDH 449 # 17130

SEAM- 14 Lwr. Band

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 180 & 181



REFLECTANCE 0.05 % INCREMENTS.

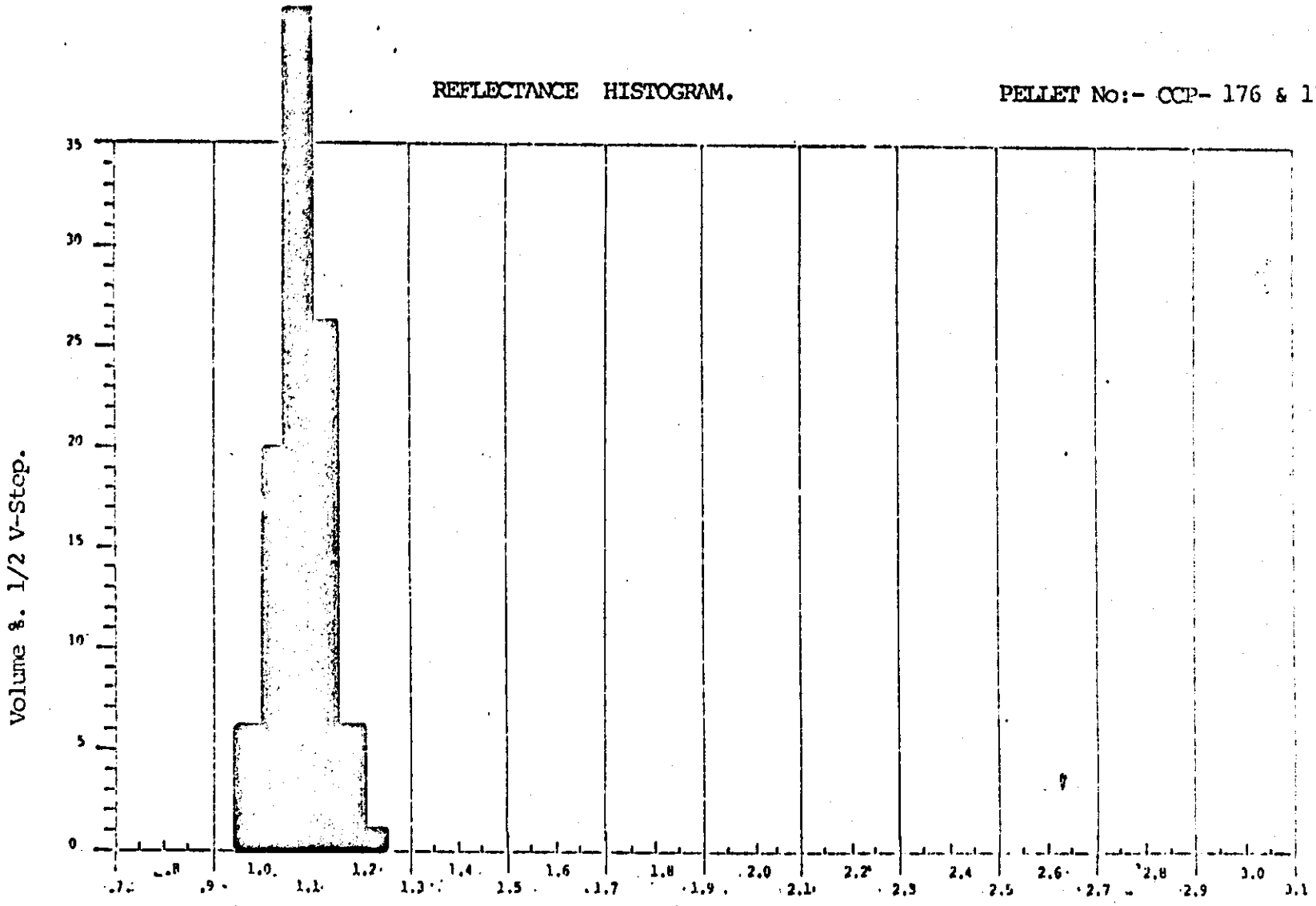
DDH 449# 17179

SEAM- I4 Lwr. Band

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 176 & 177



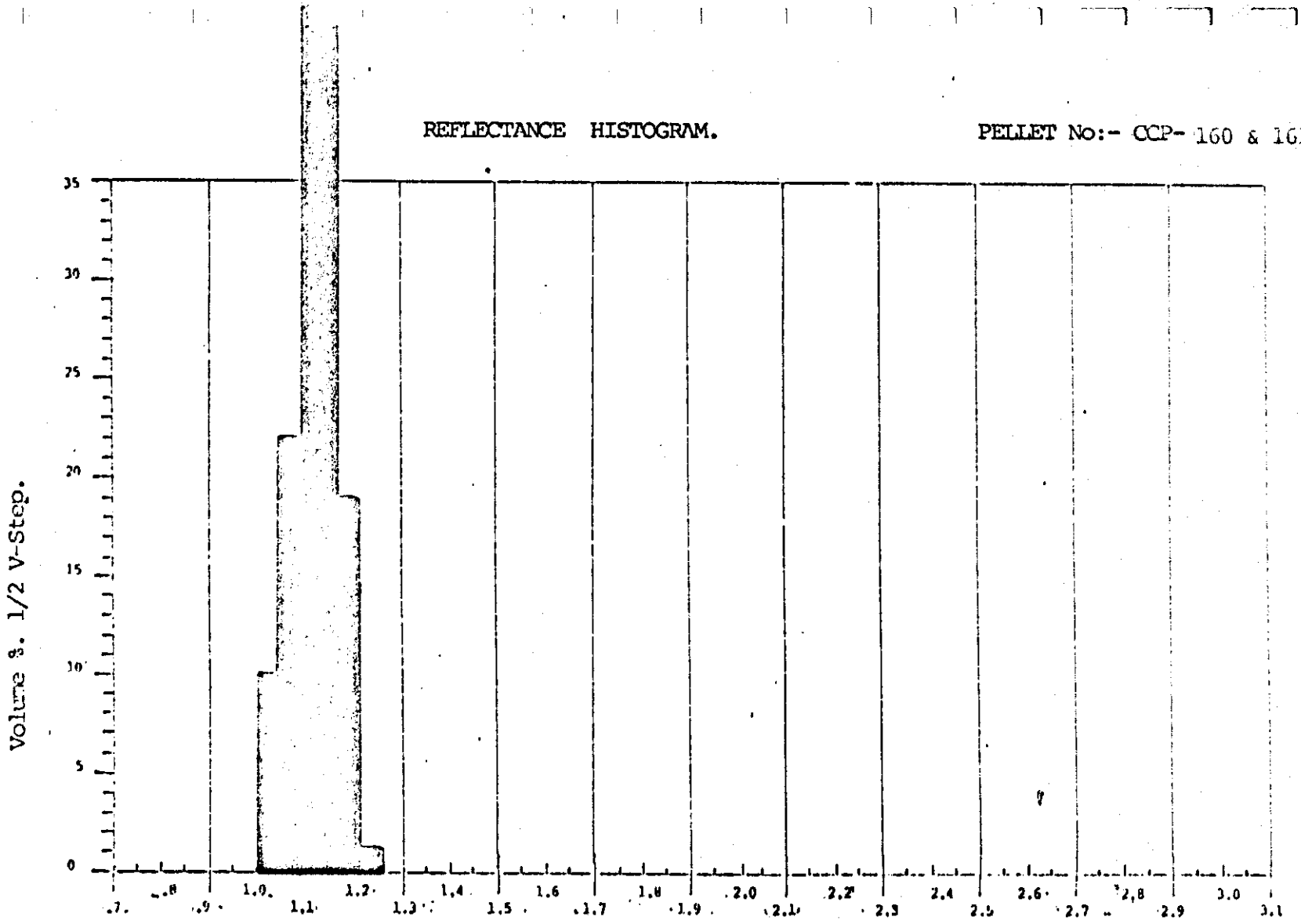
REFLECTANCE 0.05 % INCREMENTS.

DDH 449 # 17135

SEAM-13

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 160 & 161



REFLECTANCE 0.05 % INCREMENTS.

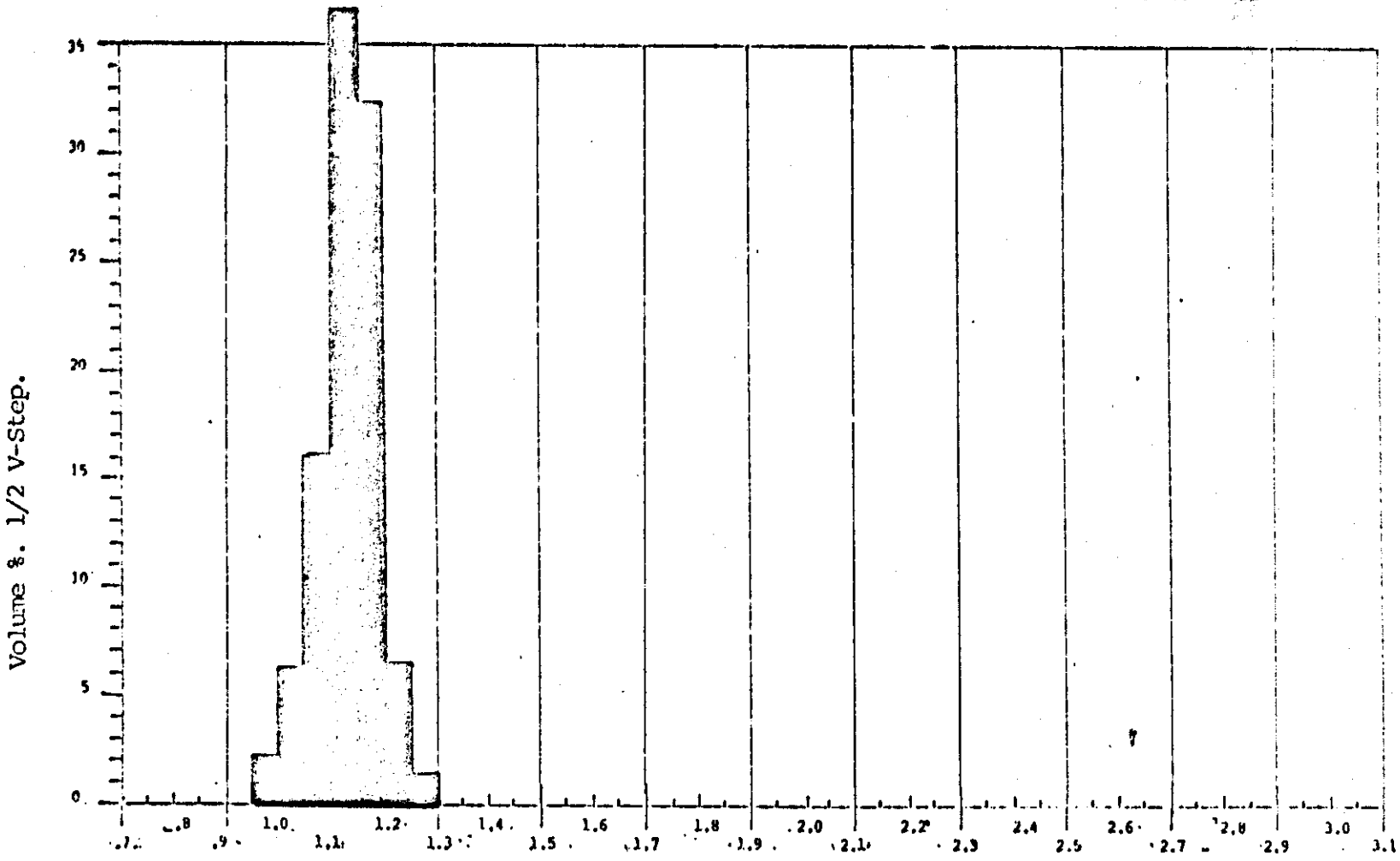
DDH 449 # 17139

SEAM - IIu

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 178 & 179



REFLECTANCE 0.05 % INCREMENTS.

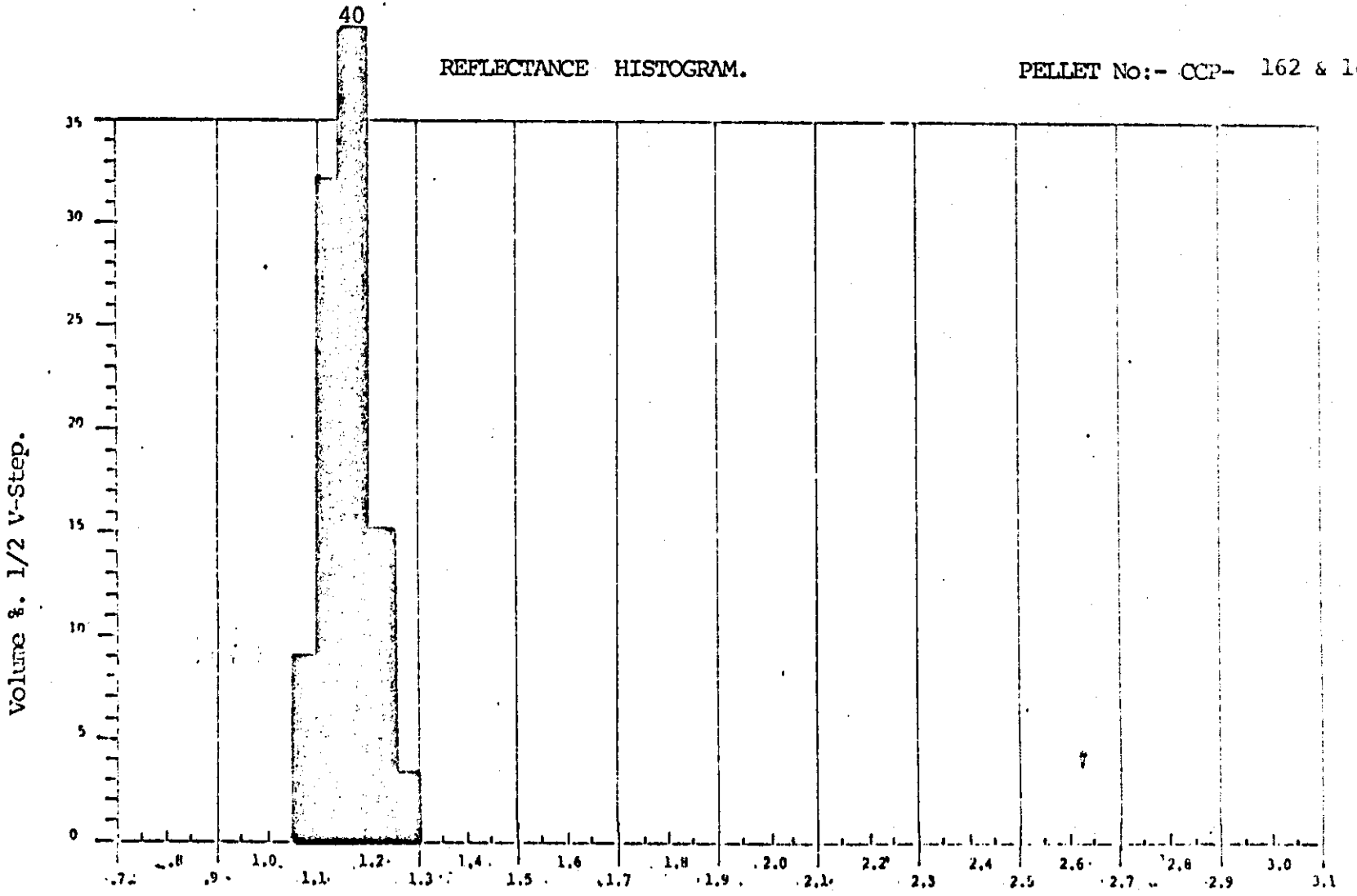
DDH 449 # 17136 / 38

SEAM - 12

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 162 & 163



REFLECTANCE 0.05 % INCREMENTS.

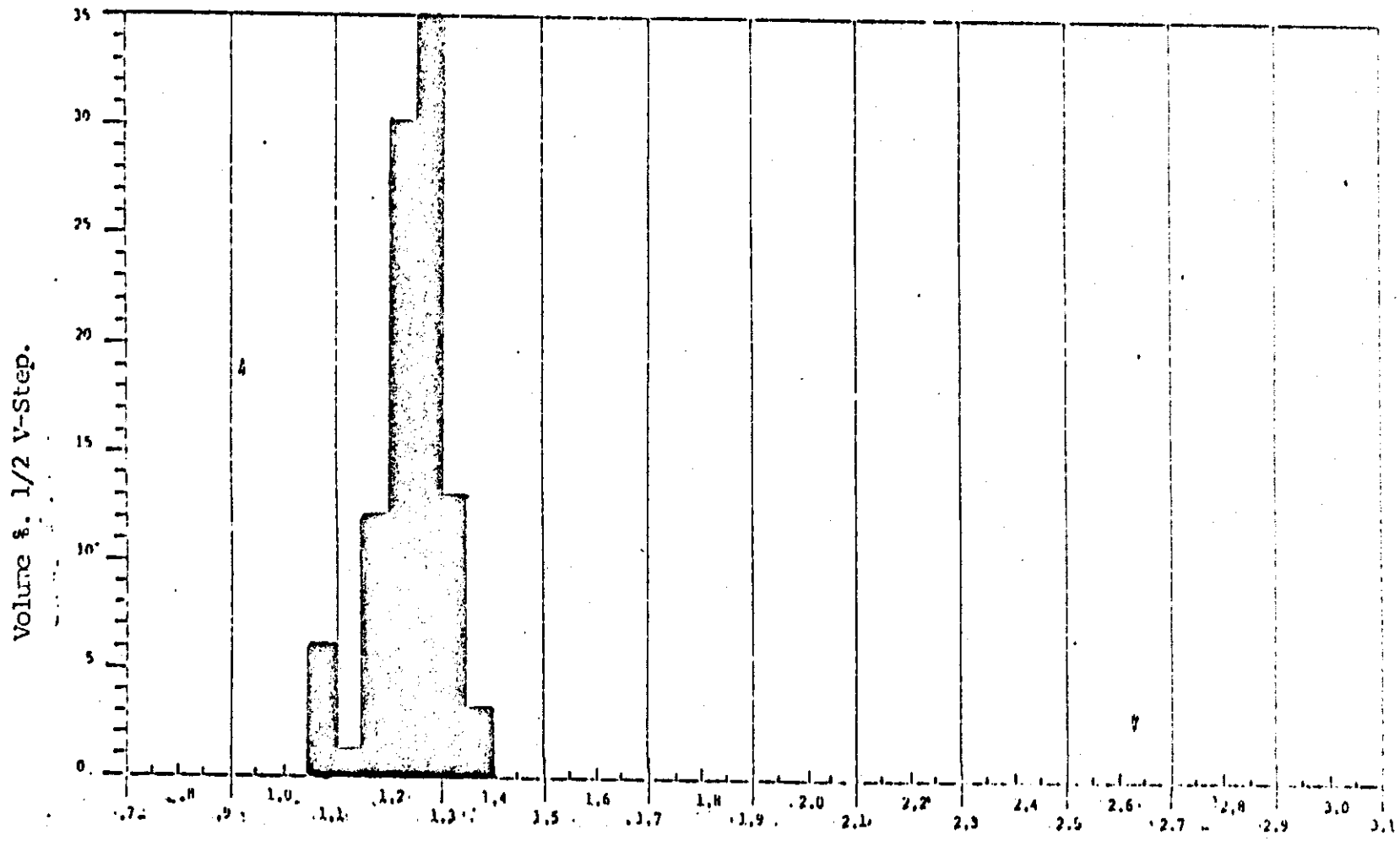
DDH 449 # 17140 / 142

SEAM - II

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 108 & 109



REFLECTANCE 0.05 % INCREMENTS.

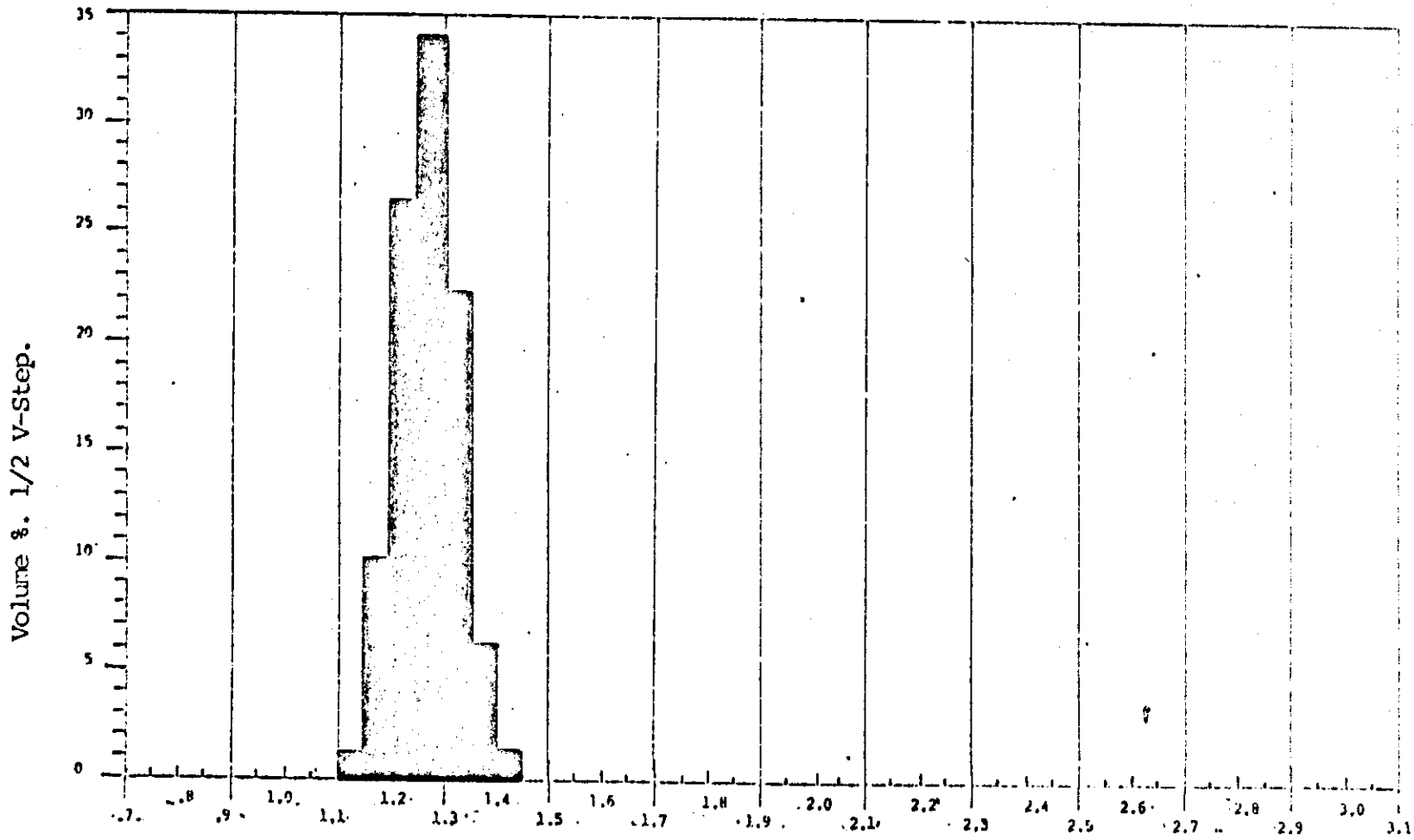
DDH 449# 17144

SEAM-9

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 184 & 185



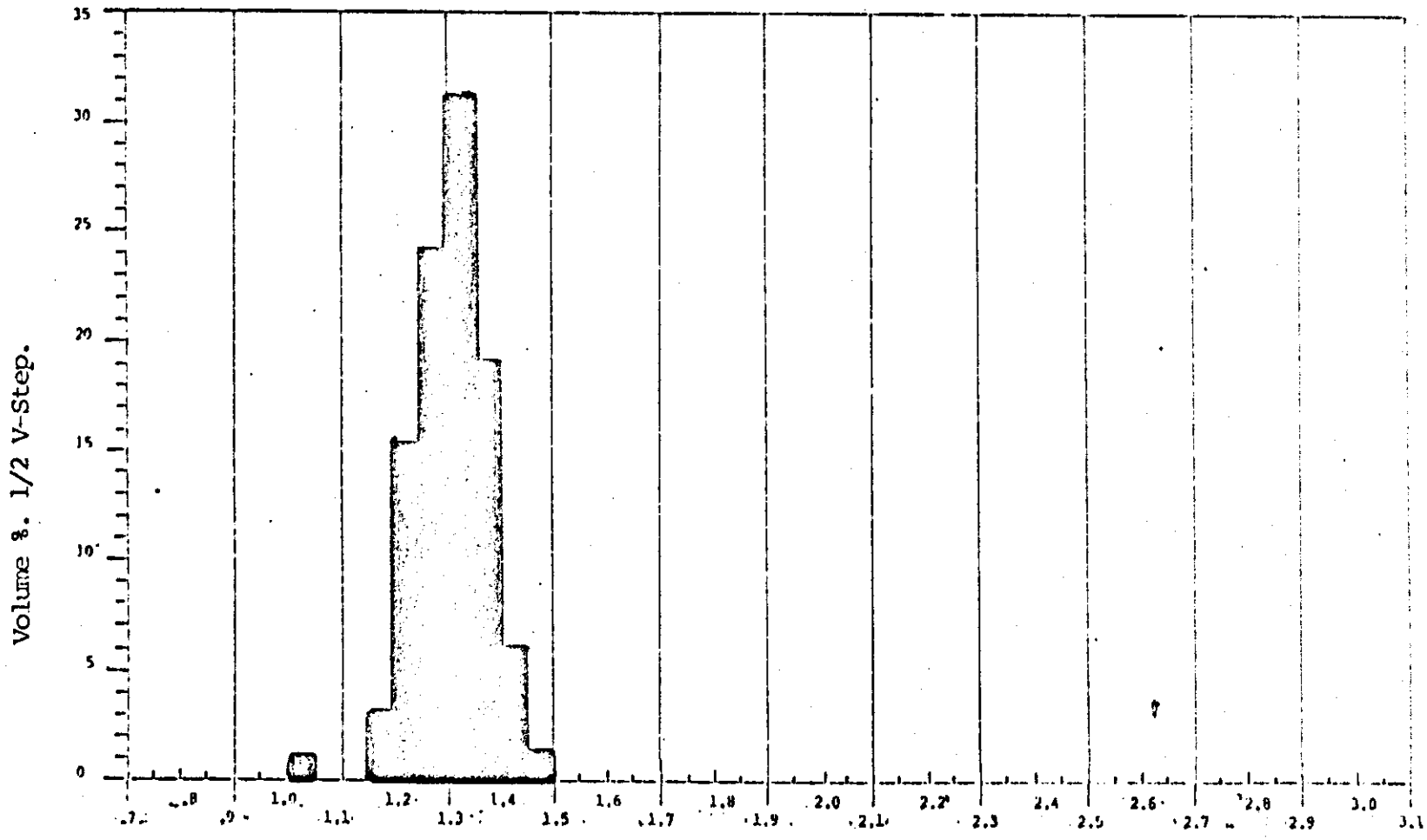
REFLECTANCE 0.05 % INCREMENTS.

DDH 643 # 13576 / 77

SEAM -7

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 174 & 175.



REFLECTANCE 0.05 % INCREMENTS.

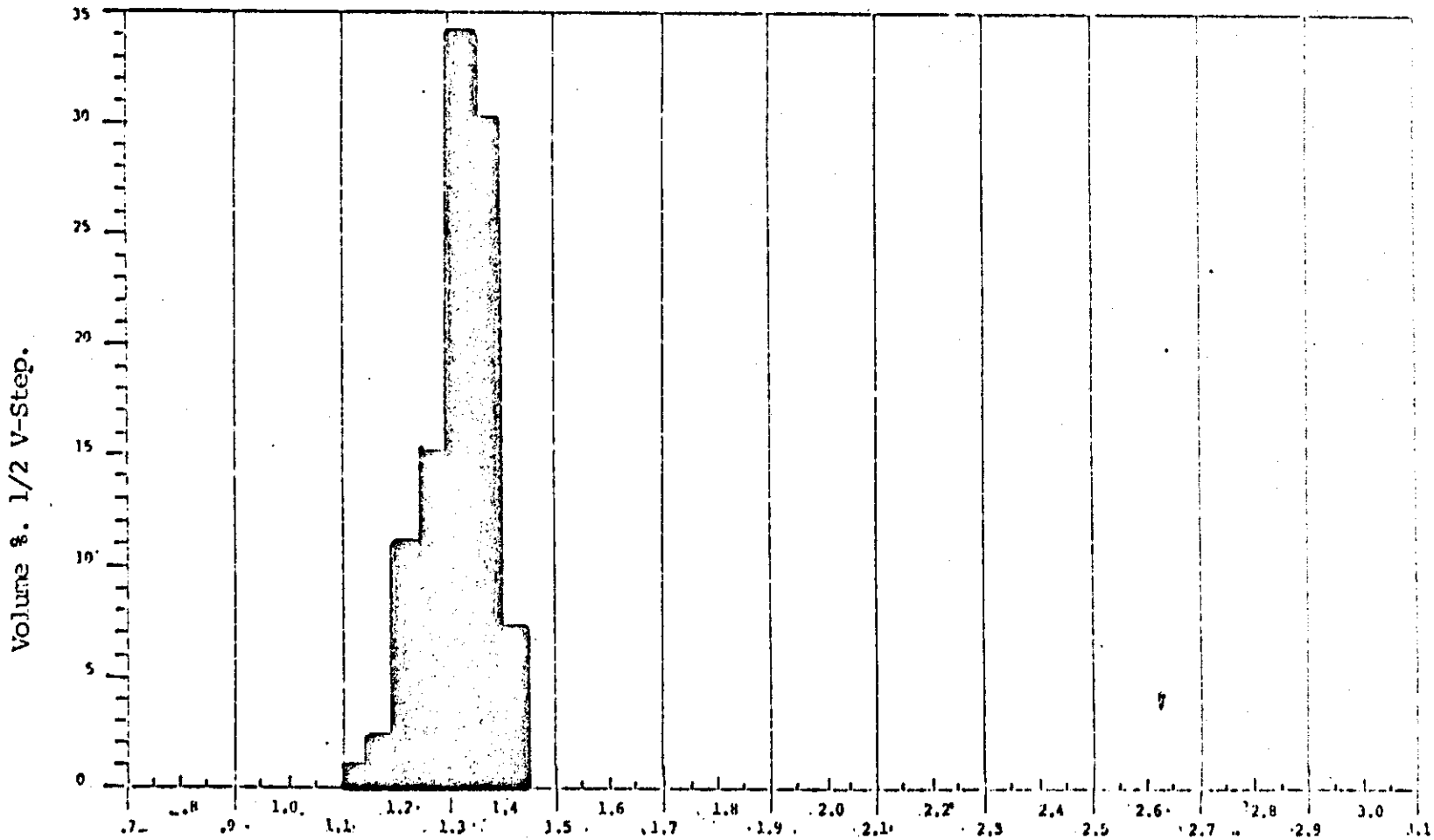
DDH 643 # 13593 /96 - 13551

SEAM - R7

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 172 & 173



REFLECTANCE 0.05 % INCREMENTS.

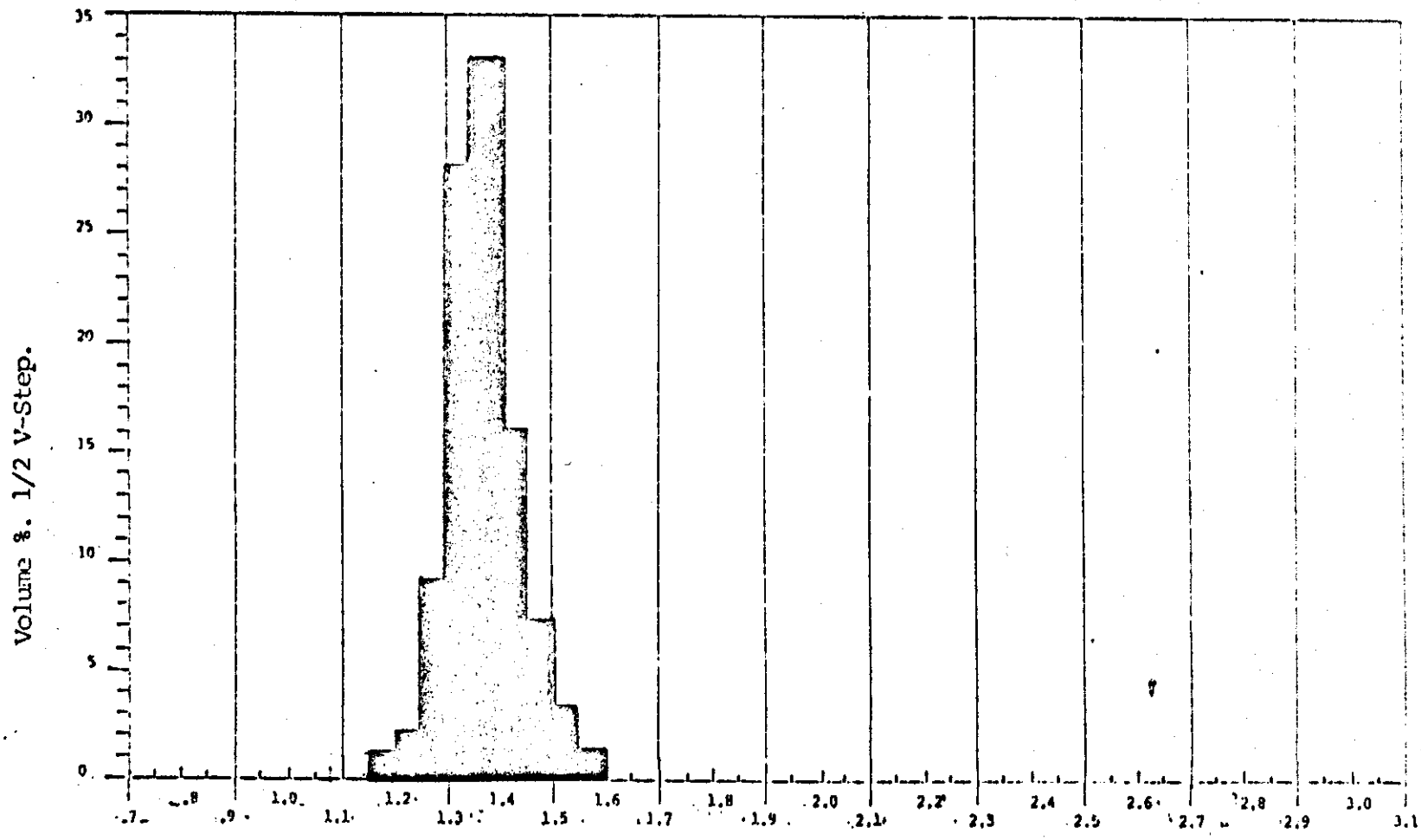
DDH 643 # 13588 / 90

SEAM - 4

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 170 & 171



REFLECTANCE 0.05 % INCREMENTS.

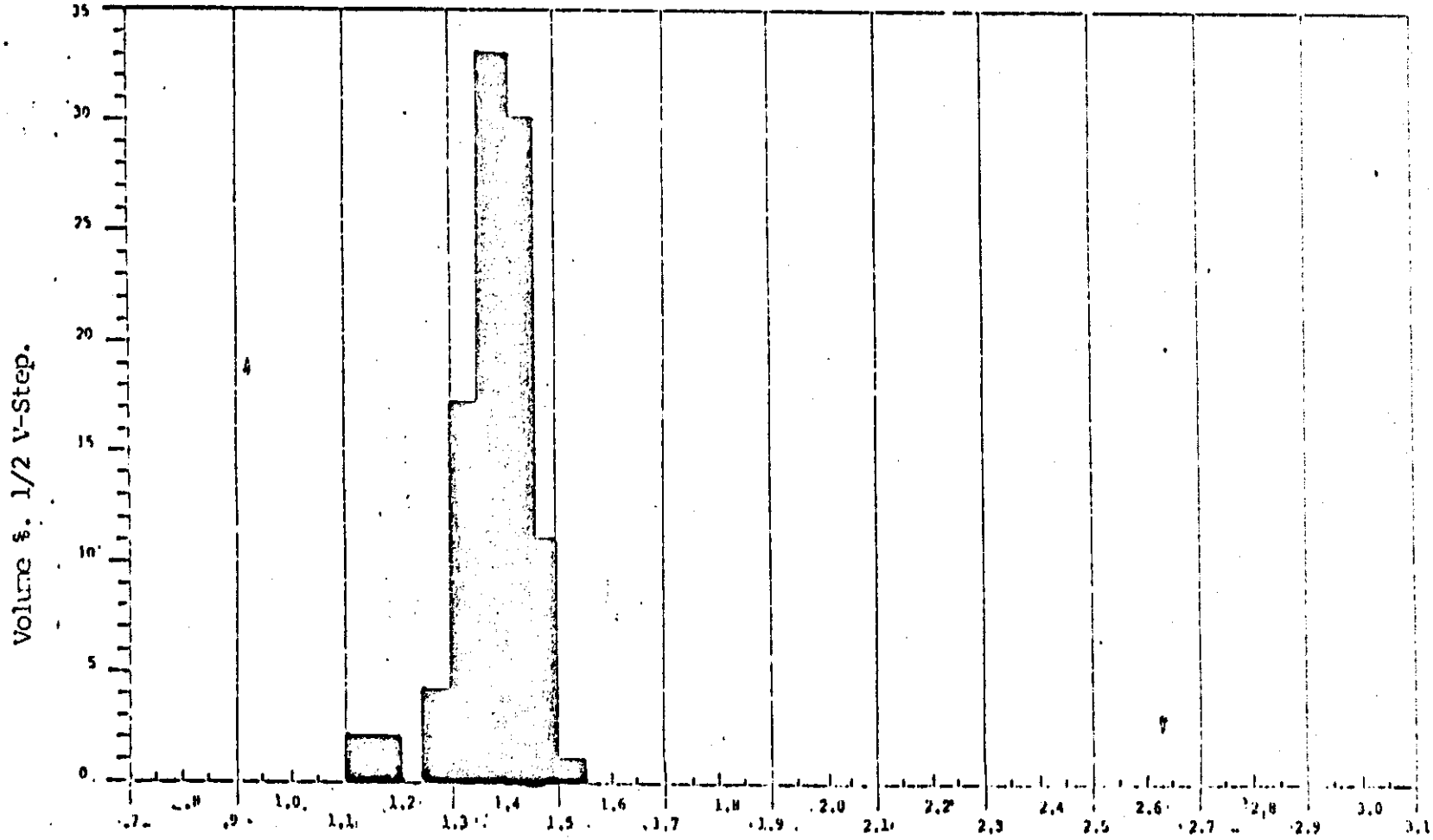
DDH 643 # 13580 / 584

SEAM- 5

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP-186 & 187



REFLECTANCE 0.05 % INCREMENTS.

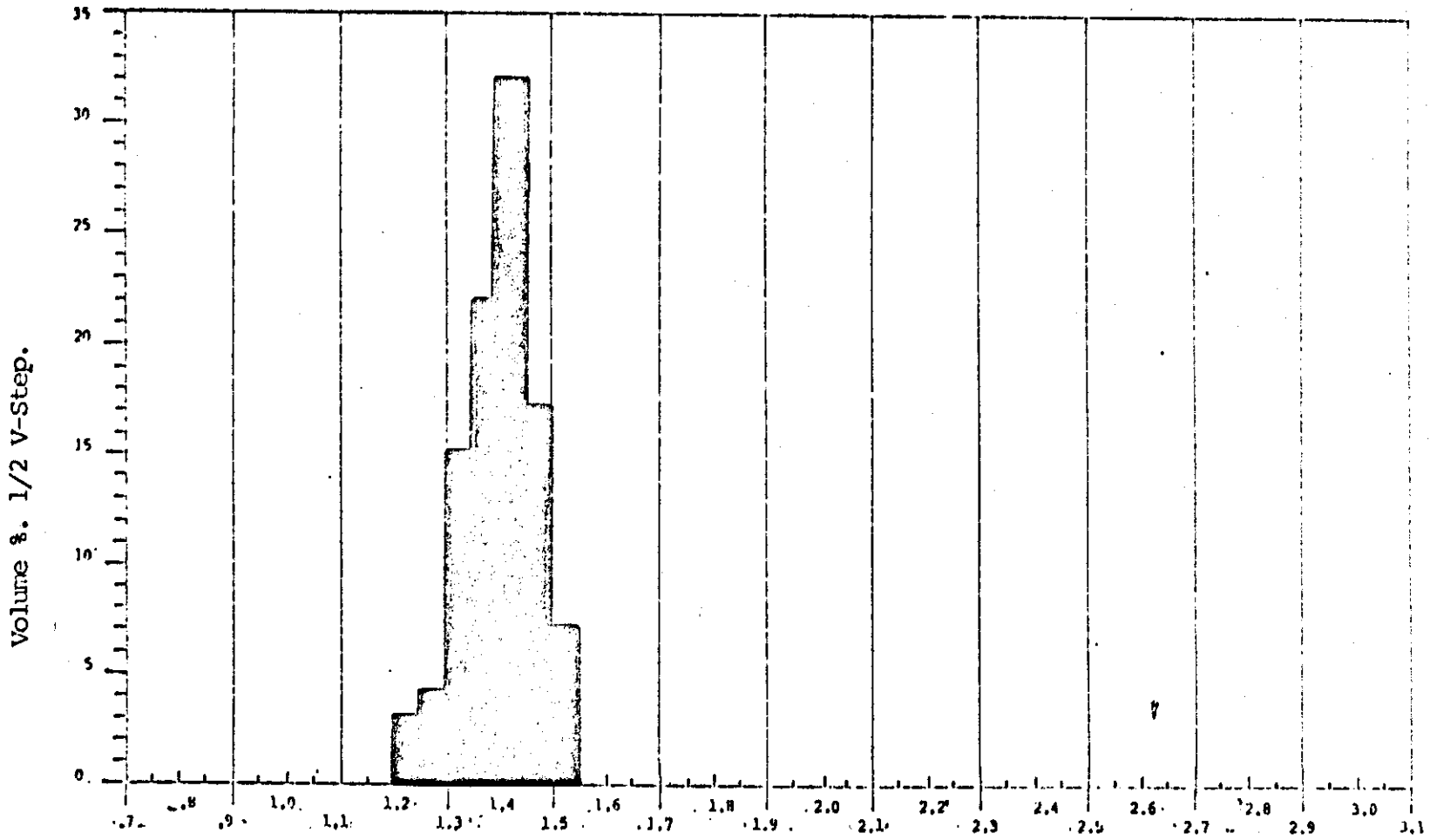
DDH 643 # 13599

SEAM - R7u

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 182 & 183



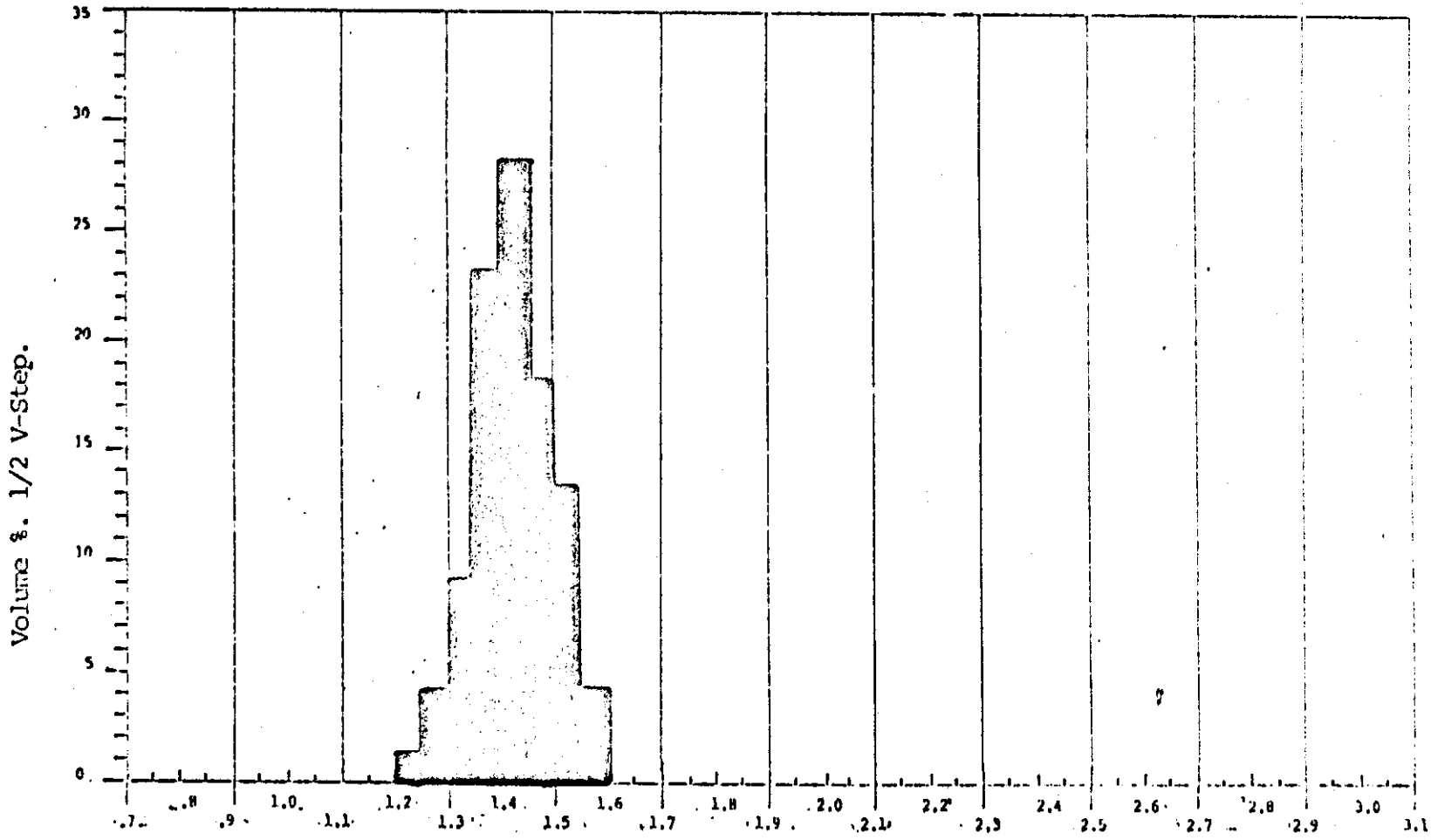
REFLECTANCE 0.05 % INCREMENTS.

DDH 643 # 13557 / 62

SEAM - R5

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 168 & 169

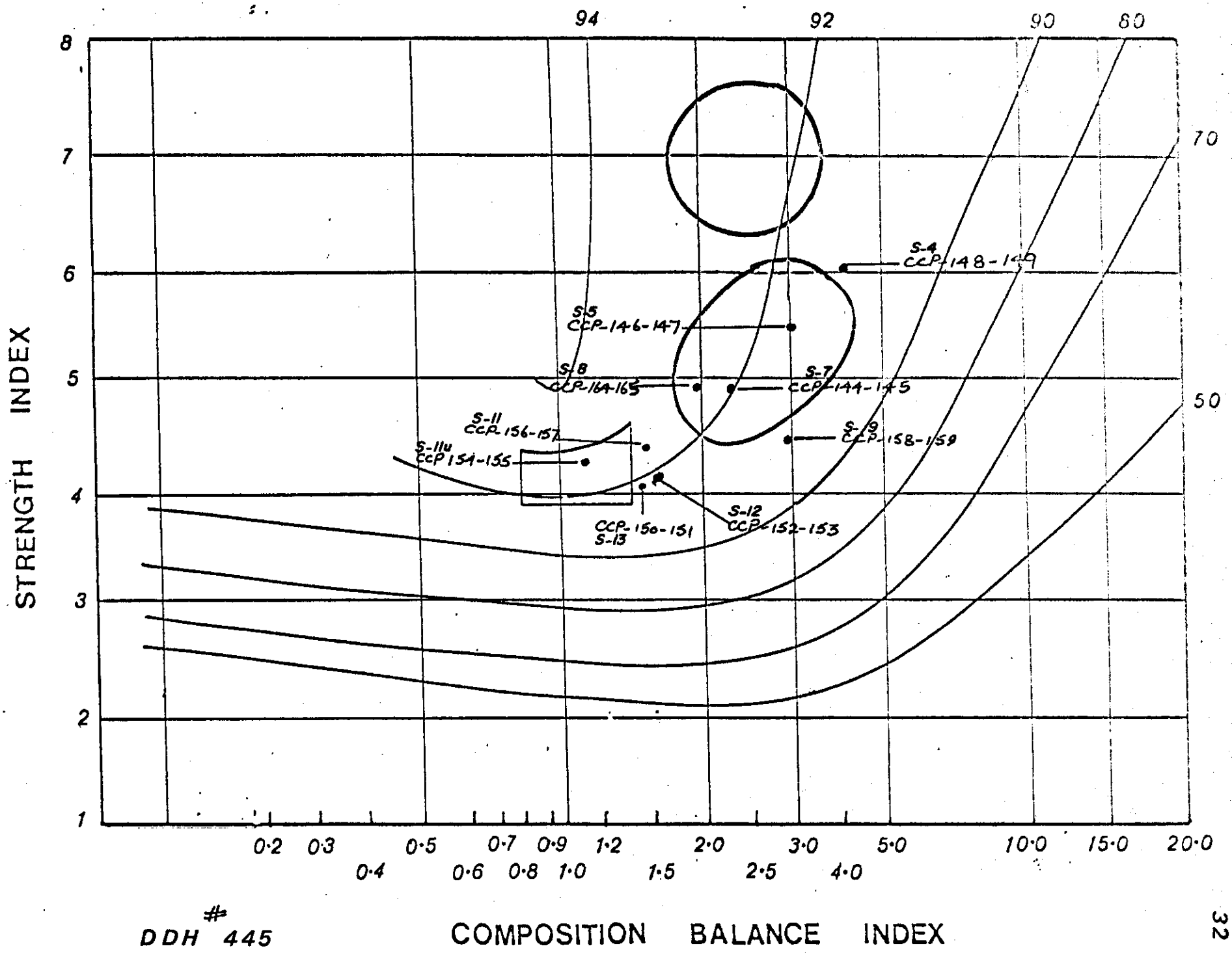


REFLECTANCE 0.05 % INCREMENTS.

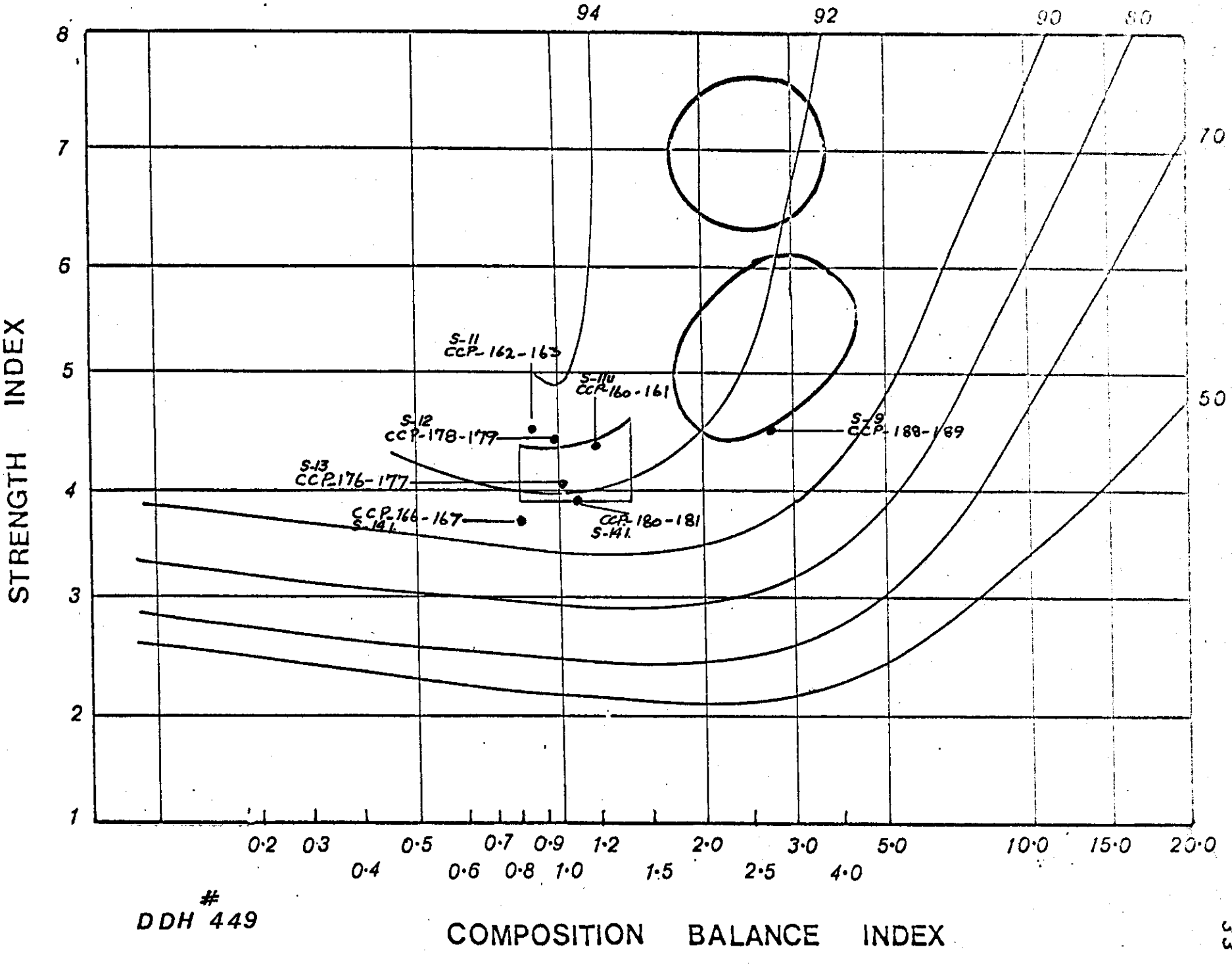
DDH 643 # 13553 / 56

SEAM - R5

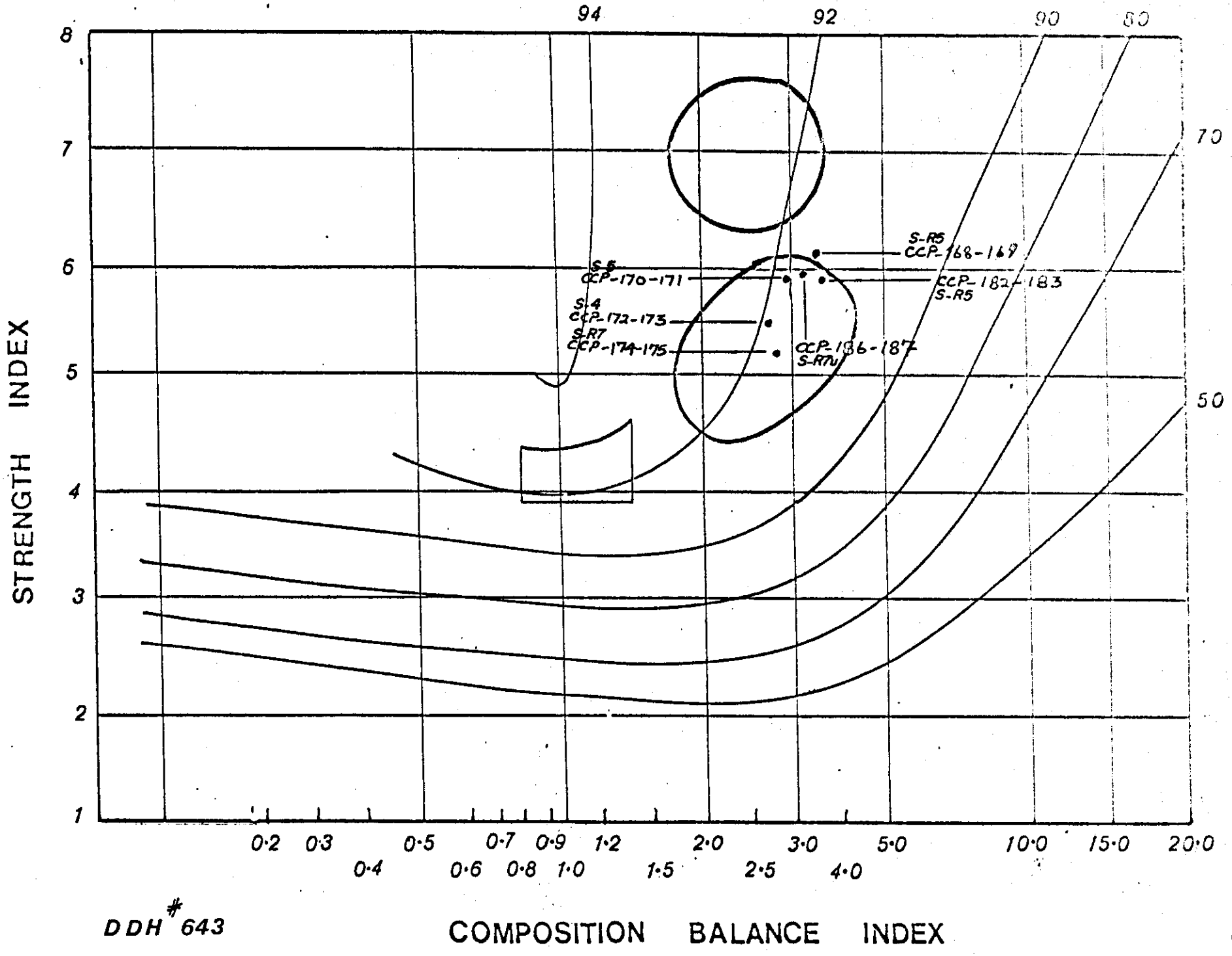
Cascade Coal Petrography Limited.

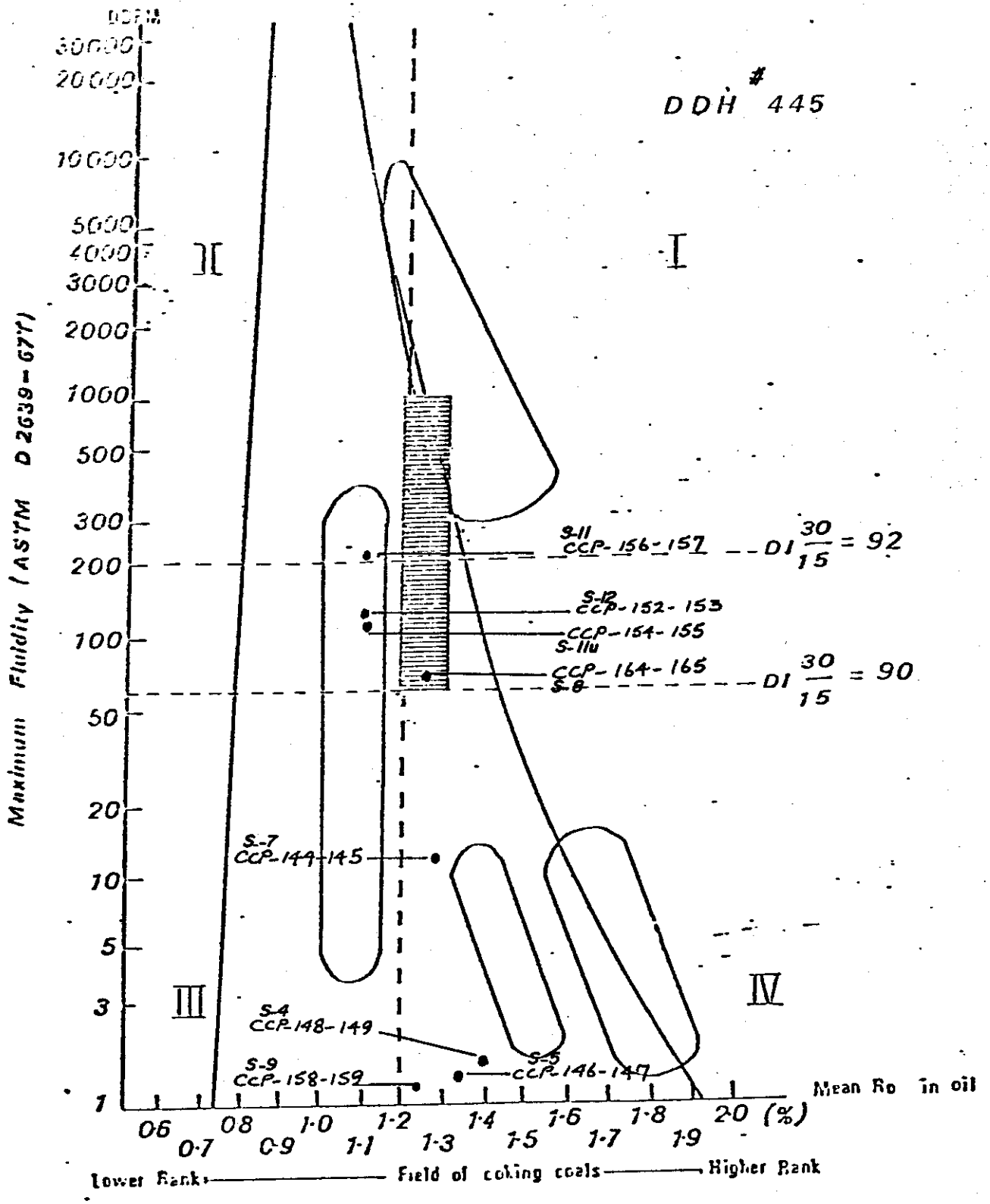

94
92
90
80
70
50
8
7
6
5
4
3
2
1
STRENGTH INDEX
S-4
CCP-148-149
S-5
CCP-146-147
S-8
CCP-164-165
S-7
CCP-144-145
S-11
CCP-156-157
S-11a
CCP 154-155
S-9
CCP-158-159
CCP-150-151
S-13
S-12
CCP-152-153
0·2
0·3
0·4
0·5
0·6
0·7
0·8
0·9
1·0
1·2
1·5
2·0
2·5
3·0
4·0
5·0
10·0
15·0
20·0
COMPOSITION BALANCE INDEX

DDH # 445

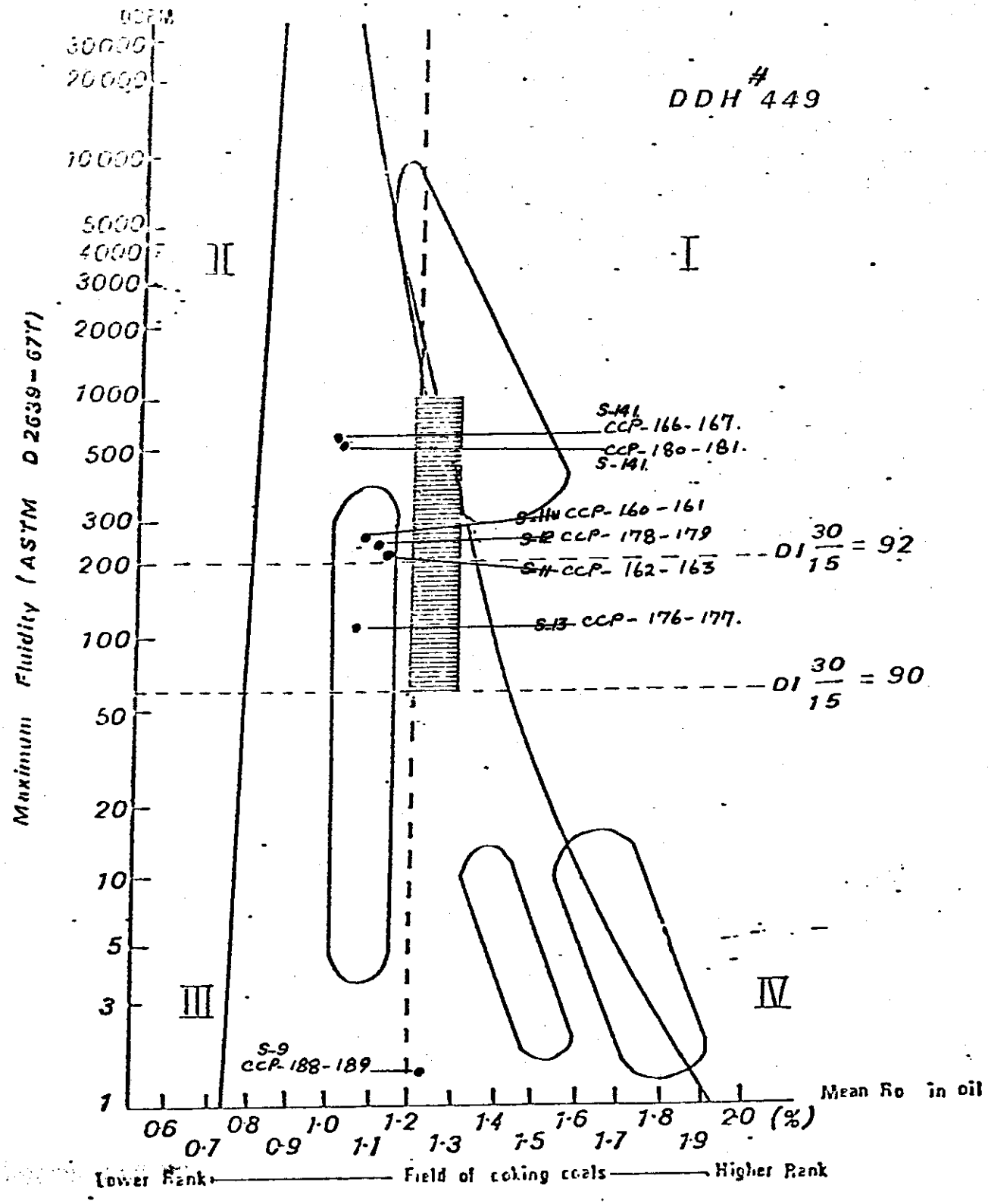

94
92
90
80
70
60
50
8
7
6
5
4
3
2
1
STRENGTH INDEX
S-11
CCP-162-163
S-11a
CCP-160-161
S-12
CCP-178-179
S-13
CCP-176-177
S-9
CCP-188-189
CCP-166-167
S-14
CCP-180-181
S-14
0·2
0·3
0·4
0·5
0·6
0·7
0·8
0·9
1·0
1·2
1·5
2·0
2·5
3·0
4·0
5·0
10·0
15·0
20·0
COMPOSITION BALANCE INDEX

DDH # 449

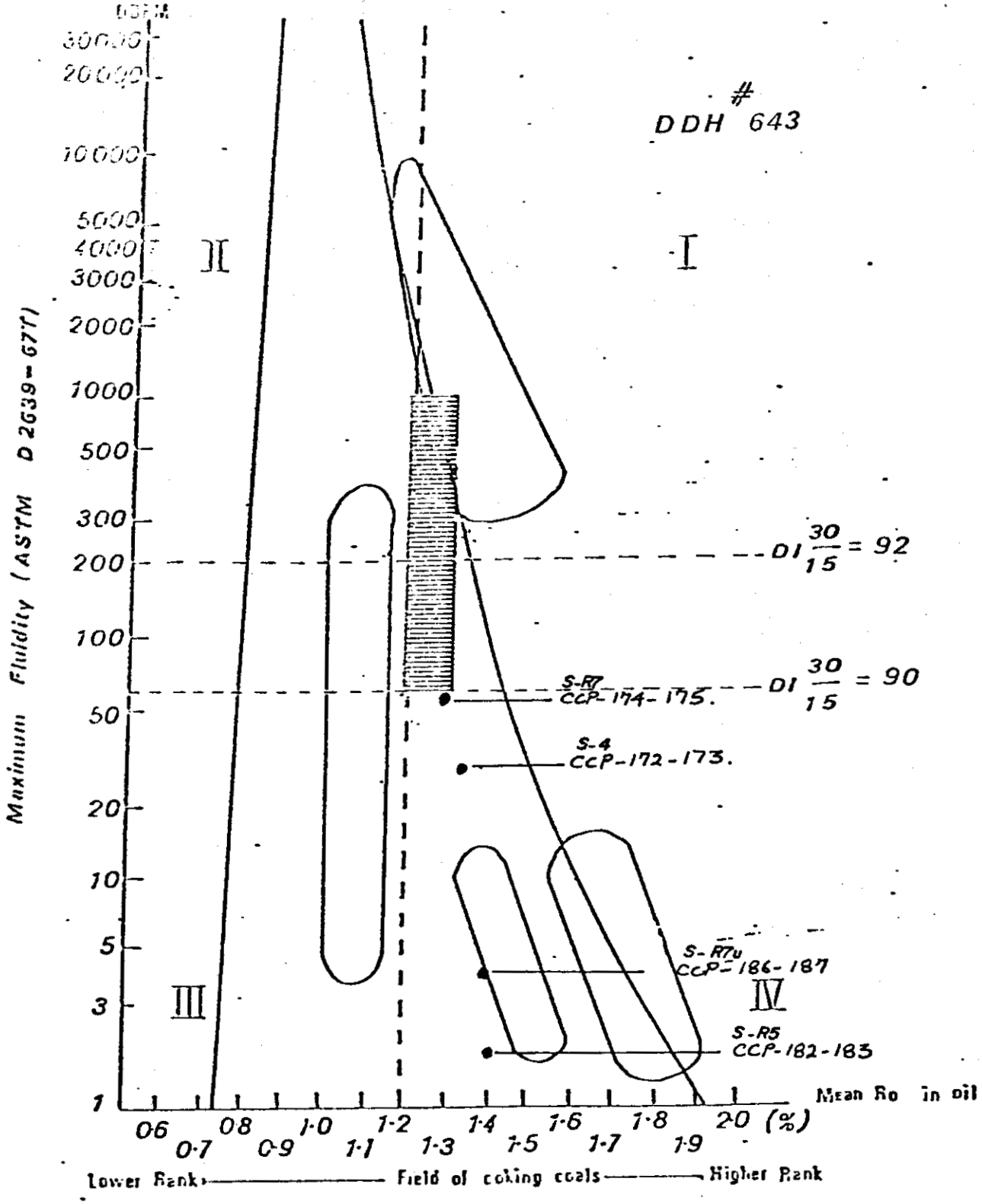

94
92
90
80
70
50
8
7
6
5
4
3
2
1
S-R5
CCP-168-169
S-5
CCP-170-171
CCP-182-183
S-R5
S-4
CCP-172-173
S-R7
CCP-174-175
CCP-186-187
S-R7u
STRENGTH INDEX
0·2
0·3
0·4
0·5
0·6
0·7
0·8
0·9
1·0
1·2
1·5
2·0
2·5
3·0
4·0
5·0
10·0
15·0
20·0
DDH # 643
COMPOSITION BALANCE INDEX



Relation between Maximum Fluidity and Rank of coals.



Relation between Maximum Fluidity and Rank of coals.



Relation between Maximum Fluidity and Rank of coals.

DDH 445

Seam	Footing	Cascade Coal CCP	Ash	VCM	I.M	F.C	FSI	S	BTU
13	13601-602	150-151	5.2	26.9	1.0	66.9	½	.68	13546
12	13606-09	152-153	8.0	22.4	.8	68.8	7½	.49	13762
11 u	13610-11	154-155							
11	13612-15	156-157							
9	13618-21	158-159	8.5	20.0	.7	70.8	4	.5	13880
8	13623	160-161							
7	13526-30	162-163	8.8	26.6	.7	63.9	6½	.84	13957
5	13531-35	164-165	10.1	26.2	1.3	62.4	4	.20	13676
4	13540-44	148-149	7.0	21.8	.8	70.4	5½	.85	14355
	13546								

DDH 449

Seam	Footing #	CCP #	Ash	VCM	IM	F.C.	FSI	S	BTU
1↑ Lwr.	17179	180-181	6.5	29.9	.7	62.9	7 ½	.71	14174
1↓ Lwr	17130	166-167	8.0	29.7	.8	61.5	7	.70	13659
13	17135	176-177	9.7	27.1	1.0	62.2	8	.06	13210
12	17136-38	178-179	6.4	27.9	.8	64.9	8	.74	13824
11 U	17139	160-161	9.6	24.9	.9	64.6	8	.78	13810
11	17140-42	162-163	8.0	22.4	.8	68.8	7 ½	.49	13762
9 Faut	17144	188-189	9.0	22.0	.6	68.4	4	.52	13623

DDH 643

Seam	Footage #	CCD #	Ash	VCM	TM	FC	FSI	S	BTU
7 Part	13576-77	184-185	9·7	23·3	1·4	65·6	1	·32	8905
5	13590-91	170-171	8·6	20·8	1·4	69·2	2	·51	13452
4	13588-90	172-173	9·1	21·4	1·0	68·5	7	·48	14011
R7U	13579	186-187	9·3	21·0	·5	69·2	7	·81	13673
R7	13551-13553-96	174-175	8·4	22·2	1·2	68·2	7	·28	13939
R5	13553-56	168-169	8·0	20·8	1·1	70·1	3 ½	·75	14188
R5	13557-562	182-183	10·1	20·0	·7	69·2	4	·32	13816

APPENDIX 2 (a)

Memorandum

For Use Within The Company Only

Cominco

To P. Daignault (Use Title if Possible) Date November 2, 1977

From Bill Shaw (Use Title if Possible) File No.

Subject WEST TURNBULL GEOLOGICAL REPORT Reference

Part of the 1976 and 1977 Turnbull exploration programs were carried out to better define the "repeat seams" (R7u, R7, R5, R4, R2, R1) in the proposed Turnbull West Pit area.

The geology was mapped by traversing all linear topographic features such as stream courses and ridges. Due to the low relief and gentle slopes, more than 80% of the West Turnbull area is covered by alluvium and pleistocene deposits. Little trenching information could be obtained as a result of these deposits. Structural and stratigraphic data was mainly derived from chip samples from bore hole drilling and gamma-neutron geo-logging.

Structurally the pit area is located on the Turnbull anticline. The westerly dipping major thrust is stratigraphically present throughout the area.

The stratigraphy is characterized by interbedded siltstones and mudstones that occur above the major thrust as well as above R5 seam. R5 seam is underlain by interbedded siltstones and sandstones which grades to sandstone near R4 seam.

Structure

The West Turnbull structure is characterized by two structural domains; (1) the easterly dipping beds above the major thrust and (2) the Turnbull anticline below the major thrust (figures 2, 3).

The structural features can be summarized as follows:

(1) The major thrust is flat lying to the east of departure 77,000E and dips up to 26°W, to the west of 77,000E. The major thrust passes upward through the bedding over its entire length. The horizontal displacement in this area is approximately 1600 feet. (taken from sections) The rock units adjacent to the fault plane can be locally disturbed, but are usually free of any major distortic

(2) A series of small, closely spaced thrust faults which are located immediately above the major thrust may be concordant with a later kinematic pattern. These faults appear to terminate at length along bedding surfaces where there is no stratigraphic separation.

(3) The general strike and dip of the bedding above the thrust is 315°, with an easterly dip from 8° to 25°. The bedding does not appear to be interrupted by thrusting above the 5800 feet elevation.

. . . 2

Signed W. Shaw

810-1810

Memorandum

For Use Within The Company Only

To P. Daignault (Use Title if Possible) Date November 2, 1977

From Bill Shaw (Use Title if Possible) File No.

Subject WEST TURNBULL GEOLOGICAL REPORT Reference

(4) The Turnbull anticline occurs (figure 2, 3) below the major thrust. The atitudes of the west and east limbs are 310°/13° and 010°/14° respectively. The trend of the anticline is 022° and the plunge is 10° northerly.

(5) Number 2 thrust zone occurs between R5 and R4 seams. The thrust zone is comprised of two or three flat lying thrust faults. This zone increases the stratigraphic interval up to 100 feet. Where the thrust zone intersects R5 seam, the seam is increased in thickness by 100 feet. The structural relationship between the major thrust and number 2 thrust zone has not been defined.

Stratigraphy

Three principal rock types have been recognized.

(1) Siltstone, dark grey, fine to coarse grained, resistant, thinly bedded, cross-bedded, weathers, dark brown to rust.

(2) Mudstone, brown to black, carbonaceous, immediately above and below seams, structureless, weathers, typically light grey to brown or black if carbonacec Exposures form rubble in a very short time.

(3) Sandstone, mostly protoquartizite, medium grey, commonly limonitic, fine to coarse grained, bedding well defined 1 to 3 feet, medium scale tabular cross-bedding, weathers light brown.

Most contacts between these rock types are gradational. The transition is marked by interbeds of each rock type. The lithological composition of the rock units va laterally as well as vertically. The sandstones above 7 seam are the most anisotr The sandstone above 4 seam is the only rock unit which can be traced consistently.

A typical stratigraphic section in the West Turnbull area is summarized in Figure

The stratigraphic interval between the coal seams are summarized on Table 1. Dril holes of interest are RH 614, 634, 640, 644, 646, 647.

. . . 3

Signed

Memorandum
For Use Within The Company Only

Cominco

To P. Daignault (Use Title if Possible) Date November 2, 1977

From Bill Shaw (Use Title if Possible) File No.

Subject WEST TURNBULL GEOLOGICAL REPORT Reference

The average coal thicknesses are summarized as follows:

12 seam	- 17 feet thick	R7u seam	- 5 feet thick
11u	- 13.5	R7	- 25
11	- 8	R5	- 40
9	- 15	R4	- 35
7	- 30	R2	- 4
5	- 30	R1	- 8
4	- 30		

cc: J.L.P.
R.S.J.
J.B.T.
L.R.L.

:kmh

Signed

210-1810

RH 128
4' N

RH 122
30' S

63
60' S

RH 257
5' S

RH 255
96' S

RH 609
57' N

MAJOR NOSE THRUST

R7

R5

R4

R2

R1

Figure 3

No.	Revisions	By	Date	No.	Revisions	By	Date

R.K. MAY '74 OCT '72 TOPOGRAPHY (LOWER SECTION) Drawn by R.K. NOV 10.72

Fording Operations

Cominco

GEOLOGICAL SECTIONS

TURNBULL 500,000 N

Scale 1 inch = 100 Feet

Drawing No

RH 129
0' N

RH 126
26' N

RH 644
24' S

FLT. 2

FLT. ?

MAJOR THRUST

12

11U

11

9

R7U

R7

R5

R4

6000

5800

5600

5400

5200

Figure 2

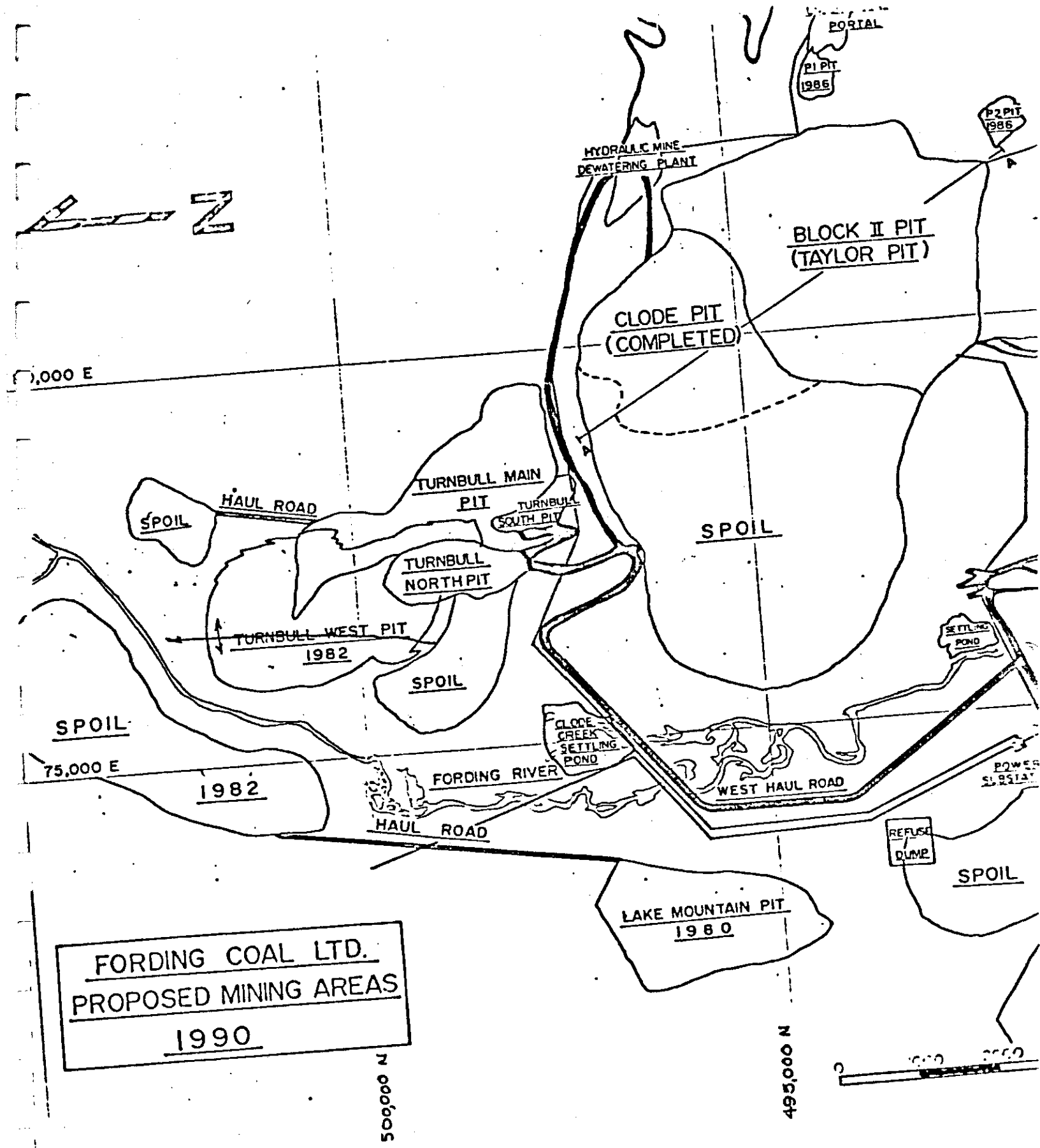
Fording
Operations

Cominco

GEOLOGICAL SECTIONS
TURNBULL 501,000 N

Scale

FIGURE-2



FORDING COAL LTD.
PROPOSED MINING AREAS
1990

Figure 1

mudstone, dark grey with interbeds of siltstone, dark grey, fine grained

sandstone, grey, medium grained, limonitic

MAJOR THRUST

mudstone, black, carbonaceous

siltstone, dark grey, fine grained with interbeds of sandstone

sandstone, grey, fine to coarse grained, small to medium scale planar crossbedding.

sandstone, light grey, medium grained, small to medium scale tabular crossbedding

sandstone, Moose Mtn. medium to coarse grained, medium scale planar crossbedding

Figure 4 - Generalized Stratigraphic Section in the central area of West Turnbull Pit

SEAMS TURNBULL	RH 600	RH 602	RH 603	RH 604	RH 605	RH 606	RH 607	RH 608	DDH 18	CLODE HAULROAD	RH 609	RH 610	RH 611	RH 612	RH 613	RH 614	RH 615	RH 616	RH 617	RH 618	RH 619	RH 620	RH 638
15-14U	-	-	-	-	-	-	-	-	195.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14U-14L	57.0	-	-	-	-	-	-	-	81.0	-	-	-	-	-	-	-	90	-	-	-	-	-	78
14L-13U	50.0	96.0	-	-	-	-	-	-	92.2	-	-	-	-	-	82	-	93	-	-	-	-	-	84
13U-13L	83.0	8.0	8.0	-	-	-	-	-	52.6	-	-	-	-	-	106	-	27	-	-	-	-	-	53.5
13L-12	54.0	65.5	77.0	-	-	-	-	-	72.9	-	-	-	-	-	-	91	110	-	-	-	-	-	87.5
12-11U	84.0	37.5	26.4	-	-	36.5	-	-	36.7	-	-	-	23	-	57	68	30	-	-	-	-	-	36
11U-11	28.0	26.5	27.1	-	16	25.5	22.3	-	-	-	-	46	20	64	45	119	41	--	-	-	-	-	-
11-9	-	127.5	153.0	-	132	126.5	-	-	(11U-9) 224.6	-	-	175	174	250	116	105	-	-	-	-	-	156	200
9-7U	-	-	-	335.0	-	-	-	328.4	-	380.0	270	-	-	-	-	-	-	-	-	-	-	-	-
7U-7	-	-	-	11.0	-	-	-	26.0	-	10.0	64	-	-	-	-	-	-	-	-	-	-	-	-
7-5	-	-	-	54.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7-R7U	-	-	-	-	-	-	-	-	-	-	96	-	-	-	-	-	-	-	-	-	-	-	-
9-R7U	-	-	-	-	-	-	-	-	-	-	-	215+	253	-	-	-	-	155+	170+	-	219	212	-
R7U-R7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	155	92	105	97	-	-
R7-R5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88	139	94	75 (105)	(thrust seam)	-
R5-R4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	248	-	-	-	-

TABLE 1. Intervals between seams in Turnbull Total 15-5 1163 ft. (Southwest Turnbull)

SEAMS TURNBULL	RH 621	RH 622	RH 623	RH 624	RH 625	RH 626	RH 627	RH 628	RH 629	RH 630	RH 631	RH 632	RH 633	RH 634	RH 635	RH 636	RH 637
15-14																	
14-13																	
13-12																	
12-11U																	
11U-11												16					
11-9												14^{5}					137
9-7												485+			320	470+	351
7-5										87				56	66		
5-4																	
4-2																	
2-1					16^{5}	14^{5}	17										
R7U-R7										76							
R7-R5										61			585				
R5-R4					228	217	232^{5}	202					377+				
R4-R2			167														
R2-R1			16														
5-R7U										225							
4-R7																	
4-R5																	
1-R5					129	105	75	75									
1-R4	376				357	3215	3075	275									
1-R7																	

SEAMS TURNBULL	RH 638	RH 639	RH 640	RH 641	RH 642	RH 643	RH 644	RH 645	RH 646	RH 647	RH 648	RH 649	RH 650	RH 651	RH 652
15-14	Refer to first sheet of Table 1.														
14-13															
13-12															
12-11U												36	SURFACE		
11U-11												30^5	TO		
11-9												138	R4		
9-7				320								465			
7-5				51^5	57^5	53									
5-4				161	147^5	231^5									
4-2															
2-1			228												
R7U-R7							72^5		SURFACE	92					
R7-R5		56	46	139	123^5	84	77		TO	97^5	78^5				
R5-R4		476+	196	329^5		261^5	214		R4	213	318^5			224	
R4-R2						143^5									
R2-R1						13^5									
5-R7U															
4-R7															
4-R5				251^5	253	214									
1-R5			79^5												
1-R4			280												
1-R7		46													

APPENDIX 2 (b)

1977 TOTAL TURNBULL GEOLOGICAL REPORT

TOTAL TURNBULL GEOLOGICAL REPORT

Introduction

This report presents the structure, stratigraphy and hydrology in the Turnbull Total Pit (Turnbull Main, North and South Pits) collected during the 1977 exploration program. A total of 18 rotary holes and 3 HQ diamond holes were drilled in the Turnbull Total area.

Previous drilling programs in 1976 and 1975 were carried out to define the upper seams (15 to 9 Seam). Three reconnaissance diamond holes were drilled prior to 1977. Diamond drill holes 18, 21 (1968) and 600 (1970). Field outcrop field mapping and trenching was carried out in the 1975 and 1976 field seasons.

Field Program

a) Drilling

Two drilling companies, Tonto Drilling and SDS Drilling were awarded contracts for the exploration of the Turnbull Total Pit. Tonto Drilling cored three holes in the area. The three holes were located to define the increased section between R5 and R4 which was encountered in DDH21.

A total of 18 double wall rotary holes were completed by SDS Drilling. Two rigs were used, one to pentrate to a depth of 750 feet and the other was used to pentrate strata at shallower depths.

During the operation 3110 feet (948 m) of coring was completed and 10,556 feet (3218 m) of rotary drilling was completed.

b) Mapping

An extensive structural remapping program was carried out by Sid Siska and Ken Heck under the direction of the writer during the 1977 field program. This mapping program besides locating major structural features included measurements of the structural fabric of the rock and coal units. The resulting scatter diagrams are presented in equal area

diagrams in Figures 1a, 1b, 1c. Logging of the exploration drill core was also done by S. Siska and K. Heck. Besides coal quality and stratigraphic information the diamond drill core was logged to determine:

1. nature of joints; orientation relative to the core axis and bedding, infillings, etc.
2. broken core or fault zones.
3. an estimation of Rock Quality Designation. (RQD)
4. fracture frequency.

c) Hydrology

Hydrological testing was carried out on diamond drill holes DDH 641, 643, and rotary hole RH605A by Malcolm MacFadyen of Golder, and the writer. The tests are summarized as follows:

1. Packer testing were carried out on DDH 641, 643 to delineate the approximate pore pressures and to determine the permeability of the test zones.

   Reliable permeability values derived from packer tests in DDH 643, produce a range from 3×10^{-6} cm/sec to 6×10^{-6} cm/sec in a sandstone, R4, R2, R1 horizon. These values are a minimum permeability as a result of drilling mud on the sidewall of the hole. The values are consistant and indicate that the rock should allow for drainage along lower stratigraphic unit into the pit walls. The permeability for the upper stratigraphic units should be tested in future drilling programs.

2. A Thor pneumatic piezometer was installed in DDH 641 at 873 feet below R5 and above R4 (Figure 2). The piezometer was installed on May 14, 1977 and was read on May 18, 1977. The reading of 138 psi indicates a hydrostatic water level of 317 feet above this piezometer point.

   A standpipe was installed in RH 605 A at 895 feet below 5 and above the Major thrust. Readings are summarized in Figure 3.

The static water level was also recorded in all the open holes in the Total Turnbull area. Results are shown in Table 1.

Stratigraphy

The principal lithological units in the Turnbull Total area are:

1. mudstone, brown to black, carbonaceous immediately above and below coal seams, structureless, weathers typically light grey to brown or black if carbonaceous. Exposures form rubble in a very short time.

2. siltstone, dark grey, fine to coarse grained, resistant, thinly bedded, small scale trough cross-bedding, weathers dark brown to rust.

3. sandstone, mostly protoquartzite, medium grey, commonly limonitic, fine to coarse grained, bedding well defined 1 to 3 feet, medium scale tabular cross-bedding, weathers light brown.

4. coal, generally clarain with fusain and vitrain bands, some durain.

Most contacts between these rock types are gradational. The transition is marked by interbeds of each rock type. The lithological composition of the rock units vary laterally as well as vertically. The sandstones are the most anisotropic unit. Although the units are anistropic the sandstone units above 7 and 4 seams can usually be used as a marker bed.

The Turnbull section contains distinctive units, however gradation in the lithology in the upper section results in a general lack of distinguishing topographic expression. Super 7 sandstone outcrops on the southwest corner of Turnbull Mountain; however, continuous exposure does not occur to the North. Sandstone units above 4 and R4 seams do not outcrop except where the Fording River has eroded at the base of the western slope of Turnbull Mountain.

The thickness between 15 and R4 seam is approximately 1500 vertical feet. A typical stratigraphic section is shown in Figure 4.

Structure

The stratigraphy of the Turnbull Total Pit area (Turnbull Main, North, South Pits) form part of the west limb of the asymmetrical Eagle Mountain Syncline. Three groups of structures of different ages and origin occur in the study area; flexural slip faulting thrust faulting and normal faulting.

The Eagle Mountain syncline trends 310° and plunges 10° North. The bedding of the west limb (represented in figure 4) averages 312°/22° East.

a) Flexural Slip Thrusting

Flexural Slip Thrusting is common above the 7 seam horizon. This type of thrusting dips in a easterly direction and cuts the bedding at relatively low angles. They are approximately parallel to the major fold axis. These thrusts are best developed at the boundaries of the thickest and most competent rock strata. Plate 1 shows flexural slip faulting above 7 seam on the boundary between sandstone and siltstone horizon. Also this faulting occurs on the contact between coal and competent siltstone in the synclinal axis. They appear to provide local adjustment to the folding of the syncline. These east dipping faults terminate along the bedding planes at depth.

b) Thrust Faulting

The flat lying Major thrust present throughout the Total Turnbull area, has a horizontal displacement of 1600 feet.

The thrust passes upward through the bedding over its entire length. Nine seam through to 1 seam are repeated in the Total Turnbull area. Where it is exposed on Clode Pit haulroad the rock units adjacent to the fault plane are relatively free of distortion (Plate 2).

Number 2 thrust zone which was described in the West Turnbull report, is present throughout the Total Turnbull area. The stratigraphic position of this zone, was intersectioned in RH 633, 639, DDH 641, 642, 21. This zone increases the section by 300 feet in the Turnbull nose area. The western boundary of the stratigraphic increase is defined by drill hole DDH 643, the zone is not present in Clode Pit to the south; to the north and east it is not defined. The strike of the zone in the nose area is approximately 350°

c) Normal Faulting

There are a number of late cutting normal faults in the area. They have a north - south strike which is subparallel to the synclinal axis and they dip steeply east. Plate 2 shows a late cutting normal fault which has displaced the Major thrust approximately 30 feet. There are two other continuous normal faults located in the 7 and 5 seam horizon. Both are subparallel to synclinal axis and displace the strata in the range of 30 feet. There are numerous minor normal faults observed in the Turnbull nose area, however, displacement is minimal.

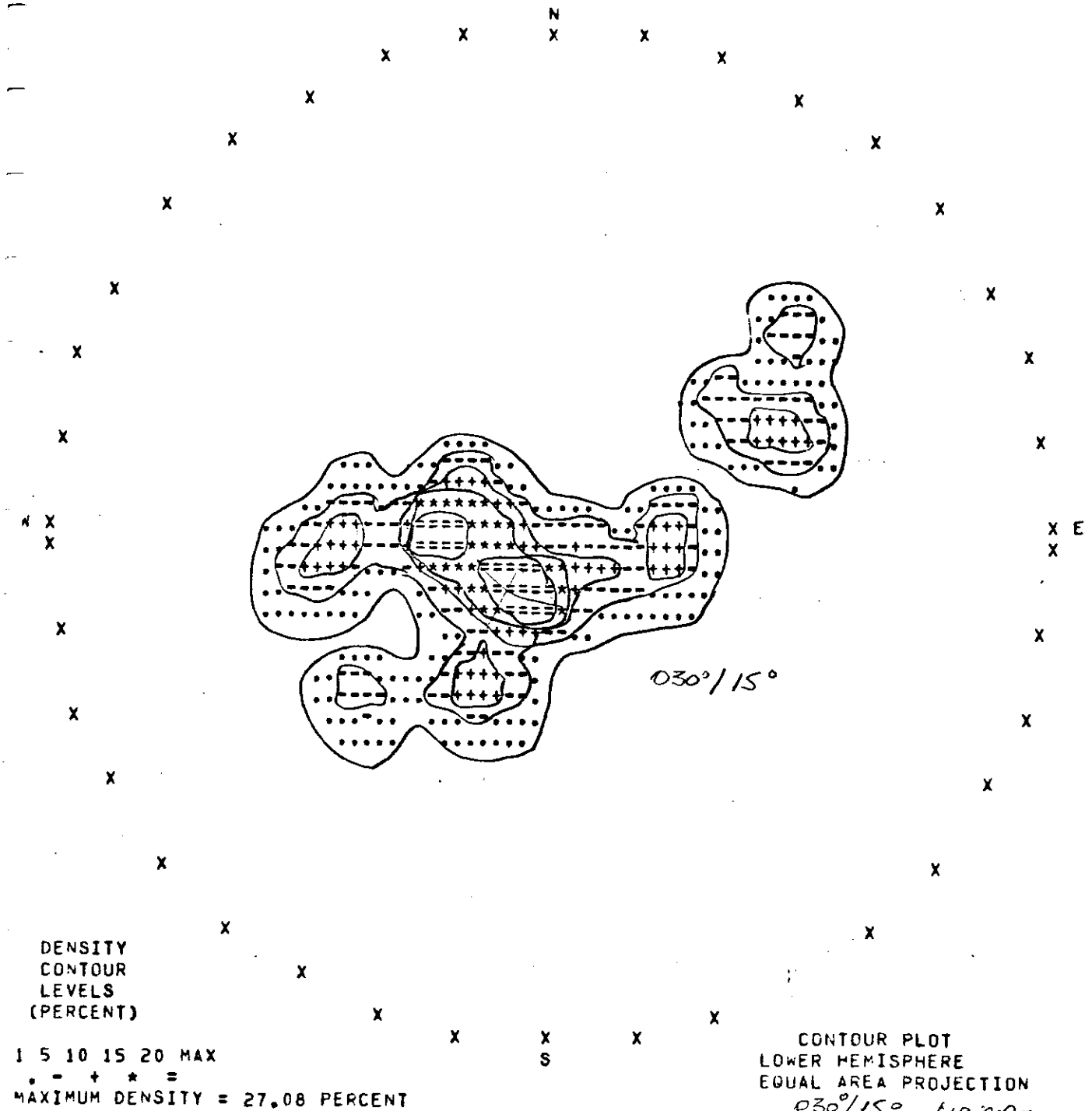
W. H. Shaw,
Exploration Geologist

WHS:sja

V77341 - FORDING COAL

TURNBULL PIT - TRAVERSE 1 - ALL BEDDING

27 ORIGINAL POLES



DENSITY CONTOUR LEVELS (PERCENT)

1 5 10 15 20 MAX

. - + * =

MAXIMUM DENSITY = 27.08 PERCENT

CONTOUR PLOT
LOWER HEMISPHERE
EQUAL AREA PROJECTION

030°/15° DIP DIRECTION / DIP

FIGURE 1 A

V773-1 - FORDING COAL

TURNBULL PIT - TRAVERS 1 - ALL JOINTS

401 ORIGINAL POLES

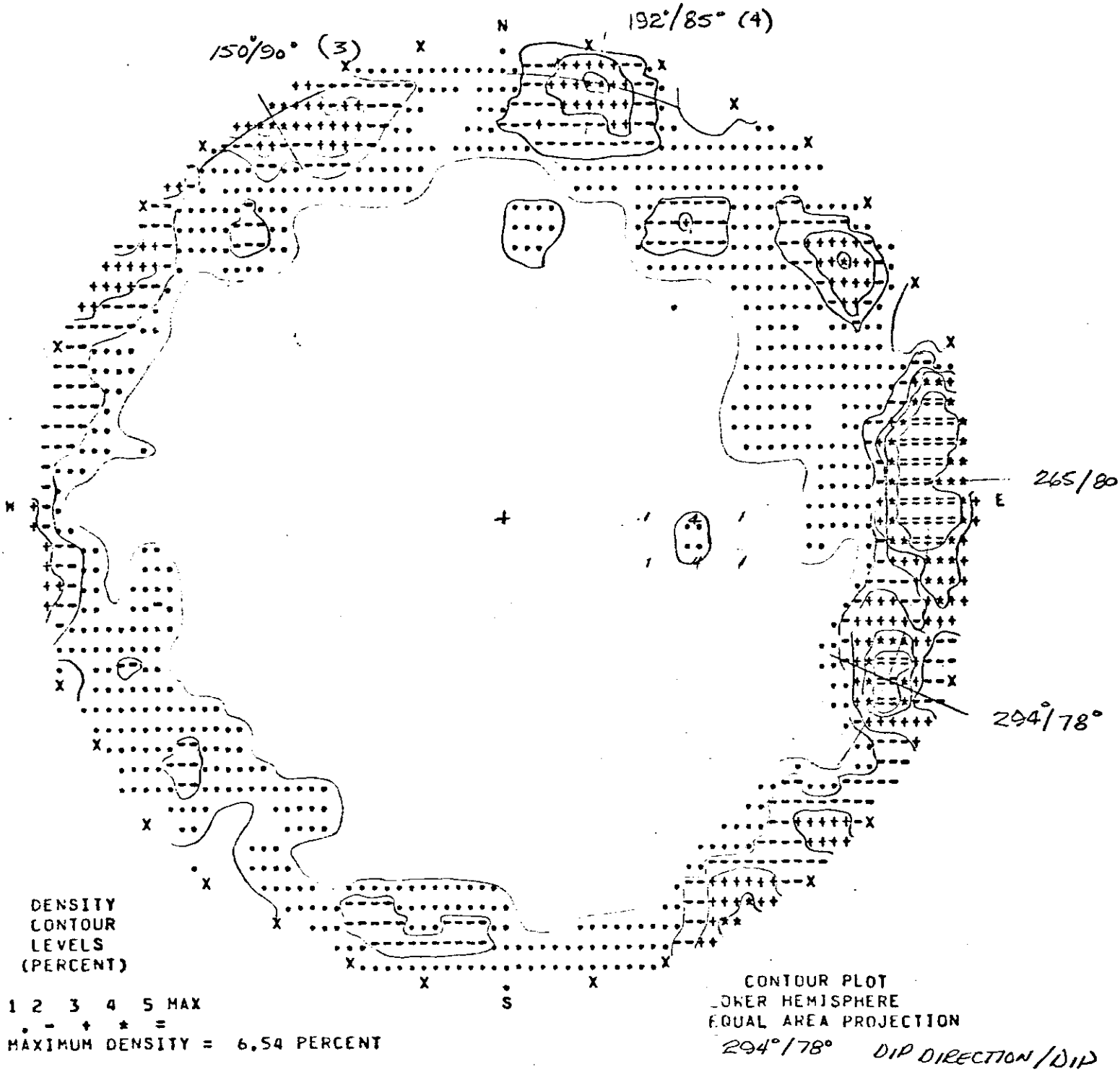


FIGURE 1 B

V77341 - FORDING COAL

TURNBULL PIT - TRAVERSE 2 - ALL JOINTS

148 ORIGINAL POLES

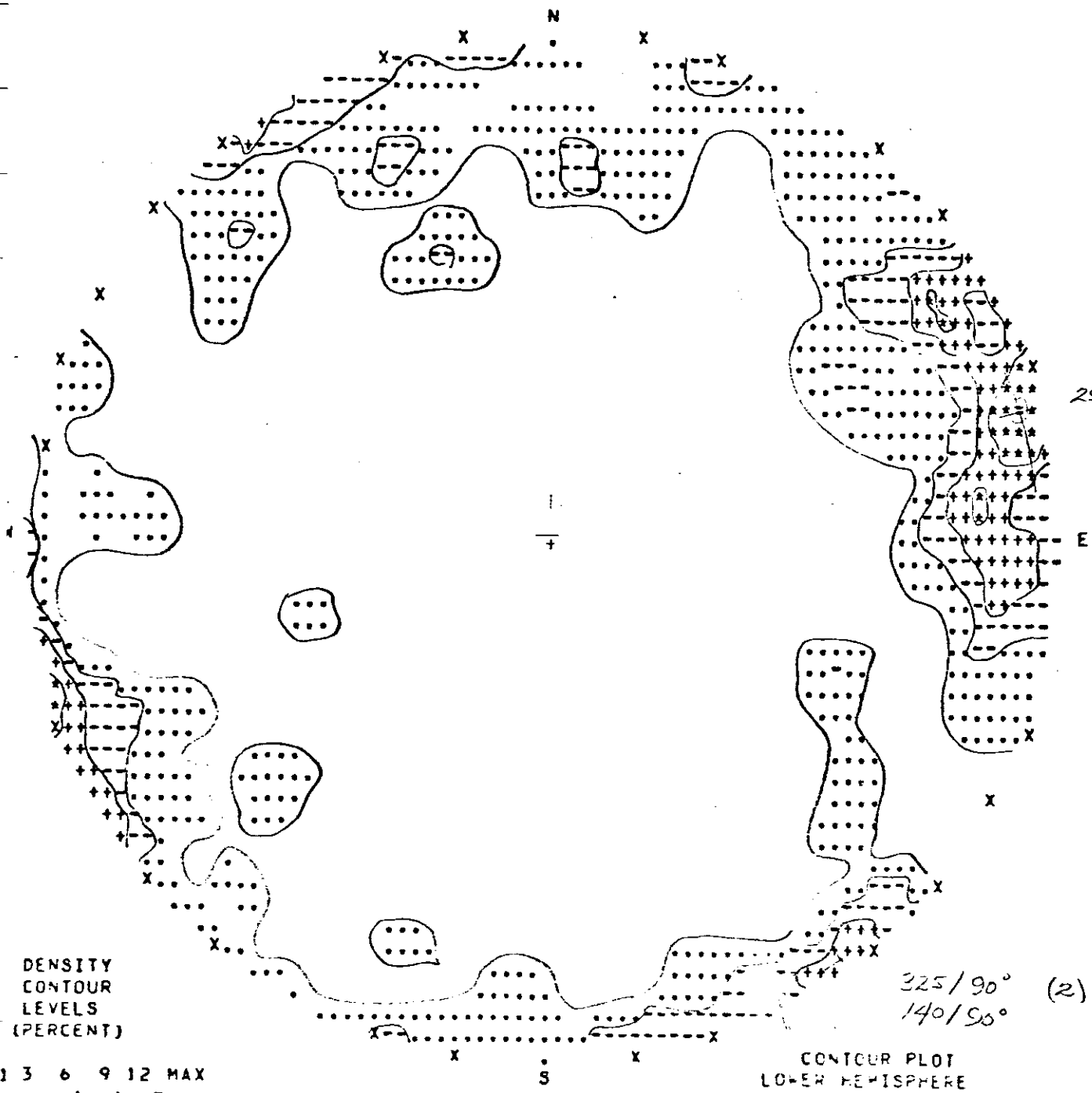


FIGURE 1 C

Golder Associates

Subject: FARRUS CORP — TURNHILL PIT — GWL in OPEN HOLES

Made by: JMM

Checked by:

Approved by:

Job No: V77361

Date: 20 JUN 77

Sheet No: 1

UPDATED 21 NOV

TABLE 1

HOLE N°	T.D. FT	DEPTH TO WATER FT.	DATE	Remarks.
DDH 18				Caved at 20 ft.
DDH 600		88.7	6 JUN 77	
DDH 641*	OPEN TO 592	316.6	8 JUN 77	313.7 7 JUL 77
DDH 642				Not measured.
DDH 643	983	289.6	31 MAY 77	Measured during packer tests. Casing pulled.
RH 604†	~550	>357.6	6 JUN 77	Caved at 357.6
RH 605A	751	352.0	19 JUL 77	Immediately before standpipe installation
RH 606	~550	296.6	6 JUN 77	
RH 608	~550			Caved at surface.
RH 609	~550	144.4	6 JUN 77	
RH 610	~550	14.8	6 JUN 77	
RH 621	473	166.0	6 JUN 77	166.0 7 JUL 77
RH 624	415	208.0	6 JUN 77	195.2' 7 JUL 77
RH 625	558	>20	8 JUN 77	Caved at 20 ft.
RH 626	485			(Probe not working).
RH 627	502			(Could not locate).
RH 628	442	36.7	6 JUN 77	38.5 7 JUL 77
RH 637	not completed	(50.0)	JUN 77	Drillers report damp cuttings return.
RH 638	680	519.8	6 JUN 77	
RH 640	428	97.1	6 JUN 77	Water seepage into hole above S.W.L. 87.2 7 JUL 77
RH 124		0	MAY 77	Flowing
RH 129		0	MAY 77	Water level at Top of casing. No flow.
RH 644	483	0	MAY 77	Flowing

* PNEUMATIC PIEZO: PERMEABLE TEST SECTION.: 758-892 max.
TIP DEPTH: 873.7'
DEPTH TO WATER HEAD: 554.9' (4 days)
(No longer in operation)

+ STANDPIPE: PERMEABLE TEST SECTION: 595-616
DEPTH TO WATER: 313.6' (1 month)
(Top seal inoperative).

† STANDPIPE PERMEABLE TEST SECTION: 596'-615'
DEPTH TO WATER: 409.1' (2 months)

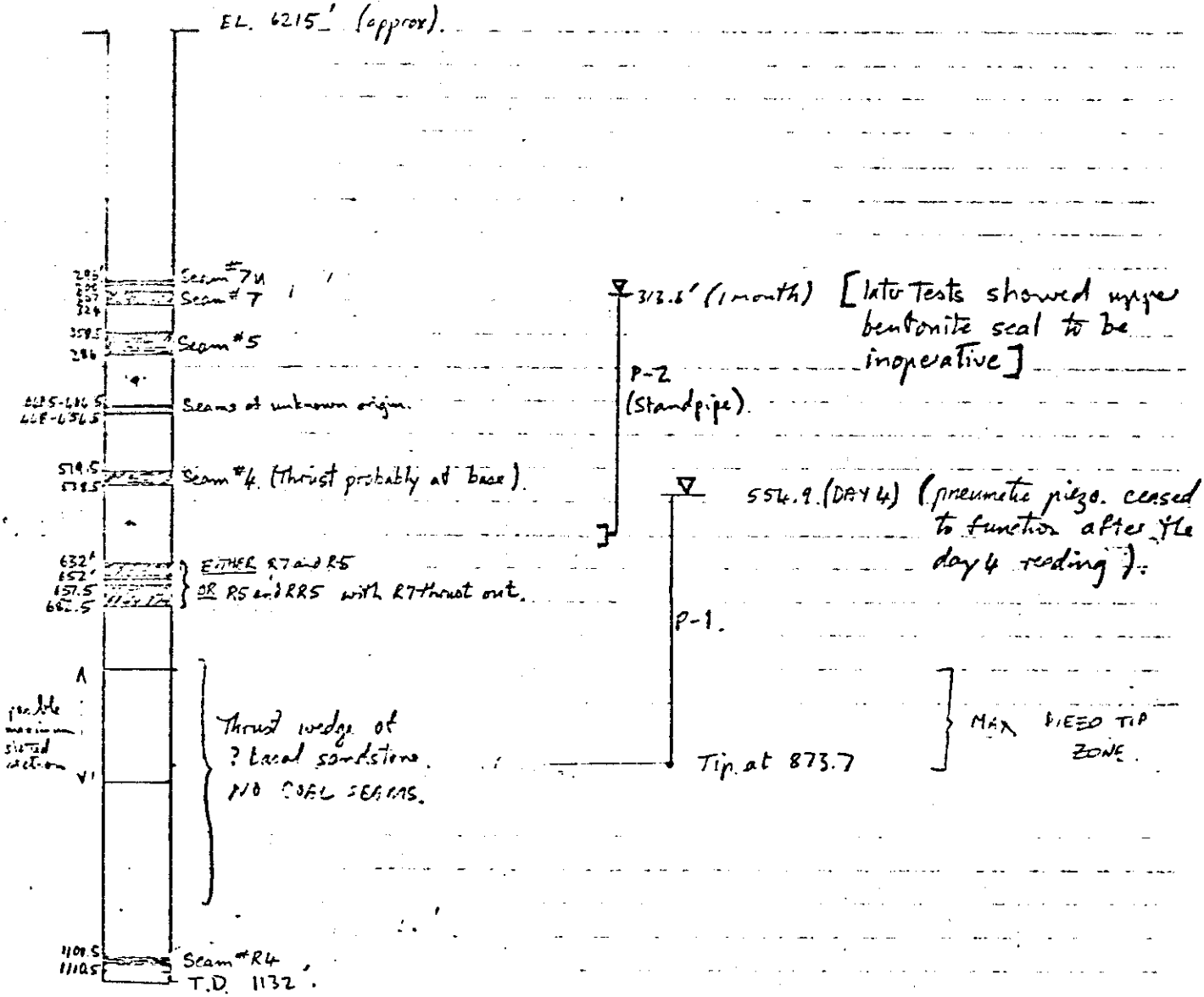
Golder Associates

Subject: P.T. No. 1
TYPICAL
STRATIGRAPHY + PIEZO.

Made by:
Checked by:
Approved by:

Job No:
Date:
Sheet No:

FIGURE 2



Golder Associates

Project RH 605A

TOPHILL PIT Stratigraphy

Drawn by MFM

Checked by

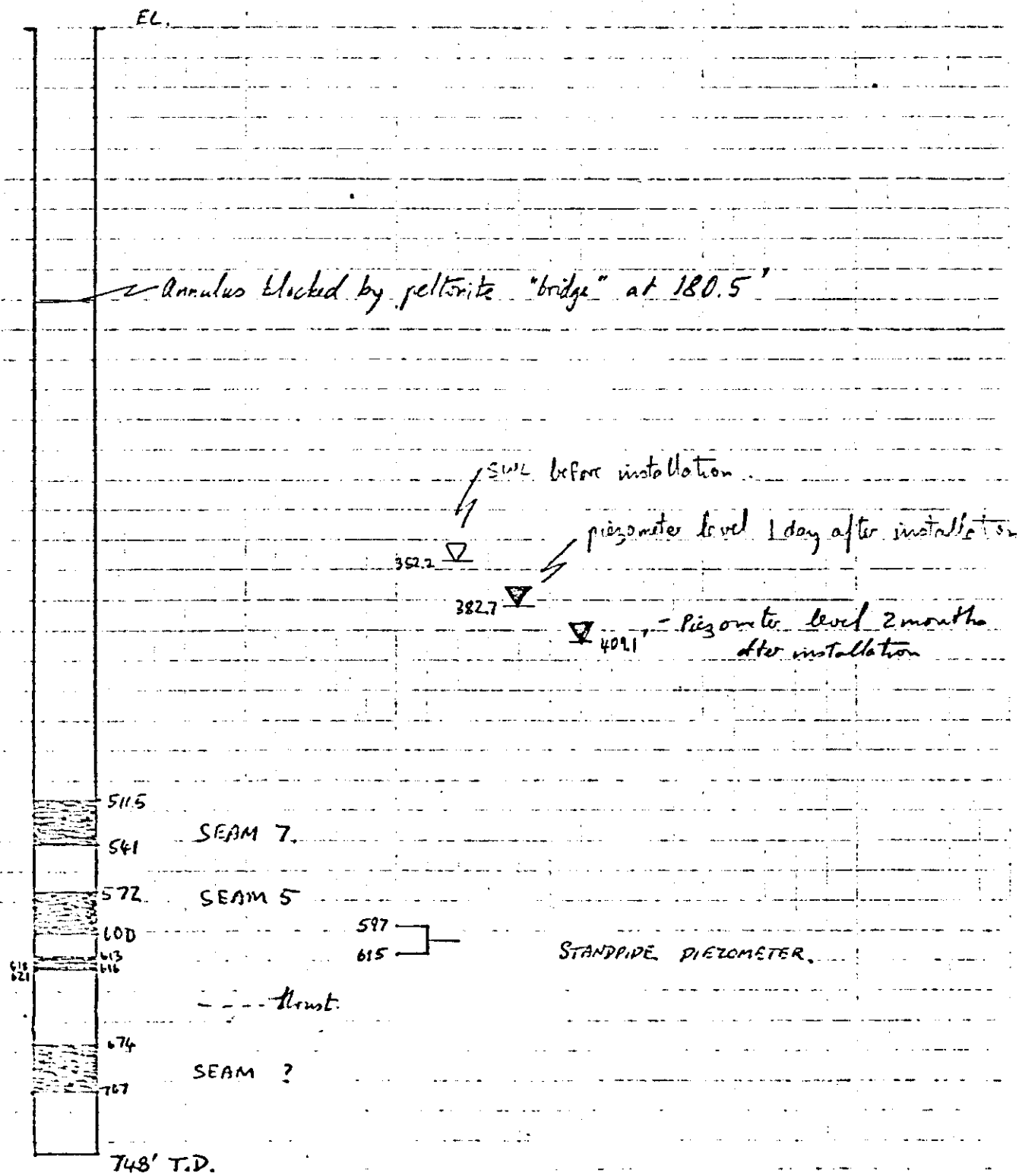
Approved by

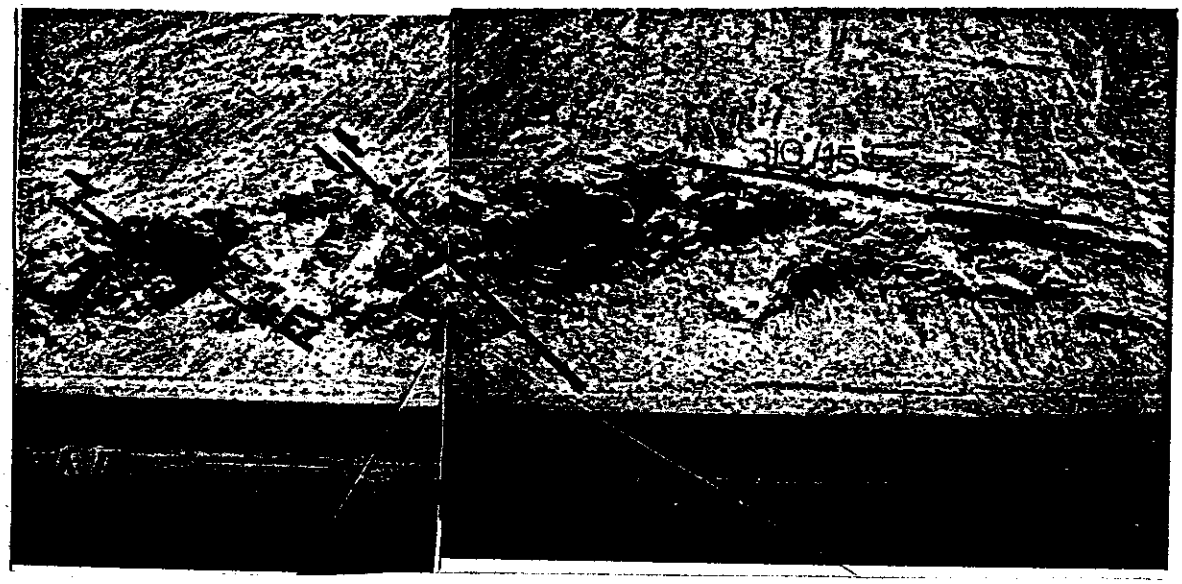
Job No V77341

Date 22 JUL 77

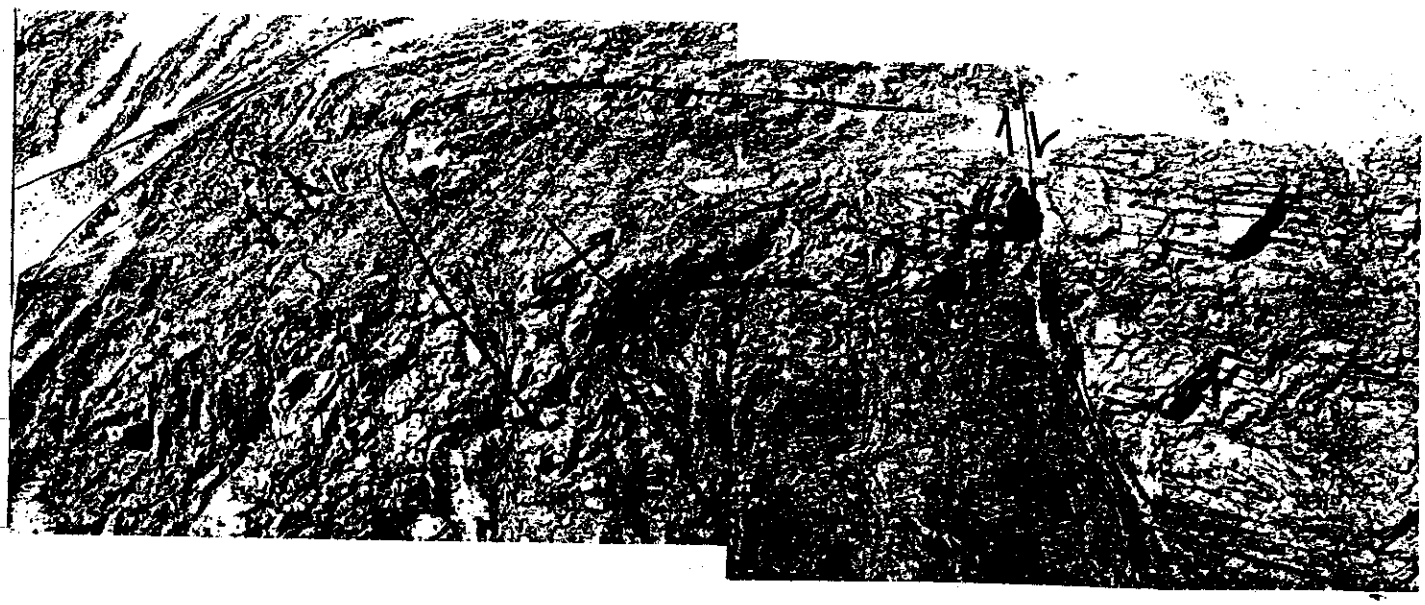
Sheet No

FIGURE 3



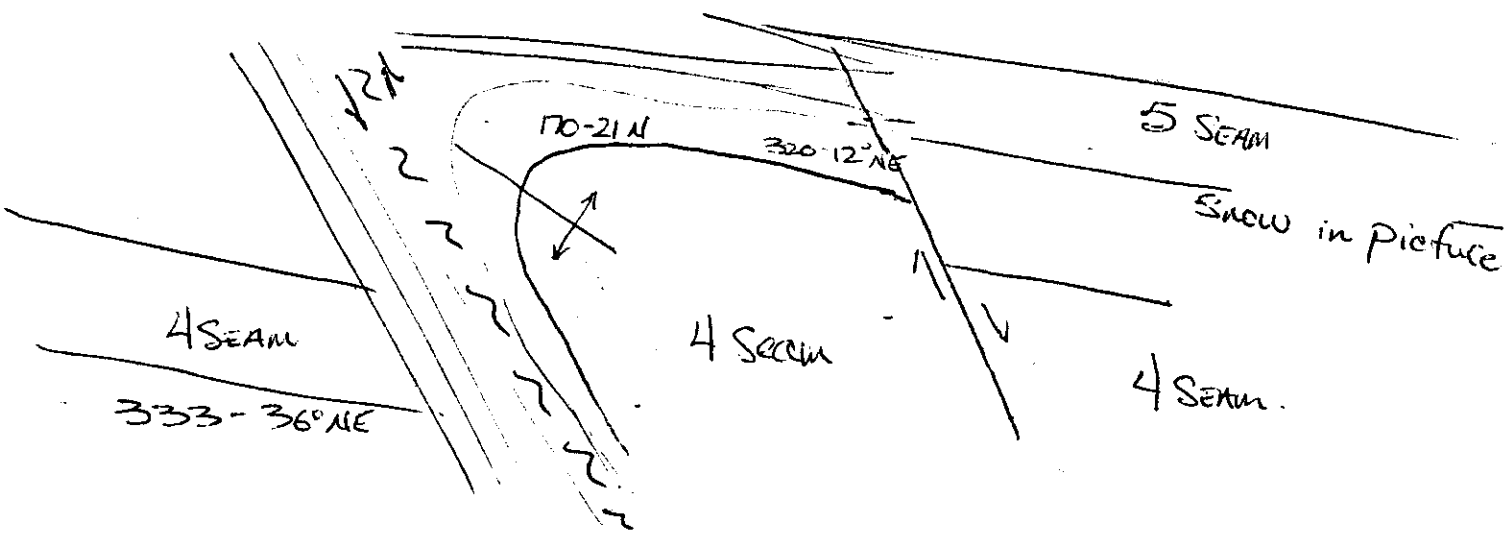


a) Flexural slip faulting above 7 seam. Picture taken on Clode Haulroad looking north.

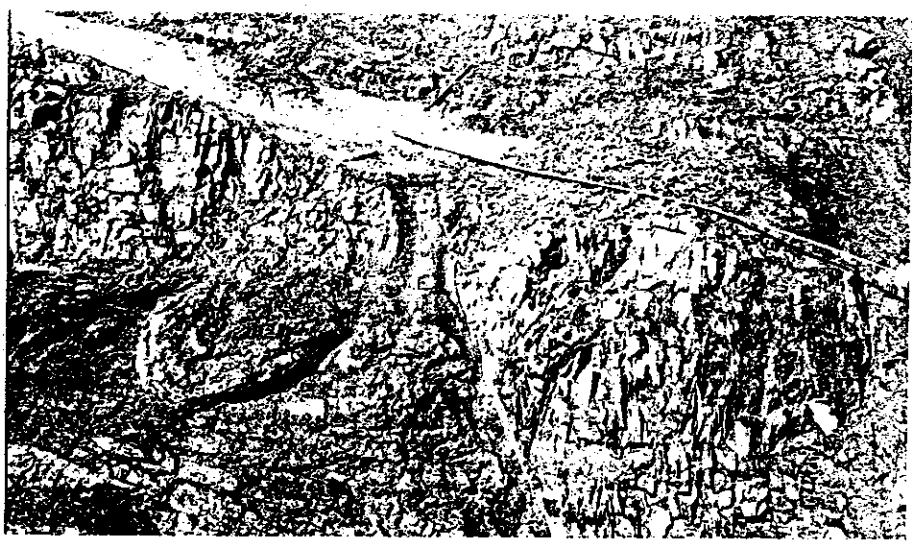


b) Overturned fold on flexural slip fault. Note minor normal faulting in 4 seam.

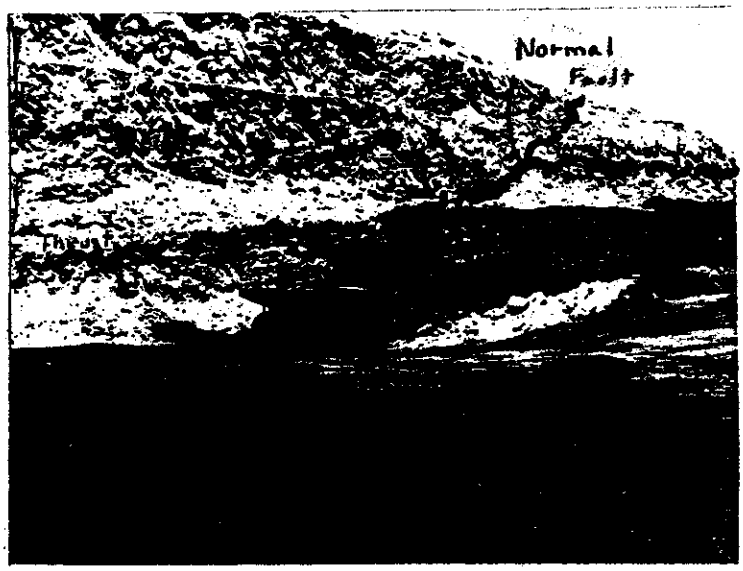
OVERTURNED FOLD - CLOSE HAUL ROAD



COMMON INTERPRETATION - FAULT FORMING ON THE OVERTURNED FOLDING AND BEING DRAWN OUT INTO A THRUST FAULT



a) Late cutting normal fault displacing major thrust approximately 30'.



b) Normal fault displacing Major Thrust in the Repeat 4 seam pit. Displacement is approximately 30 feet. Looking Southeast.

79,000 E
80,000 E
81,000 E
82,000 E
6800
6600
6400
6200
6000
5800
5600
5400
76,000 E
77,000 E
78,000 E
79,000 E
otc
RH 213 33'S
DDH 215 59'S
RH 213 69'S
RH 623 (38S)
RH 621 93'N
RH 625 11'N
RH 248 22'S
RH 245 21'N
DDH641 26'N
RH 604 57'S
RH605A/150'N (RH605B/15'N)
RH 632 12'N
R4 39'
R2 9'
R1 10'
R4 33(31)'
R4 34(32)'
R4 29.5(28)'
R7 48'
R5 10'
R7 20'
25'
R5 shlg.C.
R4 10'
C.Trs.
M. FLT.
Jan'74
Mar'77
Oct'77
K-FORDING RIVER 77(2)A.
320

Revisions				Revisions				Revisions			
No.	Made by	Date	Description	No.	Made by	Date	Description	No.	Made by	Date	Description

R K MAY '74 OCT '72 TOPOGRAPHY (LOWER SECTION)

Drawn by R K Oct. 6, 72

Fording Operations

Cominco

GEOLOGICAL SECTIONS

TURNBULL 498,000 N

Scale 1 Inch = 100 Feet

Drawing No.

Revisions			
No.	Made by	Date	Description
	R K	MAY '74	OCT' 72 TOPOGRAPHY
		Nov 75	[illegible] trenching
		Nov 76	
	WHS	OCT 77	

Drawn by RK Oct. 6, 72

Fording Operations

Cominco

GEOLOGICAL SECTIONS

TURNBULL 498,250 N

K-FORDING RIVER 77(2)A.

320

Scale 1 Inch = 100 Feet

Drawing No.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.	
LSD	
SEC	
TWP	
RGE	
W M	

COMPANY FORDING COAL LIMITED

WELL Figure 4 (Composite Section)

LOCATION Turnbull Mountain (Turnbull Total Pit Area)

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services:

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.

CSG

G.L.

Run. No.	ONE		
Date			
First Reading			
Last Reading			
Footage Logged			
Depth Reached			
Depth Driller			
Casing Roke	7		
Casing Driller			
Fluid Type	AIR/WATER		
Liquid Level	41		
Min. Diam.	4 7/8		
Rm @ °F			
Operating Time			
Truck No.			

320

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	125-003	LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1¾	TOOL MODEL NO.	125-003
DETECTOR MODEL NO.		DIAMETER	1¾
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.8 FT	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	34	SERIAL NO.	256
INSTRUMENT TRUCK NO.	34	SPACING	17 INCH
TOOL SERIAL NO.	125-003	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	41	12	4	100	0	15	3	1000	6.7L	375
	41	518	12	4	100	0	15	3	1000	1L	100

REMARKS

APPENDIX 2 (c)

1977 CASTLE MOUNTAIN EXPLORATION PROGRAM

INTRODUCTION

This report presents the stratigraphic and structural information collected in the 1977 Castle Mountain exploration program.

Reconnaissance investigations of the geology in parts of the map area were carried out in 1968 and 1970 to establish the basic stratigraphy. One diamond drill hole was drilled in 1968 to test the lower stratigraphic section. In 1970 three diamond drill holes were terraced along section B to intersect 11 seam through to the Basal sand. All of the seam trenching was done in the 1970 field season (Figure 1).

Fourteen rotary holes were drilled in 1977, all of them on the west face. All new exploration roads and drill sites were prelogged before construction was started. Fourteen thousand five hundred feet of prelogging was carried out on the west face of Castle Mountain (Figure 2).

FIELD PROGRAM

A. Drilling

SDS Drilling completed 14 holes for a total of 8590 feet (2618 m) from July to September 1977. The three rigs used penetrated the stratigraphy from 13 seam to the Basal sand; drill hole depths ranged from 409 feet (124.7 m) to 862 feet (262.7 m).

B. Mapping

Mapping was concentrated on the west face of Castle Mountain. The steep slopes above 7 seam provided excellent outcrop information. The consistent recognition of the super 7 sand gives confidence in the structural interpretation.

C. Hydrology

In order to define groundwater conditions a preliminary evaluation was necessary before groundwater pressures were defined by means of piezometers.

Static water levels were recorded in all the open holes. The occurence of ground water at shallow depths characterizes closely associated meteorological factors. Table 1.

The coarse grained sandstones between 9 and 7 seams (Figure 3) yields large quantities of water. Permeability of this interval is probably in the range of 1.2×10^{-2} to 3×10^{-4} cm./sec.

STRATIGRAPHY

The stratigraphy of the west face of Castle Mountain includes the formation from the mid members of the Elk Series through to the Fernie (Figure 4).

The general lithology of the coal bearing formations is shown in figure 5.

Five principal rock units were recognized in the Castle Mountain drill sequence:

1. mudstone, brown to black, carbonaceous immediately above and below coal seams, structureless, weathers typically light grey to brown or black if carbonaceous.

2. siltstone, dark grey, fine to coarse grained, resistant, thinly bedded, small scale trough cross-bedding, weathers dark brown to rust.

3. sandstone, mostly protoquartzite, medium grey, commonly limonitic, fine to coarse grained, medium scale tabular cross-bedding, weathers light grey to red.

4. sandstone, quartzose, Moose Mountain, medium to very fine grained, medium to light grey, unidirectional low angle crossbedding, massive in outcrop, weathers light yellow grey (Figure 6).

5. shale, Fernie group, non-calcareous with interbeds of siltstone and very fine grained sandstone, thickly bedded. Sandstone interbeds increase in thickness towards the top.

STRUCTURE

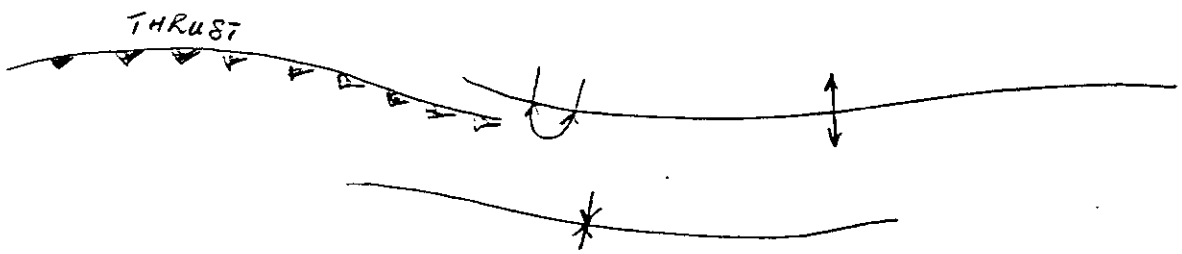
A. Folding

The major structural feature on Castle Mountain is the asymmetrical Fording River Syncline. The syncline is exposed on the north side of Castle Mountain in the Kilmarnock Valley. The east limb dips up to 45 degrees and the west limb varies between 30 degrees to 10 degrees (Figure 7).

The west limb has a small anticlinal - synclinal structure which was presumably tied to complementary features on the eroded adjacent anticline.

On the northern limit of west face of Castle Mountain the anticline is overturned. This is possibly a fold to fault transition zone. Presumably fault displacement decreases southerly until the fault merges with a overturned anticline and small syncline.

FIGURE 8 - Fault to fold transition zone



These displacement transfer zones are common between the fault and fold structures of Front Ranges and Foothills structural belts (Gardner, Spang). The wave lengths of the anticline and syncline increase to the south (Figure 9).

The structural features of the antilcline -syncline fold are summarized as follows:

1. The general strike of both folds are 330 degrees.

2. The two folds are generally asymmetric in cross-section although changes occur along strike.

The west limb of the anticline is overturned at the north end of the map area. The mean dip south of the overturned area is 65 degrees over the mapped strike length. Sections are enclosed in the back folder.

3. Both structures are double plunging.

B. Faulting

Outcrop information suggests that the Basal sand is repeated in the area below DDH 7. Thrusting in the Basal may continue to the southern boundary.

Thrusting may account for the increase in section of the super 7 sandstone in the RH 2011, 2014 area.

A high angle normal fault striking 315 degrees between drill holes RH 2004 - RH 2017, RH 2008 - RH 2011, RH 2012 - RH 2011 has a vertical displacement of 300 feet. The fault shows an apparent strike separation in the order of 800 feet in a right lateral sense.

This fault may also affect the Basal sand in the area below DDH 7.

RECOMMENDATIONS

The drilling program should be continued to define the seams above 13 on the west face. Due to steep slopes and narrow switch-backs accessability for large rotary equipment is not possible. Also due to the hole depths diamond drill equipment will have to be used.

Water supply is limited on the upper slopes, therefore this hole(s) should be completed in the month of June.

A deep hole (greater than 1000 feet) should be drilled below RH 2011 on section Y to reach the Basal sand. This will help define the positioning of the synclinal structure west of the normal fault.

Trenching was unable to accurately define 9 seam south of RH 2013. A hole located above the upper trench on Section Z would define 9 seam and also define the lower section.

The rotary drilling equipment was unable to effectively unload water in the holes even with auxilliary equipment. Drills equiped with mud and with the capability of drilling to 1500 feet must be used.

A drill hole located in the southern boundary area should penetrate the Basal sand at least 200 feet to ensure that the lower portion of the coal formation has not been repeated by thrusting.

The coal lease(s) immediately south of the drill area should be mapped to determine the extent of the above described structures and coal thickness.

W. H. Shaw,
Exploration Geologist

February 2, 1978

WHS:sja

TABLE 1

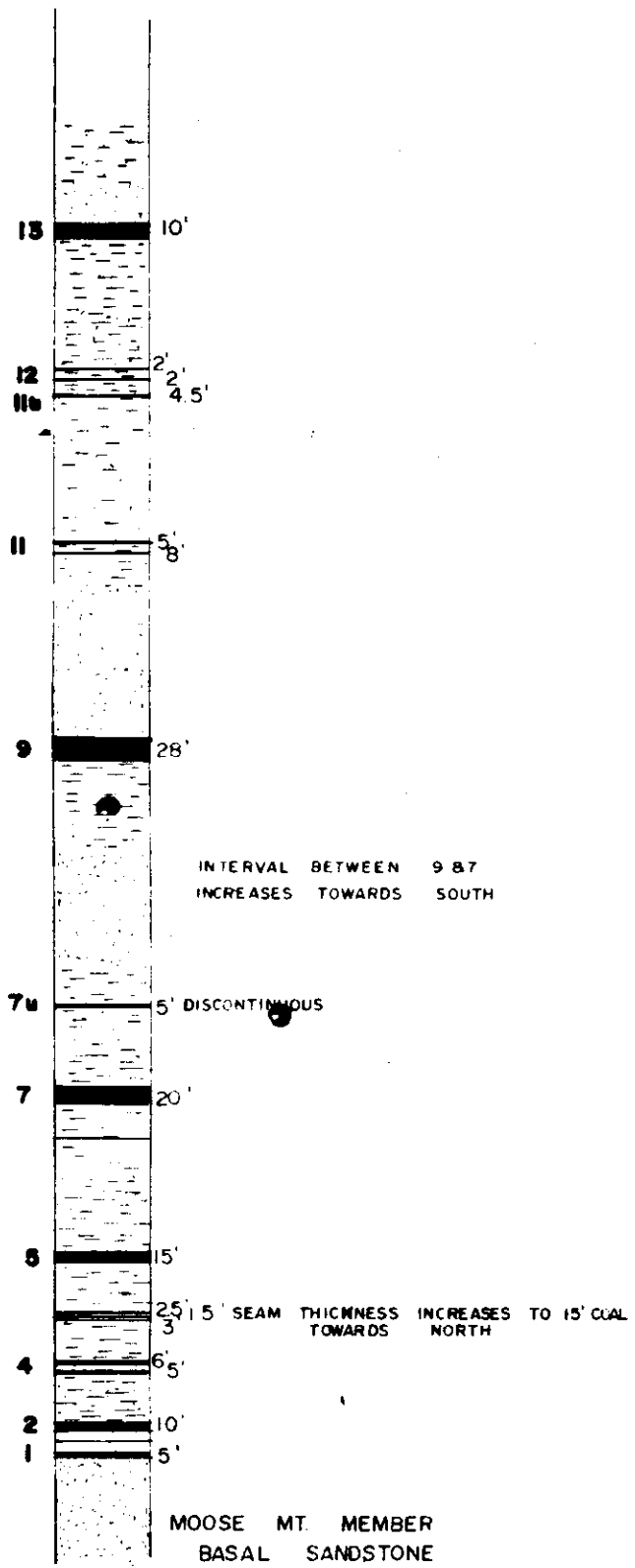
Static Water Levels in Open Holes

Drill Hole Number	Total Logged Depth	Depth to Water Level	Date Hole Completed	Date Water Level Read
DDH 400	786	127	12/9/70	12/9/70
DDH 401	800	121	26/8/70	26/8/70
DDH 402	397	92	4/9/70	4/9/70
RH 2000	439	34	16/7/77	13/7/77
RH 2000	658	34	5/8/77	5/8/77
RH 2002	550	300	25/7/77	26/7/77
RH 2003	535	334	12/7/77	13/7/77
RH 2008	646	104	18/7/77	25/7/77
RH 2009	825	126	17/8/77	17/8/77
RH 2011	658	50	3/8/77	5/8/77
RH 2012	666	221	24/8/77	24/8/77
RH 2013	862	112	20/8/77	22/8/77
RH 2014	525	53	30/7/77	2/8/77
RH 2014	830	114	28/8/77	28/8/77
RH 2015	602	155	14/7/77	15/7/77
RH 2017	409	10	22/7/77	28/8/77

Figure 2 - Prelogging of an exploration road.

Figure 3 - Sandstone unit between 9 and 7 seams.

Figure 4 - View of the West face of Castle Mountain showing the strata from the Fernie to the Upper Elk member of the Kootenay Formation.



GENERALIZED STRATIGRAPHIC SECTION

CASTLE MT. *SCALE* 1"= 200'

RK JAN '78

FIGURE - 5

Figure 6 - Basal sandstone. Note: low angle crossbedding.

Figure 7 - Exposure of the Fording River Syncline at the north end of Castle Mountain.

12 30

SEC M

SEC X

SEC Y

SEC Z

SEAM-9

SEAM-7

SEAM-5

SEAM-4

S-7

S-5

2000 656' 7.5

2001 658' 7.4

2002 520' 11-1

2003 535' 13-11

2004 470' 7-1

2005 662' 9-4

2006 426' 7

2007 409' 7.5

2008 7-1

2009 825' 9-1

2012 667' 7-1

2014 830' 9.7

2015 642' 7-1

2016 452'

2017 409' 7.5

401 11-5

402 7

400 7.4

LEGEND

- 1977 DRILL HOLE
- EXISTING ROAD
- THRUST FAULT (Teeth indicate upthrust side)
- NORMAL FAULT (Solid circle indicates downthrow side)
- TRANSVERS FAULT (Arrows indicate relative movement)
- SYNCLINE (PLUNGE)
- ANTICLINE, OVERTURN (PLUNGE)

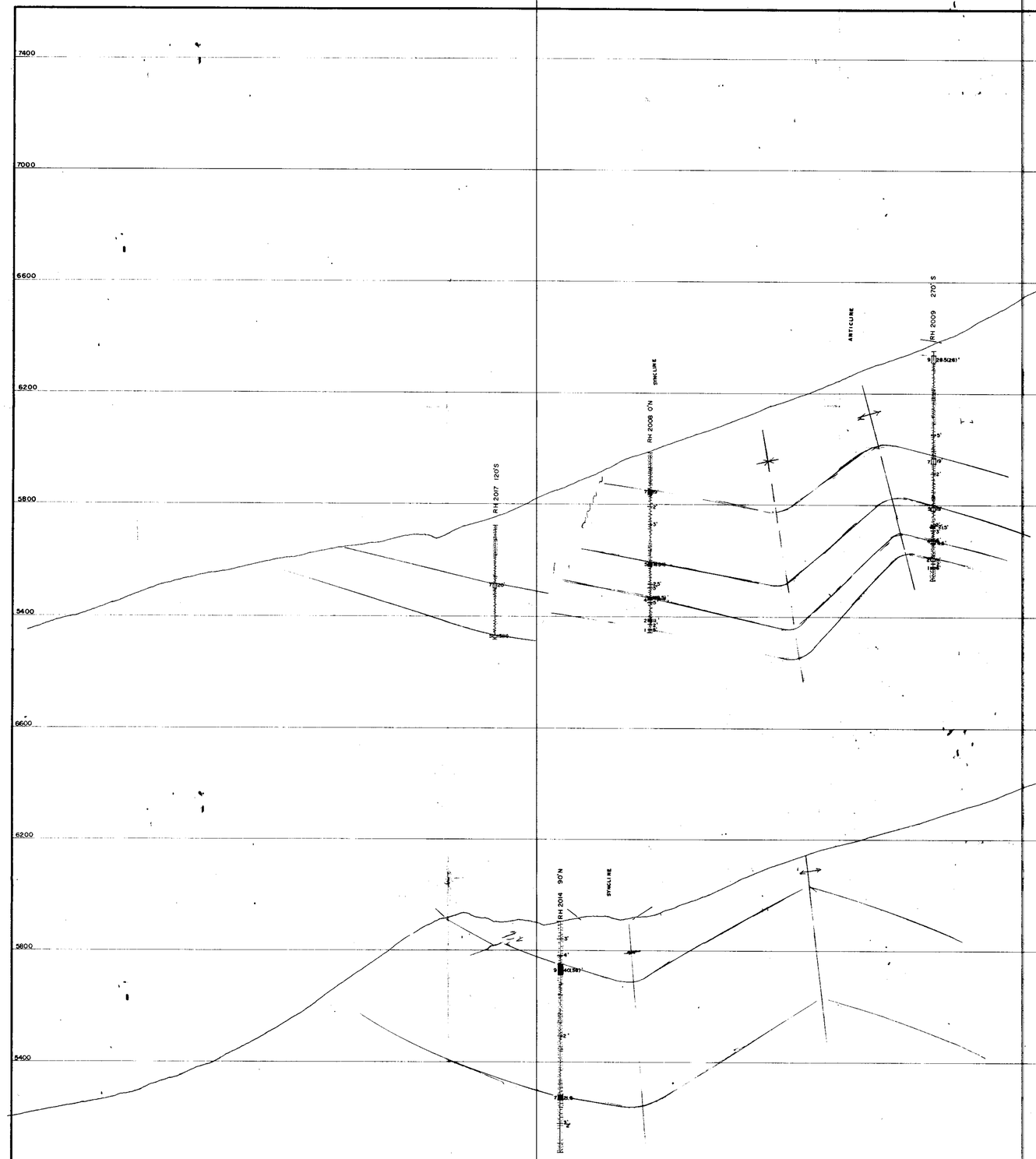
320 K- FORDING RIVER 77(2) A

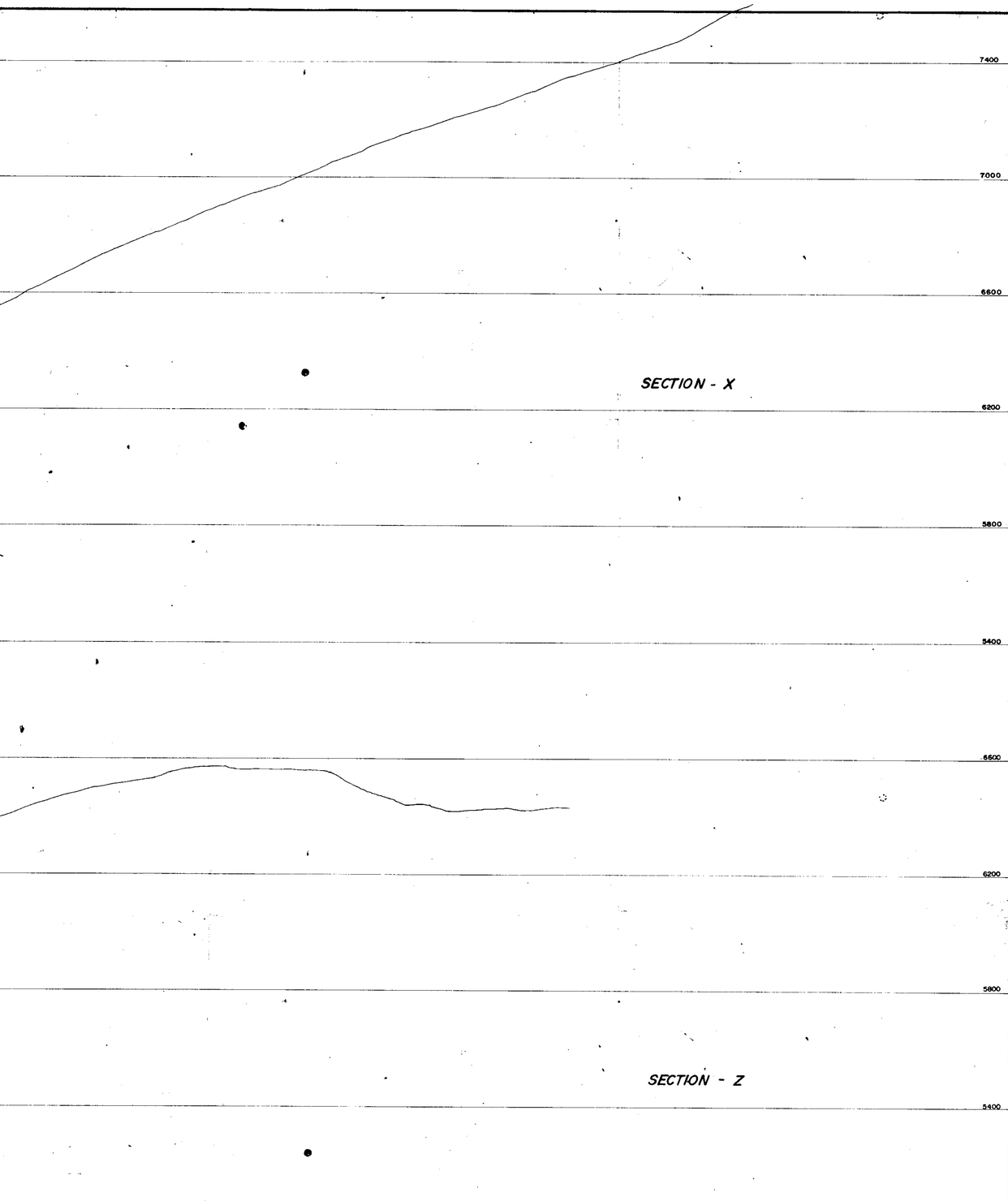
FORDING OPERATIONS	DRILL HOLES & DRILL ACCESS ROADS	SCALE 1" = 200'
COMINCO	1977 EXPLORATION & DEVELOPMENT	PLATE - 11, 12, 30 & 31
	CASTLE MT.	

FIGURE 1

P/C

11 31





Revisions			
No.	Made by	Date	Description

Revisions			
No.	Made by	Date	Description

Revisions			
No.	Made by	Date	Description

Drawn by RK JAN '78

Fording Operations

3220

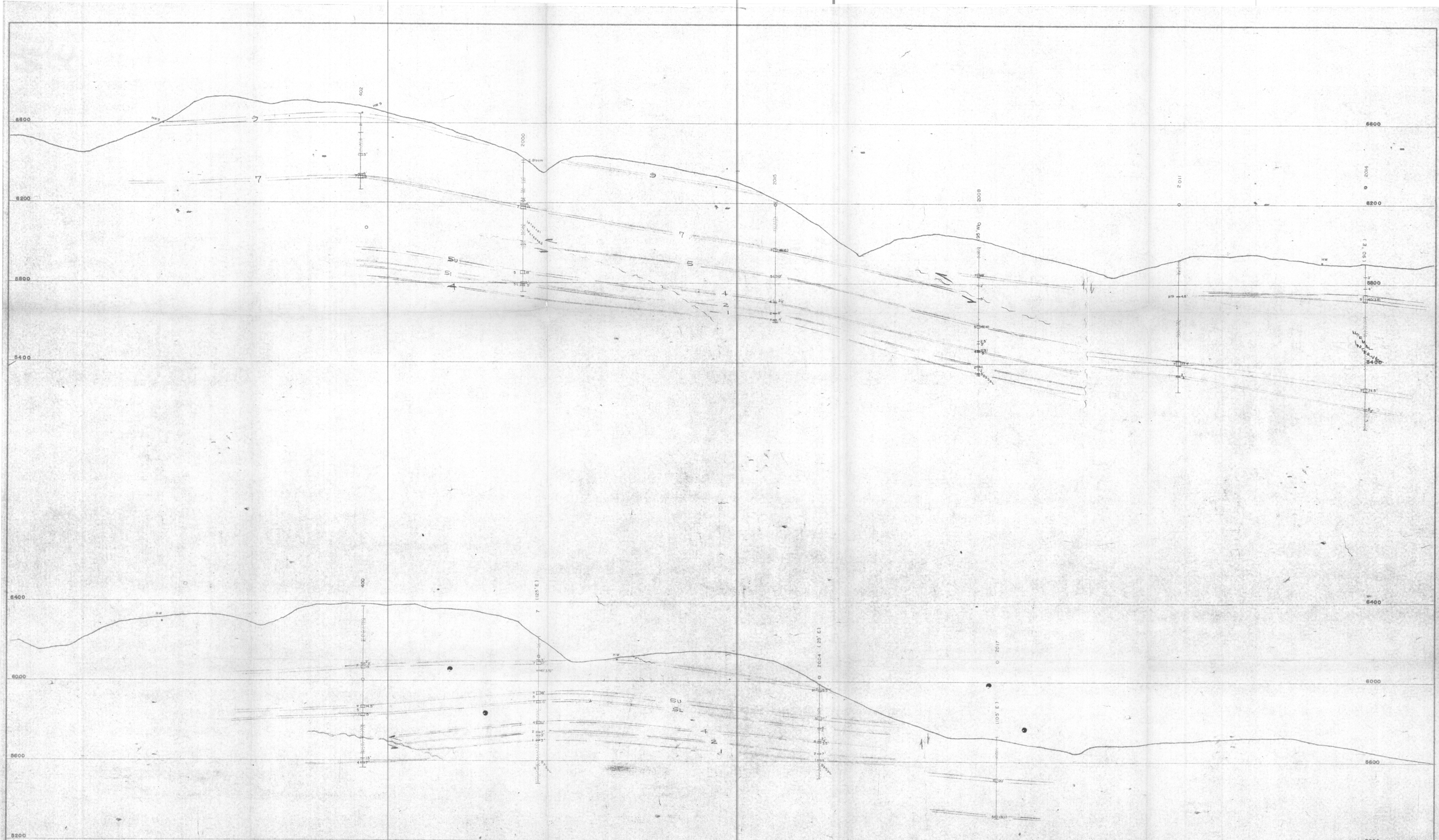
K-FORDING RIVER 77(2)A.

GEOLOGICAL SECTIONS

CASTLE MT.

Scale 1 Inch = 200 Feet

Drawing No. — FIGURE 9



Revisions				Drawn by	RK	JAN '78	Fording Operations	Dominco	GEOLOGICAL LONGITUDINAL SECTIONS CASTLE MT.	KEY MAP	Scale 1 Inch = 200 Feet
No.	Made by	Date	Description								Drawing No.

320

P/C

K-FORDING RIVER 77(2)A

APPENDIX (d)

Note: Appendix 1 and the summary table on page 3 are not complete. The required information will be forwarded when available from the lab.

FORDING COAL LIMITED

FORDING RIVER OPERATIONS

GEOLOGICAL REPORT: LAKE MOUNTAIN

JANUARY 1978

K. A. Komenac,
Assistant Pit Geologist

TABLE OF CONTENTS

LAKE MOUNTAIN GEOLOGICAL REPORT

I. INTRODUCTION

A. General Geology

Lake Mountain is situated on the east limb of the Greenhills syncline. The area is cut-off to the east by the major Erickson fault which occurs along the western margin of the Fording River Valley, and to the west by a branch of the Erickson fault which forms the stream valley between Lake Mountain and the north Greenhills range (Figure 1).

The stratigraphy is characterized by interbedded sandstone, siltstone, and mudstone. Persistant sandstone beds are confined to the lower half of the stratigraphic section. Ten major coal seams (5' to 30' thick) and several minor seams (5') have been identified in the stratigraphic succession at Lake Mountain.

B. Summary of 1977 Exploration Drilling Program

Eight, centre return rotary drill holes (R.H. 1086; 1088 to 1094 inclusive) for a total of 4150 feet were drilled in the Lake Mountain area during August and September 1977 (Figure 2). Coal seams were sampled in 2' intervals and the samples were delivered to the Fording lab for % ash and F.S.I. determinations. For each drill hole, the interval samples were combined to form a composite sample of each coal seam. Composite samples were analysed for % Ash, % Volatiles, % Fixed Carbon, % Sulphur, Free Swelling Index, and b.t.u. rating. Composite sample results are included in Appendix 1.

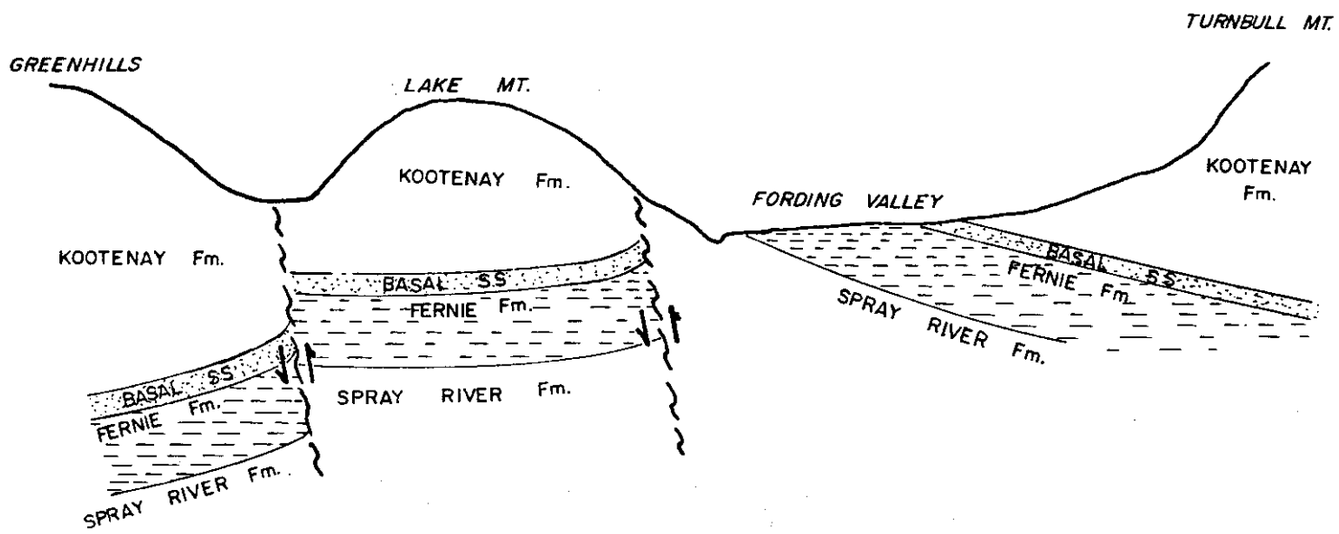
Seven drill holes (R.H. 1086 and 1088 to 1093) intersected a total of 8 major coal seams, identified as seams "D", "E", "F", "G lower","G upper", "H lower", "H upper", and "I". R. H. 1094 intersected thin bedded shales of the Spray River formation indicating that this hole was drilled to the east of the main Erickson fault.

Each hole was logged using the down hole gamma ray - neutron method. Lithological logs, based on interpretation of the gamma ray - neutron logs are shown on cross-sections A to F (Figures 3 to 8).

II. STRUCTURE

The Erickson fault system is the dominant structure influencing the Lake Mountain area. The fault splits into two branches, approximately 3,000 feet south of the base of the mountain. Preferential erosion along the fault traces was instrumental in the formation of Lake Mountain.

Essentially, Lake Mountain is a "step" block structure, with upward displacement on the eastern side of both fault branches, as shown in the following schematic cross-section:



Schematic cross-section looking north. Not to scale.

The bedding strike in the Lake Mountain region varies from 015 to 045 degrees as measured from the top of seam contours for seam "H" (Figure 9). This compares to strikes of 350 to 005 degrees measured in "F" pit, located on the Greenhills side of the Erickson fault system. This strike change may be attributed to differntial "strike-slip" movement along the major faults. The bedding dip for "H" seam is 17 to 20 degrees N. W., and for "F" seam is 18 to 21 degrees W.

The geology of Lake Mountain is complicated by several thrust faults and at least one normal fault. The low density of drill hole information does not allow a detailed interpretation of the fault systems, but variations in seam thickness and inter-seam rock intervals, indicate that faulting is a prevalent feature which will adversely effect mining in Lake Mountain.

III. STRATIGRAPHY

The Kootenay formation of Lake Mountain is an interbedded succession of three principal rock types:

1. Siltstone, light to dark grey, variably carbonaceous, fine to coarse grained, hard, resistant, thinly bedded, often cross-bedded, weathers dark grey-brown to rust.

2. Mudstone, dark brown to black, often very carbonaceous, soft, structureless, recessive, weathers grey brown to black, breaks down quickly upon exposure.

3. Sandstone, light to medium grey, slightly guartzitic, sometimes displays "salt and pepper" texture, fine to coarse grained, bedded, cross-bedded, rarely massive, resistant, cliff forming, weathers grey-brown.

Siltstone is the predominant rock type, often interbedded with mudstone or fine to medium grained sandstone. Mudstone most commonly occurs immediately above and below the coal seams. Sandstone is usually interbedded with siltstone. Siltstone is the dominant rock type above the "G" seam horizon, and sandstone becomes progressively more abundant below "G" seam. Sandstone units tend to be lenticular in shape and variable in thickness.

Most contacts are gradational, and lithologies vary laterally as well as vertically. Exceptions are the sandstone units above "B" seam, and between seams "E" and "F", which are continuous laterally.

IV. SEAM THICKNESS AND COAL QUALITY

The following table summarizes the average seam thickness and weighted averages for raw coal quality, b.t.u. value and diluted plant yield (refer to Appendix 1 for detailed information).

Seam	NO. OF SOURCES TH.	Qual.	Yield	Thickness	RAW COAL QUALITY (undiluted) % Ash	% VCM	% F.C.	FSI	% S	Actual BTU	% Yield Del'd
I	3	3	0	22.3'							N.A.
H(H_u+H_l)	10	8	0	21.6'							N.A.
Gu	11	9	0	~~11.4'~~ 10.5'							N.A.
Gl	9	7	0	~~9.4'~~ 9.5'							N.A.
F	6	5	1	11.0'							58.6
E	8	5	4	23.4'							62.6
D	7	6	4	23.9'							71.2
Dl	5	2	2	6.1'							50.0
B	2	0	0	23.8'	-	-	-	-	-	-	N.A.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The 1977 Lake Mountain exploration drilling program, together with the limited work done in 1969 and 1970 provides an adequate geological base for planning further work in the area. Coal seams "B" to "I" have been identified, and proven to be continuous within the limits of present drill hole information. Thrust and normal faulting, as evidenced by seam thinning, seam repeating, and highly fluctuating inter seam rock intervals, is prevelant in the area. The available drill hole information is not adequate for determing the extent of the various fault systems.

Based on the present geological information two areas on Lake Mountain have possible open - cut mining potential: (Figure 10)

1. The north west flank for seams "I" and "H". The seams are dipping to the north-west, roughly parallel to the topography (Figure 5).

2. The south face for seams "B", "D", and "E". Normal faulting has decreased the interval between seams "D" and "B" (Figure 3).

B. Recommendations

Information to date indicates three areas in which follow-up exploration programs should be considered:

1. A drilling program to investigate a possible dip-slope mining situation for seams "I" and "H" on the north-west flank.

2. A drilling program to investigate the possibility of a small open pit mining situation on the south face.

3. A geological and structural mapping program for all outcrops and road cut exposures.

K. A. Komenac
Assistant Pit Geologist

cc: DLJ, JLP, RSJ, HGR (Calgary), File (1)

KAK:sja

VI. LIST OF ILLUSTRATIONS AND APPENDIX

A. Maps and Cross - Sections

B. Appendix

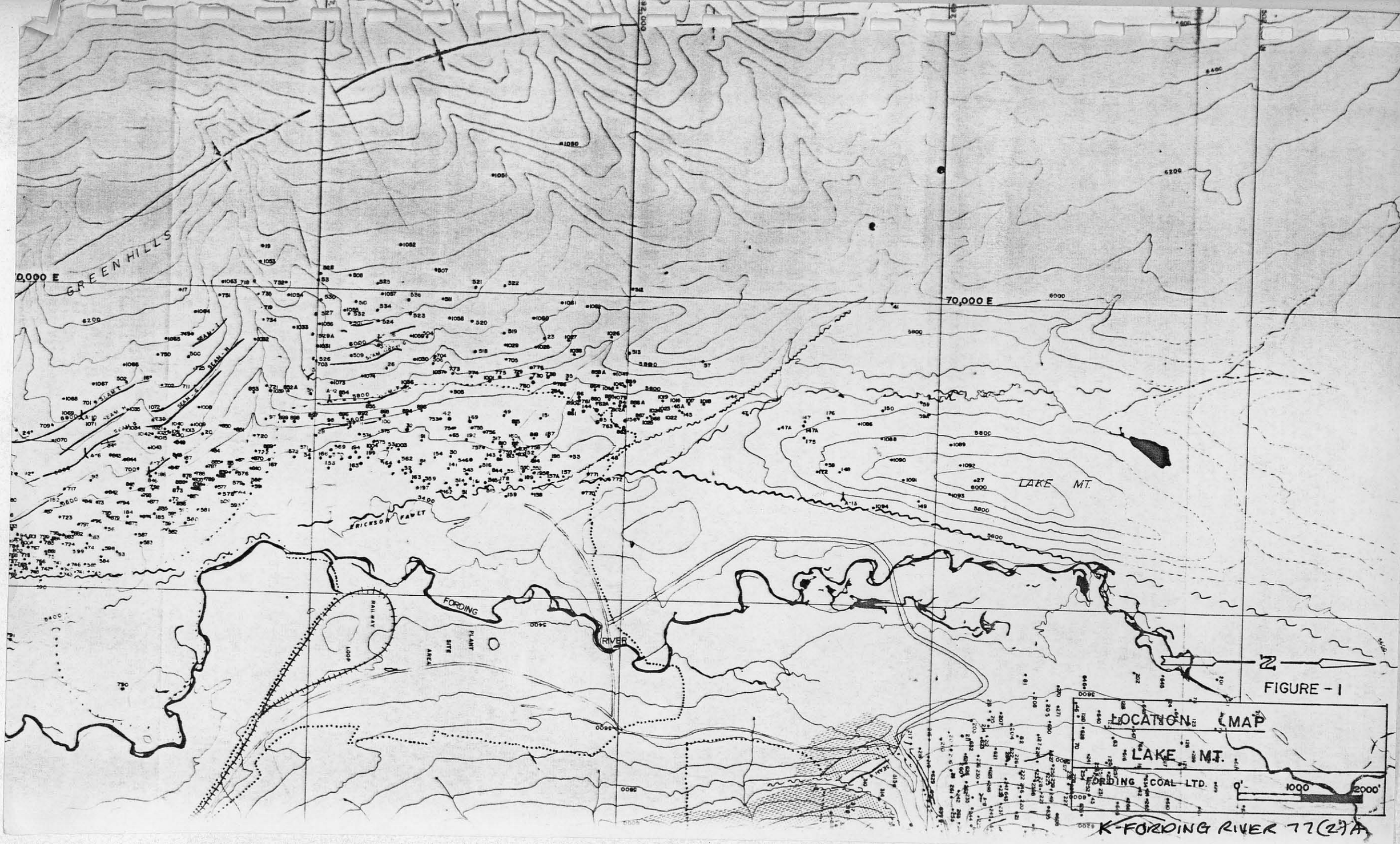
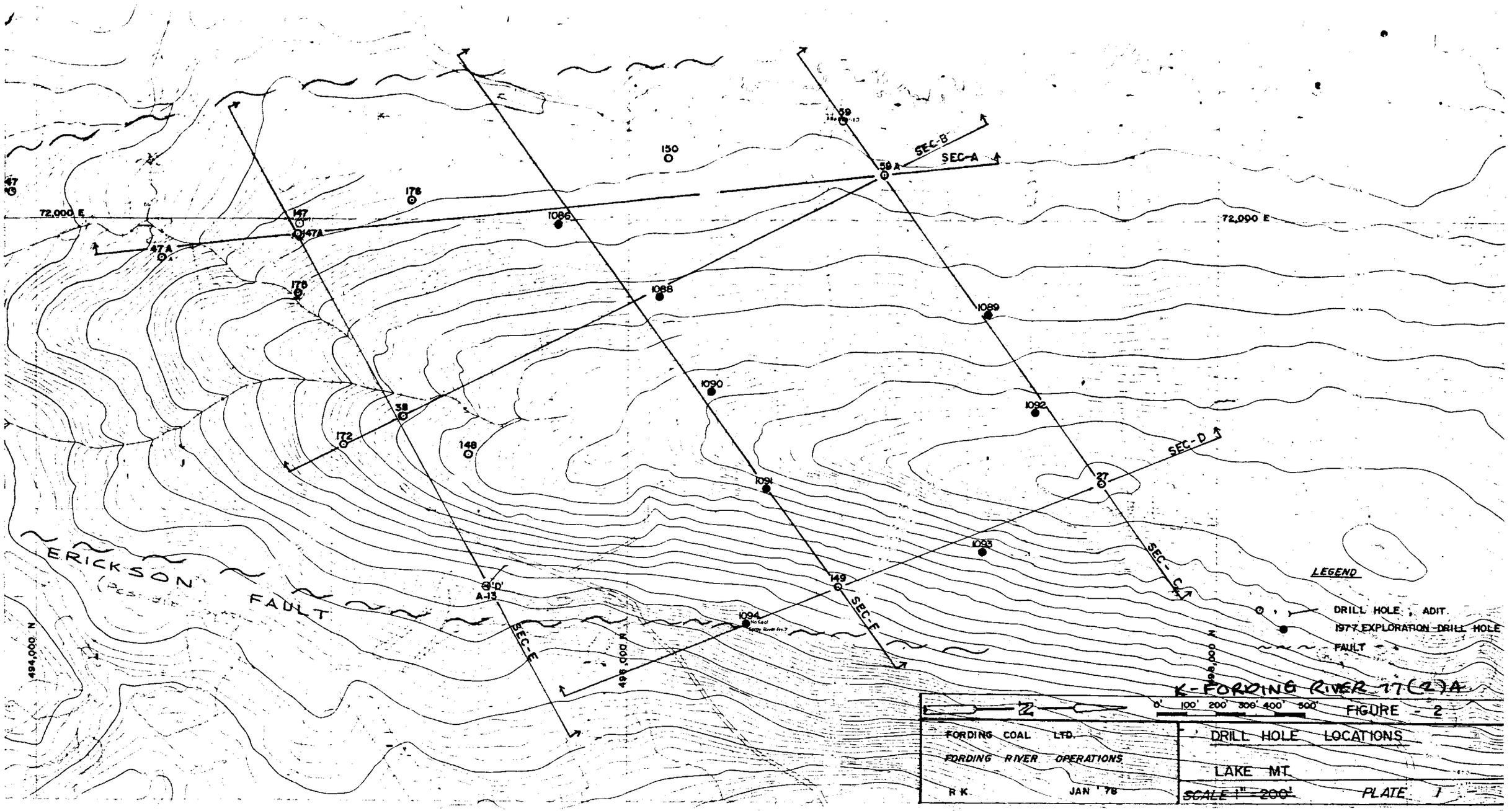


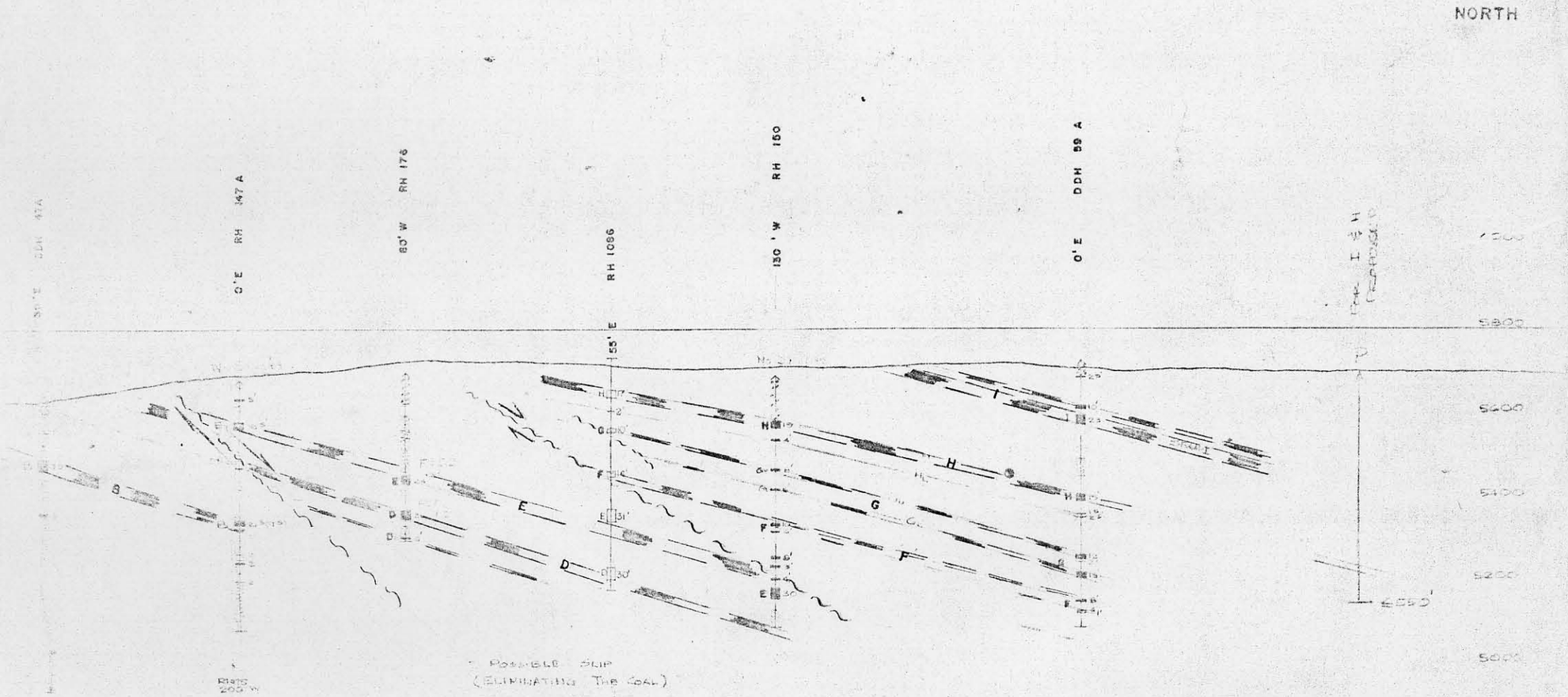
FIGURE - 1

K-FORDING RIVER 77(27)A



K-FORDING RIVER 77(4)A

FIGURE - 2



K-FORDING RIVER 77(2)A.

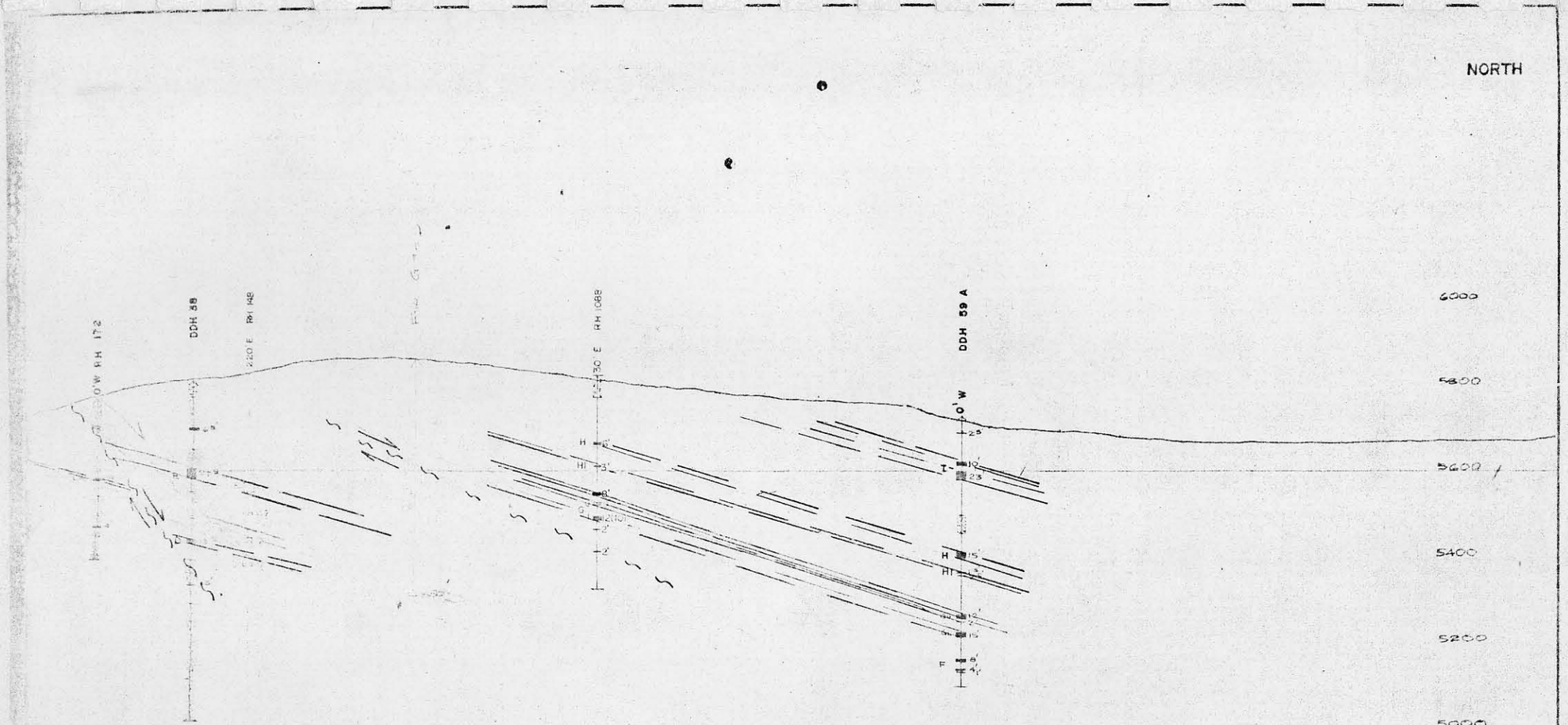
FIGURE - 3

0' 200' 400'

Drawn by AP, RK	Traced by
Revised By / Date	Revised By / Date

SECTION - A (THROUGH HOLES R
& 59 A, LOOKING WEST)
NORTH GREENHILLS AZIM

Scale ~~1" = 200'~~ Date Feb 75



K-FORDING RIVER 77(2) A.

FIGURE-4

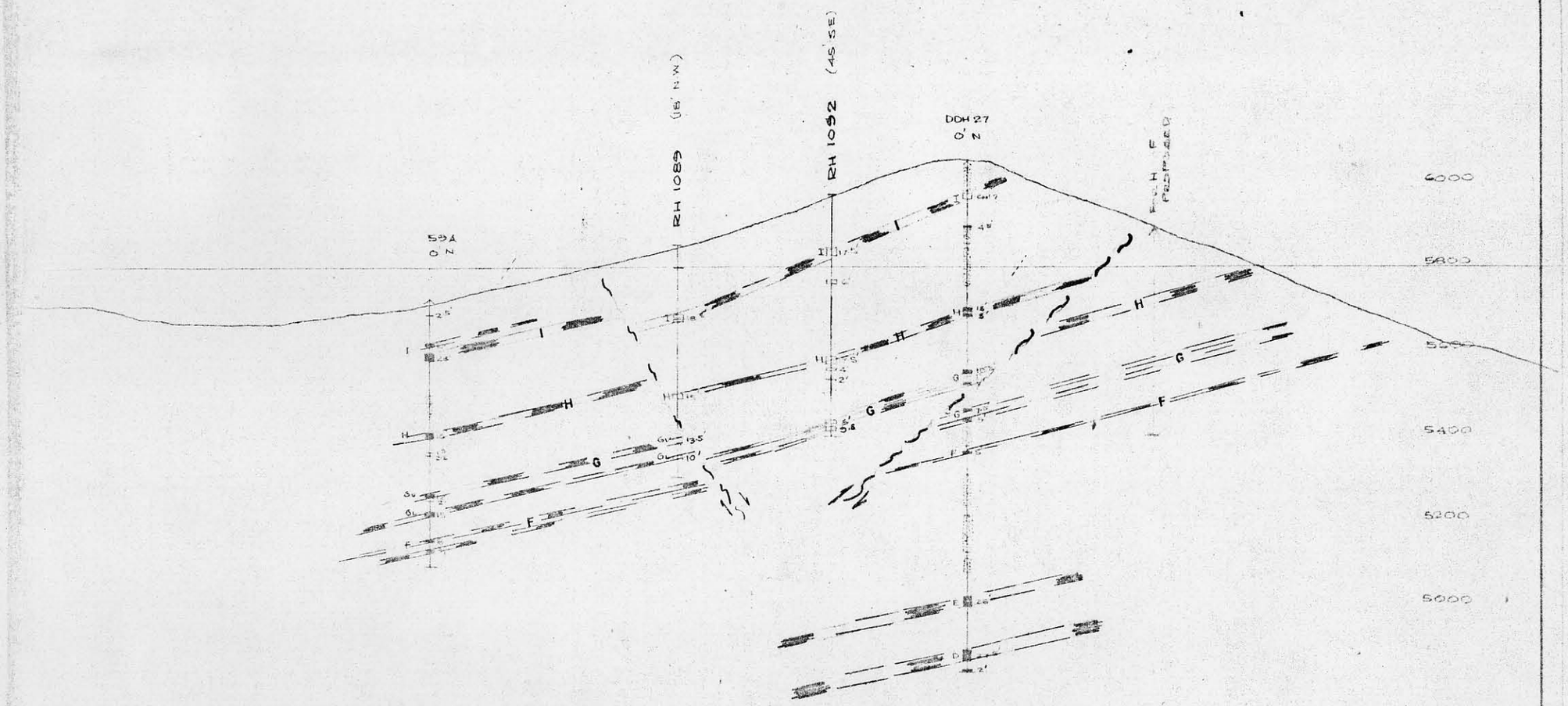
0' 200' 400'

Drawn by: R.K	Traced by:
Revised by: Date	Revised by: Date

SECTION -B (THROUGH HOLES 172 & 59A, LOOKING WEST)

NORTH GREENHILLS

Scale 1" = ~~200'~~ Date Feb 75 Plate 1, Area



K-FORDING RIVER 77(2)A.

FIGURE - 5

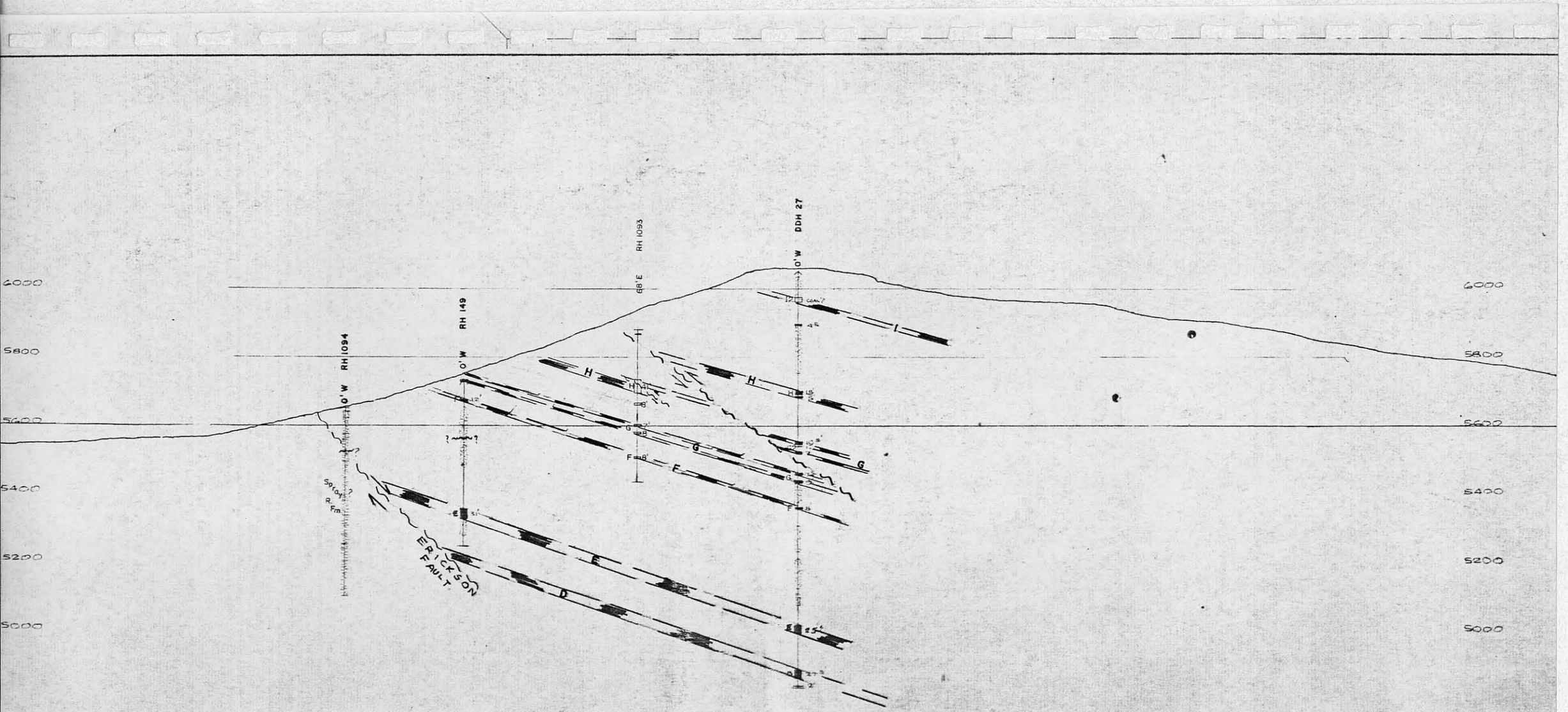
0' 200' 400'

Drawn by: RK.	Traced by:
Revised by / Date	Revised by / Date

SECTION - C (THROUGH HOLES 59A & 27, LOOKING NORTH)

NORTH GREENHILLS

Scale 1" = 200' Date Feb 75 Plate 1, Area



K - FORDING RIVER 77(2)A.

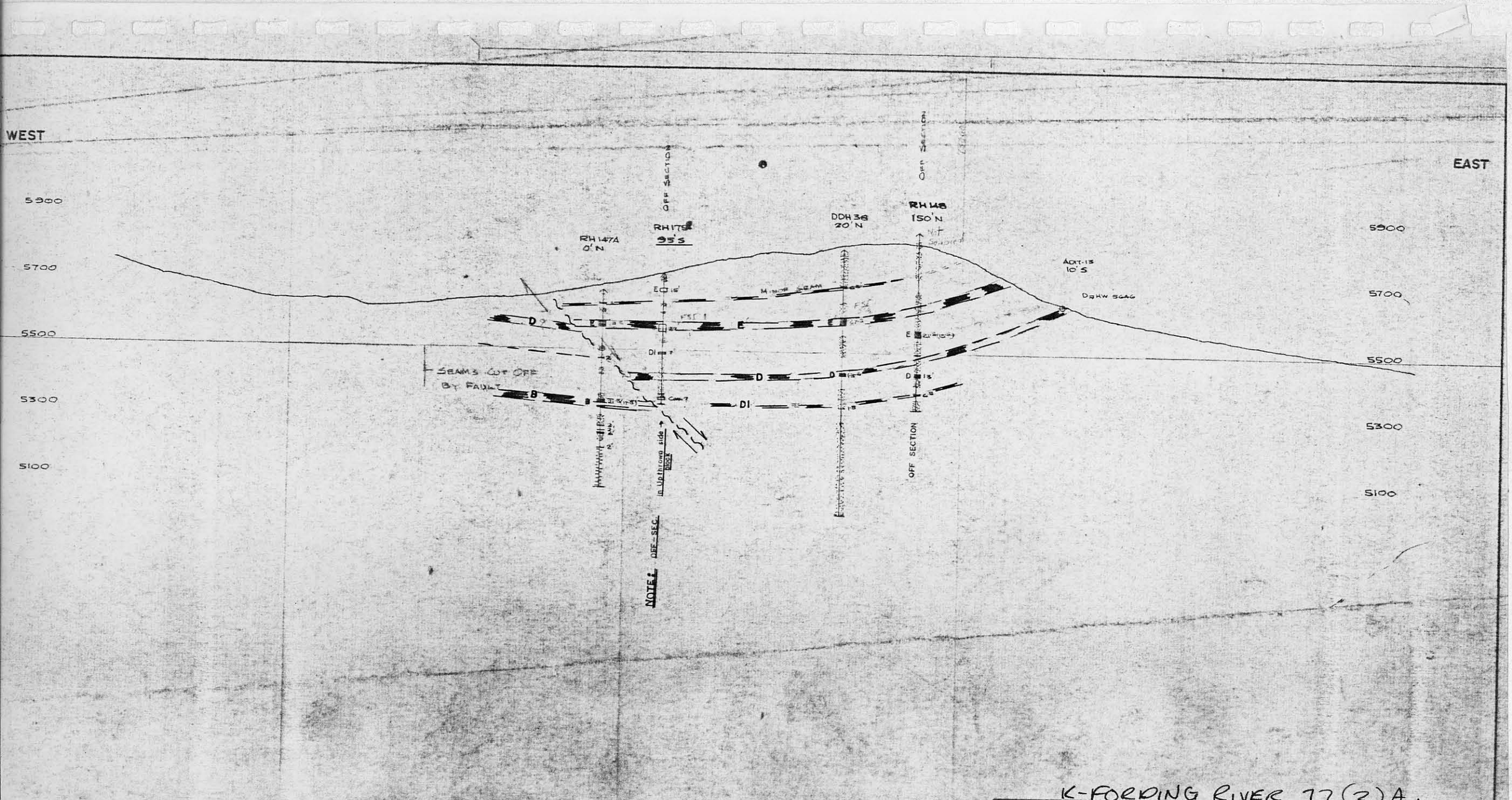
FIGURE-6

0' 200' 400'

Drawn by: ACM, RH	Traced by:
Revised by: Date	Revised by: Date

SECTION D (THROUGH HOLES 149 & 27, LOOKING WEST)
NORTH GREENHILLS

Scale 1" = 200' Date Feb 75 Plate 1, Area



K-FORDING RIVER 77(2)A.

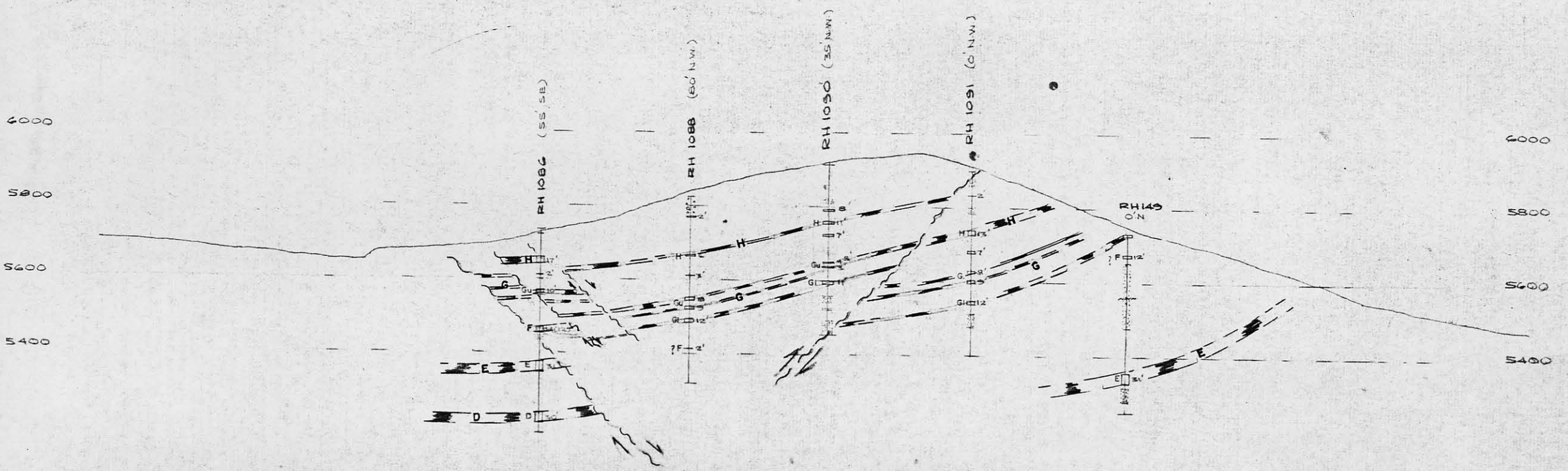
FIGURE - 7

0' 200' 400'

Drawn by: UEP | Traced by:

SECTION - E (THROUGH HOLE 147 A & ADIT 13, LOOKING NORTH)

NORTH GREENHILLS



K-FORDING RIVER 77 (2) A.

FIGURE - 8

0' 200' 400'

Drawn by: RK	Traced by:
Revised by: Date	Revised by: Date

SECTION F (THROUGH HOLES 149 1086 1088 1090-91 LOOKING N.

Scale 1" = 200' Date: AUG 77

72 000 E

72000 E

ERICKSON FAULT

498000 N

498000 N

150 5586-19'

176 only E

1086 5659-17'

1088 5668-8'

1089 5590-15'

1090 5732-11'

1091 5739-13'

1092 5584-17.5'

1093 5734-41'

1094 No Coal Scott River Fm?

148 only E

149 only F

172

38

47A

175

A-13 'D'

27 5705-13/63-17.5'

5400 5450 5500 5550 5600 5650 5700 5750 5800 5850

UP DN.

K-FORDING RIVER 77 (2) A.

0' 100' 200' 300' 400' 500' FIGURE - 9

FORDING COAL LTD

FORDING RIVER OPERATIONS

R.K JAN '78

TOP OF SEAM CONTOURS

- - SEAM - H

LAKE MT.

SCALE 1" = 200' PLATE 1

47
72,000 E
147
147A
47A
176
175
150
1086
1088
39
39A
1089
72,090 E
1090
1092
AREA - 2
AREA - 1
38
172
148
1091
27
1093
149
ERICKSON FAULT
A-13
1094
194,000 N
196,000 N
198,000 N
K-FORDING RIVER 77(2)A.

N
0' 100' 200' 300' 400' 500'

FIGURE - 10

FORDING COAL LTD.
FORDING RIVER OPERATIONS
RK JAN' 78

AREAS FOR FOLLOW UP EXPLORATION
LAKE MT.
SCALE 1" = 200' PLATE 1

Appendix 1: Seam thickness and coal quality for seams "I" to "B"

SEAM THICKNESS AND COAL QUALITY

SEAM "I"

SOURCE	D.D.H.59A	R.H.1089	R.H.1092								WEIGHTED AVERAGE
DATE	1969	1977	1977								
COAL THICKNESS	10';23'	16·5'	17·5'								22·3'
RAW COAL QUALITY											
% ASH	25·7	14·8									
% V.C.M.	25·5	26·0									
% F.C.	47·8	58·6									
F.S.I.	7	6½									
% S.	0·65	0·53									
ACTUAL B.T.U.	N.D.	12,797									
CLEAN COAL QUALITY											
% ASH											
% V.C.M.											
% F.C.											
F.S.I.											
% S.											
% LAB YIELD											
CORRECTED TO 9.5 % ASH											
UNDILUTED PLANT YIELD											
DILUTED PLANT YIELD @ 16 % DIL.											

SEAM THICKNESS AND COAL QUALITY

SEAM "H" ("H$_U$" & "H$_L$")

SOURCE	D.D.H.27	D.D.H.59A	R.H.1086	R.H.1088	R.H.1089	R.H.1090	R.H.1091	R.H.1092	R.H 1093	R H 150		WEIGHTED AVERAGE
DATE	1968	1969	1977	1977	1977	1977	1977	1977	1977	1970		
COAL THICKNESS	20'	15'	17'	6'; 3'	15'	8'; 11'; 7'	13'; 7'	17.5'; 4'	41'; 8'	19'; 4'		21.6
RAW COAL QUALITY												
% ASH	9.0	16.7			21.6							
% V.C.M.	29.7	28.6			25.3							
% F.C.	60.2	54.0			52.9							
F.S.I.	8	8			7½							
% S.	0.56	0.64			0.60							
(ACTUAL) B.T.U.	N.D.	N.D.			11,189							
CLEAN COAL QUALITY												
% ASH												
% V.C.M.												
% F.C.												
F.S.I.												
% S.												
% LAB YIELD												
CORRECTED TO 9.5 % ASH												
UNDILUTED PLANT YIELD												
DILUTED PLANT YIELD @ 16 % DIL.												

Samples contaminated/ at lab.: results not used

NOT SAMPLED SINGLE WALL PIPE

SEAM THICKNESS AND COAL QUALITY

SEAM "G" upper

SOURCE	DDH 27		DDH 59A	RH 150	RH 1086	RH 1088	RH 1089	RH 1090	RH 1091	RH 1092	RH 1093		WEIGHTED AVERAGE
DATE	1968		1969	1970	1977	1977	1977	1977	1977	1977	1977		
COAL THICKNESS	10.5; 7.5		12'	8'	10'	9'; 8'	13.5'	4.5'; 3'	8'; 9'	6'	7'		10.5'
RAW COAL QUALITY				NOT SAMPLED SINGLE WALL PIPE					SAMPLES CONTAMINATED AT LAB, RESULTS NOT USED.				
% ASH	14.4	15.0	22.3				20.7						
% V.C.M.	27.1	24.0	24.9				22.7						
% F.C.	57.4	59.9	52.2				56.3						
F.S.I.	7	8	7½				6						
% S.	0.52	0.64	0.60				0.44						
(ACTUAL) B.T.U.	N.D	N.D.	N.D.				11,987						
CLEAN COAL QUALITY													
% ASH													
% V.C.M.													
% F.C.													
F.S.I.													
% S.													
% LAB YIELD													
CORRECTED TO 9.5 % ASH													
UNDILUTED PLANT YIELD													
DILUTED PLANT YIELD @ 16 % DIL.													

SEAM THICKNESS AND COAL QUALITY

SEAM "G" lower

SOURCE	DDH 27	DDH59A	RH150	RH1088	RH1089	RH 1090	RH 1091	RH 1092	RH 1093			WEIGHTED AVERAGE
DATE	1968	1969	1970	1977	1977	1977	1977	1977	1977			
COAL THICKNESS	7.0; 9.5	12'	5'	10.5'	10'	11'	12'	9.5'	8'			9.5'
RAW COAL QUALITY			NOT SAMPLED SINGLE WALL PIPE				SAMPLES CONTAMINATED AT LAB. RESULTS NOT USED.					
% ASH	12.4 20.6	20.9			17.9							
% V.C.M.	25.7 23.1	22.7			21.8							
% F.C.	60.9 55.2	55.9			59.8							
F.S.I.	8 4	7			6½							
% S.	0.68 0.77	0.67			0.58							
ACTUAL B.T.U.	ND ND	N.D.			12.331							
CLEAN COAL QUALITY												
% ASH												
% V.C.M.												
% F.C.												
F.S.I.												
% S.												
% LAB YIELD												
CORRECTED TO 9.5 % ASH												
UNDILUTED PLANT YIELD												
DILUTED PLANT YIELD @ 16 % DIL.												

SEAM THICKNESS AND COAL QUALITY

SEAM "F"

SOURCE	DDH 27	DDH 59A		RH 149	RH 150	RH 1086	RH 1093						WEIGHTED AVERAGE
DATE	1968	1969		1970	1970	1977	1977						
COAL THICKNESS	5'	8' ; 4'		12'	10' ; 6'	14'	7'						11.0'
RAW COAL QUALITY					NOT SAMPLED SINGLE WALL PIPE								
% ASH	11.5	16.7	36.0	22.9									
% V.C.M.	24.2	23.1	19.7	21.4									
% F.C.	63.1	59.6	44.3	55.4									
F.S.I.	9	5½	2	5½									
% S.	0.53	0.61	0.44	0.30									
(ACTUAL) B.T.U.	N.D.	N.D	N.D.	ND									
CLEAN COAL QUALITY													
% ASH				7.7									
% V.C.M.				23.6									
% F.C.				67.7									
F.S.I.				8									
% S.				0.68									
% LAB YIELD				65.8									
CORRECTED TO 9.5 % ASH				73.0									
UNDILUTED PLANT YIELD				68.0									
DILUTED PLANT YIELD @ 16 % DIL.				58.6									58.6

SEAM THICKNESS AND COAL QUALITY

SEAM "E"

SOURCE	DDH 27	DDH38	RH 147A	RH 148	RH 149	RH 175	RH 176	RH1086				WEIGHTED AVERAGE
DATE	1968	1968	1970	1970	1970	1970	1970	1977				
COAL THICKNESS	25'	27.5'	18.5	15.5	31'	15'	24'	31'				23.4'
RAW COAL QUALITY			NOT SAMPLED SINGLE WALL PIPE	NOT SAMPLED SINGLE WALL PIPE		*						
% ASH	11.9	14.6			32.0	45.3	27.9					
% V.C.M.	21.9	20.6			20.1	16.6	19.8					
% F.C.	65.3	64.2			47.7	37.8	52.1					
F.S.I.	5	2½			5	2½	2					
% S.	0.40	0.38			0.30	0.38	0.30					
ACTUAL B.T.U.	ND.	N.D.			ND	N.D.	N.D.					
CLEAN COAL QUALITY												
% ASH	7.0	6.8			11.8	16.6	12.9					
% V.C.M.	22.2	22.2			23.1	21.2	21.1					
% F.C.	70.2	70.6			64.6	61.2	65.3					
F.S.I.	2	1½			7½	8½	4½					
% S.	0.39	0.17			0.41	0.51	0.43					
% LAB YIELD	88.5	83.9			65.8	51.4	76.9					
CORRECTED TO 9.5 % ASH	98.5	94.7			56.6	23.0	63.3					
UNDILUTED PLANT YIELD	93.5	89.7			51.6	18.0	58.3					
DILUTED PLANT YIELD @ 16 % DIL.	80.6	77.2			44.5	15.5	50.3					62.6

* Quality and yield data extremely non-typical
Sample contamination suspected.: results not used.

SEAM THICKNESS AND COAL QUALITY

SEAM "D"

SOURCE	DDH 27	DDH "38	RH 148	RH 175	RH "176	RH 1086	ADIT "13					WEIGHTED AVERAGE
DATE	1968	1968	1970	1970	1970	1977	1969					
COAL THICKNESS	27.5	13.5	13.0	27'	26'	30'	30'					23.9
RAW COAL QUALITY			NOT SAMPLED SINGLE WALL PIPE									
% ASH	11.3	13.8		22.1	19.6		9.9					
% V.C.M.	20.8	22.2		19.6	19.9		21.0					
% F.C.	66.8	63.9		58.2	60.2		68.2					
F.S.I.	3½	7½		1	1½		3½					
% S.	0.29	0.38		0.41	0.30		0.47					
(ACTUAL) B.T.U.	N.D	N.D		N.D.	N.D.		N.D.					
CLEAN COAL QUALITY												
% ASH	6.8	4.7		10.7	9.7							
% V.C.M.	20.8	24.3		19.8	20.2							
% F.C.	71.4	70.5		68.8	69.4							
F.S.I.	3½	9		2	2½							
% S.	0.33	0.27		0.53	0.43							
% LAB YIELD	88.0	82.4		79.8	83.3							
CORRECTED TO 9.5 % ASH	98.8	100.0		75.0	82.5							
UNDILUTED PLANT YIELD	93.8	95.0		70.0	77.5							
DILUTED PLANT YIELD @ 16 % DIL.	80.9	81.9		60.3	66.8							71.2

SEAM THICKNESS AND COAL QUALITY

SEAM "D" lower

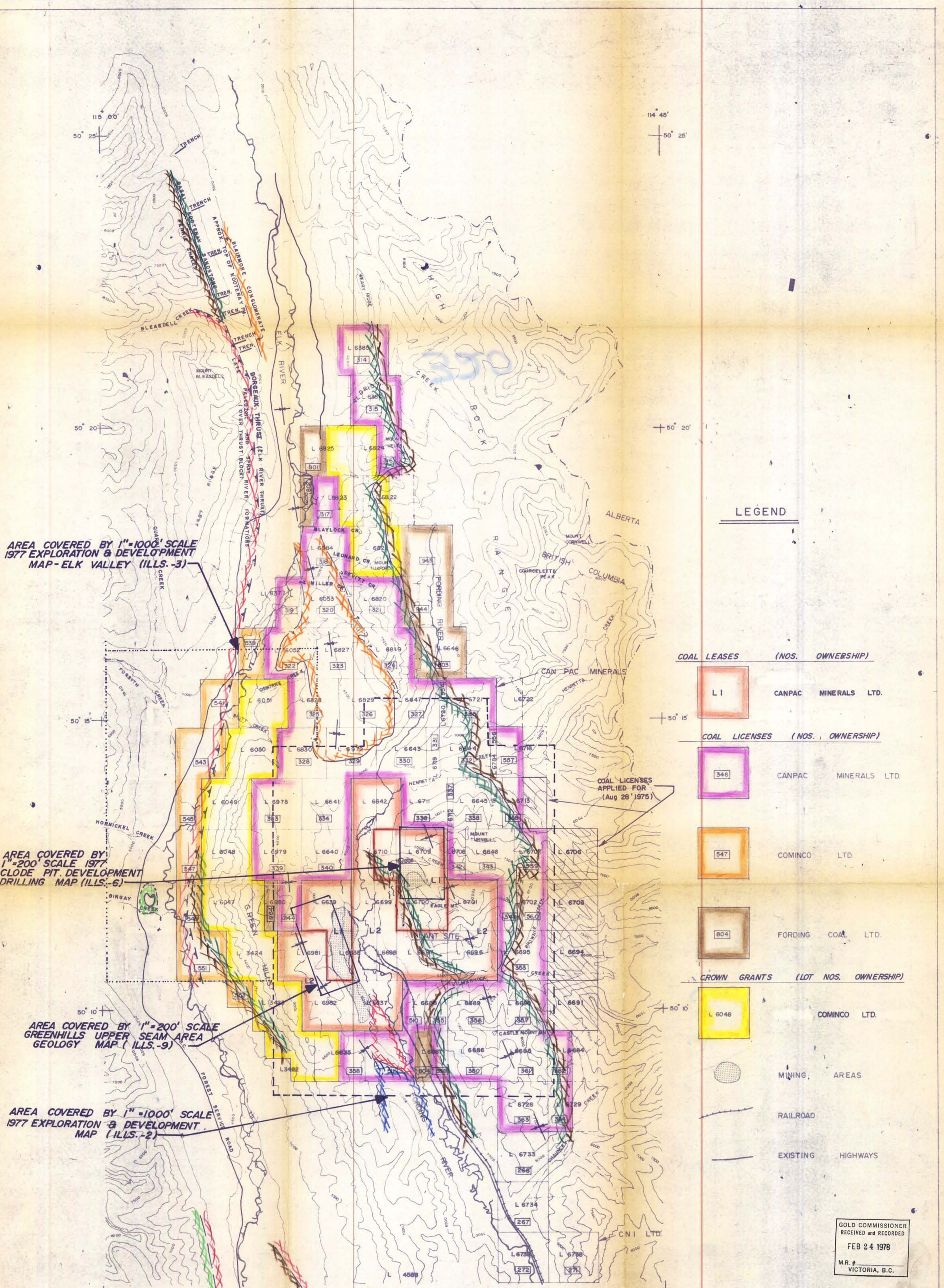
SOURCE	DDH 27	RH 148	RH 172	RH 175	RH 176							WEIGHTED AVERAGE
DATE	1968	1970	1970	1970	1970							
COAL THICKNESS	2.5'	6.5'	8.5'	7'	6'							6.1'
RAW COAL QUALITY	NOT RUN	NOT SAMPLED — SINGLE WALL PIPE	*									
% ASH			54.6	25.4	20.5							23.1
% V.C.M.			15.4	18.5	19.5							19.0
% F.C.			29.9	55.7	60.2							57.8
F.S.I.			1	1½	1½							1½
% S.			0.69	0.47	0.30							0.39
(ACTUAL) B.T.U.			N.D	ND	ND							—
CLEAN COAL QUALITY												
% ASH			10.8	14.5	13.6							14.1
% V.C.M.			21.6	19.4	19.6							19.5
% F.C.			67.2	65.3	66.2							65.7
F.S.I.			8	3	3							3
% S.			0.50	0.53	0.57							0.55
% LAB YIELD			45.2	77.2	82.6							
CORRECTED TO 9.5 % ASH			40.0	57.2	66.2							
UNDILUTED PLANT YIELD			35.0	55.2	61.2							
DILUTED PLANT YIELD @ 16 % DIL.			30.2	47.6	52.8							50.0

* Quality and yield data extremely non-typical
Sample contamination suspected: results not used.

SEAM THICKNESS AND COAL QUALITY

SEAM "B"

SOURCE	DOH 47A	RH 147A										WEIGHTED AVERAGE
DATE	1969	1970										
COAL THICKNESS	30'	17.5'										23.8
RAW COAL QUALITY	Assays not found	NOT SAMPLED SINGLE WALL PIPE										
% ASH												-
% V.C.M.												-
% F.C.												-
F.S.I.												-
% S.												-
(ACTUAL) B.T.U.												
CLEAN COAL QUALITY												
% ASH												
% V.C.M.												
% F.C.												
F.S.I.												
% S.												
% LAB YIELD												
CORRECTED TO 9.5 % ASH												
UNDILUTED PLANT YIELD												
DILUTED PLANT YIELD @ 16 % DIL.												-



330

320

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M.R. #
VICTORIA, B.C.

K-FORDING RIVER 77(2)A.

INDEX MAP

ILLUSTRATION - 1

FORDING RIVER OPERATIONS

RK RK JULY '77

GENERAL GEOLOGY & COAL PROPERTIES

FORDING COAL LIMITED

1 : 50,000 DATE OCT. 7 '1975

LEGEND

- Adits
- Drill Holes
- Railway
- Main & Haul Roads
- Cleared Mining & Plant Areas
- Fording Property Boundary (coal licence)
- Coal Seams
- Synclinal Axis
- Faults – defined, assumed
- Strike & Dip of Bedding
- 1977 - DRILL ACCESS ROAD
- 1977 - ROTARY DRILL HOLE
- 1977 - DIAMOND DRILL HOLE
- 1977 - ADIT, TRENCH etc. TRENCHING

GEOLOGY – ROCK TYPES

- Sandstone – Current bedded, Moose mtn. Basal kootenay
- Shale & Mudstone – Fernie formation
- Limestone – Rundle formation
- Blairmore – Conglomerate

N

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K – FORDING RIVER 77(2)A.

FORDING COAL LTD.
FORDING OPERATIONS

ILLUSTR. – 2

1977 EXPLORATION & DEVELOPMENT
GENERAL GEOLOGY MAP

320

By – RBA	Scale – 1" = 1000'	Date – DEC. 1975	Plate –
RK		DEC. 1977	

Job No. J.
Drawing No.
Revision

Topographic compilation by
Photography flown May 1970
McELHANNEY SURVEYING & ENGINEERING LTD.
Job No. 05533-1

Issued to

Reference

No.	Made by	Date	Description

Revisions

Drawn by K.K.
Checked by
Design Eng.
Proj. Eng.
Approved
NOV 8 '74

Dominion Engineering

GENERAL GEOLOGY & COAL PROPERTIES
ELK VALLEY

KEY MAP

Scale 1" to 1000'
Drawing No. 5
Revision

210-0650

L 6052 CL 322
L 6828 CL 325
L 6830 CL 328
L 6641 CL 334
L 6640 CL 340
L 6639 CL 345
L 6981 CL 349
L 6978 CL 333
L 6979 CL 339
L 6980 E 1/2 CL 344
L 6980 W 1/2 CL 964
L 6051
L 6050
L 6049
L 6048
L 6047
L 3424
CL 540
CL 541
CL 542
CL 543
CL 544
CL 545
CL 546
CL 547
CL 548
CL 549
CL 550
CL 551
CL 552

649,150E 554,450N
647,500E 554,500N
645,550E 550,350N
644,150E 550,350N

CROSSING CREEK
WHITE CREEK
QUARRIE CREEK
FORSYTH CREEK
HORNICKER CREEK
BIRKAY CREEK
ELK RIVER
KAN-ELK POWER LINE
POWER LINE ROAD
FOREST SERVICE ROAD
B.C.

OEV1 OEV2 OEV3 OEV4 OEV5 OEV6 OEV7/EV8

FROM 100' SCALE PLAN IN #5398 ADITS NOT SEEN IN 1967
FROM PLAN 1909-YR. ADIT SEEN 1967
GEOL FROM PLAN 1909-YR. ADIT SEEN 1967

SECTION-6 SECTION-5 SECTION-4 SECTION-3

2' Seam
Two or more 2' Seams
3 Thin Seams
2 Thin Seams
3'4" Seams
4'8.5' Seams
2.5'4.5' Seams
20' Seam
8' Seam
9.5'8.5' Seams
Coal
TRENCH

LEGEND

- BLAIRMORE CONGLOMERATE
- UPPER KOOTENAY FM. - Rhythmic sequence of ± 15' layers of s.s., silt, sh. a few coal seams < 2'.
- LOWER KOOTENAY FM. - Interbedded 10-150' sequences, each consisting predominantly of either s.s., or silt. & sh. Up to 6 coal seams > 3'.
  (After MR Wolford Aug. 1967 (Plate ER-4))
- FERNIE FM.
- SPRAY RIVER FM.
- ROCKY MOUNTAIN GROUP

- CLIFF MARKER s.s.
- COAL SEAM defined, assumed
- GEOLOGICAL CONTACT definite, approximate
- FAULT - high angle reverse
- ? THRUST FAULT - assumed surface trace
- ADIT
- 1974 DRILLING - rotary drill hole

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OGE

EV7/EV8 1977 ROTARY DRILL HOLES

K-FORDING RIVER 77(4)A.

FORDING COAL LTD
FORDING OPERATIONS

ILLUSTR.- 3

1977 EXPLORATION & DEVELOPMENT
GENERAL GEOLOGY MAP
ELK VALLEY

By RK | Scale 1"= 1000' | Date DEC '77

80000 81000 82000 83000

7700 7500 7300 7100 6900 6700 6500 6300 6100

DDH449 30°S
3.5'
5'
7.5(6)'
4 42(5)'
20(17)'
12 15'
11 9.5'
18(16)'
Pt.9 5'+

14-HW
DDH 481 48°S
13-HW7121
ADIT-17 (38'-140'S)
12-HW7050
ADIT-18 (82'-200'S)
11-HW6930
9-HW
7-HW6671
5-HW
4-HW
2-HW

RH 467 42°S
30(28)'
3.5'
29.5(27.5)'

'MY' 5'
6'
7 22(20)'
3.5'
5 22'
4 29'
4
(48'S)

RH 464 54°S
3'
5'
3'
2'
2'
18.5'
12 17'
11 10'

15-HW
RH 416 48°N
5'
2'
3.5'
U-14
5'
4 26'
7'
3'
13 20'
12 17'

JAN '77
FEB '77

492000

5400 5500 5600 5700 5800 6000 6200 6400 6600 6800 7000 7200 7400 7600 7800 8000 8200

7100 7200 7300

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K-FORDING RIVER 77 (2)A.

Revisions				Revisions				Revisions			
No.	Made by	Date	Description	No.	Made by	Date	Description	No.	Made by	Date	Description

Drawn by RBd 20/4/72

Fording Operations

Comaco

GEOLOGY 492000 N

WEST FACE EAGLE MT.

Scale 1 Inch = 100 Feet

Drawing No. ILLUSTR.-4

492 000

492 000 N

491 900

491 900 N

491 800

81 100 E

81 200 E

81 300 E

81 400 E

ADIT - 18 SEAM - 12

8.4 % Ash, ,7 1/2 FSI

9.8 % Ash, ,6 1/2 FSI

8% Ash, ,7 1/2 FSI, 0.72 S

ADIT - 17 SEAM - 13

25.0 , 0

41.4, 1/2

26.0 , 4

13.0, 8

27.3, 5 1/2

104, 8

13.7, 7 1/2

12.7 , 7 1/2

13.0 , 7 1/2

16.7, 8, 0.50 S

% Ash

FSI

N

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VICTORIA, B.C.

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K-FORDING RIVER 77 (2) A.

ILLUSTR. - 5

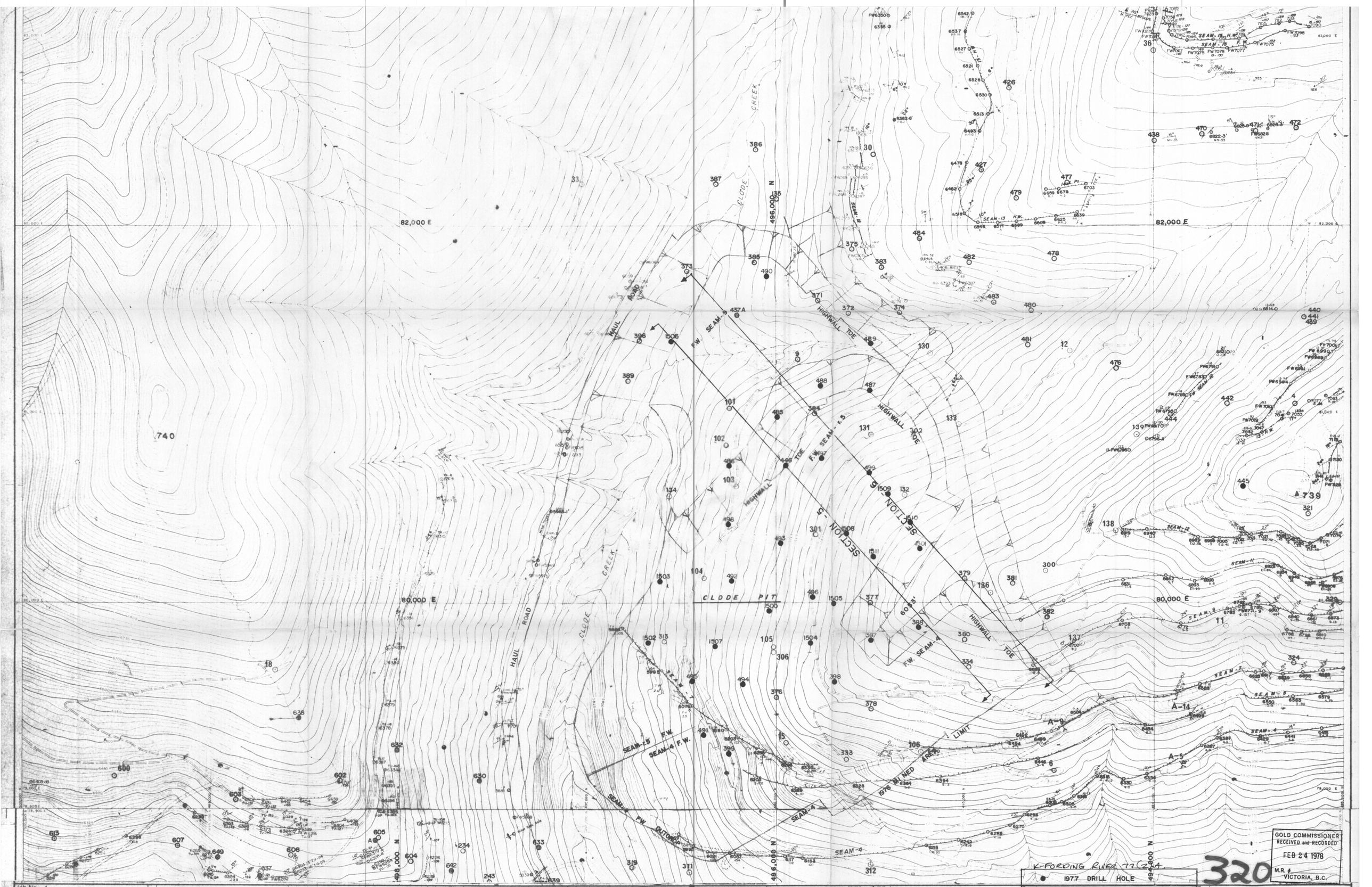
Cominco

Drawn by:	Traced by:
Revised by / Date	Revised by / Date

TEST ADITS IN EAGLE MT.

ADIT # 17 & 18

Scale: 1" = 20' Date: SEPT. 30/77 Plate:



Job No. J.	Topographic compilation by Lockwood Survey Corporation from aerial photography flown in 1968. Fair drawings by: McELHANNEY SURVEYING & ENGINEERING LTD. Job No. 05390-3	LEGEND	Seam 'B'	Seam 4	Issued to	Drawn by RK	DEC '77	Engineering	1977 CLODE PIT DEVELOPMENT DRILLING	Scale 1 Inch = 200 Feet
Drawing No.			Seam 'D'	Seam 5		Checked by			CLODE PIT AREA	Drawing No. ILLUSTR.-6
Revision			Seam 'E'	Seam 7		Design Eng.				Revision 3
						Proj. Eng.	Approved			

Revisions			
No.	Made by	Date	Description

K-FORDING RIVER 77 (2) A

GOLD COMMISSIONER RECEIVED and RECORDED FEB 24 1978 M.R. # VICTORIA, B.C.

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GEOLOGY - DRILL HOLES, SEAM Otc.

SEC-5

SEC-6

REF. LINE

MAJOR THRUST

320

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K-FORDING OVER 77(2)A.

ALL HOLES PROJ. ALONG STRIKE

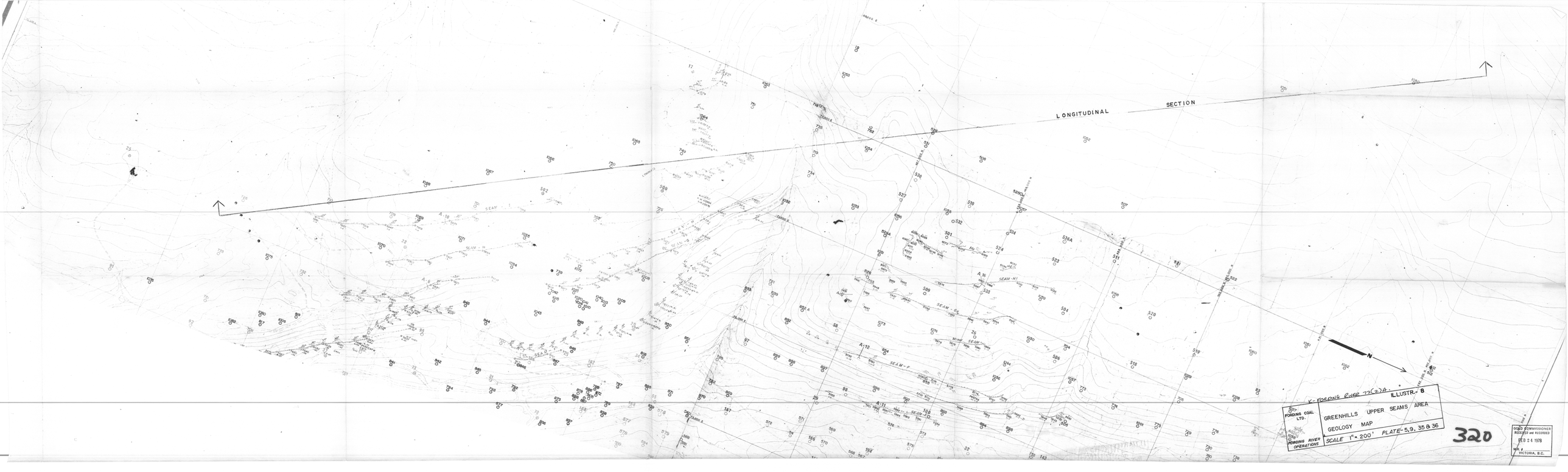
ILLUSTR. - 7

Drawn by: RK | Traced by:

CLODE PIT SECTIONS
LOOKING N. W.

Scale: 1" = 100' | Date: JUL '77 | Plate:

FORM 210-0850


LONGITUDINAL SECTION
N
K-FORDING EXEC 77(2)A.
ILLUSTR.- 8
FORDING COAL LTD.
FORDING RIVER OPERATIONS
GREENHILLS UPPER SEAMS AREA
GEOLOGY MAP
SCALE 1" = 200' PLATE- 5,9, 35 & 36
320
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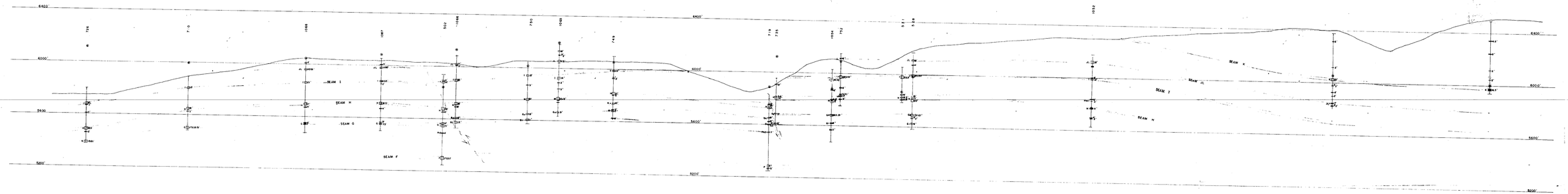

K- FORDING RIVER 77 (2) A.

ILLUSTR. - 9

FORDING COAL LTD. — FORDING RIVER OPERATIONS	LONGITUDINAL SECTION GREENHILLS UPPER SEAMS AREA	Scale 1" = 200' RR JAN '78

320

SECTION 480,500 N

SECTION 482,000 N

ERICKSON FAULT

INFERRED LOCN.

K-FORDING RIVER 77 (2) A

1977 EXPLORATION -- DRILL HOLE

1977 EXPLORATION

GREENHILLS S.- BURNT RIDGE EXT. AREA

SCALE 1" = 200'

JUL 1977 R K

FORDING COAL LTD.

ILLUSTR. - 10

320

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K-FORDING RIVER 72(2)A.

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Revisions	No.	Made by	Date	Description

Revisions	No.	Made by	Date	Description

Revisions	No.	Made by	Date	Description

Drawn by RK

Fording Operations

Cominco

GEOLOGICAL SECTIONS
GREENHILLS 482,000 N

Scale 1 Inch = 100 Feet
Drawing No.
ILLUSTR. -12

73,000 E

74,000 E

75,000 E

6000

5800

5600

5400

5200

5000

4800

DDH 25
127' S

DDH 91
112' N

RH 827
0' N

RH 180
16' N

RH 777
30' N

RH 714
21' N

RH 179
5' S

480,500 N

INFERRED LOCNS. ONLY
FOR SEAM I, H & G

I 12.5 (11.5)'

H 9'
10'

G 25(21)'
25'

5' 5' 5' 3.5' 7' 7' 5' 8'

F 13'
16'
1'

Eu 16.5'
El 15'
D 17'

5.5'
29'
4'

El 44'
D 10.5'

FAULT
ERICKSON

5900 5800 5700 5600 5500

DDH 25
DDH 91
RH 180
RH 714
RH 179

480,500 N

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Revisions			
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Drawn by R K

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Cominco

GEOLOGICAL SECTIONS
GREENHILLS 480,500 N

Scale 1 Inch = 100 Feet
Drawing No. ILLUSTR.-11

12 30

SEC M

SEC X

SEC Y

SEC Z

SEAM-9

SEAM-7

SEAM-5

SEAM-4

S-7

S-5

2000 656' 7.5

2001 658' 7.4

2002 520' 11-1

2003 535' 13-11

2004 470' 7-1

2005 662' 9-4

2006 426' 7

2007 409' 7.5

2008 7-1

2009 825' 9-1

2012 667' 7-1

2014 830' 9.7

2015 642' 7-1

2016 452'

2017 409' 7.5

401 11-5

402 7

400 7.4

LEGEND

- 1977 DRILL HOLE
- EXISTING ROAD
- THRUST FAULT (Teeth indicate upthrust side)
- NORMAL FAULT (Solid circle indicates downthrow side)
- TRANSVERS FAULT (Arrows indicate relative movement)
- SYNCLINE (PLUNGE)
- ANTICLINE, OVERTURN (PLUNGE)

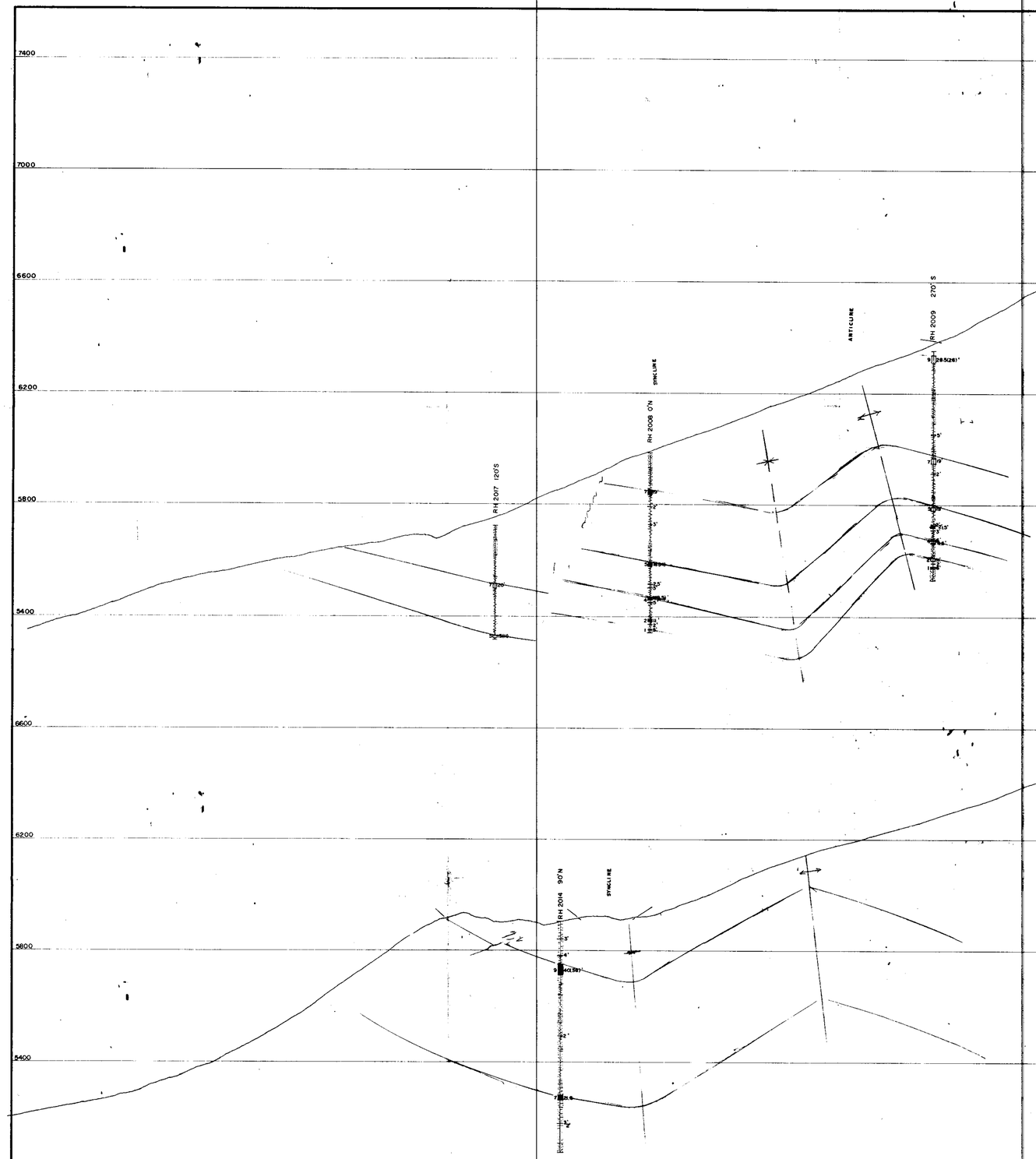
320 K- FORDING RIVER 77(2) A

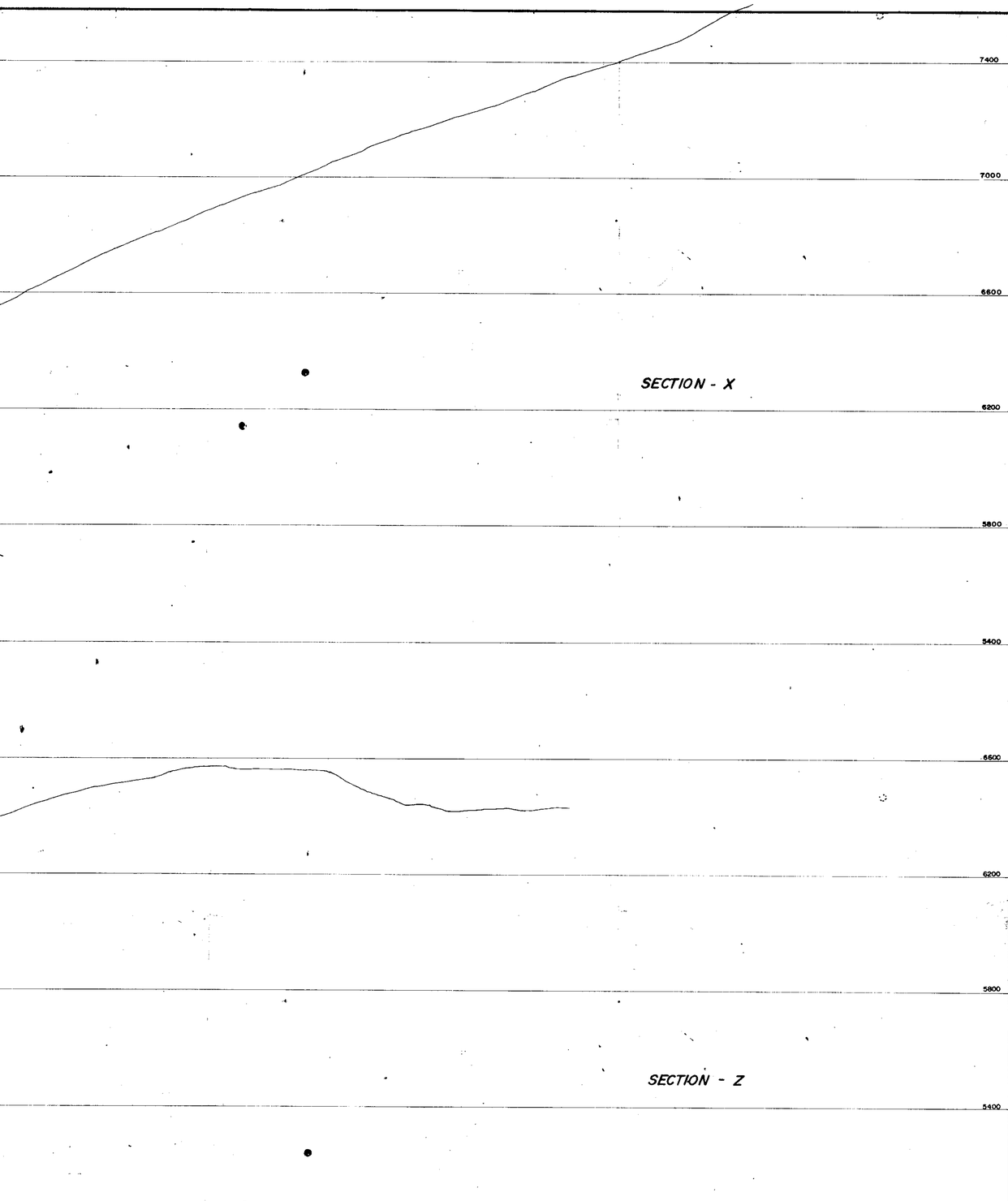
FORDING OPERATIONS	DRILL HOLES & DRILL ACCESS ROADS	SCALE 1" = 200'
COMINCO	1977 EXPLORATION & DEVELOPMENT	PLATE - 11, 12, 30 & 31
	CASTLE MT.	

FIGURE 1

P/C

11 31





Revisions			
No.	Made by	Date	Description

Revisions			
No.	Made by	Date	Description

Revisions			
No.	Made by	Date	Description

Drawn by RK JAN '78

Fording Operations

3220

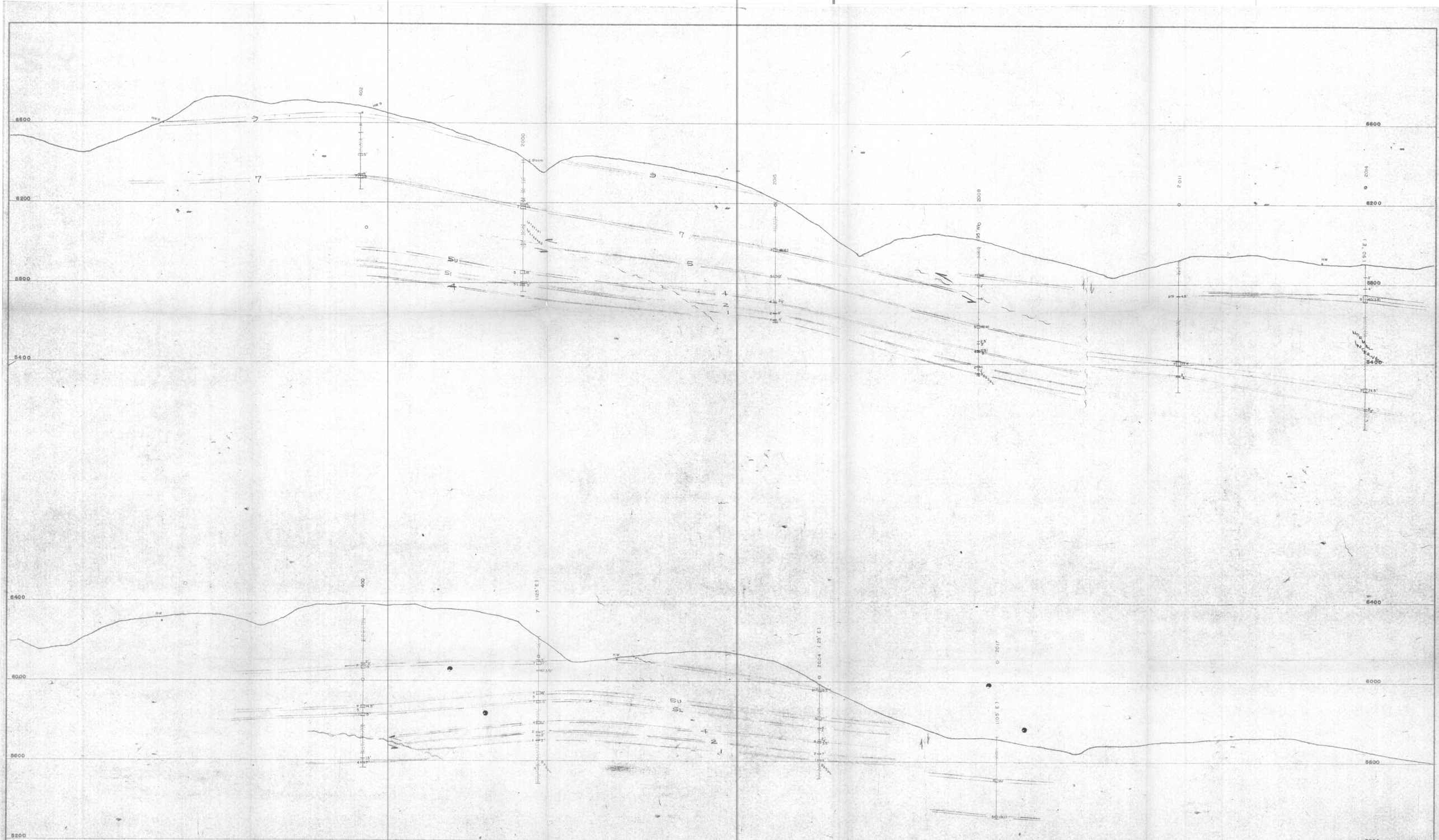
K-FORDING RIVER 77(2)A.

GEOLOGICAL SECTIONS

CASTLE MT.

Scale 1 Inch = 200 Feet

Drawing No. — FIGURE 9



Revisions				Drawn by	RK	JAN '78	Fording Operations	Dominco	GEOLOGICAL LONGITUDINAL SECTIONS CASTLE MT.	KEY MAP	Scale 1 Inch = 200 Feet
No.	Made by	Date	Description								Drawing No.

320

P/C

K-FORDING RIVER 77(2)A

K-FOSONG River 72 (3) r.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

LSD SEC TWP RGE W M — FILE NO.

COMPANY: PEGUIS OIL LIMITED

WELL: BR - DY 7

LOCATION: BEE VALLEY

FIELD: PEGUIS

PROVINCE: MANITOBA

Permanent Datum: GROUND LEVEL — Elev. K.B. D.F. G.L.

Log Measured From: KB — 7 Ft. Above Perm. Datum

Drilling Measured From: GROUND LEVEL

Other Services

Rec. No. ONE
Date 13 JULY 1977
Time Reached 511
Last Reading 0
Driller Logged 511
Logger Logged 511
Depth Driller 511
Depth Logger 510
Casing Size 4 1/2
Casing Type & Wgt.
Casing Depth 320
Fluid Type AIR/WATER
Liquid Level 65
Max. Temp.
Min. Diam.
Rm. @ °F
Operating Time
Truck No. 37
Recorded By JOHNSON
Witnessed By MORGAN

320

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	188
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-001	STRENGTH	~ 3 CURIES

LOGGING DATA

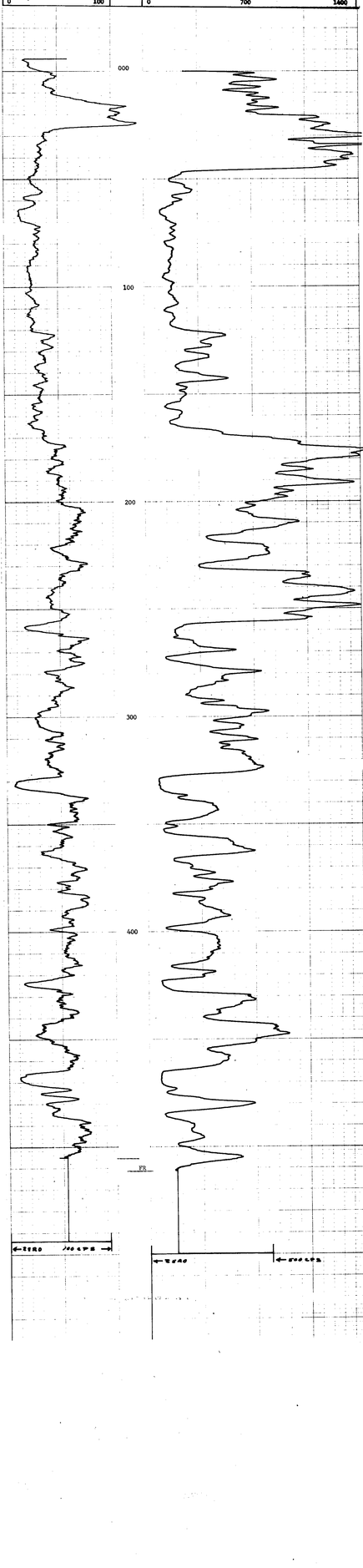
GENERAL				GAMMA RAY					NEUTRON			
RUN NO.	DEPTHS FROM	TO	SPEED FT./MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	511	12	5	100	01	10	3	500	01	70

REMARKS: LOGGED THROUGH DOUBLE WALL DRILL STEM

GAMMA RAY — DEPTHS — NEUTRON

GAMMA RAY INCREASES → API 10 — 0 — 100

NEUTRON INCREASES → API 70 — 700 — 1400



ROKE

GAMMA RAY NEUTRON LOG

OIL ENTRIPRISES LTD. CALGARY, ALBERTA

COMPANY: FORDING COAL LIMITED

WELL: EV - 8

LOCATION: ELK VALLEY

FIELD: FORDING

PROVINCE: BRITISH COLUMBIA

Other Services: NONE

Permanent Datum: GROUND LEVEL Elev.
Log Measured from: GROUND LEVEL Ft. Above Perm. Datum
Drill Measured from: GROUND LEVEL

K.B.
D.F.
G.L.

LSD
SEC
TWP
RGE
M
M

FILE NO.

K-FORDING RIVER 77 (3) 4

320

Run No.	ONE	
Date	20 SEPT 1977	
First Reading	510	
Last Reading	0	
Bottom Logged	510	
Depth Reached	512	
Depth Driller	512	
Casing Size		
Casing Driller	48	
Fluid Type	WATER	
Fluid Level	FULL	
Max. Recorded Temp.		
Rm @ °F		
Rmf @ °F		
Rmc @ °F		
Source: Rmf / Rm		
Rm @ BHT		
Time Since Circ.		
Max. Rec. Temp.		
Equip. Location		
Recorded By	JOHNSON	
Witnessed By	MACQUARRIE	

Operating Time
Truck No.
34 HOURS
37

EQUIPMENT DATA

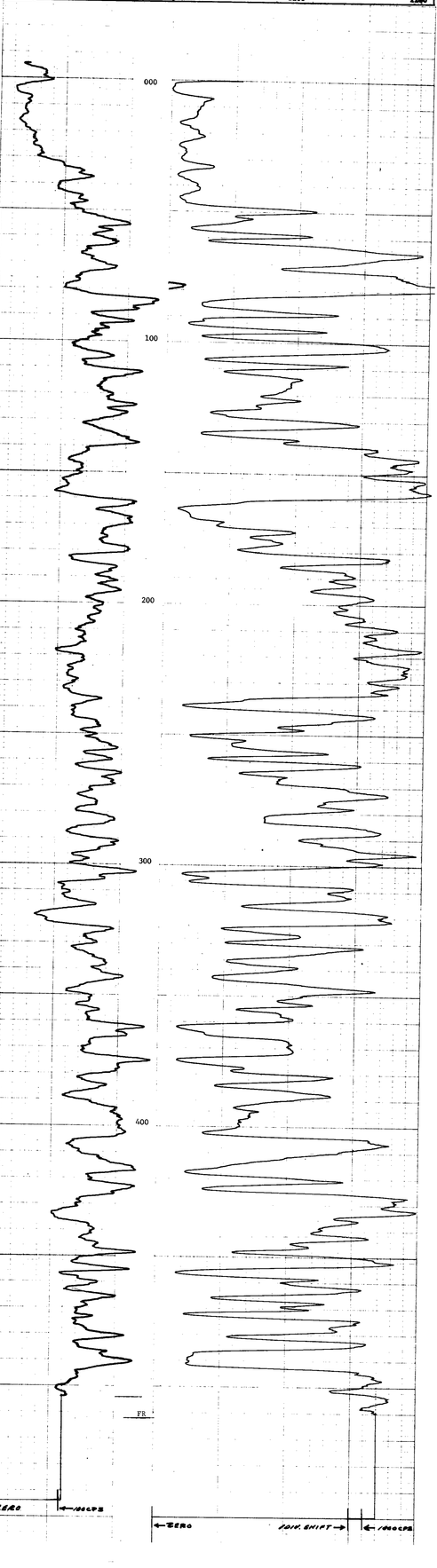
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 . INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 . FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	188
INSTRUMENT TRUCK NO.	37	SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-001	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	510	12	5	100	07.	16	3	500	11.	100

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 16		API 100 1100
0 160		100 2100



Widco WELL LOG

TURNBULL

RH 266

320

COORDINATES
N
S
ELEVATION
D F
K B
G L

RH 266
TURNBULL

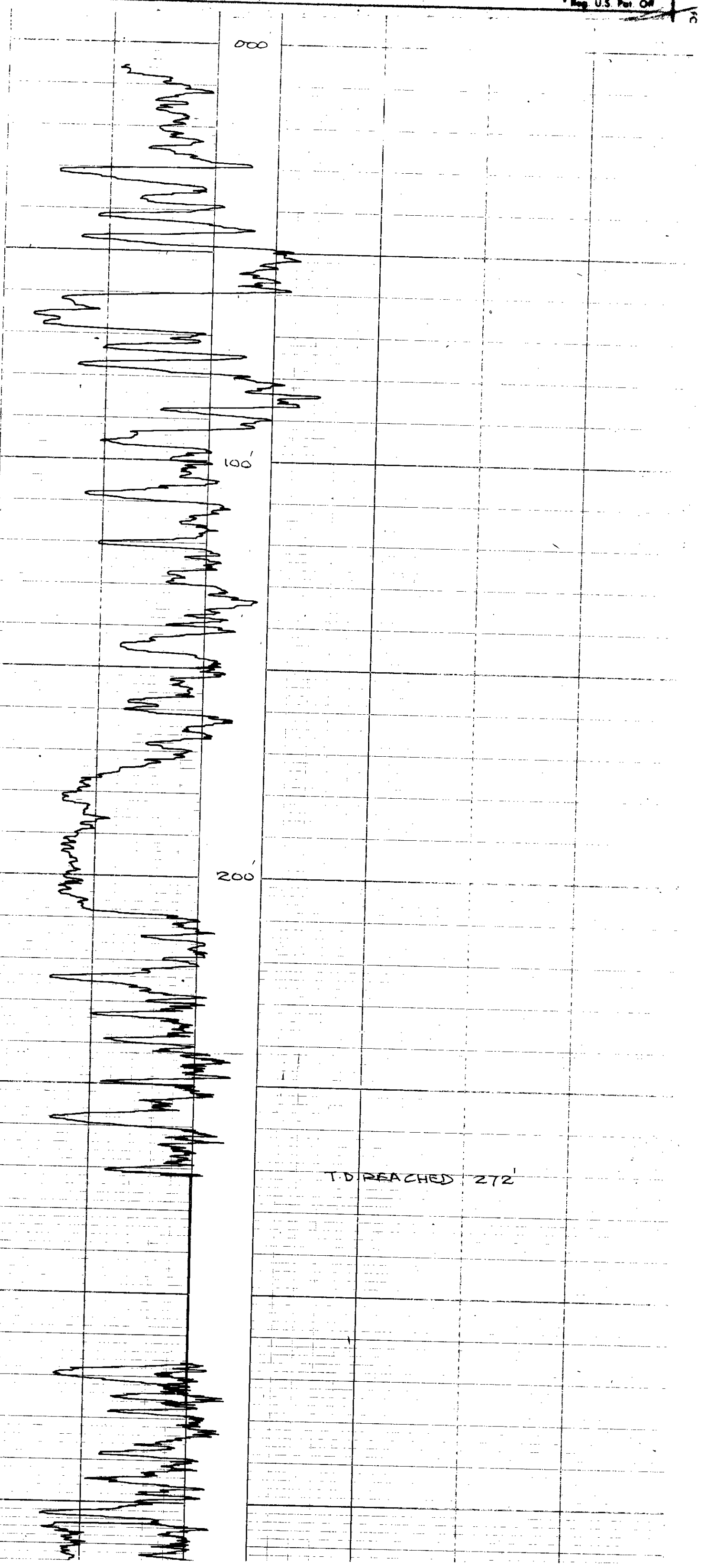
	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom Driller		
Casing Fram Log		
Casing Driller		
Casing Size		
Bit Size		
Bit Size		
Mud Type		
Density		
Viscosity	@ F	@ F
Resistivity	@ F	@ F
Res. @ BHT	@ F	@ F
pH		
Fluid Loss		
BH Temp		
Logged by	R.K.	
Witnessed by		

REMARKS

B 50 HOLE

13 A.P.I. OCT. 18'77.

* Reg. U.S. Pat. Off.



Widco® WELL LOG

RH 268
TURNBULL

COMPANY

AREA TURNBULL

WELL RH 268

COUNTY STATE

320

CO-ORDINATES
N
S
ELEVATION
D F
K B
G L

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp		
Casing Size			B H Temp		
Bit Size					
Bit Size					
			Logged by	RK.	
			Witnessed by		

REMARKS. B-50 HOLE

12 A.P.I. OCT. 22'77.

* Reg. U.S. Pat. Off

000

100'

200'

SEAM. R7

SEAM PART. R-5

T.D. REACHED 282'
DRILLED -285'

K-FORDING RIVER 7½ (2) A.

TURNBULL
RH 269

320

TURNBULL
RH 269

RK

B 50 DRILL
12 A.P.I.
NOV. 15 '77

Reg U.S. Pat. Off.

100'

190'

200'

245'

T.D. REACHED 274'
DRILLED – 285' (IN COAL)

Widco® WELL LOG

COMPANY

AREA TURNBULL

WELL RH 270

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
DF
KB
GL

UNIT RH 270 TURNBULL

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ Temp		
Casing Size			BH Temp		
Bit Size					
Bit Size					
			Logged by	RK.	
			Witnessed by		

REMARKS B 50 HOLE

11 API NOV. 10'77

000'

100'

200'

T.D. REACHED 267'

T.D. DRILLED 274'.

K-FORDING RIVER T(3)A.

Widco* WELL LOG

COMPANY

WELL RH 271

LOCATION TURNBULL

COMPANY

AREA TURNBULL

WELL RH 271

COUNTY STATE 320

COORDINATES

N

S

ELEVATION

D F

K B

G L

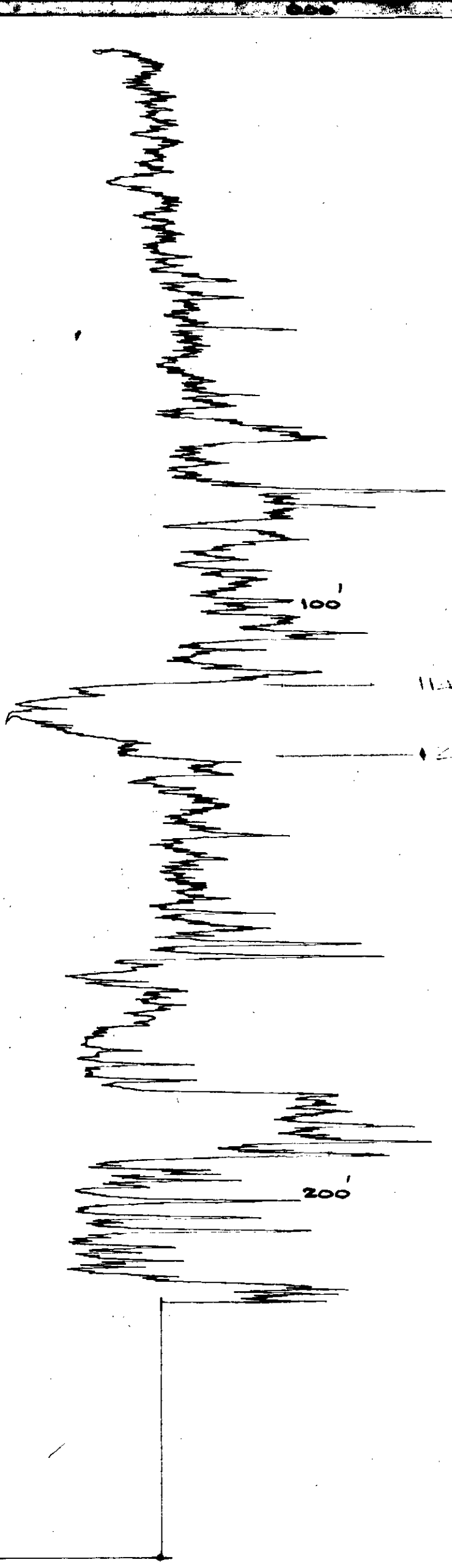
	Run No 1	Run No 2	MUD	Run No 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ °F
Footage Logged			Resistivity	@ F	@ °F
Bottom (Driller)			Res @ BHT	@ F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ Temp		
Casing Size			B H Temp		
Bit Size					
Bit Size					
			Logged by	RGA.	
			Witnessed by		

REMARKS 14 A.P.I.

B 50 HOLE.

DEC 6 '77

* Reg. U.S. Pat. Off.



Pt. RA

T.D. REACHED - 219'

DRILLED - 224'

Widco WELL LOG

RH 272 TURNBULL

COMPANY

AREA TURNBULL

WELL RH 272

COUNTY STATE 320

COORDINATES
N
S
ELEVATION
D F
K B
G L

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Nature		
Density		
Viscosity	@ F	@ F
Resistivity	@ F	@ F
Res @ BHT	@ F	@ F
pH		
Circ Temp		
BH Temp		
Logged by	RK	
Witnessed by		

REMARKS JAN. 16'78

1 B 50 HOLE 13 A.P.I.

® Reg. U.S. Pat. Off.

000'

SB

M (SLT BANDS)

47.5 4.5'
52'

M

SLT

SLT

M

100'

SLT

M

128.5 9.5' SF AM-7
138'
142 1.5'
144 2'

M

SLT

M
200

2 5.5'

M

T.D. 245'

250'

2+2+

NMOG

K-FORDING RIVER 77 (2) A.

TURNBULL
RH 273

320

RH 273
TURNBULL

Logged by
Witnessed by RK.

REMARKS B-50 HOLE
11 A.P.I. DEC 21'77

000

Widco* WELL LOG

COMPANY

AREA TURNBULL

WELL RH 274

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D F
K B
G L

COMPANY
WELL RH 274
LOCATION TURNBULL

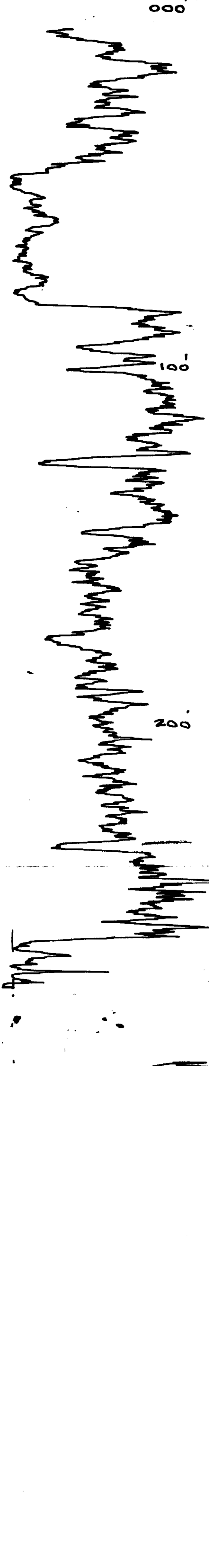
	Run No.	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ °F
Footage Logged			Resistivity	@ F	@ °F
Bottom (Driller)			Res. @ BHT	@ F	@ °F
Casing Depth (Log)			pH		
Casing (Driller)			Cake Temp.		
Casing Size			BH Temp.		
Bit Size					
Hole Size					
			Logged by	RK	
			Witnessed by		

REMARKS 14 API

B 50 HOLE

DEC 16'77

* Reg. U.S. Pat. Off.



ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

K-FERGUS (WEST) 72(8)-4

FILE NO.

COMPANY FORDING COAL LIMITED

WELL NE - 368

LOCATION CLOSE TO 320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: GROUND LEVEL Ft. Above Perm. Datum

D.F.

C.S.G.

G.L.

Other Services:

NONE

LSD SEC TWP RGE W M

Def. No.

Rec. No. 6006

First Reading 12 MAY 1977

Last Reading 447

Footage Logged 0

Depth Reached 447

Depth Driller 448

Depth Logger 450

Casing Driller

Casing Logger 12

Fluid Type AIR/WATER

Liquid Level 16

Max. Diam. 5 1/8

Rm @ °F

Operating Time 1 HOUR

Truck No. 37

Recorded By WINSOR

Witnessed By AITKEN

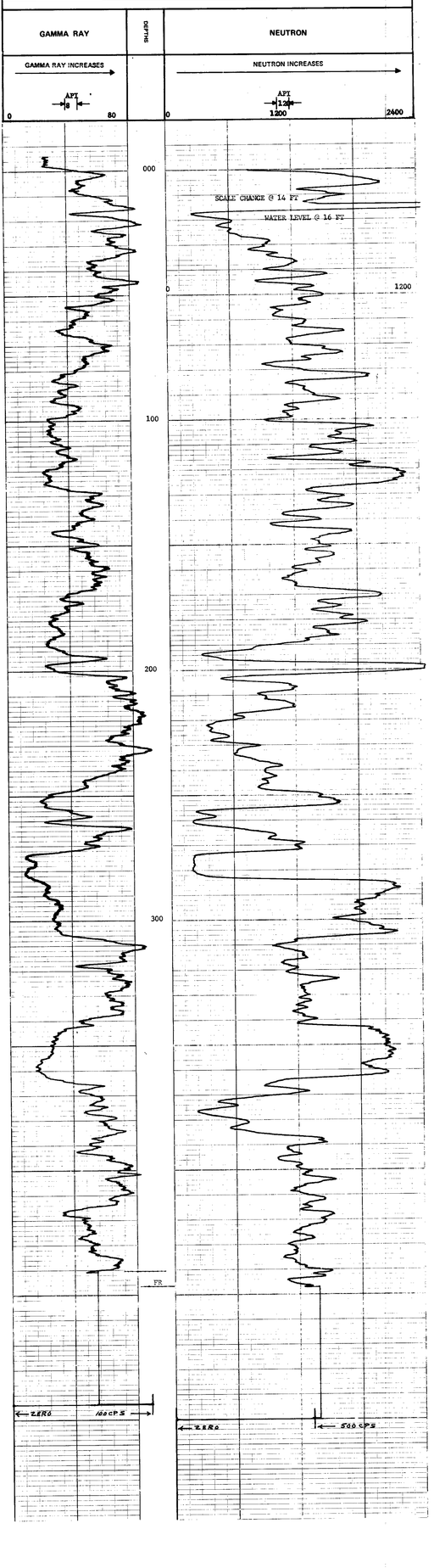
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.2 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	5 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	14	12	5	100	OL	8	3	1000	OL	120
	14	447	12	5	100	OL	8	3	500	OL	60

REMARKS



K-FORONG GAS CO. 77(3)4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL EH - 397

LOCATION CEDRE PIT 320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum: GROUND LEVEL — Elev. 0

Log Measured From: GROUND LEVEL — Ft. Above Perm. Datum

Drilling Measured From: GROUND LEVEL — G.L.

LSD SEC TWP RGE W M

Run. No.	ONE
Date	10 MAY 1977
First Reading	399
Last Reading	0
Footage Logged	399
Depth Reached	400
Depth Driller	403
Casing Rdrs	
Casing Driller	
Casing Logger	
Bit Size	4 3/4
Type Fluid in Hole	
Rm @ °F	
Recorded By	JOHNSON
Witnessed By	BAILEY
Operating Time	1 HOUR
Truck No.	37
Loggers T.D.	399
Max. Rec. Temp.	32F/MASTER
Equip. Location	25
Min. Diam.	5 1/8

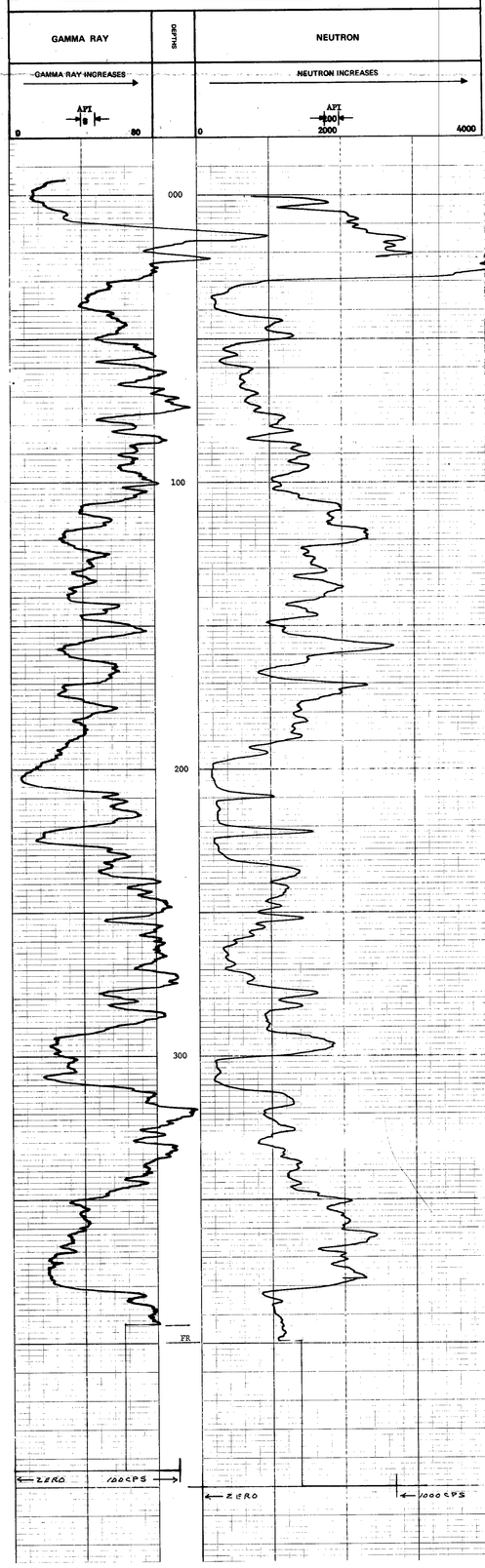
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	22	12	5	100	OL	8	3	1000	OL	200
	22	399	12	5	100	OL	8	3	500	OL	100

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO. 320

COMPANY FORDING COAL LIMITED

WELL EH - 398

LOCATION CLOSE PIT

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Run. No.	ONE
Date	15 MAY 1977
First. Reading	302
Last. Reading	0
Footage Logged	302
Depth Reached	303
Depth Driller	
Casing Rdrs	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	33 '
Min. Diam.	5 1/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By SHAW

K-FORDING RIVER 72(3)4.

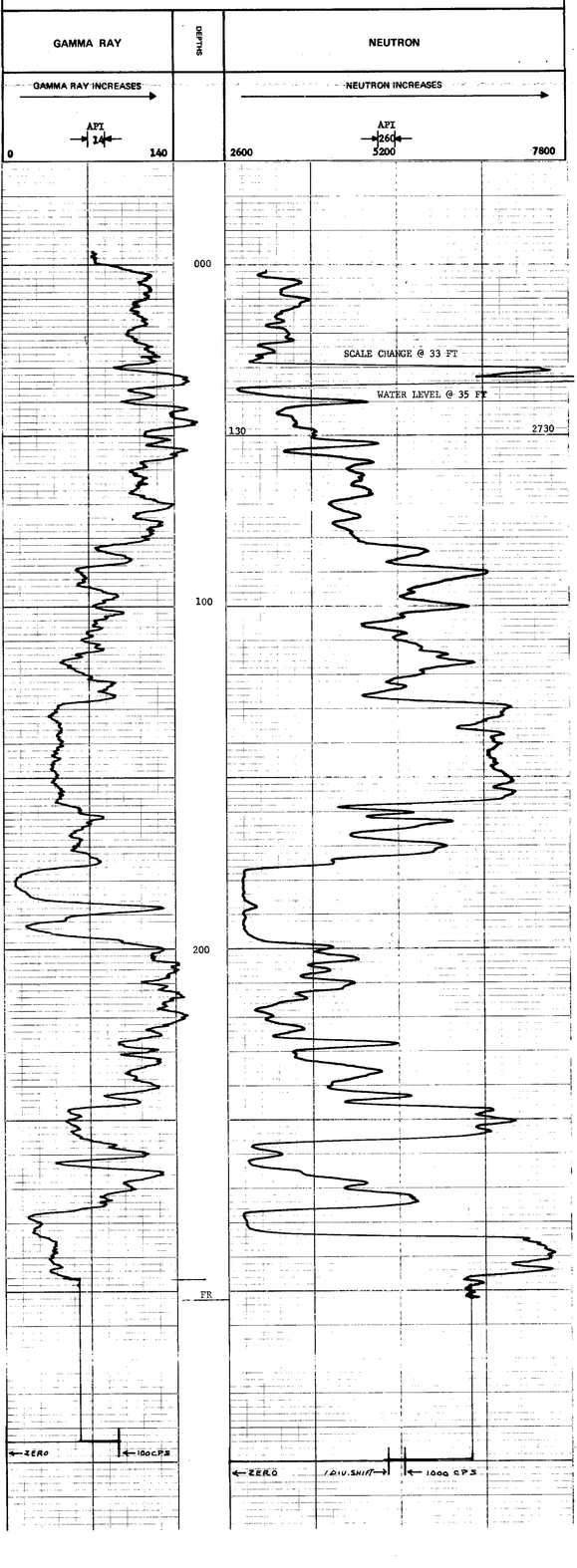
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN - 169-002	STRENGTH	3 CURIES.

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV
1	0	33	12	5	100	0L	14	3	1000	10L	260
	33	302	12	5	100	0L	14	3	500	1 L	130

REMARKS



K-FOSONG ENES 77(S) 4.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO. 320

COMPANY FORDING COAL LIMITED

WELL RE - 399

LOCATION CLOSE PIT

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Run No.	ONE
Date	27 MAY 1977
First Reading	266
Last Reading	0
Footage Logged	266
Depth Reached	257
Depth Driller	
Casing Rake	
Casing Driller	16
Fluid Type	AIR/WATER
Liquid Level	188
Min. Diam.	5
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	JOHNSON
Witnessed By	SHAW

Permanent Datum: LOG MEASURED FROM GROUND LEVEL, Elev. Ft. Above Perm. Datum

Log Measured from GROUND LEVEL, K.B. 0, D.F. , G.L.

Well Depths Measured from GROUND LEVEL

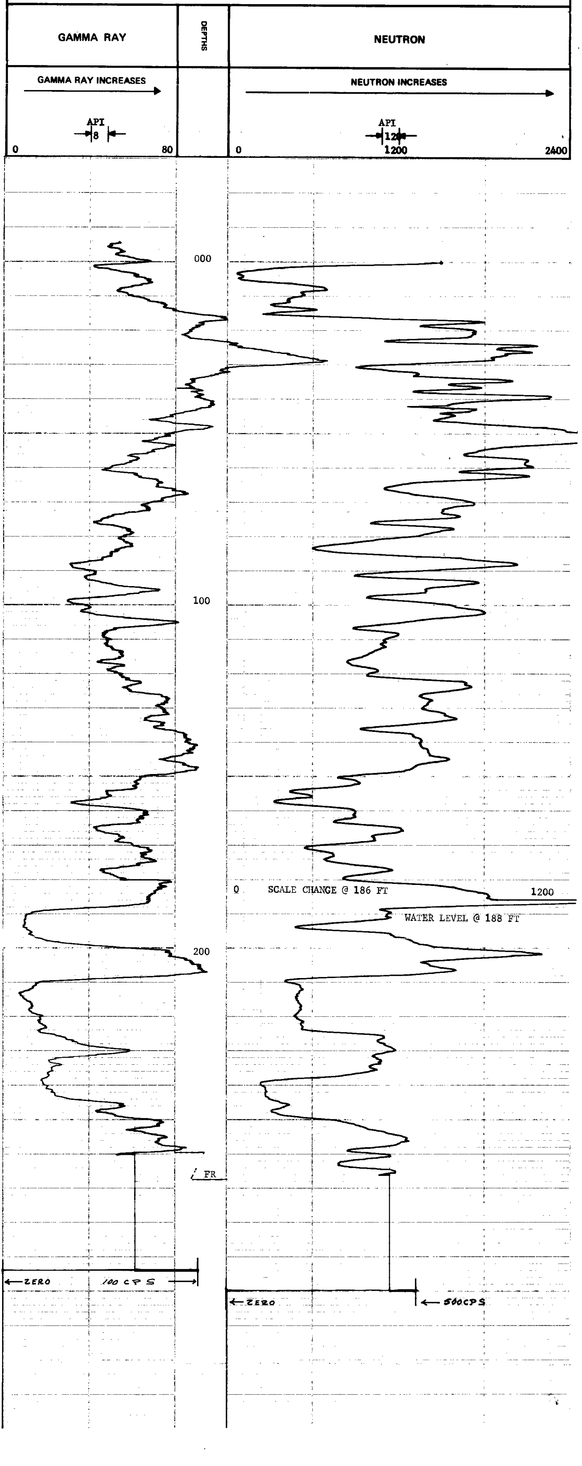
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	~~5~~ CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	186	12	5	100	OL	8	3	1000	OL	120
	186	266	12	5	100	OL	8	3	500	OL	60

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



K-6969-8 dupe 2-5-87

ROKE

GAMMA RAY NEUTRON LOG

COMPANY: ROKE OIL ENTERPRISES LTD.
CASARAY ALBERTA

WELL: 100 - 10 - 10
FIELD: CASARAY
LOCATION: RAGE 10 W4M
PERMANENT DATUM: GROUND LEVEL
LOG MEASURED FROM: K.B. 10 FEET ABOVE PERM. DATUM
DRILLING MEASURED FROM: K.B.
DATE: 2 - 3 - 87
RUN NO.: ONE
DEPTH DRILLER: 1320
DEPTH LOGGER: 1320
BTM. LOG INTERVAL: 1320
TOP LOG INTERVAL: 1315
CASING DRILLER: 8 5/8" @ 1315
CASING LOGGER: 1315
BIT SIZE: 7 7/8"
TYPE FLUID IN HOLE: GEL CHEM
DENSITY: 9.2
VISCOSITY: 38
PH: 9.5
FLUID LOSS: 10
SOURCE OF SAMPLE: FLOW LINE
RM @ MEAS. TEMP.: 1.3 @ 20°C
RMF @ MEAS. TEMP.: .9 @ 20°C
RMC @ MEAS. TEMP.: 1.8 @ 20°C
SOURCE OF RMF & RMC: MEASURED
RM @ BHT: .6 @ 50°C
TIME SINCE CIRC.: 12 HRS.
MAX. REC. TEMP.: 50°C
EQUIP. LOCATION: 320
RECORDED BY: JOHNSON
WITNESSED BY: MR. [illegible]

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	4.77	LENGTH	9 INCH
		SOURCE MODEL NO.	MISC N-SS-W
GENERAL		SERIAL NO.	147
HOIST TRUCK NO.	37	SPACING	12 INCH
INSTRUMENT TRUCK NO.		TYPE	Amrda
TOOL SERIAL NO.	S GRS 149-002	STRENGTH	— X curies

LOGGING DATA

RUN	GAMMA RAY INITIAL		SPEED	T.C.	SENS.	ZERO	API G. R. UNITS	T.C.	NEUTRON SENS.	ZERO	API N. UNITS
NO.	FROM	TO	FT/MIN	SEC.	MV	LEVEL	PER 1/8 DEFL.	SEC.	SETTING	LEVEL	PER 1/8 DEFL.
ONE	1320	600	30	3	100	OIL	12	3	1200	OIL	130
	600	1170	12	3	100	OIL	12	3	900	OIL	130

REMARKS: LOGGED THROUGH 95 SKILL ROD

GAMMA RAY: 0 – 130 API
GAMMA RAY INCREASES
NEUTRON: 0 – 1200 API
NEUTRON INCREASES
SCALE CHANGE @ 600 FT
WATER LEVEL @ 367 FT
FT

K-FORDING RIVER 77 (3) A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL DDH-445

LOCATION EAGLE MTN.

FIELD FORDING

PROVINCE BRITISH COLUMBIA

320

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. ____
Log Measured from RIG FLOOR 15 Ft. Above Perm. Datum
Well Depths Measured from RIG FLOOR

K.B. ____
CSG ____
G.L. ____

Run. No.	ONE		
Date	1 JUNE 1977		
First Reading	1120		
Last Reading	0		
Footage Logged	1120		
Depth Reached	1171		
Depth Driller	1171		
Casing Roke			
Casing Driller			
Fluid Type	AIR/WATER		
Liquid Level	567		
Min. Diam.	HQ		
Rm @ °F			
Operating Time	2 HOURS		
Truck No.	37		

Recorded By JOHNSON | Witnessed By SHRAW

EQUIPMENT DATA

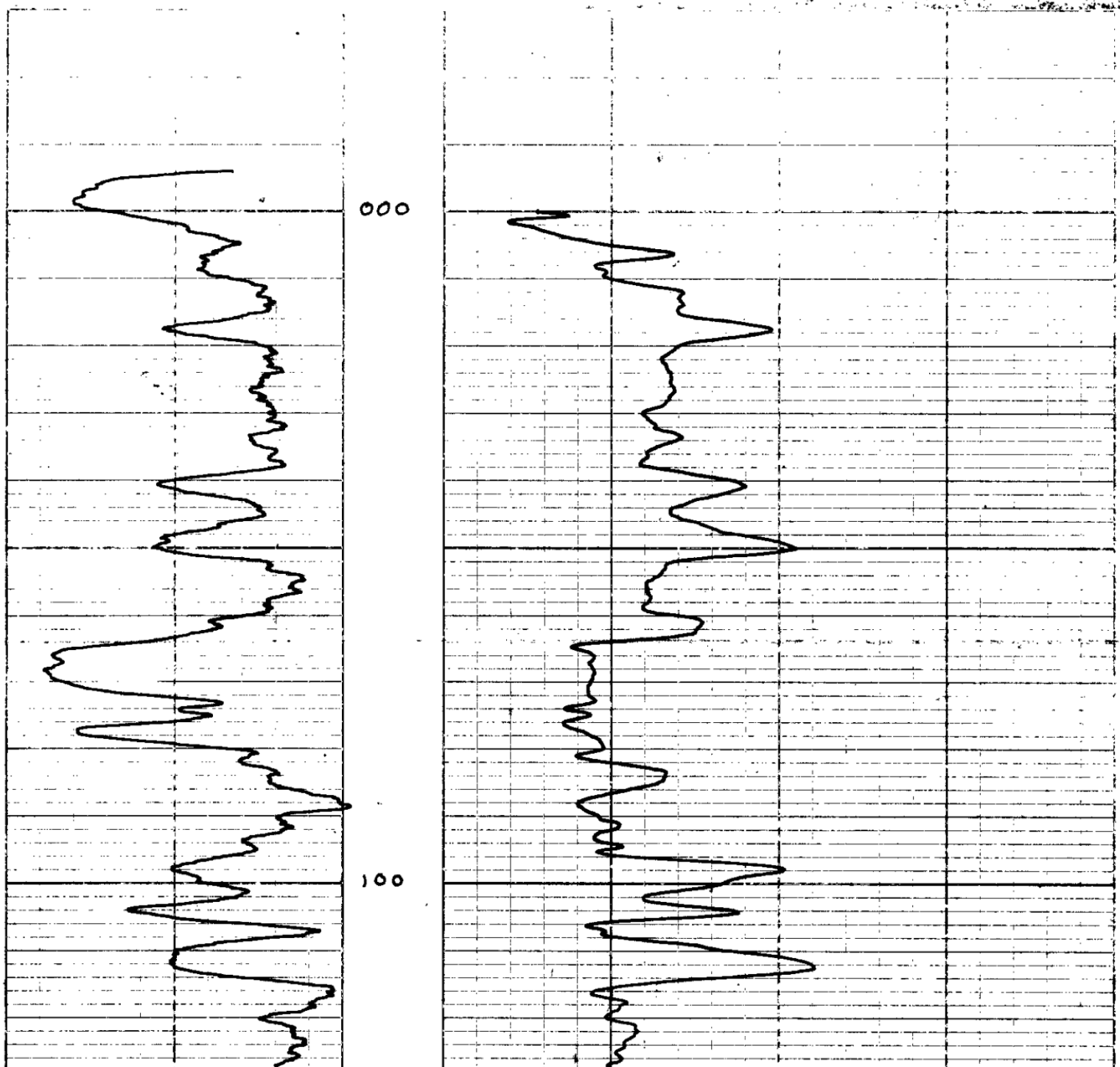
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002.	STRENGTH	3 CURIES

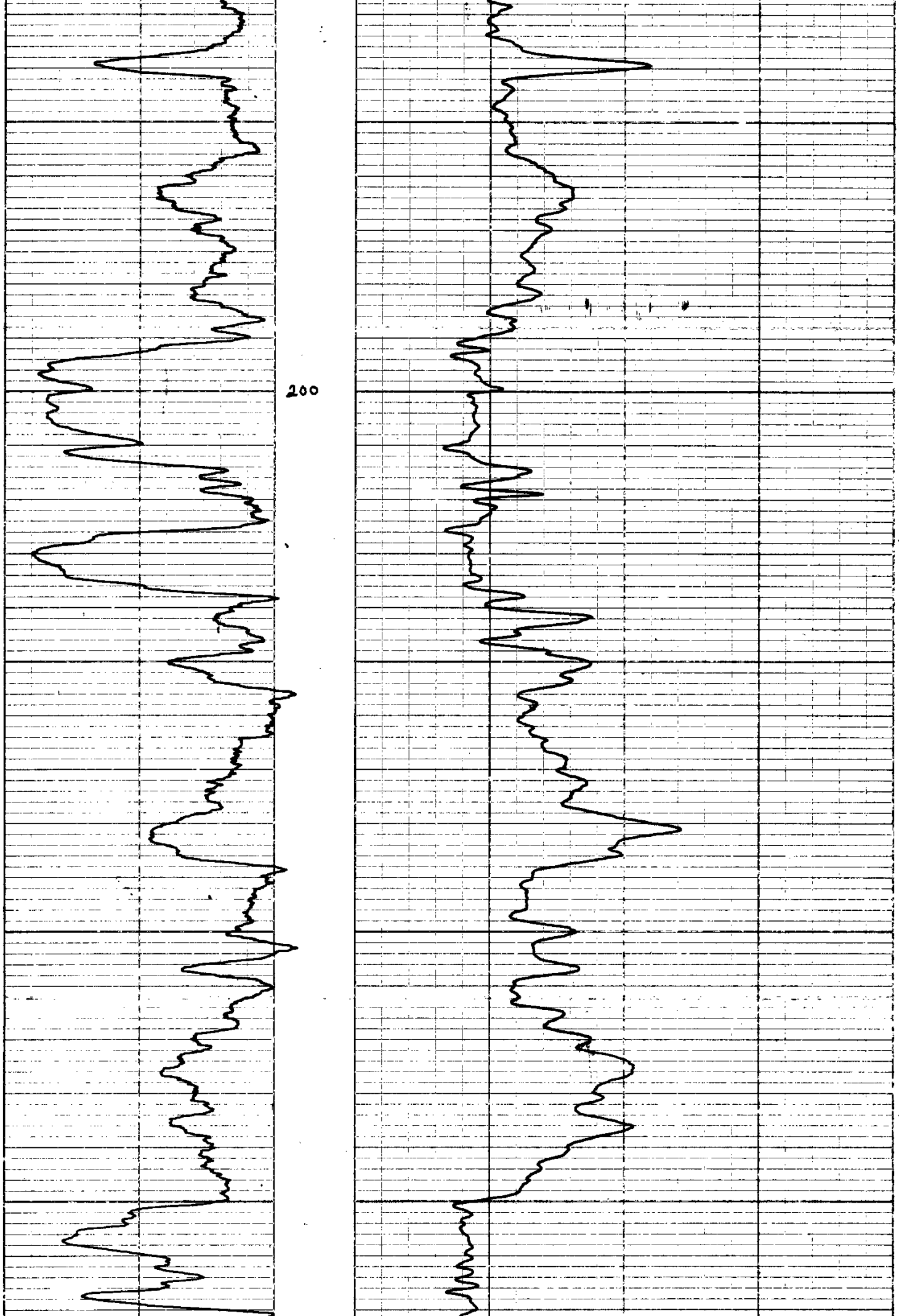
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	480	12	5	100	OL	12 API	3	1000	OL	260 API
	480	1170	12	5	100	OL	12 API	3	500	OL	130 API

REMARKS LOGGED THROUGH HQ DRILL ROD

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 12		API 260
0 — 120		0 — 2600 — 5200

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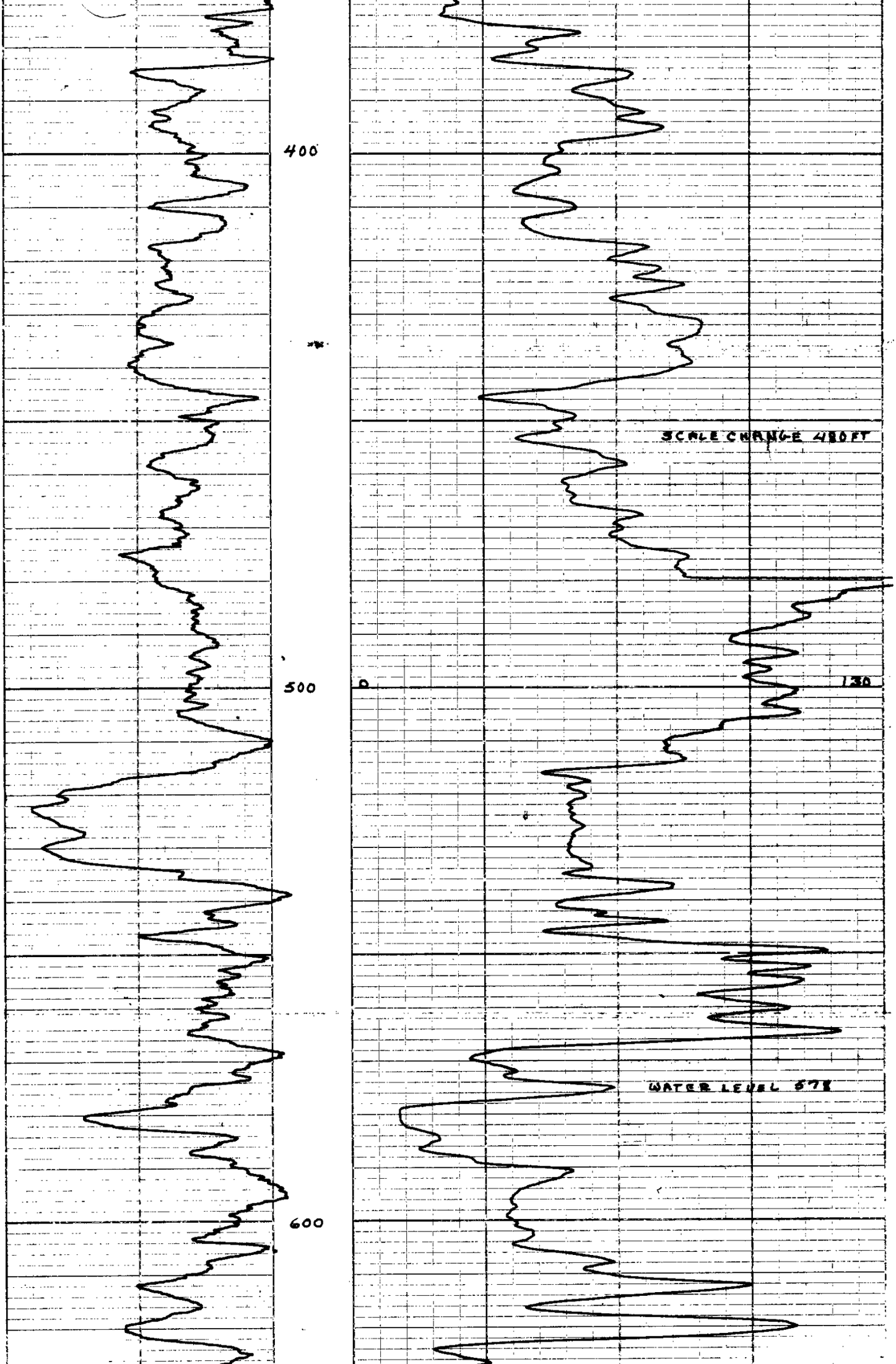
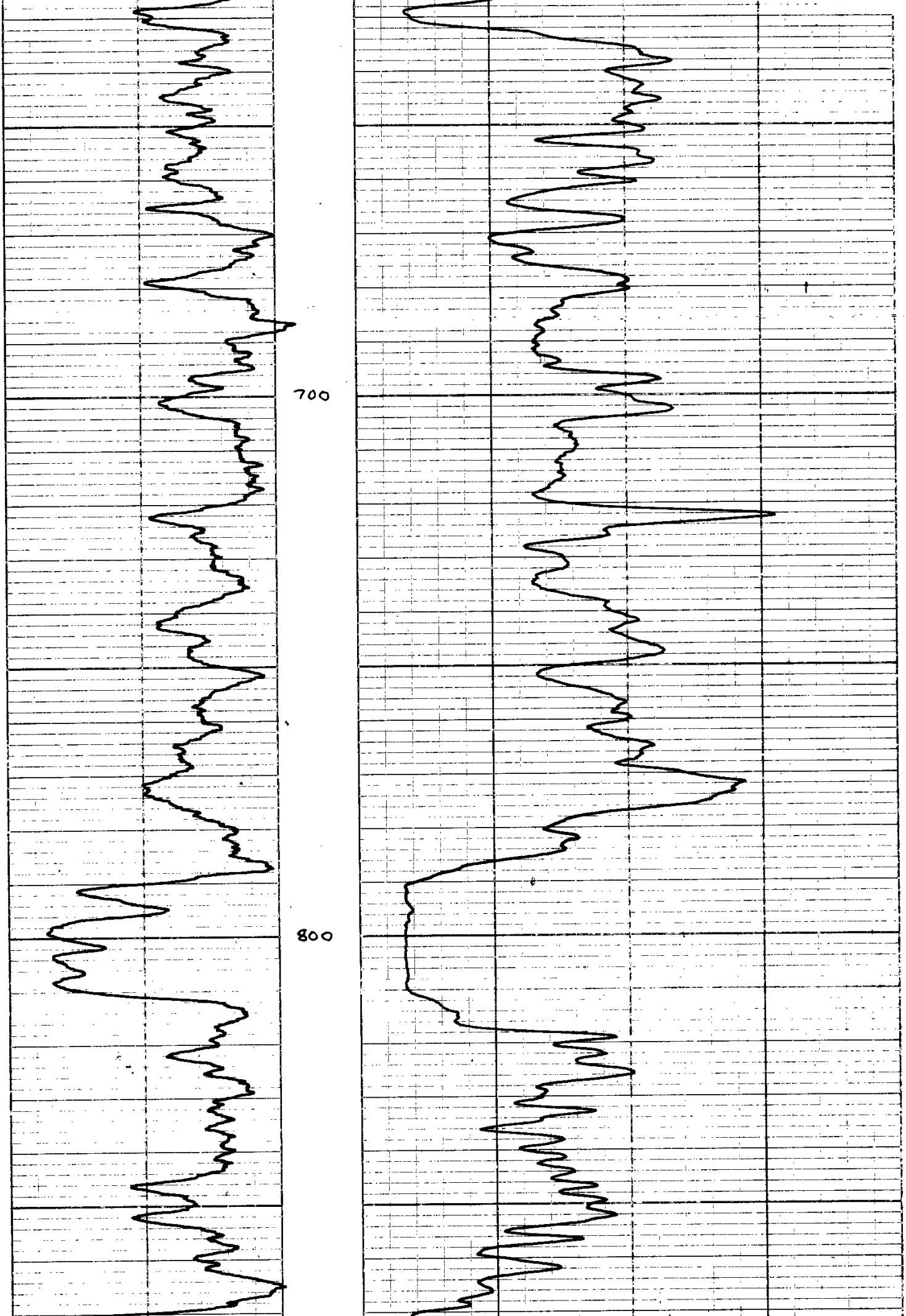

400
500
600
SCALE CHANGE 480 FT
130
WATER LEVEL 578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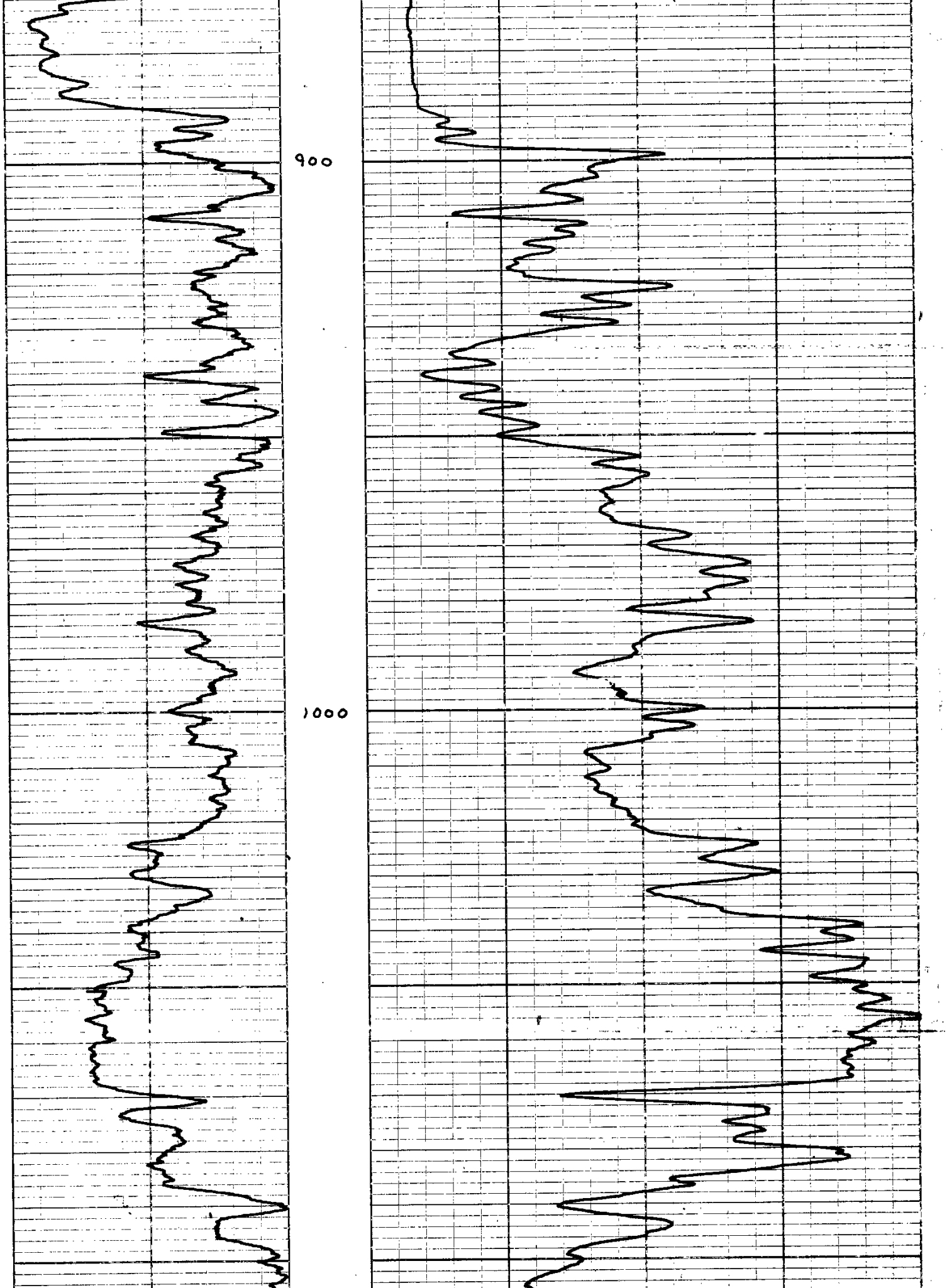
800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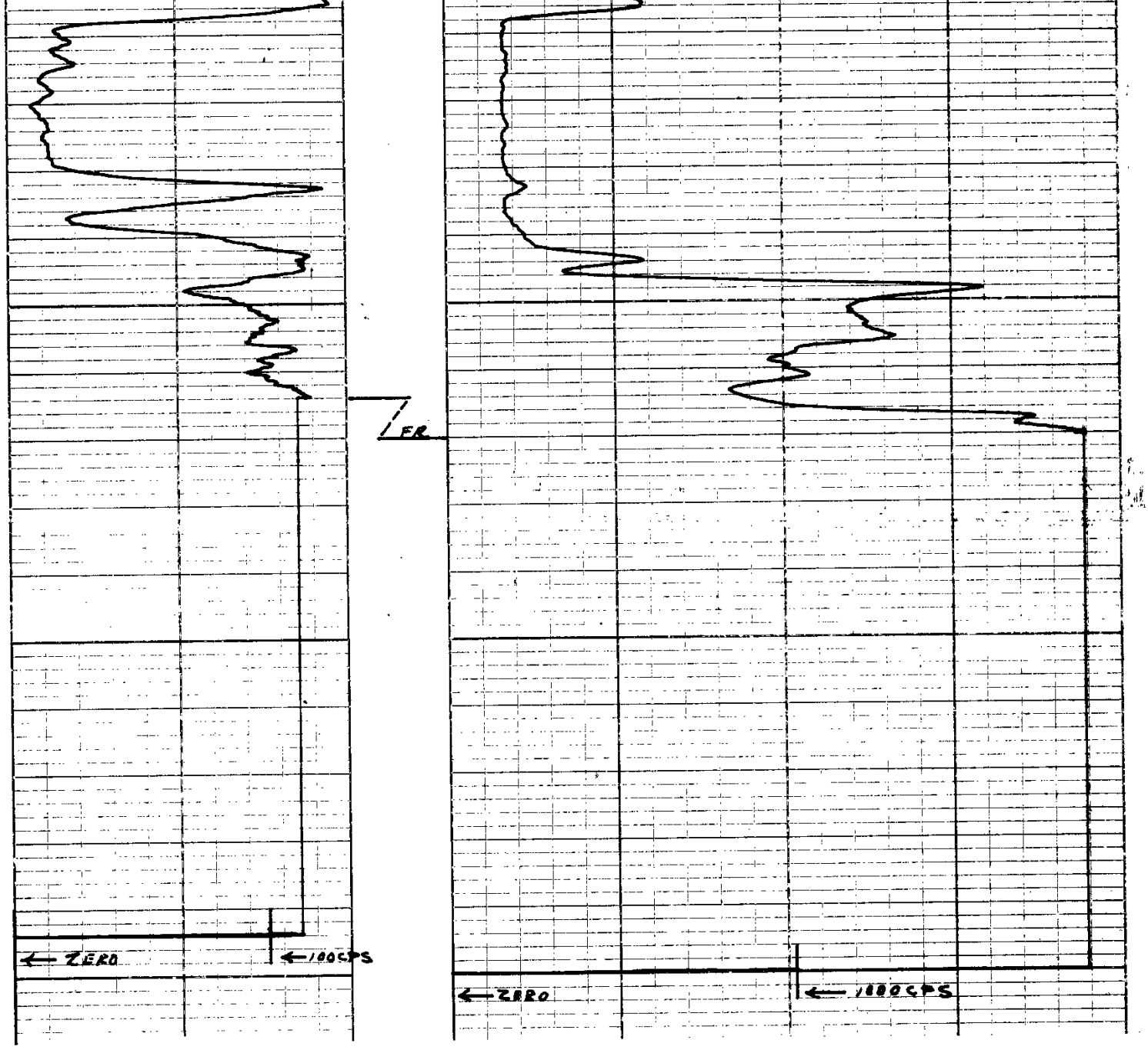
1000


FR
ZERO
100CPS
ZERO
1000CPS

K-FORONG RIVER 77 (8) 4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD SEC TWP RGE M

COMPANY FORONG COAL LIMITED

WELL RR - 446

LOCATION CLOSE FIT

FIELD FORONG

PROVINCE BRITISH COLUMBIA

Log Measured From GROUND LEVEL — Ft. Above Perm. Datum

Well Depths Measured From GROUND LEVEL — K.B. — D.F. — G.L.

Other Services: NONE

320

Run No.	ONE		
Date	19 MAY 1977		
First Reading	397		
Footage Logged	397		
Depth Reached	398		
Depth Driller	400		
Casing Rdrs			
Casing Driller	14		
Casing Logged	ASTM/METER		
Liquid Level	176		
Min. Diam.	5		
Rm @ °F			
Operating Time			
Truck No.	1 HOUR		
	37		

Recorded By JOHNSON — Witnessed By ALLEN

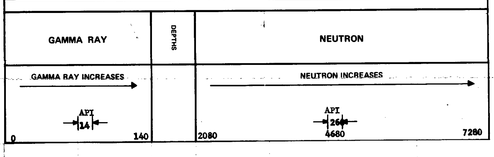
EQUIPMENT DATA

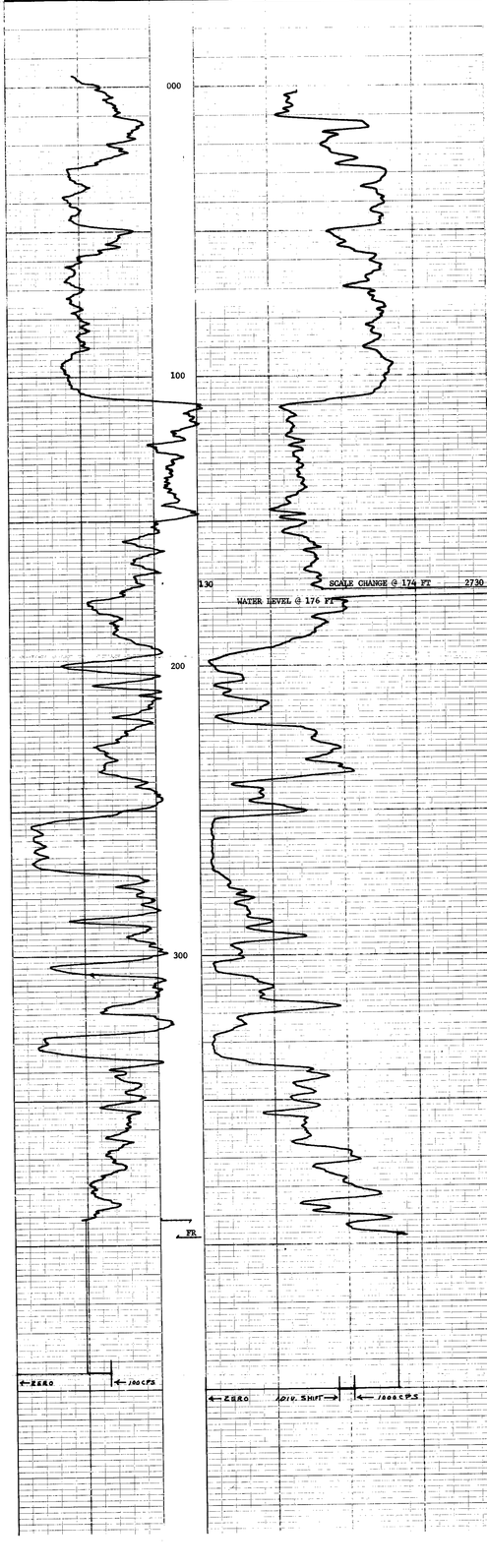
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	174	12	5	100	OL	14	3	1000	8 L	260
	174	397	12	5	100	OL	14	3	500	1 L	130

REMARKS





ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

K-FOOTAGE GAUGE 37(3)A

FILE NO.	
COMPANY	POWDER OILS LIMITED
WELL	SEE - 666
FIELD	WATER CORONATA
LOCATION	SHARD BRIDGEST
PROVINCE	ALBERTA
Other Services	SONIC
Permanent Datum	GROUND LEVEL
Log Measured From	KB 5FEET
Drilling Measured From	KB

330

Date	31 OCT 1977
Run No.	ONE
Depth Driller	670
Depth Logger	670
Bottom Logged Interval	670
Top Logged Interval	0
Casing Driller	10
Casing Logger	10
Bit Size	7 7/8
Type Fluid in Hole	WATER
Density / Visc.	1
Ph / Fluid Loss	0
Source of Sample	FLOWLINE
Rm @ Meas. Temp.	2.5 @ 70
Rmf @ Meas. Temp.	2.5 @ 70
Rmc @ Meas. Temp.	2.5 @ 70
Source of Rmf / Rmc	MEASURED
Rm @ BHT	2.5 @ 70
Time Since Circ.	32
Max. Rec. Temp.	30
Equipment No.	0860
Location	
Recorded By	JENSEN
Witnessed By	MR. HOWES

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2.7 FT.	LENGTH	8 INCH
		SOURCE MODEL NO.	MRC-N-SS-M
GENERAL		SERIAL NO.	147
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R ORE 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTH FROM	DEPTH TO	SPEED FT/MIN	T.C. SEC.	ZERO SETTINGS	API G. R. UNITS DIV. | OR M PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. | OR M PER LOG DIV.	API N. UNITS DIV. | OR M PER LOG DIV.
1	0	665	32	5	100	OIL	12	3	1000	OIL	160
	665	877	32	5	100	OIL	12	3	500	OIL	130

REMARKS: LOGGED THROUGH ID DRILL ROD

GAMMA RAY INCREASES → API 0 130

NEUTRON INCREASES → API 3600 0 3200

DEPTH

GAMMA RAY

NEUTRON

SCALE CHANGE @ 665 FT

2730

130

WATER LEVEL @ 535 FT

FT

0

100

200

300

400

500

600

700

800

← ZERO ← INCHES

← ZERO ← INCHES

K-FORDING RIVER 77(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL DDH - 449

LOCATION EAGLE MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev. ____

Log Measured from RIG FLOOR 1 Ft. Above Perm. Datum

Well Depths Measured from RIG FLOOR

K.B. ____
CSG ____
G.L. ____

Other Services: DENS

320

Run. No.	ONE		
Date	8 JUNE 1977		
First Reading	768		
Last Reading	0		
Footage Logged	768		
Depth Reached	769		
Depth Driller	778		
Casing Roke			
Casing Driller	10		
Fluid Type	WATER		
Liquid Level	FULL		
Min. Diam.	HQ		
Rm @ °F			
Operating Time	1½ HOURS		
Truck No.	37		
Recorded By	JOHNSON	Witnessed By	SHAW

EQUIPMENT DATA

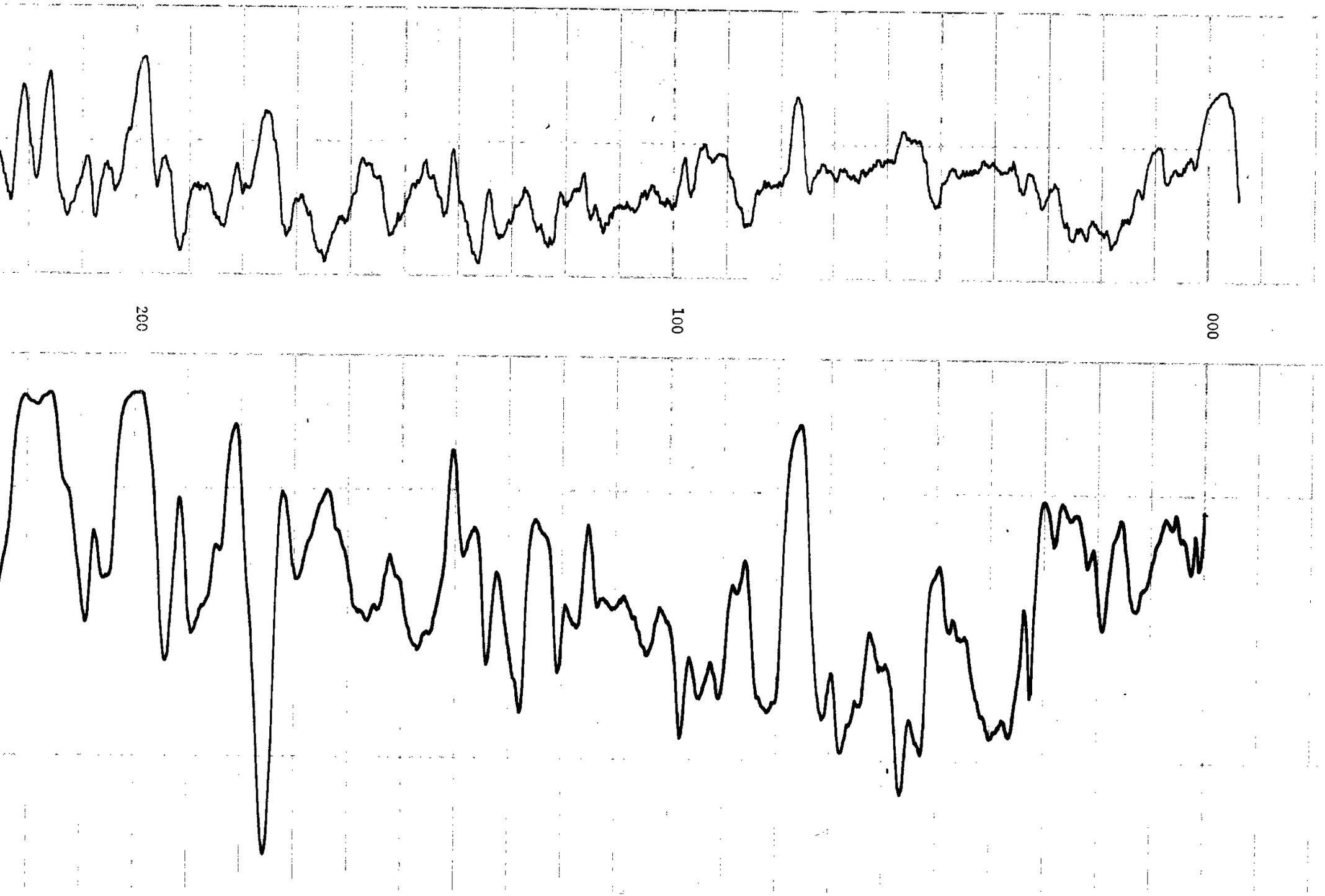
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

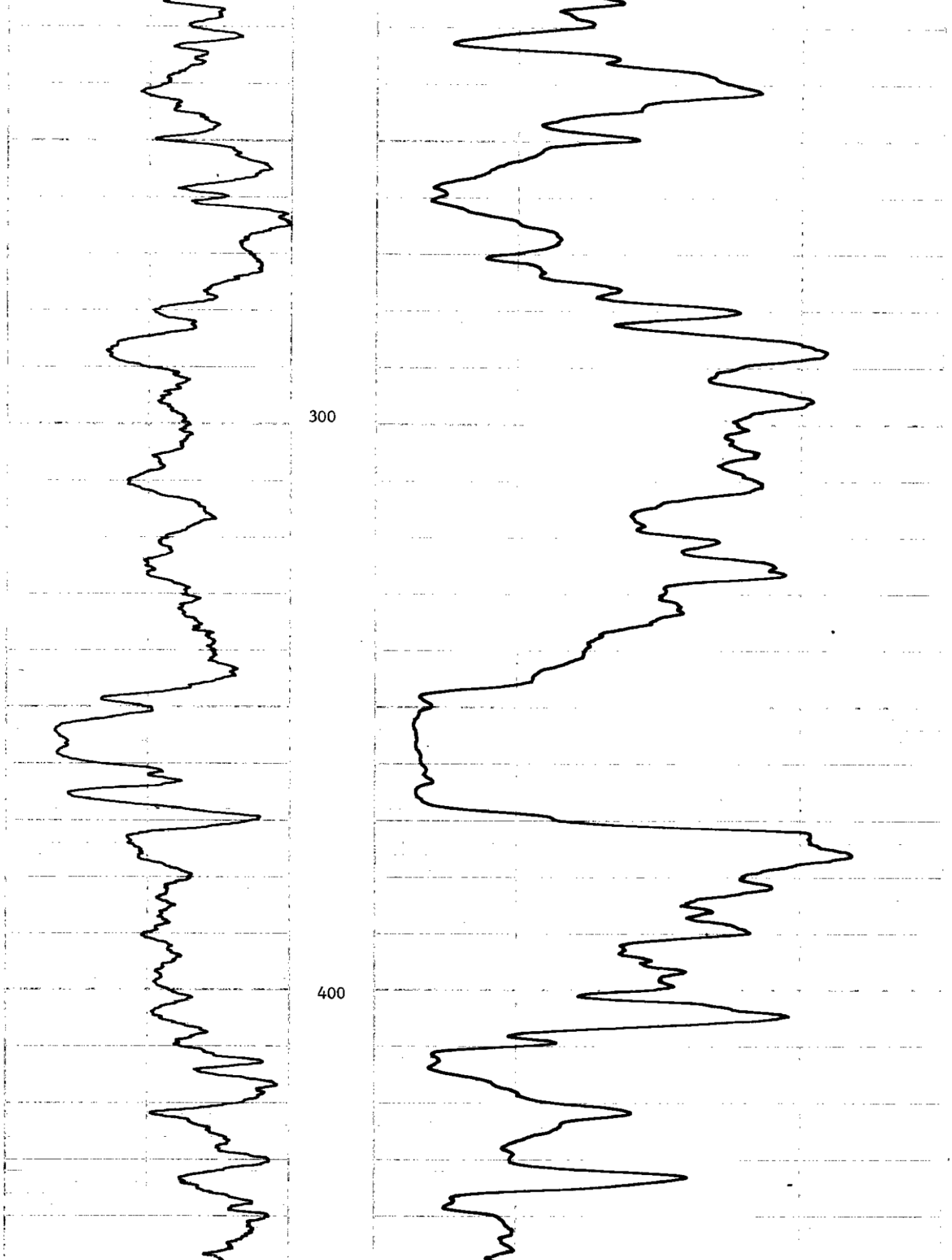
LOGGING DATA

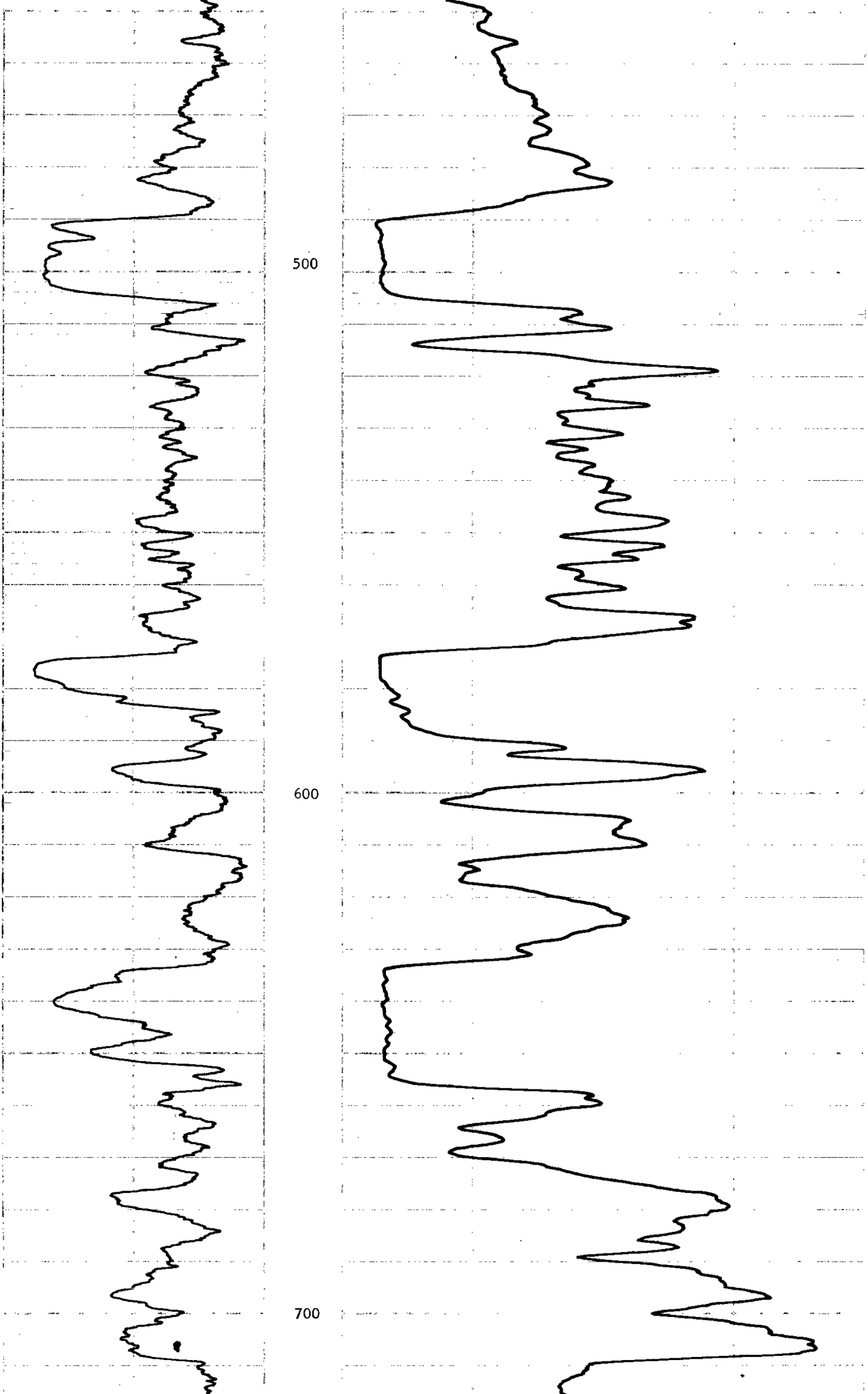
GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	768	12	5	100	OL	12	3	500	OL	130

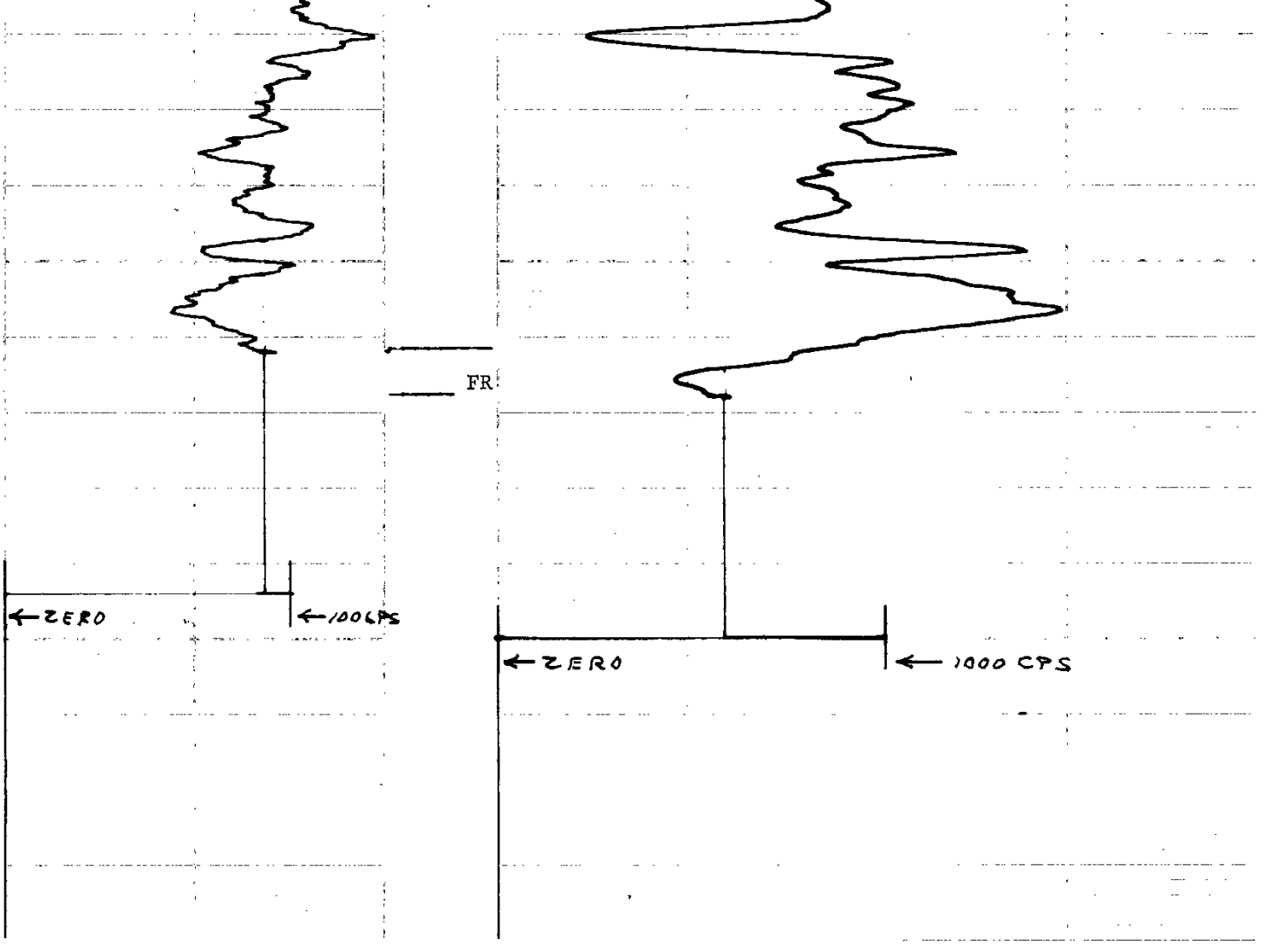
REMARKS LOGGED THROUGH HQ DRILL RODS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 12		API 130
0 — 120		0 — 1300 — 2600


200
100
000


300
400


500
600
700


FR
ZERO
100 CPS
ZERO
1000 CPS

K-ESSO NO. 6 WELL 72-(24)-4

ROKE
SIDEWALL DENSILOG

OIL ENTREPRENEURS LTD. CALGARY ALBERTA

FILE NO. SEC TWP RGE W.....M

COMPANY ESSO RESOURCES CANADA LIMITED

WELL 320 ft FSL 1320 ft FEL

LOCATION LSD 11 SEC 24 TWP 23 RGE 7 W 4 M

FIELD ESSO

PROVINCE BRITISH COLUMBIA

Log Measured from RKB 12 ft Above Perm. Datum

Other Services RUN 1 DIL

Elev.: K.B. 1012 G.L. 1000 D.F. 1011

Rig No. CANADA DRILLING RIG #4

Date 3-8-77

Run No. ONE

Depth-Driller 3750

Depth-Logger 3745

Bottom Log Interval 3744

Top Log Interval SURFACE

Casing-Driller 13 3/8 @ 1000

Casing-Logger 1000

Bit Size 12 1/4

Type Fluid in Hole GEL CHEM

Dens. Visc. 10.0 45

pH Fluid Loss 10.5 5.0

Source of Sample CIRC.

Rm @ Meas. Temp. .74 @ 70°F

Rmf @ Meas. Temp. .62 @ 70°F

Rmc @ Meas. Temp. 1.0 @ 70°F

Source of Rmf and Rmc MEAS.

Rm @ BHT .37 @ 150°F

Time Since Circ. 7 HRS.

Max. Rec. Temp. Deg. F 150°F

Equip. No. and Location 1504 K.

Recorded By STAMFORD

Witnessed By SCHMIDT

GENERAL RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY GENS SETTINGS	GAMMA RAY ZERO D/V.L. OR R	GAMMA RAY API G.R. UNITS PER LOG DIV.	SIDEWALL DENSILOG T.C. SEC.	SIDEWALL DENSILOG GENS SETTINGS	SIDEWALL DENSILOG ZERO D/V.L. OR R	SIDEWALL DENSILOG CPS/DIV.
1	340	820	5					3	100	1.48	1289
	820	540	10					3	100	1.48	1533
	540	280	5					3	100	1.48	1533
	620	660									

REMARKS LOGGED THROUGH NO DRILL ROD

TOOL 4" DIV.

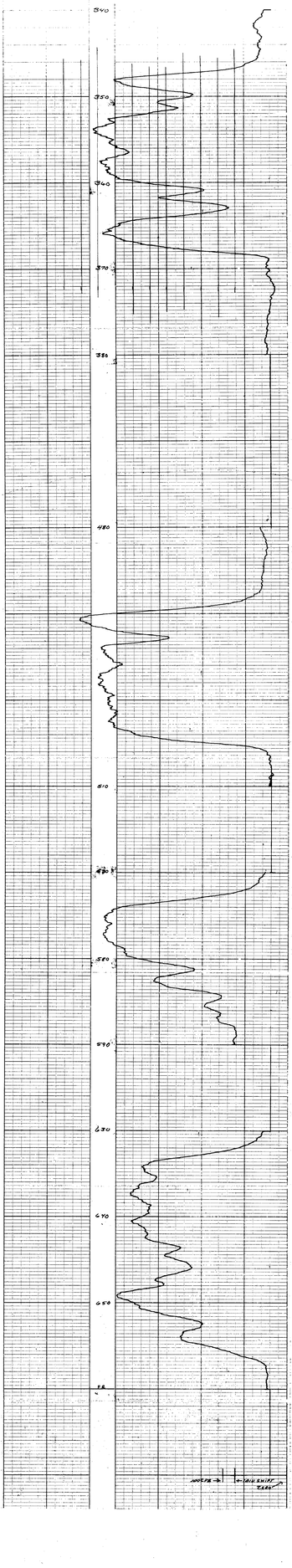
CALIPER (DIAMETER – INCHES)

GAMMA RAY API

DEPTHS

UNSCALED

BULK DENSITY (GRAMS/CC)



K-FOALDING RIVER 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY POMEROY OIL(SASK.) LIMITED

WELL RR = 444 ASS 320

LOCATION CLOSE ST

FIELD PORTOUNEY

PROVINCE CLEARWATER LAYTEL 3 MEXTER COLUMBIA

Permanent Datum: GROUND LEVEL Elev.

Log Measured From: GROUND LEVEL Ft. Above Perm. Datum

Drill Depth Measured From: GROUND LEVEL K.B. D.F. G.L.

Other Services: SONIC

Sec. Twp. Rge. M

Run No. ONE

Date 22 MAY 1977

First Reading 401

Last Reading 441

Depth Logged 440

Depth Driller 440

Casing Rdrs

Casing Driller

Casing Type 3½

Liquid Level

Max. Recorded Temp. 5

Equip. No. A130/NEUTRON

Truck No. 37

Operator's Time 1 HOUR

Recorded By JOHNSON

Witnessed By SHAW

EQUIPMENT DATA

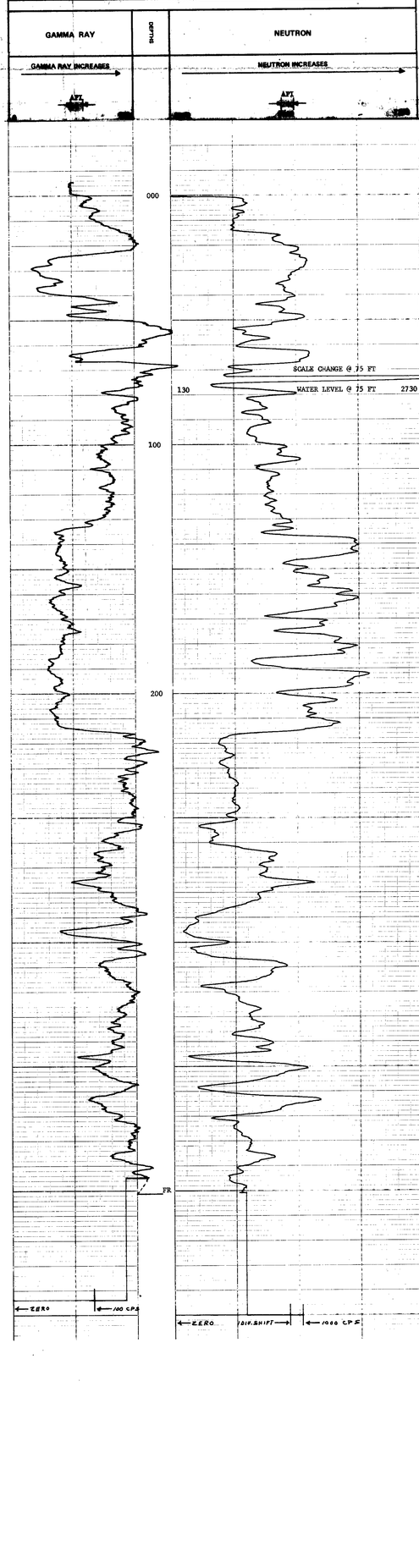
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6,7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
		SERIAL NO.	187
		SPACING	17 INCH
		TYPE	AmBe
		STRENGTH	[illegible]

GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	
TOOL SERIAL NO.	R GEM 169-002

LOGGING DATA

GENERAL			GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	75	12	5	100	OL	14	3	1000	8 L	280
	75	441	12	5	100	OL	14	3	300	1 L	130

REMARKS



K- FOSONG RIVER 77 (3) 4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD SEC TWP RGE W ____ M

COMPANY ROUNDUP COAL LIMITED

WELL 321 - 4465

LOCATION GLADE FEE

FIELD FORNDNO

320

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev.

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Drlg. Measured from: GROUND LEVEL

K.B. / D.F. / G.L.

Other Services:

NONE

Run. No.	ONE
Date	27 MAY 1977
First Reading	4446
Last Reading	0
Bottom Logged	4446
Depth Reached	4446
Depth Driller	4450
Casing Rate	
Casing Driller	
Fluid Type	
Fluid Level	
Max. Recorded Temp.	119
Min. Temp.	3
Rm @ °F	
Operating Time	
Truck No.	1 BROR
	37

Recorded By JOHNSON

Witnessed By ATKEN

EQUIPMENT DATA

GAMMA RAY	
RUN NO.	ONE
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	SCINTILLATION
LENGTH	6 INCH
DISTANCE TO N. SOURCE	5.7 FT.

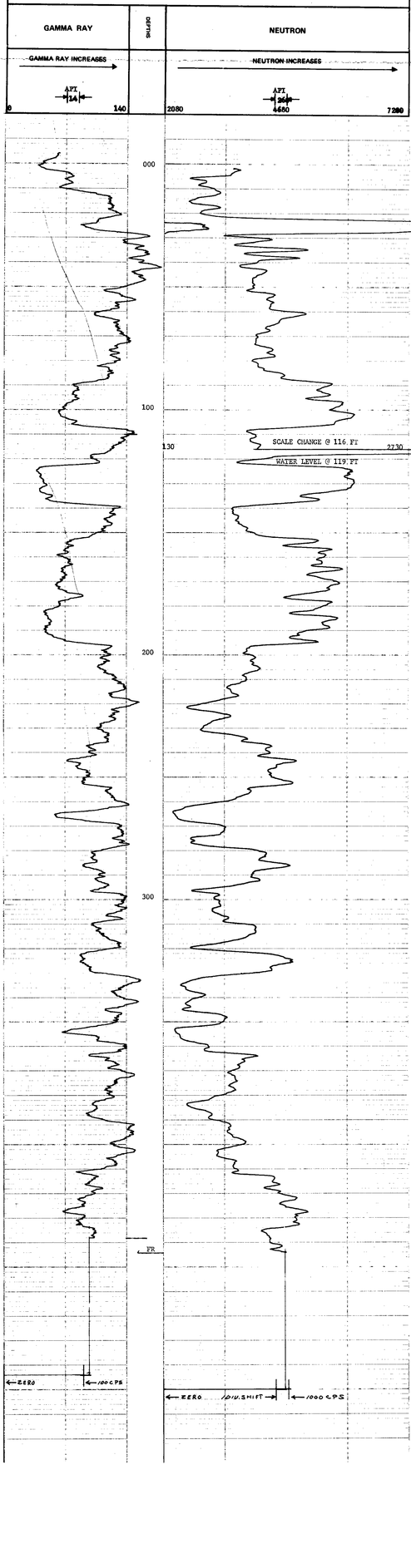
NEUTRON	
RUN NO.	ONE
LOG TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	6 INCH
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	187
SPACING	17 INCH
TYPE	AmBe
STRENGTH	3 CURIES

GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	
TOOL SERIAL NO.	R GRN 169 - 002

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	116	12	5	100	OL	14	3	1000	8 L	260
	116	444	12	5	100	OL	14	3	500	1 L	130

REMARKS



K-FOONG RIVER 77(3)A

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FOOTHILLS COAL LIMITED

WELL HR - 487

LOCATION CROWSNEST

FIELD FOOTHILLS

PROVINCE BRITISH COLUMBIA

320

Permanent Datum: GROUND LEVEL — Elev. K.B. — Elev. D.F. — Elev. G.L.

Log Measured From: GROUND LEVEL — 0 Ft. Above Perm. Datum

Drill Measured From: GROUND LEVEL

Other Services: NONE

Run. No.	ONE
Date	23 MAY 1977
First Reading	406
Last Reading	0
Footage Logged	406
Depth Reached	407
Depth Driller	
Casing Size	
Casing Driller	
Casing Logged	
Bit Size	ASR MASTER
Liquid Level	DRILL
Min. Diam.	5 1/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By: JOHNSON

Witnessed By: SHAW

EQUIPMENT DATA

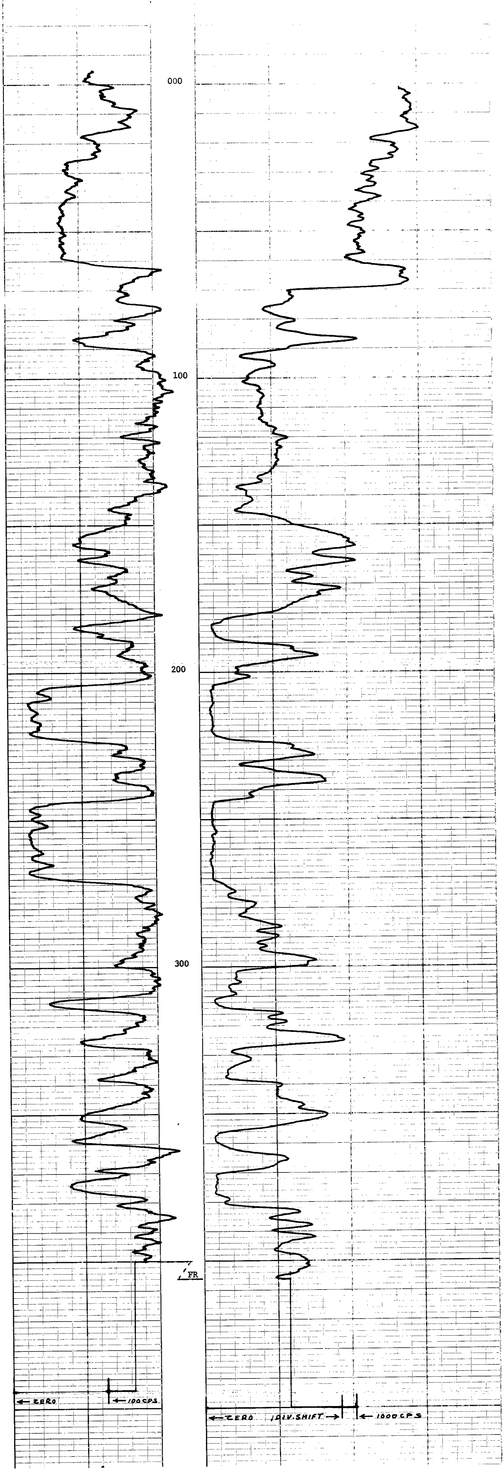
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	5 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	406	12	5	100	GL	14	3	500	1 L	130

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 14		API 130
0 — 140		1430 — 2730



K-FOREDALE RIVER 72(3)A

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO. 320

COMPANY ROKE/ROKONG COAL LIMITED

WELL RH - 467

LOCATION CLAIRE PIT

FIELD ROKONG

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL — Elev. 0 Ft. Above Perm. Datum

Log Measured from GROUND LEVEL — 0 Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL — G.L.

LSD SEC TWP RGE W M

Other Services: NONE

Run. No.	ONE	
Date	23 AUG 1977	
Last Reading	406	
First Reading	0	
Footage Logged	406	
Depth Driller	406	
Depth Reached	407	
Casing Size		
Casing Weight		
Fluid Type		
Liquid Level	AIR/WATER	
Max. Rec. Temp.	FULL	
Min. Diam.	5 1/8	
Rm @ °F		
Operating Time		
Truck No.	1 ROKE	
	37	

Recorded By JOHNSON

Witnessed By SHAW

EQUIPMENT DATA

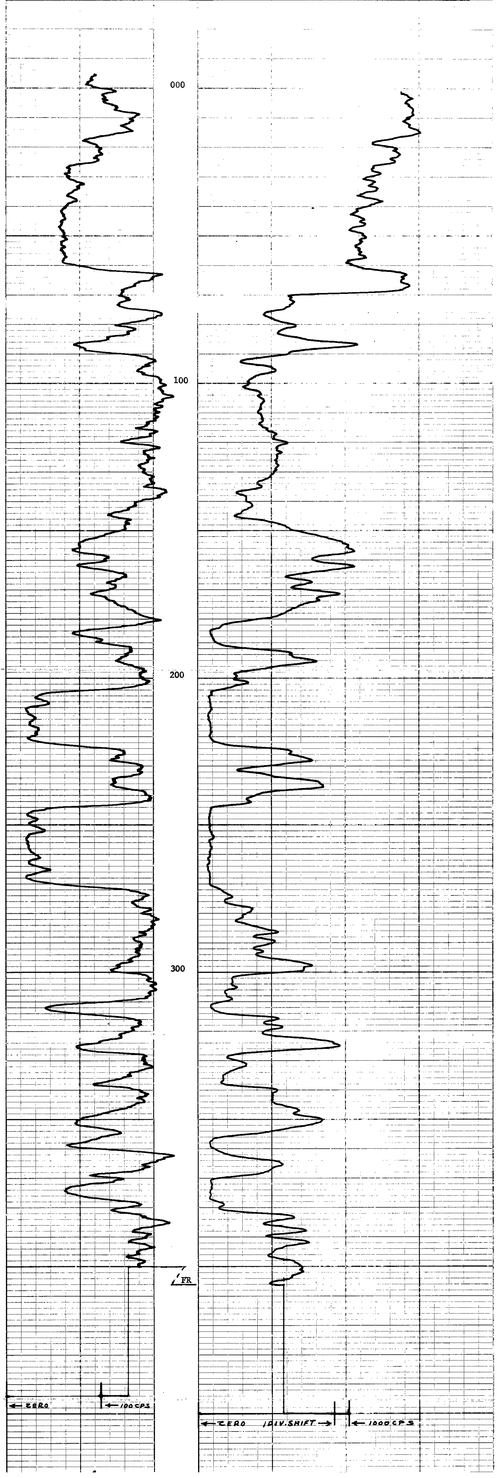
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	406	12	5	100	0L	14	3	500	1 L	130

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 14		API 130
0 — 140		130 — 1430 — 2730



K-FOREDING RIVER - 77 (G) A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.
LSD SEC TWP RGE M

COMPANY FORDING COAL LIMITED
WELL EXT. + 488
LOCATION CLOSE EXT.
FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL
Log Measured From: GROUND LEVEL
Drill Measured From: GROUND LEVEL

Elev.: K.B. / D.F. / G.L.
Ft. Above Perm. Datum

Other Services: NONE

Run No.	ONE
Date	23 MAY 1977
First Reading	449
Last Reading	0
Feet Logged	449
Depth Reached	450
Depth Driller	450
Casing Stake	
Casing Driller	0
Casing Logger	0
Fluid Level	ABOVE WATER
Liquid Level	113
Max. Rec. Temp.	5 1/8
Min. Diam.	
Rm @ °F	
Operating Time	
Truck No.	37

Recorded By: JOHNSON
Witnessed By: SHAW

EQUIPMENT DATA

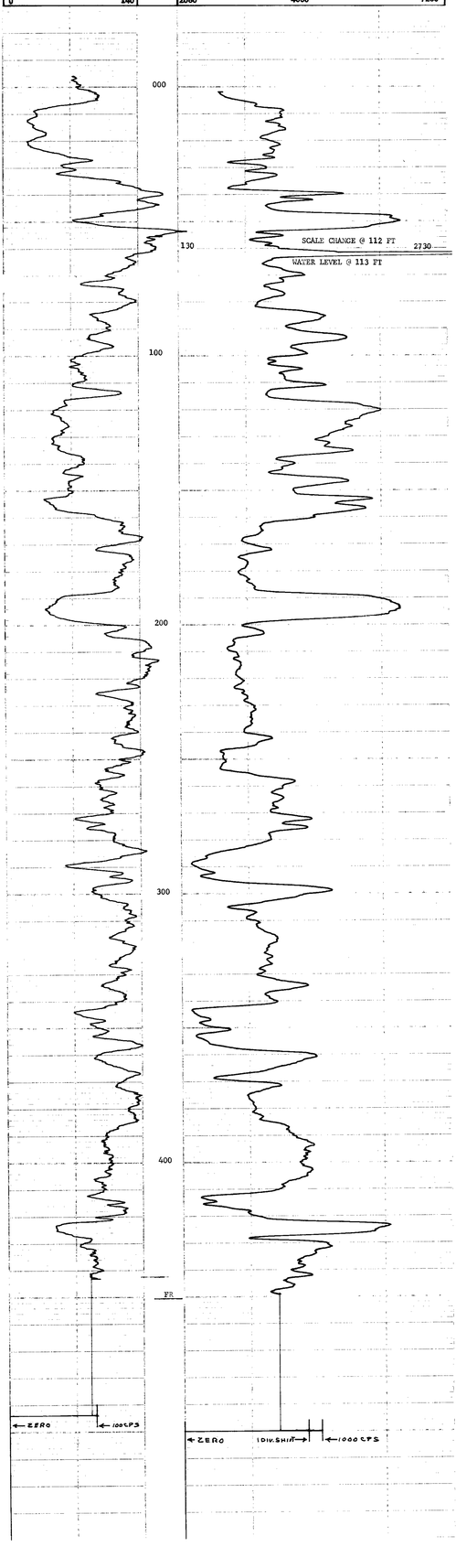
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	8 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	112	12	5	100	01.	14	3	1000	8 L	260
	112	449	12	5	100	01.	14	3	500	1 L	130

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES → API 14		NEUTRON INCREASES → API 26
0 — 140		2080 — 7280



K-FORDING RIVER 77 (3) A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL RH-489

LOCATION CLODE PIT

FIELD FORDING

PROVINCE BRITISH COLUMBIA

320

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE
Date	3 JUNE 1977
First Reading	404
Last Reading	0
Footage Logged	404
Depth Reached	405
Depth Driller	405
Casing Roke	
Casing Driller	22
Fluid Type	AIR/WATER
Liquid Level	24
Min. Diam.	5 1/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON Witnessed By SKAU

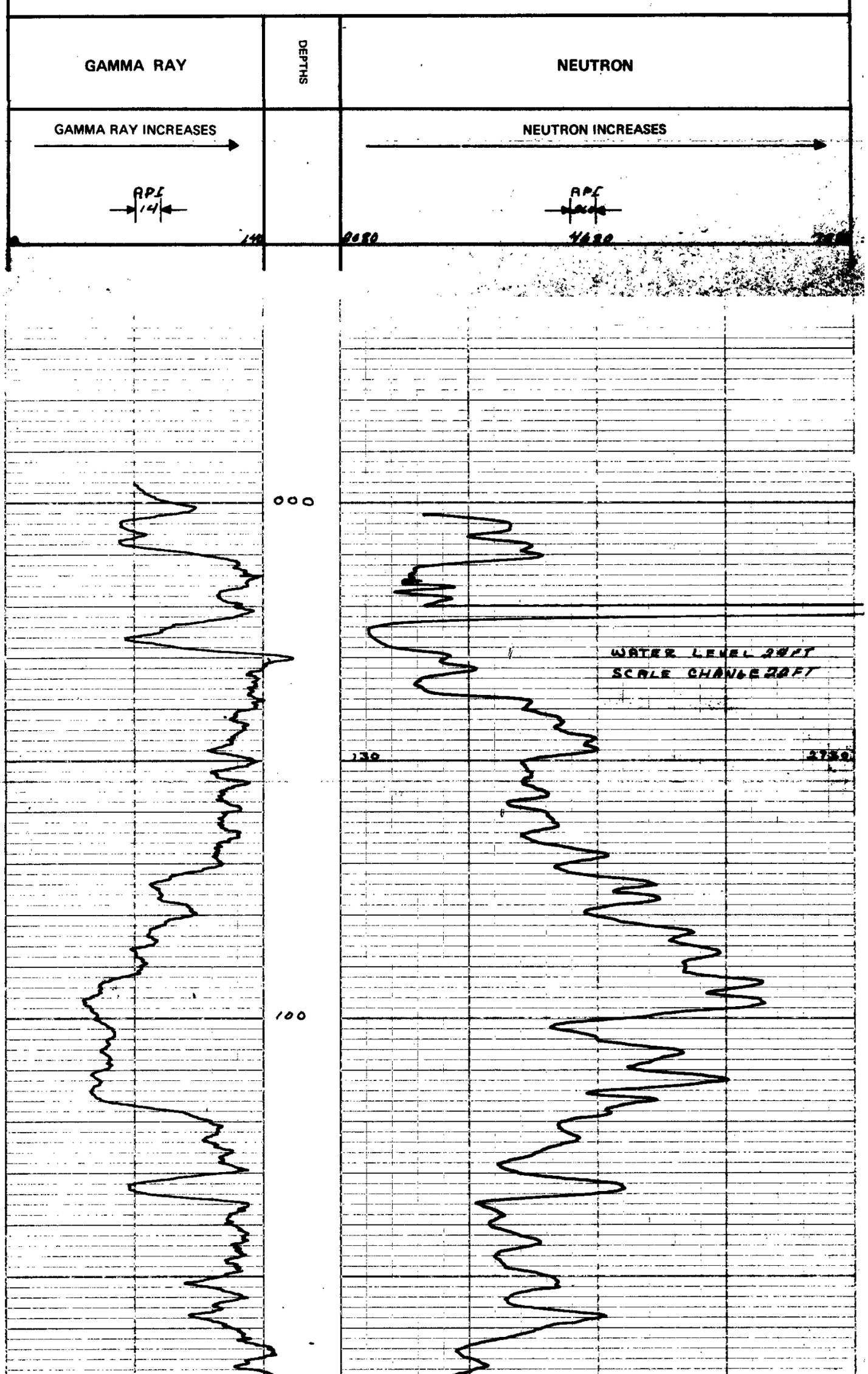
EQUIPMENT DATA

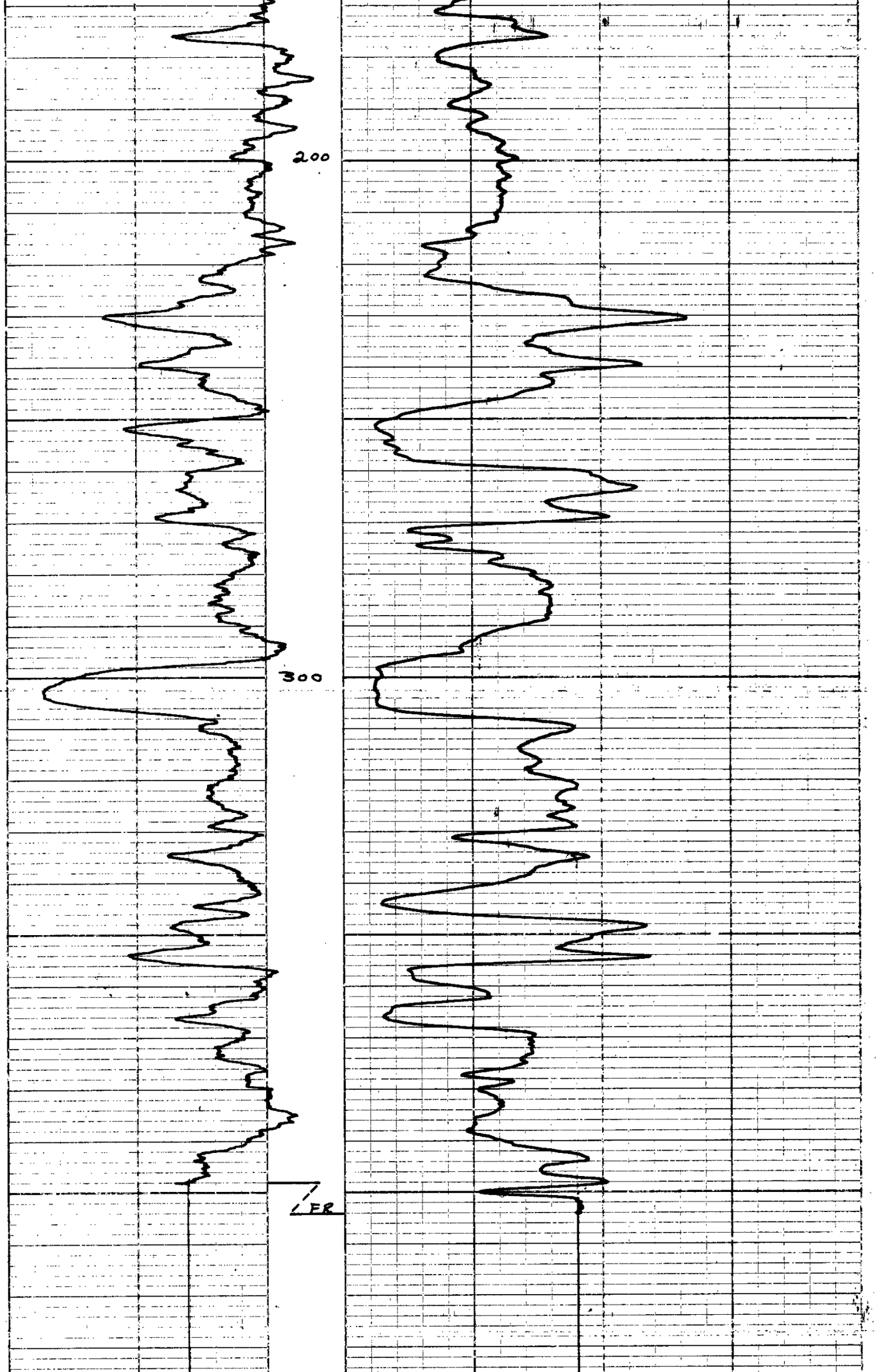
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002.	STRENGTH	3 CURIES

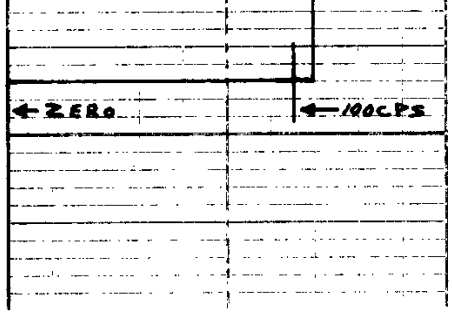
LOGGING DATA

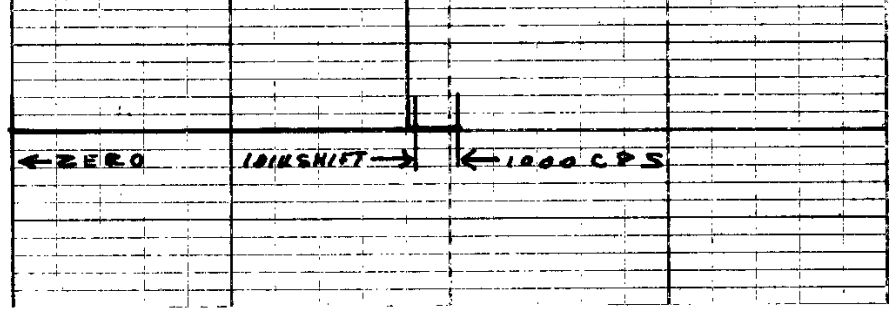
GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	22	12	5	100	0L	14API	3	1000	8L	260API
	22	404	12	5	100	0L	14API	3	500	1L	130API

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
NEUTRON INCREASES
API
API
000
100
130
WATER LEVEL 20FT
SCALE CHANGE 20FT


200
300
FR


ZERO
100CPS


ZERO
10KSHIFT
1000 CPS

K-FOR DETAILS SEE 77(8)4.

ROKE

GAMMA RAY NEUTRON LOG

COMPANY: FOOTHILLS COAL LIMITED
OIL ENTERPRISES LTD. CALGARY, ALBERTA

WELL: RR - 899-4-89
LOCATION: GLADE FIT
FIELD: FOOTHILLS

320

FILE NO.
SEC
TWP
RGE
M
W

Permanent Datum: GROUND LEVEL
Log Measured from: GROUND LEVEL
Drlg. Meas. from: GROUND LEVEL
Elev.: K.B.
Ft. Above Perm. Datum: D.F.
G.L.

Other Services: NONE

Run. No.	ONE
Date	3 JUNE 1977
First Reading	404
Last Reading	0
Recorded Logged	404
Depth Driller	405
Depth Logger	405
Casing Rdrs	22
Casing Driller	22
Fluid Type	AIR/WATER
Fluid Level	24
Max. Recorded Temp.	5 1/8
Operating Time	1 HOUR
Truck No.	37

Recorded By: JOHNSON
Witnessed By: SHAW

EQUIPMENT DATA

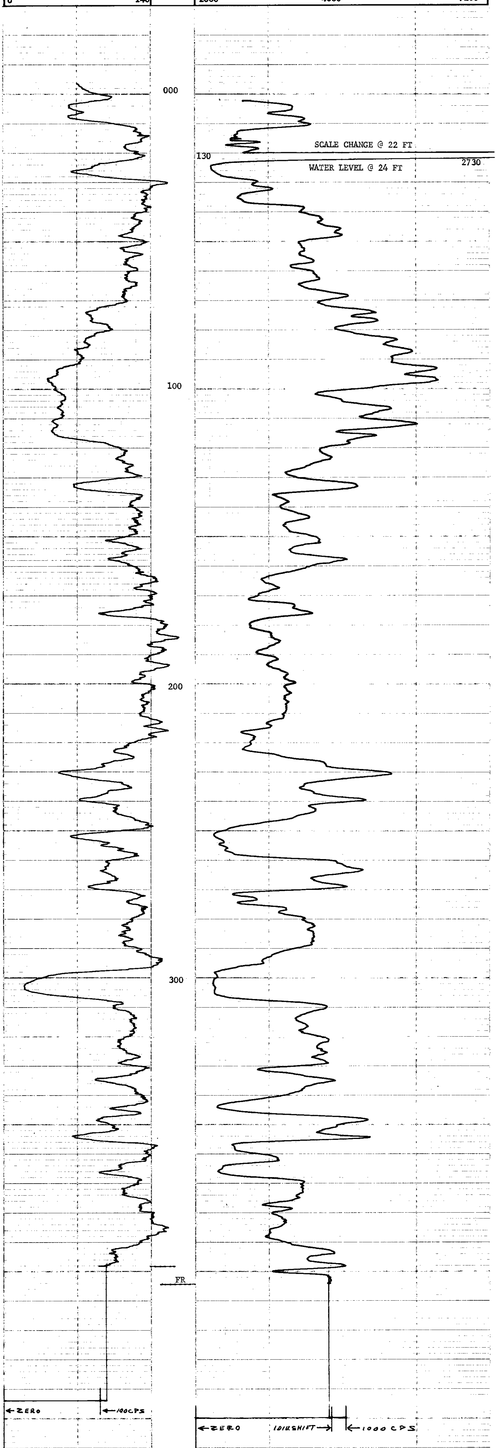
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6,7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	22	12	3	100	0L	14	3	1000	8 L	260
	22	404	12	3	100	0L	14	3	500	1 L	130

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 14		API 260
0 — 140		2080 — 4680 — 7280



K-FOLDING RIVER 77(3)A

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W.M.

COMPANY FORDING COAL LIMITED

WELL RE - 440

LOCATION GRADE PIT

320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev.
Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum
Well Depths Measured from: GROUND LEVEL

K.B.
D.F.
G.L.

Other Services: NONE

Run. No.	ONE
Date	6 JUNE 1977
First Reading	297
Last Reading	0
Footage Logged	297
Depth Reached	298
Depth Driller	
Casing Rake	
Casing Driller	14
Fluid Type	AIR/WATER
Liquid Level	24
Min. Diam.	5
Rm @ °F	
Operating Time	1 HRS
Truck No.	37

Recorded By JOHNSON

Witnessed By SHAW

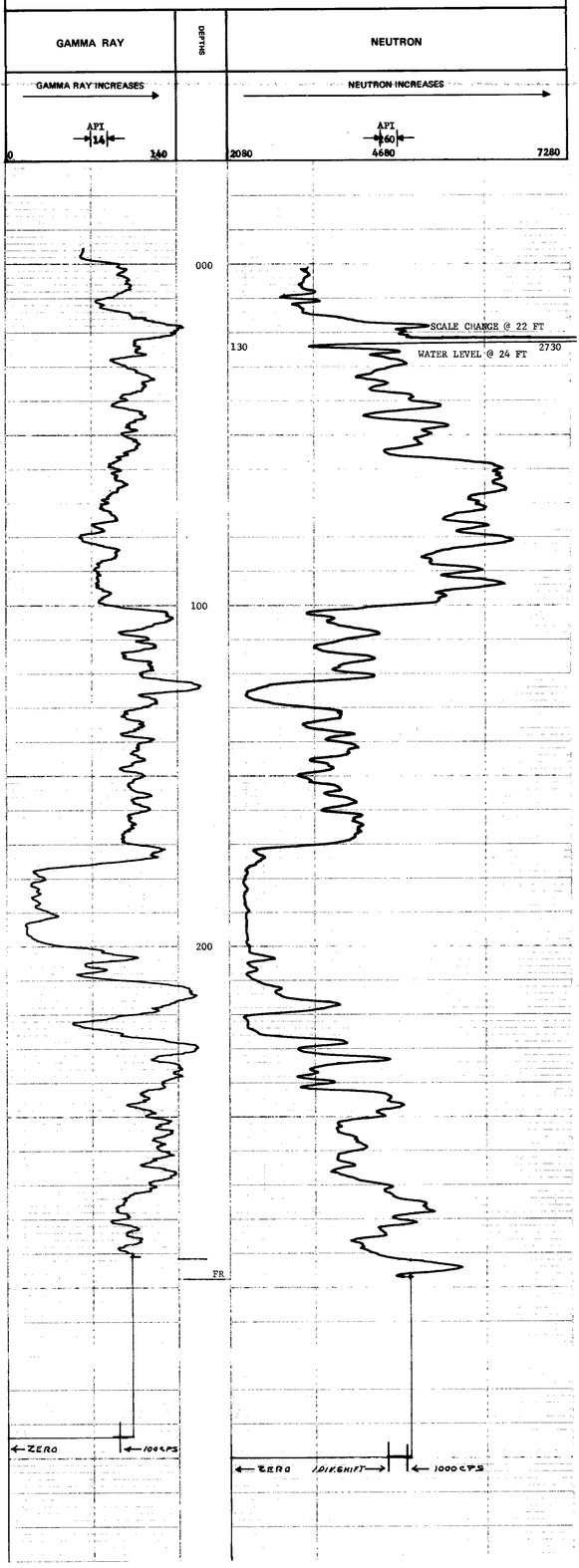
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	2 CURIES

LOGGING DATA

GENERAL				GAMMA RAY			NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	22	12	5	100	OL	14	3	1000	8 L	260
	22	297	12	5	100	OL	14	3	500	1 L	130

REMARKS



K-FOLDING RIVER 72(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD SEC TWP RGE W.....M

COMPANY FOLDING COAL LIMITED

WELL RN + 492

LOCATION GLADE PIT

FIELD FOLDING

320

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev. .....

Log Measured From GROUND LEVEL Ft. Above Perm. Datum .....

Drlg. Measured From GROUND LEVEL G.L. .....

K.B. .....

DF .....

Other Services: NONE

Run. No. ONE

Date 3 JUNE 1977

First Reading 375

Last Reading 0

Logged Interval 375

Casing Logged 375

Depth Driller 376

Depth Logger 376

Casing Bore .....

Casing Driller .....

Fluid Type AIR/WATER

Liquid Level 81

Mtr. Oper. 3 1/8

Rm @ °F .....

Operating Time .....

Truck No. 1 MOTR

Witnessed By SHAW

Recorded By JOHNSON

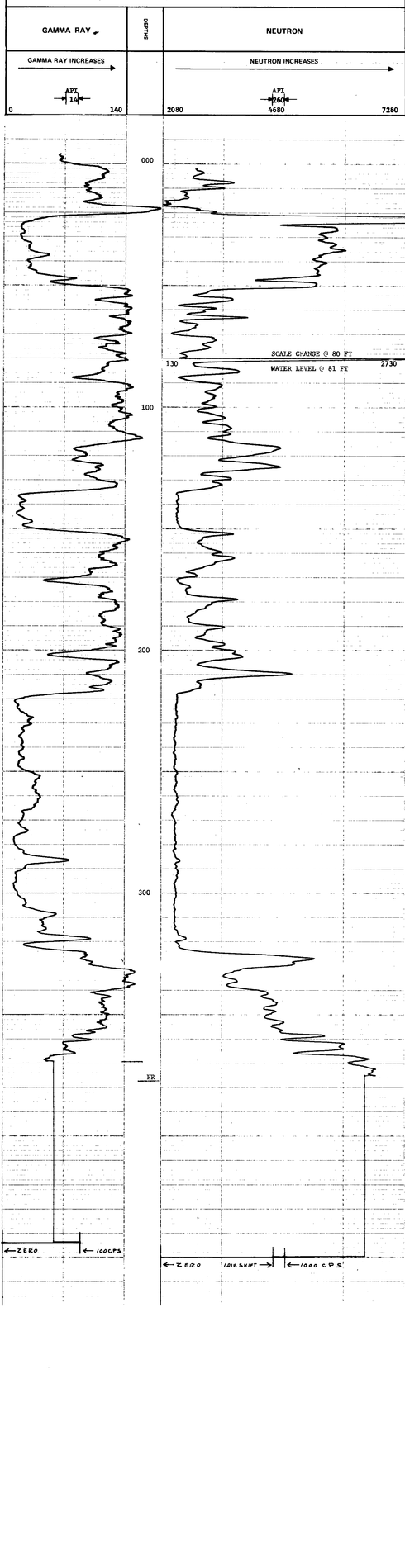
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	80	12	5	100	OL	14	3	1000	8 L	260
	80	375	12	5	100	OL	14	3	500	1 L	130

REMARKS



K-FOONG PAGE 72(a)+

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RH - 491

LOCATION CEDAR PIT

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev. K.B. —
Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum — D.F. —
Elev. Depths Measured from: GROUND LEVEL — G.L. —

Other Services: NONE

320

Run. No.	ONE		
Date	3 JUNE 1977		
Last Reading	0		
Footage Logged	375		
Depth Reached	376		
Depth Driller	376		
Casing Rdrs			
Casing Schlmbrgr			
Fluid Type	AIR/WATER		
Liquid Level	81		
Min. Diam.	5 1/8		
Rm @ °F			
Operating Time	1 HOUR		
Truck No.	37		

Recorded By JOHNSON

Witnessed By SHAW

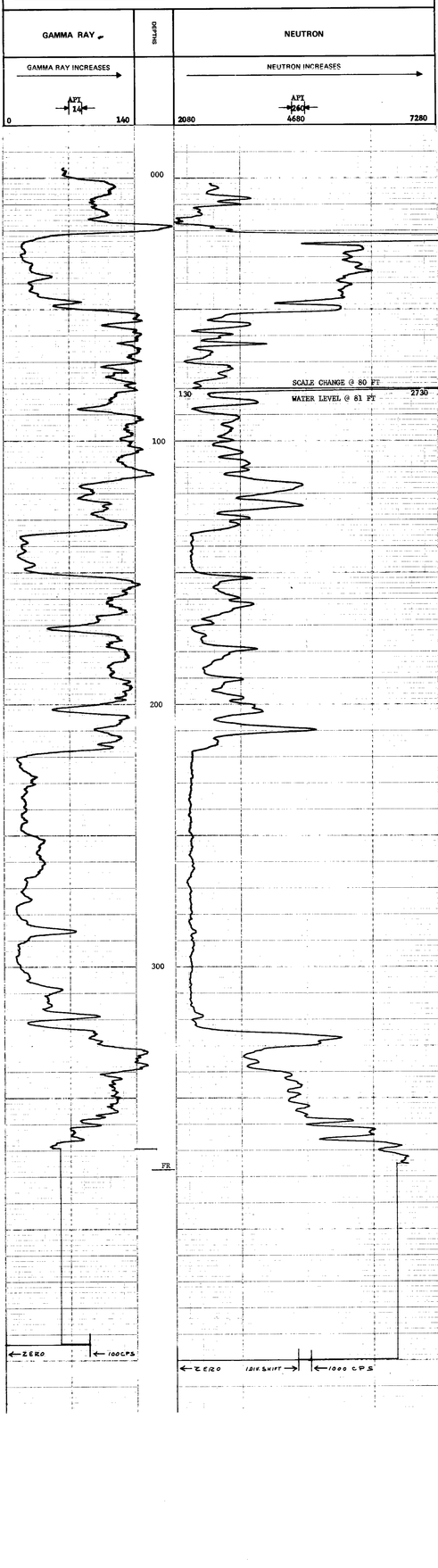
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	80	12	5	100	0L	14	3	1000	8 L	260
	80	375	12	5	100	0L	14	3	500	1 L	130

REMARKS



K-FOREDAY RIVER 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL EH - 492

LOCATION CLADE FIT 320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured From GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.

D.F.

G.L.

Other Services:

NONE

LSD
SEC
TWP
RGE
W ..... M

Run No. ONE

Date 19 JUNE 1977

First Reading 336

Last Reading 0

Footage Logged 336

Depth Reached 337

Casing Size 337

Casing Rdg.

Casing Driller 10

Fluid Type AIR/WATER

Liquid Level 53

Min. Diam. 5

Rm @ °F

Operating Time 1 HOUR

Truck No. 37

Recorded By JOHNSON

Witnessed By AARES

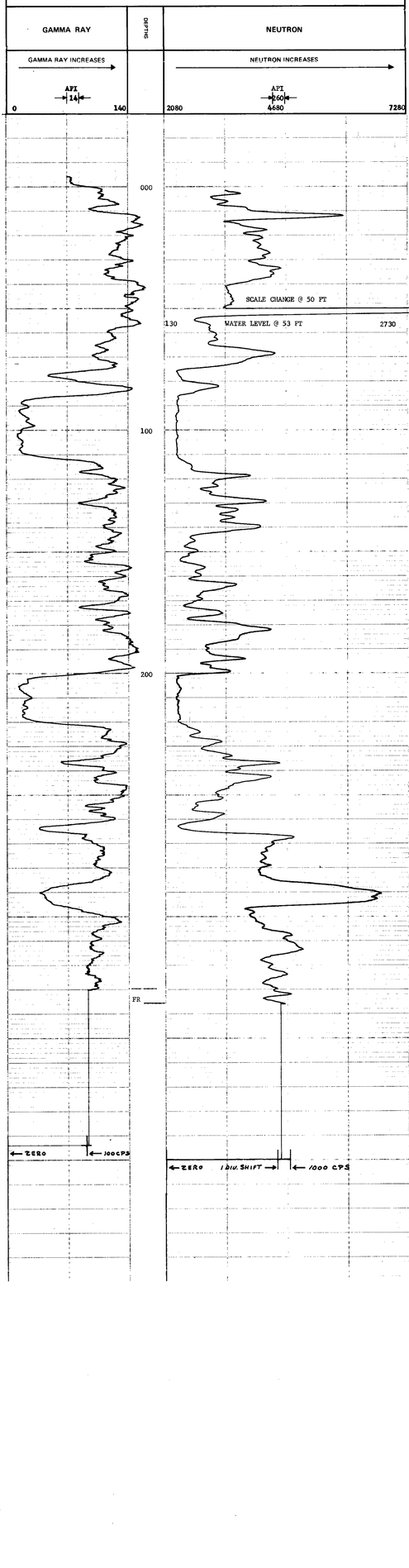
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 5/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.2 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	50	12	5	100	0L	14	3	1000	8L	260
	50	336	12	5	100	0L	14	3	500	1L	130

REMARKS



K-FOLDING RISE 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RE - 493

LOCATION GLADE PIT 320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev.

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL — K.B. / G.L.

Other Services: NONE

LSD SEC TWP RGE W M

Run. No.	ONE
Date	6 JUNE 1977
First Reading	348
Last Reading	0
Footage Logged	348
Depth Reached	348
Depth Driller	350
Casing Logged	20
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	20
Max. Temp.	
Min. Diam.	3
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	JOHNSON
Witnessed By	SHAW

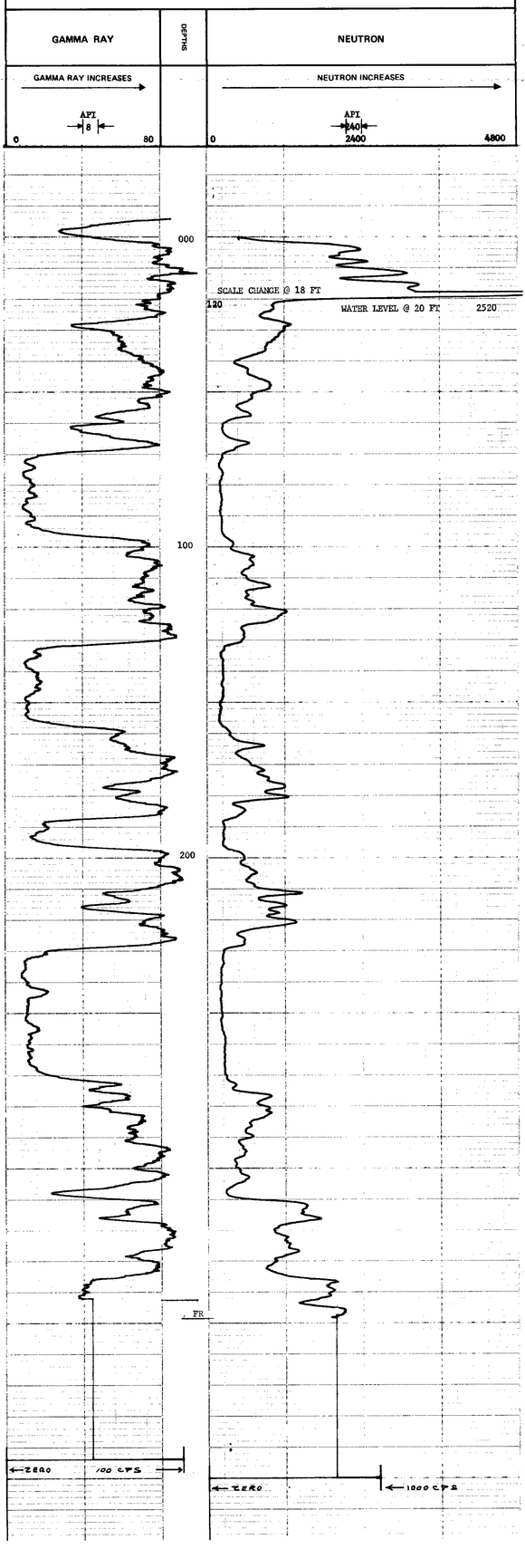
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	18	12	5	100	OL	8	3	1000	OL	240
	18	348	12	5	100	OL	8	3	500	OL	120

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FORONG-E.WEL 77(3)A

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD SEC TWP RGE M

COMPANY FORONG COAL LIMITED

WELL RE - 44A

LOCATION CLOSE ICT

FIELD FORONG

320

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: GROUND LEVEL Ft. Above Perm. Datum

D.F. / G.L.

Other Services: NONE

Run. No. ONE

Date 14 JUNE 1977

First Reading 406

Last Reading 7

Last Casing Logged 406

Depth Reached 407

Depth Driller 407

Casing Rdrs 30

Fluid Type AIR/WATER

Density / Viscosity

Min. Diam. 2"

Rm @ °F

Operating Time

Truck No. 1 ROKEN 37

Recorded By JOHNSON

Witnessed By ALLEN

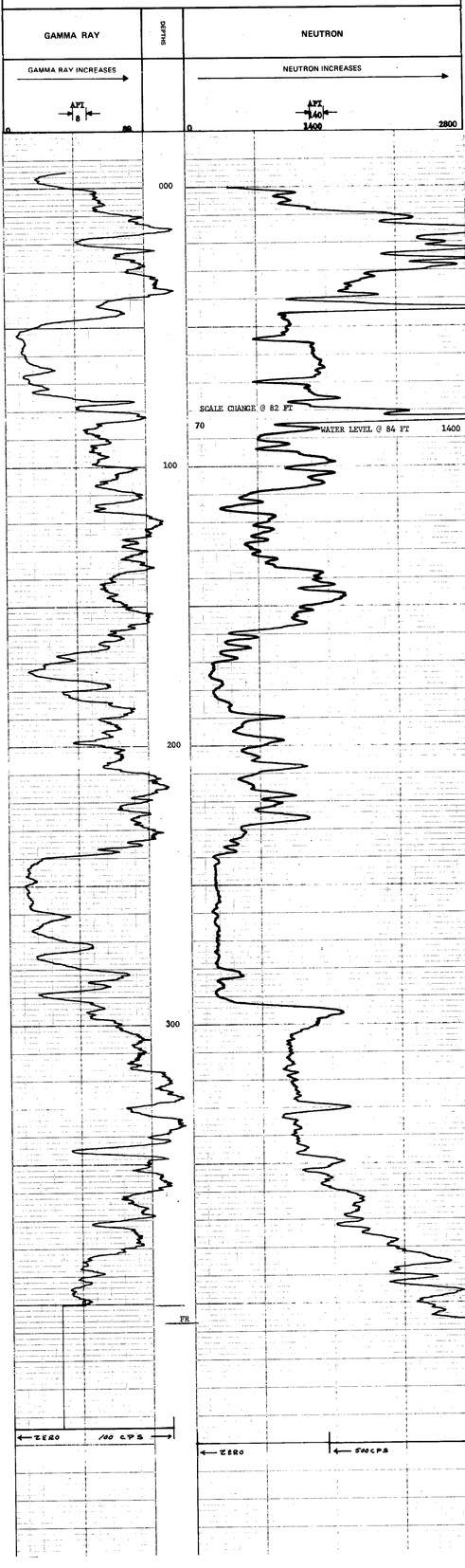
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	-
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.F FT.	LENGTH	8 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GEN 169-002	STRENGTH	2 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	82	12	5	100	OL	8	3	1000	OL	140
	82	406	12	5	100	OL	8	3	500	OL	70

REMARKS LOGGED THROUGH DOUBLE WALL STEEL



K-FOREDING RIVER 77(3)A

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD SEC TWP RGE M

COMPANY FORDING COAL LIMITED

WELL EH - 495

LOCATION GRADE FTT 320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Other Services: NONE

Run No.	ONE
Date	16 JUNE 1977
First Reading	347
Last Reading	0
Footage Logged	347
Depth Reached	346
Depth Driller	350
Casing Rate	
Casing Driller	10
Fluid Type	AIR/WATER
Liquid Level	44
Mfn. Diam.	5
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON Witnessed By ATTEN

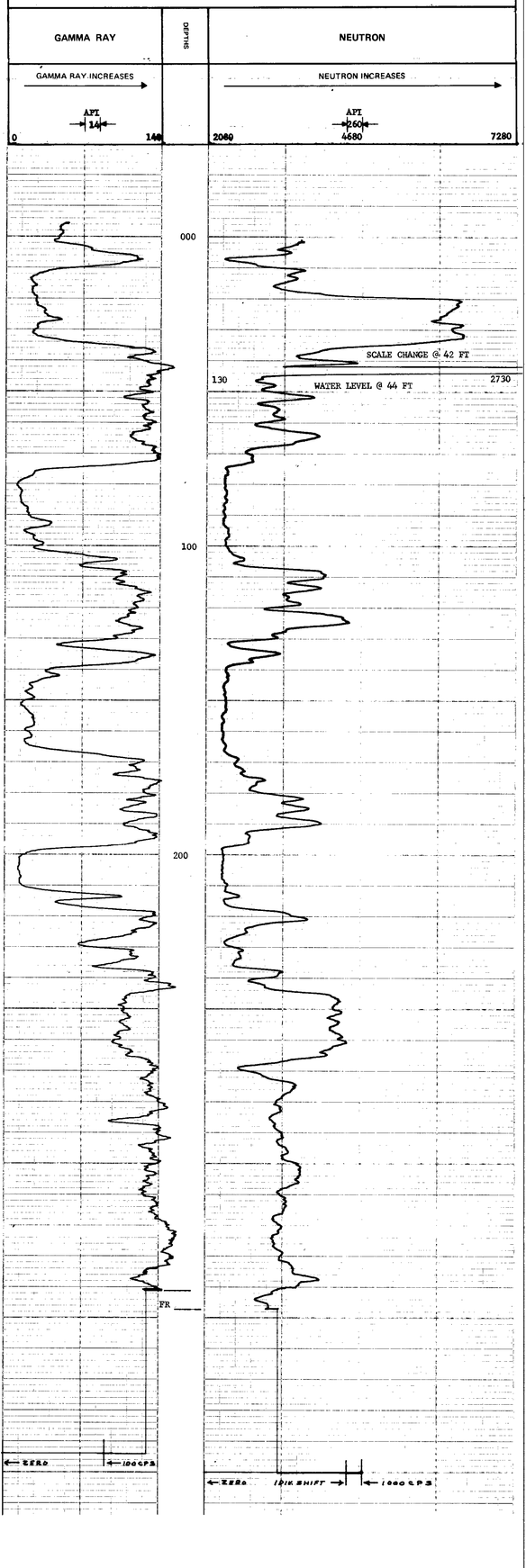
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	5 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	42	12	5	100	0L	14	3	1000	8 L	260
	42	347	12	5	100	0L	14	3	500	1 L	130

REMARKS



ROKE

GAMMA RAY - NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL EH-496

LOCATION CLOSE FIT

FIELD FORDING

PROVINCE BRITISH COLUMBIA

LSD SEC TWP RGE W M

320

Other Services: NONE

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL

K.B. D.F. G.L. CSG

Run No.	ONE		
Date	16 JUNE 1977		
First Reading	349		
Last Reading	0		
Footage Logged	349		
Depth Reached	350		
Depth Driller	350		
Casing Rake			
Casing Driller	10		
Fluid Type	AIR/WATER		
Liquid Level	31		
Min. Diam.	5		
Rm @ °F			
Operating Time	1 HOUR		
Truck No.	37		

Recorded By: [illegible]

Witnessed By: ALEX

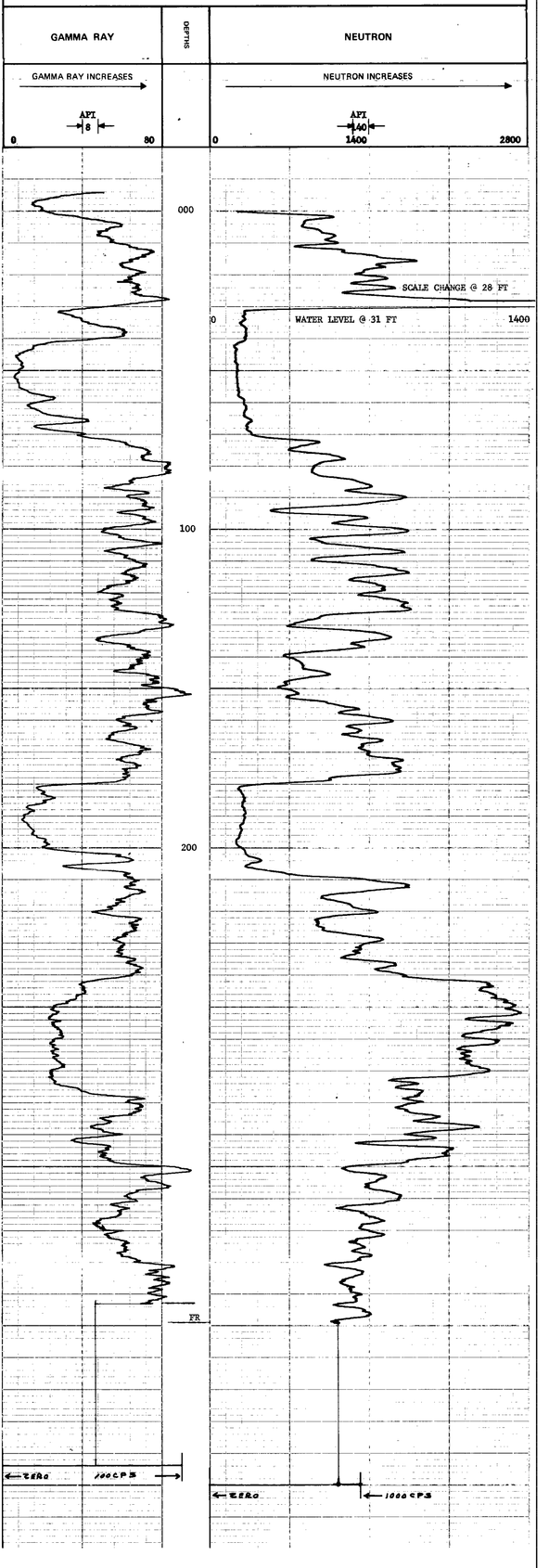
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	[illegible]	DETECTOR MODEL NO.	
LENGTH	3 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	[illegible] FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	[illegible]

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	28	12	5	100	OL	8	3	1000	OL	140
	28	349	12	5	100	OL	8	3	500	OL	70

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FOONG REMC 77(3)4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FOUDINO COAL LIMITED

WELL RR - 497

LOCATION CLADE PIT

FIELD FOUDINO

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev.: K.B. —
Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum — D.F. —
Well Depths Measured from: GROUND LEVEL — G.L. —

Other Services: NONE

LSD SEC TWP RGE W M

320

Run. No.	ONE		
Date	19 JUNE 1977		
Last Reading	331		
Footage Logged	0		
Depth Reached	331		
Depth Driller	332		
Casing Size	333		
Casing Depth	10		
Fluid Type	AIR/WATER		
Liquid Level	18		
Min. Diam.	5		
Rm @ °F			
Operating Time	1 HOUR		
Truck No.	37		

Recorded By JOHNSON — Witnessed By ALKEN

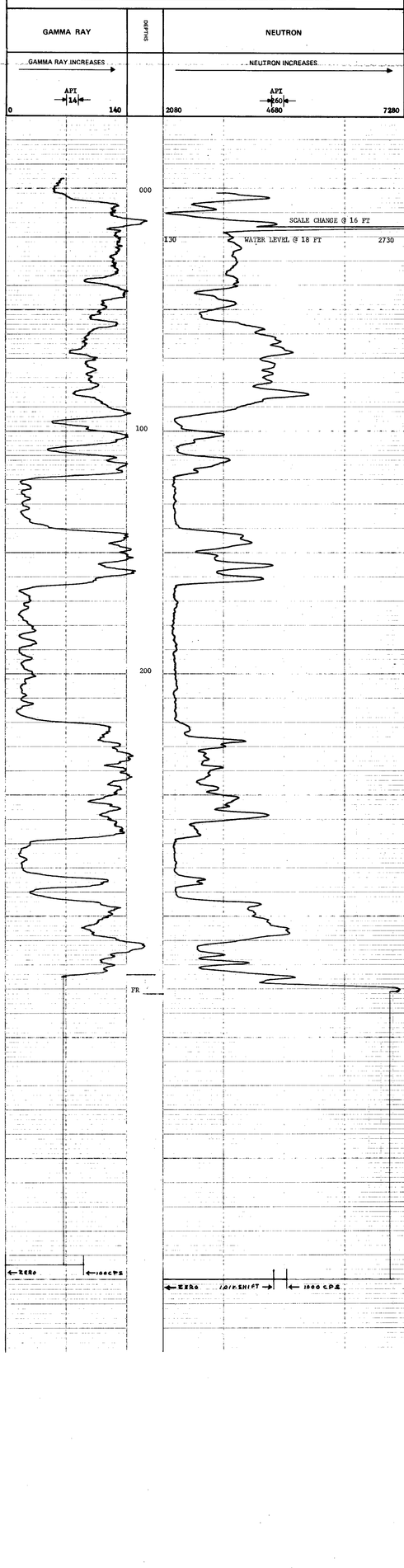
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6ft FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	16	12	5	100	0L	14	3	1000	8L	260
	16	331	12	5	100	0L	14	3	500	1L	130

REMARKS



K-FORENSIC TRACE 77 (3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RR - 498

LOCATION C1-07E PIT

320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev.

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL

K.B.

DFG

G.L.

Other Services: NONE

LSD SEC TWP RGE W ____ M

Run. No. ONE

Date 22 JUNE 1977

First Reading 390

Last Reading 0

Footage Logged 390

Depth Reached 393

Depth Driller A10

Depth Logger

Casing Driller 40

Fluid Type AIR/WATER

Liquid Level 68

Min. Diam. 4 7/8

Rm. @ °F

Operating Time 3 HRS

Truck No. 37

Recorded By ROBINSON

Witnessed By ATKEN

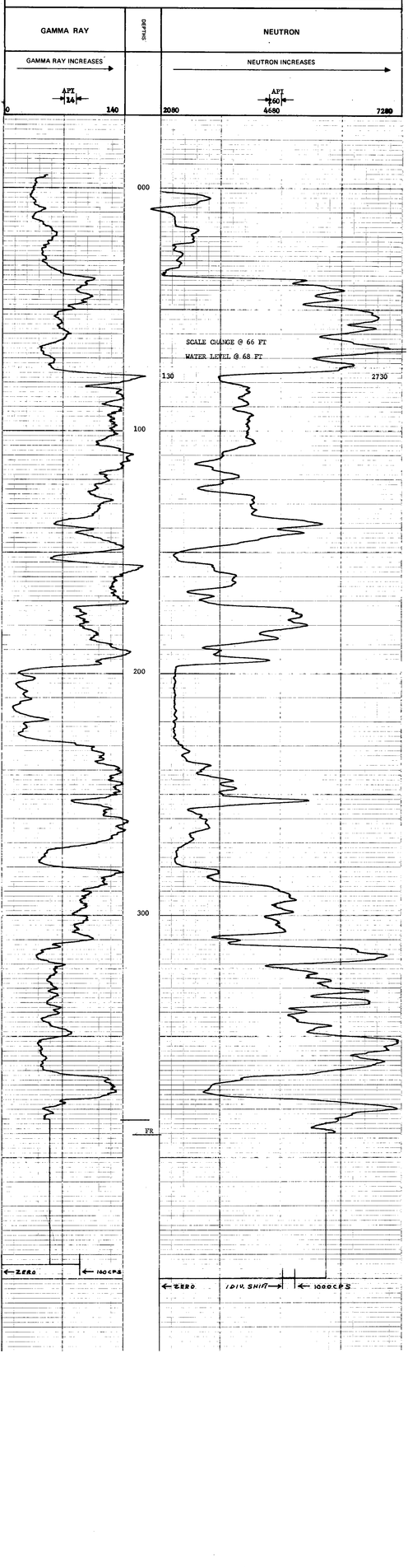
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	66	12	5	100	OL	14	3	1000	8 L	260
	66	390	12	5	100	OL	14	3	500	1L	130

REMARKS



K - FORDING RIVER 77(3)-4

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD SEC TWP RGE W M

COMPANY FORDING COAL LIMITED

WELL EH - 499

LOCATION GLADE PIT

320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.

CSG

G.L.

Other Services: NONE

Run No.	ONE
Date	27 JUNE 1977
First Reading	297
Last Reading	0
Footage Logged	297
Depth Reached	298
Depth Driller	300
Casing Rate	
Casing Driller	21
Fluid Type	AIR/WATER
Liquid Level	48
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By KOMENAC

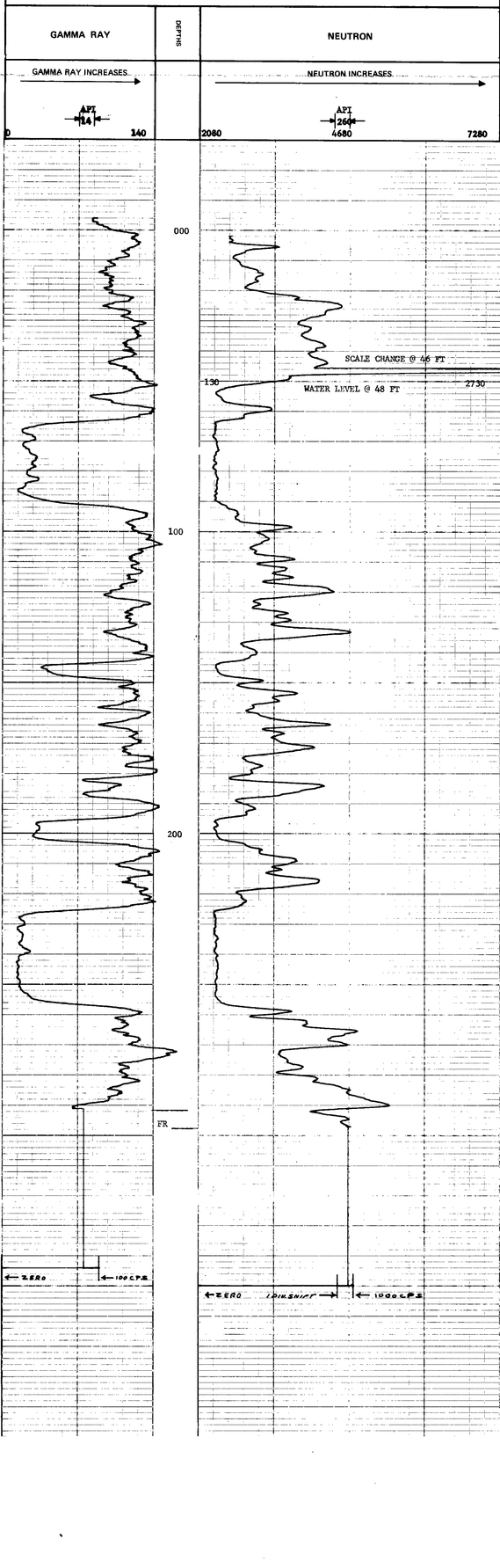
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	5 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	46	12	5	100	01 L	14	3	1000	8 L	260
	46	297	12	5	100	01 L	14	3	500	1 L	130

REMARKS



K-FORDING RIVER 77 (3) A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL RH - 605 A

LOCATION TURNBULL MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. ____
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B. ____
CSG ____
G.L. ____

Run. No.	ONE
Date	6 MAY 1977
First Reading	748
Last Reading	0
Footage Logged	748
Depth Reached	749
Depth Driller	751
Casing Roke	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	356
Min. Diam.	5 1/8
Rm @ °F	
Operating Time	1½ HOURS
Truck No.	37

Recorded By JOHNSON Witnessed By SHAW

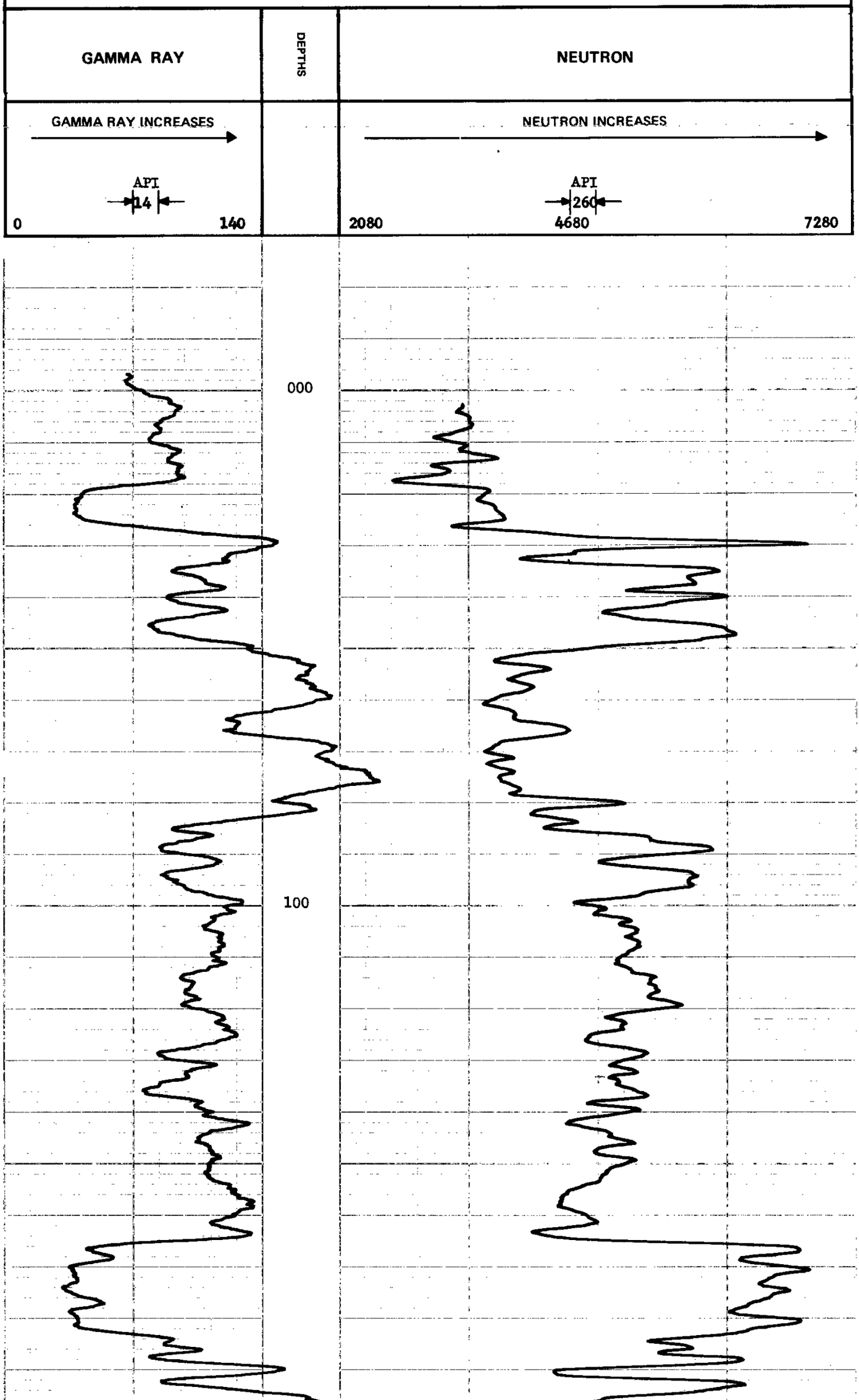
EQUIPMENT DATA

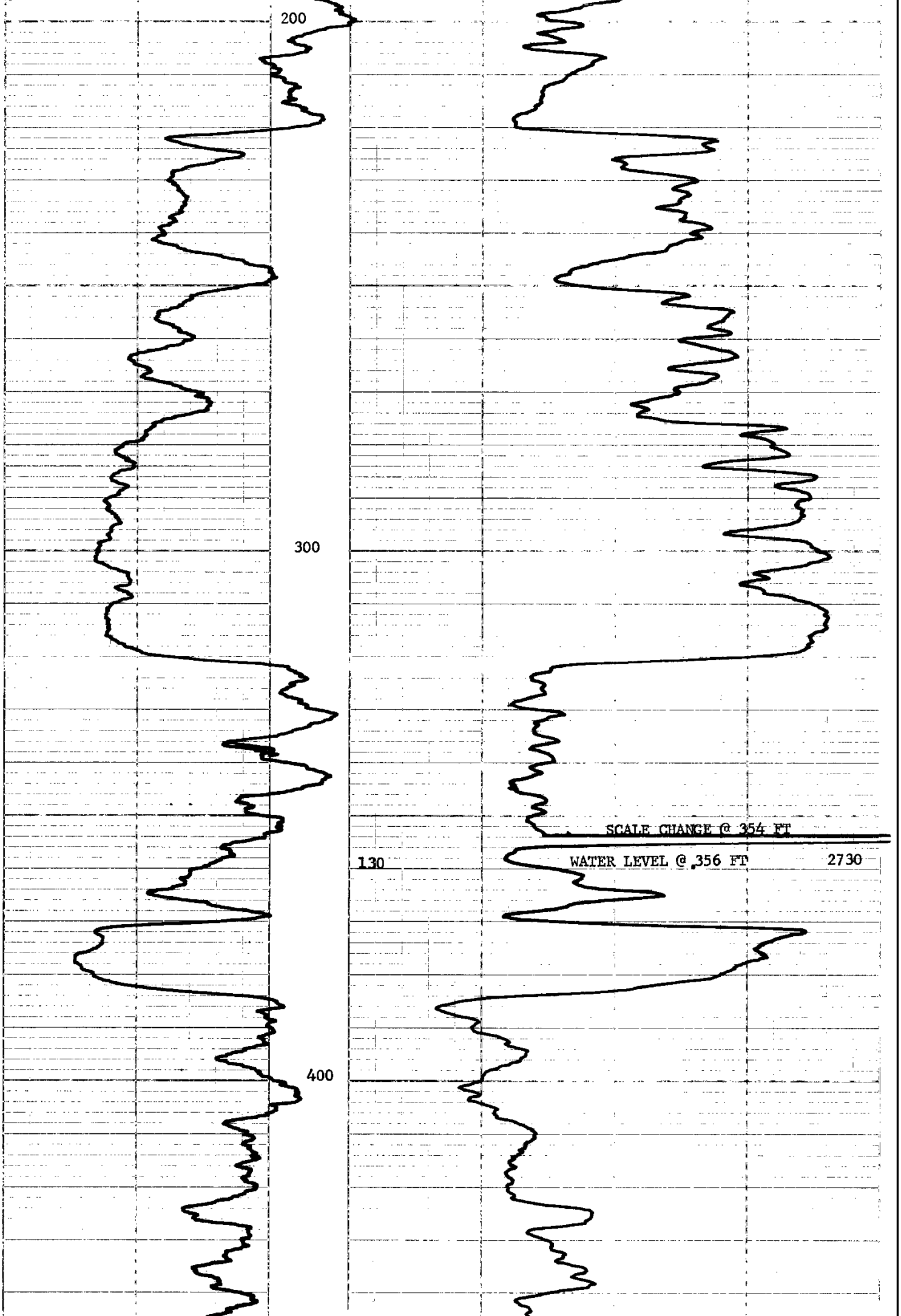
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	27 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

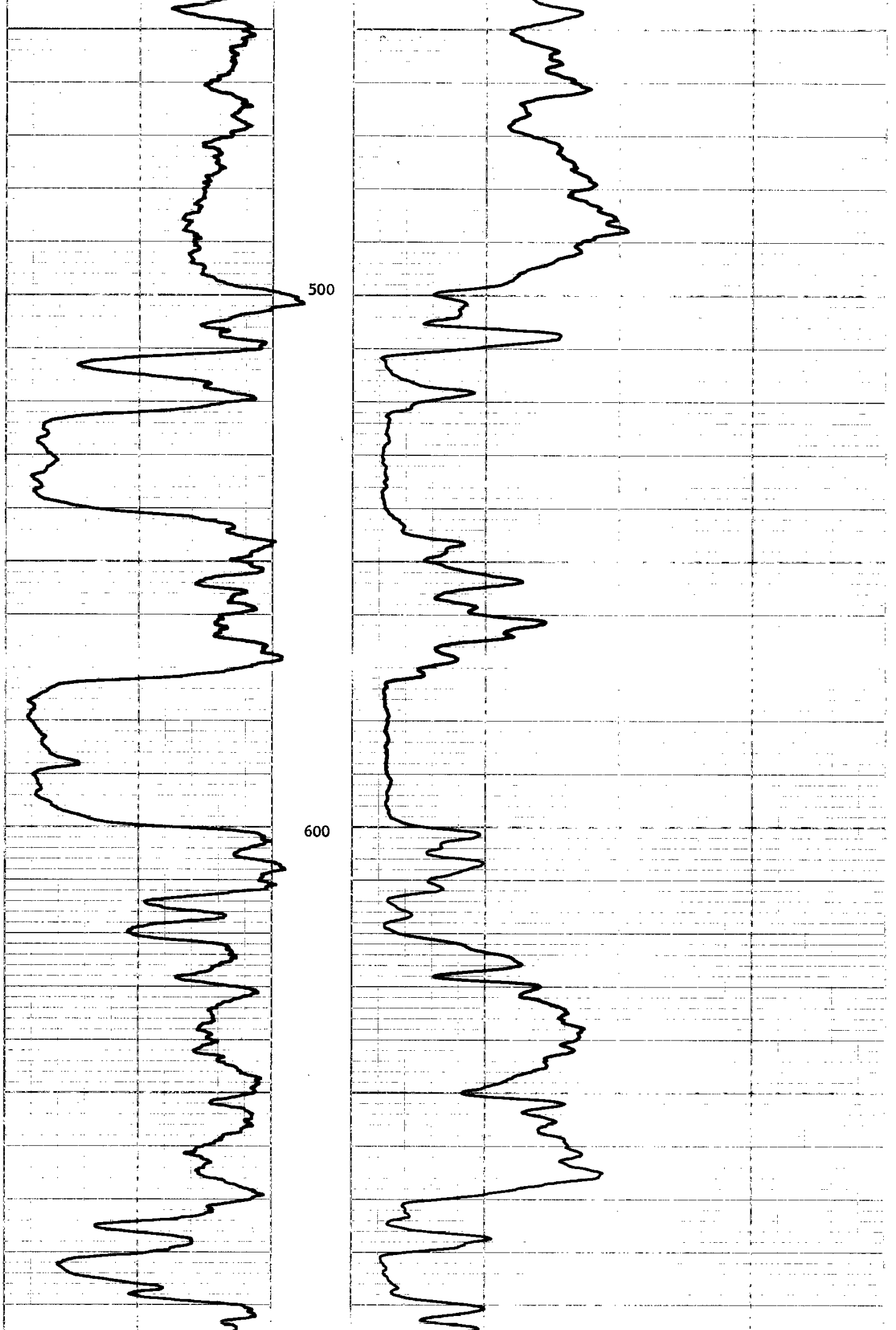
LOGGING DATA

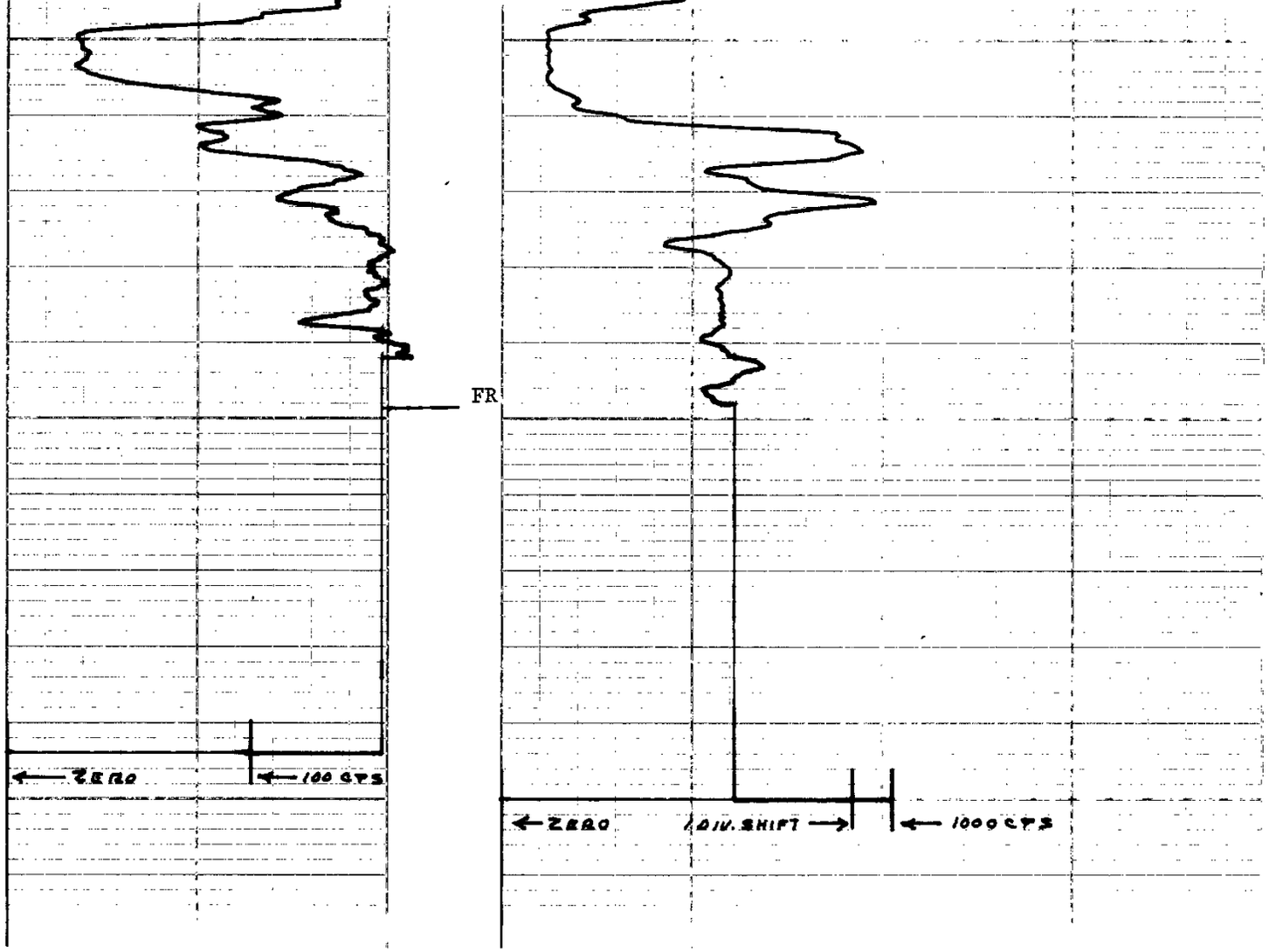
GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	354	12	5	100	0L	14	3	1000	8 L	260
	354	748	12	5	100	0L	14	3	500	1 L	130

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
API
14
0
140
NEUTRON INCREASES
API
260
2080
4680
7280
000
100


200
300
400
SCALE CHANGE @ 354 FT
130
WATER LEVEL @ 356 FT
2730


500
600


FR
ZERO
100 CPS
ZERO
1 DIV. SHIFT
1000 CPS

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

KOOTENAY RIVER 7N(3)E.

FILE NO.
SEC
TWP
RGE
M

COMPANY FORDING COAL LIMITED
WELL RE - 621
LOCATION TURNBULL MOUNTAIN
FIELD FORDING

320

Permanent Datum: GROUND LEVEL
Log Measured from: GROUND LEVEL
Drill Measured from: GROUND LEVEL
Elev. Ft. Above Perm. Datum
K.B.
D.F.
G.L.

Other Services: NONE

Run. No.	ONE
Date	6 MAY 1977
First Reading	472
Last Reading	0
Geo. Recorded	472
Depth Reached	472
Depth Driller	473
Depth Logger	473
Casing Bake	
Casing Driller	
Casing Logger	15
Bit From	SURFACE
Bit To	473
Type Fluid in Hole	AIR/WATER
Max. Rec. Temp.	
Est. Cement Top	
Equip. Location	4378
Rec. Panel No.	
Truck No.	33
Operating Time	
Recorded By	JOHNSON
Witnessed By	WALSH

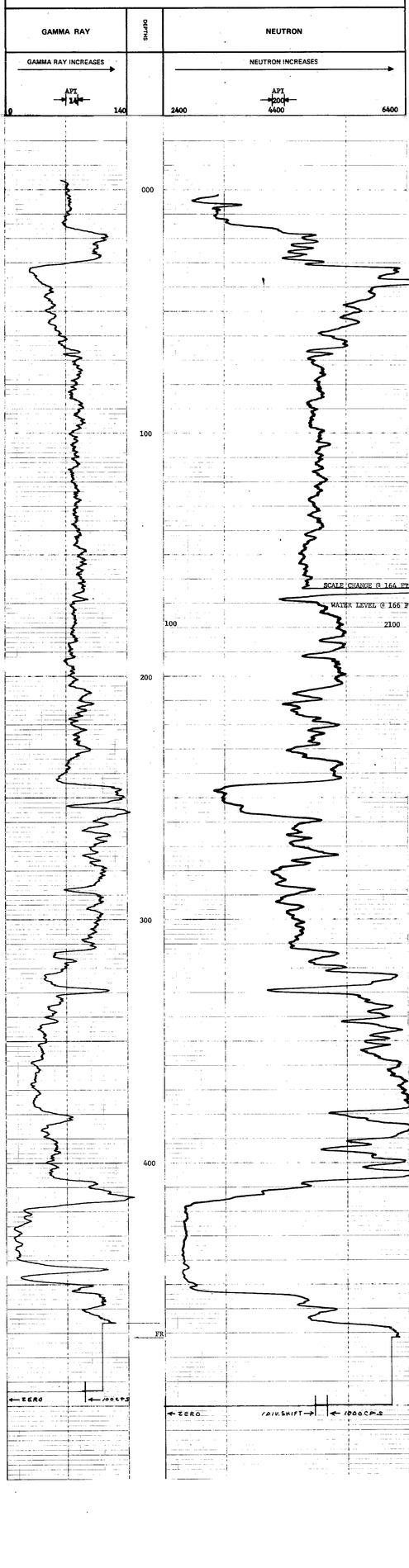
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	33	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	164	12	5	100	OL	14	3	1000	12L	200
	164	472	12	5	100	OL	14	3	500	1L	100

REMARKS



ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY PEMBINA COAL LIMITED

WELL SEC 22 TWP 62 RGE 7 W 6 M

LOCATION TERMINUS WORKINGS

FIELD PEMBINA

PROVINCE ALBERTA COLUMBIA

COUNTY STATE

ORIGINAL LOCATION

Permanent Datum: GROUND LEVEL Elev. ____

Log Measured from: K.B. ____ D.F. ____ G.L. ____

Drilling Measured from: K.B. ____ D.F. ____ G.L. ____

Other Services: NONE

Date: 28-NOV-1977

Run No.: ONE

Depth-Driller: 655

Depth-Logger: 655

Bottom Logged Interval: 651

Top Logged Interval: 551

Casing-Driller: 551

Casing-Logger: 551

Bit Size: 4 7/8

Type Fluid in Hole: AIR/WATER

Max. Rec. Temp.: 320

Equip. No. & Location: 4 7/8

Recorded By: [illegible]

Witnessed By: [illegible]

Operating Time: 3½ HOURS

Truck No.: 37

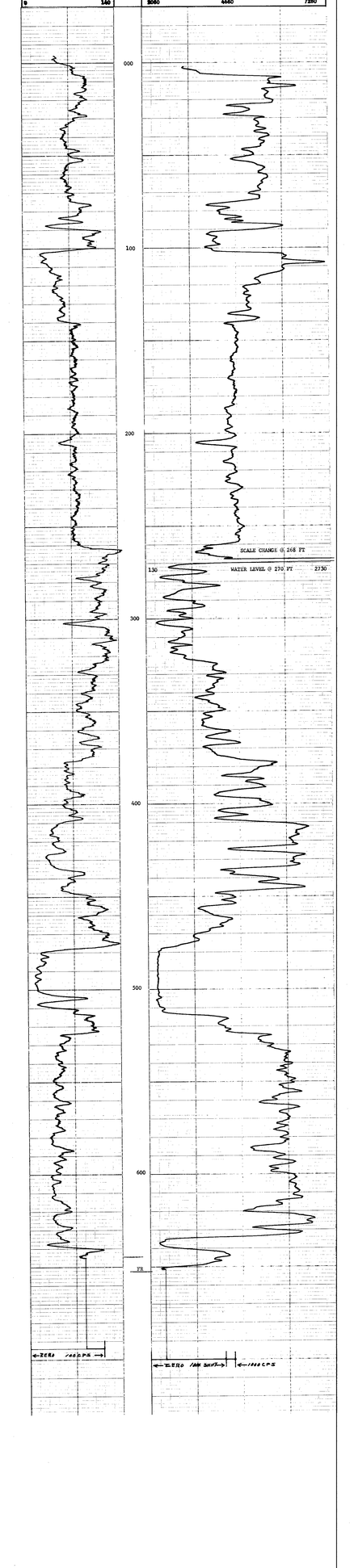
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	900 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	S GRN 169-002	TYPE	AmBe
		STRENGTH	5 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	268	12	3	100	OL	14	3	1000	8L	260
	268	651	12	5	100	OL	14	3	500	1L	130

REMARKS



K-FORDING RIVER. 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.
LSD
SEC
TWP
RGE
W. M

COMPANY FORDING COAL LIMITED

WELL RH - 623

320

LOCATION TURNBULL MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE		
Date	6 MAY 1977		
First Reading	574		
Last Reading	0		
Footage Logged	574		
Depth Reached	575		
Depth Driller	575		
Casing Roke			
Casing Driller	10		
Fluid Type	AIR/WATER		
Liquid Level	160		
Min. Diam.	4 7/8		
Rm @ °F			
Operating Time	1 HOUR		
Truck No.	83		

Recorded By [illegible] Witnessed By [illegible]

EQUIPMENT DATA

	GAMMA RAY	NEUTRON
RUN NO.	ONE	ONE
LOG TYPE		NEUTRON/NEUTRON
TOOL MODEL NO.	1 11/16	1 11/16
DIAMETER		
DETECTOR MODEL NO.	SCINTILLATION	PROPORTIONAL
TYPE	4 INCH	6 INCH
LENGTH	6.7 FT.	MRC-N-SS-W
SOURCE MODEL NO.		187
SERIAL NO.		17 INCH
SPACING		AmBe
TYPE		[illegible]
STRENGTH		

GENERAL

	GAMMA RAY	NEUTRON
RUN NO.	ONE	ONE
TOOL MODEL NO.	1 11/16	1 11/16
DIAMETER		
DETECTOR MODEL NO.	SCINTILLATION	PROPORTIONAL
TYPE	4 INCH	6 INCH
LENGTH	6.7 FT.	MRC-N-SS-W
DISTANCE TO N. SOURCE		
HOIST TRUCK NO.	33	187
INSTRUMENT TRUCK NO.		17 INCH
TOOL SERIAL NO.	R GRN 169-002	AmBe

LOGGING DATA

GENERAL

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.
1	0	158	12	5	100	OL	10
	158	574	12	5	100	OL	10

NEUTRON

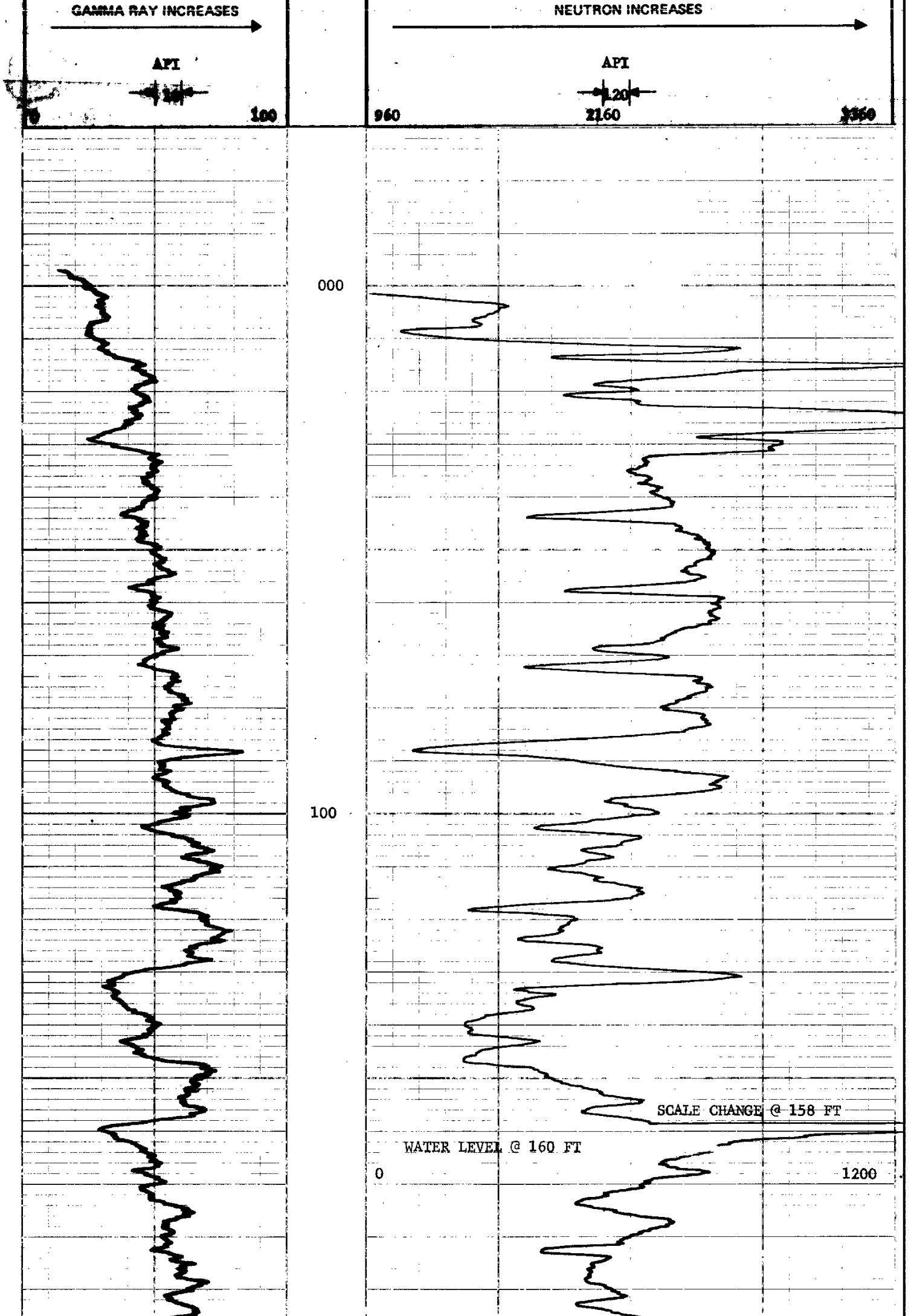
RUN NO.	DEPTHS FROM	DEPTHS TO	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	158	3	1000	12 L	120
	158	574	3	500	0 L	60

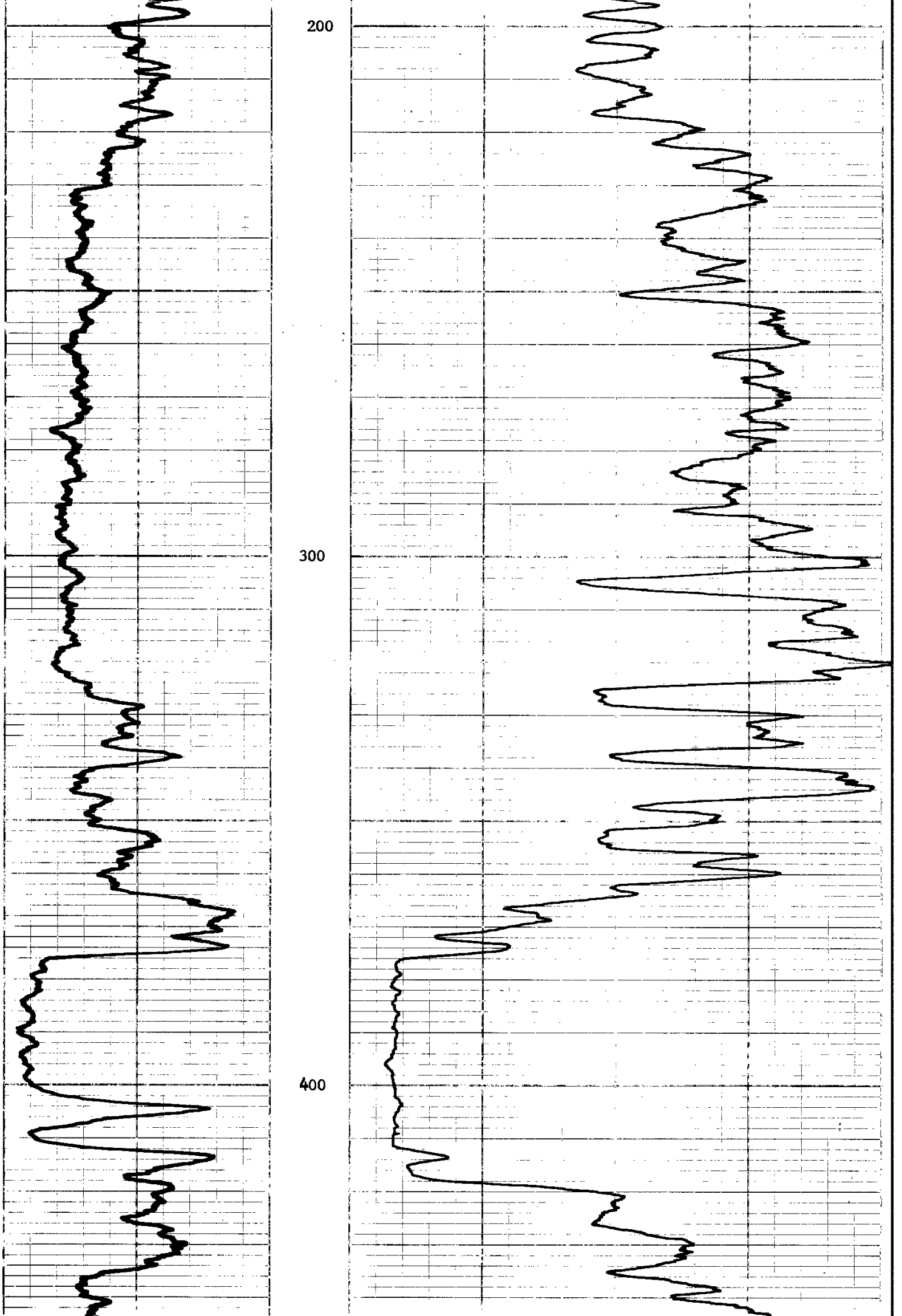
REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM

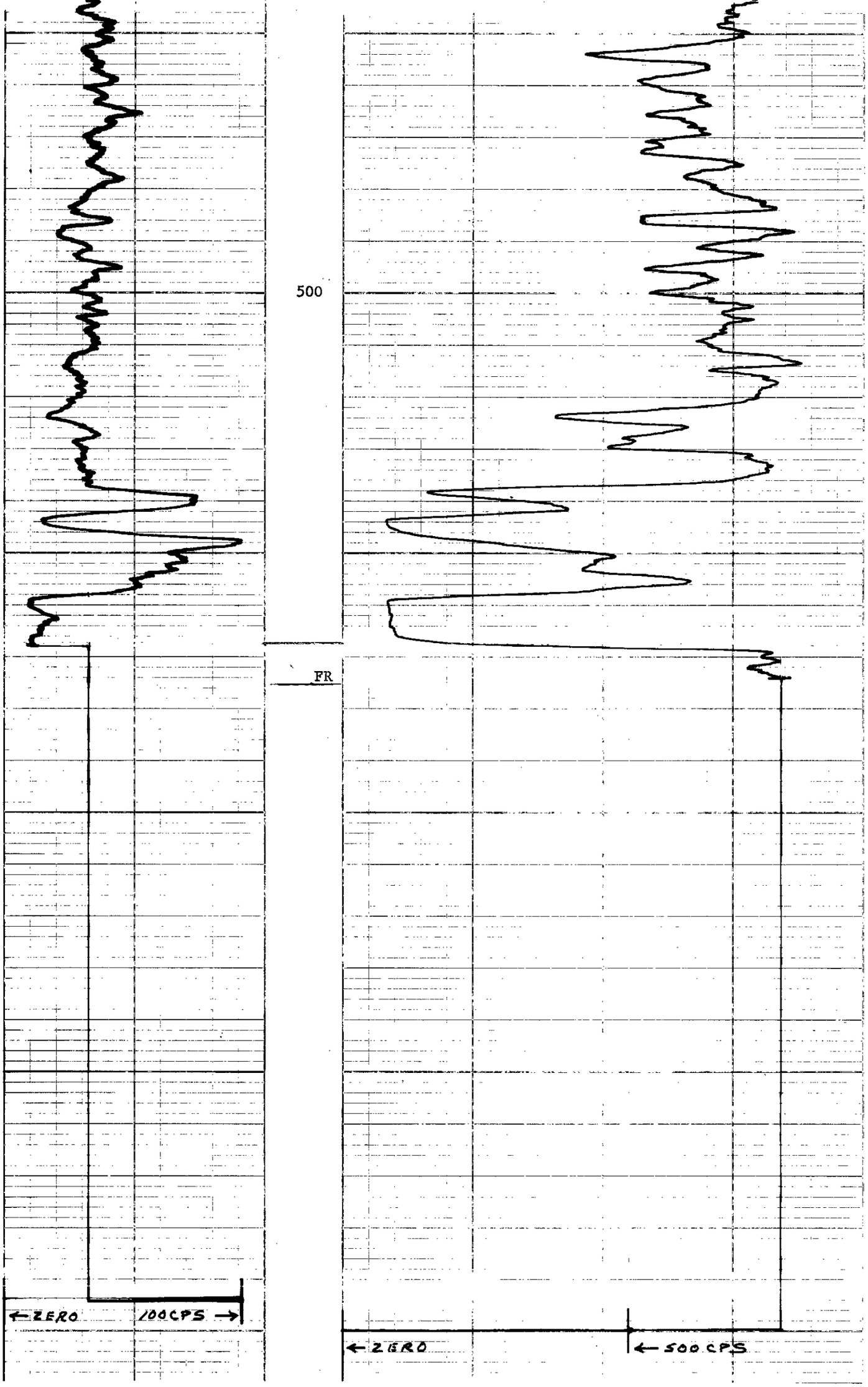
NEUTRON

DEPTHS

GAMMA RAY


GAMMA RAY INCREASES
API
0
100
NEUTRON INCREASES
API
960
2160
000
100
SCALE CHANGE @ 158 FT
WATER LEVEL @ 160 FT
0
1200


200
300
400


500
FR
← ZERO
100 CPS →
← ZERO
← 500 CPS

Widco* WELL LOG

KFORDING RIVER 77(3)A

AREA TURNBULL MT.

WELL RH 624

320

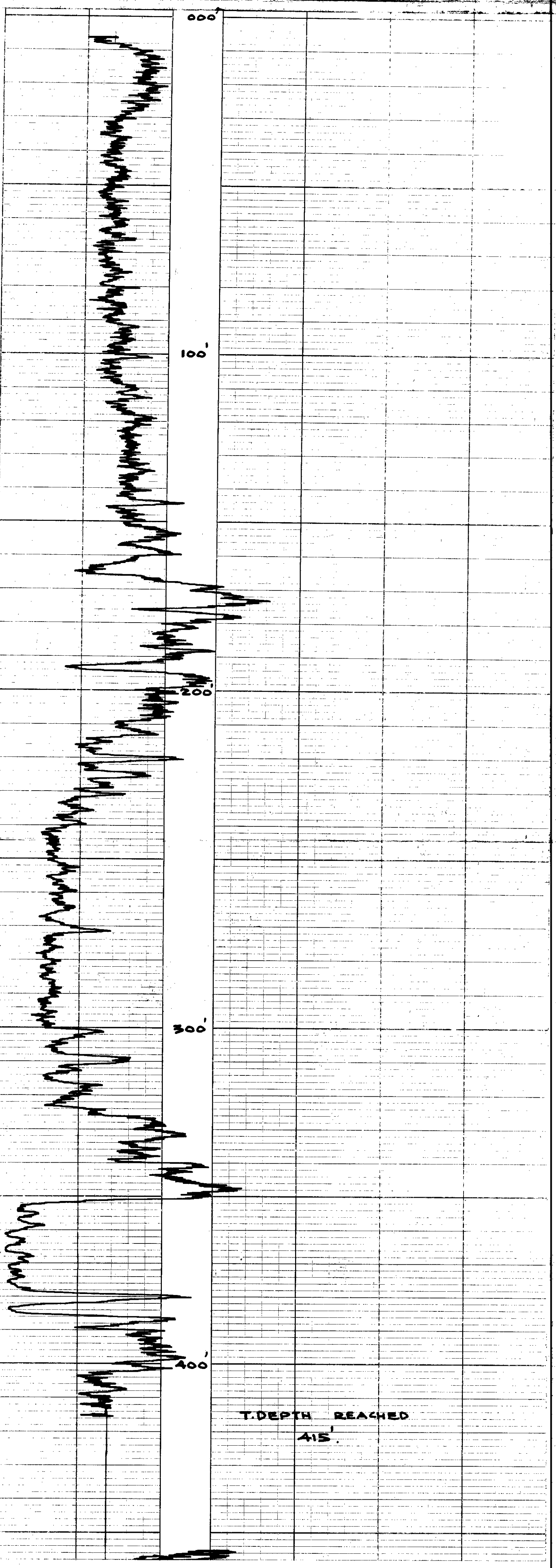
COUNTY STATE

COORDINATES
N
S
ELEVATION
D F
K B
G

RH 624 TURNBULL MT.

	Run No. 1	Run No. 2	Mud	Run No. 1	Run No. 2
Date			Mud Type		
First Reading			Density		
Last Reading			Viscosity	F	F
Footage Logged			Resistivity	F	F
Bottom Driller			Res. @ BHT	F	F
Casing From Log			pH		
Casing Driller			Fluid Loss		
Casing Size			BH Temp.		
Bit Size					
Bit Size					
			Logged by	R.K.	
			Witnessed by		

REMARKS MAY. 7 '77 12 A.P.I.



Widco* WELL LOG

COMPANY K-FORDING RIVER LTD (B) A.

AREA TURNBULL

WELL RH C25

320

COUNTY STATE

*COORDINATES N S

ELEVATION DF KB GL

RH C25 TURNBULL

	Run No.	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom Driller			Res. @ BHT	@ F	@ F
Casing From Log			pH		
Casing Driller			Circ. Temp		
Casing Size			BH Temp		
Bit From					
Bit Size			Logged by		
			Witnessed by	W.H.S.	

REMARKS 11 A.P.I. - MAY. 26'77

LOGGED THROUGH DOUBLE WALL DRILL PIPE

PART SEAM-4

SEAM-2 4'

SEAM-1 5'

SEAM-R5 10'

SEAM-R4 R4(C) 10'

T.D. DRILLED 558'

K-FOOTHILLS RIVER 72(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LOG SEC TWP RGE W M

COMPANY FORDING COAL LIMITED

WELL BH - 626

LOCATION TURNERVILLE MOUNTAIN

FIELD FORDING

320

Permanent Datum: GROUND LEVEL — Elev. — Ft. Above Perm. Datum

Log Measured From: GROUND LEVEL — K.B. —

Drill. Measured From: GROUND LEVEL — D.F. —

Other Services: NONE

Run No. ONE

Date 13 MAY 1977

First Reading 483

Last Reading 0

Depth Logged 483

Depth Driller 484

Depth Data 485

Casing Data 10

Fluid Type AIR/WATER

Fluid Level 286

Max. Obsd. Temp. 4 1/2 °C

Rm @ °F

Operating Time

Truck No. 37

Recorded By W. Howard

Witnessed By

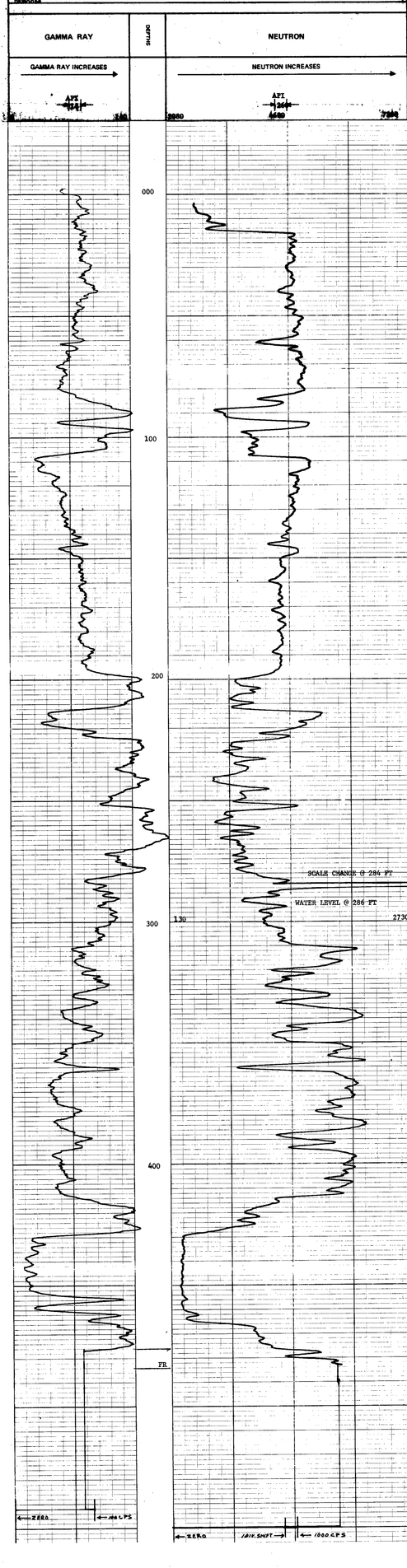
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	4.5 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-85-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 curies

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	284	12	5	100	OL	14	3	1000	6L	260
	286	483	12	5	100	OL	14	3	500	1L	130

REMARKS



K-FORKING RIVER 7.5 Ft.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY ROKE OIL LIMITED

WELL 301 - 6527

LOCATION TURNBULL MOUNTAIN

FIELD WILDCAT

320

Permanent Datum: GROUND LEVEL Elev. Ft. Above Perm. Datum

Log Measured from: GROUND LEVEL

Drill Measured from: GROUND LEVEL

K.B. 4,935

D.F.

G.L.

Other Services:

SEC. TWP. RGE. W. M.

LSD

Run No.	ONE
Date	19 MAY 1977
Last Reading	5500
First Reading	0
Casing Logged	500
Depth Reached	5501
Bit Size	5501
Casing Size	
Casing Driller	
Casing Logger	10
Fluid Type	ATTAPULGITE
Density / Viscosity	1.34
Max. Rec. Temp.	
Min. Chart Speed	5
Rm @ °F	
Operating Time	3 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By SHAW

EQUIPMENT DATA

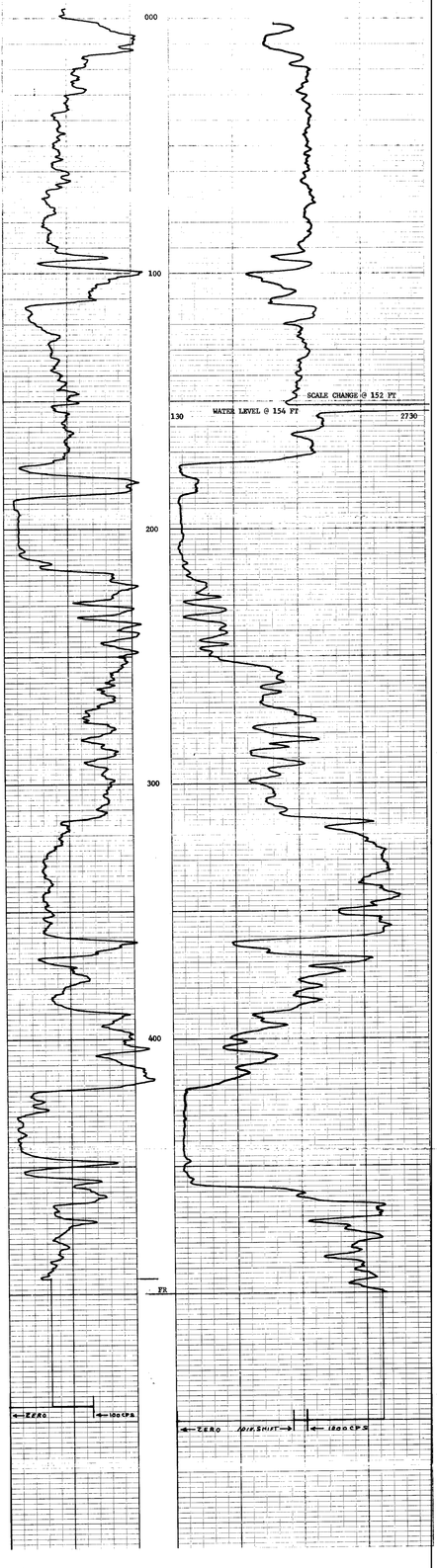
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTH FROM	DEPTH TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	152	12	5	100	01 L	14	3	1000	8 L	260
	152	500	12	5	100	01 L	14	3	500	1 L	130

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 14		API 260
0 — 140		2080 — 4680 — 7280



Widco* WELL LOG

COMPANY K-FORDING RIVER 77 (3)4.

AREA TURNBULL

WELL R H 628

COUNTY STATE

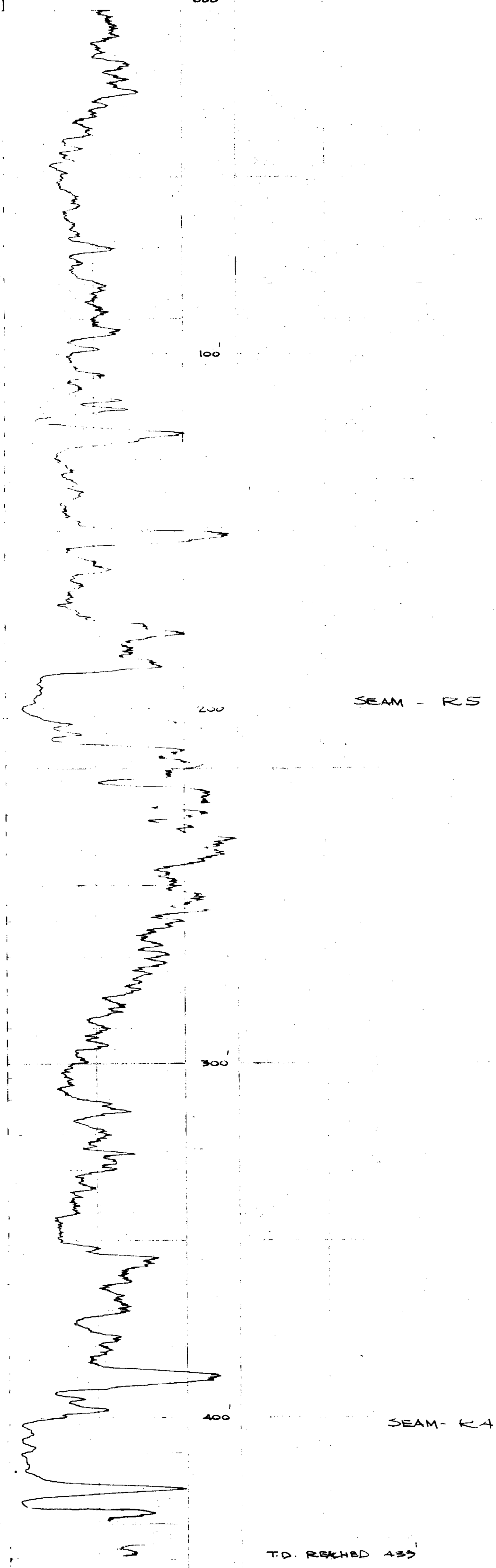
320

COORDINATES
N
S
ELEVATION
D F
K B
G L

COMPANY
WELL
FIELD
RH 628

	Run No 1	Run No 2	MUD	Run No 1	Run No 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller			Res @ BHT	F	@ F
Casing (From Log			pH		
Casing (Driller			Circ Temp		
Casing Size			B H Temp		
Bit Size					
Bit Size					
			Logged by	W. H. S.	
			Witnessed by		

REMARKS 14 A.P.I. MAY 11'77



* Reg U S Pat Off

K-FOOTHILLS RIVER 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FOOTHILLS COAL LIMITED

WELL EH - 629

LOCATION TOMBUILL MOUNTAIN

FIELD FOOTHILLS

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL K.B.

D.F.

G.L.

Other Services: NONE

320

LSD. SEC. TWP. RGE. W. M.

Recorded By JOHNSON

Witnessed By SWAN

Run No.	ONE
Date	15 MAY 1977
First Reading	305
Last Reading	0
Footage Logged	305
Depth Reached	306
Depth Driller	
Casing Rotes	
Casing Driller	30
Fluid Type	AIR/WATER
Liquid Level	15
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

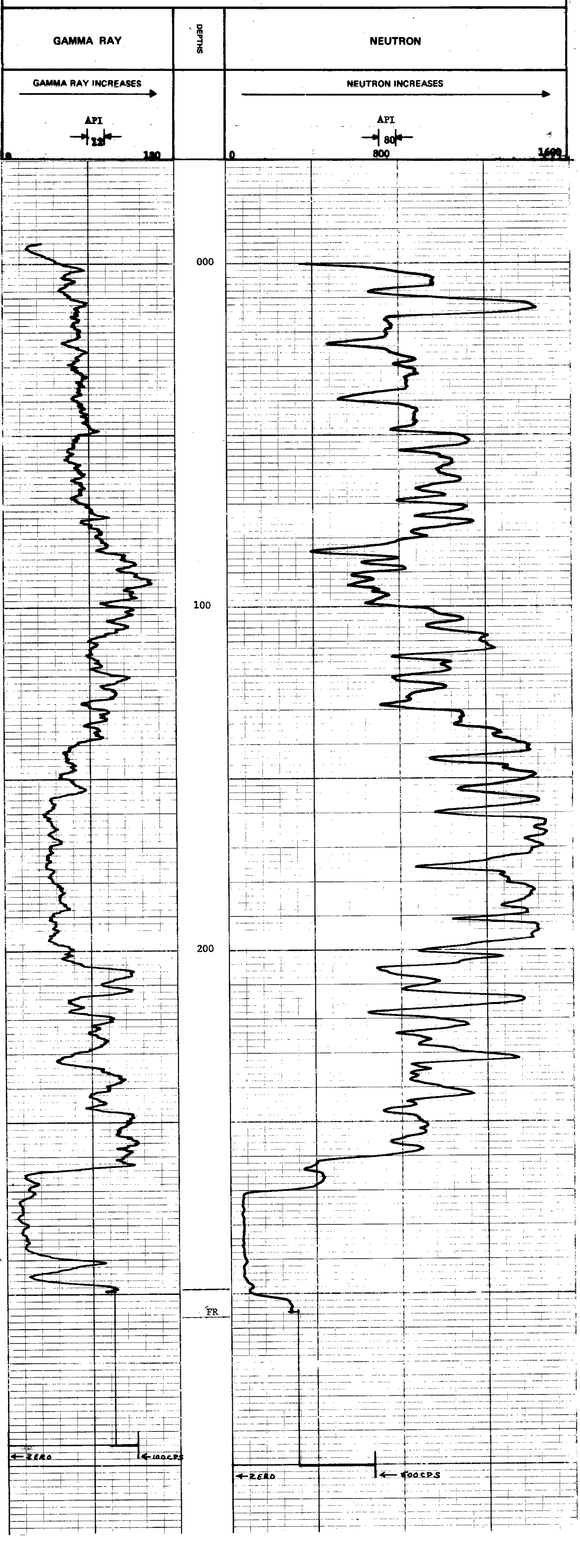
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	305	12	5	100	OL	12	3	500	OL	80

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



ROKE

GAMMA RAY DEFINITION LOG

FILE NO.

COMPANY PEMBINA OIL LIMITED

WELL 8B - 630

FIELD PEMBINA

LOCATION TERRESTRIAL MUNICIPAL 320

PROVINCE ALBERTA

COUNTRY CANADA

Other Services: NEUTRON

Permanent Datum: GROUND LEVEL — Elev.: K.B. — Elev.: D.F. — Elev.: G.L.

Log Measured From: K.B. — 14 Ft. Above Perm. Datum

Drilling Measured From: K.B.

Date: 3-7-77

Run No.: ONE

Depth-Driller: 1877

Depth-Logger: 1875

Bottom Logged Interval: 1875

Top Logged Interval: 1742

Casing-Driller: 13 3/8 @ 330

Casing-Logger: 330

Bit Size: 8 7/8

Type Fluid in Hole: AIR/WATER

Dens.: —

Visc.: —

pH: —

Fluid Loss: —

Source of Sample: —

Rm @ Meas. Temp.: —

Rmf @ Meas. Temp.: —

Rmc @ Meas. Temp.: —

Source of Rmf & Rmc: —

Rm @ BHT: —

Time Since Circ.: 6 HRS

Max. Rec. Temp. Deg. F: 90

Equip. No. & Location: 37

Recorded By: JIM

Witnessed By: JIM

K-ESSONE CURVE TRACK

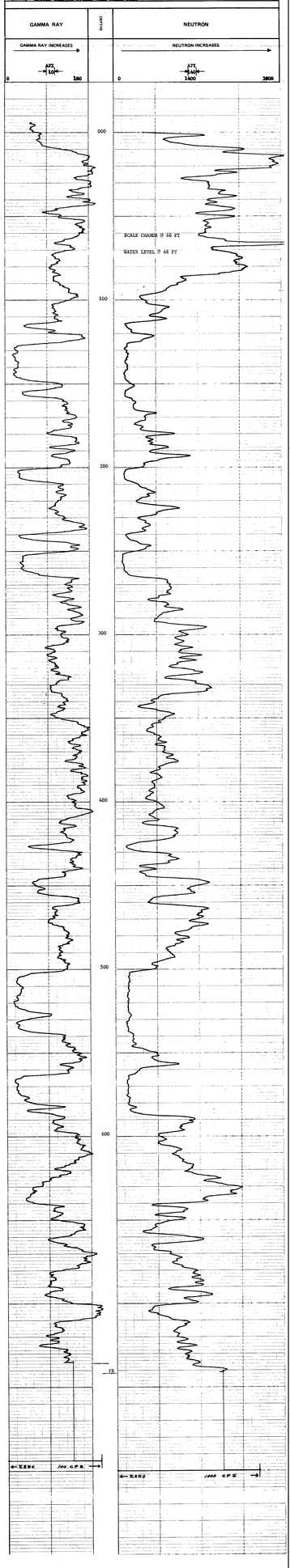
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-88-W
		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	Amrlo
TOOL SERIAL NO.	R GNN 169-002	STRENGTH	1 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTH FROM	DEPTH TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO API G. R. UNITS DIV. L. OR R.	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L. OR R.	API N. UNITS PER LOG DIV.
1	0	66	12	5	100	OL	10	3	1000	OL	160
	66	741	12	5	100	OL	10	3	500	OL	80

REMARKS: LOGGED THROUGH DOUBLE WALL DRILL PIPE



ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

COMPANY PAN AMERICAN PETROLEUM CORP.

WELL B.R.-A.P.P.

FIELD PEARL LAKE

LOCATION 12-68-24-W4M

Other Services: BOREHOLE COMPENSATED SONIC

Permanent Datum: GROUND ELEVATION

Log Measured from: KELLY BUSHING

Drilling Measured from: KELLY BUSHING

Elev.: K.B. 1320 D.F. G.L.

Date: 8-5-77

Run No.: ONE

Depth-Driller: 6488

Depth-Logger: 6488

Bottom Logged Interval: 6484

Top Logged Interval: 4800

Casing-Driller: 8 5/8 @ 488

Casing-Logger: 488

Bit Size: 7 7/8

Type Fluid in Hole: AQUAGEL

Salinity, PPM Cl: 3%

Density: 9.2

Viscosity: 35

Fluid Loss: 8

Source of Sample: FLOWLINE

Rm @ Meas. Temp.: .84 @ 70°F

Rmf @ Meas. Temp.: .63 @ 70°F

Rmc @ Meas. Temp.: .95 @ 70°F

Source of Rmf & Rmc: CALCULATED

Rm @ BHT: .42 @ 150°F

Time Since Circ.: 12 HRS.

Max. Rec. Temp. Deg. F: 150°F

Equip. No. & Location: 1502 - 5504

Recorded By: SHARPE

Witnessed By: KAPP

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.9FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-88-W
SONDE SERIAL NO.	37	SERIAL NO.	187
TRUCK NO.		SPACING	12 INCH
INSTRUMENT TRUCK NO.		TYPE	Amrlo
TOOL SERIAL NO.	R-REN-18902	STRENGTH	3 CURIES

LOGGING DATA

RUN NO.	GENERAL INTERVAL FROM	INTERVAL TO	SPEED FT/MIN	T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T.C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV
1	0	6488	15	6	100	80	10APT	3	1000	80	20APT
	6488	4800	15	6	100	80	10APT	3	1000	80	20APT

REMARKS

GAMMA RAY | DEPTH | NEUTRON

GAMMA RAY INCREASES

NEUTRON INCREASES

ACT

ACT

100

6488

4800

000

200

300

MARKER LOWER BOUNDARY BASALT CONGLOMERATE

400

500

600

700

R-REN-18902

R-REN-18902

R-REN-18902

K-ENGINEERING 7(3)3

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY POINTER GOAL TORTED

WELL 32 - 632

LOCATION TOWNSHIP MONTANA

FIELD POINTERS

PROVINCE SASKATCHEWAN ALBERTA COLUMBIA

Other Services: DIFF

Permanent Datum: Sea Level / Ground Level

Log Measured from: GROUND LEVEL

Drilling Measured from: GROUND LEVEL

Elev.: K.B. 3097 D.F. G.L.

Date: 2 JAN 1977

Run No.: ONE

Depth-Driller: 680

Depth-Logger: 680

Bottom Logged Interval: 680

Top Logged Interval: SURFACE

Type Fluid in Hole: AERATED

Salinity, PPM Cl: 20

Density: 8.4

Level: FULL

Max. Rec. Temp. °F: 34

Equip. No. & Location: 3178

Recorded By: JOHNSON

Witnessed By: ISAM

Operating Time: 31 HOURS

Truck No.:

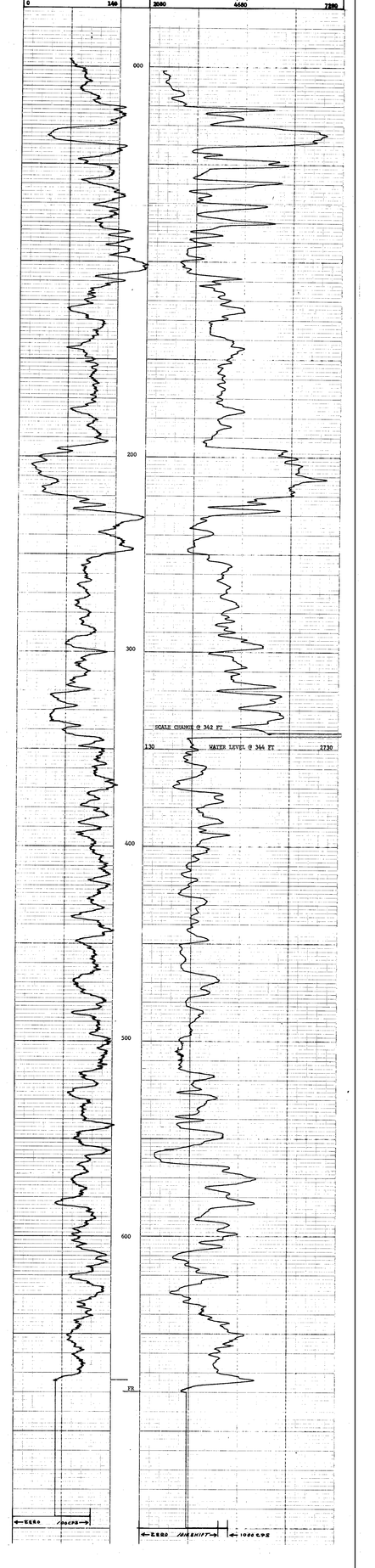
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-85-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R CRN 169 - 002	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV
1	0	342	12	5	100	OL	14	1	1000	RT.	260
2	342	680	12	5	100	OL	14	1	500	LT.	130

REMARKS



K-Ref Dwg. K.V.62.77 (81)Ar.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

TITLE NO. LSD SEC TWP RGE W M

COMPANY PEACHLAND COAL LIMITED

WELL BH - 633

LOCATION TUMBLER RIDGE/AH

320

FIELD FOREMAN

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL Elev.

Log Measured From: K.B. Above Perm. Datum

Drilling Measured From: G.L.

K.B. 3NONE

Other Services

Rec. No.	3NONE
Date	31 JAN 1977
First Reading	521
Last Reading	0
Footage Logged	521
Bottom Driller	522
Bottom Logged	546
Casing Size	7"
Casing Depth	521
Casing Weight	23
Fluid Type	AIR/WATER
Liquid Level	116
Max. Ohmm.	5
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By SHAW

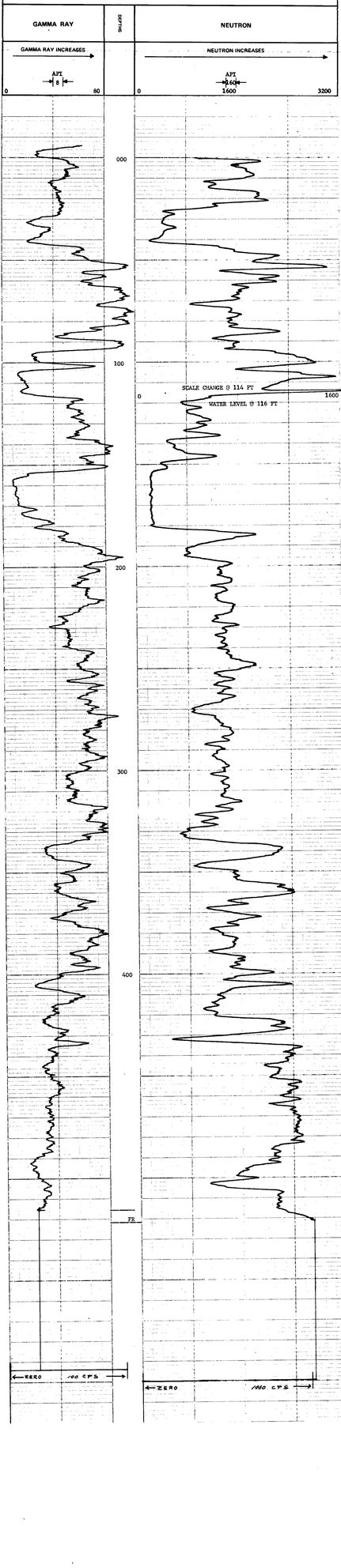
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	8.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	114	12	5	100	OL	8	3	1000	OL	160
	114	521	12	5	100	OL	8	3	500	OL	80

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FORDING RIVER 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL RH - 634

320

LOCATION TURNBULL MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE		
Date	28 JULY 1977		
First Reading	658		
Last Reading	0		
Footage Logged	658		
Depth Reached	659		
Depth Driller	662		
Casing Roke			
Casing Driller	15		
Fluid Type	AIR/WATER		
Liquid Level	61		
Min. Diam.	4 7/8		
Rm @ °F			
Operating Time	1½ HOURS		
Truck No.	37		

Recorded By JOHNSON Witnessed By SHAW

EQUIPMENT DATA

	GAMMA RAY	NEUTRON
RUN NO.	ONE	ONE
TOOL MODEL NO.	$1\frac{11}{16}$	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	$1\frac{11}{16}$
DETECTOR MODEL NO.	SCINTILLATION	PROPORTIONAL
TYPE	4 INCH	6 INCH
LENGTH	6.7 FT.	MRC-N-SS-W
DISTANCE TO N. SOURCE		187
SERIAL NO.	37	17 INCH
SPACING	37	AmBe
TYPE	R GRN 169 - 002	3 CURIES
STRENGTH		

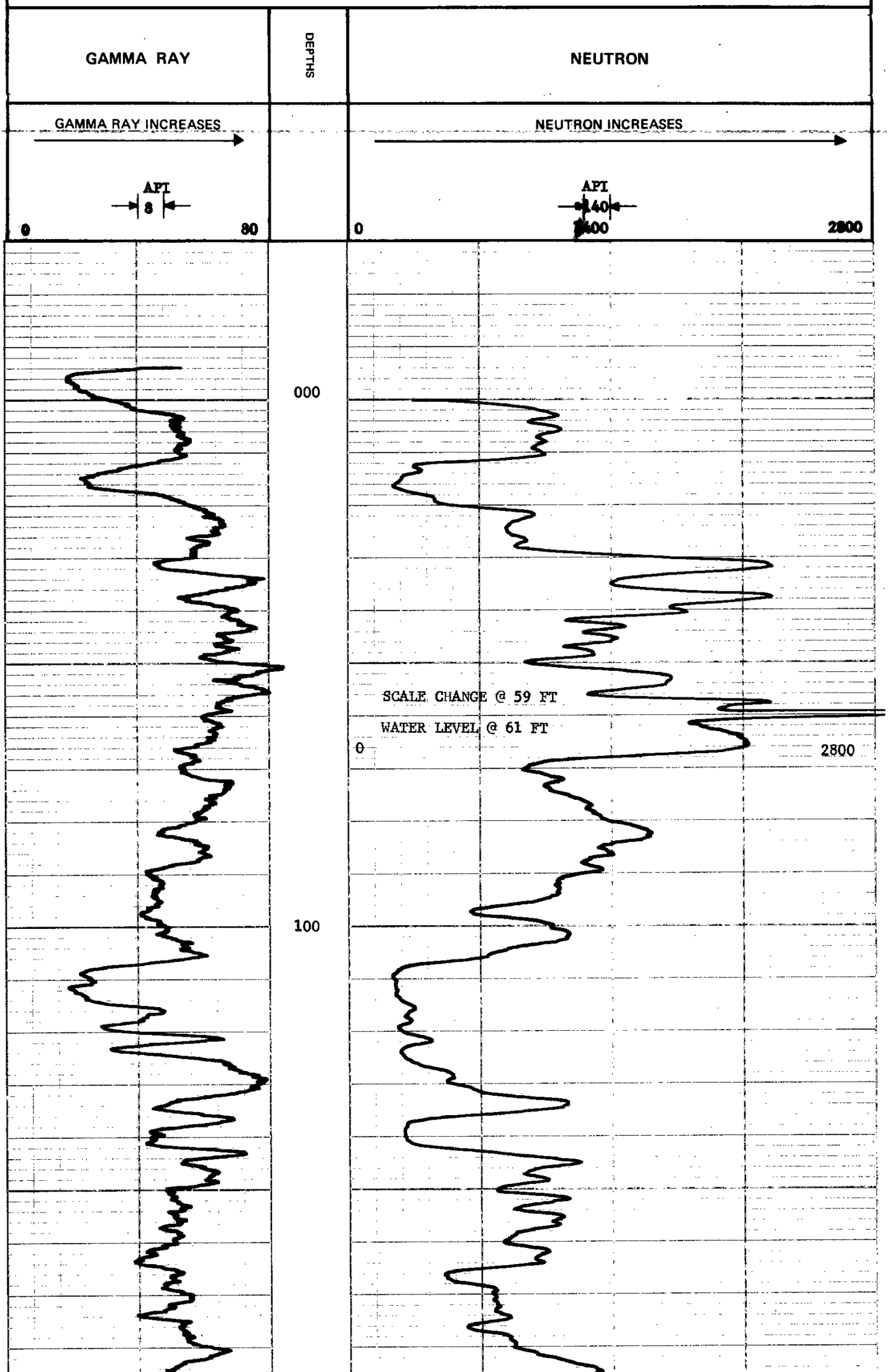
GENERAL

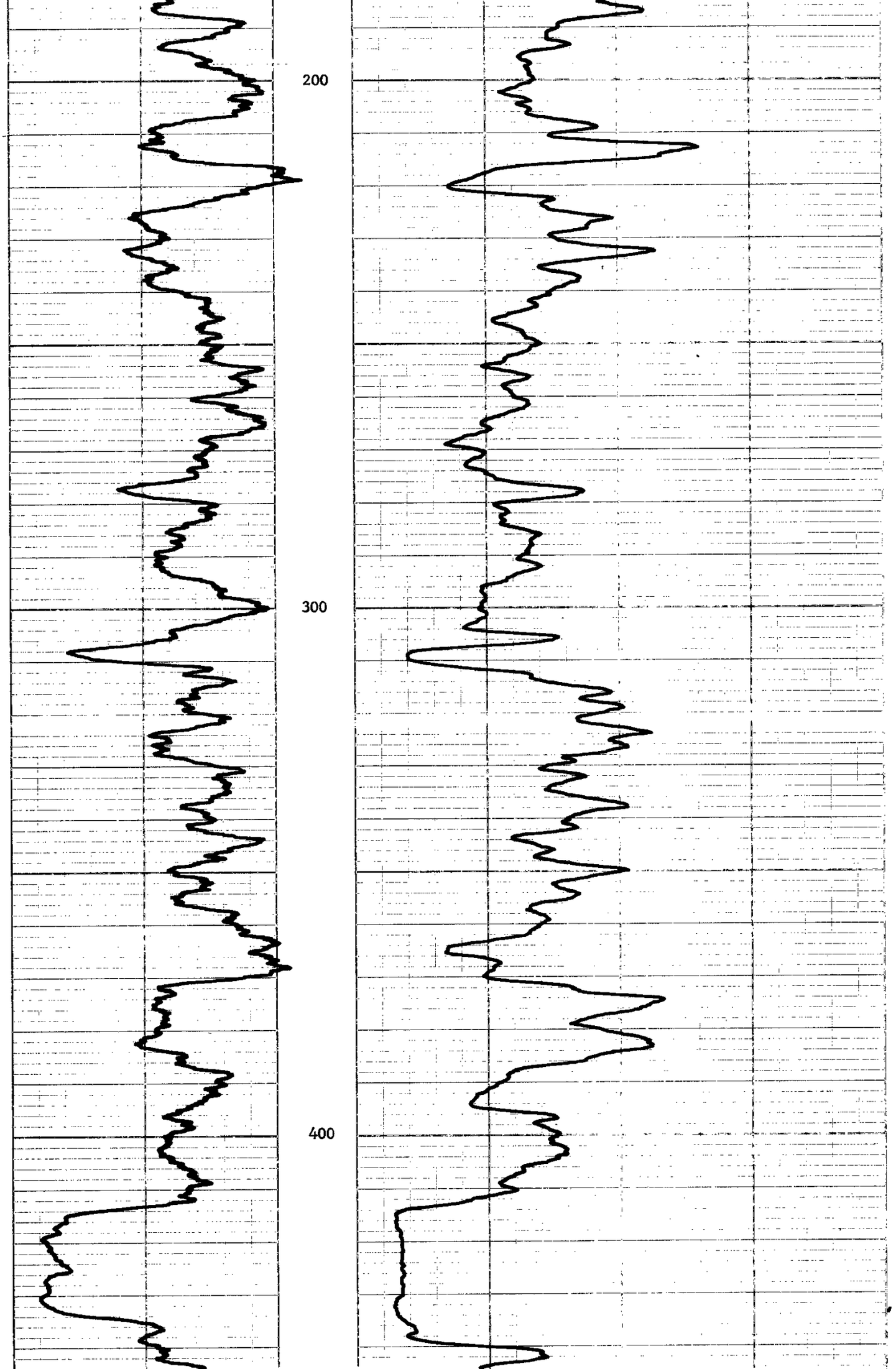
HOIST TRUCK NO.
INSTRUMENT TRUCK NO.
TOOL SERIAL NO.

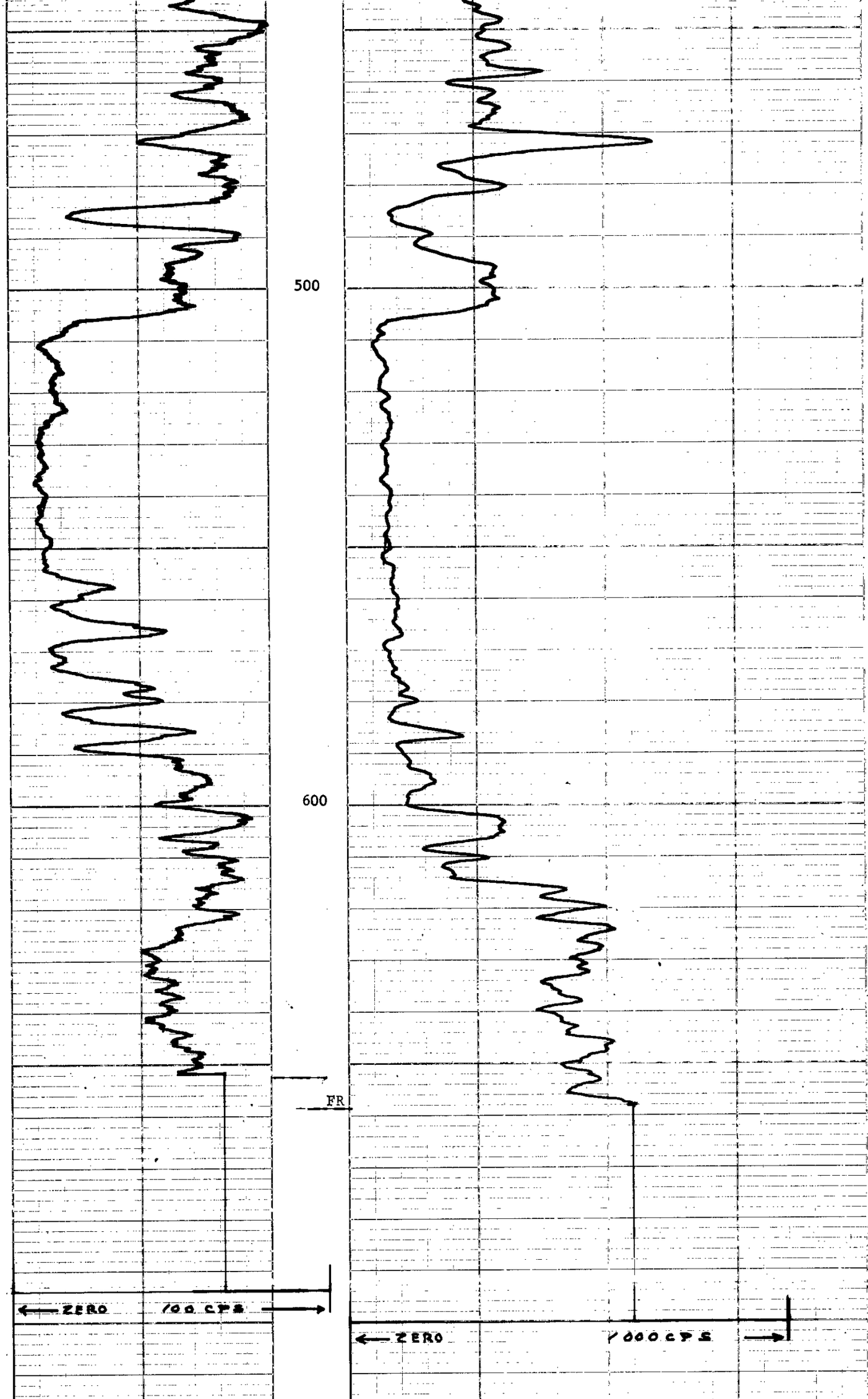
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON		
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	59	12	5	100	OL	8	3	1000	OL	140
	59	658	12	5	100	OL	8	3	500	OL	70

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
NEUTRON INCREASES
API
8
0
80
API
140
0
2800
000
100
SCALE CHANGE @ 59 FT
WATER LEVEL @ 61 FT
0
2800


200
300
400


500
600
FR
ZERO
100 CPS
ZERO
1000 CPS

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

SEC. TWP. RGE. M

COMPANY ROKE OIL ENTERPRISES LTD. CALGARY, ALBERTA

WELL HR + 635

FIELD WILDCAT LOCATION TERRITORIAL BOUNDARY

PROVINCE NORTH WEST TERRITORIES CANADA

Permanent Datum GROUND LEVEL Elev. ____ K.B. ____

Log Measured From GROUND LEVEL ____ Ft. Above Perm. Datum D.F. ____

Drilled From GROUND LEVEL G.L. ____

Other Services: NONE

320

Recorded By JOHNSON

Witnessed By SHAW

Run. No.	ONE
Date	27 JUNE 1977
Depth Reading	3449
Log Reading	0
Feet Logged	3449
Depth Driller	3550
Depth Logger	3550
Casing Rules	
Casing Driller	
Casing Logger	
Liquid Level	146
Max. Diam.	4 7/8
Rm. @ °F	
Operating Time	
Truck No.	37

EQUIPMENT DATA

GAMMA RAY

RUN NO.	ONE
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	SCINTILLATION
LENGTH	6 INCH
DISTANCE TO N. SOURCE	6,7 FT.

GENERAL

HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	
TOOL SERIAL NO.	R GRN 169-002

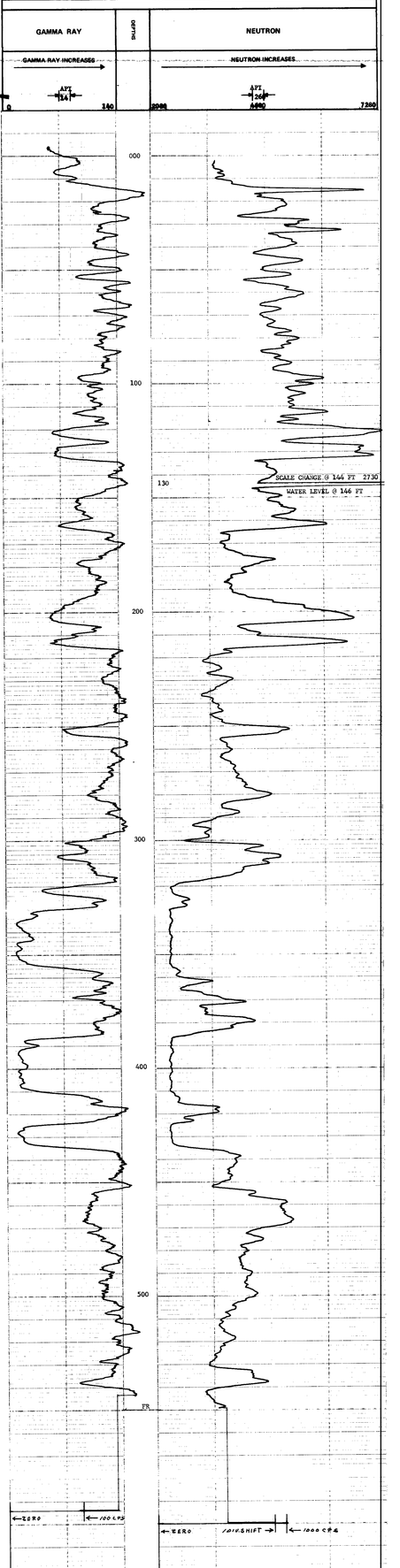
NEUTRON

RUN NO.	ONE
TOOL TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	6 INCH
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	187
SPACING	17 INCH
TYPE	AmBe
STRENGTH	3 CURIES

LOGGING DATA

GENERAL RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	144	32	1	100	07	10	1	1000	8.1	250
	144	569	32	1	100	07	10	1	500	1.1	150

REMARKS



K-ERGINS RUN 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 320

COMPANY PRODUCERS GAS LIMITED

WELL RIX - 636

LOCATION TERRITORIAL MONTANA

FIELD PONDING

PROVINCE BRITISH COLUMBIA

LSD SEC TWP RGE W.....M

Permanent Datum: GROUND LEVEL — Elev. 2730

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Other Services: NONE

K.B. ____ D.F. ____ G.L. ____

Rec. No. ONE

Date 6 JUNE 1977

Run No. ONE

Depth-Driller 583

Depth-Logger 583

Btm. Log Interval 584

Top Log Interval SURFACE

Casing-Driller 8 INCH @ 6,7 FT.

Casing-Logger

Bit Size

Type Fluid AIR/WATER

Dens. Visc.

Level 208

Max. Rec. Temp.

Est. Temp. BHT

Rig No. 9

Operating Time 2 HOURS

Truck No. 37

Recorded By JORDEN

Witnessed By SHAW

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	8 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6,7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	5 CURIES

LOGGING DATA

GENERAL				GAMMA RAY			NEUTRON		
RUN NO.	DEPTH FROM	DEPTH TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	206	12	5	100	01.	14	3	1000	8 L.	260
	206	583	12	5	100	01.	14	3	500	1 L.	130

REMARKS

GAMMA RAY | DEPTHS | NEUTRON

GAMMA RAY INCREASES → API 14 — 0 — 140

NEUTRON INCREASES → API 260 — 4680 — 7280 — 2080

000

100

200

SCALE CHANGE @ 206 FT

130 — 2730

WATER LEVEL @ 208 FT

300

400

500

FB

ZERO — 100 CPS

ZERO — 10K SHIFT → — 1000 CPS

ROKE OIL ENTERPRISES LTD.

CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

E-LOGGING SERVICE

LOG
SEC
TWP
RGE
M

FILE NO.

COMPANY PEMBINE COAL LIMITED

WELL BH - 627

FIELD PEMBINE LOCATION TOWNSITE, MOUNTAIN

320

Permanent Datum: GROUND LEVEL
Log Measured from: GROUND LEVEL
Drilling Measured from: GROUND LEVEL

Elev.: K.B. 3008
D.F.
G.L.

Other Services

Run. No.	ONE		
Date	13 JUNE 1977		
First Reading	691		
Last Reading	691		
Feet Logged	691		
Depth Driller	692		
Depth Logger	692		
Casing Driller	692		
Casing Logger			
Bit Size	4 7/8		
Type Fluid in Hole			
Density			
Level	ASSY CUTTS		
Max. Recorded Temp.	245		
Max. Chain	4 7/8		
Rm. @ Tf			
Operating Time	1½ HOURS		
Truck No.	37		

Recorded By: JOHNSON

Witnessed By: BIRK

SAM-9-17

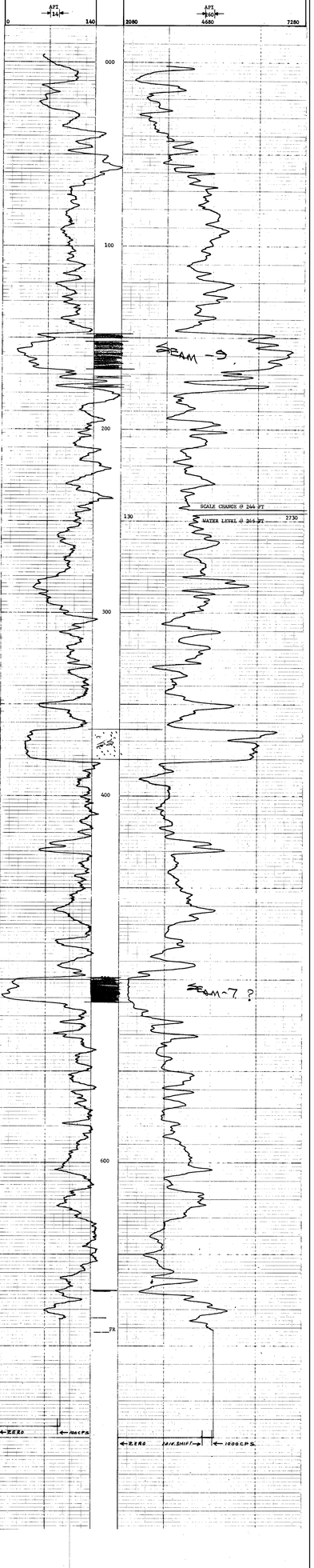
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	8.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-55-W
		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	Am-Be
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL			GAMMA RAY				NEUTRON			
RUN NO.	DEPTH FROM	DEPTH TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	244	12	5	100	OL	14	3	1000	8L	260
	244	691	12	5	100	OL	14	3	500	11L	130

REMARKS



K-EOE2LOG (WGC-2L(S))A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY: ROKEMERE COAL LIMITED

WELL: RGE + 638

LOCATION: TOWNSHIP, MONTGOMERY

FIELD: FOREMERE

PROVINCE: BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev. 1 Above Perm. Datum

Log Measured From: GROUND LEVEL — 6 Ft. Above Perm. Datum

Drilling Measured From: GROUND LEVEL — 6 Ft. Above Perm. Datum

Other Services: NONE

Run No.	ONE
Date	1 JUNE 1977
Last Reading	671
First Reading	0
Casing Logged	671
Bit Size	11
Casing Driller	680
Casing Logger	671
Bottom Driller	680
Bottom Logger	671
Type Fluid in Hole	AIR/WATER
Max. Rec. Temp.	120
Equip. Location	5/178
Recorded By	JOHNSON
Witnessed By	DAVID

Depth Control: Tape No. 37 — Other Services: 1 METER

LOG: 320

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.2 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	NR GRN 169-002	STRENGTH	3 curies

LOGGING DATA

GENERAL				GAMMA RAY					NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L. OR R.	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L. OR R.	API N. UNITS PER LOG DIV.
1	0	518	12	5	100	OT.	16	5	1000	8 T.	260
	518	671	12	5	100	OT.	16	5	500	1 T.	130

REMARKS

GAMMA RAY — DEPTHS — NEUTRON

GAMMA RAY INCREASES → API 0 to 140

NEUTRON INCREASES → API 2080 to 7280

000
100
200
300
400
500
600

SCALE CHANGE @ 518 FT

WATER LEVEL @ 520 FT

FR

← ZERO ← 400 CPS

← ZERO ← 1000 SHIFT → ← 1000 CPS

K. FOLDING CHART 37 (5) E

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY PRODUCING OASIS LIMITED

WELL No. 320

LOCATION TERRAHILL MOUNTAIN

FIELD PRODUCING

PROVINCE BRITISH COLUMBIA

Other Services: DEV

Permanent Datum: GROUND LEVEL — Elev.: K.B. / D.F. / G.L.

Log Measured From: GROUND LEVEL — 6 Ft. Above Perm. Datum

Drilling Measured From: GROUND LEVEL

Run No. ONE

Date 11 AUG 1977

Depth-Driller 640

Depth-Logger 640

Bottom Logged Interval 640

Top Logged Interval 0

Casing-Driller 6 5/8 @ 640

Casing-Logger

Bit Size 4 1/2

Type Fluid in Hole WATER

Salinity, PPM Cl

Density

Level FULL

Max. Rec. Temp. Deg. F

Operating Time

Recorded By GOODRICH/OAKES

Witnessed By SHAW

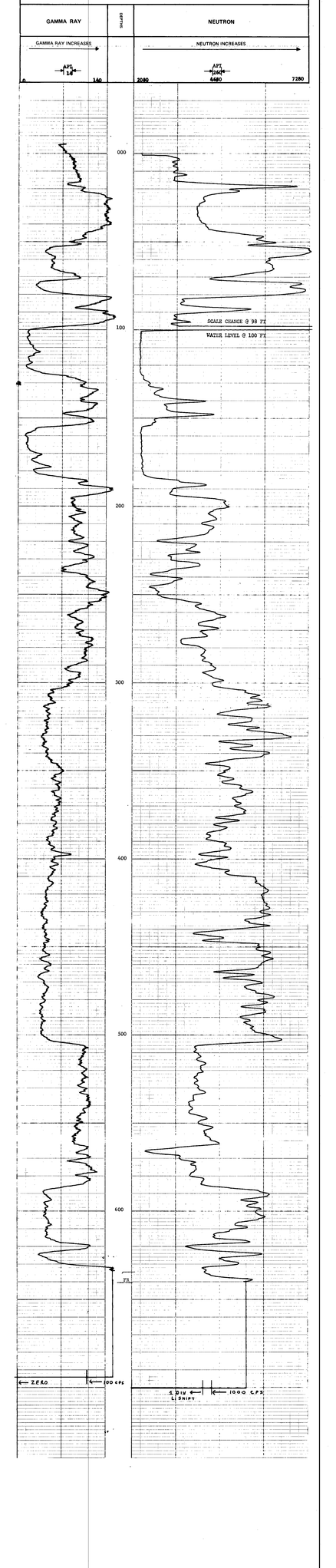
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4" INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	8 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	~3 Curies

LOGGING DATA

RUN NO.	GENERAL DEPTHS FROM	TO	SPEED FT/MIN	T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	T.C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	98	12	5	100	OL	14	3	1000	8L	260
	98	640	12	5	100	OL	14	3	500	1L	130

REMARKS



K-FOOTHILLS RIVER 11(8)1E

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FOOTHILLS COAL LIMITED

WELL EH - 640

LOCATION TURBULA MOUNTAIN

FIELD FOOTHILLS

PROVINCE BRITISH COLUMBIA

Other Services: NONE

LSD SEC TWP RGE W..... M

Permanent Datum: GROUND LEVEL Elev. ..... K.B. .....

Log Measured From: GROUND LEVEL Ft. Above Perm. Datum ..... DFG .....

Well Depths Measured From: GROUND LEVEL G.L. .....

Run. No.	ONE
Date	19 MAY 1977
First Reading	435
Last Reading	0
Footage Logged	435
Depth Reached	435
Depth Driller	435
Depth Logger	435
Casing Driller	
Casing Logger	
Fluid Type	AIR/WATER
Liquid Level	130
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	
Truck No.	
	1 HOUR
	37

Recorded By JOHNSON

Witnessed By SWAN

320

EQUIPMENT DATA

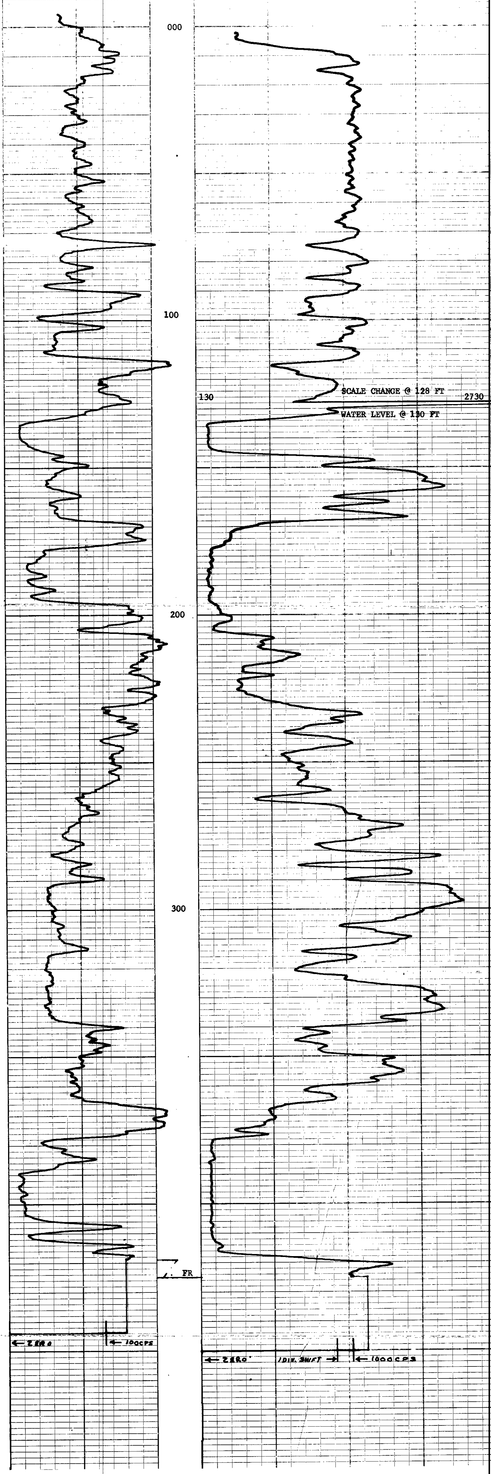
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	2 CURIES

LOGGING DATA

RUN NO.	GENERAL DEPTHS FROM	TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	128	12	5	100	OL	14	3	1000	8 L	260
	128	425	12	5	100	OL	14	3	500	1 L	130

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 14		API 260
0 — 140		2080 — 4680 — 7280



ROKE OIL ENTERPRISES LTD.
1000, 444 - 5th AVENUE S.W.
CALGARY ALBERTA

Company	ROKE OIL ENTERPRISES LTD.
Well	320
Field	PEMBINA
County/Parish	PEMBINA
State/Province	ALBERTA
Location	6-27-49-7W5
Permanent Datum	GROUND LEVEL
Elevation	2000
Log Measured From	KELLY BUSHING
Drilling Measured From	KELLY BUSHING
Elev.	K.B. 2010
	D.F. 2009
	G.L. 2000
Date	23 JUL 77
Run No.	ONE
Depth-Driller	3660
Depth-Logger	3660
Bottom Log Interval	3660
Top Log Interval	SURFACE
Casing-Driller	8 5/8 @ 222
Casing-Logger	222
Bit Size	7 7/8
Type Fluid in Hole	GEL CHEM
Density	9.5
Viscosity	45
pH	10.5
Fluid Loss	5.6
Source of Sample	FLOWLINE
Rm @ Meas. Temp.	1.32 @ 70
Rmf @ Meas. Temp.	1.10 @ 70
Rmc @ Meas. Temp.	1.65 @ 70
Source of Rmf & Rmc	CALC
Rm @ BHT	1.01 @ 120
Time Since Circulation	12 HRS
Time Since Log Stopped	1 HR
Max. Rec. Temp.	120
Equipment Number	10
Location	6-27-49-7W5
Recorded By	A. BOWES
Witnessed By	MR. BOYCE

Run Number: ONE
Depth-Driller: 3660
Depth-Logger: 3660
Bottom Log Interval: 3660
Top Log Interval: SURFACE
Casing-Driller: 8 5/8 @ 222
Casing-Logger: 222
Bit Size: 7 7/8
Type Fluid in Hole: GEL CHEM
Density: 9.5
Viscosity: 45
pH: 10.5
Fluid Loss: 5.6
Source of Sample: FLOWLINE
Rm @ Meas. Temp.: 1.32 @ 70
Rmf @ Meas. Temp.: 1.10 @ 70
Rmc @ Meas. Temp.: 1.65 @ 70
Source of Rmf & Rmc: CALC
Rm @ BHT: 1.01 @ 120
Time Since Circulation: 12 HRS
Time Since Log Stopped: 1 HR
Max. Rec. Temp.: 120
Equipment Number: 10
Location: 6-27-49-7W5
Recorded By: A. BOWES
Witnessed By: MR. BOYCE

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG CURVE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	5' 2" FT.	TYPE	PROPORTIONAL 8 INCH
DISTANCE TO S. SOURCE		LENGTH	
GENERAL		SOURCE MODEL NO.	MISC-N-88-M
		MATERIAL	18
HOIST TRUCK NO.	37	SPACING	17 1/2CM
INSTRUMENT TRUCK NO.		TYPE	Amrb
TOOL SERIAL NO.	B 1259 149-202	STRENGTH	3 CURIES

LOGGING DATA

RUN	GENERAL INTERVAL FROM	TO	SPEED FT/MIN	T.C. SEC.	SENS. GAMMA RAY API/IN	ZERO	SPC. & AMPS. GAMMA RAY API/IN	SEC.	T.C. SEC.	SENS. NEUTRON	NEUTRON ZERO	SPC. & AMPS. NEUTRON L.S.R. PER 1000 CPS
NO.	0	103	1800	1	100	0	12	3	1	1000	0	280
ONE	103	1329	12	1	100	0%	12	3	1	300	1 L	130
			1									

REMARKS: LOGGED DOWNHOLE ON DRILL RODS

GAMMA RAY

GAMMA RAY INCREASES

API

0 — 130

NEUTRON

NEUTRON INCREASES

API

260 — 3660 — 3660

SCALE CHANGES @ 103 FT

WATER LEVEL @ 108 FT

130 — 2730

0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

ROKE

OIL ENTERPRISES LTD.

GAMMA RAY NEUTRON LOG

CALGARY ALBERTA

Well No.	10-25-026-25W4
Field	WILDCAT
County, Province	CLARKE LAKE — B.C.
Location	10-25-026-25W4
Other Services	
Permanent Datum	GROUND LEVEL
Elevation	3178
Log Measured From	K.B. 10 FT. ABOVE PERM. DATUM
Drilling Measured From	K.B.
Date	3-JUNE-71
Run No.	ONE
Depth-Driller	3320
Depth-Logger	3320
Bottom Logged Interval	3320
Top Logged Interval	2600
Casing-Driller	8 5/8 @ 1251
Casing-Logger	1251
Bit Size	7 7/8
Type Fluid in Hole	GEL CHEM
Density	9.8
Viscosity	40
pH	10
Fluid Loss	8
Source of Sample	CIRC.
Rm @ Meas. Temp.	.75 @ 70
Rmf @ Meas. Temp.	.60 @ 70
Rmc @ Meas. Temp.	.90 @ 70
Source of Rmf & Rmc	CALC.
Rm @ BHT	.45 @ 140
Time Since Circ.	12 HRS
Max. Rec. Temp.	140
Equip. No. & Location	1320
Recorded By	JOHNSON
Witnessed By	DUNN

RECORDED FIELD PRINT — SCHLUMBERGER WELL SURVEY CORP. — CALGARY, ALBERTA

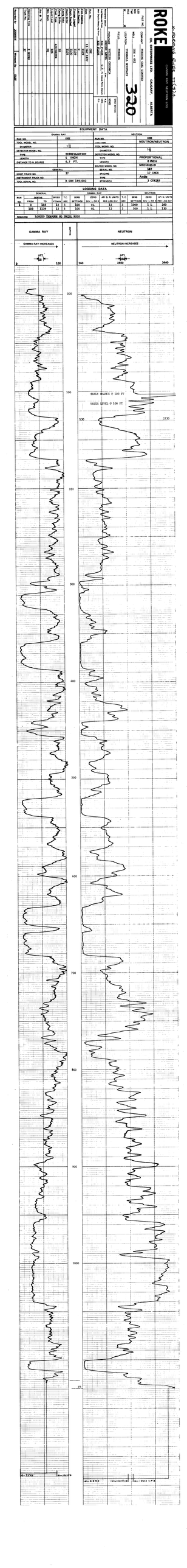
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	NEUTRALIZATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.		6 INCH
		SOURCE MODEL NO.	MISC-N-65-W
VERTICAL		SERIAL NO.	183
JOINT TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	Am/Be
TOOL SERIAL NO.	3 GRD 159-502	STRENGTH	3 CURIES

LOGGING DATA

RUN	GENERAL				GAMMA RAY				NEUTRON			
	SPECIAL		SPEED	T.C.	SENS	ZERO	API & N. UNITS		T.C.	SENS	ZERO	API & UNITS
NO.	FROM	TO	FT/MIN	SEC.	DEFLECTION	API & UNITS	PER CPS/DCS	SEC.	DEFLECTION	API & UNITS PER CPS/DCS		
1	0	503	32	3	100	CL	32	3	1000	L L	260	
	503	1139	32	3	100	CL	32	3	500	L L	130	

REMARKS LOGGED TOWARDS BG BILLS ROSS



ROKE

OIL & GEOTECHNICAL LTD. CALGARY, ALBERTA

COMPANY: PRAIRIE OWL GOSTER

WELL: 10C-24-

FIELD: TWINNING

COUNTY/PARISH: BEAVER

PROVINCE: ALBERTA

320

Permanent Datum: GROUND LEVEL

Elev.: K.B. 1975 D.F. G.L. 1971

Log Measured From: K.B. 4 FT. ABOVE PERM. DATUM

Drilling Measured From: K.B.

Date: 1-Dec-84

Run No.: ONE

Depth-Driller: 2600

Depth-Logger: 2600

Bottom Logged Interval: 2600

Top Logged Interval: 1000

Casing-Driller: 9.5/8 @ 1000

Casing-Logger: 1000

Bit Size: 8.3/4

Type Fluid in Hole: GEL CHEM

Density: 10.0

Viscosity: 70

pH: 9.5

Fluid Loss: 6.0

Source of Sample: FLOWLINE

Rm @ Meas. Temp.: 0.55 @ 70 °F

Rmf @ Meas. Temp.: 0.45 @ 70 °F

Rmc @ Meas. Temp.: 1.1 @ 70 °F

Source of Rmf & Rmc: MEAS.

Rm @ BHT: 0.35 @ 120 °F

Time Since Circ.: 3 HRS

Max. Rec. Temp. Deg. F: 120

Equip. No. & Location: 1971 EDMONTON

Recorded By: JOHNSON

Witnessed By: DAVE

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATOR	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	8 INCH
		SOURCE MODEL NO.	MNC-N-55-M
GENERAL		SERIAL NO.	167
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	N CRU 169-002	INTENSITY	3 CURIES

LOGGING DATA

RUN	GAMMA RAY						NEUTRON				
	RADIAL		SPEED	T.C.	SENS.	API N. UNITS	T.C.	SENS	API N. UNITS		
NO.	FROM	TO	FT/MIN.	SEC.	SETTINGS	DIV. 1 CM =	SEC.	SETTINGS	DIV. 1 CM =	PER 100 DIV.	
1	0	20	12	3	100	OIL	12	5	1000	OIL	200
	20	393	12	3	100	.05	12	5	500	.05	130

REMARKS: LOGGED TOWARDS BY DRILL INFO

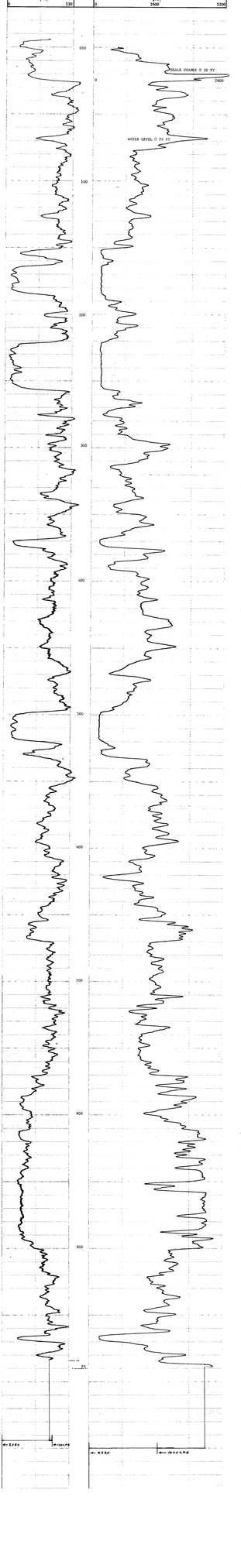
GAMMA RAY | DEPTH | NEUTRON

GAMMA RAY INCREASES → API 0 110 330

NEUTRON INCREASES → API 2600 3300

SCALE CHANGE @ 20 FT

WATER LEVEL @ 74 FT



ROKE

OIL ENTERPRISES LTD.

CALGARY ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO. 320

COMPANY PANCON GOLD LIMITED

WELL 3D8 - 843

LOCATION 33 TOWNSHIP 7 RANGE 1 W 5 MERIDIAN

FIELD PORCUPINE

PROVINCE ONTARIO

Permanent Datum: GROUND ELEVATION Elev. 1000

Log Measured from: KELLY BUSHING 5 ft. Above Perm. Datum

Drilling Measured from: K.B.

Elev.: K.B. 1005 G.L. 1000

Other Services

Rig No. 7

Date 3 NOV 1977

Run No. ONE

Depth-Driller 2,500

Depth-Logger 2,500

Bottom Logged Interval 2,500

Top Logged Interval SURFACE

Type Fluid in Hole WATER

Salinity, PPM Cl 350

Density 8.9

Level FULL

Max. Rec. Temp. 50°F

Est. Cement Top SURFACE

Equipment No. 2

Recorded By JACKSON

Witnessed By DAVID

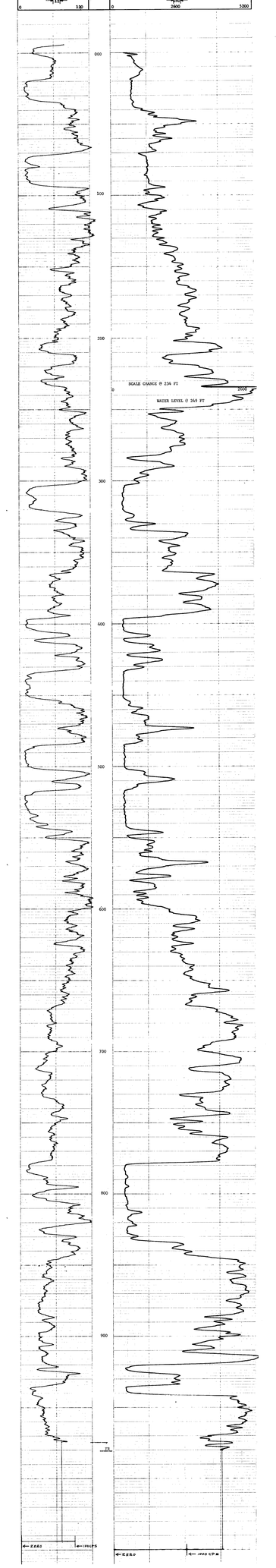
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	1 11/16	LOG ZONE	NEUTRON/NEUTRON
DIAMETER		TOOL MODEL NO.	1 11/16
DETECTOR MODEL NO.	SCINTILLATION	DIAMETER	
TYPE	4 INCH	DETECTOR MODEL NO.	PROPORTIONAL
LENGTH	4.7 FT.	TYPE	6 INCH
DISTANCE TO N. SOURCE		LENGTH	MRC-N-55-W
GENERAL		SOURCE MODEL NO.	107
HOSE TRUCK NO.	37	SERIAL NO.	17 INCH
INSTRUMENT TRUCK NO.		SPACING	AmBe
TOOL SERIAL NO.	X CBX 165-002	TYPE	3 CURIES
		STRENGTH	

LOGGING DATA

RUN NO.	GENERAL DEPTH FROM	TO	SPEED FT/MIN	T.C. SEC.	GAMMA RAY SENS SETTINGS	ZERO DIV. L OR M	API G. R. UNITS PER 1 DIV. DIV.	T.C. SEC.	NEUTRON SENS SETTINGS	ZERO DIV. L OR M	API N. UNITS PER 1 DIV. DIV.
1	0	234	12	5	100	CL	12	3	1000	CL	250
	234	990	12	5	100	#L	12	3	500	CL	130

REMARKS LOGGED THROUGH 3D CASING 360



ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL No. - 644

LOCATION TOBACCO PLAINS, MONTANA

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL

Other Services: NONE

K.B.

D.F.

G.L.

LSD SEC TWP RGE M

320

Rec. No.

Date No. 22 MAY 1977

Run No. ONE

Btm. Bldg. 482

Last Bldg. Ftg. 0

Footage Logged 482

Depth Reached 483

Depth Driller 483

Depth Logger 485

Casing Driller 10

Fluid Type AIR/WATER

Liquid Level 6

Max. Diam. 4 7/8

Rm @ °F

Operating Time 1 HOUR

Truck No. 37

Recorded By JOHNSON

Witnessed By BRIAN

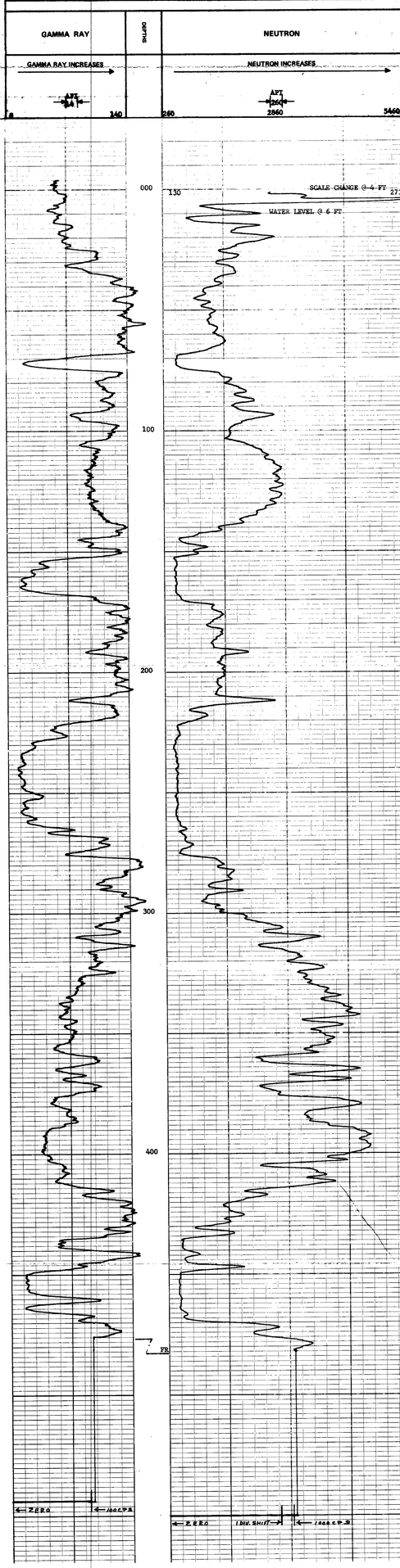
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7' FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	Amble
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	5 curies

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV
3	0	4	12	5	100	OL	14	3	1000	1 L	260
4	482		12	5	100	OL	14	3	500	1 L	130

REMARKS



K - ROCKIES AREA - 77(3)4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

320

FILE NO.
COMPANY FORDING COAL LIMITED
WELL HR - 646
LOCATION TUNNEL MOUNTAIN
FIELD FORDING
Other Services: MORE

Permanent Datum: GROUND LEVEL Elev. 0 ft. Above Perm. Datum
Log Measured from: GROUND LEVEL 4 ft. Above Perm. Datum
Well Depths Measured from: GROUND LEVEL K.B. G.L.

LSD SEC TWP RGE W M

Run. No.	ONE
Date	22 MAY 1977
Last Reading	437
Footage Logged	437
Depth Driller	438
Depth Reached	438
Casing Rdrs	
Casing Type	
Field Tyrite	
Liquid Level	66
Min. Diam.	4 1/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON Witnessed By SHAW

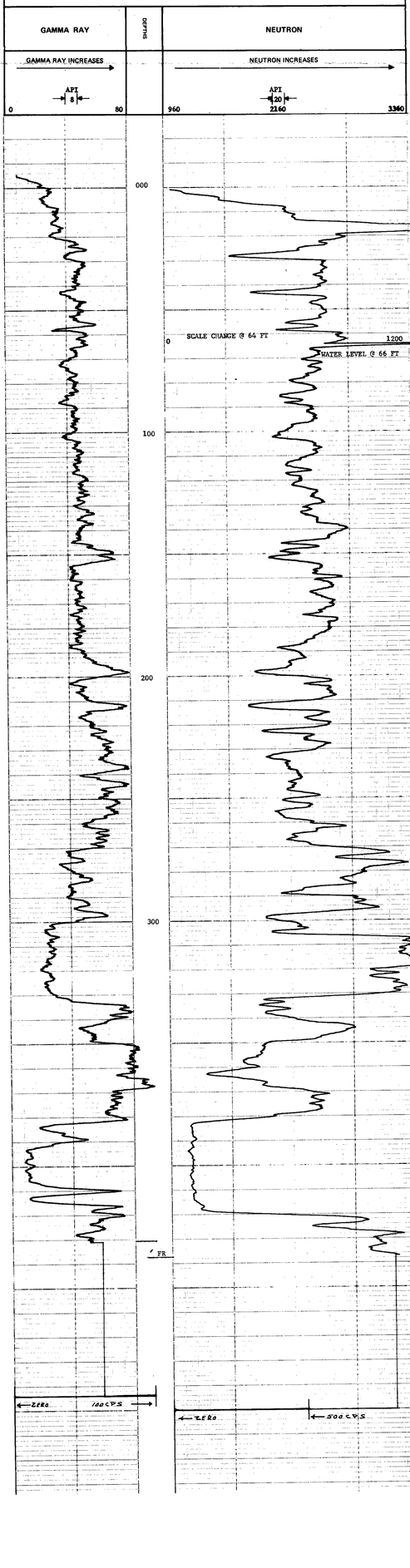
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	~~SCINTILLATION~~	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6 1/2 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	~~5~~ CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTH FROM	DEPTH TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	64	12	5	100	OL	8	3	1000	0	120
	64	437	12	5	100	OL	8	3	500	0	60

REMARKS: LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FORONG RIVER 77 (3) A.

Widco* WELL LOG

COMPANY
AREA TURNBULL
WELL RH 647
COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D.F.
K.B.
G.L.

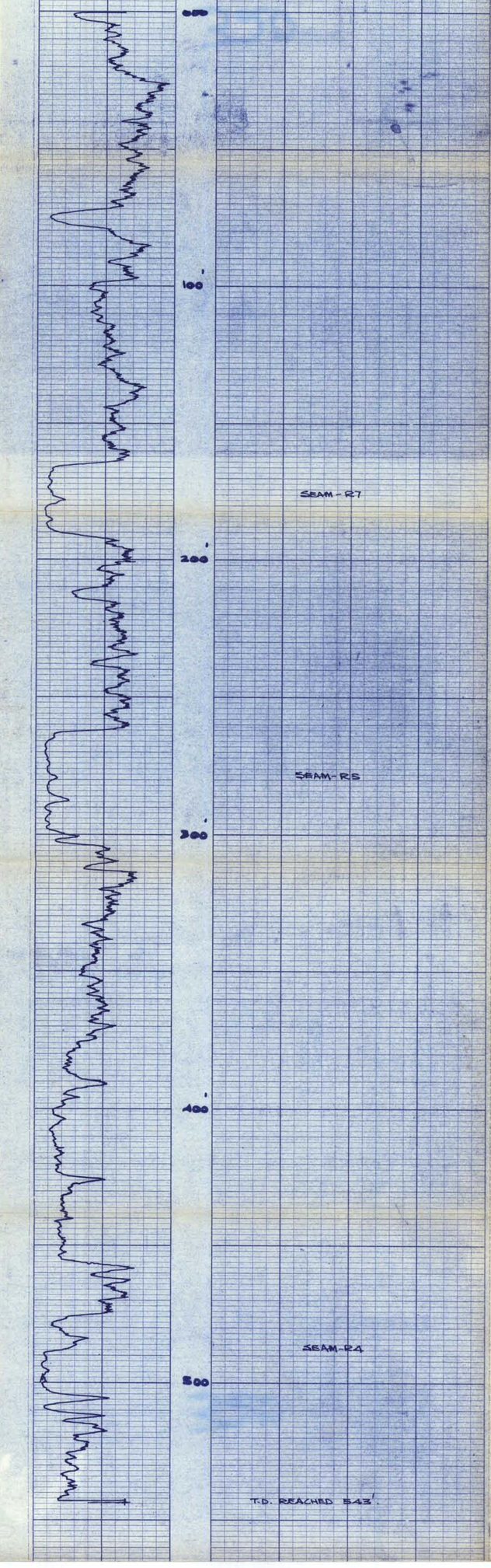
COMPANY
WELL RH 647
LOCATION TURNBULL

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log)		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Nature		
Density		
Viscosity	@ °F	@ °F
Resistivity	@ °F	@ °F
Res. @ BHT	@ °F	@ °F
pH		
Circ. Temp.		
B.H. Temp.		
Logged by	K. A. K.	
Witnessed by		

REMARKS Logged through double wall drill stem 12 A.P.I. AUG. 23'77

* Reg. U.S. Pat. Off.



Widco® WELL LOG

COMPANY K-FORDING RIVER 77(3)A.
AREA TURNBULL MT.
WELL RH 648
COUNTY STATE

320

COORDINATES N S
ELEVATION DF KB GL

COMPANY
WELL RH 648
LOCATION TURNBULL MT.

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ °F	@ °F
Footage Logged			Resistivity	@ °F	@ °F
Bottom (Driller)			Resistivity Filt	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size					
Bit Size					
			Logged by	R.B.A.	
			Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM.
10 A.P.I. SEPT. 14'77
FOR TOP 362' SEE GM.-NT. LOG.

® Reg. U.S. Pat. Off.

000'
100'
200'
300'
400'
445'
21(15)' SEAM - RA
470'
T.D. REACHED 486'
500'

K Fencing Rules 77(3)4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY: ROSEDALE COAL LIMITED

WELL: RE - 648

LOCATION: ROSEDALE MOUNTAIN

FIELD: ROSEDALE

PROVINCE: BRITISH COLUMBIA

LSD / SEC / TWP / RGE / W. M.

Permanent Datum: GROUND LEVEL — Elev.

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Other Services: NONE

K.B. / D.F. / G.L.

Run No.: ONE
Date: 11 APR 1977
First Reading: 362
Last Reading: 0
Footage Logged: 362
Depth Reached: 362
Depth Driller: 362
Depth Logger: 362
Casing Driller:
Casing Logger:
Fluid Type: AIR/WATER
Liquid Level: 42
Max. Diam.: 5

Rm @ °F

Operating Time: 1 HOUR
Truck No.: 37

Recorded By: KENSINGTON/MATERS
Witnessed By: SHAW

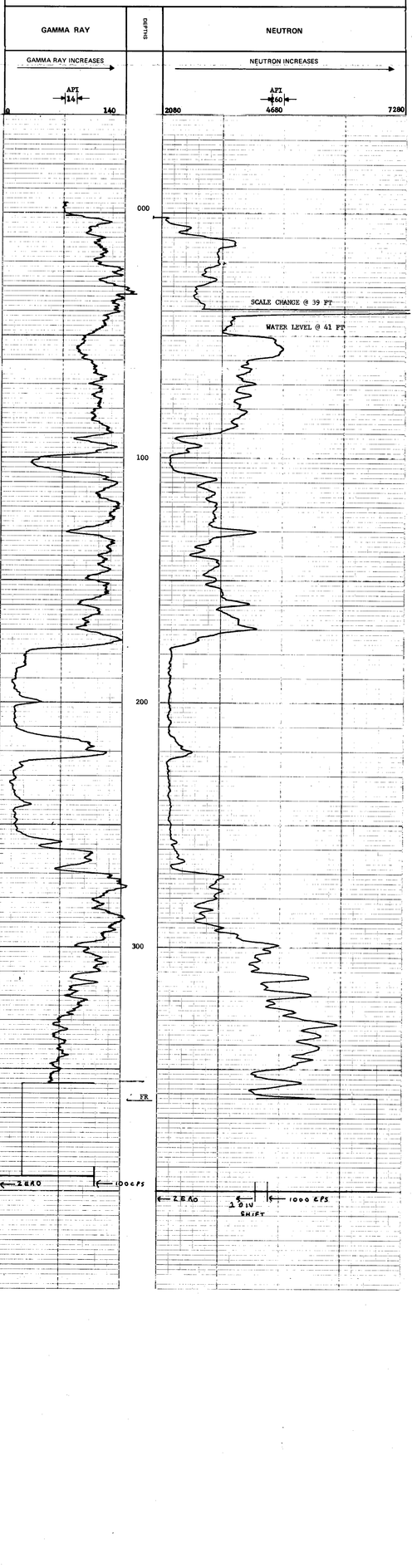
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	39	12	5	100	OL	14	3	1000	8L	260
	39	362	12	5	100	OL	14	3	500	1L	130

REMARKS



ROKE [redacted]

OIL ENTERPRISES LTD. CALGARY, ALBERTA

K-FORDING RIVER 77(3)A.

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL HE - 649

LOCATION TUNNELL MOUNTAIN 320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Other Services: NONE

Run. No.	ONE
Date	15 JULY 1977
First Reading	750
Last Reading	0
Footage Logged	750
Depth Reached	751
Depth Driller	751
Casing Roke	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	210
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	2 HOURS
Truck No.	37

Recorded By THOMSON Witnessed By SHAW

EQUIPMENT DATA

GAMMA RAY	
RUN NO.	ONE
TOOL MODEL NO.	[redacted]
DIAMETER	[redacted]16
DETECTOR MODEL NO.	
TYPE	[redacted]TION
LENGTH	4 INCH
DISTANCE TO N. SOURCE	6.7 FT.

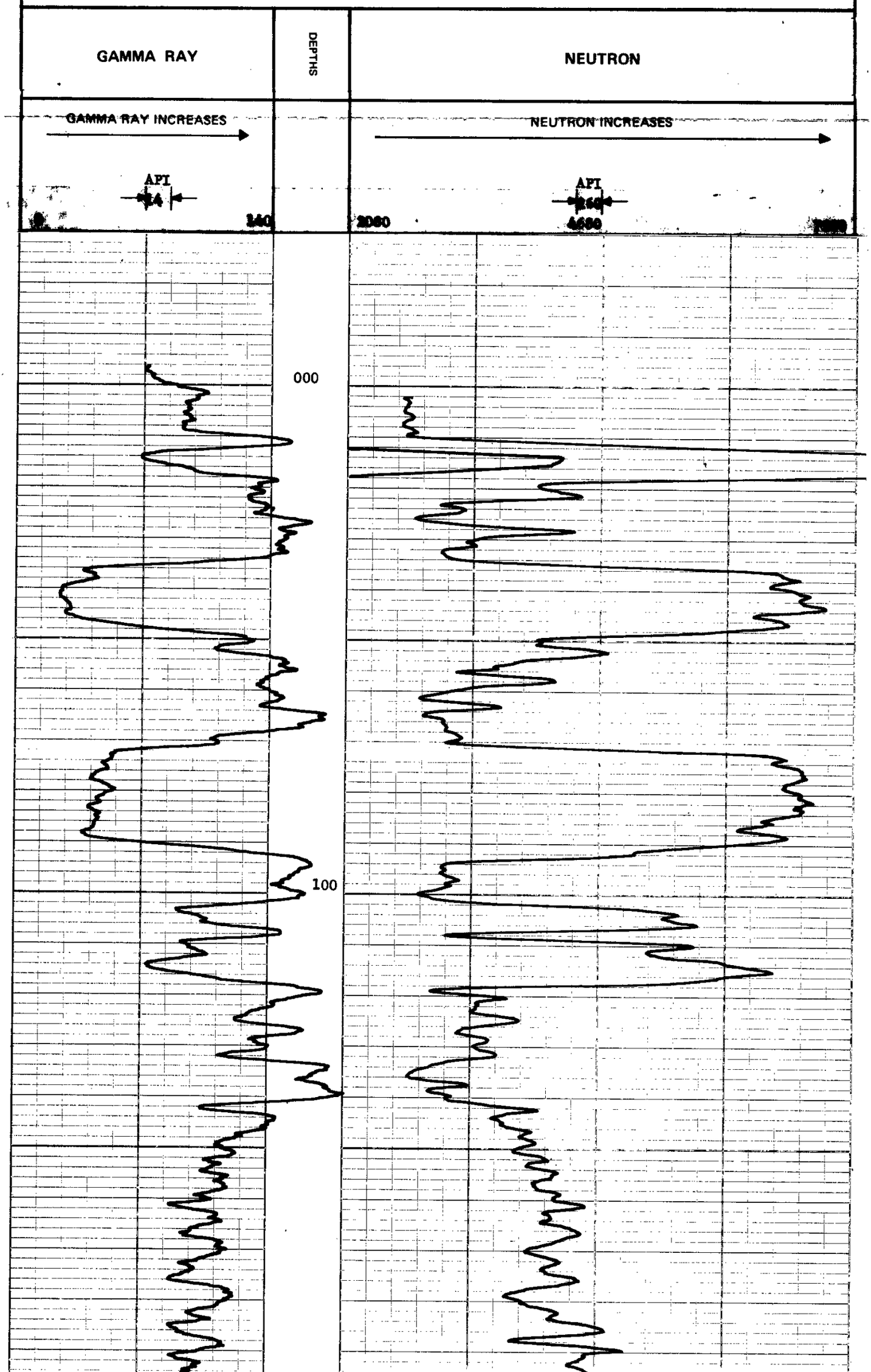
NEUTRON	
RUN NO.	ONE
LOG TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	[redacted]6
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	[redacted]
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	[redacted]
SPACING	17 INCH
TYPE	AmBe
STRENGTH	[redacted]

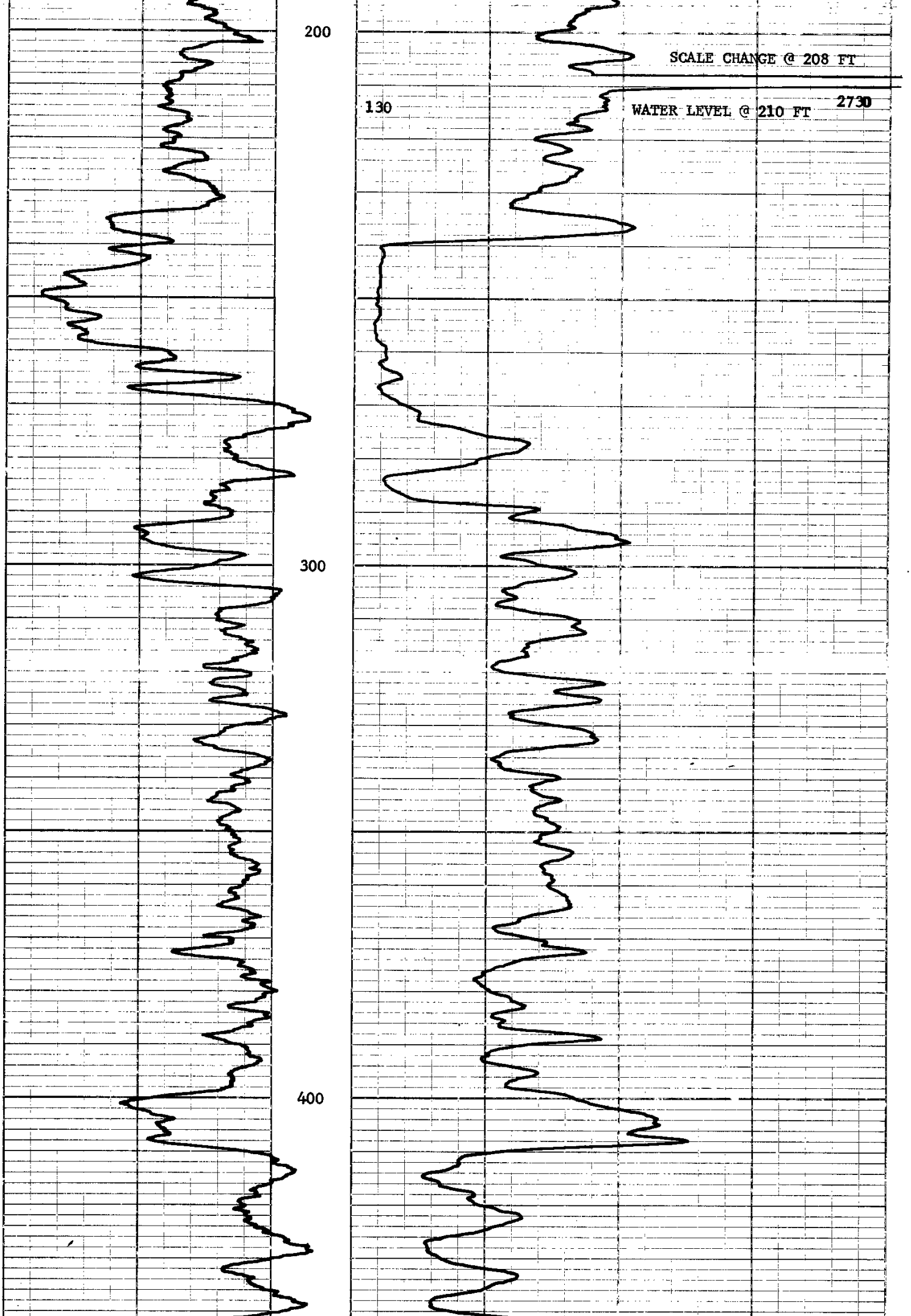
GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	37
TOOL SERIAL NO.	R GRM 169-002

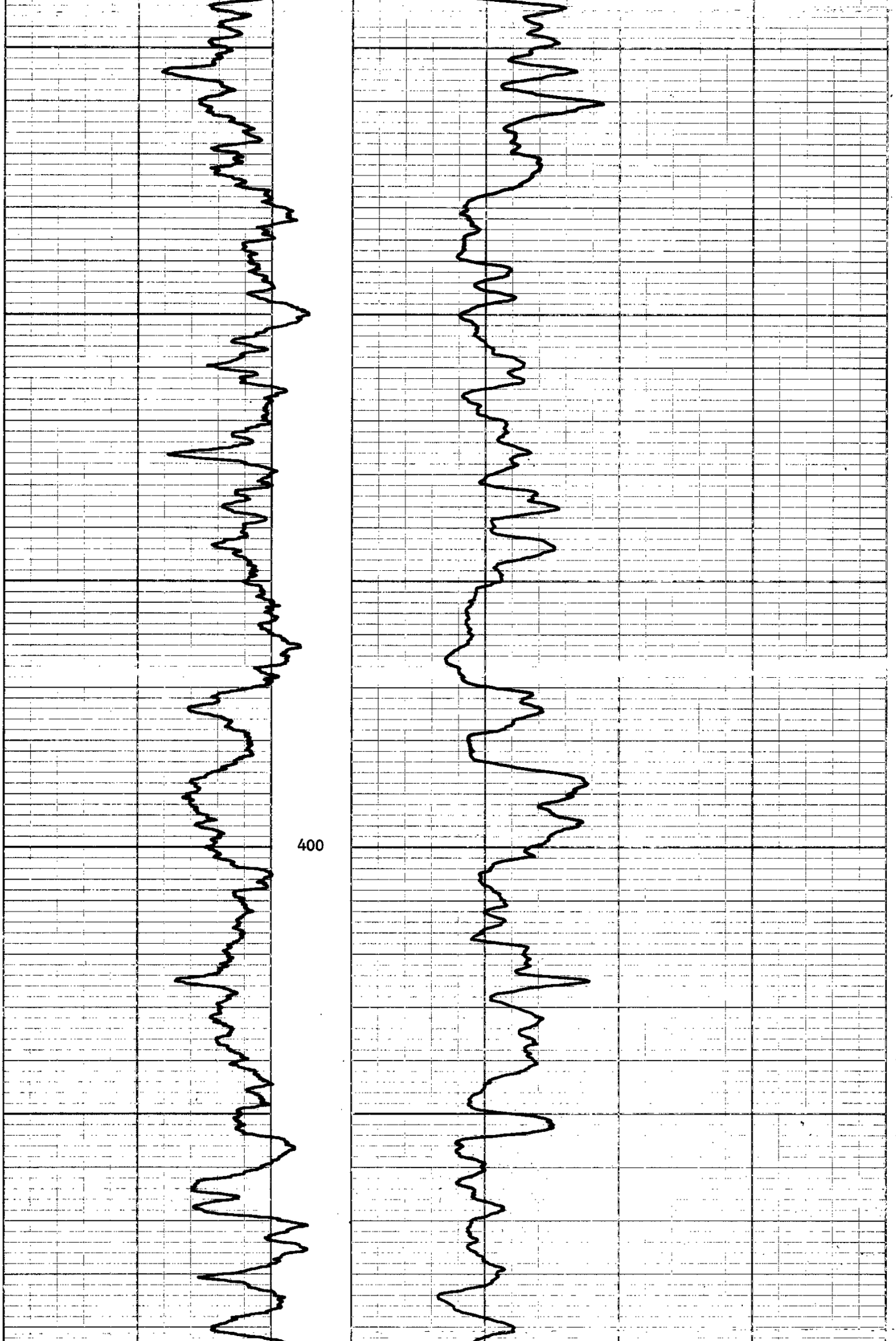
LOGGING DATA

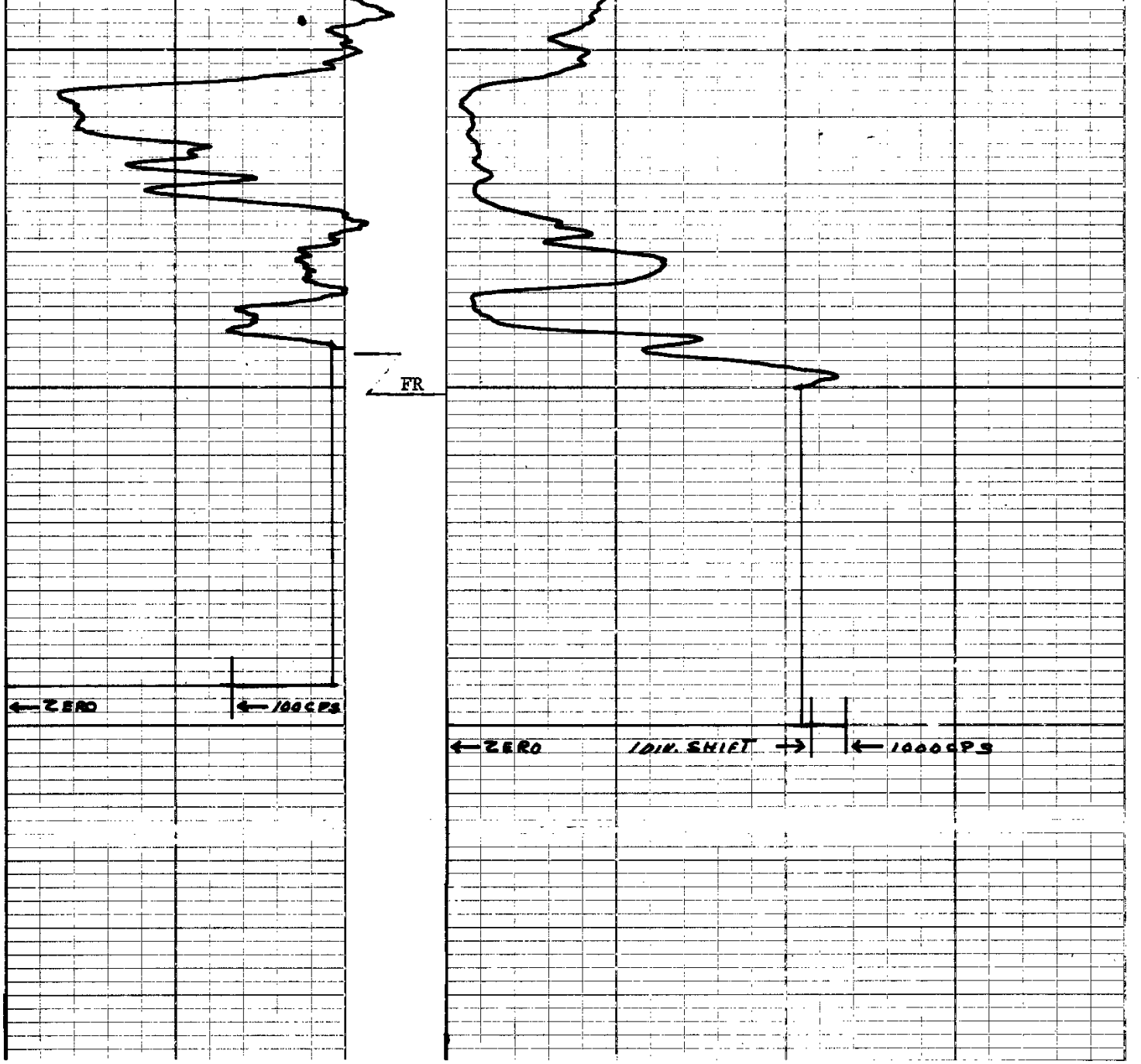
GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	208	12	5	100	0L	14	3	1000	8L	260
	208	750	12	5	100	0L	14	3	500	1L	130

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
NEUTRON INCREASES
API
API
000
100


200
300
400
SCALE CHANGE @ 208 FT
130
WATER LEVEL @ 210 FT
2730


400


FR
←ZERO
←100CPS
←ZERO
1DIV. SHIFT →
←1000CPS

K-FORDING RIVER 77(3)A.

Widco* WELL LOG

RH 650 TURNBULL

COMPANY

AREA TURNBULL

WELL RH 650 320

COUNTY STATE

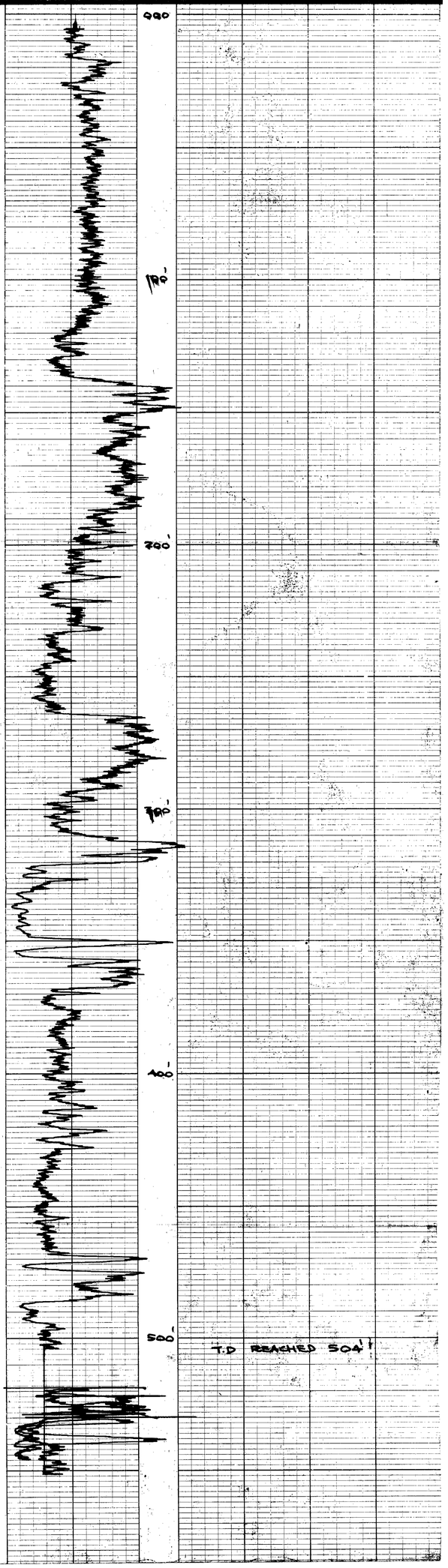
COORDINATES
N
S
ELEVATION
D.F.
K.B.
G.L.

	Run No.	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom - Driller		
Casing - From Log		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Source		
Density		
Viscosity	@ F	@ F
Resistivity	@ F	@ F
Res. @ BHT	@ F	@ F
pH		
Circ. Temp.		
B.H. Temp.		

Logged by R.K.
Witnessed by

REMARKS JUN. 23'77. 12 A.P.I.



K-FOLDING CREEK -77(3)-K

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO. 320

COMPANY FOLDING COAL LIMITED

WELL RR - 653

LOCATION TURNBULL MOUNTAIN

FIELD FOLDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev. K.B. —

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Drill Depths Measured from: GROUND LEVEL — G.L.

Other Services: K.B. NONE; DFD; G.L.

LSD SEC TWP RGE M

Run. No.	ONE
Date	11 AUG 1977
Last Reading	395
First Logged	103
Footage Logged	292
Depth Driller	396
Depth Reached	396
Casing Rake	398
Casing Driller	
Casing Logged	
Fluid Level	AIR/WATER
Liquid Level	132
Max. Ohms	
Min. Ohms	5
Rm @ °F	
Operating Time	
Truck No.	1 ROKE
	37

Recorded By: ROBINSON/MAYER

Witnessed By: SHAW

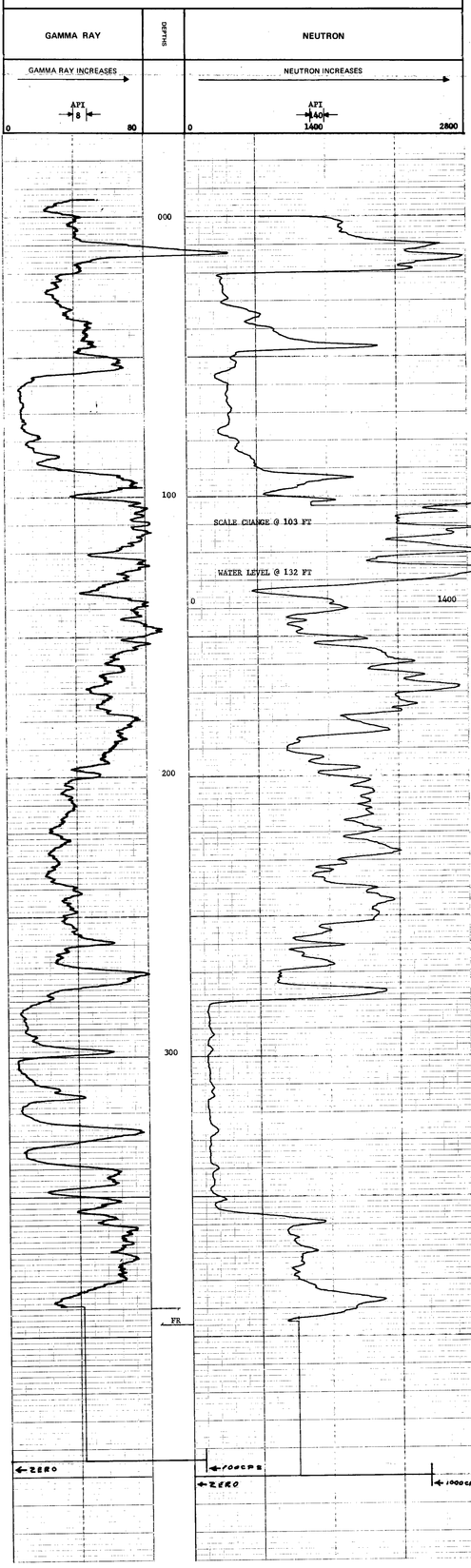
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.2 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIE

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	103	12	5	100	OL	8	3	1000	OL	140
	103	395	12	5	100	OL	8	3	500	OL	70

REMARKS: LOGGED THROUGH DOUBLE WALL DRILL STEM



Widco WELL LOG

RH 652 TURNBULL

TURNBULL MT.
RH 652
320

Date			Mud Type	Run No. 1	Run No. 2
Type Log			Density		
Top Logged Int.			Viscosity		
Bottom Log Int.			Resistivity		
Bit Size Drilled			Resistivity @ BHT		
Casing Driller			pH		
Casing Logger			Circ. Temp.		
Casing Size			BH Temp.		
Bit Size					
Bit Size			Logged by	W.H.S.	
			Witnessed by		

REMARKS 10 A.P.I. LOGGED THROUGH DOUBLE WALL DRILL STEM.

©OCT. 5 '77

* Reg. U.S. Pat. Off.

100'

200'

300'

400'

500'

T.D. REACHED 494'

T.D. DRILLED 577'

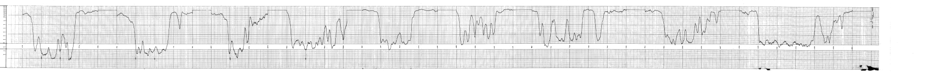
RECORDING CHARTS

ROKE

SIDEWALL DENSILOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

320



K-ERDOUG Rock 77/6/6

ROKE

OIL ENTERPRISES LTD.
GAMMA RAY NEUTRON LOG

CALGARY, ALBERTA

FILE NO.	
LOG NO.	
RUN NO.	
COMPANY	ROKE OIL LIMITED
WELL	320
FIELD	PROVOST
LOCATION	8-20-37-3W4
PROVINCE	ALBERTA

Other Services: GR/N

Permanent Datum	GROUND LEVEL
Elev.	2988
Log Measured From	KELLY BUSHING
Drilling Measured From	KELLY BUSHING
Elev. K.B.	2988
Elev. D.F.	
Elev. G.L.	2988
Date	77/6/6
Run No.	ONE
Depth Driller	1000
Depth Logger	1000
Bottom Logged Interval	1000
Top Logged Interval	0
Casing Driller	13 3/8 @ 237
Casing Logger	237
Bit Size	8 1/2
Type Fluid in Hole	GEL CHEM
Density	9.8
Viscosity	45
pH	10.5
Fluid Loss	8.4
Source of Sample	FLOWLINE
Rm @ Meas. Temp.	.83 @ 70°F
Rmf @ Meas. Temp.	.75 @ 70°F
Rmc @ Meas. Temp.	1.1 @ 70°F
Source of Rmf & Rmc	CALCULATED
Rm @ BHT	.45 @ 120°F
Time Since Circ.	5 HRS
Max. Rec. Temp.	120°F
Equip. Location	3-37-3W4
Recorded By	JOHNSON
Witnessed By	MR.

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
SENSITIVITY	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	4.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N.66-M
GENERAL		SERIAL NO.	197
HOIST TRUCK NO.	37	LOCATION	12 INCH
INSTRUMENT TRUCK NO.		TYPE	Am-Be
TOOL SERIAL NO.	B CDN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY			NEUTRON			
RUN	DEPTH	SPEED	T.C.	SENS	ZERO	API G. R. UNITS	T.C.	SENS	ZERO	API N. UNITS
NO.	FROM TO	FT/MIN	SEC.	SETTINGS	DIV. L OR R	PER LOG DIV.	SEC.	SETTINGS	DIV. L OR R	PER LOG DIV.
1	0 365	12	3	100	OL	12	3	1000	OL	260
	365 1118	12	3	100	OL	12	3	500	OL	130

REMARKS: LOGGED THROUGH 9⅝ METAL SIDE

GAMMA RAY

GAMMA RAY INCREASES

API 0 130

NEUTRON

NEUTRON INCREASES

API 2600 5200

SCALE CHANGE @ 365 FT

WATER LEVEL @ 365 FT

100 200 300 400 500 600 700 800 900 1000

FT

2.5 in/100 ft

2.5 in/100 ft

K-FORDING EVEC 77(3)4.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD SEC TWP RGE W M

COMPANY FORDING COAL LIMITED

WELL RH - 1045

LOCATION GREEN HILLS

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum: GROUND LEVEL — Elev.: K.B.

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum: C.S.G.

Well Depths Measured from: GROUND LEVEL — G.L.

Run No.	ONE
Date	12 AUG 1977
First Reading	244
Last Reading	0
Footage Logged	244
Depth Reached	265
Depth Driller	
Casing Rake	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	78
Mn. Diam.	3 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By

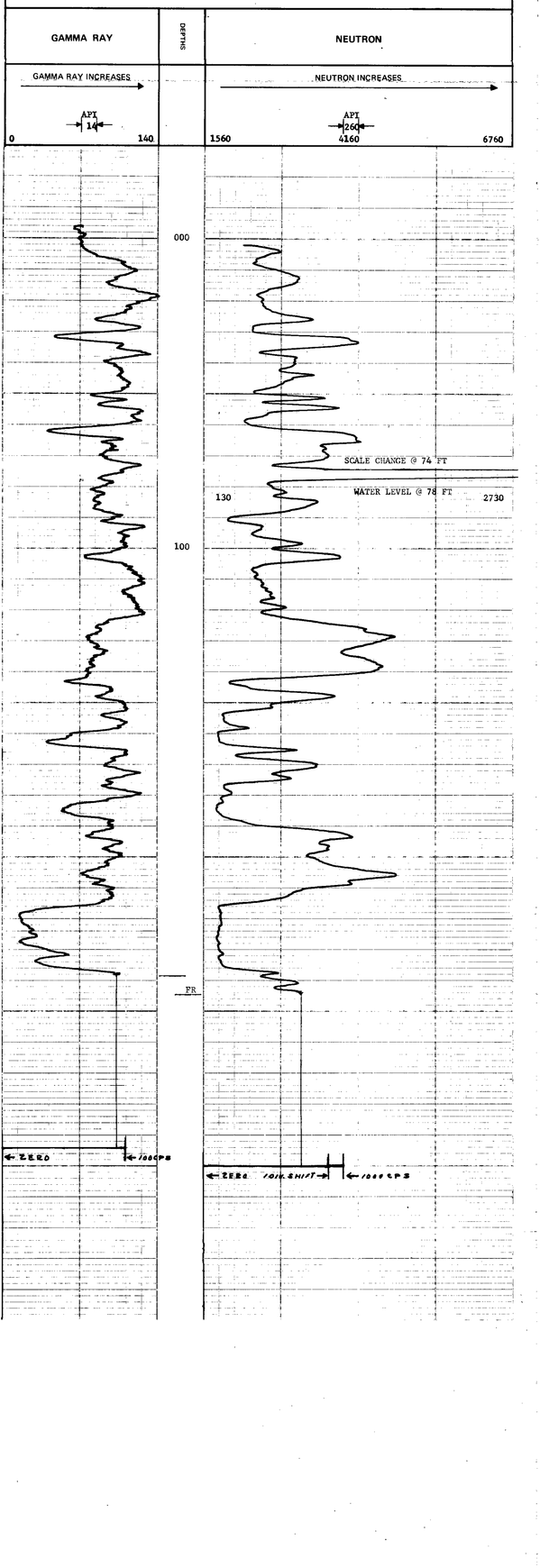
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	74	12	5	100	0L	14	3	1000	6L	260
	74	244	12	5	100	0L	14	3	500	1L	130

REMARKS



K - FORDING RIVER 77 (3) 4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL RH - 1046

LOCATION GREEN HILLS

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE									
Date	22 AUG 1977									
First Reading	247									
Last Reading	0									
Footage Logged	247									
Depth Reached	248									
Depth Driller	250									
Casing Roke										
Casing Driller										
Fluid Type	AIR/WATER									
Liquid Level	99									
Min. Diam.	4 7/8"									
Rm @ °F										
Operating Time	1½ HOURS									
Truck No.	34									
Recorded By	CHAPIN	Witnessed By	KONOWAG							

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	[illegible]ATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	[illegible] FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	50
HOIST TRUCK NO.	34	SPACING	17 INCH
INSTRUMENT TRUCK NO.	34	TYPE	AmBe
TOOL SERIAL NO.	177	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	99	12	5	100	OL	10	3	1000	OL	120
	99	247	12	5	100	OL	10	3	500	OL	60

REMARKS LOGGED THROUGH DOUBLE WALL PIPE

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 0 — 100		API 60 — 0 — 600 — 1200

000

100

SCALE CHANGE
LOGGED ON 1000 TAP
WATER LEVEL @ 99 FT

0 — 1200 — 2400
0 — 600 — 1200

200

FR

ZERO — 100 CPS

ZERO — 100 CPS

K-FORDING RIVER 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

320

FILE NO.	COMPANY FORDING COAL LIMITED		
LSD	WELL RH - 1046		
SEC			
TWP	LOCATION GREEN HILLS		
RGE			
W M	FIELD FORDING		Other Services:
	PROVINCE BRITISH COLUMBIA		NONE
Permanent Datum GROUND LEVEL	Elev.		K.B.
Log Measured from GROUND LEVEL	Ft. Above Perm. Datum		CSG
Well Depths Measured from GROUND LEVEL			G.L.

Run. No.	ONE		
Date	22 AUG 1977		
First Reading	247		
Last Reading	0		
Footage Logged	247		
Depth Reached	248		
Depth Driller	250		
Casing Roke			
Casing Driller			
Fluid Type	AIR/WATER		
Liquid Level	99		
Min. Diam.	4 7/8"		
Rm @ °F			
Operating Time	1½ HOURS		
Truck No.	34		
Recorded By GRAVEN	Witnessed By KOMENAC		

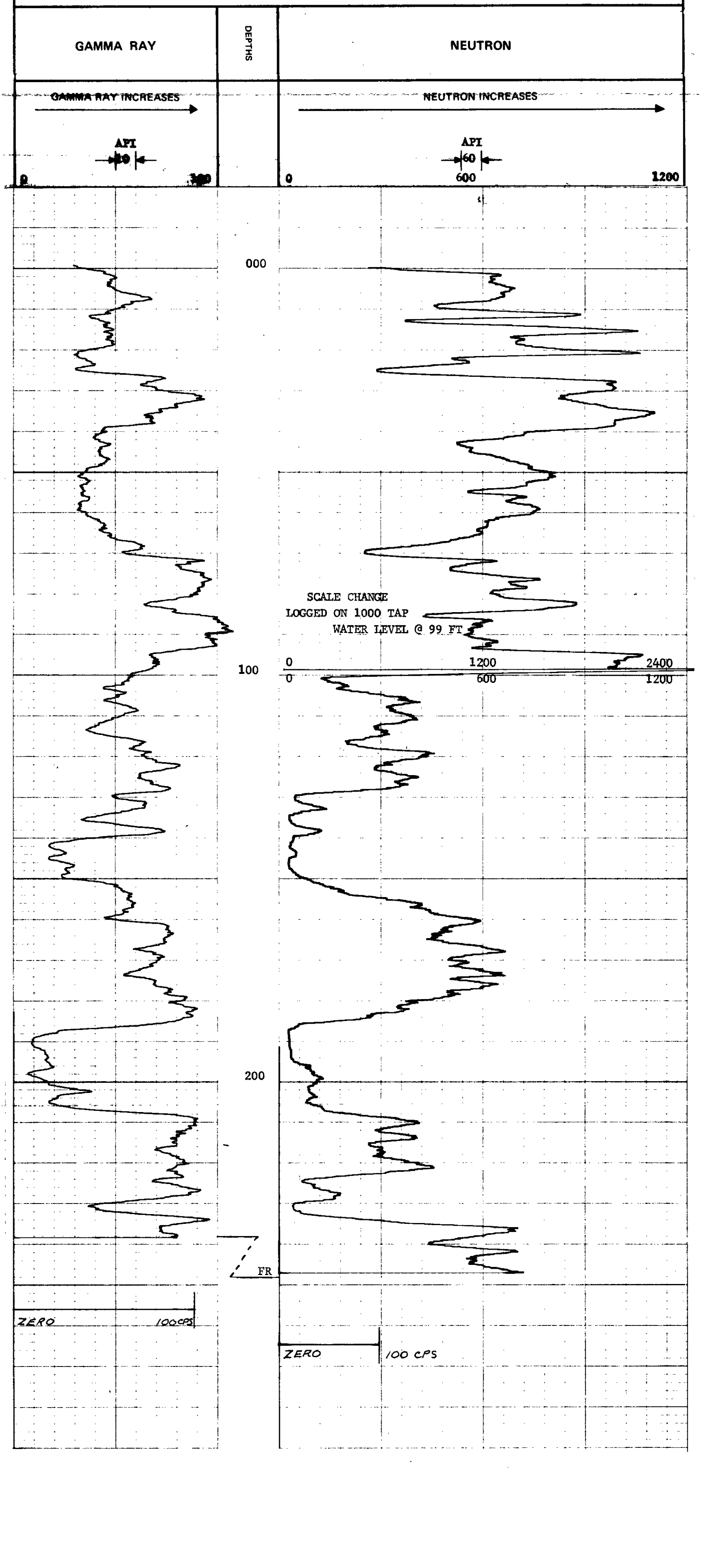
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	8.38 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	50
HOIST TRUCK NO.	34	SPACING	17 INCH
INSTRUMENT TRUCK NO.	34	TYPE	AmBe
TOOL SERIAL NO.	177	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	99	12	5	100	OL	10	3	1000	OL	120
	99	247	12	5	100	OL	10	3	500	OL	60

REMARKS LOGGED THROUGH DOUBLE WALL PIPE



ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

K-Falcon & Eagle: 77(5) A.

320

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RH - 1047

LOCATION GREEN HILLS

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

LSD SEC TWP RGE W M

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL

K.B.

CSG

G.L.

Run No.	ONE
Date	10 SEPT 1977
First Reading	352
Last Reading	0
Footage Logged	352
Depth Reached	353
Depth Driller	355
Casing Driller	
Casing Bake	12
Fluid Type	AIR/WATER
Liquid Level	68
Min. Diam.	5 1/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By KONDYAC

EQUIPMENT DATA

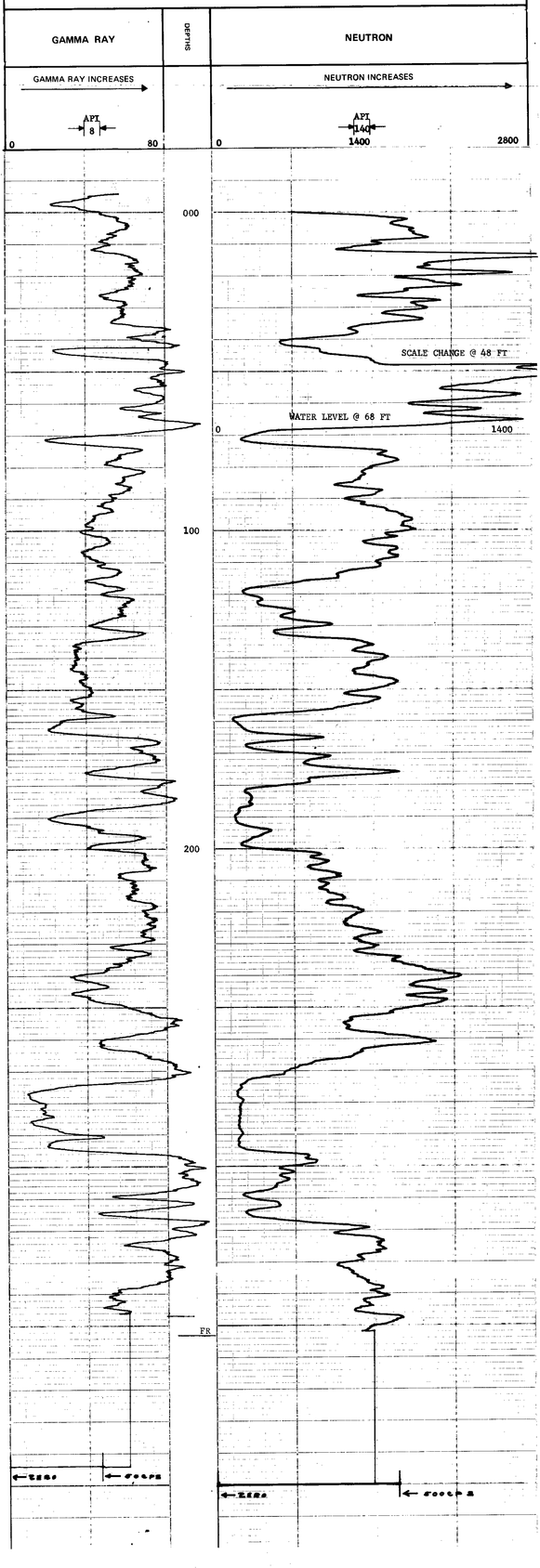
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
		SERIAL NO.	188
		SPACING	17 INCH
		TYPE	AmBe
		STRENGTH	.3 CURIES

GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	37
TOOL SERIAL NO.	R GRN 169-001

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	48	12	5	100	OL	8	3	1000	OL	140
	48	352	12	5	100	OL	8	3	500	OL	70

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



ROKE

POSITION RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

K-ROKE 5-7(3)-1

320

FILE NO.	
LOG SEC TWP RGE M	
COMPANY	ROKE OIL LIMITED
WELL	RR - 1050
LOCATION	GREEN TITLES
FIELD	ROKE
PROVINCE	BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev. 0
Log Measured From: GROUND LEVEL — 0 Ft. Above Perm. Datum
Drilling Measured From: GROUND LEVEL

Other Services: NONE

Rec. No. 27
Date 27 JUNE 1977
Run No. ONE
Depth Driller 542
Depth Logger 542
Bottom Logged Interval 542
Top Logged Interval 0
Casing Driller 5½ @ 542
Casing Logger
Bit Size 4 7/8
Type Fluid in Hole LIQUID WATER
Dens. Visc. 295
Liquid Level 4 7/8
Max. Rec. Temp. Deg. F
Equip. No. & Location
Recorded By JOHNSON
Witnessed By SYNDRAL

Operating Time
Truck No. 37
1 HOUR

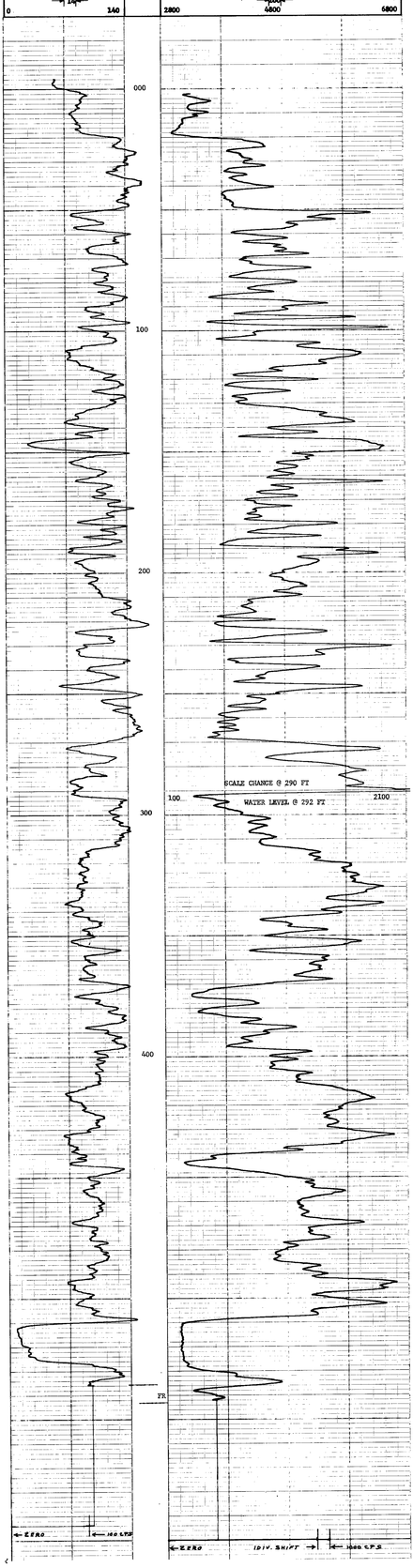
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	5 curies

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	290	12	5	100	OL	14	3	1000	14 L	200
	290	542	12	5	100	OL	14	3	500	1 L	100

REMARKS



KEROONG RIVER 77(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL RH - 1051

LOCATION GREEN HILLS

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Other Services: NONE

Run. No.	ONE
Date	19 JUNE 1977
First Reading	555
Last Reading	0
Footage Logged	555
Depth Reached	556
Depth Driller	556
Casing Roke	
Casing Driller	10
Fluid Type	AIR/WATER
Liquid Level	179
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON Witnessed By McKENNY

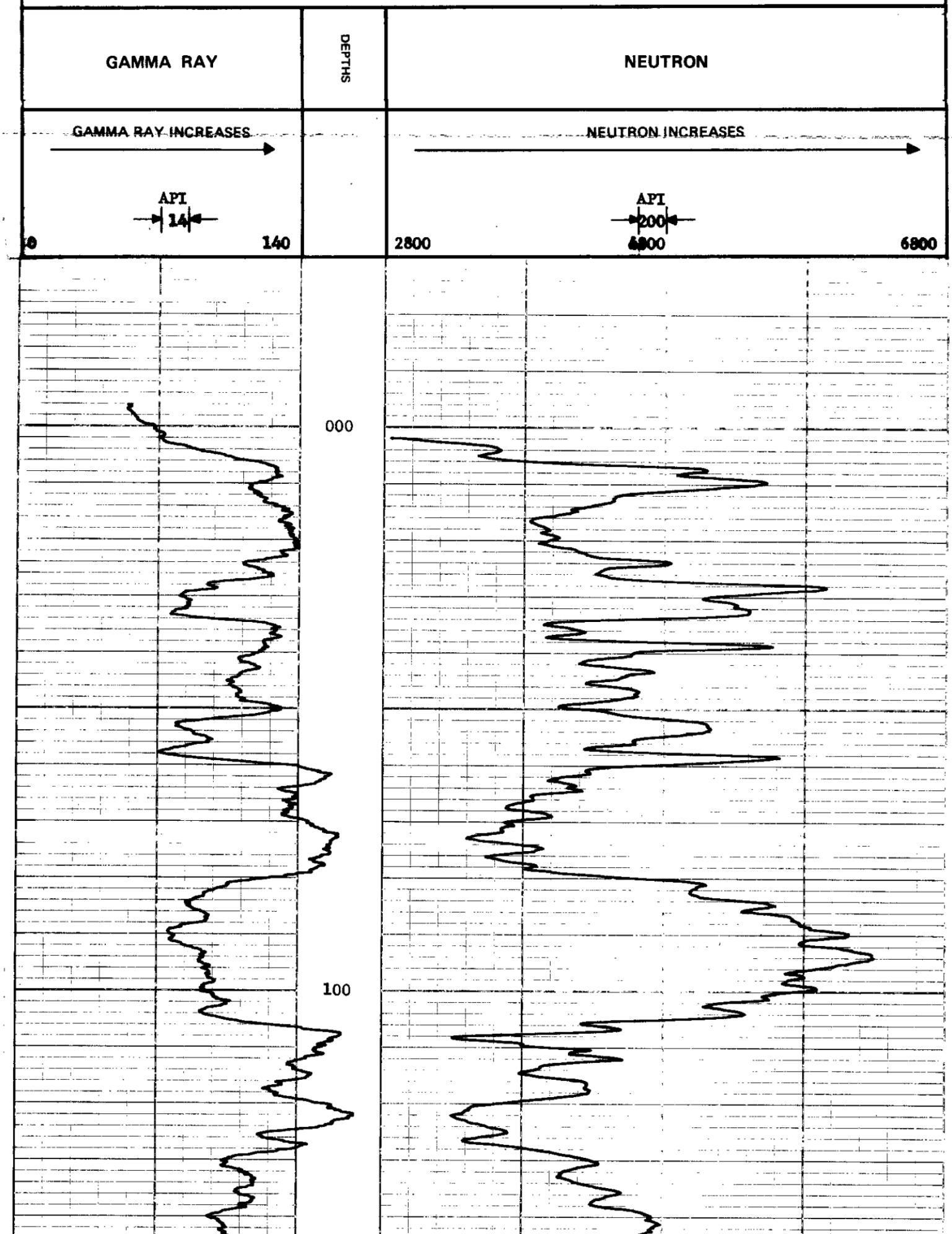
EQUIPMENT DATA

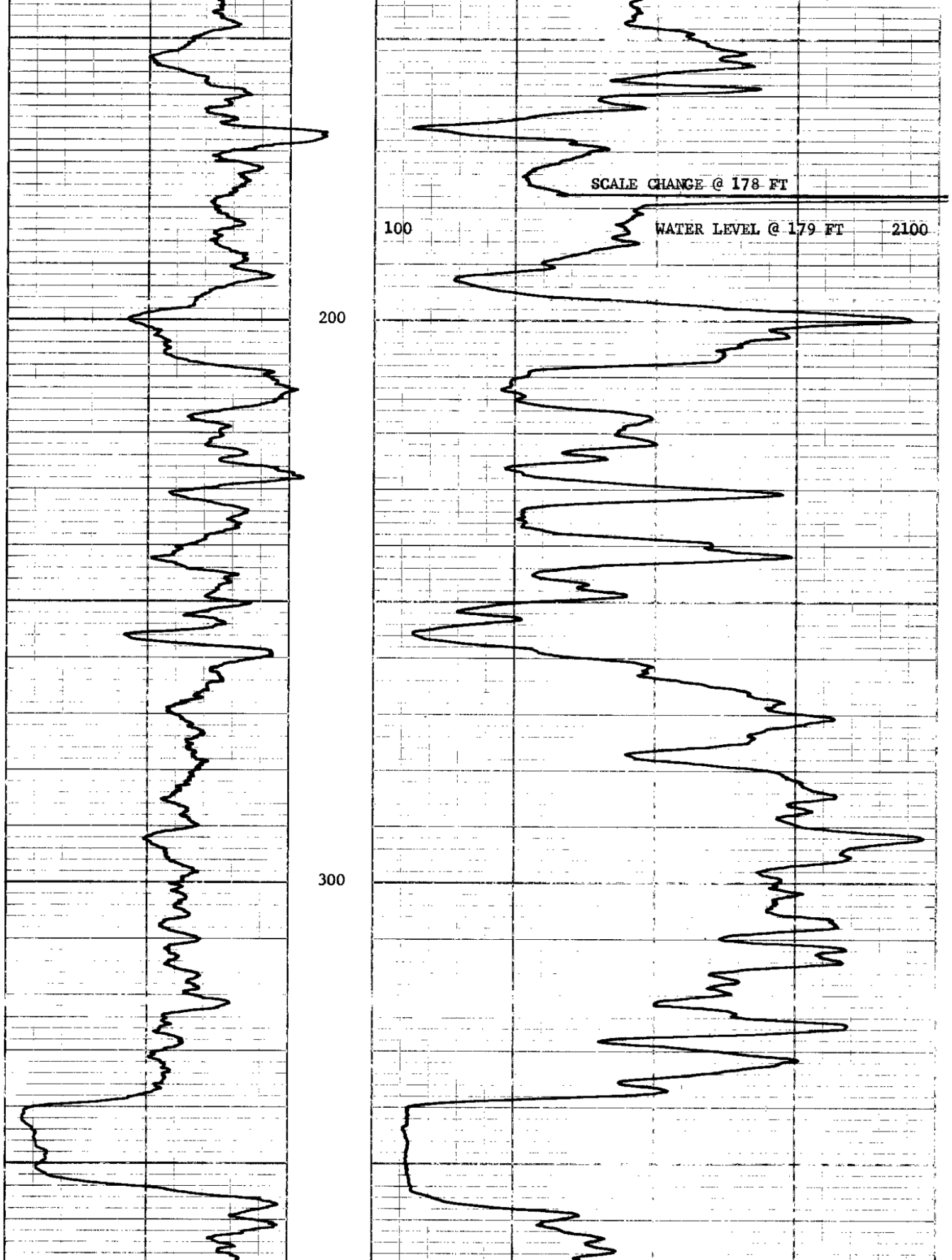
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.1 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

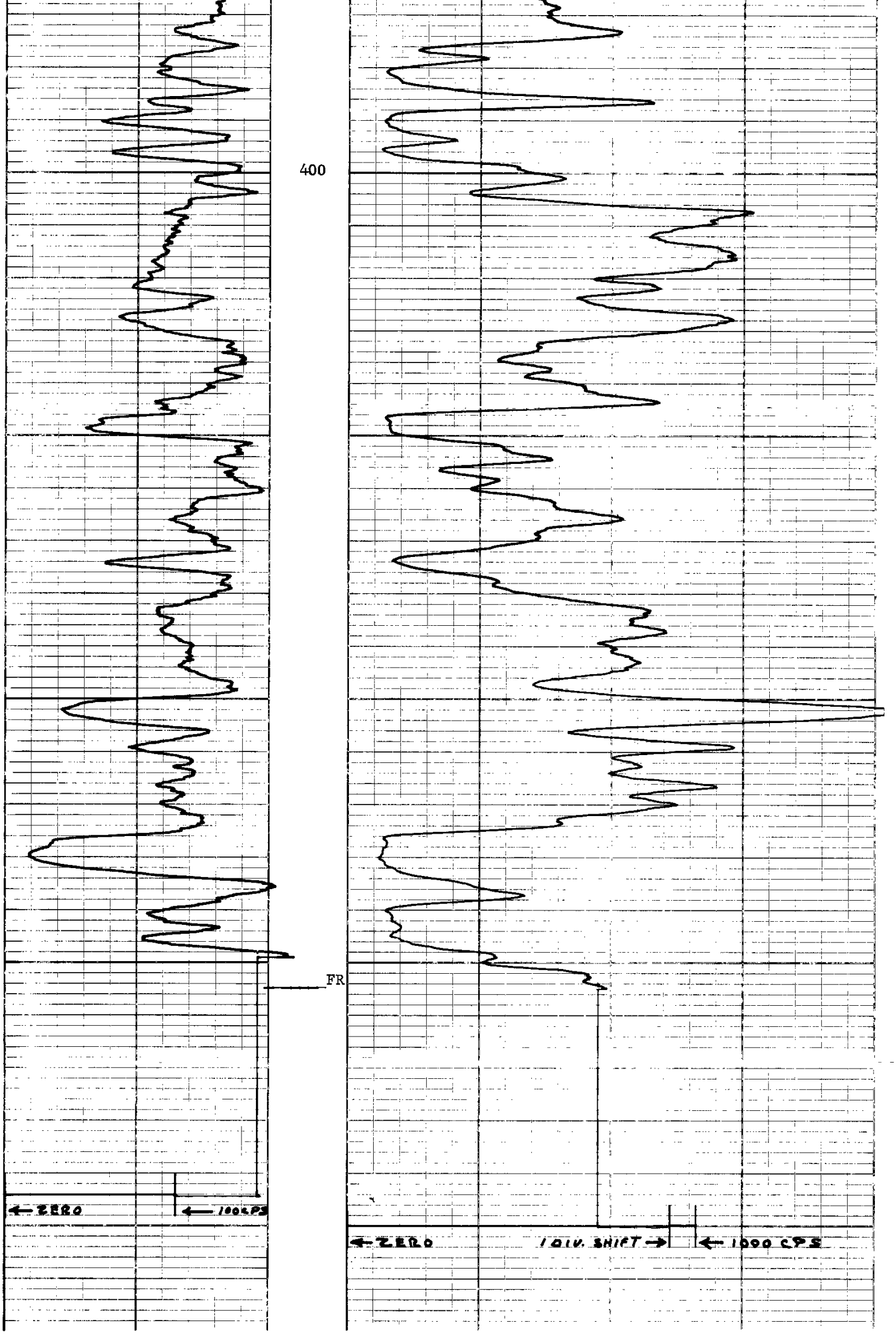
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	178	12	5	100	0L	14	3	1000	14L	200
	178	555	12	5	100	0L	14	3	500	1L	100

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
NEUTRON INCREASES
API
14
140
2800
6800
000
100


SCALE CHANGE @ 178 FT
100
WATER LEVEL @ 179 FT
2100
200
300


400
FR
← ZERO
← 1000 CPS
← ZERO
1 DIV. SHIFT →
← 1000 CPS

K-FOR-ON-6 (WEE 77-(3)-A

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 320

LSD SEC TWP RGE W M

COMPANY PRAIRIE OHIA LIMITED

WELL 102 - 1053

LOCATION CROSS HILLS

FIELD PRAIRIE

PROVINCE BRITISH COLUMBIA

Permanent Datum: MEAN SEA LEVEL

Log Measured from: GROUND LEVEL

Drilling Measured from: GROUND LEVEL

Elev.: K.B. [ ] D.F. [ ] G.L. [ ]

Other Services: NONE

Rec. No. ONE

Date 29 JUNE 1977

First Reading 2800

Last Reading 6800

Depth Driller 5467

Depth Reached 5467

Bottom Logged 5466

Top Logged 4350

Casing Driller 12

Casing Logged 1346

Fluid Type AIR/WATER

Liquid Level 1346

Max. Temp.

Rm @ °F

Operating Time 3 HRS.

Truck No. 37

Recorded By JOHNSON

Witnessed By MORROW

EQUIPMENT DATA

GAMMA RAY

RUN NO.	ONE
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	SCINTILLATION
LENGTH	4 INCH
DISTANCE TO N. SOURCE	6.7 FT.

GENERAL

HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	37
TOOL SERIAL NO.	R GRN 169 + 002

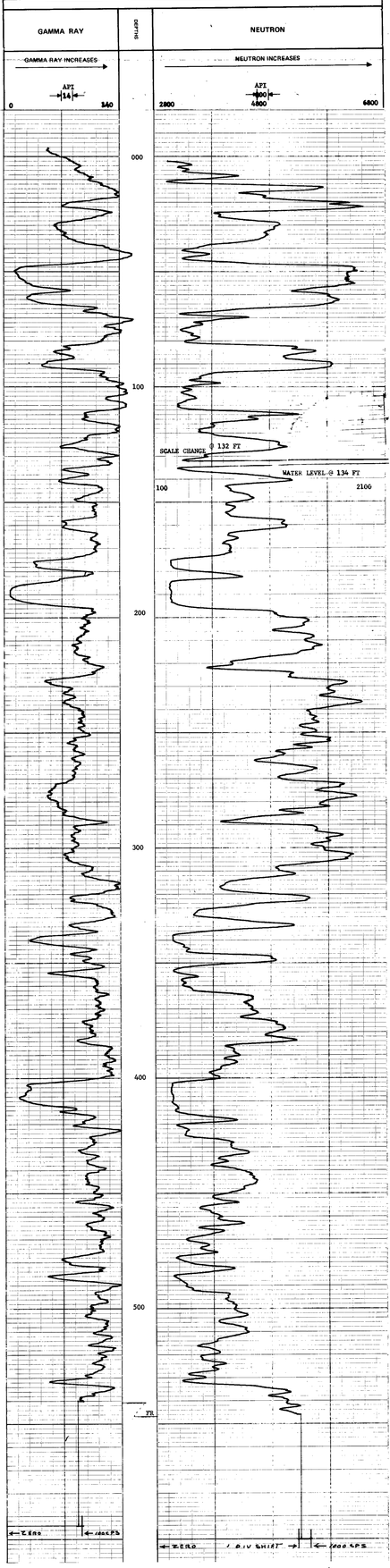
NEUTRON

RUN NO.	ONE
LOG TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	6 INCH
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	187
SPACING	17 INCH
TYPE	AmBe
STRENGTH	[illegible]

LOGGING DATA

GENERAL RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T.C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	132	12	5	100	OL	14	3	1000	14L	200
	132	546	12	5	100	OL	14	3	500	11L	100

REMARKS



K-5(6)9 KWES 71(5)A

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

LSD SEC TWP RGE M

FILE NO.

COMPANY PEDDEN COAL LIMITED

WELL NO. 1053

FIELD

LOCATION GREEN HILLS

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL Elev. 3320 Ft. Above Perm. Datum

Log Measured From: GROUND LEVEL Ft. Above Perm. Datum

Other Services: NONE

Rec. No. 14 Date JUNE 1977 First Reading 585 Last Reading 225 Depth Logged 585 Depth Reached 585 Depth Driller 587 Casing Logged 587 Casing Driller 10 Fluid Type AIR/WATER Liquid Level 230 Max. Chain 4 7/8 Rig # 92

Operating Time 1 HOUR

Truck No. 37

Recorded By JOHNSON

Witnessed By MCGARRY

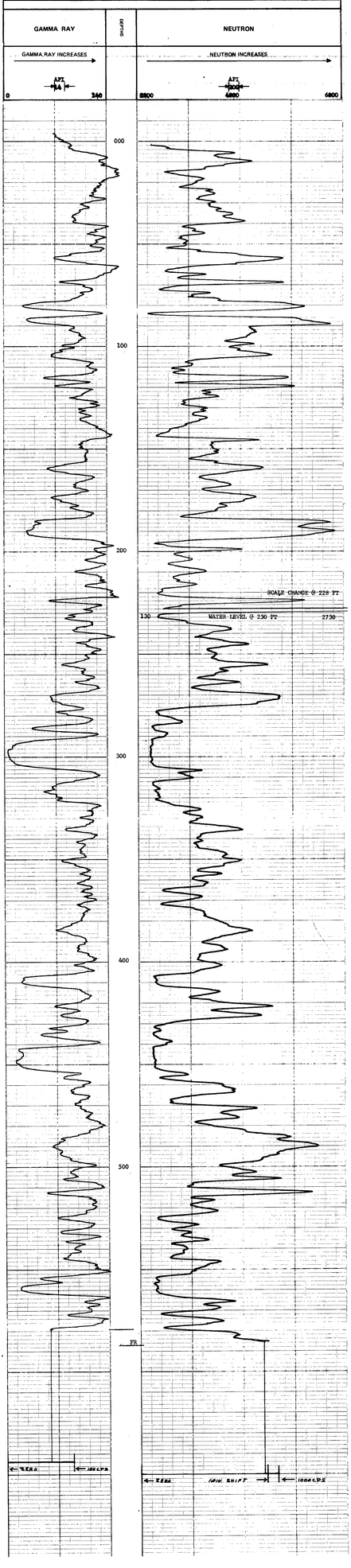
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	1.5 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 165-002	STRENGTH	10 MILLICURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	228	12	5	100	ON	14	3	1000	13.2 L	200
	228	585	12	5	100	ON	14	3	500	1 R	100

REMARKS



KFOROING RIVER 77(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

[redacted]

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL EK - 1054

LOCATION [redacted] HILLS

FIELD [redacted]

PROVINCE BRITISH COLUMBIA

Permanent Datum [redacted] Elev. ____

Log Measured from [redacted] Ft. Above Perm. Datum

Well Depths Measured from [redacted]

Other Services: NONE

K.B. ____
DF ____
G.L. ____

Run. No.	ONE		
Date	24 JUNE 1977		
First Reading	545		
Last Reading	0		
Footage Logged	545		
Depth Reached	545		
Depth Driller	545		
Casing Roke			
Casing Driller			
Fluid Type	AIR/WATER		
Liquid Level	140		
Min. Diam.	5		
Rm @ °F			
Operating Time	1 HOUR		
Truck No.	37		
Recorded By	[redacted]	Witnessed By	[redacted]

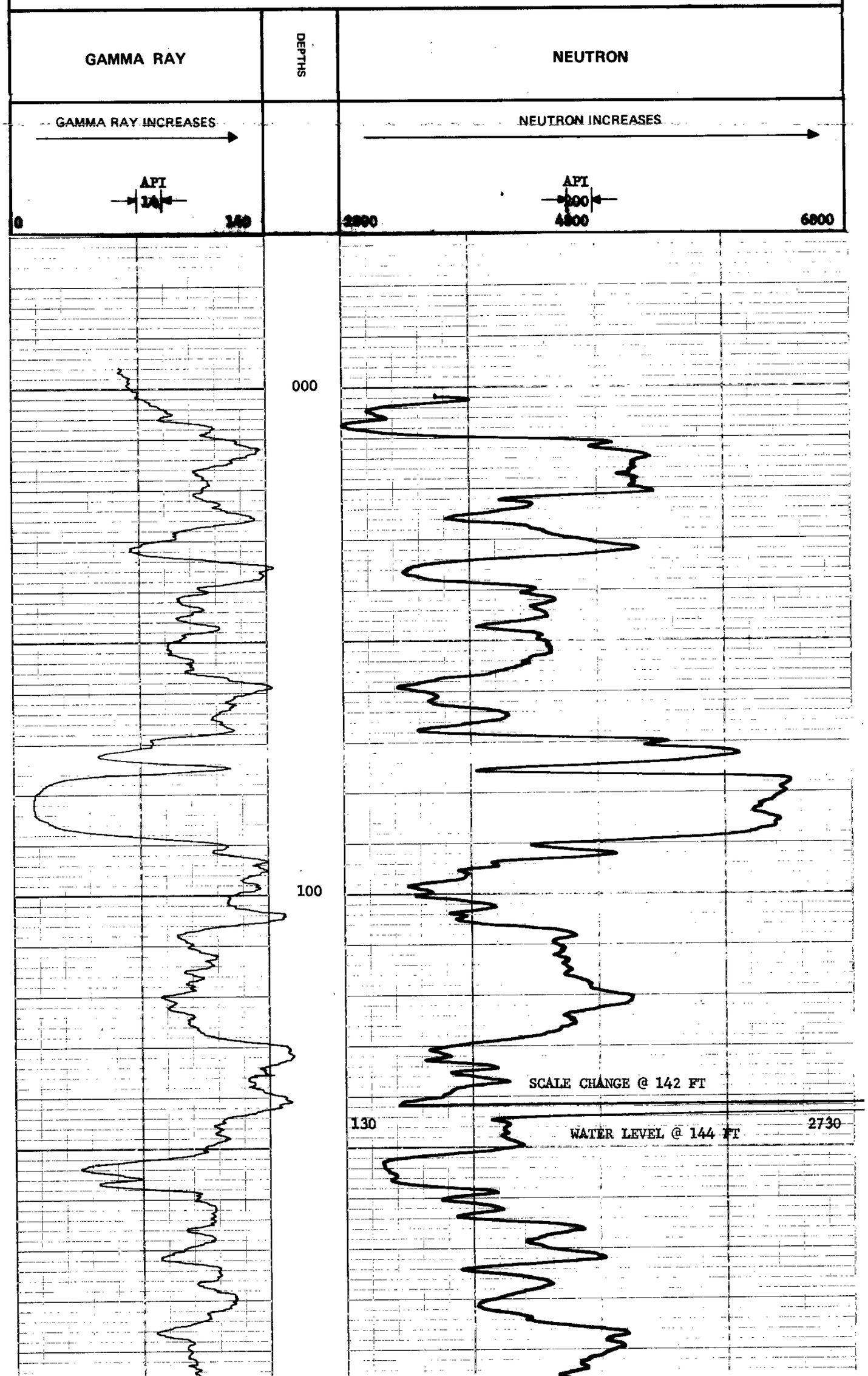
EQUIPMENT DATA

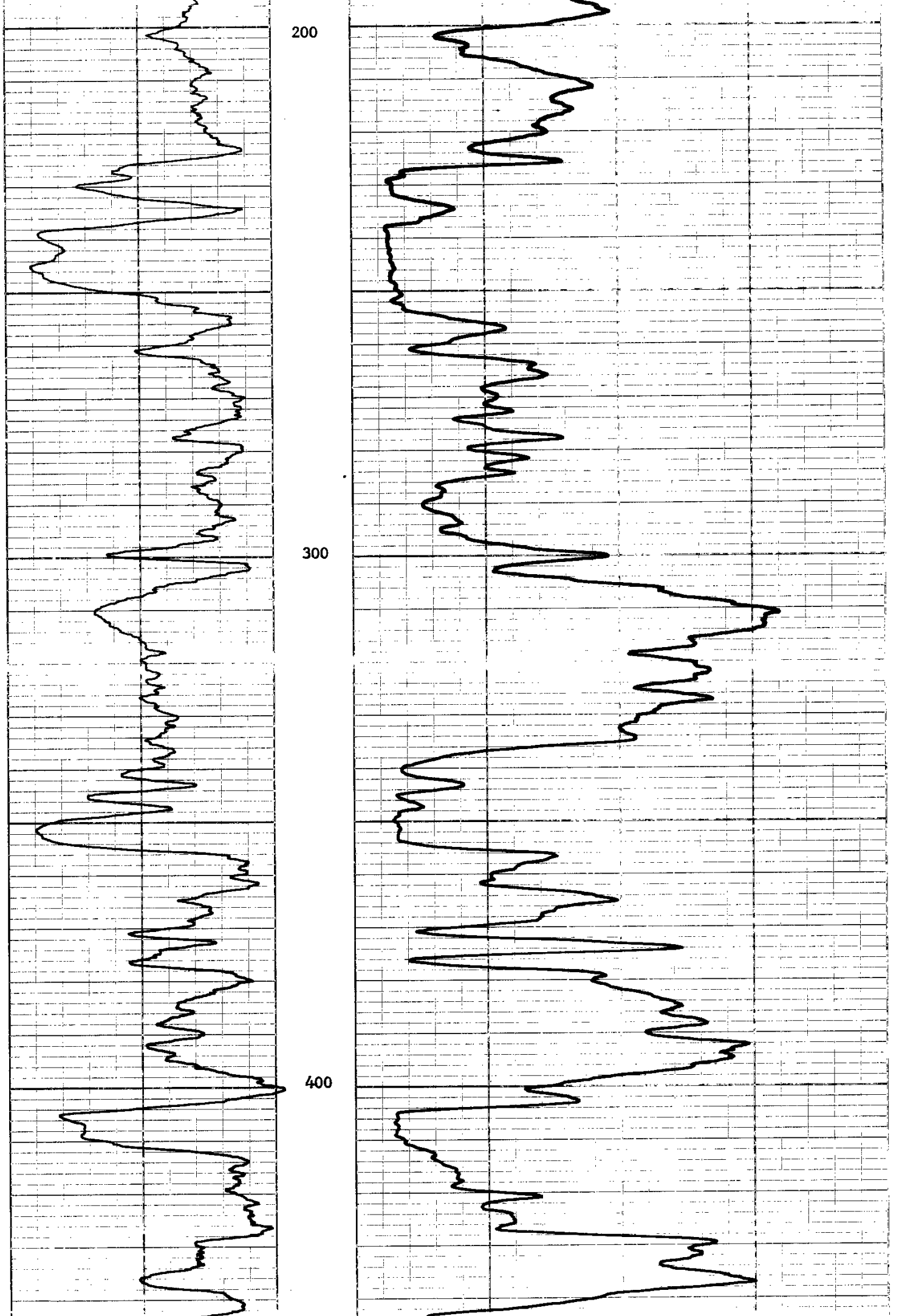
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	[redacted]	DETECTOR MODEL NO.	
LENGTH	[redacted] INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	[redacted] FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	[redacted]

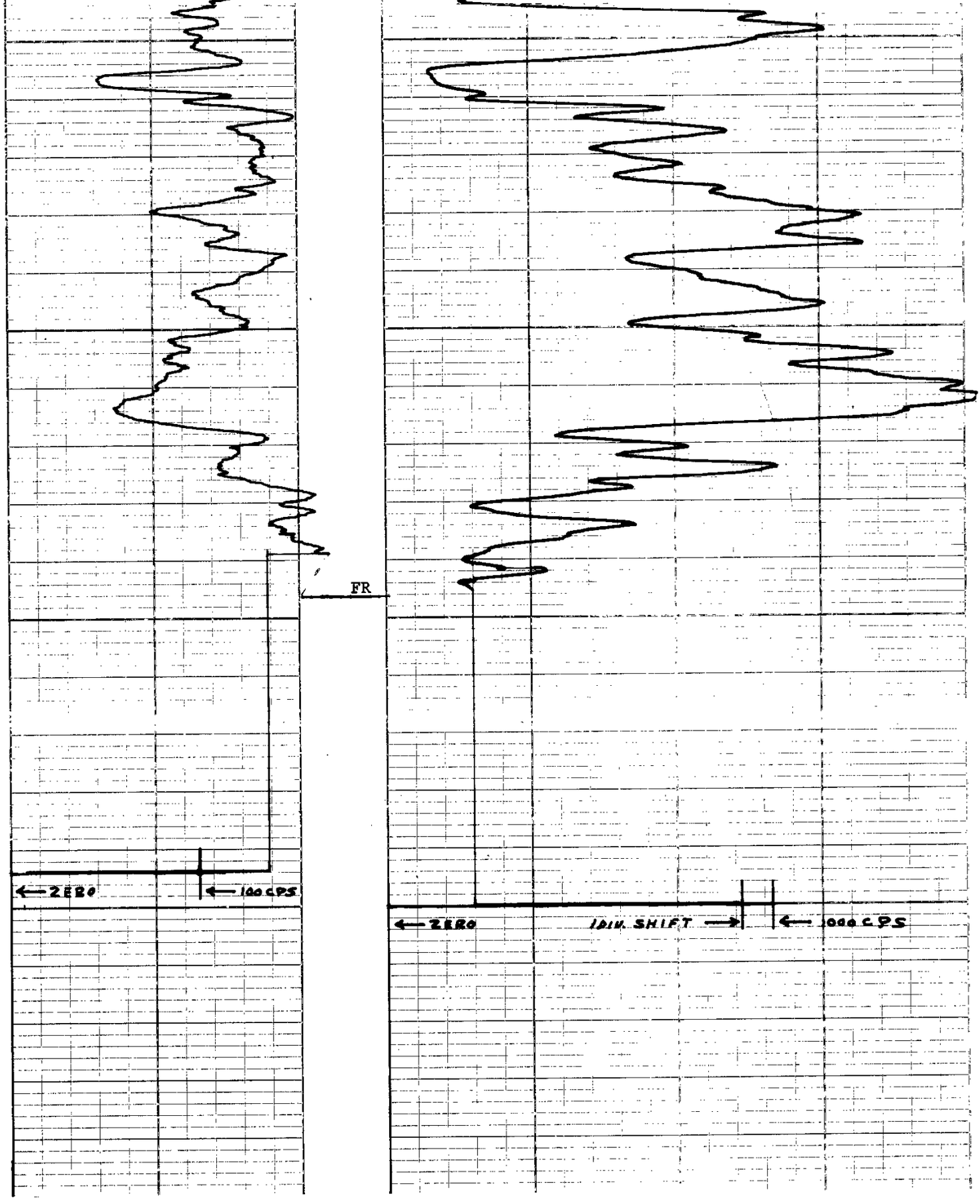
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	142	12	5	100	0%	14	3	1000	14 L	200
	142	545	12	5	100	0%	14	3	500	1 L	100

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
API
0
NEUTRON INCREASES
API
2800
4800
6800
000
100
SCALE CHANGE @ 142 FT
130
WATER LEVEL @ 144 FT
2730


200
300
400


FR
ZERO
100 CPS
ZERO
1 DIV. SHIFT
1000 CPS

K-FORDING RIVER 71(3)A

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL RH - 1055

LOCATION GREEN HILLS

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE
Date	16 JUNE 1977
First Reading	546
Last Reading	0
Footage Logged	546
Depth Reached	547
Depth Driller	550
Casing Roke	
Casing Driller	10
Fluid Type	AIR/WATER
Liquid Level	206
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By McCANNY

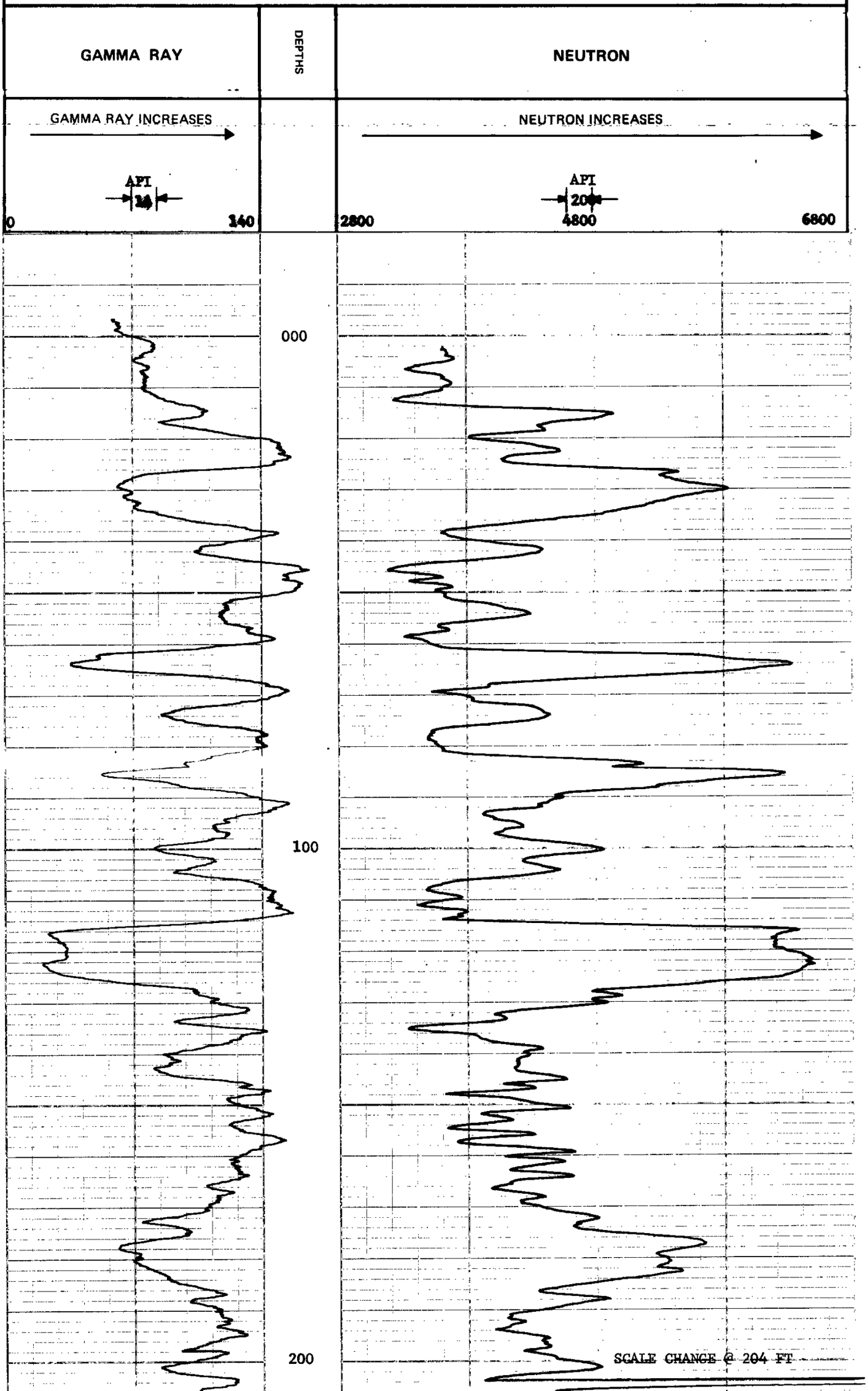
EQUIPMENT DATA

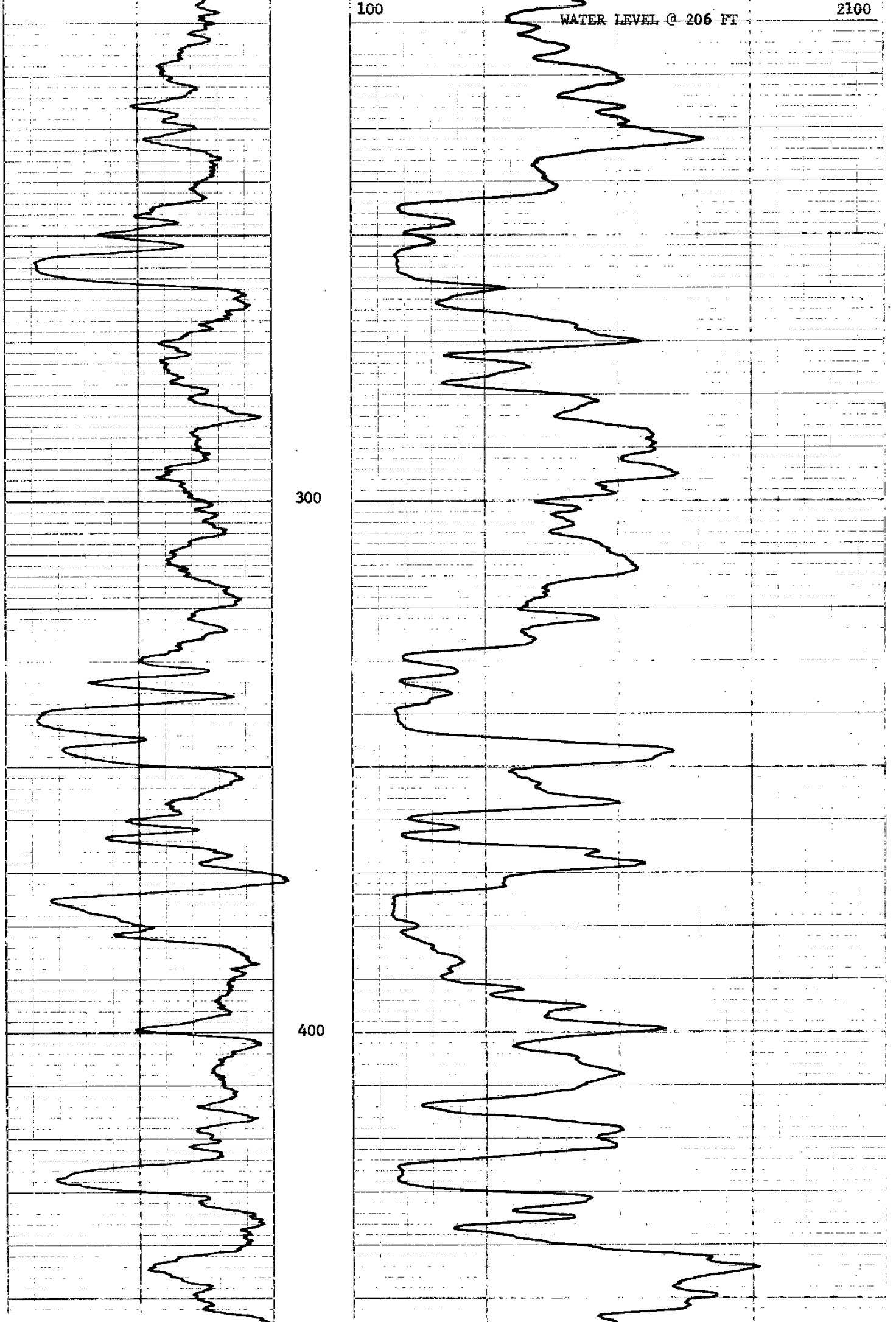
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

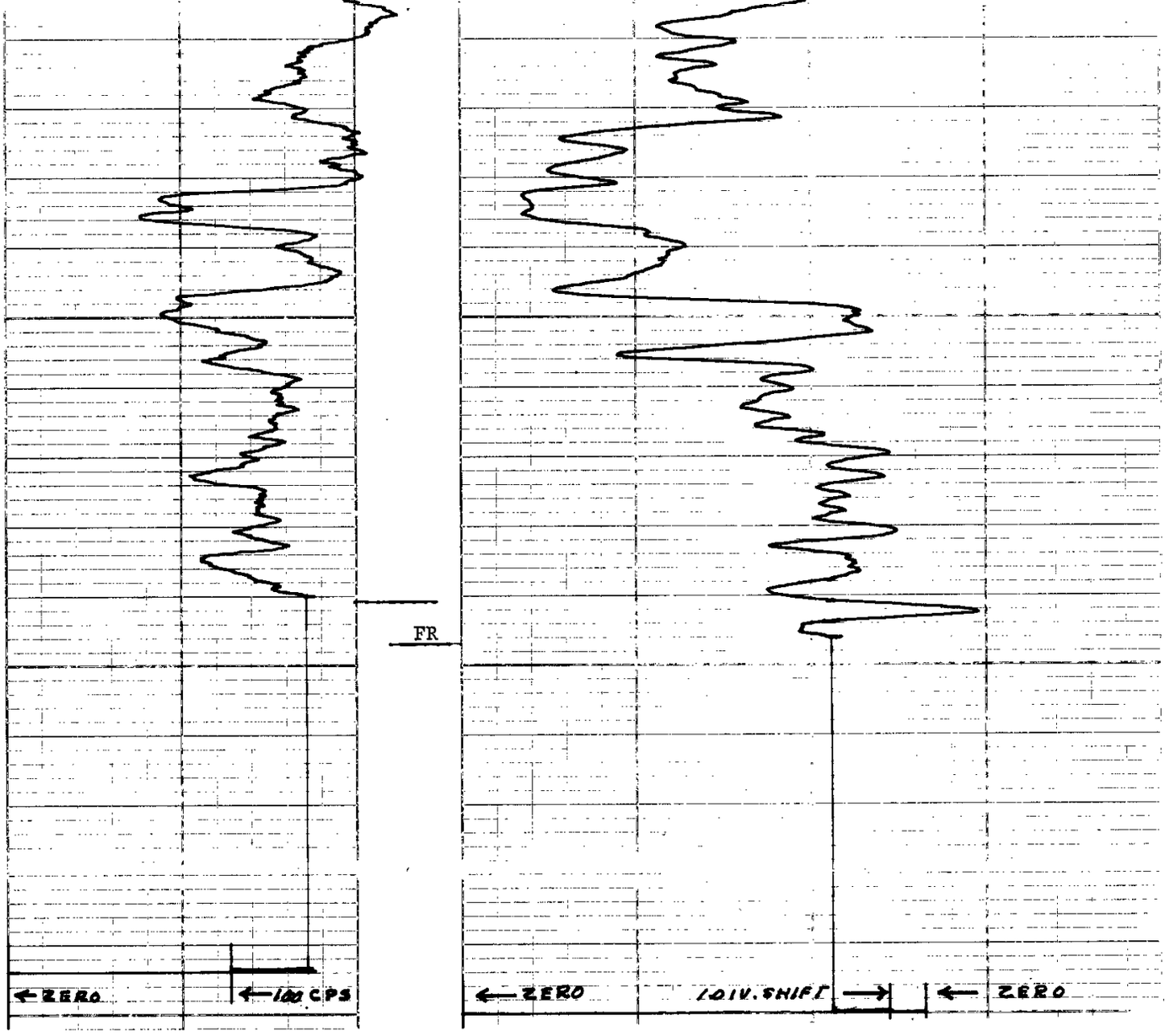
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	204	12	5	100	0L	14	3	1000	14L	200
	204	546	12	5	100	0L	14	3	500	1 L	100

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
API
0
140
NEUTRON INCREASES
API
2800
4800
6800
000
100
200
SCALE CHANGE @ 204 FT


100
WATER LEVEL @ 206 FT
2100
300
400


FR
← ZERO
← 100 CPS
← ZERO
10 IV. SHIFT →
← ZERO

Widco* WELL LOG

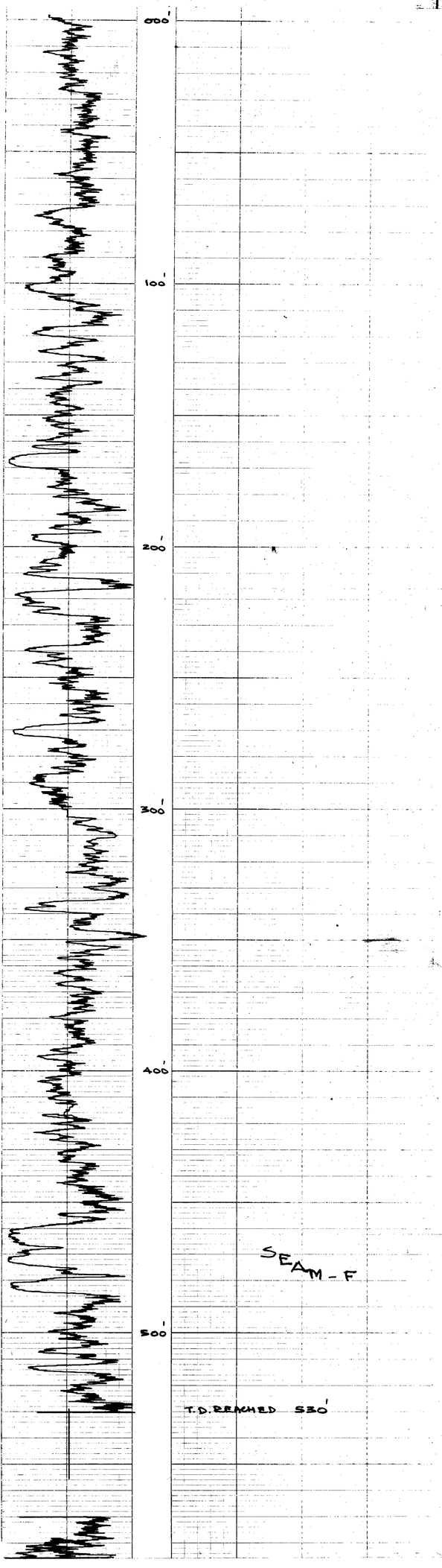
RH 105C
GREENHILLS

COMPANY
AREA GREENHILLS
WELL RH 105C 320
COUNTY STATE

	Run No.		Run No.	Run No. 2
Date				
First Reading				
Last Reading				
Footage Logged				
Bottom Driller				
Casing From Log				
Casing Driller				
Casing Size				
Bit Size				
Bit Size				
Logged by / Witnessed by			RK.	

REMARKS 10 A.P.I.
LOGGED THROUGH DOUBLE WALL DRILL STEM

*Reg. U.S. Pat. Off.



K-FORCING CURVES 72 (3)4

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. | LSD | SEC | TWP | RGE | M

COMPANY ROKE OILS LIMITED

WELL 102 + 1057

LOCATION GREEN RIVER

FIELD WILDCAT

PROVINCE ALBERTA

Permanent Datum: GROUND LEVEL — Elev. 4276 Ft. Above Perm. Datum

Log Measured from: GROUND LEVEL — 20 Ft. Above Perm. Datum

Other Services: NONE

K.B. ____ D.F. ____ G.L. ____

320

Rec. No. ORE

Date 14 JUNE 1977

Run No. ONE

Depth Driller 500

Depth Logger 498

Bottom Logged Interval 498

Top Logged Interval 100

Casing Driller 20 @ 100

Casing Logger SURFACE

Fluid Type FRESH WATER

Liquid Level 172

Max. Hole Temp. 37°

Rm @ °F

Operating Time

Truck No. 97 — 1 UNIT

Recorded By JOHNSON

Witnessed By MCCABE

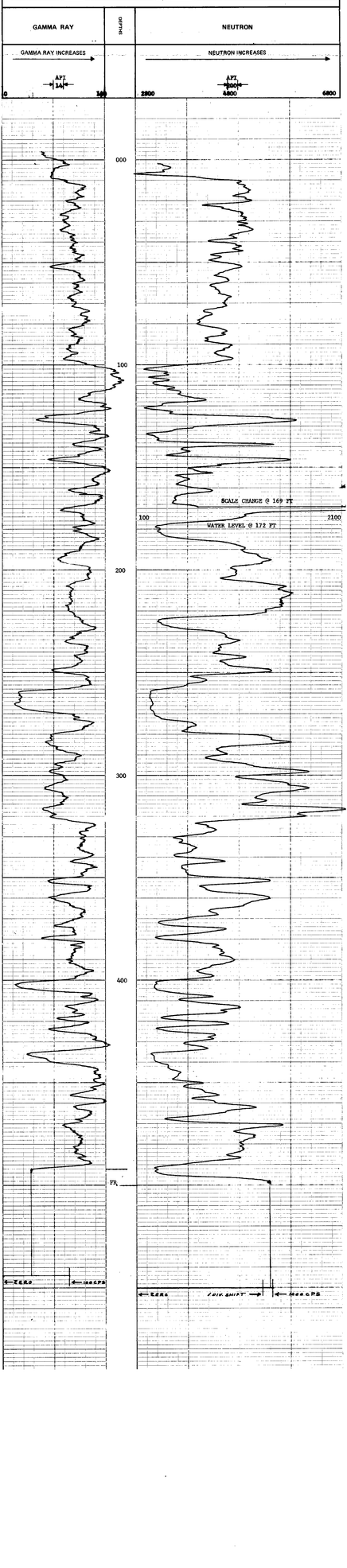
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.	SCINTILLATION	DIAMETER	1 11/16
TYPE		DETECTOR MODEL NO.	
LENGTH	6' INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	5' 10" FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	167
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERVICE NO.	R GEN 169-002	TYPE	Am-Be
		STRENGTH	5 CURIES

LOGGING DATA

RUN NO.	GENERAL DEPTHS FROM	GENERAL DEPTHS TO	GENERAL SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV
1	0	169	12	5	100	OL	14	3	1000	1/2L	200
	169	498	12	5	100	OL	14	3	500	1 L	100

REMARKS



K-FOSONG 2/Sec 17 (3) A

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY KOOTENAY COAL LIMITED

WELL NE - 1058

LOCATION GREEN HILLS

FIELD FOORDING

320

LSD SEC TWP RGE W M

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: GROUND LEVEL Ft. Above Perm. Datum

Other Services: NONE

K.B. DF G.L.

Run No. ONE
Date 7 AUG 1977
First Reading 0
Last Reading 525
Footage Logged 525
Depth Reached 526
Depth Driller 526
Depth Logger
Casing Driller 16
Casing Logger
Fluid Type AIR/WATER
Fluid Level
Max. Rec. Temp. Deg. F
Min. Chks.
Rm @ °F

Recorded By JACKSON
Witnessed By KOOTENAY

Operating Time
Truck No.
1. HOUR
37

EQUIPMENT DATA

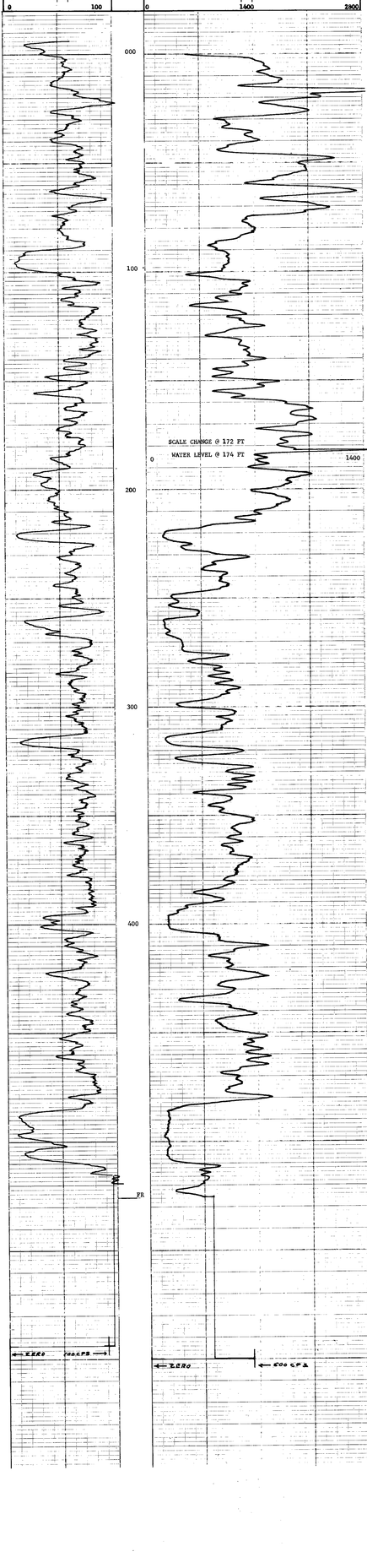
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.	37	SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	4 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T.C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	172	12	5	100	OL	10	3	1000	OL	140
	172	525	12	5	100	OL	10	3	500	OL	70

REMARKS

LOGGED THROUGH DOUBLE WALL DRILL STEM



K-ERONA Rge 22 (3)4

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W.....M

COMPANY FORDING COAL LIMITED

WELL No. 88 - 1058

FIELD LOCATION CREEK FIELDS

FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev. 0
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Drill Depths Measured from GROUND LEVEL

Other Services

NONE

320

Run. No.	ONE	
Date.	7 JUNE 1977	
First Reading	525	
Last Reading	0	
Last Reading Logged	525	
Depth Reached	525	
Depth Driller	525	
Casing Logged	525	
Casing Driller	16	
Fluid Type	AIR/WATER	
Liquid Level	172	
Max. Temp.	4 1/2	
Rm @ °F		
Operating Time	3 HOUR	
Truck No.	37	

Recorded By JOHNSON

Witnessed By EDMONIC

EQUIPMENT DATA

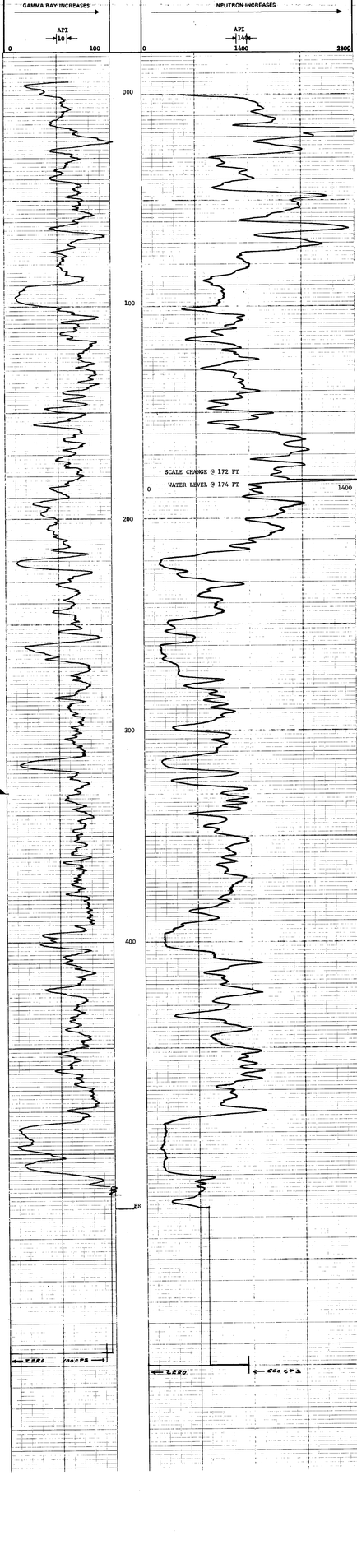
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.	37	SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	1 CURIE

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	172	12	5	100	OL	10	3	1000	OL	140
	172	525	12	5	100	OL	10	3	500	OL	70

REMARKS

LOGGED THROUGH DOUBLE WALL DRILL STEM



K-Fording River 77 (3) 4.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

320

FILE NO.
LSD
SEC
TWP
RGE
W___M

COMPANY FORDING COAL LIMITED
WELL RH - 1059
LOCATION GREEN HILLS
FIELD FORDING
PROVINCE BRITISH COLUMBIA

Other Services:
NONE

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE
Date	14 JUNE 1977
First Reading	454
Last Reading	0
Footage Logged	454
Depth Reached	455
Depth Driller	455
Casing Roke	
Casing Driller	10
Fluid Type	AIR/WATER
Liquid Level	92
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON Witnessed By McKINNY

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	[illegible]ON	DETECTOR MODEL NO.	
LENGTH	4 [illegible] INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.[illegible] FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	(3 CU[illegible]

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	90	12	5	100	0L	14	3	1000	14 L	200
	90	454	12	5	100	0L	14	3	500	1 L	100

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 14 0 140		API 200 2800 4800 6800

K-FOCNS (WEE 74(3)A

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL HH - 1060

LOCATION GREEN HILLS 320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: K.B. 0 Ft. Above Perm. Datum

Drilling Measured from: GROUND LEVEL G.L.

Other Services: NONE

LOC SEC TWP RGE W M

Recorded By JOHNSON

Witnessed By MACNAUG

Run No. ONE

Depth Driller 549

Depth Logger 549

Bottom Logged Interval 549

Top Logged Interval 0

Casing Driller 550

Casing Logger

Bit Size

Type Fluid in Hole

Salinity, PPM

Density

Level

Max. Temp. Deg. F.

Est. Cement Top

Time Since Circ.

Time on Bottom

Unit No.

Date 27 JUNE 1977

Rm @ °F

Rmf @ °F

Rmc @ °F

Source of Rm

Rm @ BHT

Time Since Circ.

Max. Rec. Temp. Deg. F.

Equip. Location

Recorded By JOHNSON

Witnessed By MACNAUG

Operating Time

Truck No. 37

1 WEEK

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL, MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	38	12	5	100	0L	14	3	1000	14 L	200
	38	548	12	5	100	0L	14	3	500	1 L	100

REMARKS

GAMMA RAY INCREASES

API 14 A

0 140

DEPTHS

NEUTRON

NEUTRON INCREASES

API 1004

2800 4800 6800

000

100

200

300

400

FR

SCALE CHANGE @ 38 FT

100

WATER LEVEL @ 40 FT

2100

ZERO

100 CPS

ZERO

1 DIV. SHIFT

1000 CPS

K-FORDING RIVER 77(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W ___ M

COMPANY FORDING COAL LIMITED

WELL RH - 1061

LOCATION GREEN HILLS

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev. ___

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B. ___
CSG ___
G.L. ___

Other Services: NONE

Run. No.	ONE		
Date	27 JUNE 1977		
First Reading	575		
Last Reading	0		
Footage Logged	575		
Depth Reached	576		
Depth Driller			
Casing Roke			
Casing Driller	16		
Fluid Type	AIR/WATER		
Liquid Level	43		
Min. Diam.	4 7/8		
Rm @ °F			
Operating Time	1 HOUR		
Truck No.	37		
Recorded By	JOHNSON	Witnessed By	KOMENAC

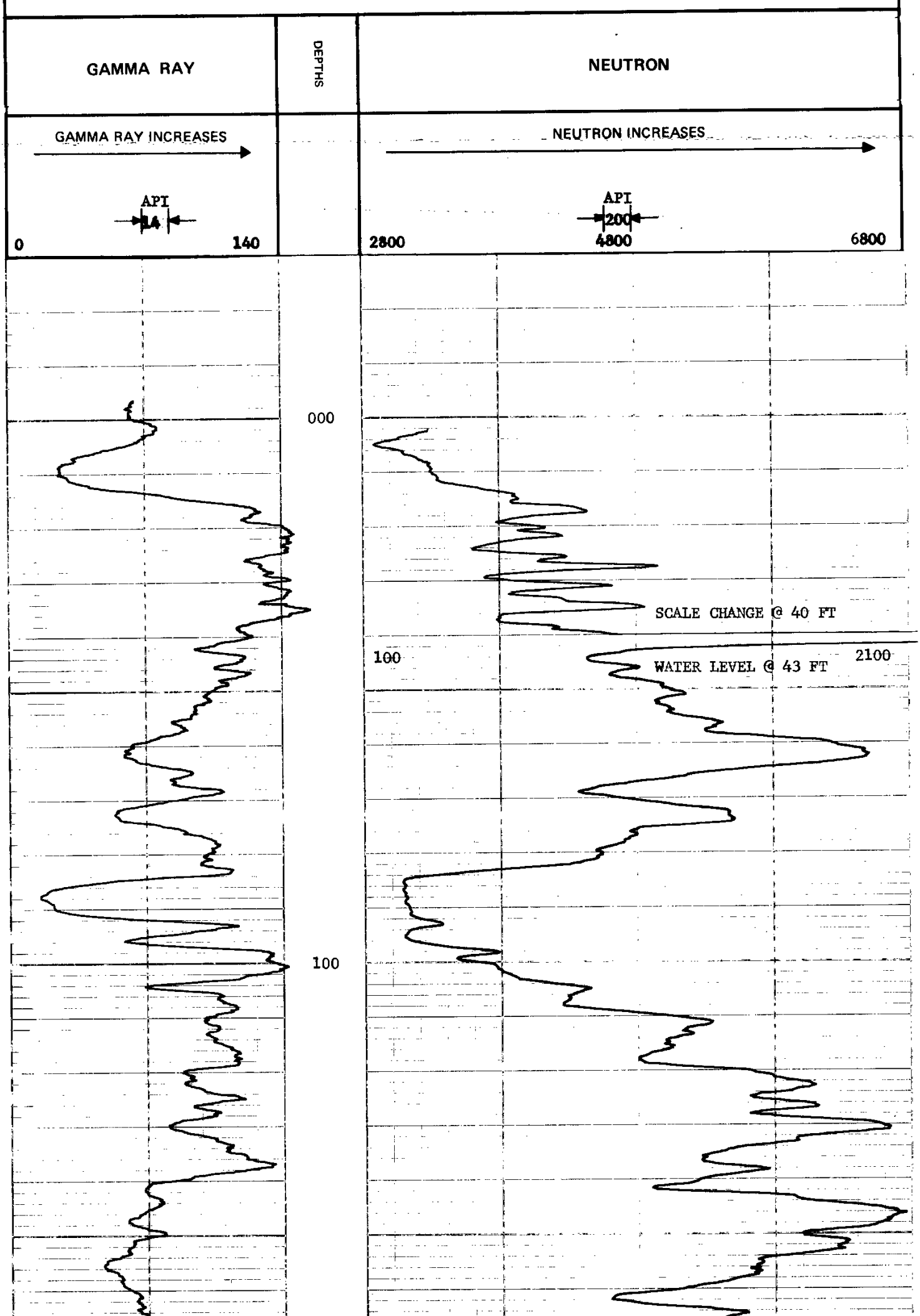
EQUIPMENT DATA

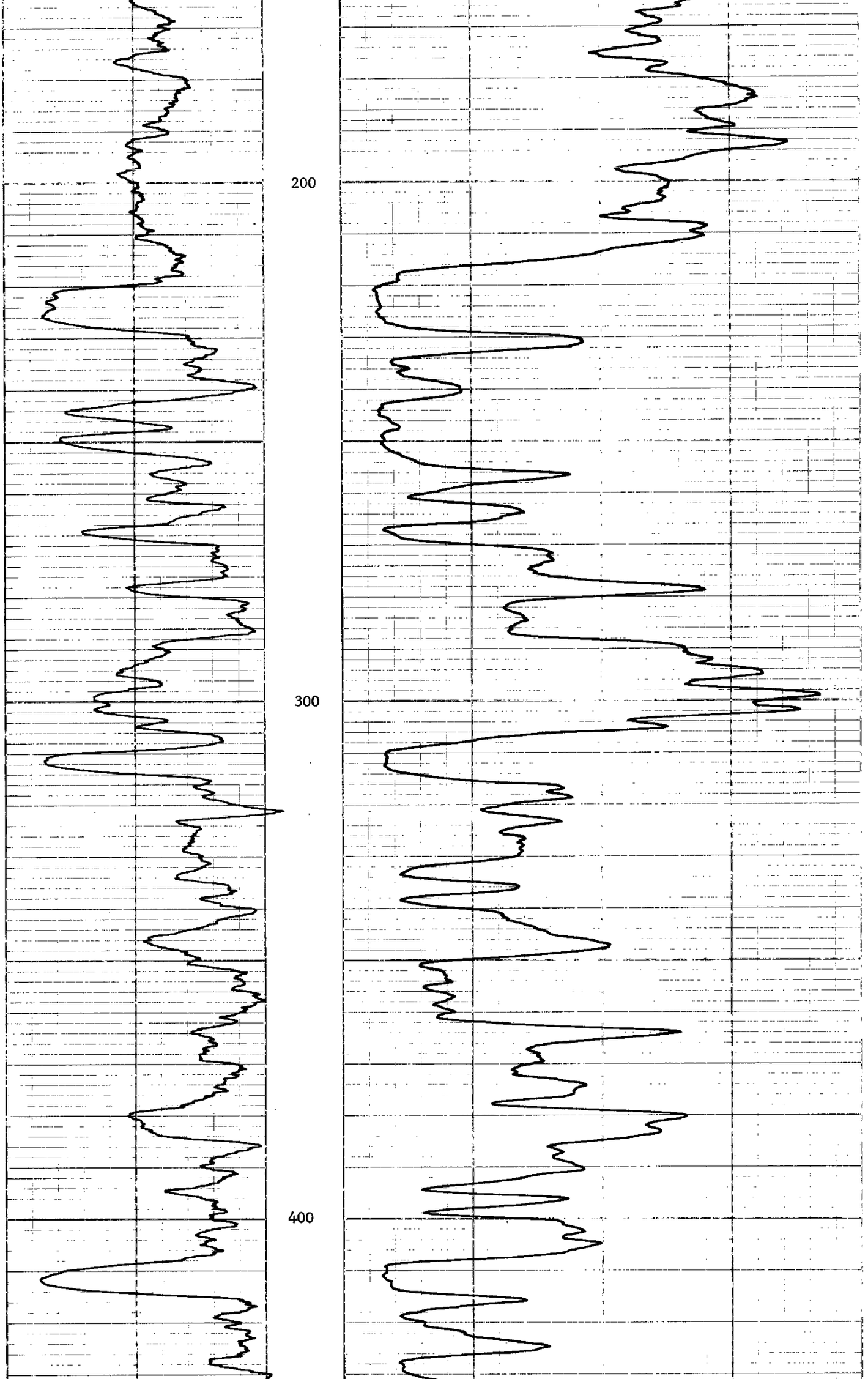
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

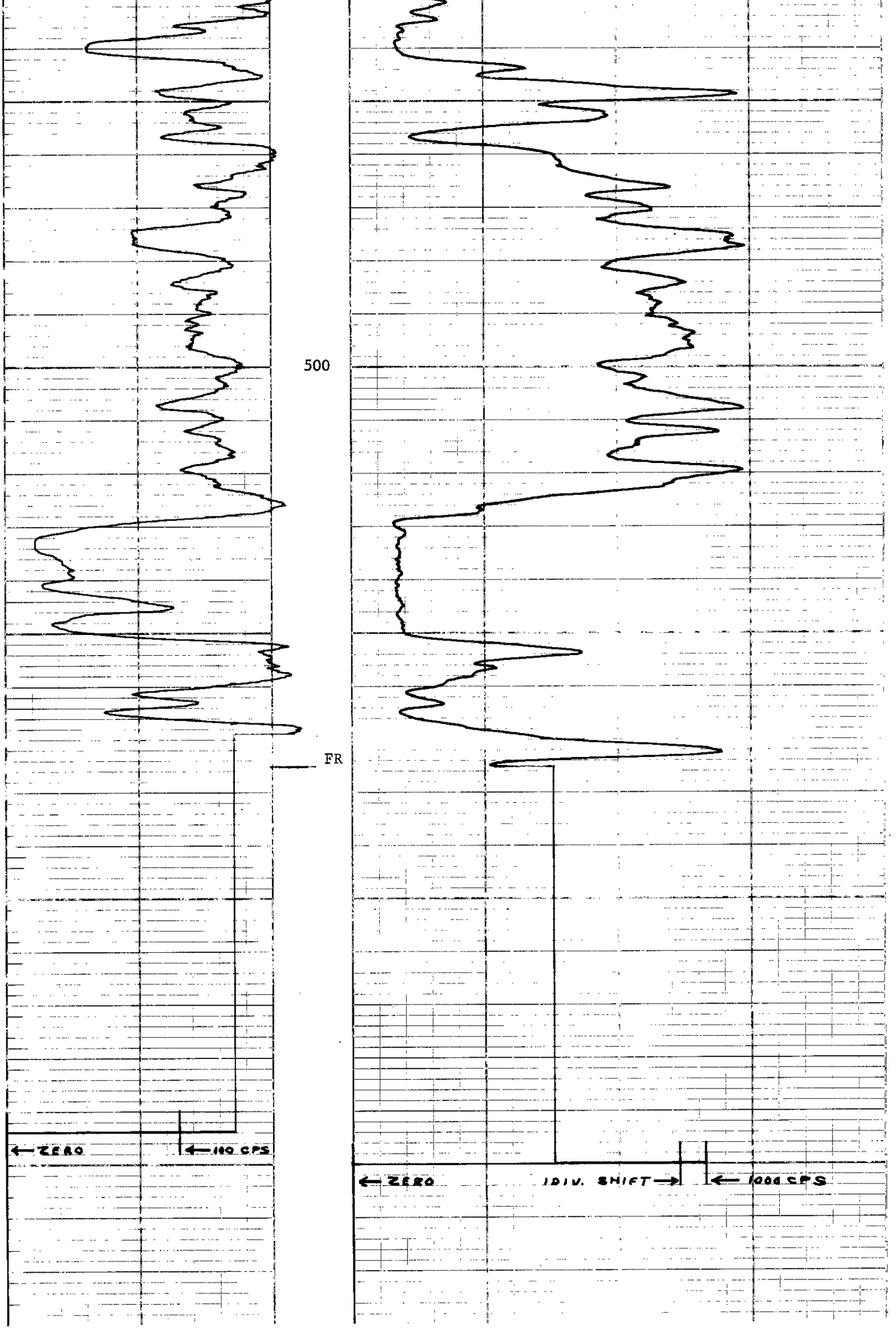
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	40	12	5	100	OL	14	3	1000	14 L	200
	40	575	12	5	100	OL	14	3	500	1 L	100

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
API
14
0
140
NEUTRON INCREASES
API
200
2800
4800
6800
000
100
SCALE CHANGE @ 40 FT
100
2100
WATER LEVEL @ 43 FT


200
300
400


500
FR
← ZERO
← 110 CPS
← ZERO
1 DIV. SHIFT →
← 1004 CPS

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

K-FOGANG RIVER 77(3)A

320

FILE NO.

COMPANY PYRAMID OILS LIMITED

WELL No. 1052

LOCATION GREEN FIELDS

FIELD PYRAMID

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum: GROUND LEVEL Elev. 1706

Log Measured from: GROUND LEVEL 7 Ft. Above Perm. Datum

Drlg. Measured from: GROUND LEVEL

LSD SEC TWP RGE W of M

Run No.	ONE	
Date	22 JUNE 1977	
First Reading	484	
Last Reading	484	
Hole Size	6¾	
Depth Driller	485	
Depth Logger	485	
Bottom Logged Interval	484	
Casing Driller	10	
Casing Logger	10	
Fluid Type	AIR/WATER	
Liquid Level	17	
Max. Depth	4 7/8	
Rm @ °F		
Operating Time		
Truck No.	1, 18008, 37	

Recorded By JOHNSON

Witnessed By MACKAY

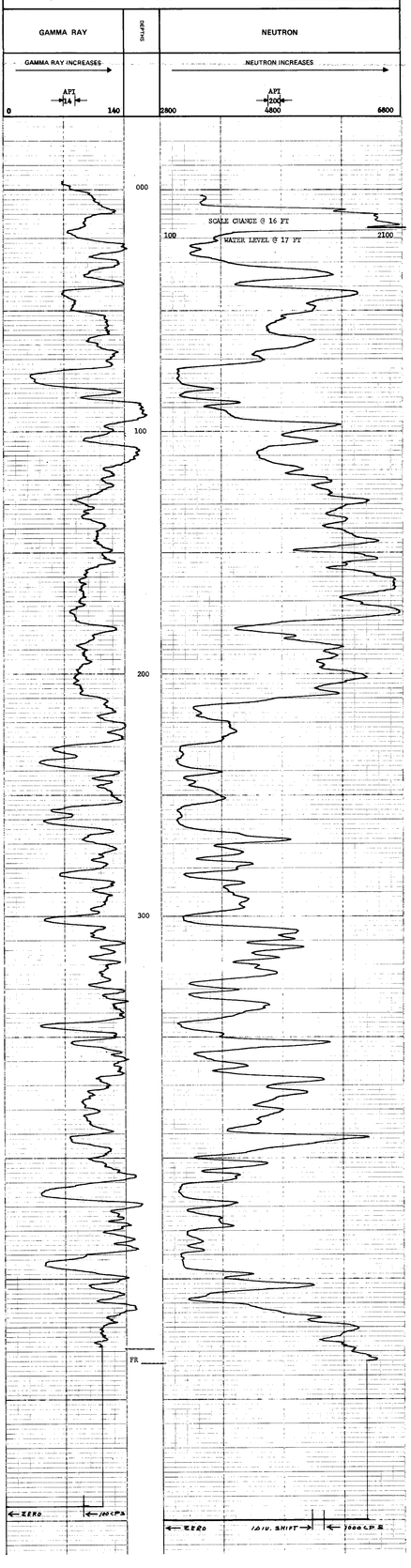
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T.C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	16	12	5	100	OL	14	3	1000	1 L	200
	16	485	12	5	100	OL	14	3	500	1 L	100

REMARKS



K - FORDING RIVER 77(3)A.

Widco* WELL LOG

COMPANY

AREA U. GREENHILLS

WELL RH 1063

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D.F.
K.B.
G.L.

COMPANY
WELL RH 1063
LOCATION U. GREENHILLS

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size					
Bit Size			Logged by	K.K.	
			Witnessed by		

REMARKS 12 A.P.I. LOGGED THROUGH DOUBLE WALL DRILL STEM
JUL. 5 '77

* Reg. U.S. Pat. Off.

000'
100'
200'
300'
400'

T.D. REACHED 448'

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY ROKE OIL LIMITED

WELL RIX - 1066

LOCATION GREEN HILLS

FIELD FORDING

PROVINCE BRITISH COLUMBIA

COUNTY OR DISTRICT

STATE

LOG MEASURED FROM GROUND LEVEL

PERMANENT DATUM GROUND LEVEL

ELEV. K.B. 320

ELEV. D.F.

ELEV. G.L.

LOG MEASURED FROM

DRILLING MEASURED FROM

LSD SEC RGE W. M

Other Services

NONE

Rig No. ORE

Date 6 OCTOBER 1977

First Reading

Last Reading

Feet Logged 569

Depth Reached 570

Depth Driller 570

Depth Logger 570

Casing Driller 12

Fluid Type AIR/WATER

Liquid Level 156

Max. Temp. 4 7/8

Rm @ °F

Operating Time 1 HOUR

Truck No. 37

Recorded By JOHNSON

Witnessed By SWAN

K-FORGING RIVER 21(3)2

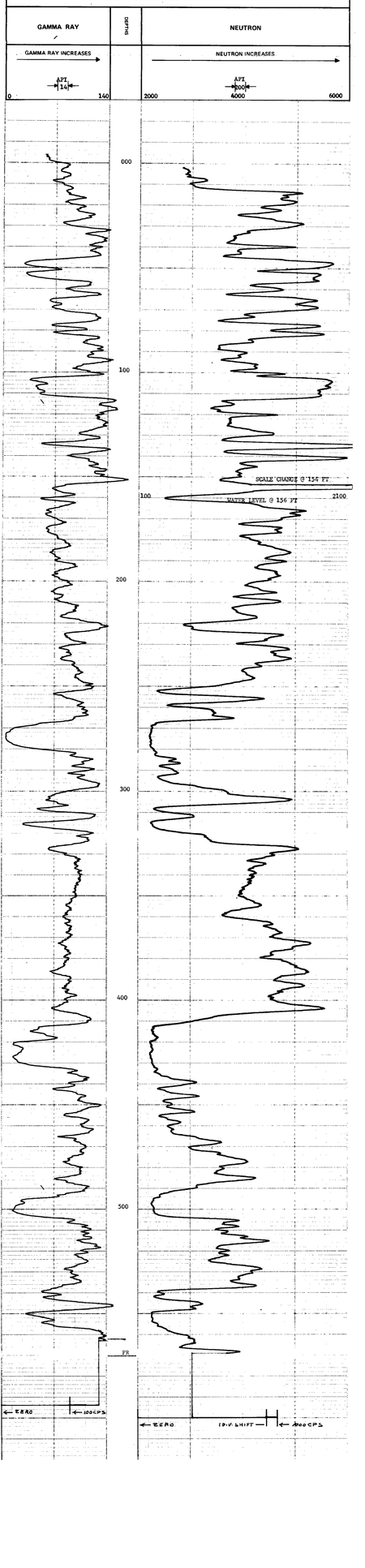
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6,7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	5 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	154	12	5	100	01 L	14	3	1000	10 L	200
	154	569	12	5	100	01 L	14	3	500	1 L	200

REMARKS



ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

(GAMMA RAY NEUTRON LOG)

K-ENERGING FILE 77(a)3

FILE NO.	
COMPANY	PRODUCE OIL LIMITED
WELL	RU - 1065
LOCATION	GREEN HILLS
FIELD	TOMBORO
PROVINCE	BRITISH COLUMBIA
Permanent Datum	GROUND LEVEL
Log Measured From	GROUND LEVEL
Drilling Measured From	GROUND LEVEL
Elev.	K.B.
Above Perm. Datum	D.F.
	G.L.

320

Rge.	
Twp.	
Sec.	
Other Services	NONE

Run. No.	ONE
Date	6 JUNE 1977
First Reading	550
Last Reading	0
Footage Logged	550
Casing Logged To	550
Depth Driller	551
Depth Logger	551
Casing Rate	54
Bottom Hole Temp.	60°F
Fluid Type	AIR/WATER
Liquid Level	56
Max. Diam.	4 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By SHAW

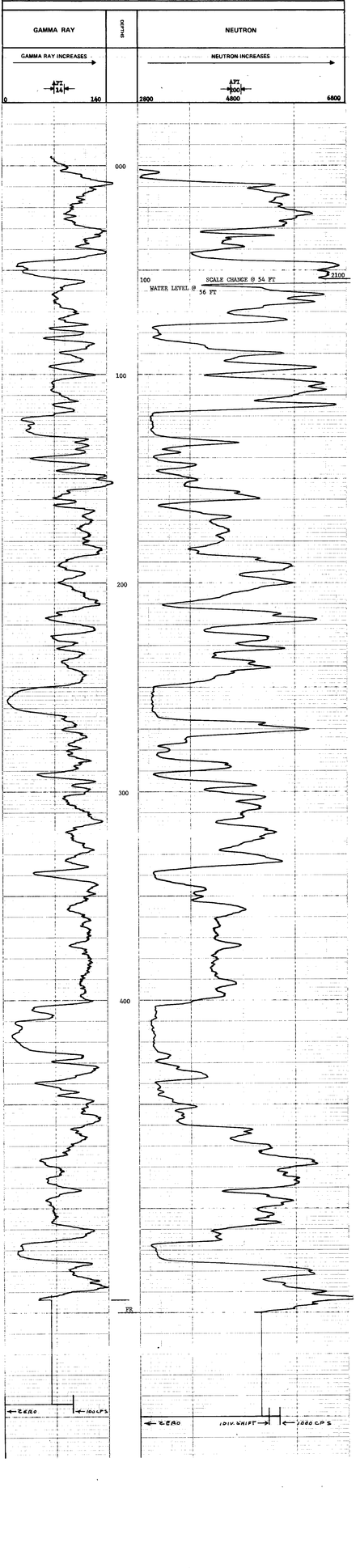
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6,7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	3 curies

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	54	12	5	100	0L	14	3	1000	14 L	200
	54	550	12	5	100	0L	14	3	500	1 L	100

REMARKS



K-FOOTING @ 1162 77(3)4

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY ROKE COAL LIMITED

WELL ER - 1066

FIELD GREEN HILLS

LOCATION FOOTING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Other Services NONE

Rge. 6 W

Twp. 9

Sec. 32

LSD

M

Rig No. 9

Operating Time

Truck No. 37

Recorded By JOHNSON

Witnessed By MR. [illegible]

Run No. ONE

Date 31 MAY 1977

Last Reading 0

Footage Logged 496

Depth Reached 497

Depth Driller 497

Casing Size 4

Casing Depth 497

Fluid Type AIR/WATER

Fluid Level 0

Max. Rec. Temp. 4 7/8

Min. Diam.

K.B.

D.F.

G.L.

320

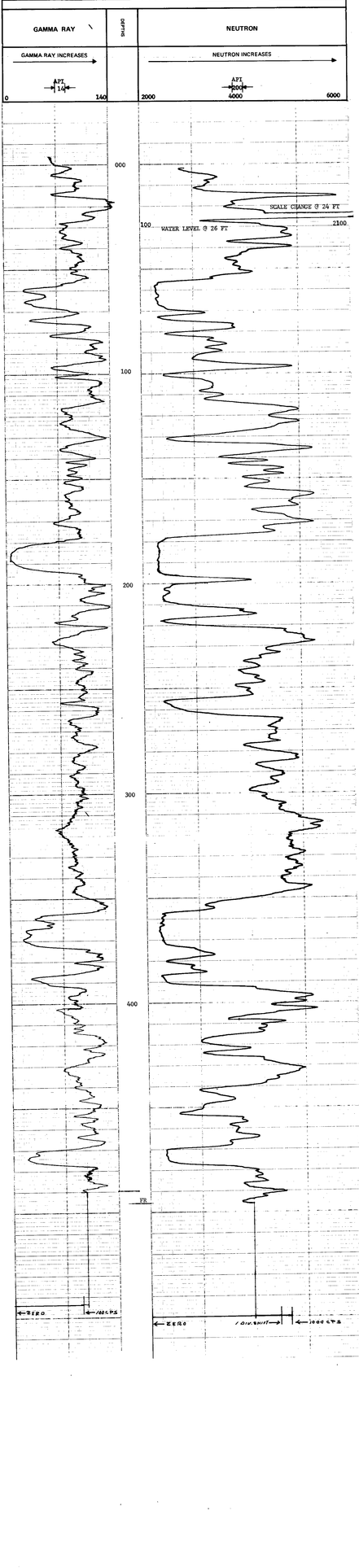
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	24	12	5	100	OL	14	3	1000	10 L	200
	24	496	12	5	100	OL	14	3	500	1 L	100

REMARKS



K- FORONG RIVER 77(3)A

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY PEMBINA OIL LIMITED

WELL HR - 1961

LOCATION GREEN HILLS

FIELD PEMBINA

PROVINCE BRITISH COLUMBIA

320

Permanent Datum: GROUND LEVEL — Elev. 0

Log Measured From: GROUND LEVEL — Ft. Above Perm. Datum

Drilling Measured From: G.L. — K.B.

Other Services:

NOTE

LOG SEC TWP RGE M W

Rec. No.	ONE
Date	3 JUNE 1977
Last Reading	549
First Reading	0
Footage Logged	549
Depth Driller	550
Depth Logged	550
Casing Driller	-
Casing Logged	-
Fluid Type	AIR/WATER
Liquid Level	74
Max. Diam.	4 7/8
Run #	1
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By SHAW

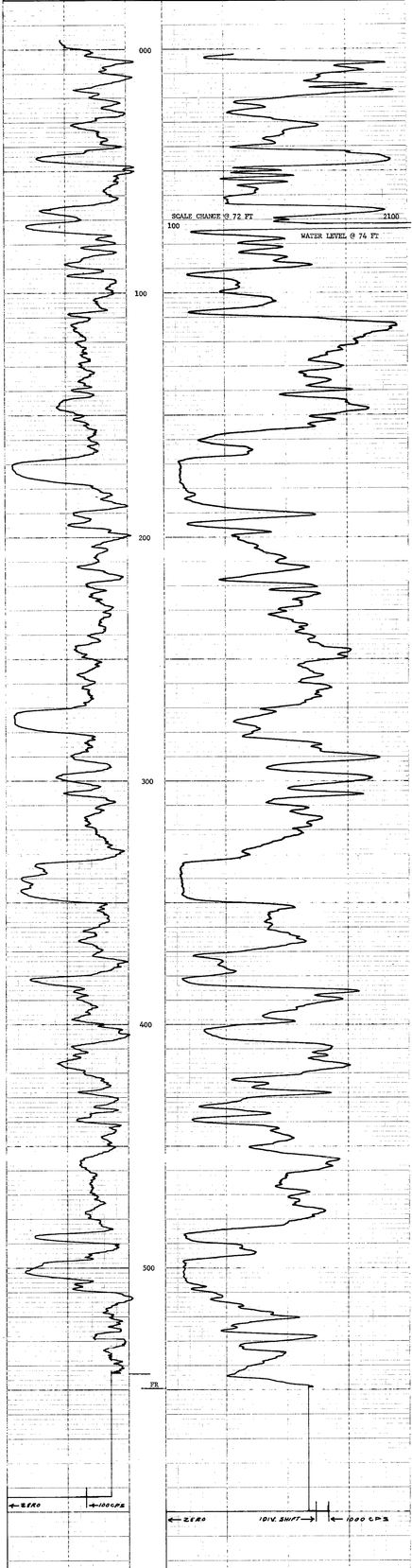
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	4.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	B GRN 169-002	STRENGTH	5 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS DIV. L OR R	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T.C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	72	12	5	100	01	14	3	1000	8 L	200
	72	549	12	5	100	01	14	3	500	1 L	100

REMARKS



K-FORDING RIVER, 77 (3) A.

ROKE [redacted]

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL RH - 1068

LOCATION GREEN HILLS

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Other Services: NONE

320

Run. No.	ONE
Date	10 JUNE 1977
First Reading	536
Last Reading	0
Footage Logged	536
Depth Reached	537
Depth Driller	537
Casing Rake	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	151
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	JOHNSON
Witnessed By	McGINNY

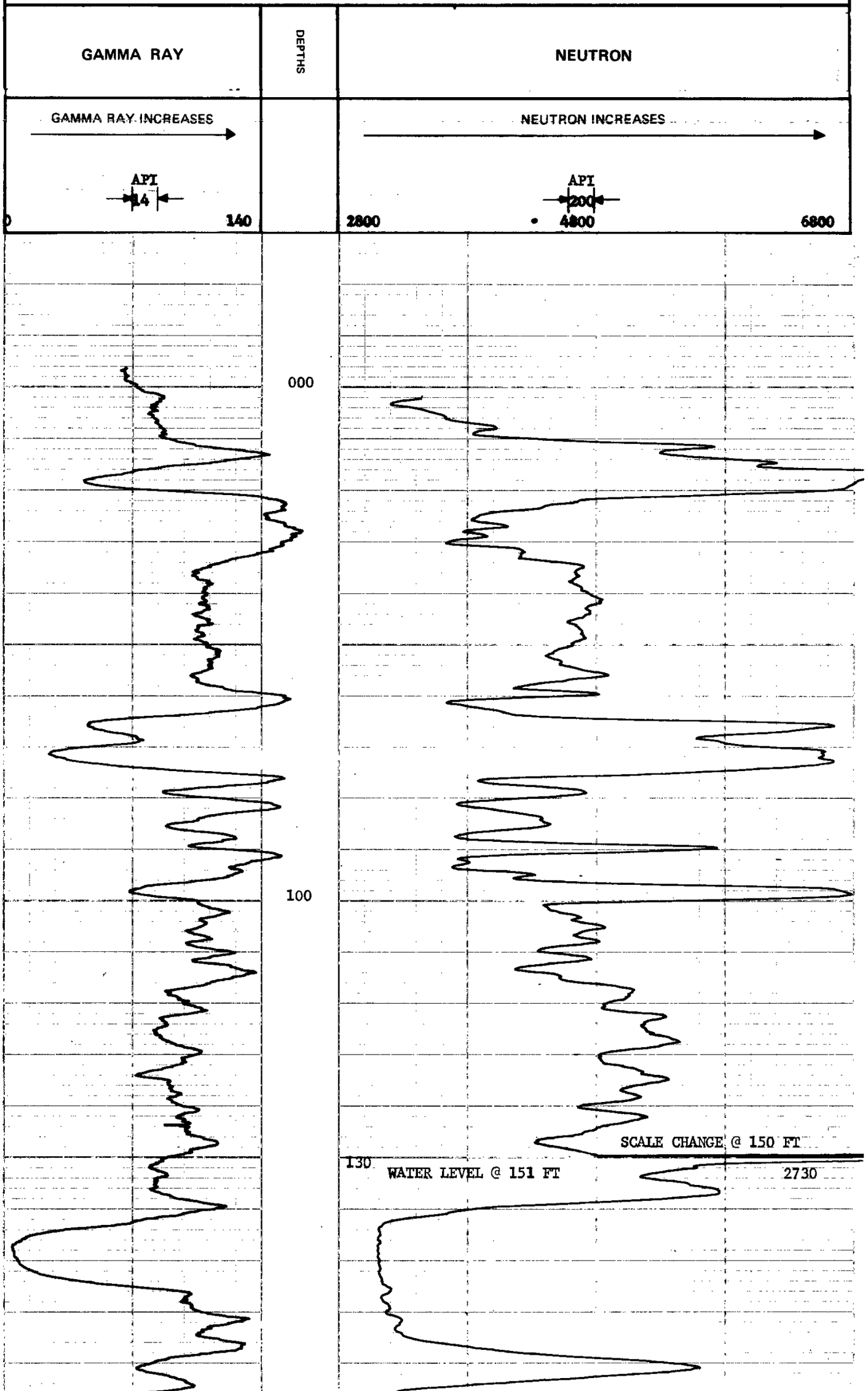
EQUIPMENT DATA

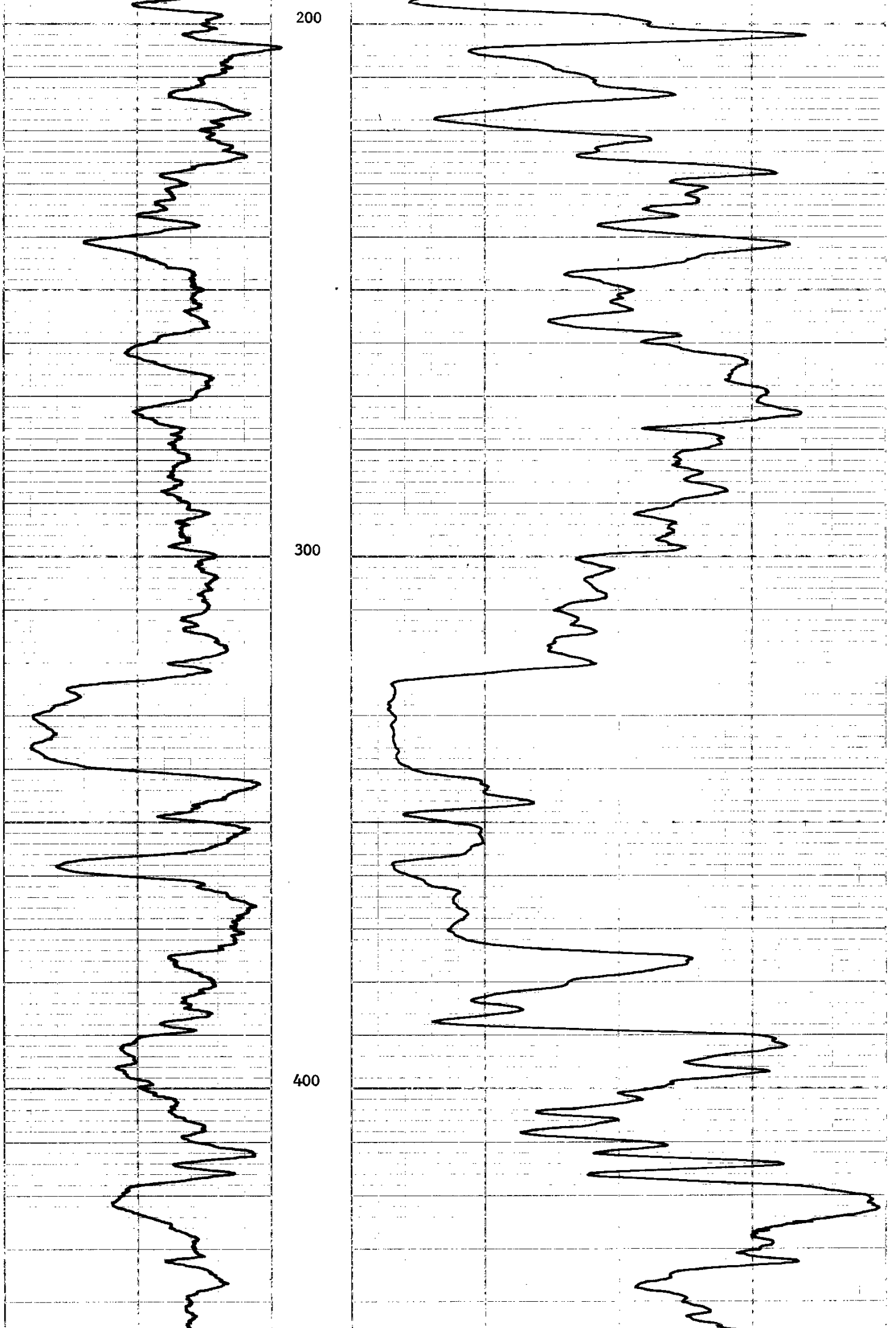
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 GRAMS

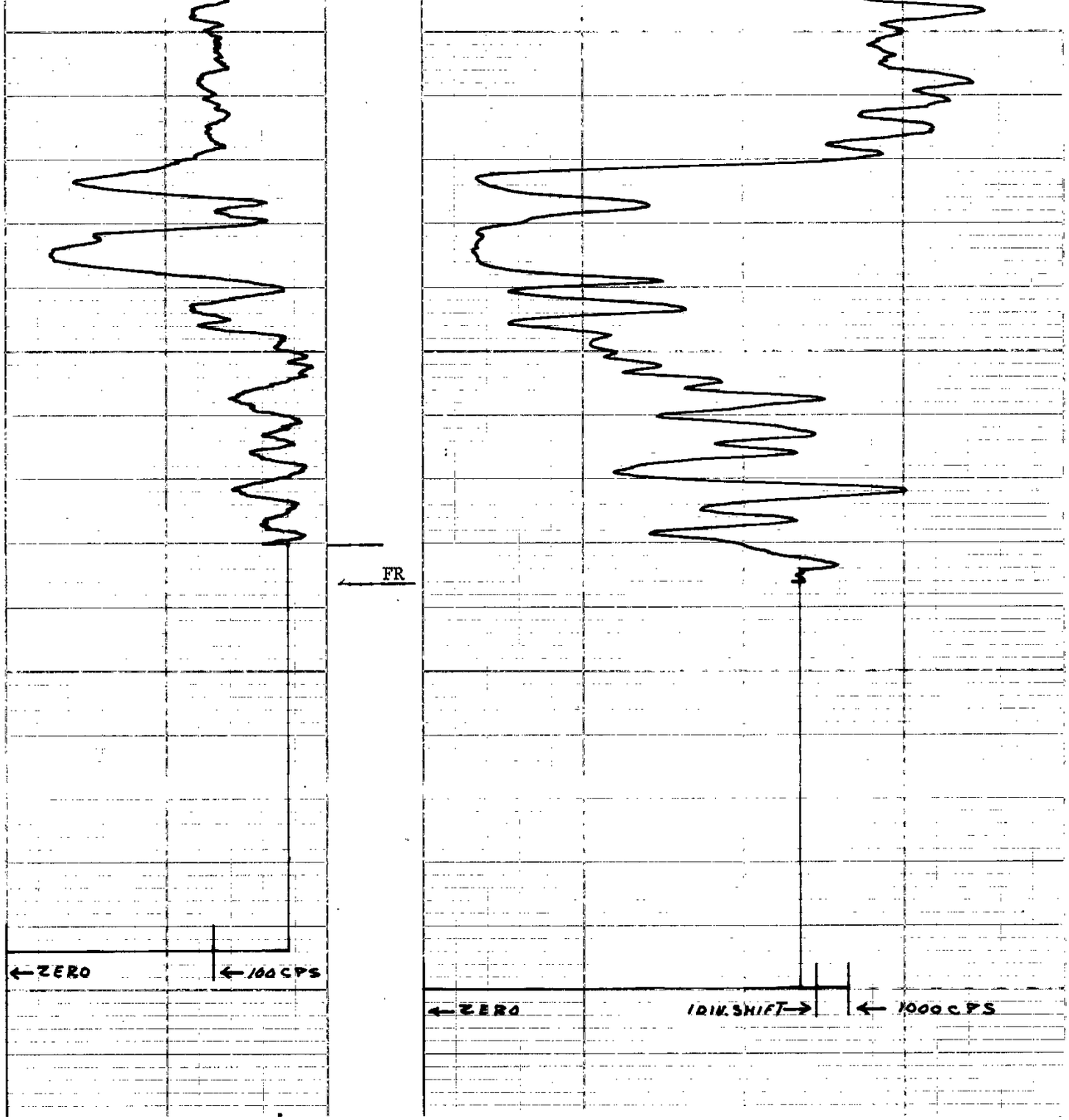
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	150	12	5	100	0L	14	3	1000	14 L	200
	150	536	12	5	100	0L	14	3	500	1 L	100

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
NEUTRON INCREASES
API
14
0
140
API
200
2800
4800
6800
000
100
SCALE CHANGE @ 150 FT
130
WATER LEVEL @ 151 FT
2730


200
300
400


FR
←ZERO
←100 CPS
←ZERO
1DIV. SHIFT→
← 1000 CPS

K-Boeing River - 77(8)4.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD SEC TWP RGE W M

COMPANY POWDER COAL LIMITED

WELL RE - 1069

LOCATION GREEN HILLS

FIELD POINTED

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev.

Log Measured From: K.B. — Ft. Above Perm. Datum

Drilling Measured From: G.L.

Other Services: NONE

320

Run. No.	ONE
Date	30 JUNE 1977
First Reading	445
Last Reading	0
Footage Logged	445
Depth Reached	445
Depth Driller	440
Casing Rdrs	
Casing Driller	
Casing Logger	10
Fluid Type	AIR/WATER
Liquid Level	139
Max. Temp.	73°F
Min. Diam.	4 7/8
Rm @ °F	
Operating Time	
Truck No.	1 MOBILE 32

Recorded By: MORRISON

Witnessed By: McKINNEY

EQUIPMENT DATA

GAMMA RAY	
RUN NO.	ONE
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	SCINTILLATION
LENGTH	6 INCH
DISTANCE TO N. SOURCE	6.0 FT.

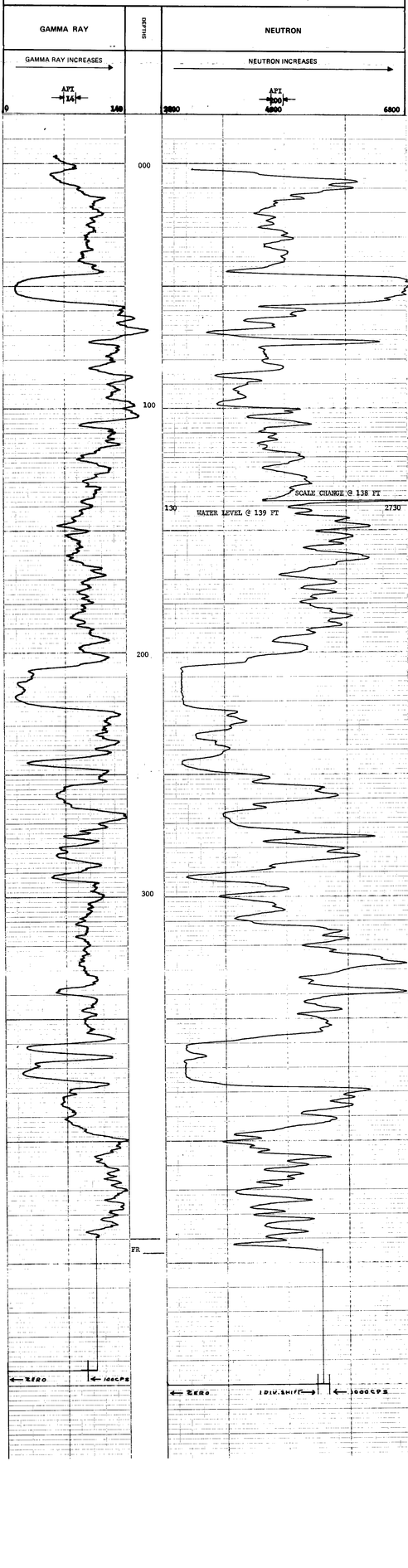
NEUTRON	
RUN NO.	ONE
LOG TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	6 INCH
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	187
SPACING	17 INCH
TYPE	AmBe
STRENGTH	3 CURIES

GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	
TOOL SERIAL NO.	R GRN 169-002

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	138	12	5	100	0L	14	3	1000	14 L	200
	138	445	12	5	100	0L	14	3	500	1 L	100

REMARKS



K-FOREMOST PAGE 71(3)4.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY FORDING COAL LIMITED

WELL HH - 1070

LOCATION GREEN HILLS

FIELD FORDING

PROVINCE BRITISH COLUMBIA

320

LSD SEC TWP RGE W M

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL K.B. G.S.C. G.L.

Other Services: NONE

Run No.	ONE
Date	24 JUNE 1987
First Reading	233
Last Reading	0
Footage Logged	233
Depth Reached	234
Depth Driller	238
Casing Rake	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	54
Min. Diam.	
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	JOHNSON
Witnessed By	MCKENZIE

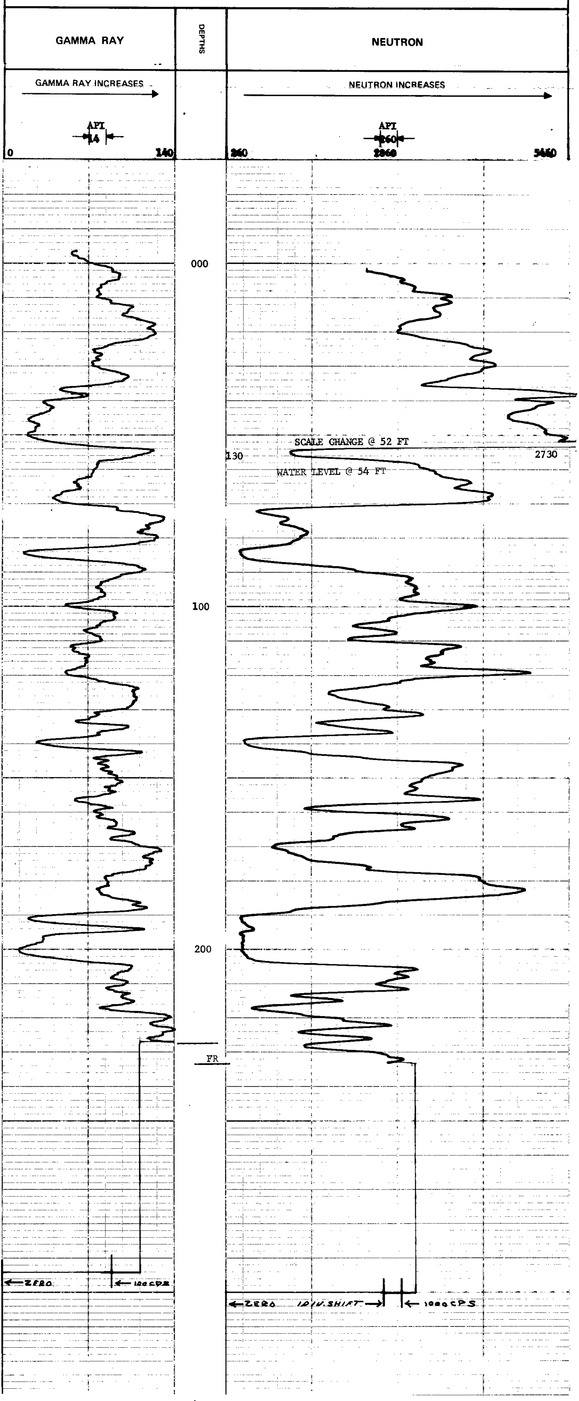
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4. INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 [illegible]

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	52	12	5	100	OL	14	3	1000	11	280
	52	233	12	5	100	OL	14	3	500	11	130

REMARKS



K-FORDING RIVER 77 (3) A.

Widco* WELL LOG

COMPANY

AREA GREENHILLS.

WELL RH 1070

COUNTY STATE

320

COORDINATES

N

S

ELEVATION

D F

K B

G L

COMPANY

WELL RH 1070

LOCATION GREENHILLS

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log)		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Nature		
Density		
Viscosity	@ F	@ F
Resistivity	@ F	@ F
Res @ BHT	@ F	@ F
pH		
Circ Temp		
B H. Temp.		
Logged by	C. McK.	
Witnessed by		

REMARKS B-50 DRILL JUN. 13 '77

14. A.P.I

* Reg. U.S. Pat. Off.

DRILLER'S INTERSECTION

100'

200'

33-55

70-76

82-86

138-142

169-172

190-205

216-218

224-228

228-230'

T.D. REACHED 235'

DRILLED 235'

RECORDING CHARTS

K-FORDING RIVER 77(3)A.

Widco* WELL LOG

RI 1072.

COMPANY

AREA GREEN HILLS

WELL RH 1072. 320

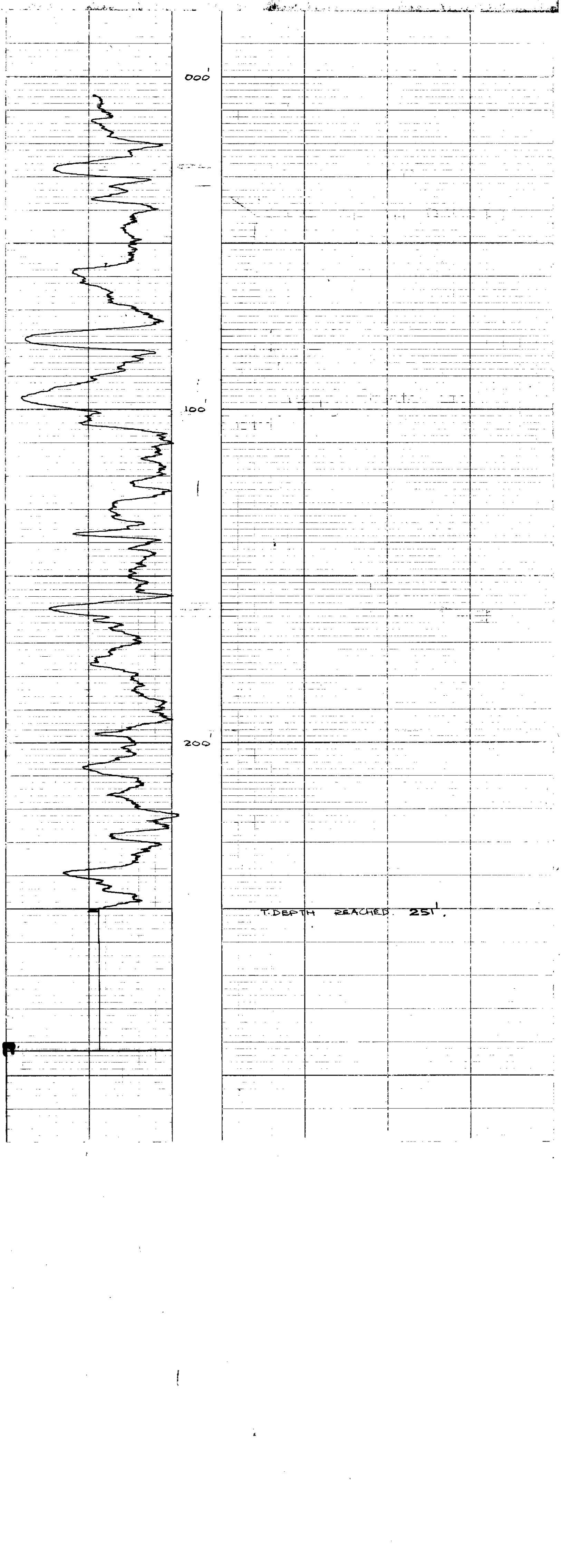
COUNTY STATE

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Type		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Fluid Loss		
Casing Size			BH Temp.		
Bit Size					
Bit Size					
			Logged by	CMck	
			Witnessed by		

REMARKS 14. A.P.I. MAY. 12 '77

* Reg U.S. Pat. Off

FO 1



K-FOOTING RIVER 77 (3) 4.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RH - 1072

LOCATION GREEN HILLS

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

LSD
SEC
TWP
RGE
W M

Permanent Datum: GROUND LEVEL — Elev.
Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum
Well Depths Measured from: GROUND LEVEL — K.B. / D.F. / G.L.

Other Services: NONE

Run. No.	ONE
Date	8 JUNE 1977
First Reading	261
Last Reading	0
Footage Logged	261
Depth Reached	262
Depth Driller	268
Casing Rote	
Casing Driller	10
Fluid Type	AIR/WATER
Liquid Level	228
Min. Diam.	3 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By SHAW

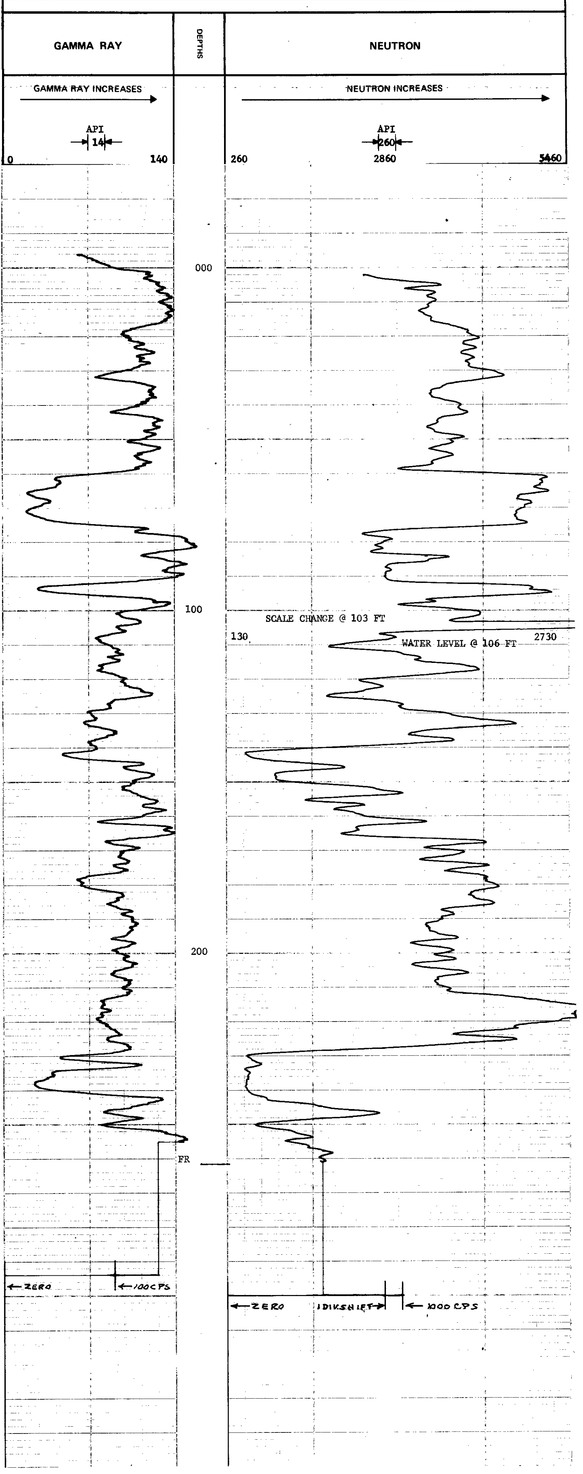
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	224	12	5	100	OL	14	3	1000	1 L	260
	224	261	12	5	100	OL	14	3	500	1 L	130

REMARKS



K- FORDING RIVER 77 (3)A.

Widco* WELL LOG

COMPANY

AREA

WELL RH 1073

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D F
K B
G L

RH 1073
GREEN HILLS

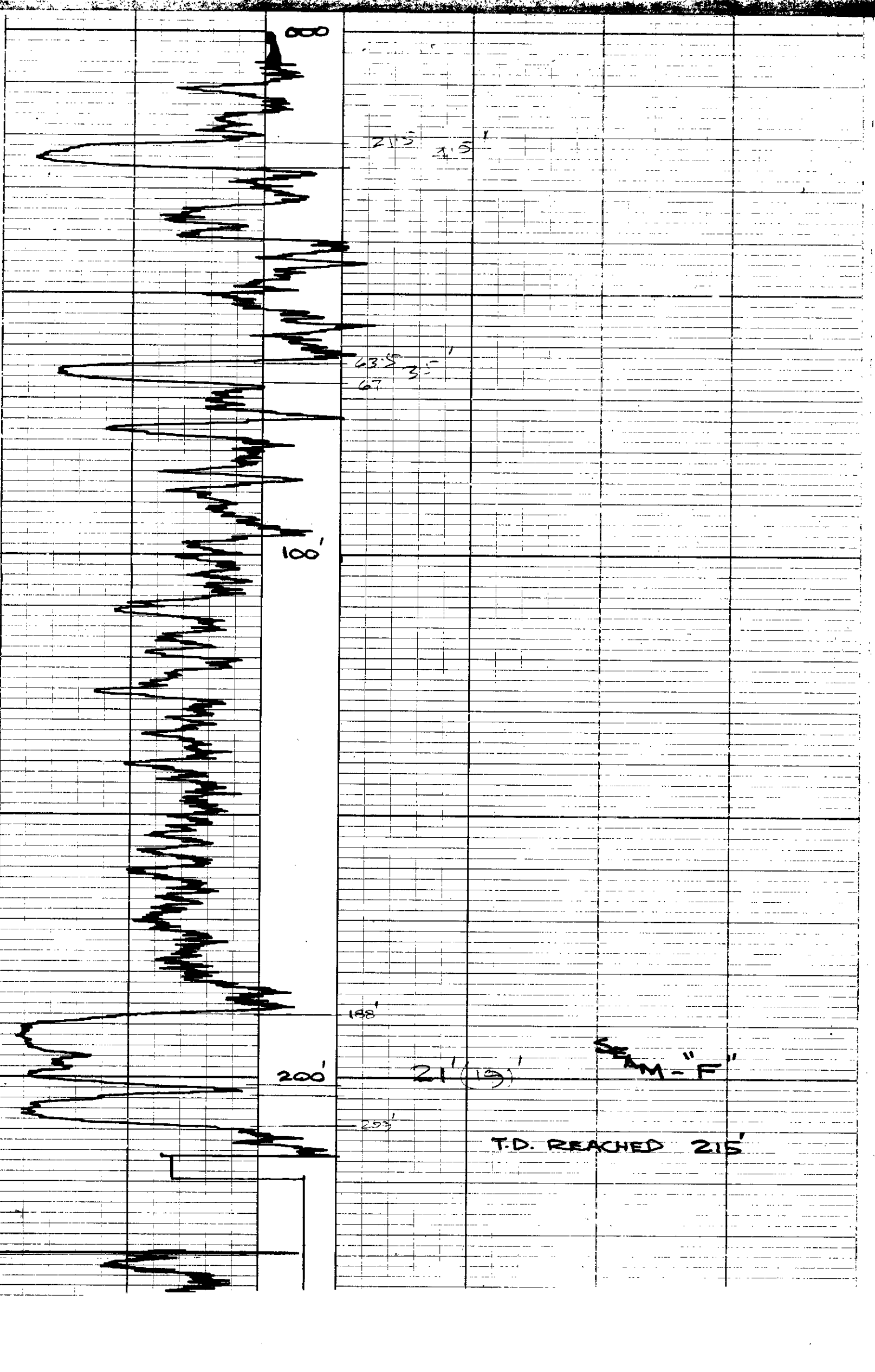
	Run	Run No. 2	Mud	Run No. 1	Run No. 2
Date			Mud Type		
First Reading			Density		
Last Reading			Viscosity	F	F
Footage Logged			Resistivity	F	F
Bottom Driller			Resistivity BHT	F	F
Casing From Log			pH		
Casing Driller			Chl Temp		
Casing Size			BH Temp		
Bit Size					
Bit Size			Logged by	RK.	
			Witnessed by		

REMARKS 13 A.P.I.

Jun 21'77

B.S.O. Drill Hole

* Reg. U S Pat Off.



ENGLISH 5 INCH API 1600 CHART NO.

K. FORGING - RNEC 77(3)A.

Widco* WELL LOG

RH 1074
GREENHILLS

OPERATOR

AREA GREENHILLS

WELL RH · 1074

COUNTY STATE

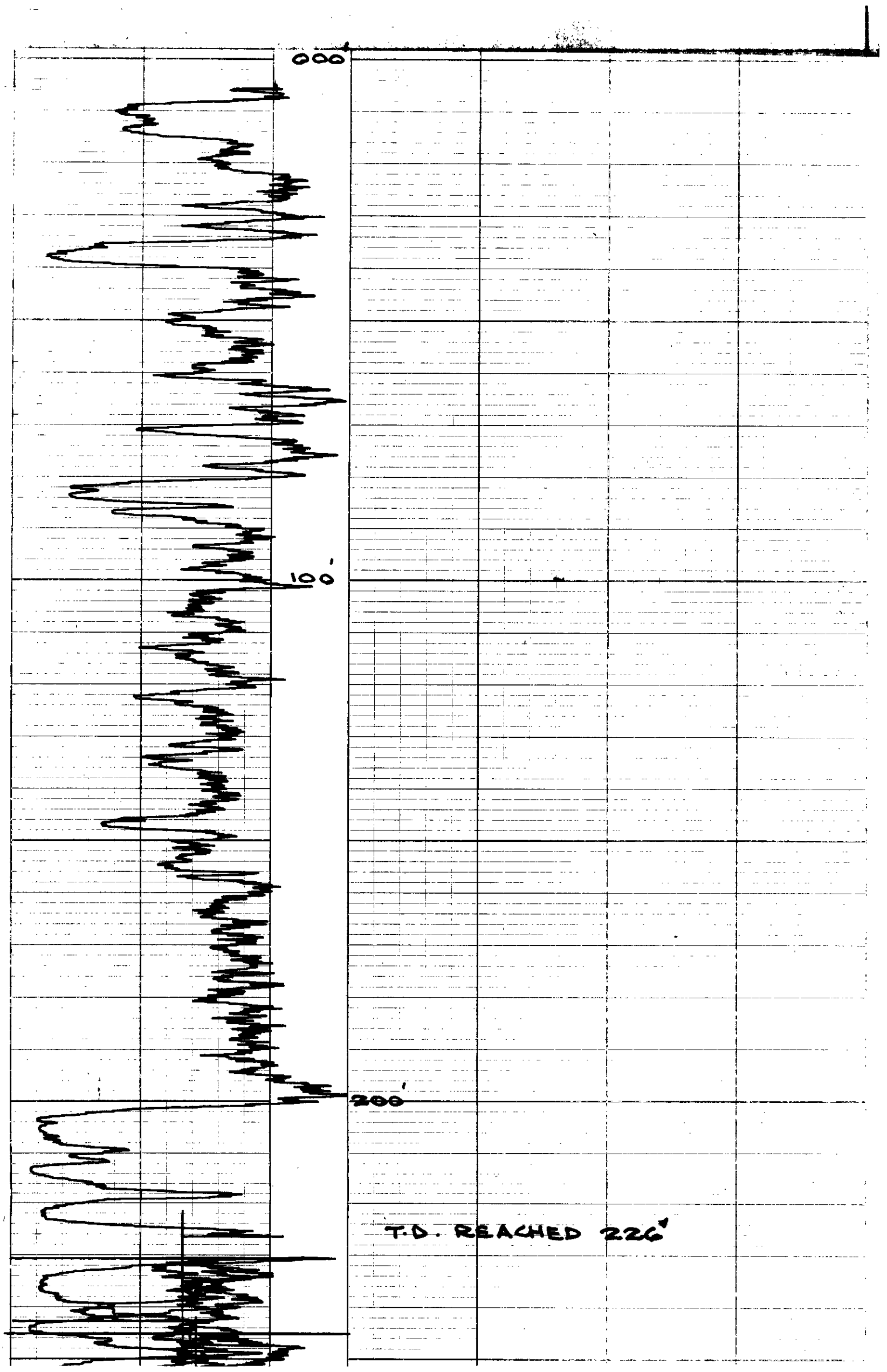
320

LOCATION
N
E

ELEVATION
G L
K B
D F

	Run No.	Run No. 2	M U D	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	F	F
Bottom (Driller)			Resistivity Bht	F	F
Casing (From Log)			pH		
Casing (Driller)			Chl. Content		
Casing Size			B.H. Temp.		
Bit Size					
Run Size			Logged by	RK	
			Witnessed by		

REMARKS 14 A.P.I. JUN. 17'77



* Reg U S Pat Off

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

K-BSON 6 ENGR 73-34

320

FILE NO.	
COMPANY	ROKE OIL ENTERPRISES LTD. CALGARY, ALBERTA
WELL	IRI - 10175
LOCATION	GREEN HILLS
FIELD	TOUZING
PROVINCE	BRITISH COLUMBIA
Other Services	NONE

Permanent Datum: GROUND LEVEL Elev.
Log Measured From: GROUND LEVEL 1 Ft. Above Perm. Datum
Drilling Measured From: GL

LOG SEC TWP RGE M

Rec. No.
Run No. ONE
Date 21 JUNE 1977
Last Reading 526
First Reading 0
Casing Logged 525
Casing Driller 525
Depth Driller 527
Bottom Logged 526
Casing Joints
Fluid Type AIR/WATER
Liquid Level 6
Max. Diam. 4 7/8
Run @ 9:
Operating Time 1 HOUR
Truck No. 37

Recorded By: ANDERSON
Witnessed By: MCKINNEY

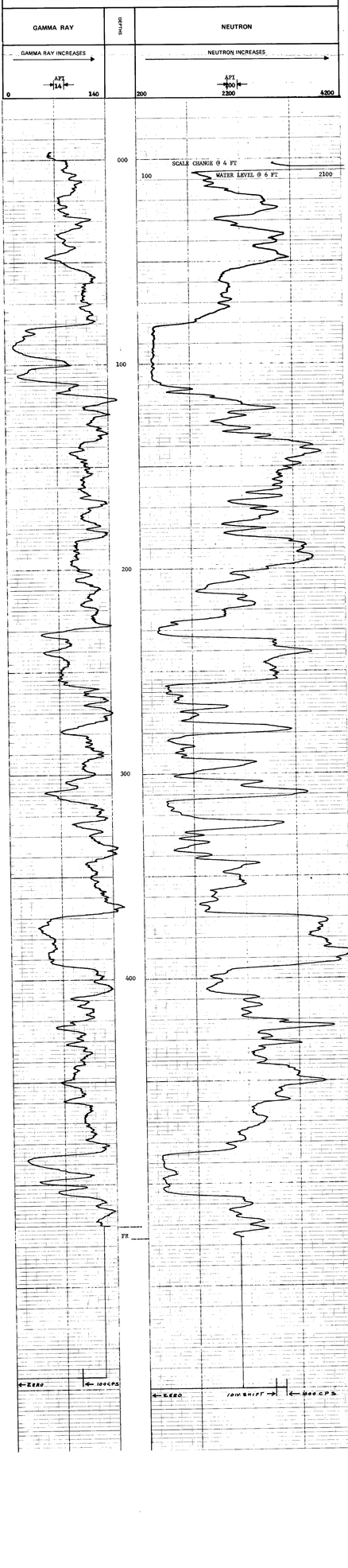
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	4.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	2 curies

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	4	12	3	100	0L	14	3	1000	1 L	200
	4	526	12	5	100	0L	14	3	500	1 L	100

REMARKS



K-FORDING RIVER 77(3)4.

ROKE [redacted]

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL EH - 1076

LOCATION GREEN HILLS

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. ____
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B. ____
CSG ____
G.L. ____

Run. No.	ONE
Date	29 JUNE 1977
First Reading	597
Last Reading	0
Footage Logged	597
Depth Reached	598
Depth Driller	600
Casing Roke	
Casing Driller	18
Fluid Type	AIR/WATER
Liquid Level	54
Min. Diam.	5
Rm @ °F	
Operating Time	14 HOURS
Truck No.	37

Recorded By JOHNSON Witnessed By KOMENAG

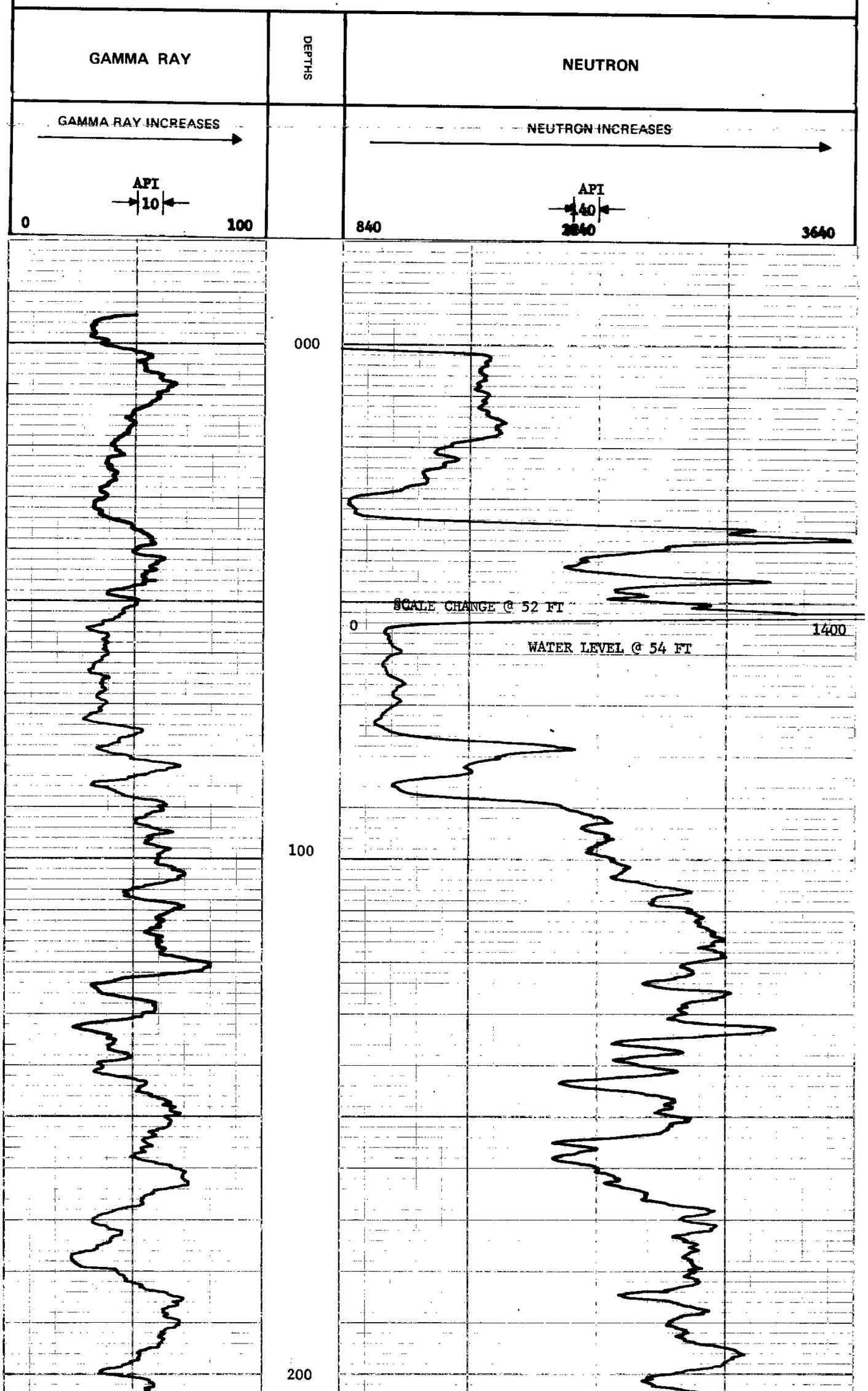
EQUIPMENT DATA

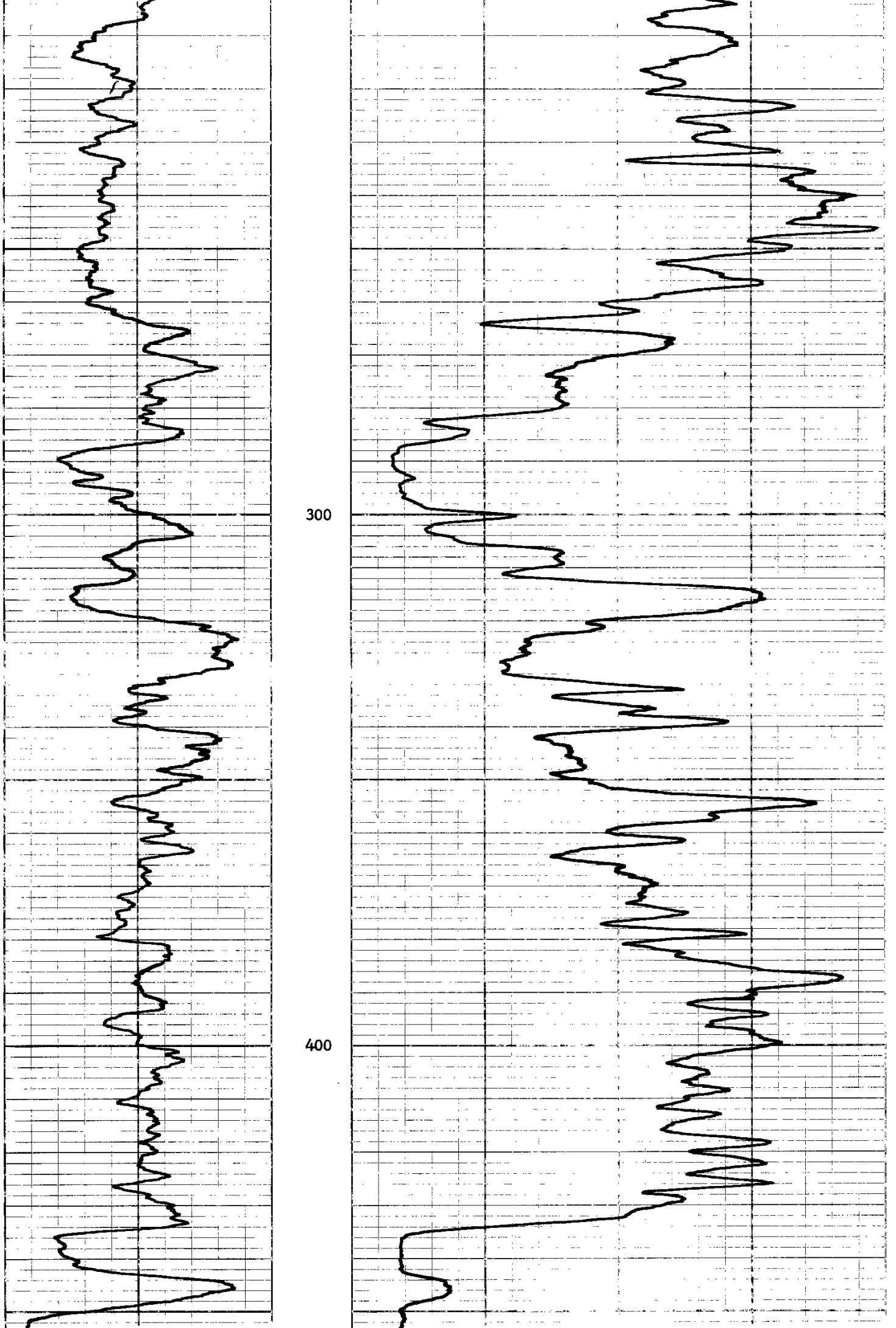
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	67 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	[redacted]

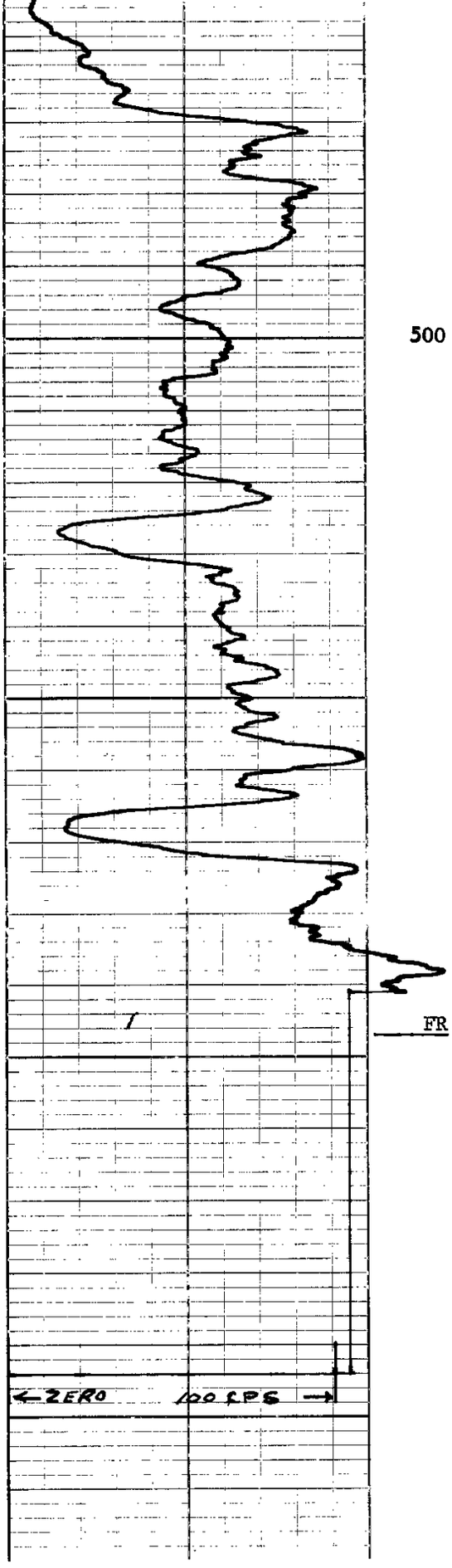
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	52	12	5	100	OL	10	3	1000	6L	140
	52	597	12	5	100	OL	10	3	500	1L	70

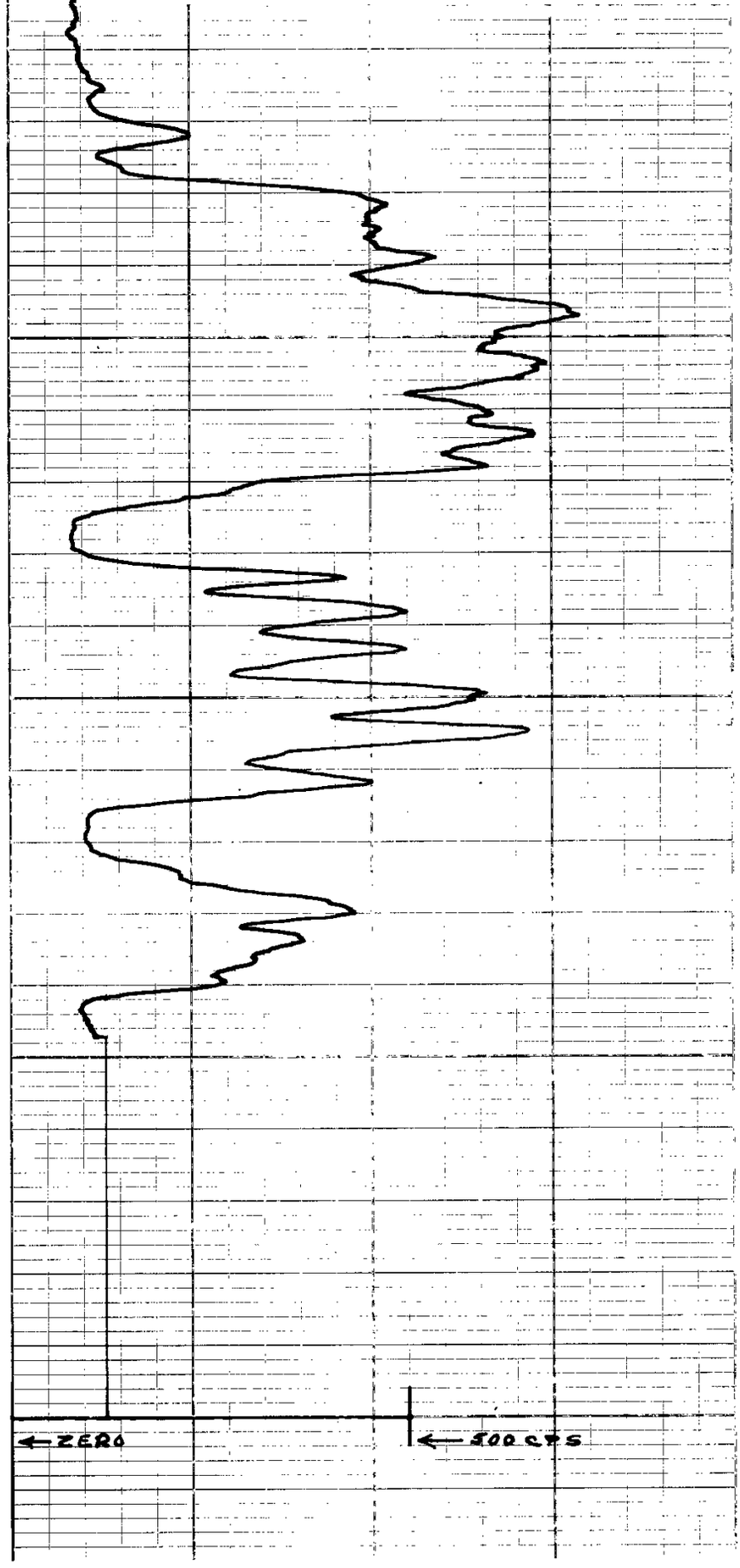
REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
API
10
0
100
NEUTRON INCREASES
API
40
840
2840
3640
000
SCALE CHANGE @ 52 FT
0
1400
WATER LEVEL @ 54 FT
100
200


300
400



500



K-FORDING RIVER 77 (3) A.

Widco* WELL LOG

COMPANY

AREA GREENHILLS

WELL RH 1077

COUNTY STATE

320

COORDINATES:
N
S
ELEVATION:
D.F
K.B.
G.L.

COMPANY
WELL RH 1077
LOCATION GREENHILLS

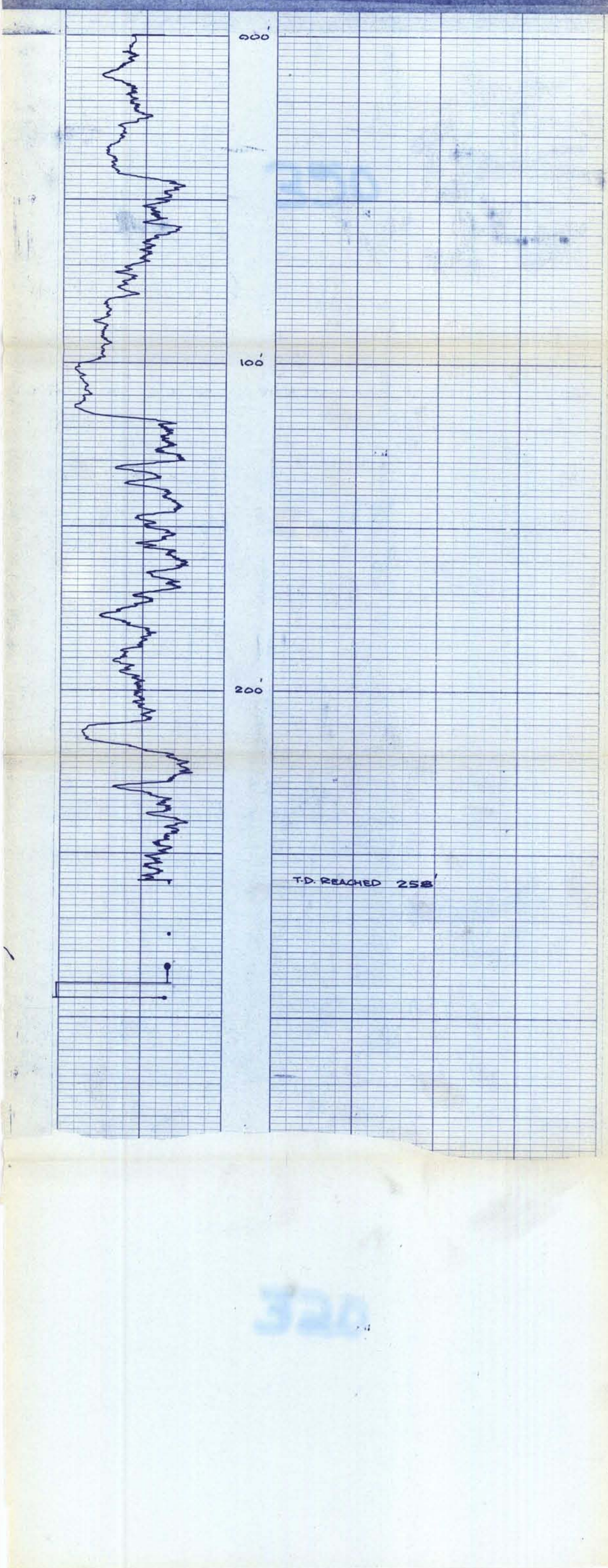
	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log)		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Nature		
Density		
Viscosity	@ °F	@ °F
Resistivity	@ °F	@ °F
Res. @ BHT	@ °F	@ °F
pH		
Circ. Temp.		
B.H. Temp.		
Logged by	K.K.	
Witnessed by		

REMARKS 12 A.P.I. LOGGED THROUGH DOUBLE WALL DRILL STEM.

JUL 5 '77

* Reg. U.S. Pat. Off.



320

Widco* WELL LOG

COMPANY K- FORDING RIVER 77(3)A-

AREA GREEN HILLS.

WELL RH 1078

COUNTY STATE

320

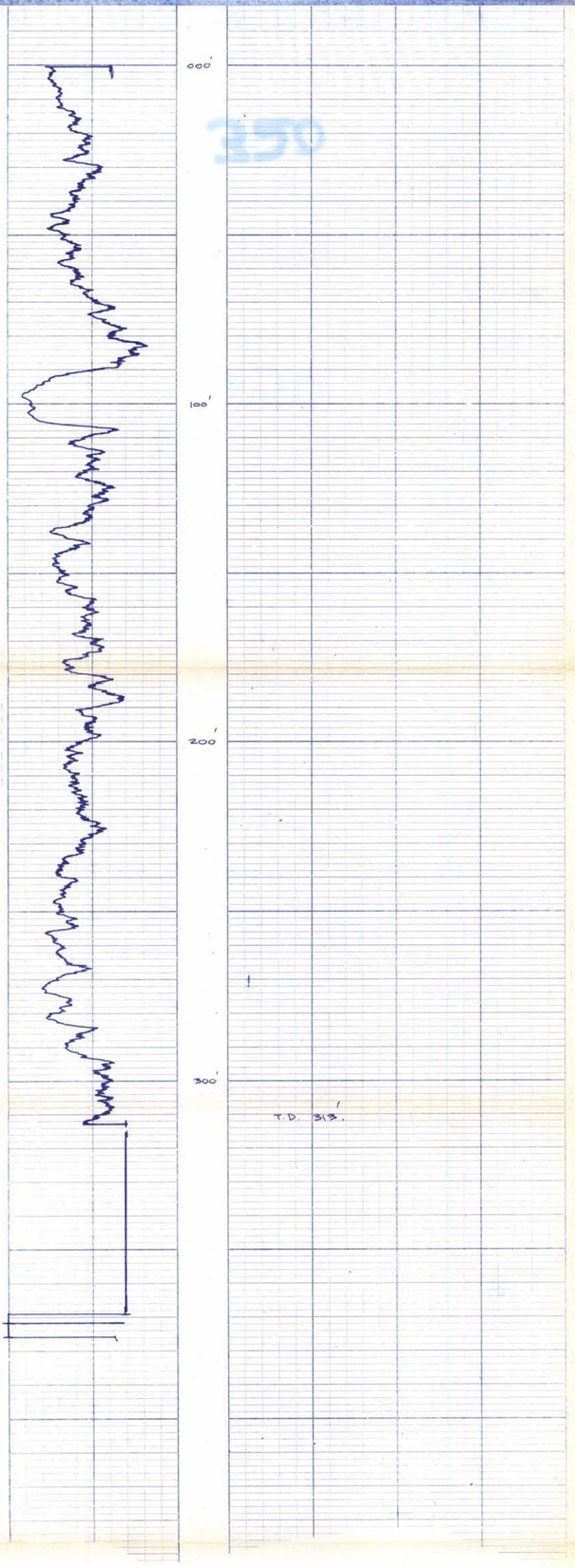
COORDINATES
N
S
ELEVATION
DF
KB
GL

COMPANY
WELL RH 1078
FIELD GREEN HILLS
COUNTY

	Run No.	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			BH Temp.		
Bit Size					
Bit Size			Logged by	K.K.	
			Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM
JUN 30'77

* Reg. U.S. Pat. Off.



RECORDING CHARTS

K-FORDING RIVER 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W_____M

COMPANY FORDING COAL LIMITED

WELL KH - 1079 320

LOCATION GREEN HILLS

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE										
Date	3 AUG 1977										
First Reading	70										
Last Reading	0										
Footage Logged	70										
Depth Reached	71										
Depth Driller	72										
Casing Roke											
Casing Driller											
Fluid Type	AIR/WATER										
Liquid Level	18										
Min. Diam.	3 7/8										
Rm @ °F											
Operating Time	½ HOUR										
Truck No.	37										
Recorded By	JOHNSON	Witnessed By	SHAW								

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	16	12	5	100	0L	14	3	1000	1L	260
	16	70	12	5	100	0L	14	3	500	1L	130

REMARKS

GAMMA RAY — DEPTHS — NEUTRON

GAMMA RAY INCREASES →

API 14 — 0 — 140

NEUTRON INCREASES →

API 260 — 260 — 2860 — 5460

000

SCALE CHANGE @ 16 FT

130 — WATER LEVEL @ 18 FT — 2730

FR

← ZERO ← 100 CPS

← ZERO 10% SHIFT → ← 1000 CPS

K-FORDING RIVER 77(3)A-

Widco* WELL LOG

RH 1080 GREENHILLS

COMPANY
AREA GREENHILLS
WELL RH 1080 320
COUNTY STATE

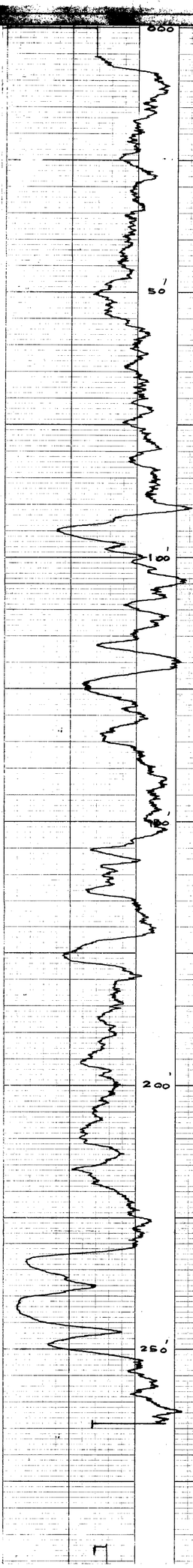
COORDINATES
N
E
ELEVATION
D.F.
K.B.
G.L.

	Run No. 1	Run No. 2	Run No. 1	Run No. 2
Date			Matrix	
First Reading			Density	
Last Reading			Viscosity @ F	@ F
Footage Logged			Resistivity @ F	@ F
Bit No. or Diameter			Res. of Bmf @ F	@ F
Casing From Log			pH	
Casing Driller			Circ. Temp	
Casing Size			B.H. Temp F	
Bit Size				
Bit Size			Logged by	
			Witnessed by	K. K.

REMARKS B-50 HOLE JUL. 5'77

SCALE 10 DIV. = 10'

12 A.P.I.



Widco* WELL LOG

COMPANY K-FORDING RIVER 77(B)A.
AREA GREENHILLS
WELL RH 1081
COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D.F.
K.B.
G.L.

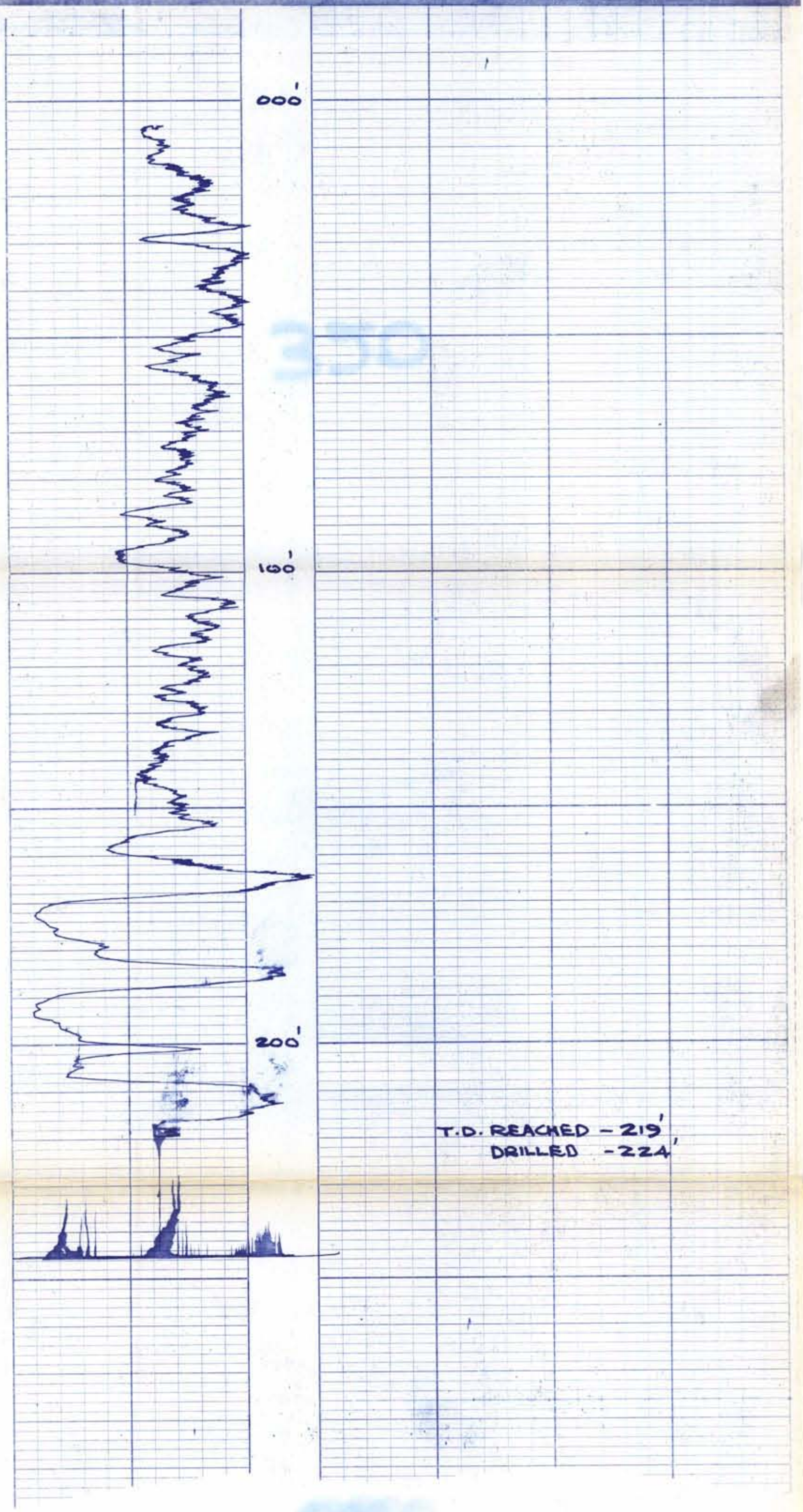
COMPANY
WELL RH 1081
LOCATION GREENHILLS

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log)		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Nature		
Density		
Viscosity	@ °F	@ °F
Resistivity	@ °F	@ °F
Res. @ BHT	@ °F	@ °F
pH		
Circ. Temp.		
B.H. Temp.		
Logged by	RK	
Witnessed by		

REMARKS B-50 DRILL
12 A.P.I. JUL 12 '77

* Reg. U.S. Pat. Off.



T.D. REACHED - 219'
DRILLED - 224'

Widco* WELL LOG

COMPANY RH 1082

LOCATION GREENHILLS

K-FORDING RIVER 77 (3) A.

COMPANY

AREA GREENHILLS.

WELL RH 1082

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D F
K B
G L

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

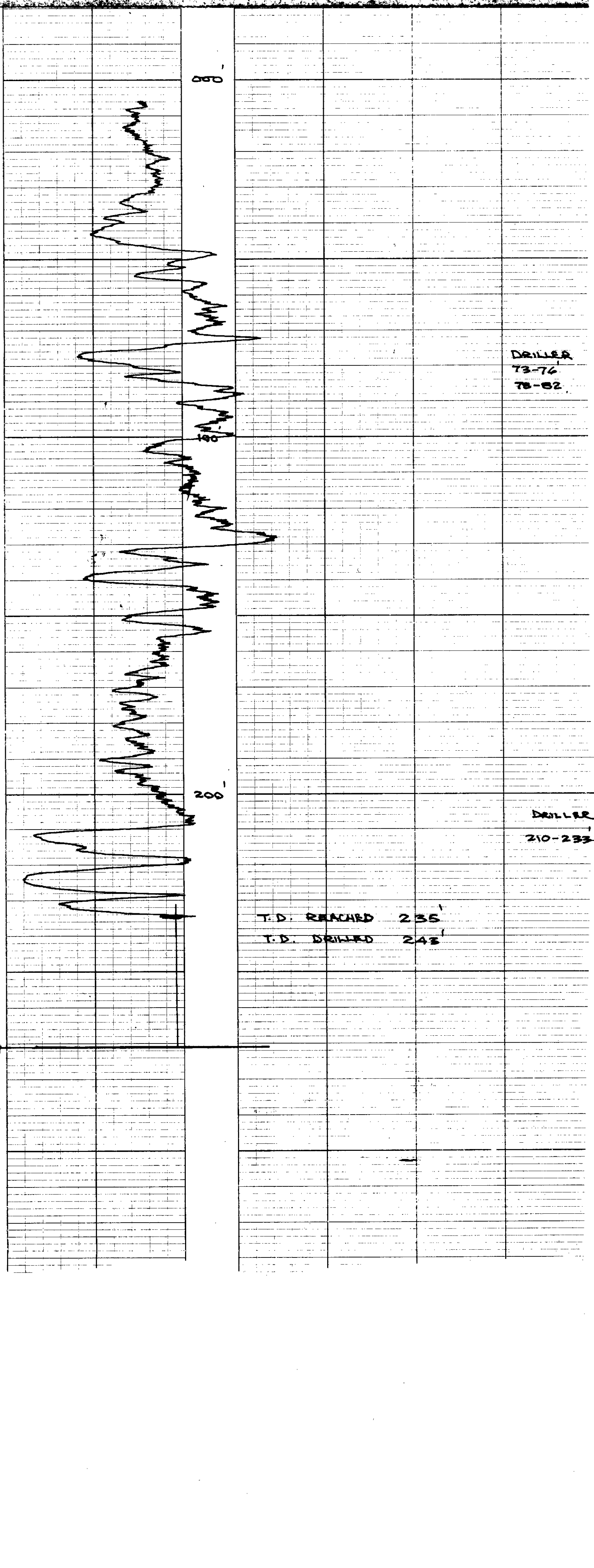
MUD	Run No. 1		Run No. 2	
Nature				
Density				
Viscosity	@	F	@	F
Resistivity	@	F	@	F
Res @ BHT	@	F	@	F
pH				
Circ Temp				
B H Temp				
Logged by	RK.			
Witnessed by				

REMARKS 12. A.P.I. JUL 20'77

B-50 HOLE

* Reg. U.S. Pat. Off.

FO-1



E 1082

K-FORGING RIVER 77 (3) A.

Widco* WELL LOG

RH 1083

GREENHILLS

AREA GREENHILLS.

WELL RH 1083

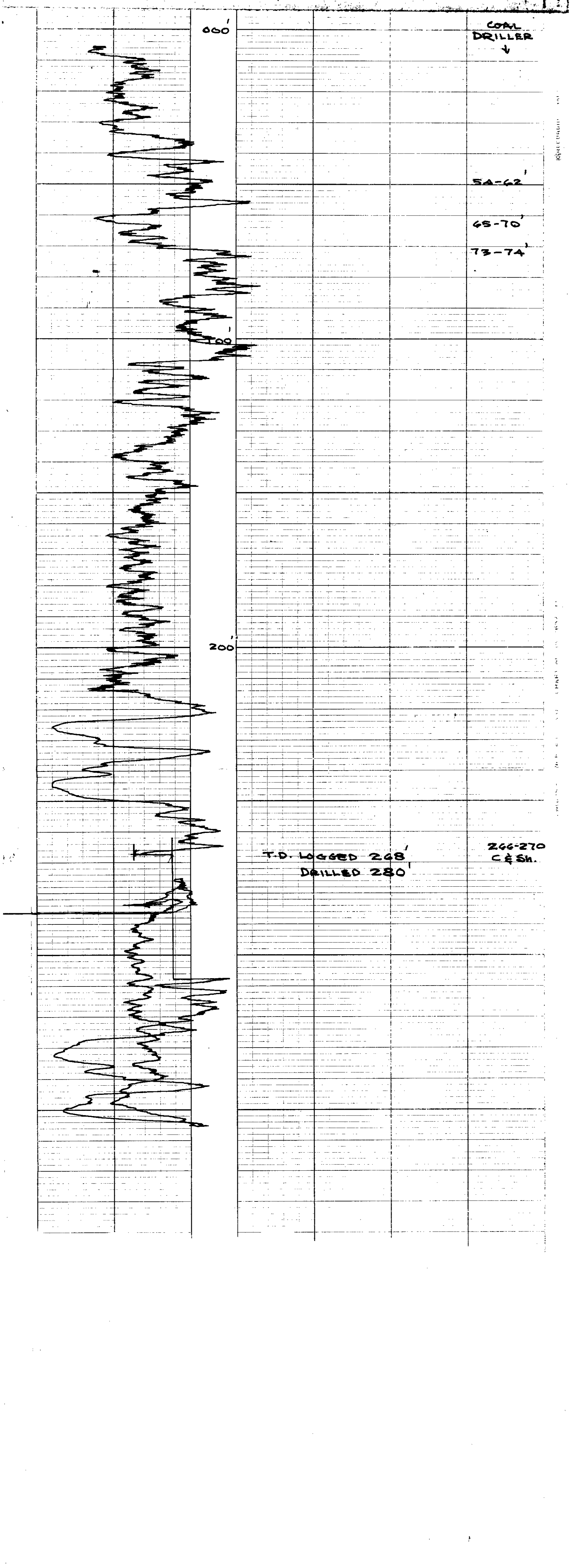
STATE 320

COORDINATES
N
S
ELEVATION
D F
K B
G L

	Run No.	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
Run Number			Density		
Depth—Driller			Viscosity	@ F	@ F
B. Hole Cover			Resistivity	@ F	@ F
Casing Prom Log			Res. @ BHT	@ F	@ F
Casing Driller			pH		
Casing Size			Circ. Temp		
Bit Size			B.H. Temp		
Bit Size					
			Logged by		
			Witnessed by		

REMARKS B-50 DRILL 13 A.P.I.
JUL 26 '77

* Reg. U.S. Pat. Off.



K-FORDING River 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL RH - 1084

LOCATION GREEN HILLS

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. ____ K.B. ____

Log Measured from GROUND LEVEL Ft. Above Perm. Datum CSG ____

Well Depths Measured from GROUND LEVEL G.L. ____

Run. No.	ONE	
Date	5 AUG 1977	
First Reading	255	
Last Reading	0	
Footage Logged	255	
Depth Reached	256	
Depth Driller		
Casing Roke		
Casing Driller		
Fluid Type	AIR/WATER	
Liquid Level	58	
Min. Diam.	3 7/8	
Rm @ °F		
Operating Time	1 HOUR	
Truck No.	37	
Recorded By	JOHNSON	Witnessed By SHAW

EQUIPMENT DATA

GAMMA RAY	
RUN NO.	ONE
TOOL MODEL NO.	
DIAMETER	$1\frac{11}{16}$
DETECTOR MODEL NO.	
TYPE	SCINTILLATION
LENGTH	4 INCH
DISTANCE TO N. SOURCE	6.7 FT.

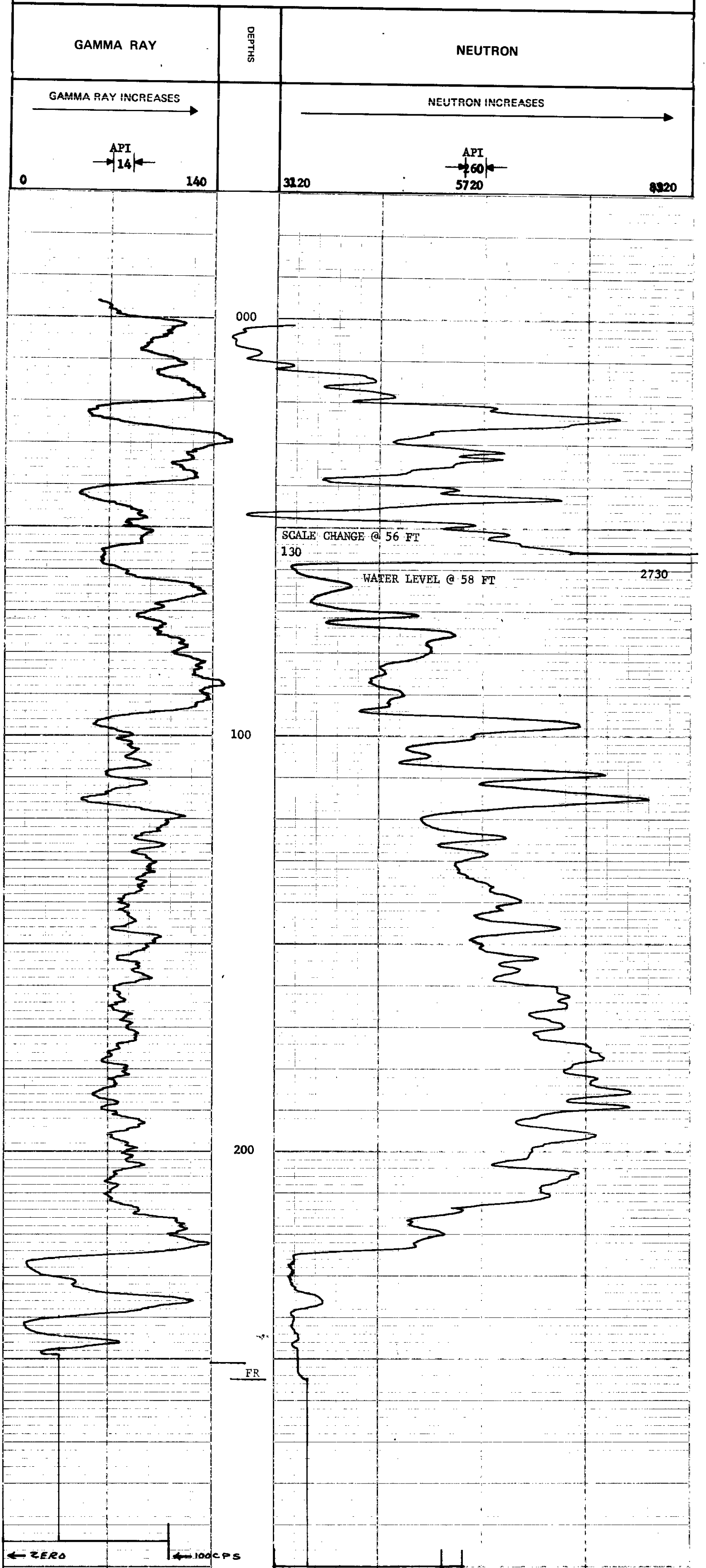
GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	37
TOOL SERIAL NO.	R GRN 169 - 002

NEUTRON	
RUN NO.	ONE
LOG TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	$1\frac{11}{16}$
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	6 INCH
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	187
SPACING	17 INCH
TYPE	AmBe
STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	56	12	5	100	0L	14	3	1000	12L	260
	56	255	12	5	100	0L	14	3	500	1L	130

REMARKS



K-FORDING RIVER 77(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL RH-1086

LOCATION LAKE MTN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

320

Run. No.	ONE
Date	2 AUGUST 1977
First Reading	406
Last Reading	0
Footage Logged	406
Depth Reached	407
Depth Driller	410
Casing Roke	
Casing Driller	10
Fluid Type	AIR/WATER
Liquid Level	60
Min. Diam.	
Rm @ °F	
Operating Time	1HRHR
Truck No.	37

Recorded By JOHNSON

Witnessed By ALLEN

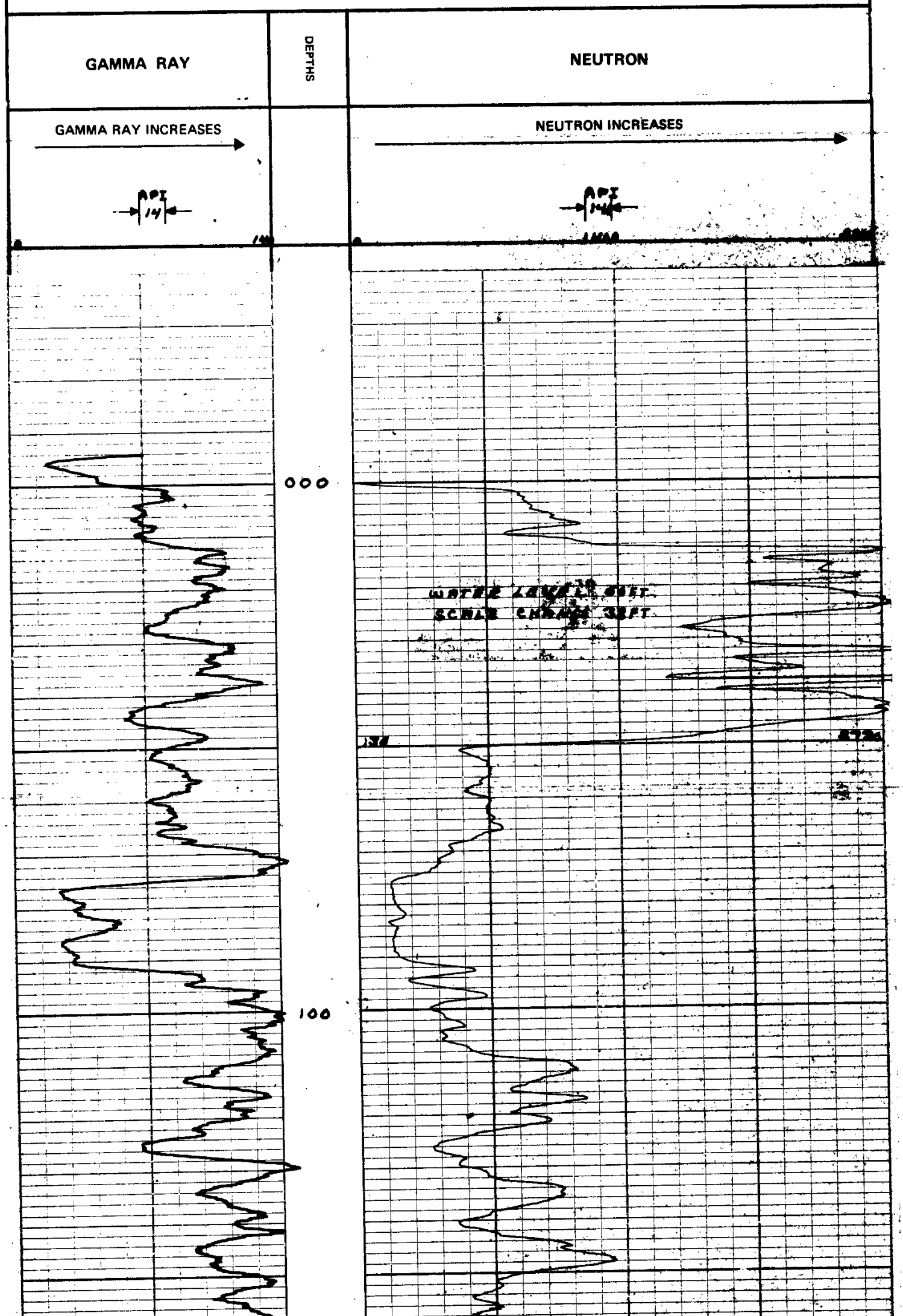
EQUIPMENT DATA

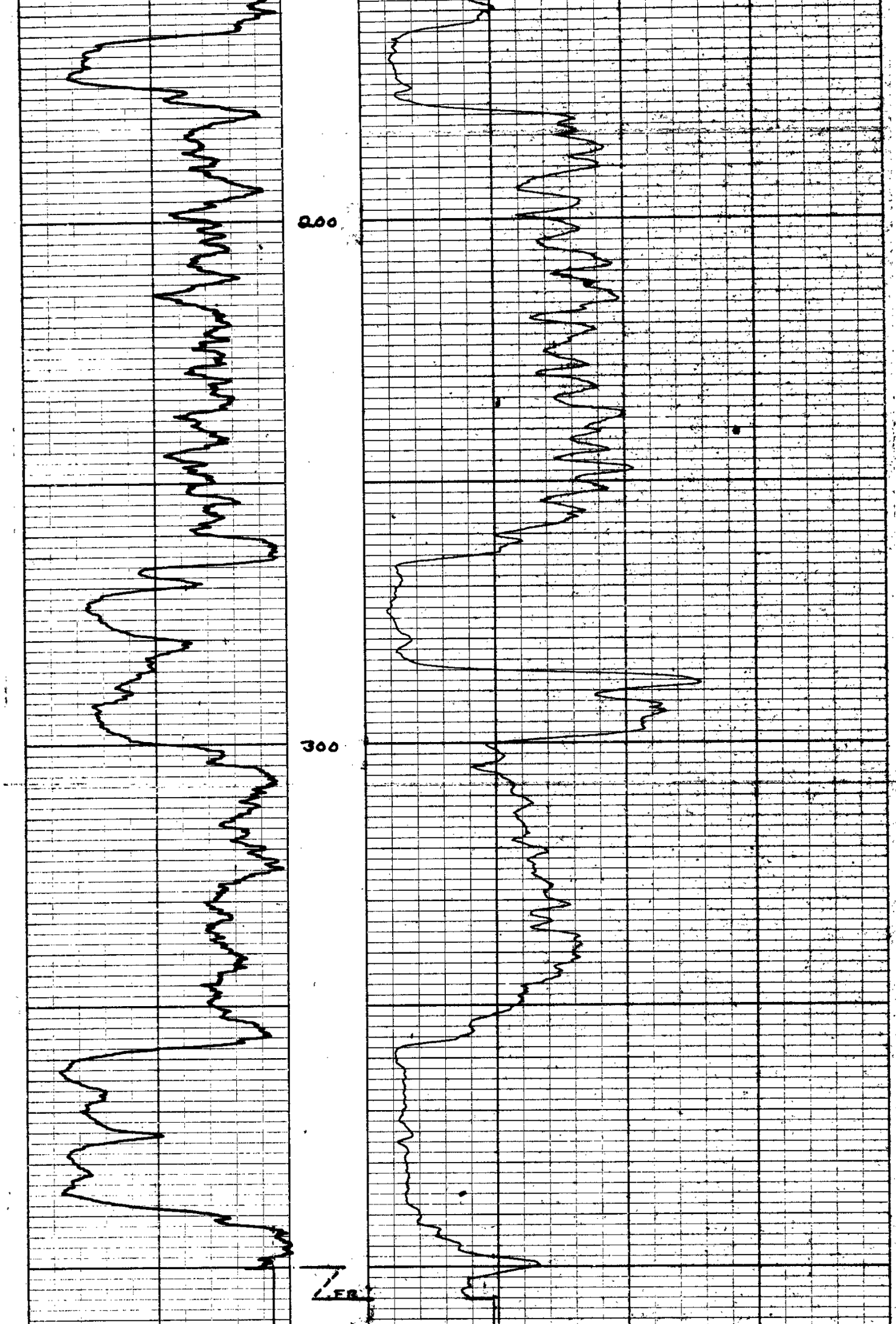
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

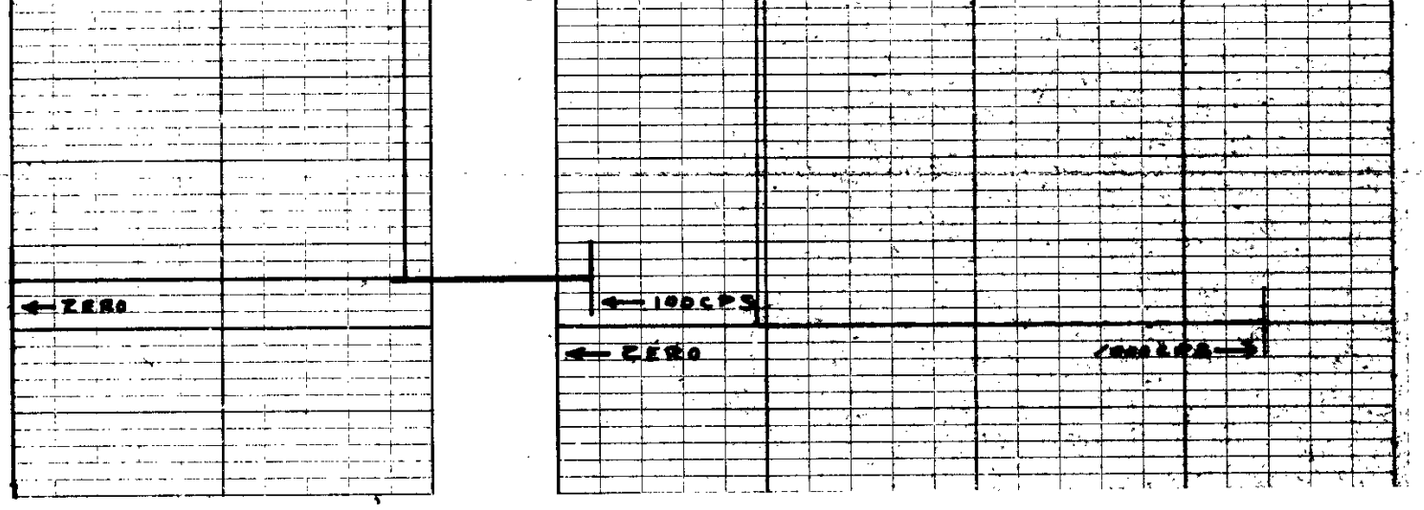
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	38	12	5	100	OL	8API	3	1000	OL	14API
	38	406	12	5	100	OL	8API	3	500	OL	7API

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
NEUTRON INCREASES
API
14
000
100
WATER LEVEL 30 FEET
SCALE CHANGE 30FT


200
300
ZERO


ZERO
100CPS
ZERO

K-FORDING 2nd Fr. 77(3)4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RU - 1088

LOCATION LAKE MOUNTAIN

320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL Elev. 0 Ft. Above Perm. Datum

Log Measured from GROUND LEVEL

Well Depths Measured from GROUND LEVEL

Other Services: NONE

Run. No.	ONE
Date	15 AUG 1977
Last Reading	501
First Reading	0
Footage Logged	501
Depth Reached	502
Depth Driller	505
Casing Size	
Casing Depth	
Fluid Type	
Liquid Level	289
Max. Recorded Temp.	
Min. Recorded Temp.	
Rm @ °F	
Operating Time	1 HOUR
Truck No.	32
Recorded By	VERRAN
Witnessed By	ATKEN

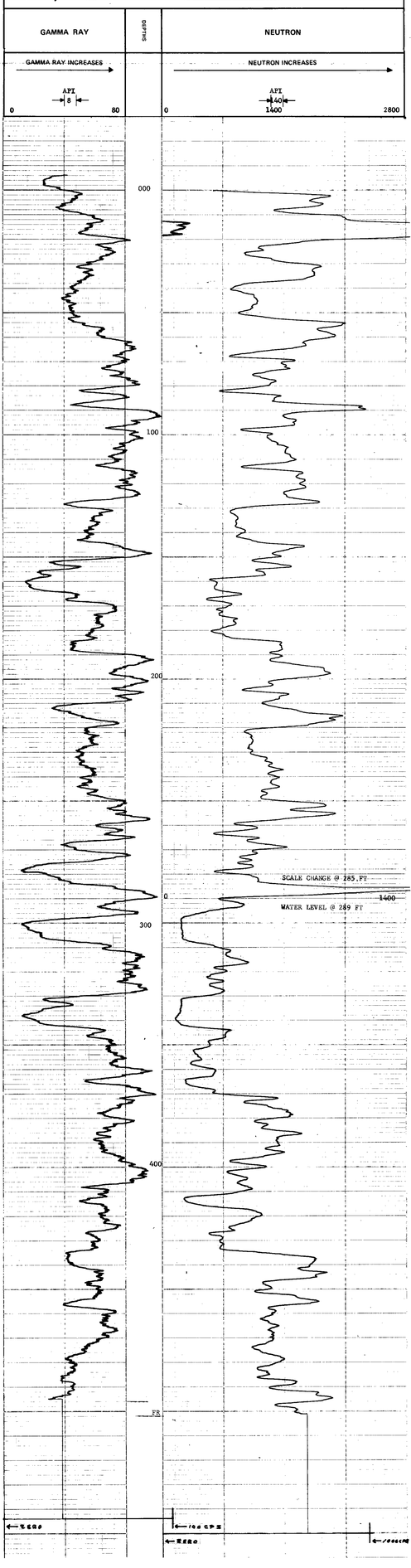
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	285	12	5	100	OL	8	3	1000	OL	140
	285	501	12	5	100	OL	8	3	500	OL	70

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FORDING RIVER 77(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL RH - 1089

LOCATION LAKE MOUNTAIN

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Other Services: NONE

Run. No.	ONE
Date	15 AUG 1977
First Reading	549
Last Reading	0
Footage Logged	549
Depth Reached	550
Depth Driller	550
Casing Roke	
Casing Driller	
Fluid Type	WATER
Liquid Level	FULL
Min. Diam.	5
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	JOHNSON
Witnessed By	ALLEN

EQUIPMENT DATA

GAMMA RAY	
RUN NO.	ONE
TOOL MODEL NO.	
DIAMETER	$1\frac{11}{16}$
DETECTOR MODEL NO.	
TYPE	SCINTILLATION
LENGTH	4 INCH
DISTANCE TO N. SOURCE	6.7 FT.

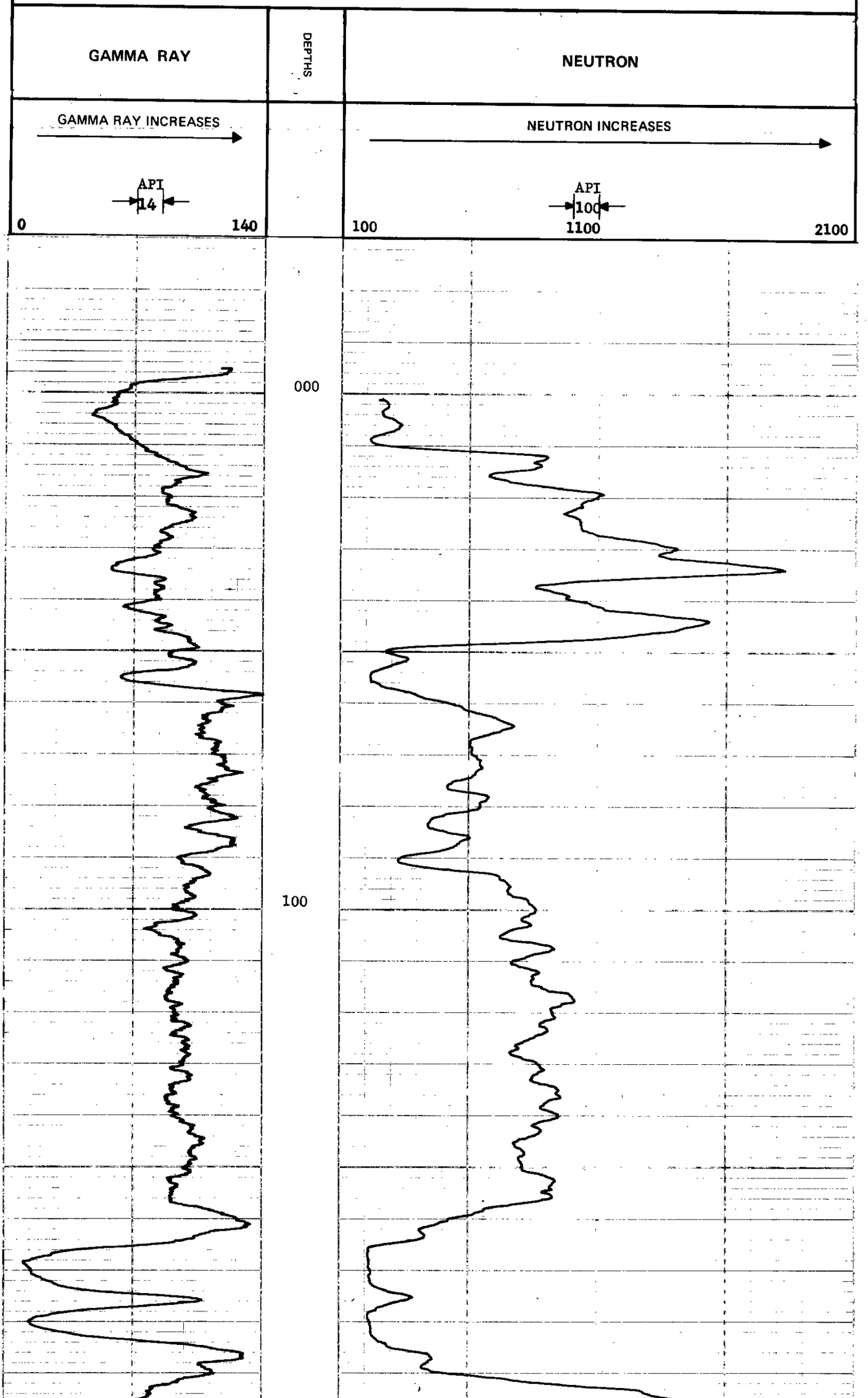
GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	37
TOOL SERIAL NO.	R GRN 169-002

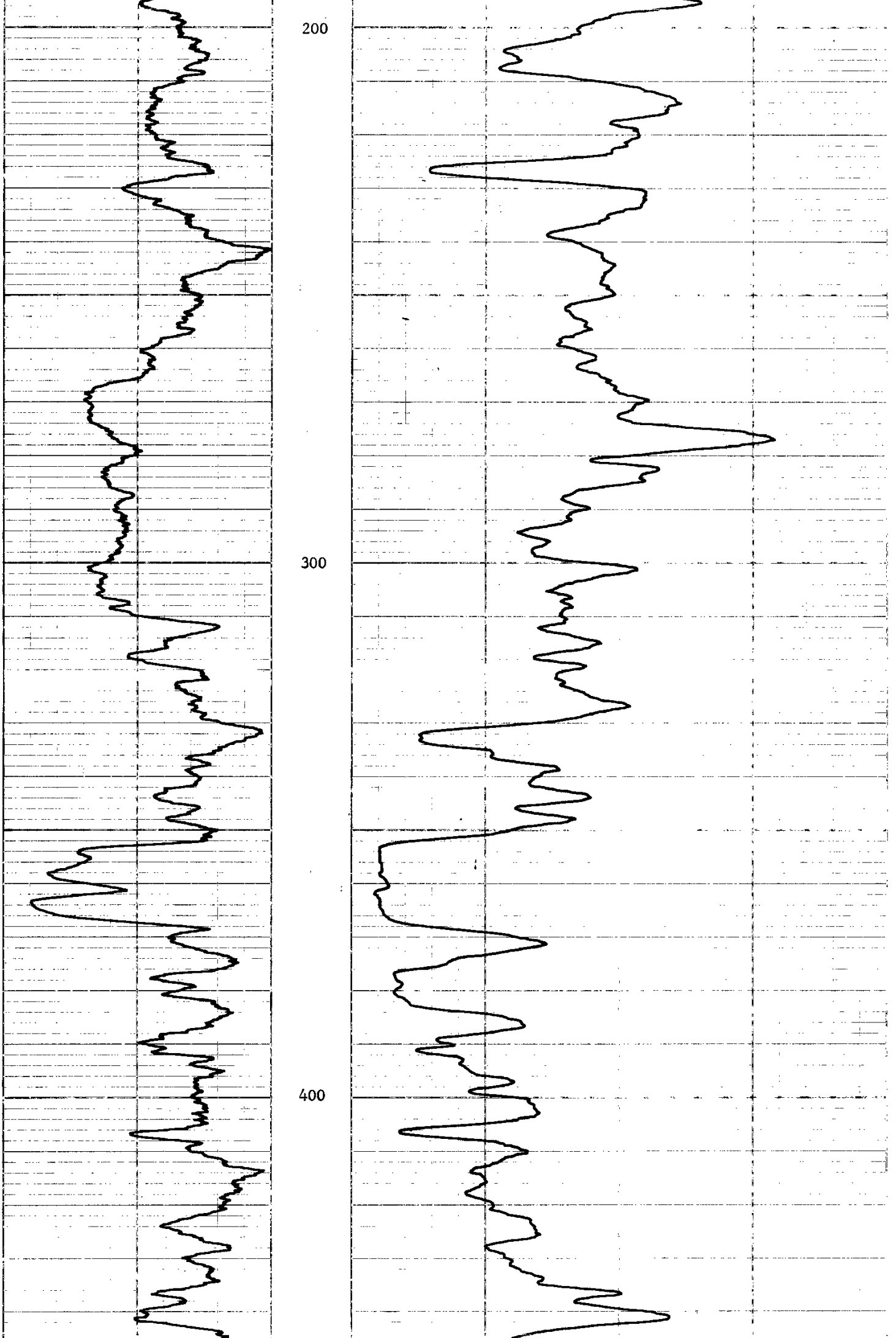
NEUTRON	
RUN NO.	ONE
LOG TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	$1\frac{11}{16}$
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	6 INCH
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	187
SPACING	17 INCH
TYPE	AmBe
STRENGTH	3 CURIES

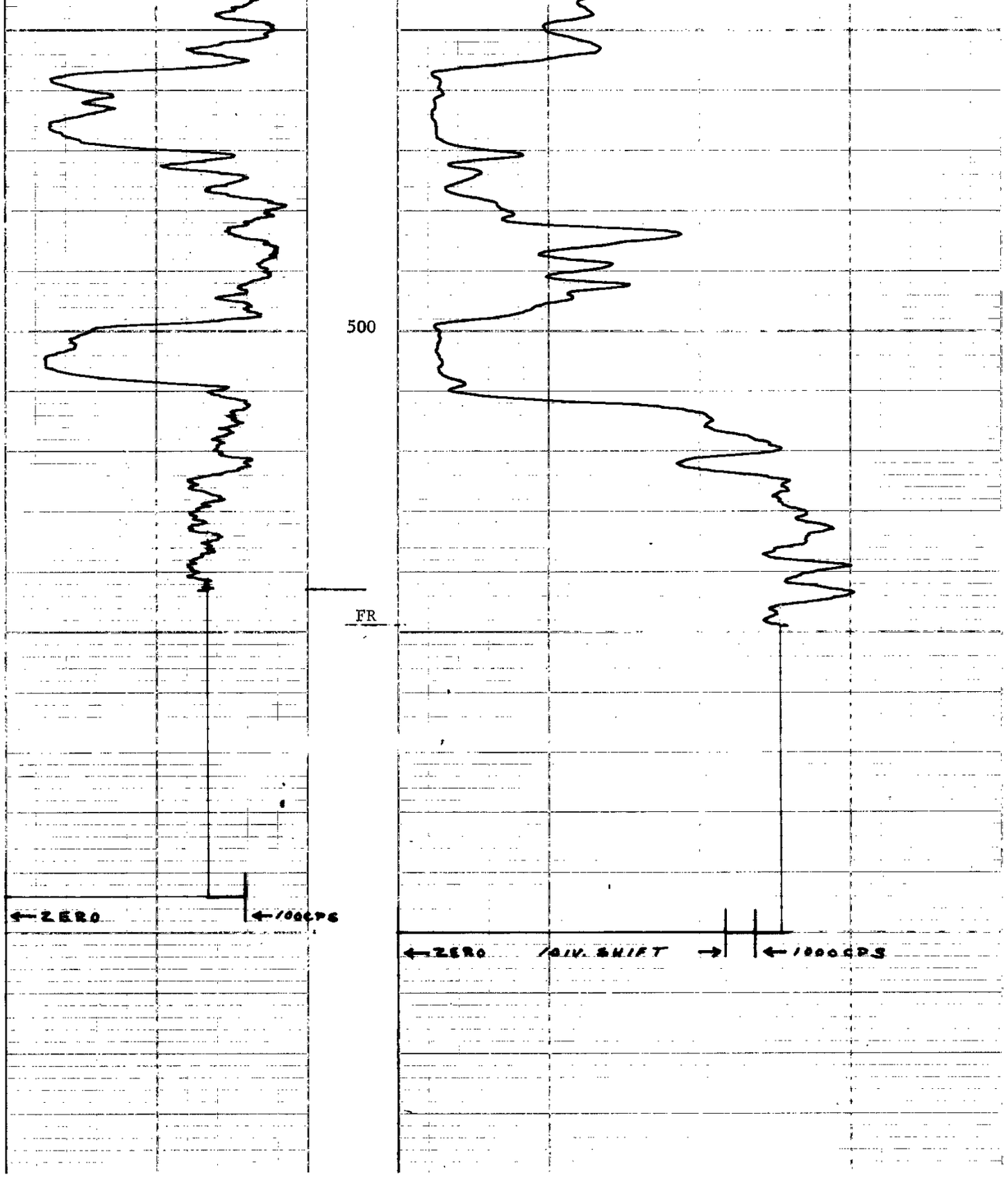
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	549	12	5	100	OL	14	3	500	1L	100

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
API
14
0
140
NEUTRON INCREASES
API
100
100
1100
2100
000
100


200
300
400


500
FR
←ZERO
←100CPS
←ZERO
10IV. SHIFT →
←1000CPS

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

SEC 32
TWP
RGE
W ____ M

COMPANY PORDING COAL LIMITED

WELL RR - 1090

LOCATION LAKE MOUNTAIN

320

FIELD PORDING

Permanent Datum: GROUND LEVEL — Elev. ____
Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum
Drill Pipe Measured from: GROUND LEVEL — K.B. ____ D.F. ____ G.L. ____

Other Services: NONE

Run. No.	ONE
Date	18 AUG 1977
First Reading	462
Last Reading	0
Casing - Logged	462
Depth - Driller	463
Depth - Logger	462
Casing Driller	500
Casing Logger	
Fluid Type	AIR/WATER
Liquid Level	
Max. Recorded Temp.	58
Rm @ °F	
Operating Time	1½ HOURS
Truck No.	30

Recorded By MAIER

Witnessed By ANDERSON

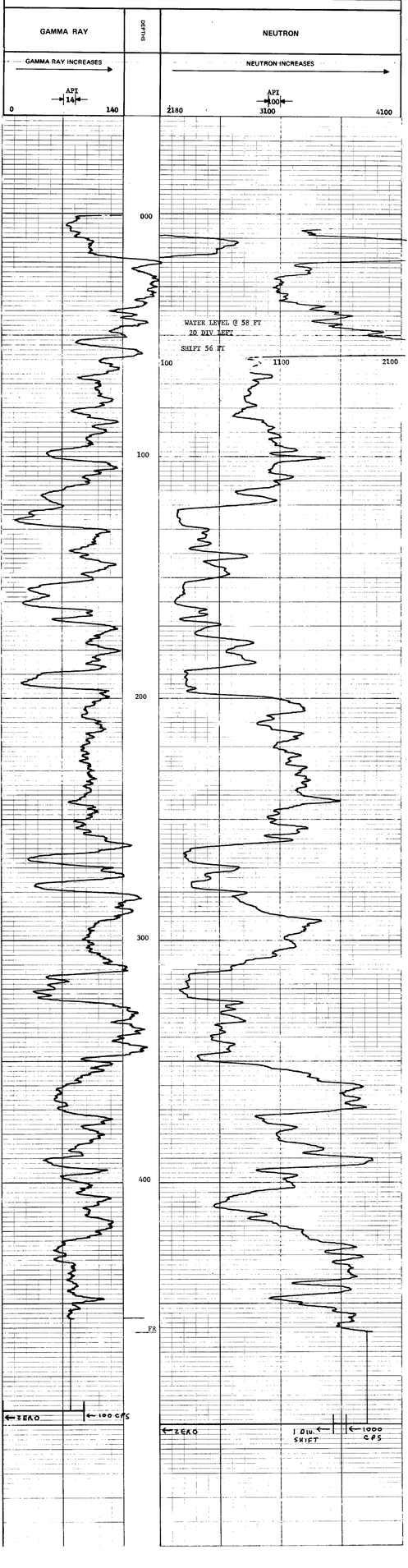
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6,8 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	188
HOIST TRUCK NO.	30	SPACING	17 INCH
INSTRUMENT TRUCK NO.	30	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-001	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	58	12	5	100	OL	14	3	1000	21L	100
	58	462	12	5	100	OL	14	3	1000	14	100

REMARKS



K-FOR DUAL LOG 73 (S)A

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

SEC 20 TWP 8 RGE 1 W M

COMPANY FORDING COAL LIMITED

WELL RE - 1093

LOCATION LAKE MOUNTAIN

FIELD FORDING

PROVINCE ALBERTA COLUMBIA

Permanent Datum: GROUND LEVEL Elev. ____

Log Measured From: GROUND LEVEL Ft. Above Perm. Datum

Drilling Measured From: GROUND LEVEL K.B. ____ D.F. ____ G.L. ____

Other Services: IRONE

Run. No. ONE
Date 18 NOV 1977
First Reading 498
Last Reading 0
Footage Logged 498
Depth Driller 498
Depth Logger 498
Casing Driller 500
Casing Logger
Bottom Hole Temp.
Liquid Level AIR BLOWER
Max. Rec. Temp. 112
Min. Diam.
Rm. @ °F

Operating Time
Truck No.
30 3 HOURS

Recorded By MAYER

Witnessed By ALLEN

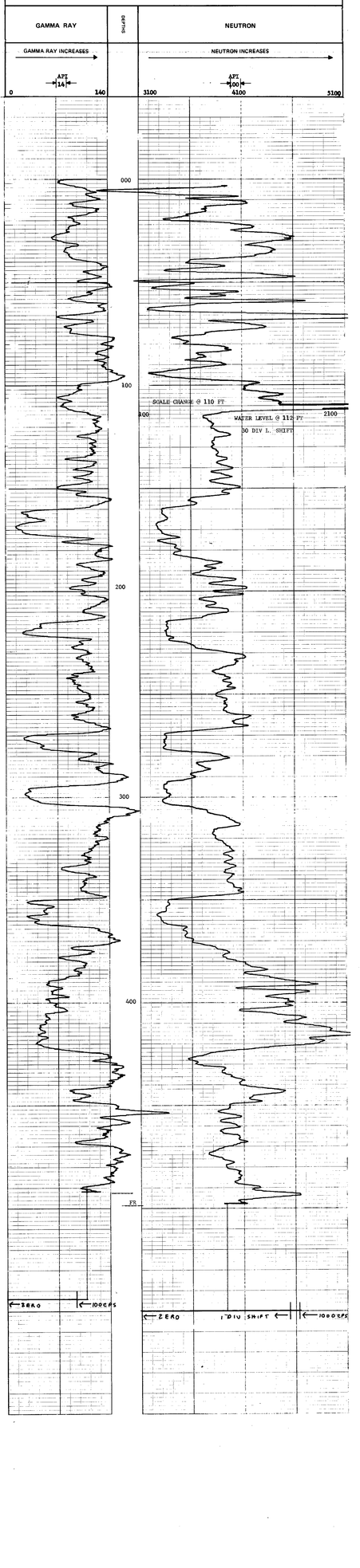
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.8 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	188
HOIST TRUCK NO.	30	SPACING	17 INCH
INSTRUMENT TRUCK NO.	30	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-001	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY					NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.		T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	112	12	5	100	01	14		3	1000	11	100
	112	498	12	5	100	01	14		3	1000	11	100

REMARKS



ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RE - 1072

LOCATION LAKE KOOTENAY

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev. —
Log Measured From: GROUND LEVEL — Ft. Above Perm. Datum
Drill Depth Measured From: GROUND LEVEL

K.B. —
D.F. —
G.L. —

Other Services: NONE

SEC. 32 TWP. 3 RGE. 5 M

320

Run No.	ONE	
Date	22 AUG 1977	
First Reading	578	
Last Reading	0	
Feet Logged	578	
Depth Reached	578	
Bottom Logged Interval	578	
Casing Rules		
Casing Driller		
Casing Logged		
Liquid Type	ASH DENSITY	
Liquid Level	106	
Max. Temp.	4 7/8	
Min. Diam.		
Rm @ °F		
Rmf @ °F		
Rm @ °F		
Operating Time	2. HOURS	
Truck No.	34	

Recorded By: CHARTH

Witnessed By: KOSKINAS

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	~~SCINTILLATION~~	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.35 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	30
HOIST TRUCK NO.	34	SPACING	17 INCH
INSTRUMENT TRUCK NO.	34	TYPE	AmBe
TOOL SERIAL NO.	177	STRENGTH	5 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON		
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	106	12	5	100	OL	15	3	1000	OL	240
	106	578	12	5	100	OL	15	3	500	OL	120

REMARKS

GAMMA RAY — DEPTHS — NEUTRON

GAMMA RAY INCREASES →
API
15
0 — 150

NEUTRON INCREASES →
API
1200
0 — 2400

SCALE CHANGE
LOGGED ON 1000 TAP
0 — 2400
0 — 4800

WATER LEVEL @ 106

000
100
200
300
400
500

FR

ZERO. 100 CPS.

ZERO 500 CPS

K-ESSING @ 1:66 77 (3)4.

K-FARDUG & WELL 77(6)A-

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FARDUG COAL LIMITED

WELL R-84-A3 320

LOCATION LAKE MTN.

FIELD FARDUG

LSD SEC TWP RGE W. M

Permanent Datum: GROUND LEVEL

Log Measured from: GROUND LEVEL

Drilling Measured from: GROUND LEVEL

Elev.: K.B. D.F. G.L.

Other Services: NONE

PROVINCE BRITISH COLUMBIA

Rec. No. ONE

Date 12 SEPT. 1977

First Reading 445'

Last Reading 446'

Footage Logged 446'

Depth Driller 446'

Depth Logger 446'

Casing Driller 10

Casing Logger 446 WATER

Fluid Type

Fluid Level 99

Max. Rec. Temp.

Equip. No. @ Loc.

Operators Time

Truck No. 37

Recorded By JOHNSON

Witnessed By KOOSMAC

EQUIPMENT DATA

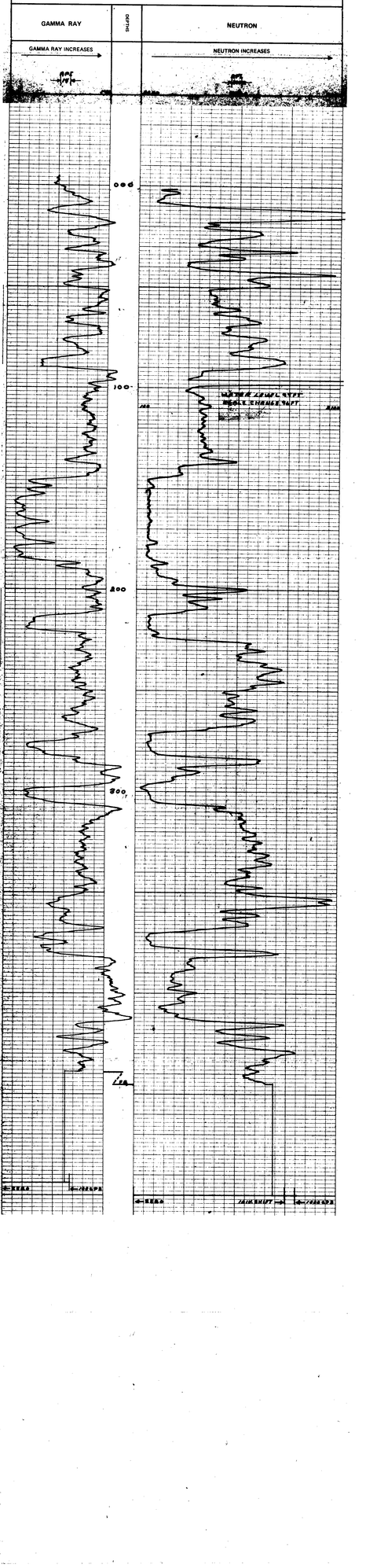
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 1/2	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 1/2
TYPE	SCINTILLATION	TYPE	PROPORTIONAL
LENGTH	4 INCH	LENGTH	6 INCH
DISTANCE TO N. SOURCE	4.7 FT.	SOURCE MODEL NO.	MRC-N-SS-W
		SERIAL NO.	103
		SPACING	19 INCH
		TYPE	AmBe
		STRENGTH	3 CURIES

GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	
TOOL SERIAL NO.	R GEN 169-001

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	96	12	5	100	OL	1HAPI	3	1200	1L	2HAPI
	96	445	12	5	100	OL	1HAPI	3	800	1L	1HAPI

REMARKS



Wilco WELL LOG

RH 1094
LAKE MT.

COMPANY
AREA LAKE MT.
WELL RH 1094
COUNTY STATE

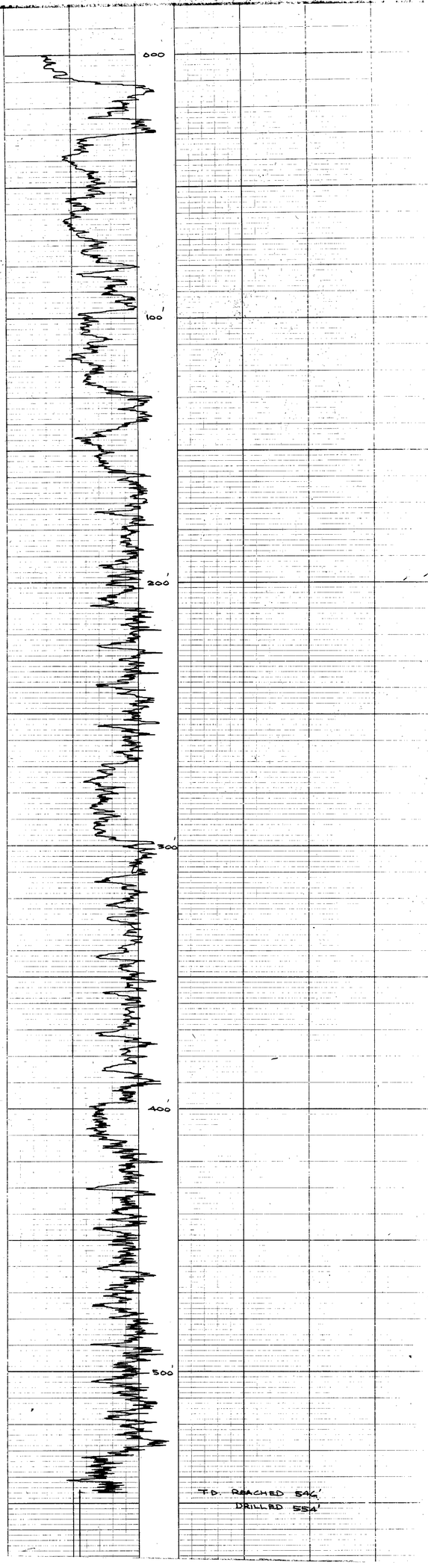
320

COORDINATES
N
S
ELEVATION
D F
K B
G L

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log)		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		
MUD		
Nature		
Density		
Viscosity	@ F	@ F
Resistivity	@ F	@ F
Res. @ BHT	@ F	@ F
pH		
Circ. Temp.		
B.H. Temp.		
Logged by	R.K.	
Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM.
8 A.P.I.
TOP 111' LOGGED BY ROKE (GSM-NT.)

* Reg. U.S. Pat. Off.



K-FORDING RIVER 77 (3) A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W_____M

COMPANY FORDING COAL LIMITED

WELL RH - 1094 320

LOCATION LAKE MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE		
Date	22 AUG 1977		
First Reading	111		
Last Reading	0		
Footage Logged	111		
Depth Reached	112		
Depth Driller	350		
Casing Roke			
Casing Driller			
Fluid Type	AIR		
Liquid Level		/	
Min. Diam.	4 7/8		
Rm @ °F			
Operating Time	3/4 HOUR		
Truck No.	34		
Recorded By	CHAPIN	Witnessed By	KOHNAG

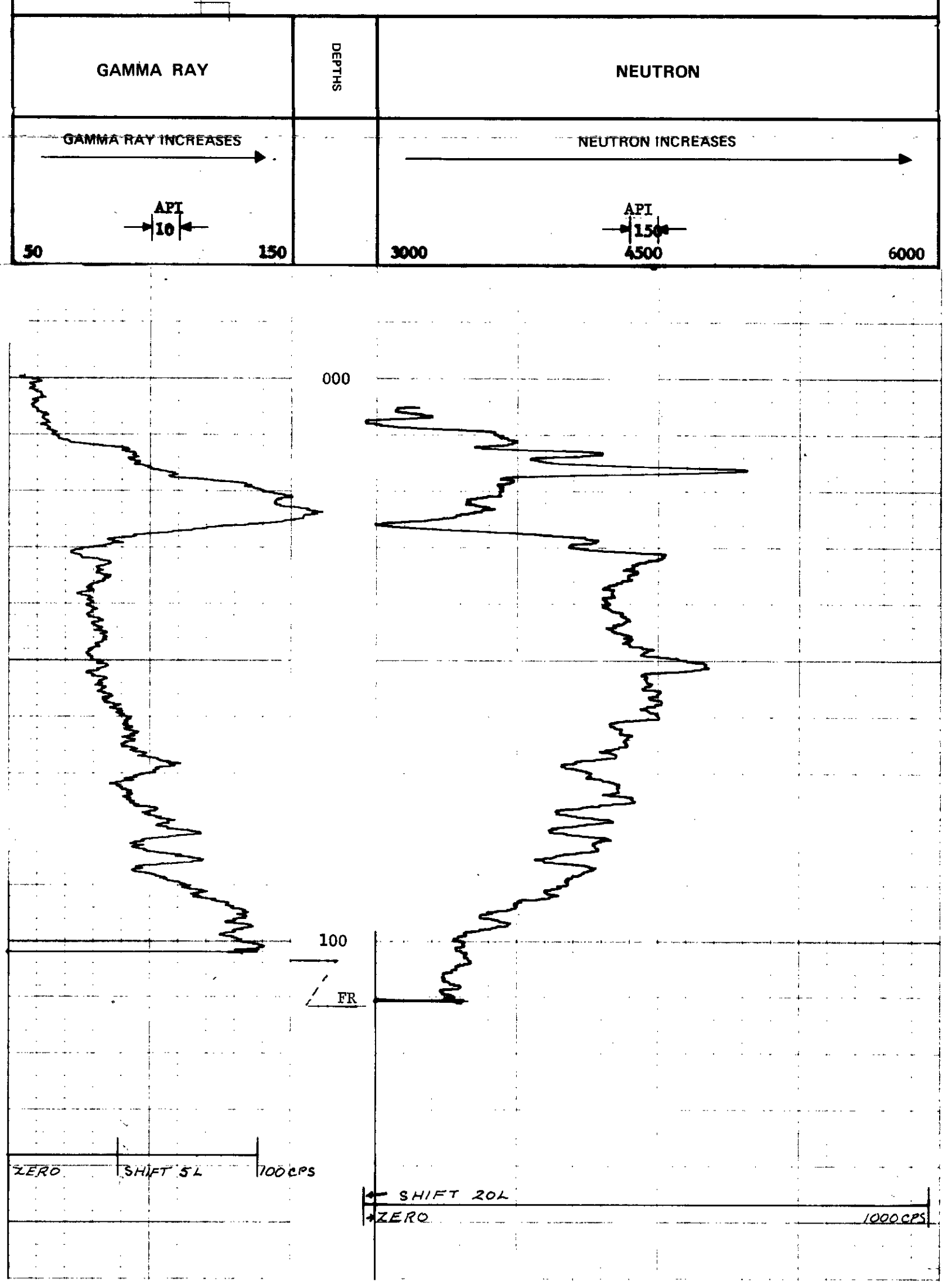
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	8.33 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	50
HOIST TRUCK NO.	34	SPACING	17 INCH
INSTRUMENT TRUCK NO.	34	TYPE	AmBe
TOOL SERIAL NO.	177	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	111	12	5	100	5L	10	3	1000	20L	150

REMARKS



K-FORDING RIVER 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL RH - 1094

LOCATION LAKE MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

320

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. ____ K.B. ____

Log Measured from GROUND LEVEL Ft. Above Perm. Datum CSG ____

Well Depths Measured from GROUND LEVEL G.L. ____

Run. No.	ONE		
Date	22 AUG 1977		
First Reading	111		
Last Reading	0		
Footage Logged	111		
Depth Reached	112		
Depth Driller	350		
Casing Roke			
Casing Driller			
Fluid Type	AIR		
Liquid Level			
Min. Diam.	4 7/8		
Rm @ °F			
Operating Time	3/4 HOUR		
Truck No.	34		
Recorded By	GRAPIN	Witnessed By	KOMENAC

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2.35 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	50
HOIST TRUCK NO.	34	SPACING	17 INCH
INSTRUMENT TRUCK NO.	34	TYPE	AmBe
TOOL SERIAL NO.	177	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	111	12	5	100	5L	10	3	1000	20L	150

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 10		API 150
50 — 150		3000 — 4500 — 6000

000

100

FR

ZERO — SHIFT 5L — 100 CPS

SHIFT 20L

ZERO — 1000 CPS

K-FOLDING RIVER 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL RH - 1094

LOCATION LAKE MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE										
Date	22 AUG 1977										
First Reading	111										
Last Reading	0										
Footage Logged	111										
Depth Reached	112										
Depth Driller	350										
Casing Roke											
Casing Driller											
Fluid Type	AIR										
Liquid Level											
Min. Diam.	4 7/8										
Rm @ °F											
Operating Time	3/4 HOUR										
Truck No.	34										
Recorded By CHAPIN	Witnessed By KOMRNAC										

EQUIPMENT DATA

GAMMA RAY	
RUN NO.	ONE
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	SCINTILLATION
LENGTH	4 INCH
DISTANCE TO N. SOURCE	8.55 FT.

NEUTRON	
RUN NO.	ONE
LOG TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	6 INCH
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	50
SPACING	17 INCH
TYPE	AmBe
STRENGTH	3 CURIES

GENERAL				
HOIST TRUCK NO.	34			
INSTRUMENT TRUCK NO.	34			
TOOL SERIAL NO.	177			

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	111	12	5	100	5L	10	3	1000	20L	150

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 10		API 150
50 — 150		3000 — 4500 — 6000

000

100

FR

ZERO — SHIFT 5L — 100 CPS

ZERO — SHIFT 20L — 1000 CPS

K-FORDING RIVER 77 (3)4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W_____M

COMPANY FORDING COAL LIMITED

WELL RH - 1094 320

LOCATION LAKE MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

Run. No.	ONE		
Date	22 AUG 1977		
First Reading	111		
Last Reading	0		
Footage Logged	111		
Depth Reached	112		
Depth Driller	350		
Casing Roke			
Casing Driller			
Fluid Type	AIR		
Liquid Level			
Min. Diam.	4 7/8		
Rm @ °F			
Operating Time	3/4 HOUR		
Truck No.	34		
Recorded By CHAPIN		Witnessed By KOSKINAS	

EQUIPMENT DATA

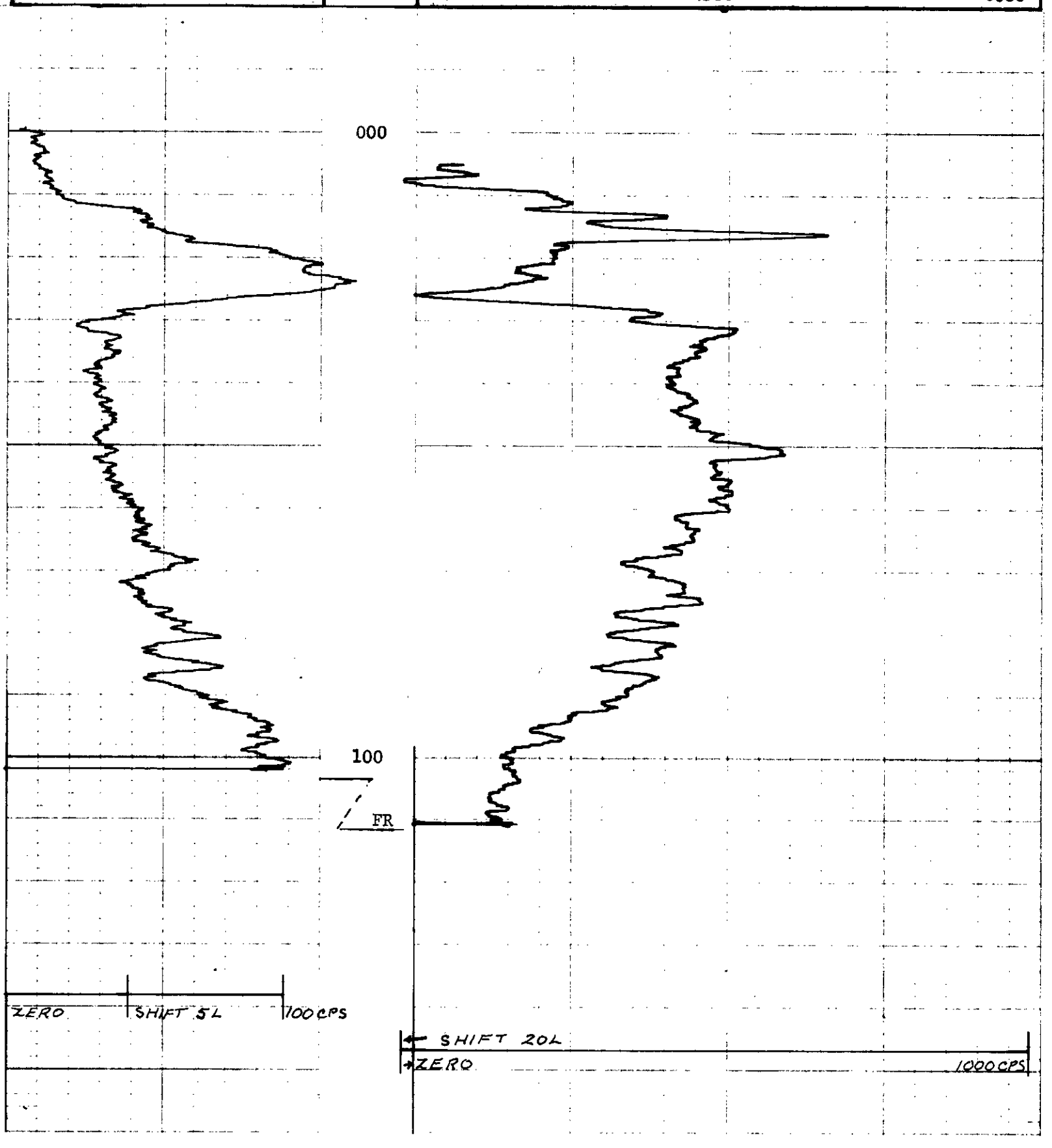
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	8.58 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	50
HOIST TRUCK NO.	34	SPACING	17 INCH
INSTRUMENT TRUCK NO.	34	TYPE	AmBe
TOOL SERIAL NO.	177	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	111	12	5	100	5L	10	3	1000	20L	150

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 10		API 150
50 — 150		3000 — 4500 — 6000



WELL LOG

COMPANY K-FORDING RIVER 77(2)A

AREA GREENHILLS S.

WELL RH 1035

COUNTY _____ STATE _____

320

COORDINATES:
N
S
ELEVATION:
D.F.
K.B.
G.L.

GREENHILLS S. RH 1035

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log)		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Nature		
Density		
Viscosity	@ °F	@ °F
Resistivity	@ °F	@ °F
Res. @ BHT	@ °F	@ °F
pH		
Circ. Temp.		
B.H. Temp.		
Logged by	K.A.K.	
Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM
AUG 25 '77

* Reg. U.S. Pat. Off.

000'
100'
200'
300'
400'
500'
550
60
70

T.D. REACHED 570'
DRILLED 586'

ENGLISH 5 INCH A.P.I. G.O.I. CHART NO. 15-1502-G1

RECORDING CHARTS

Widco* WELL LOG

COMPANY K-FORDING RIVER 77 (3) A

AREA GREENHILLS S.

WELL RH 1096

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D F
K B
G L

COMPANY
WELL RH 1096
LOCATION GREENHILLS S.

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom Driller		
Casing From Log		
Casing Driller		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Nature		
Density		
Viscosity	@ F	@ F
Resistivity	@ F	@ F
Res. @ BHT	@ F	@ F
pH		
Circ. Temp.		
B.H. Temp.		
Logged by	S.S.	
Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM
28 AUG. '77

* Reg. U.S. Pat. Off.

RH
1096

327' DRILLERS
326' LOGGED

0 000'
50
100 100'
150
200 200'
F
250
300 300'
KS
527'
26'
172
6

T.D. REACHED 326'

K- FORDING RIVER 11(3)A.

Widco* WELL LOG

COMPANY

AREA GREENHILLS S.

WELL RH 1097

COUNTY STATE

320

COORDINATES:
N
S
ELEVATION:
D.F
K.B
G.L

COMPANY
WELL RH 1097
LOCATION GREENHILLS S.

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ °F	@ °F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size					
Bit Size					
			Logged by	S.J.S.	
			Witnessed by		

REMARKS AUG 31 '77

LOGGED THROUGH DOUBLE WALL DRILL STEM

* Reg. U.S. Pat. Off.

RECORDING CHARTS

ENGLISH 5 INCH A.P.I. G.O.I. CHART NO. 15-1652-03

Widco* WELL LOG

COMPANY

AREA GREENHILLS S. BURNT RIDGE

WELL RH 1098

COUNTY STATE K-FORGING RIVER 77(3)A.

COORDINATES
N
S
ELEVATION
DF
KB
GL

COMPANY
WELL RH 1098
LOCATION GREENHILLS S.

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp		
Casing Size			B.H. Temp		
Bit Size					
Bit Size					
	320		Logged by	S.J.S.	
			Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM.

11. A.P.I. SEPT. 7 '77

* Reg. U.S. Pat. Off.

K-FORDING RIVER 77 (3) A.

Widco * WELL LOG

COMPANY
AREA GREENHILLS S.
WELL RH 1099
COUNTY STATE

320

COORDINATES:
N
S
ELEVATION
D.F.
K.B.
G.L.

COMPANY
WELL RH 1099
LOCATION GREENHILLS

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ °F	@ °F
Footage Logged			Resistivity	@ °F	@ °F
Bottom (Driller)			Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size					
Bit Size			Logged by	S.J.S.	
			Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM
SEPT. 1 '77

* Reg. U.S. Pat. Off.

RH1099
457'
SEPT 1 77

350

00'

100'

200'

300'

400'

T.D. REACHED - 458'

K-FORDING RIVER 77(3)A.

Widco* WELL LOG

COMPANY

AREA GREENHILLS. S

WELL RH 1100

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
DF
KB
GL

COMPANY
WELL RH 1100
FIELD GREENHILLS S.

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp		
Casing Size			B.H. Temp		
Bit Size					
Bit Size					
			Logged by	S.J.S.	
			Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM.

EXPANDED SCALE (1 DIV. = 1')

* Reg U.S. Pat. Off

RH 400

194' RULERS

193' LOGGED

0'

10

25

50'

100'

150'

T.D. REACHED 192'

200'

K-FORDING RIVER 77(3)A.

Widco* WELL LOG

COMPANY

AREA GREENHILLS S.

WELL RH 1101

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
DF
KB
GL

COMPANY
WELL RH 1101
LOCATION GREENHILLS S.

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log			pH		
Casing (Driller)			Circ. Temp		
Casing Size			B.H. Temp		
Bit Size					
Bit Size			Logged by	S.J.S.	
			Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM.
AUG. 30 '77.

* Reg U.S. Pat Off.

0
50
100
150
200
250
300
350
378
T.D. 378
378
378

000'
100'
200'
300'
400'

T.D. REACHED 378'

K-FORDING RIVER 77(3)A

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 320

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED
WELL RH - 1102
LOCATION GREEN HILLS
FIELD FORDING
PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. ____
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B. ____
CSG ____
G.L. ____

Run. No.	ONE	
Date	10 SEPT 1977	
First Reading	181	
Last Reading	0	
Footage Logged	181	
Depth Reached	182	
Depth Driller	200	
Casing Roke		
Casing Driller		
Fluid Type	AIR/WATER	
Liquid Level	42	
Min. Diam.	4 7/8	
Rm @ °F		
Operating Time	½ HOUR	
Truck No.	37	
Recorded By	JOHNSON	Witnessed By KOMENAC

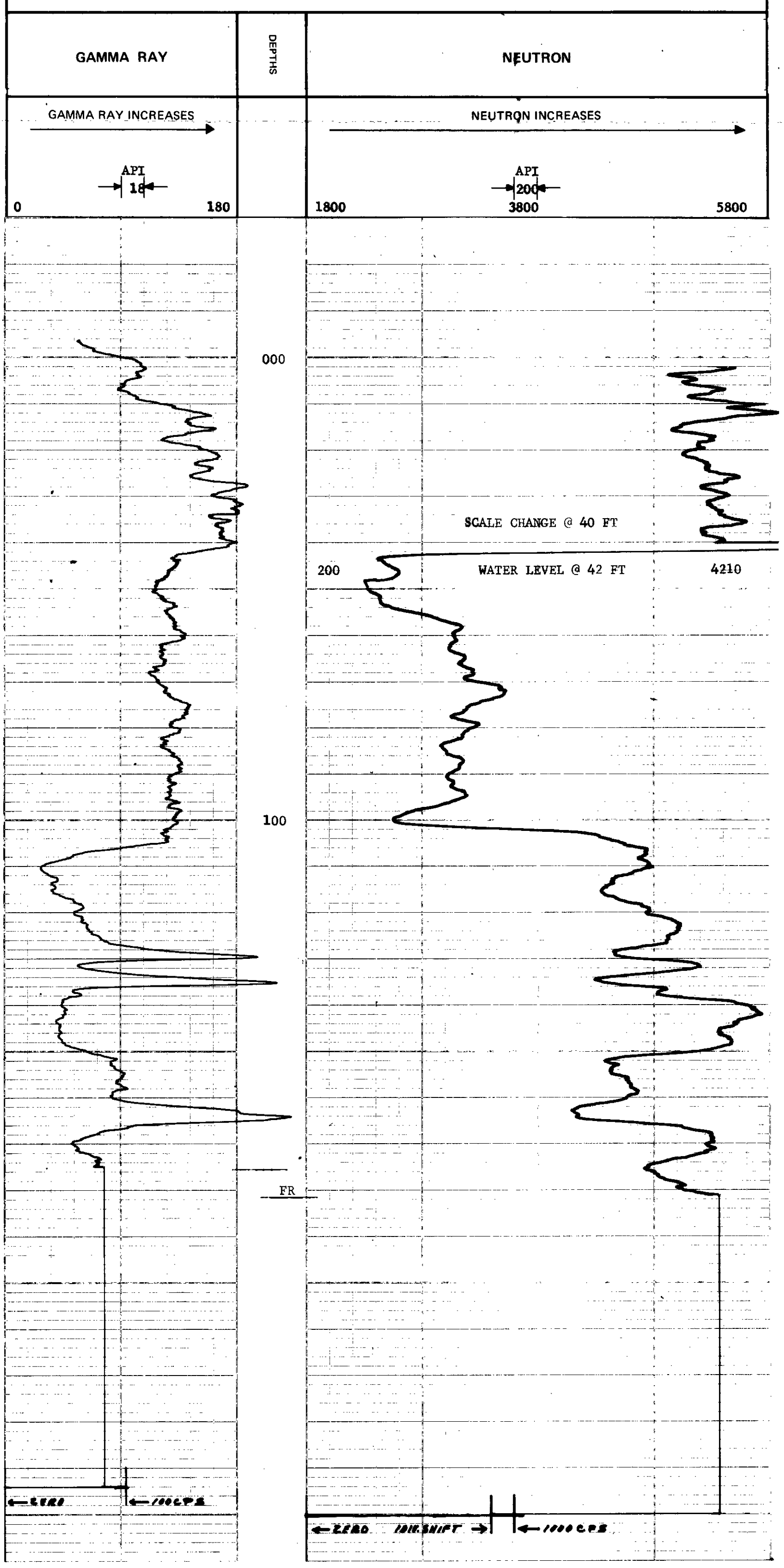
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	188
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 001	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	40	12	5	100	0L	18	3	500	9L	200
	40	181	12	5	100	0L	18	3	500	1L	100

REMARKS



K-FORDING RIVER 77(3)A.

Widco* WELL LOG

COMPANY

AREA GREENHILLS SOUTH

WELL RH 1104

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D F
K B
G L

COMPANY

WELL RH 1104

LOCATION GREENHILLS S.

	Run No. 1	Run No. 2
Date		
First Reading		
Last Reading		
Footage Logged		
Bottom (Driller)		
Casing (From Log)		
Casing (Driller)		
Casing Size		
Bit Size		
Bit Size		

MUD	Run No. 1	Run No. 2
Nature		
Density		
Viscosity	@ F	@ F
Resistivity	@ F	@ F
Res @ BHT	@ F	@ F
pH		
Circ Temp		
B-H Temp		
Logged by	R.B.A.	
Witnessed by		

REMARKS B.S.O. HOLE.

JAN. 20 '78

400'

100'

T.D. REACHED 152'

T.D. DRILLER 160'

ENGLISH & INTHAM, TYPE NO. 15 1652.03

K-FOLDING 8 USE 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FOLDING COAL LIMITED

LSD SEC TWP RGE W M

WELL RH - 1500

LOCATION GLADE PIT 320

FIELD FOLDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.

CSG

G.L.

Other Services: NONE

Run No.	ONE
Date	27 JUNE 1977
First Reading	330
Last Reading	0
Footage Logged	330
Depth Reached	331
Depth Driller	333
Casing Logged	
Casing Driller	
Casing Type	22
Fluid Type	AIR/WATER
Fluid Level	
Max. Diam.	4 7/8
Min. Diam.	
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	JOHNSON
Witnessed By	KONSMAC

EQUIPMENT DATA

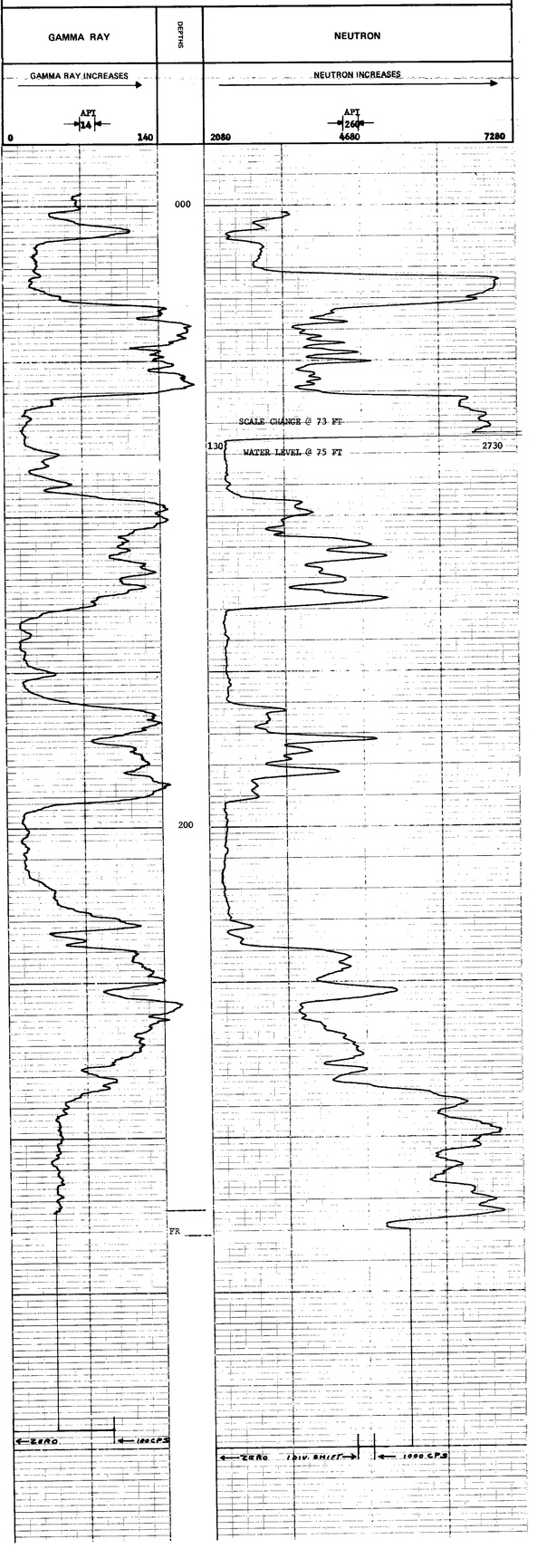
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
		SERIAL NO.	187
		SPACING	17 INCH
		TYPE	AmBe
		STRENGTH	5 CURIES

GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	
TOOL SERIAL NO.	R GRN 169-002

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	73	12	5	100	OL	14	3	1000	8 L	260
	73	330	12	5	100	OL	14	3	500	1 L	130

REMARKS



K-Fording River 72(3)A

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RH - 1501

LOCATION CROSS PIT

FIELD FORDING

LSD
SEC
TWP
RGE
M

Permanent Datum: GROUND LEVEL — Elev. 4320 ft
Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum
Well Depths Measured from: GROUND LEVEL — G.L.

Other Services: NONE

Run. No.	ONE
Date	27 JUNE 1977
First Reading	412
Last Reading	0
Footage Logged	412
Depth Reached	413
Depth Driller	415
Casing Type	
Casing Driller	22
Fluid Type	AIR/WATER
Liquid Level	93
Max. Diam.	4 7/8
Min. Diam.	
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	ROBINSON
Witnessed By	EDMONIAC

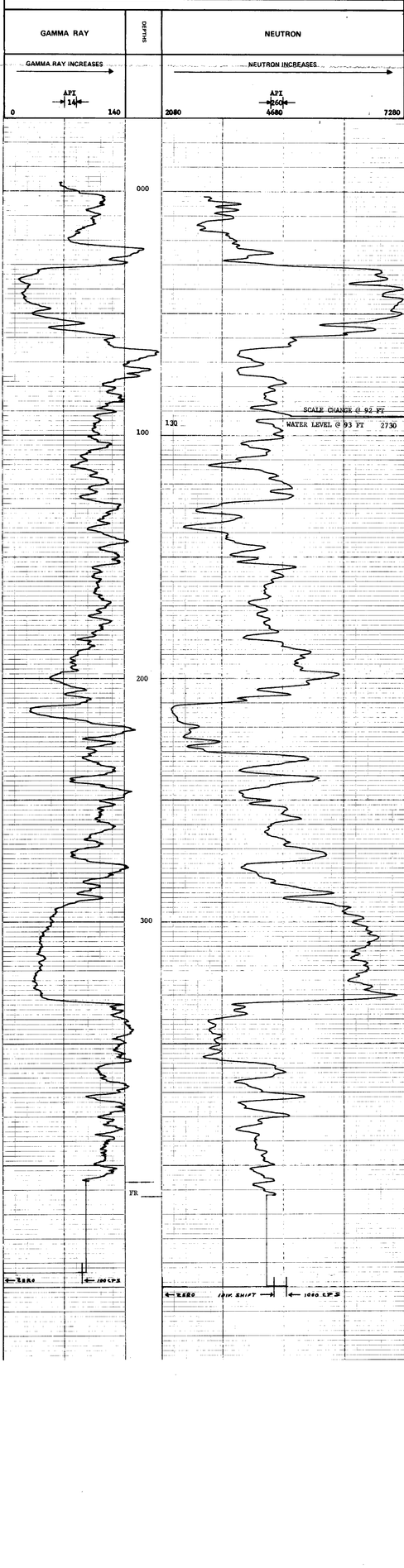
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	92	12	5	100	0L	14	3	1000	8L	260
	92	412	12	5	100	0L	14	3	500	1L	130

REMARKS



K-FOLDING RULES 77(3)4

ROKE OIL ENTERPRISES LTD.

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY: FORDING COAL LIMITED

WELL: RM - 1502

LOCATION: GLADE PIT

FIELD: FORDING

PROVINCE: ALBERTA

GARY, ALBERTA

320

SEC. TWP. RGE. M

Permanent Datum: GROUND LEVEL — Elev.: K.B. / D.F. / G.L.

Log Measured from: GROUND LEVEL — 6 Ft. Above Perm. Datum

Drilling Measured from: GROUND LEVEL — Other Services: NONE

Run. No.	ONE
Date	7 APR 1977
Last Reading	271
Log Direction	0
Escape Logged	275
Depth Driller	276
Depth Logged	280
Casing Rotary	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	146
Max. Diam.	
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	ROBSON
Witnessed By	ALLEN

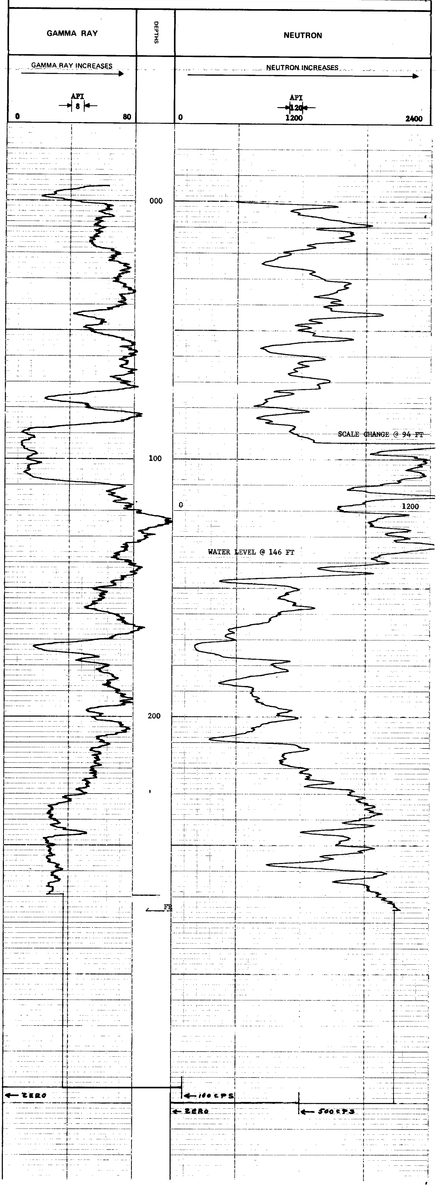
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	5 CURIES

LOGGING DATA

GENERAL			GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	94	12	5	100	OL	8	3	1000	OL	120
	94	275	12	5	100	OL	8	3	500	OL	60

REMARKS: LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FORDING RUN 77 (S)4

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RK-1668 320

LOCATION CADE PIT

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.

C&G

G.L.

Other Services NONE

LSD SEC TWP RGE W

Run. No.	ONE
Date	7 AUGUST 1971
First Reading	475
Last Reading	0
Footage Logged	475
Depth Reached	475
Depth Driller	475
Casing Rotary	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	1½
Max. Temp.	
Min. Diam.	
Rm @ °F	
Operating Time	
Truck No.	37

Recorded by JOHNSON Witnessed by ALLEN

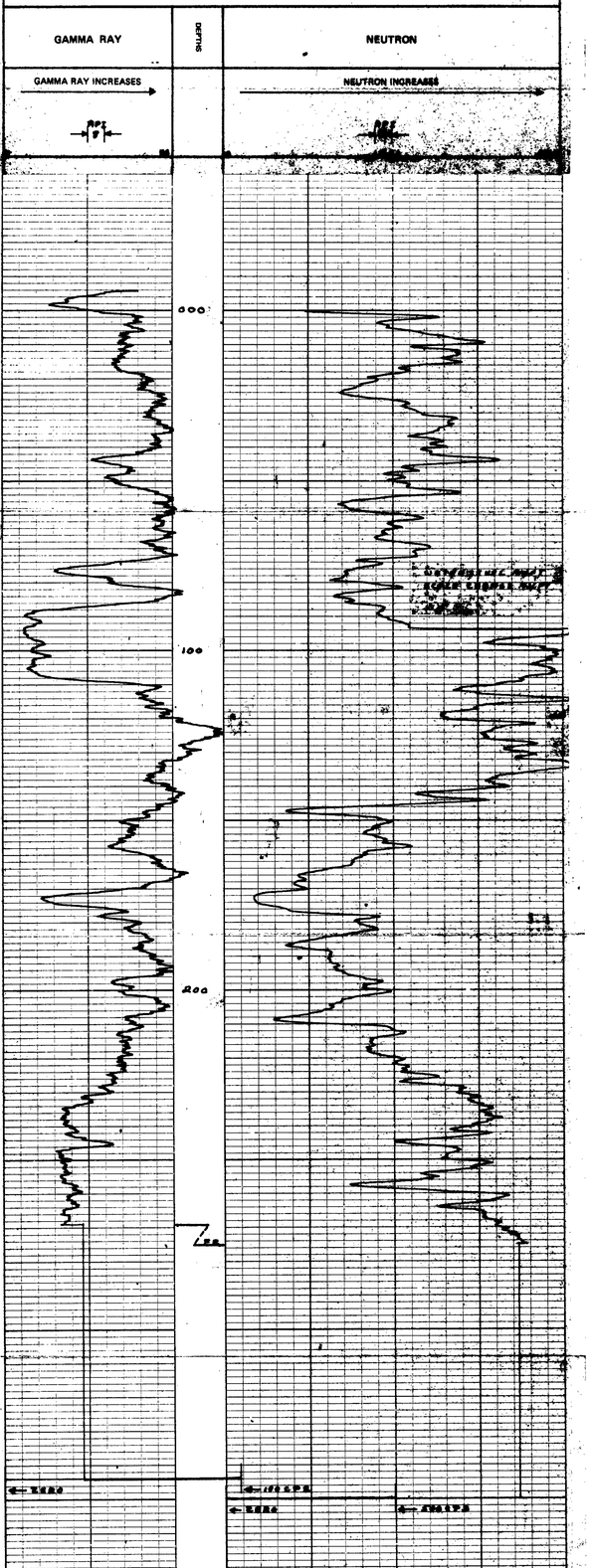
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	4.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-88-W
GENERAL		SERIAL NO.	127
HOIST TRUCK NO.	37	SPACING	12 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 149-002	STRENGTH	3 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS. SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV
1	0	94	18	5	100	OL	88PT	3	1000	OL	44APX
	94	375	18	5	100	OL	88PT	3	500	OL	44APX

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FORMING RWCE 77 (3) A

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO. 320

LSD
SEC
TWP
RGE
W ... M

COMPANY FORDING COAL LIMITED

WELL EH - 1503

LOCATION CEDAR PIT

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev.

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL — K.B. / G.L.

Other Services: NONE

Run No.	ONE
Date	6 AUG 1977
First Reading	347
Last Reading	0
Footage Logged	347
Depth Reached	348
Depth Driller	350
Casing Rake	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	46
Min. Diam.	5
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37
Recorded By	JOHNSON
Witnessed By	SHAW

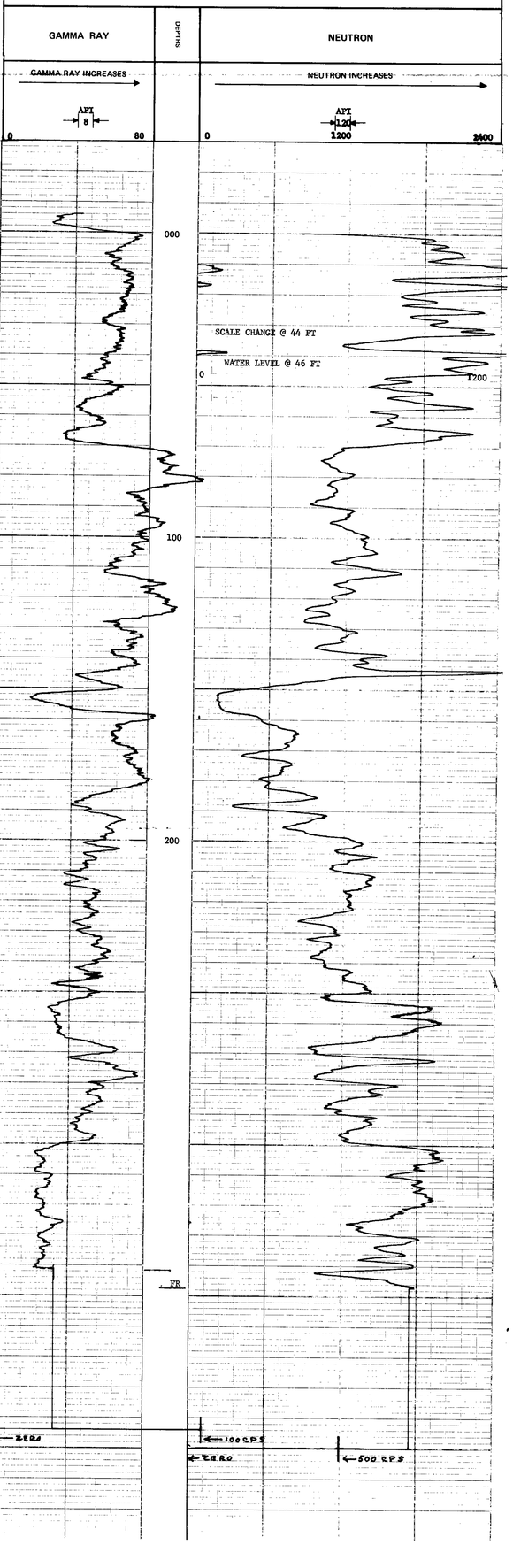
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	44	12	5	100	OL	8	3	1000	OL	120
	44	347	12	5	100	OL	8	3	500	OL	60

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FORDING RIVER 77 (3) 4.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W_____M

COMPANY FORDING COAL LIMITED

WELL RH - 1504

LOCATION CLODE PIT

FIELD FORDING

320

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. _____

Log Measured from GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B. _____
CSG _____
G.L. _____

Run. No.	ONE		
Date	6 AUG 1977		
First Reading	259		
Last Reading	0		
Footage Logged	259		
Depth Reached	260		
Depth Driller	261		
Casing Roke			
Casing Driller			
Fluid Type	AIR/WATER		
Liquid Level	134		
Min. Diam.	5		
Rm @ °F			
Operating Time	½ HOUR		
Truck No.	37		
Recorded By	JOHNSON	Witnessed By	SHAW

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	132	12	5	100	0L	8	3	1000	4L	120
	132	259	12	5	100	0L	8	3	500	0L	60

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 8		API 120
0 — 80		480 — 1680 — 2880

000

200

SCALE CHANGE @ 132 FT

0 — 1200

WATER LEVEL @ 134 FT

FR

← ZERO ← 100 CPS

← ZERO ← 500 CPS

K-FORDING RIVER 77(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY FORDING COAL LIMITED

WELL BH-1584 LOCATION CABLE PIT 320

FIELD FORDING PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. K.B.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum CSG

Well Depths Measured from GROUND LEVEL G.L.

LSD SEC TWP RGE W M

Run No.	ONE
Date	11 AUGUST 1977
First Reading	334
Last Reading	0
Footage Logged	334
Depth Reached	340
Depth Driller	334
Casing Rake	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	28
Min. Diam.	5
Rm @ °F	
Operating Time	HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By S. HAW

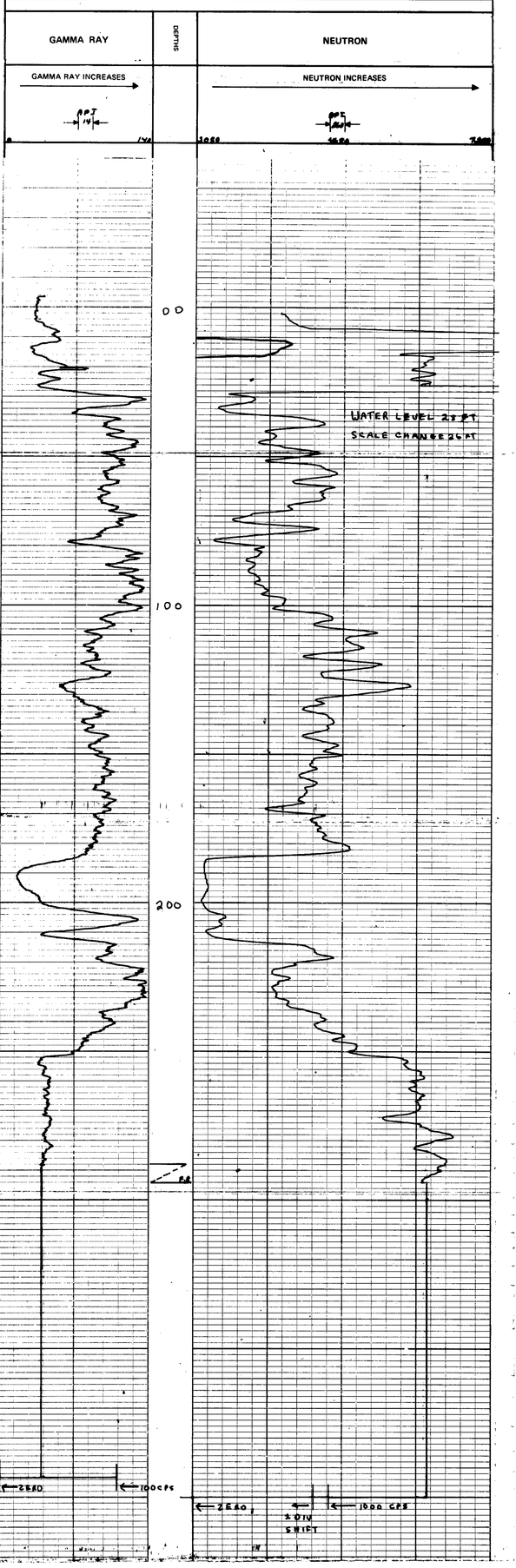
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	26	12	6	100	0 L	14API	3	1000	8 L	24APD
	26	294	12	6	100	0 L	14API	3	500	14 L	12APD

REMARKS HOLE LOGGED THROUGH PIPE ON 6 AUG 1977



K-FOOTING RISE 77(3) A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY FORDING COAL LIMITED

WELL RE - 1505

LOCATION CLOSE PIT

320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

LSD SEC TWP RGE M

Permanent Datum: GROUND LEVEL Elev.

Log Measured from: GROUND LEVEL Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL K.B. OSG G.L.

Run. No.	ONE
Date	8 AUG 1977
First Reading	244
Last Reading	0
Footage Logged	244
Depth Reached	245
Depth Driller	245
Casing Rake	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	42
Min. Diam.	4 1/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By ATLEN

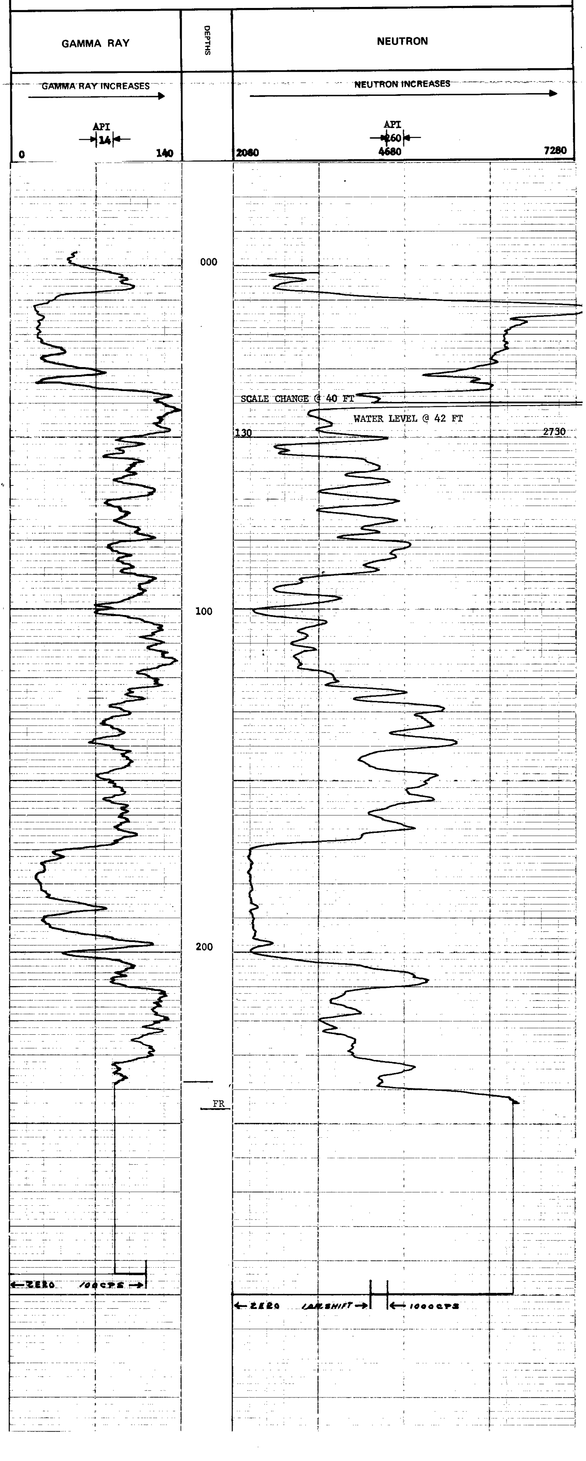
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	40	12	5	100	0L	14	3	1000	6L	250
	40	244	12	5	100	0L	14	3	500	1L	130

REMARKS



K-FORDING RIVER 77(8)4

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY FORDING COAL LIMITED

LSD SEC TWP RGE W M

WELL PIT 320

LOCATION GRADE PIT 320

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services

Permanent Datum GROUND LEVEL Elev. K.B.

Log Measured from GROUND LEVEL Ft. Above Perm. Datum D.F.

Drilled Depths Measured from GROUND LEVEL G.L.

Run. No.	ONE
Date	8 AUGUST 1972
First Reading	244
Last Reading	0
Footage Logged	244
Depth Reached	244
Depth Driller	244
Casing Driller	
Casing Logged	
Fluid Type	AIR/WATER
Liquid Level	4%
Min. Diam.	4%
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON

Witnessed By ALLEN

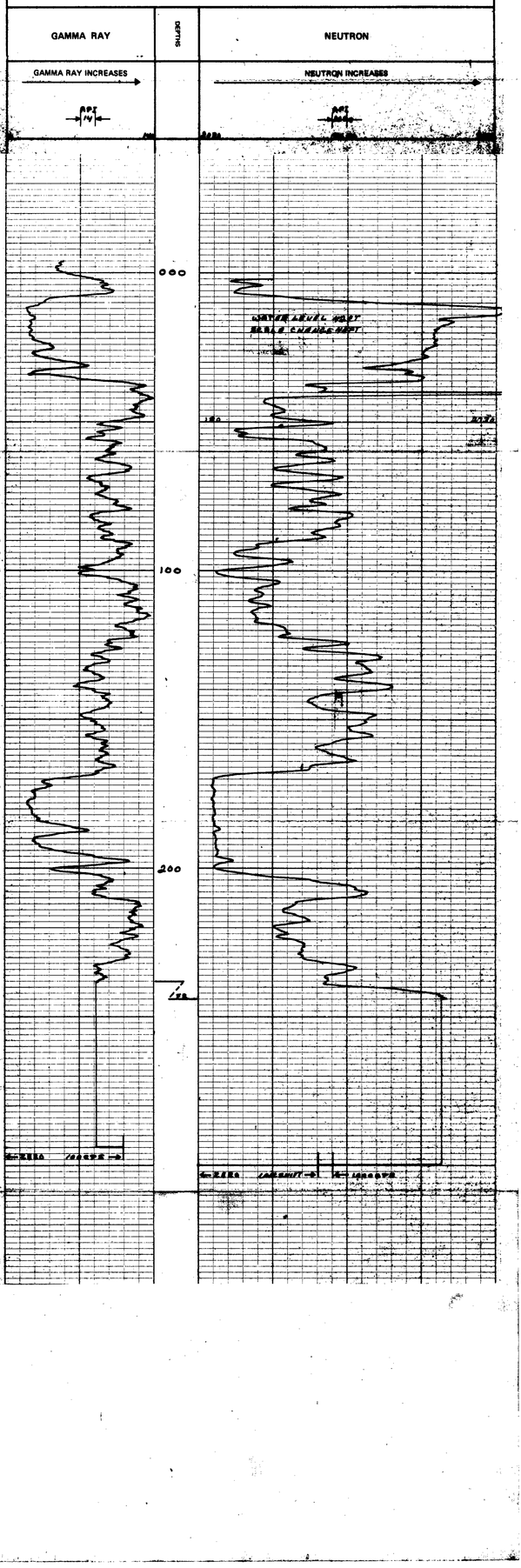
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	127
INSTRUMENT TRUCK NO.		SPACING	12 INCH
TOOL SERIAL NO.	R CGN 149-003	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T. C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV
1	0	40	12	6	100	0L	14API	3	1000	8L	286 API
	40	244	12	6	100	0L	14API	3	600	1L	170API

REMARKS



K-FORONG GWEC 77(3) 4.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

LSD SEC TWP RGE W M

COMPANY FORDING COAL LIMITED

WELL BH - 1056 (506)

LOCATION CLODE PIT

FIELD FORDING

PROVINCE BRITISH COLUMBIA

320

Permanent Datum: GROUND LEVEL — Elev.

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Well Depths Measured from: GROUND LEVEL — K.B.

CSG.

G.L.

Other Services: NONE

Run No.	ONE
Date	12 AUG 1977
First Reading	276
Last Reading	0
Footage Logged	276
Depth Reached	277
Depth Driller	277
Casing Driller	287
Casing Rate	
Fluid Type	WATER
Liquid Level	FULL
Min. Diam.	
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By JOHNSON/BAKER

Witnessed By SHAW

EQUIPMENT DATA

GAMMA RAY	
RUN NO.	ONE
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	~~SCINTILLATION~~
LENGTH	4 INCH
DISTANCE TO N. SOURCE	5.7 FT.

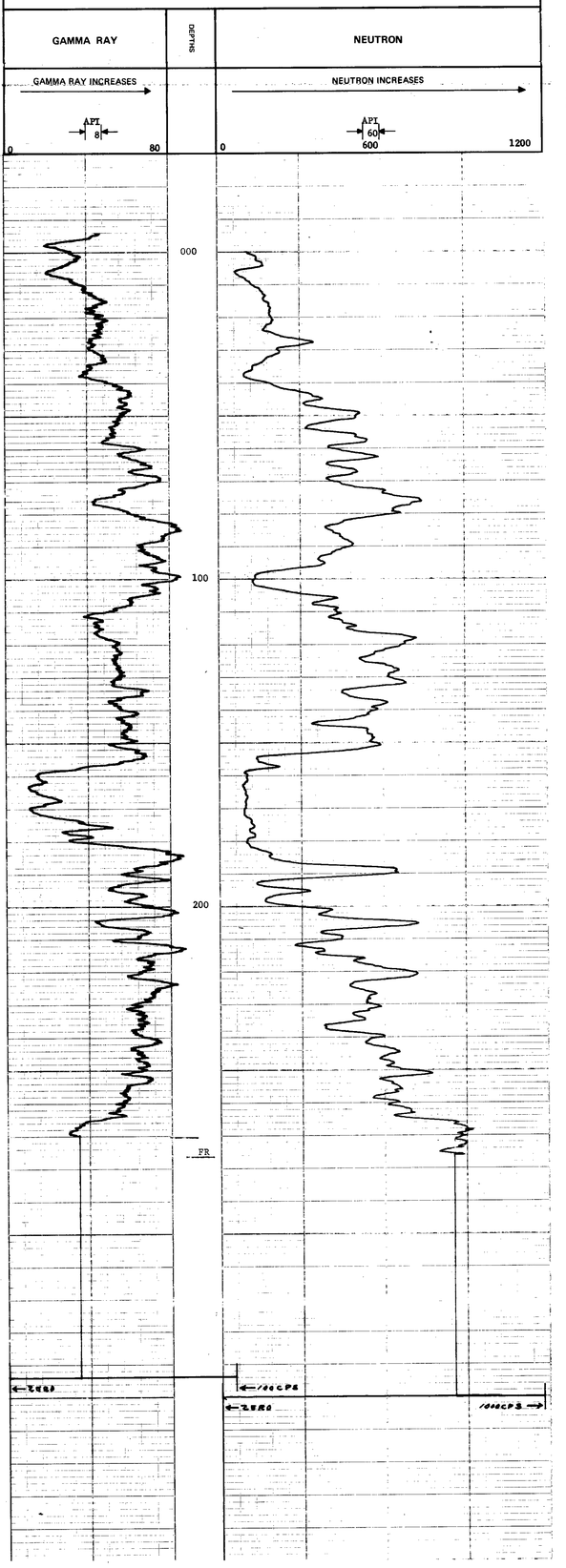
NEUTRON	
RUN NO.	ONE
LOG TYPE	NEUTRON/NEUTRON
TOOL MODEL NO.	
DIAMETER	1 11/16
DETECTOR MODEL NO.	
TYPE	PROPORTIONAL
LENGTH	6 INCH
SOURCE MODEL NO.	MRC-N-SS-W
SERIAL NO.	187
SPACING	17 INCH
TYPE	AmBe
STRENGTH	3 CURIES

GENERAL	
HOIST TRUCK NO.	37
INSTRUMENT TRUCK NO.	37
TOOL SERIAL NO.	R GRN 169-002

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	276	12	5	100	0L	8	3	500	0L	60

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM



K-FORDING RIVER 77(3) A.

Widco* WELL LOG

COMPANY

AREA CLODE PIT.

WELL RH 1507.

COUNTY STATE

320

COORDINATES
N
S
ELEVATION
D.F
K.B
G.L

COMPANY
WELL RH 1507
LOCATION CLODE PIT

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ °F	@ °F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size:					
Bit Size:					
			Logged by		
			Witnessed by		

REMARKS 2 A.P.I. NO SHIFT
LOGGED THROUGH DOUBLE WALL DRILL STEM
JUNE 23 '77

500'
100'
200'
T.D. REACHED 250'

K-FORGING RIVER 77(3)A.

Widco* WELL LOG

COMPANY
WELL RH 1508
LOCATION CLODE PIT.

COMPANY
AREA CLODE PIT
WELL RH 1508
COUNTY STATE

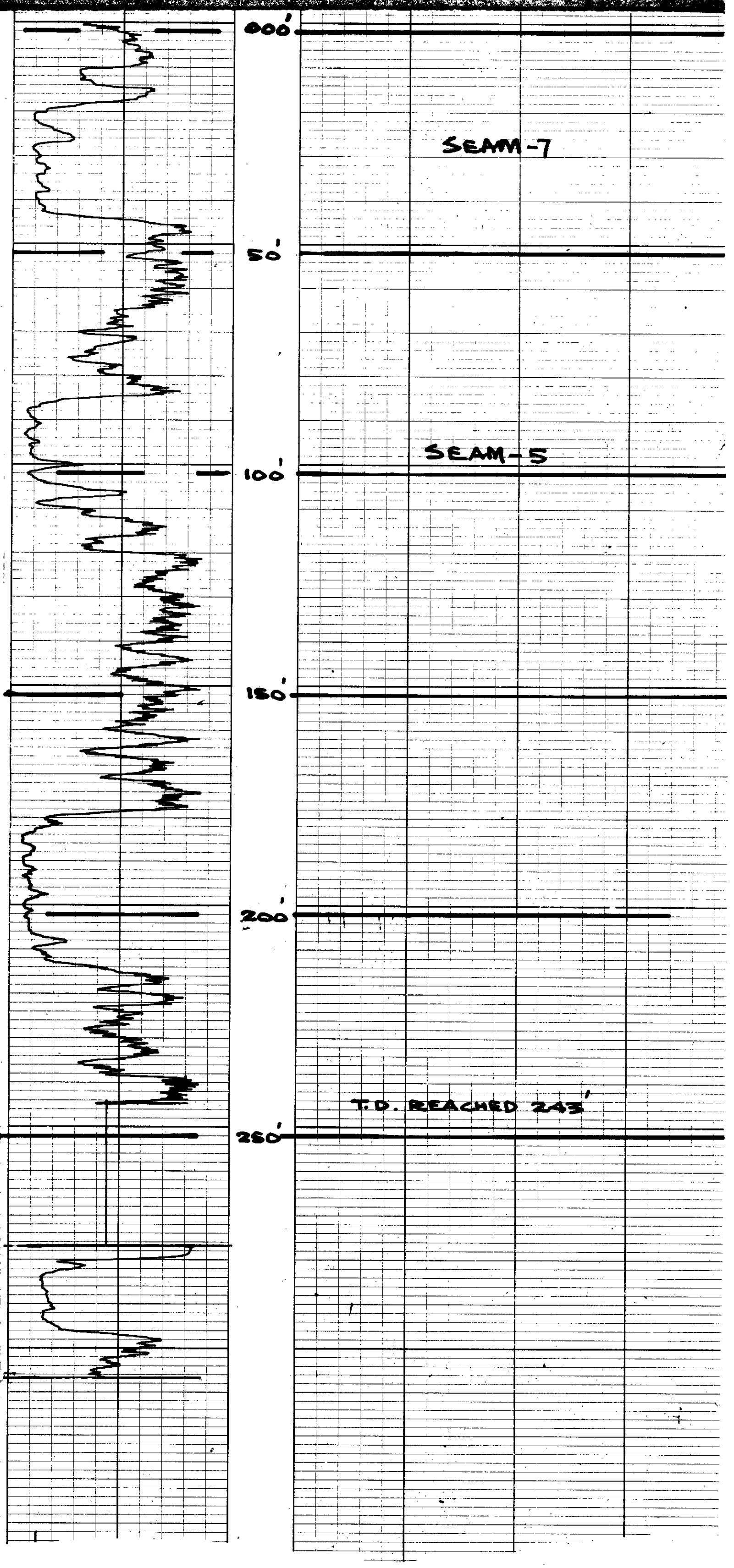
320

COORDINATES
N
S
ELEVATION
DF
KB
GL

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ Temp.		
Casing Size			BH Temp		
Bit Size					
Bit Size			Logged by	R.K.	
			Witnessed by		

REMARKS 10 API NO SHIFT.
LOGGED THROUGH DOUBLE WALL DRILL STEM
SEPT. 28'77

* Reg. U.S. Pat. Off.



K-FORDING RIVER 77(3)A.

Widco* WELL LOG

COMPANY

AREA GLODE PIT.

WELL RH 1509

COUNTY STATE

320

COORDINATES.
N
S
ELEVATION:
D F
K B
G L

LOCATION GLODE PIT

WELL RH 1509

COMPANY

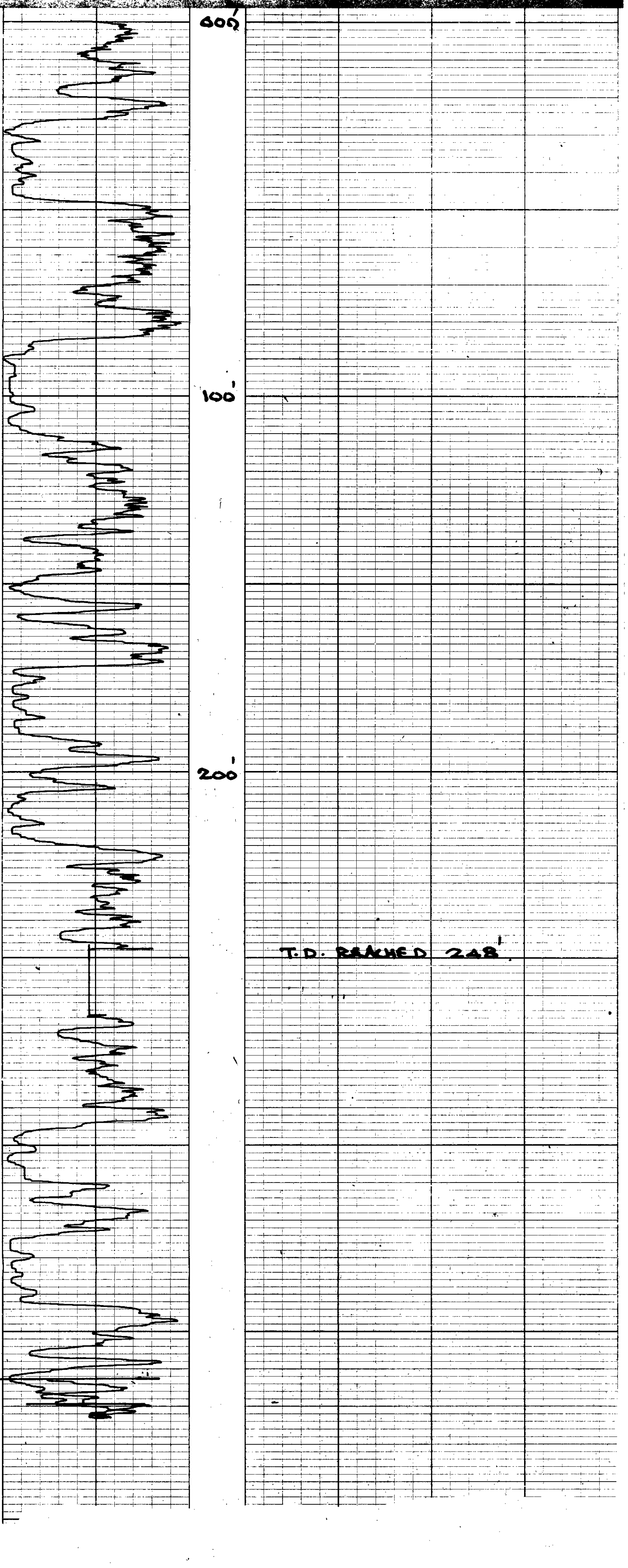
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ °F	@ °F
Footage Logged			Resistivity	@ °F	@ °F
Bottom (Driller)			Res @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ Temp.		
Casing Size			B.H Temp.		
Bit Size					
Bit Size					
			Logged by	RK	
			Witnessed by		

REMARKS 10 API NO SHIFT

LOGGED THROUGH DOUBLE WALL DRILL STEM

SEPT. 28'77

* Reg. U.S. Pat. Off.



Widco® WELL LOG

RH 1510
CLODE PIT.

COMPANY

RH 1510
CLODE PIT

320

WELL NAME

LOCATION
N
E
ELEVATION
D F
K B
G L

FIELD

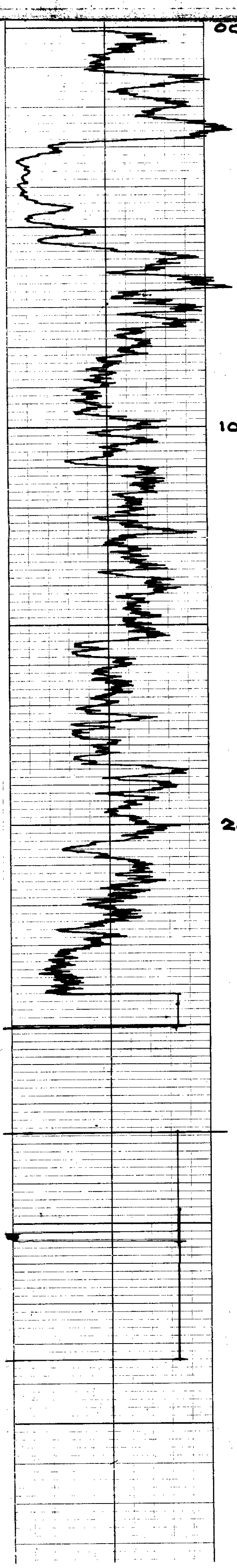
STATE

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom Driller			Res. @ BHT	@ F	@ F
Casing Mom Log			pH		
Casing Driller			Circ Temp		
Casing Size			BH Temp		
Bit Size					
Bit Size			Logged by	RBA.	
			Witnessed by		

REMARKS 10 A.P.I. LOGGED THROUGH DOUBLE WALL DRILL STEM.

OCT. 5 '77

Reg. U.S. Pat. Off.



T.D. REACHED 242'

Wide

RIVER 77(3)A.

RI 1511
CLODE PIT.

AREA CLODE PIT

WELL RH 1511

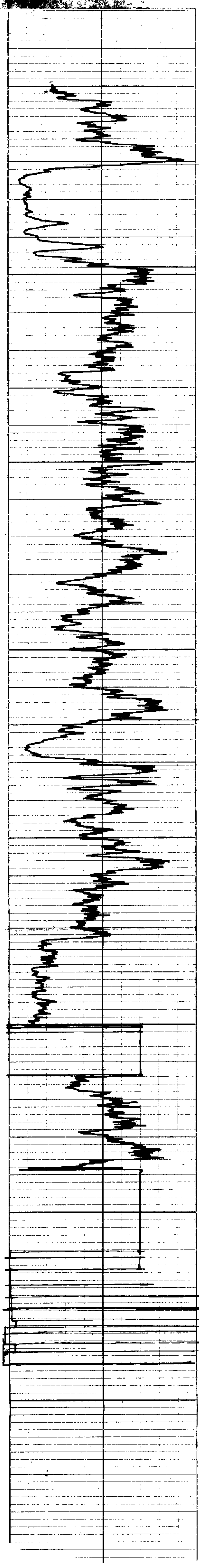
320

Date
First Reading
Last Reading
Recorded Through
Bottom Driller
Casing From Log
Casing Driller
Casing Size
Bit Size
Bit Size

KAK.

REMARKS 11 A.P.I. LOGGED THROUGH DOUBLE WALL DRILL STEM
OCT. 5 '77

Reg. U.S. Pat. Off.



RECORDING CHARTS

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

K-FOSSIL RIVER 77(8)A

FILE NO.

COMPANY: BOUNDARY COAL LIMITED

WELL: BH - 2000

LOCATION: CASTLE MOUNTAIN

FIELD: BOUNDARY

PROVINCE: BRITISH COLUMBIA

320

LSD SEC TWP RGE W ___ M

Permanent Datum: GROUND LEVEL Elev.: K.B. ___ D.F. ___ G.L. ___

Log Measured from: GROUND LEVEL ___ Ft. Above Perm. Datum

Other Services: NONE

Run. No.	ONE
Date	13 JULY 1977
First Reading	438
Last Reading	0
Footage Logged	438
Depth Reached	439
Depth Driller	439
Depth Logger	
Casing Rdrs	
Casing Driller	
Casing Logger	
Liquid Level	ABV. WATER
Min. Diam.	37
	4 7/8
Rm @ °F	
Operating Time	
Truck No.	37
	1 HOUR

Recorded By: JOHNSON

Witnessed By

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
		SERIAL NO.	187
		SPACING	17 INCH
		TYPE	AmBe
		STRENGTH	3 CURIES

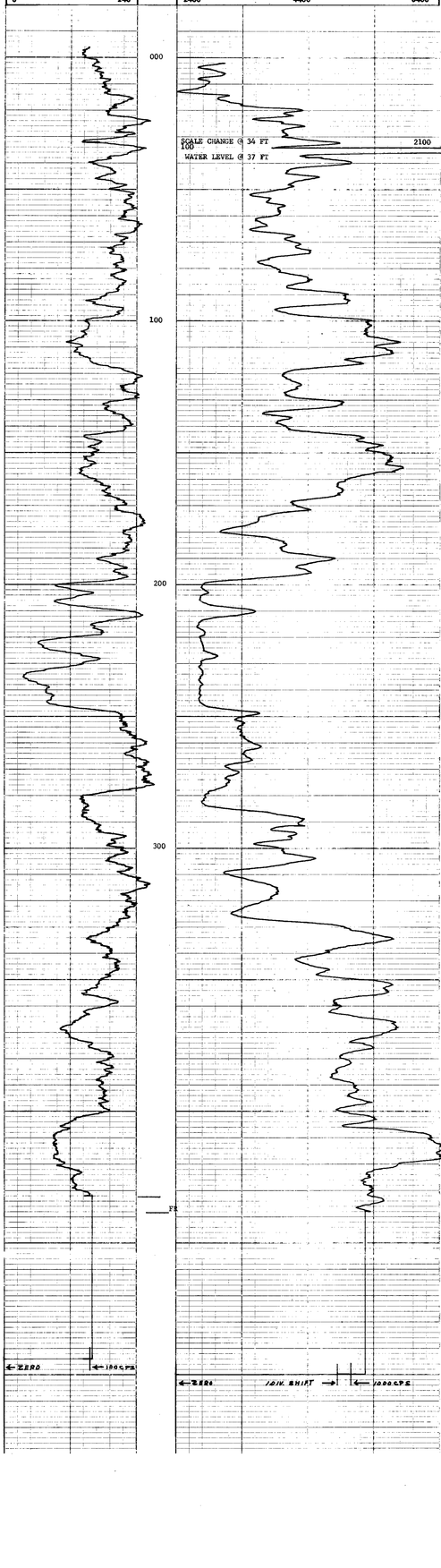
GENERAL		
HOIST TRUCK NO.	37	
INSTRUMENT TRUCK NO.	37	
TOOL SERIAL NO.	R GRN 169-002	

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	34	12	5	100	OL	14	3	1000	12L	200
	34	438	12	5	100	OL	14	3	500	11L	100

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES → API 14		NEUTRON INCREASES → API 20
0 — 140		2400 — 4400 — 6400



K-Fording River 77(3)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.	COMPANY FORDING COAL LIMITED
LSD	WELL RH - 2000 320
SEC	
TWP	LOCATION CASTLE MOUNTAIN
RGE	
W M	FIELD FORDING
	PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev. K.B.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum CSG
Well Depths Measured from GROUND LEVEL G.L.

Run. No.		TWO
Date		5 AUG 1977
First Reading		657
Last Reading		430
Footage Logged		227
Depth Reached		658
Depth Driller		658
Casing Roke		
Casing Driller		
Fluid Type		AIR/WATER
Liquid Level		
Min. Diam.		5
Rm @ °F		
Operating Time		1 HOUR
Truck No.		37
Recorded By	JOHNSON	Witnessed By SHAW

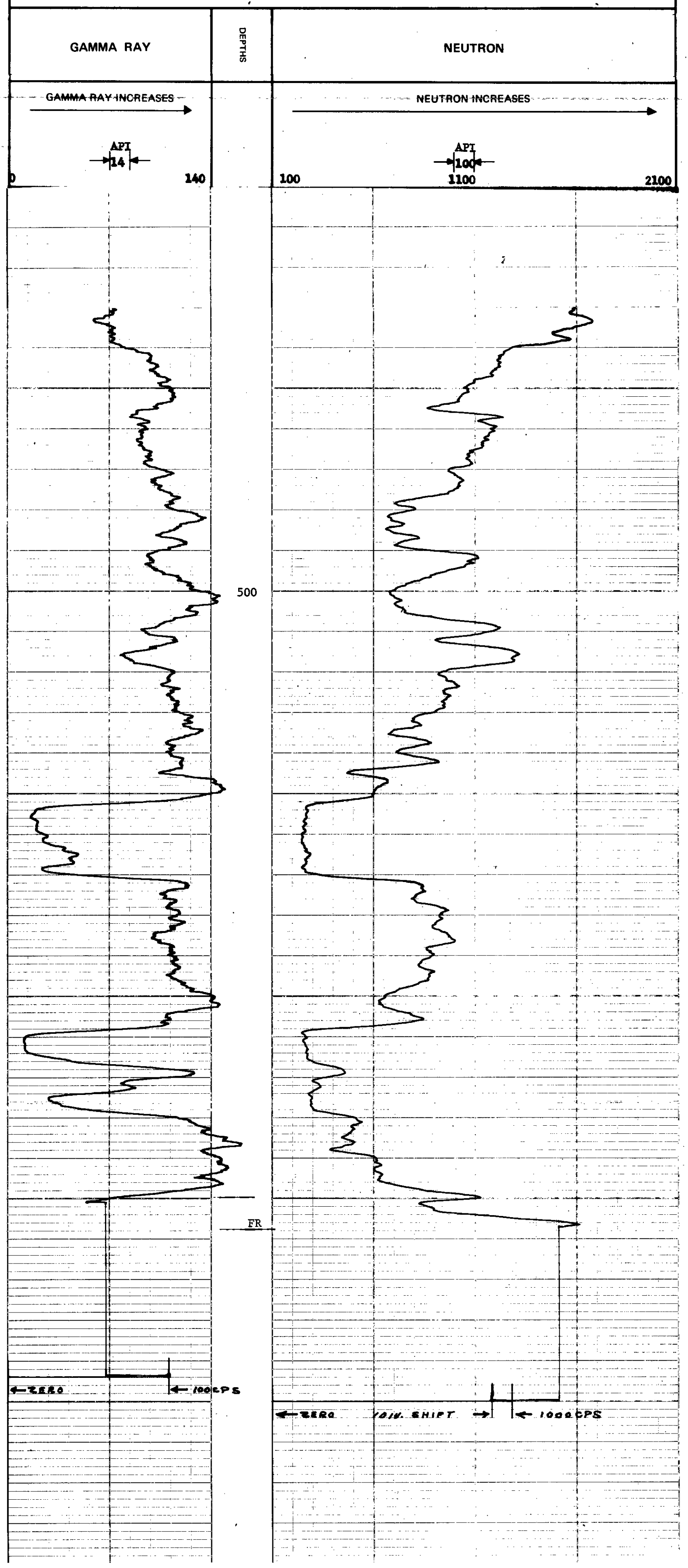
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	TWO	RUN NO.	TWO
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	430	657	12	5	100	0L	14	3	500	1L	100

REMARKS RUN NUMBER ONE LOGGED ON 13 JULY, 1977



ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 320

LSD SEC TWP RGE W. M

COMPANY POISON COAL LIMITED

WELL RE - 2002

LOCATION CASTLE MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev.: 4,564

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Drlg. Measured from: GROUND LEVEL — K.B. — G.L. — Other Services: NONE

Run No. ONE

Date 26 JAN 1977

First Reading 564

Last Reading 0

Casing Logged 548

Depth, Reached 560

Depth, Driller 550

Casing Size 4 1/2

Casing Driller 548

Fluid Type AIR/WATER

Fluid Level 295

Max. Hole Temp. 8 1/2

Rm @ °F

Rmf @ °F

Rmc @ °F

Operating Time 1½ HOURS

Truck No. 37

Recorded By JOHNSON

Witnessed By SHAW

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	5 CURIES

LOGGING DATA

GENERAL				GAMMA RAY			NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	294	12	5	100	OL	14	3	1000	8L	260
	294	548	12	5	100	OL	14	3	500	11L	130

REMARKS

GAMMA RAY — DEPTHS — NEUTRON

GAMMA RAY INCREASES

API 14

0 140

NEUTRON INCREASES

API 260

2080 4680 7280

000

100

200

300

400

500

FR

SCALE CHANGE @ 294 FT

130 WATER LEVEL @ 295 FT 2730

← ZERO /40 CPS →

← ZERO /20 KHIGHT → ← 1000 CPS

K-FOSCNG EVEE 37(3)4

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 320

COMPANY ROUNDING COAL LIMITED

WELL RR + 2002

LOCATION CASTLE MOUNTAIN

FIELD ROUNDING

PROVINCE ALBERTA SASKATCHEWAN ONTARIO

Permanent Datum: GROUND LEVEL — Elev. —

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Drilling Measured from: GROUND LEVEL — K.B. — G.L. — Other Services: NONE

Rec. No. ONE

Date 26 JULY 1977

Last Reading 306

Bottom Logged 0

Casing Logged 548

Depth Driller 548

Depth Logger 550

Casing Size

Casing Driller

Casing Logger

Bit From Surface

Liquid Level

Max. Temp.

Max. Diam. 6 7/8

Rec. # Op

Operating Time

Truck No.

Recorded By BOURDEAU

Witnessed By SHAW

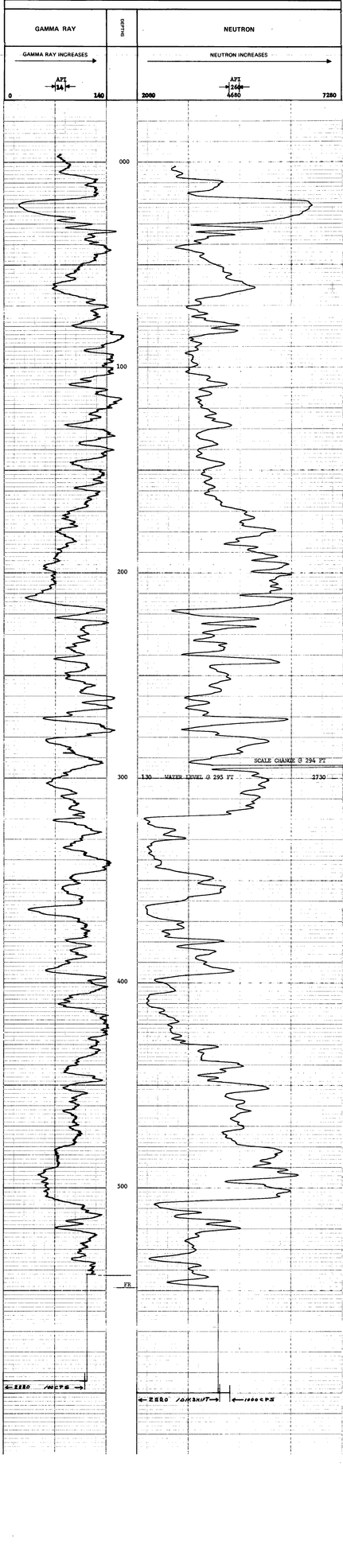
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	6 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.5 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.		SPACING	17 INCH
TOOL SERIAL NO.	R GRN 169-002	TYPE	AmBe
		STRENGTH	5 CURIES

LOGGING DATA

GENERAL			GAMMA RAY					NEUTRON			
RUN NO.	DEPTH FROM	DEPTH TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	294	12	5	100	OL	14	3	1000	BL	260
	294	548	12	5	100	OL	14	3	500	TL	130

REMARKS



ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 320

COMPANY PEMBINA COAL LIMITED

WELL BH - 2003

LOCATION CASTLE MOUNTAIN

FIELD PEMBINA

LSD ____ SEC ____ TWP ____ RGE ____ W ____ M

Permanent Datum: GROUND LEVEL — Elev. 0 — Elev.: K.B. ____ D.F. ____ G.L. ____

Log Measured from: GROUND LEVEL — 6.7 Ft. Above Perm. Datum

Drilled Depth: 336 — Other Services: NONE

Run No.	ONE
Date	13 JULY 1977
First Reading	334
Last Reading	0
Feet Logged	334
Depth Reached	336
Bit From	0
Bit To	335
Casing Driller	
Casing Logger	
Fluid Type	AIR/WATER
Fluid Level	DRY
Max. Rec. Temp.	4 7/8
Rm @ °F	
Operating Time	1 HOUR
Truck No.	37

Recorded By: ROBINSON — Witnessed By: SHAW

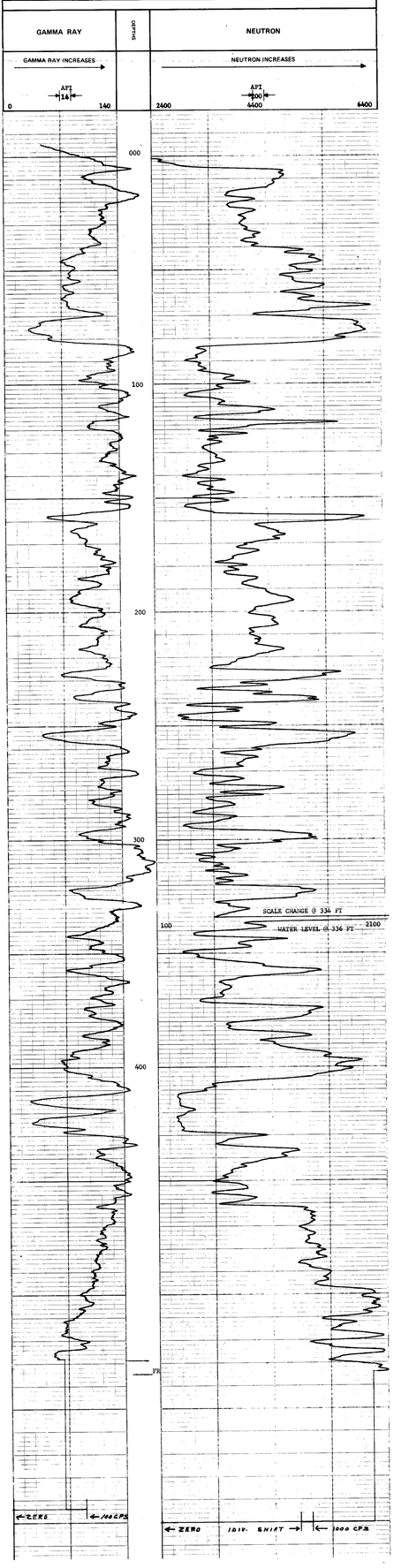
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	GAMMA RAY SENS SETTINGS	GAMMA RAY ZERO DIV. L OR R	GAMMA RAY API G. R. UNITS PER LOG DIV.	NEUTRON T.C. SEC.	NEUTRON SENS SETTINGS	NEUTRON ZERO DIV. L OR R	NEUTRON API N. UNITS PER LOG DIV.
1	0	336	12	5	100	01	14	3	1000	12L	200
	334	536	12	5	100	01	14	3	500	11	100

REMARKS



Widco WELL LOG

COMPANY
AREA CASTLE MT
WELL R H 2004
COUNTY K-FORONG STATE

320

COORDINATES: N, S
ELEVATION: D.F., K.B., G.L.

COMPANY
WELL R H 2004
LOCATION CASTLE MT

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ °F	@ °F
Footage Logged			Resistivity	@ °F	@ °F
Bottom (Driller)			Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size					
Bit Size			Logged by	W. H. S.	
			Witnessed by		

REMARKS 3 ARM.
LOGGED THROUGH DOUBLE WALL DRILL STEM

000'
DRILLER. 29' Overburden
SEAM-7
33.5
100'
SEAM-5
200'
SEAM-4
300'
SEAM-2
SEAM-1
400'
T.D. DRILLED 470'

Widco WELL LOG

RH 2008
CASTLE MT.

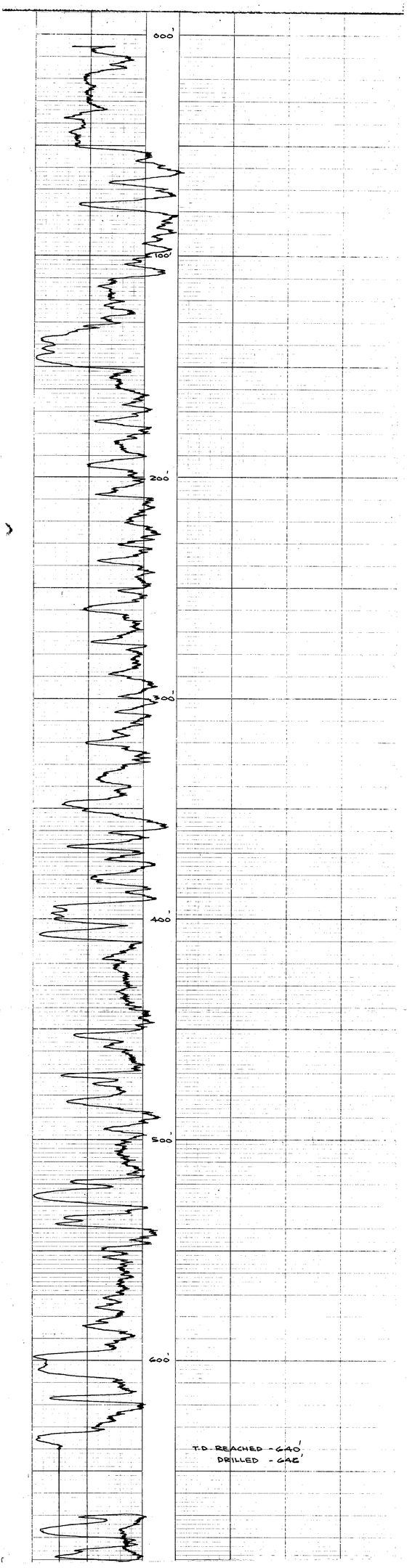
COMPANY
AREA CASTLE MT.
WELL RH 2008 320
COUNTY STATE

LOCATION: FT. FROM S.L. & FT. FROM E.L. OF SEC. TWP. RGE.
ELEVATION: D.F. K.B. G.L.

	Run No.	Run No.	Run No.	Run No.
Date				
First Reading				
Last Reading				
Footage Logged				
Bottom Driller				
Casing From Log				
Casing Driller				
Log Type				
Bit Size				
Bit Size				
Type Fluid				
Density				
Viscosity				
Resistivity				
Resistivity Bht				
pH				
Fluid Loss				
Source				
Rm @ Meas. Temp.				
Rm @ BHT				
Rmf @ Meas. Temp.				
Rmf @ BHT				
Rmc @ Meas. Temp.				
Rmc @ BHT				
Max. Rec. Temp.				
Equip. No.				
Location				
Recorded By				
Witnessed By	R.M.			

REMARKS 12 A.P.I. ONE DIV. SHIFT. (LEFT)
JUL 19'77

* Reg. U.S. Pat. Off.



K-FORDING RIVER 77(B)A.

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.	
LSD	
SEC	
TWP	
RGE	
W M	
COMPANY	FORDING COAL LIMITED
WELL	RH - 2009
LOCATION	CASTLE MOUNTAIN
FIELD	FORDING
PROVINCE	BRITISH COLUMBIA
Other Services:	NONE

320

Permanent Datum GROUND LEVEL Elev. ______ K.B. ______
Log Measured from GROUND LEVEL Ft. Above Perm. Datum CSG ______
Well Depths Measured from GROUND LEVEL G.L. ______

Run. No.	ONE		
Date	17 AUG 1977		
First Reading	824		
Last Reading	0		
Footage Logged	824		
Depth Reached	825		
Depth Driller	825		
Casing Roke			
Casing Driller			
Fluid Type	AIR/WATER		
Liquid Level	128		
Min. Diam.	5		
Rm @ °F			
Operating Time	1½ HOURS		
Truck No.	37		

Recorded By JOHNSON Witnessed By ALLEN

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	37	SERIAL NO.	187
INSTRUMENT TRUCK NO.	37	SPACING	17 INCH
TOOL SERIAL NO.	X GEN 169 - 002	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	126	12	5	100	0L	14	3	1000	8L	260
	126	824	12	5	100	0L	14	3	500	1L	130

REMARKS

K-BARONS Sec 27 (3) A-

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY ROKEDYK GOAL DIRECTED

WELL BR - 2011

LOCATION CARIBOU MOUNTAIN

FIELD WILDCAT

320

PROVINCE OF BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev. 0

Log Measured From GROUND LEVEL 6.7 Ft. Above Perm. Datum

Drilling Measured From GROUND LEVEL

K.B. DDM

G.L.

Other Services

MSFE

Date	5 OCT 1977	Density Recorded	658
Run No.	ONE	Density Driller	658
Depth Driller	658	Density Logger	658
Depth Logger	658	Casing Driller	
Bottom Logged Interval	658	Casing Logger	
Top Logged Interval	0	Fluid Type	AIR/WATER
Type Fluid in Hole	DRY	Fluid Density	
Salinity PPM Cl		Fluid Level	
Density		Max. Rec. Temp.	3
Viscosity		Est. Cement Top	
pH		Max. Rec. Temp.	
Fluid Loss		Equip. Location	
Source of Sample		Recorded By	JOHNSON
Rm @ Meas. Temp.		Witnessed By	BRAY
Rmf @ Meas. Temp.			
Rmc @ Meas. Temp.			
Source of Rmf & Rmc			
Rm @ BHT			
Time Since Circ.			
Max. Rec. Temp.			
Equip. Location			
Recorded By	JOHNSON		
Witnessed By	BRAY		

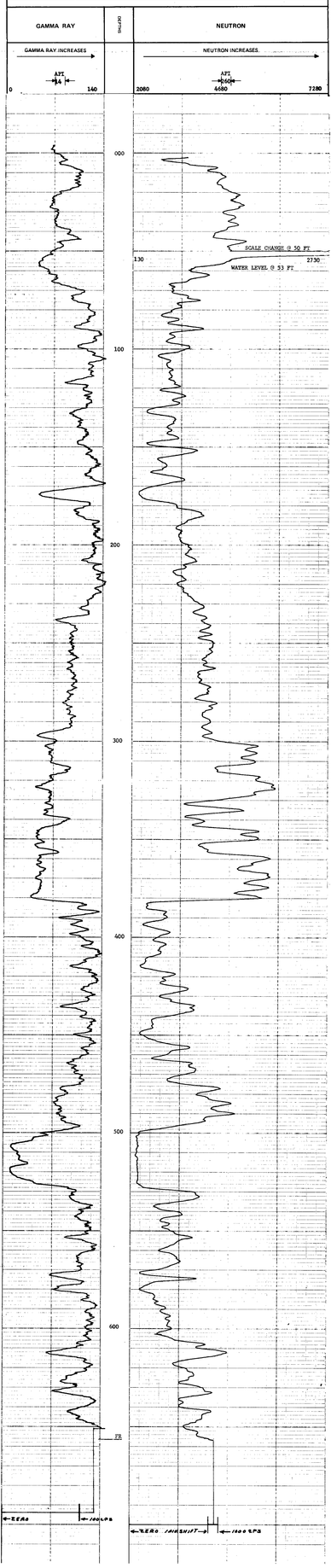
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R CRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	GETTING FROM	GETTING TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	50	12	5	100	OL	14	3	1000	8L	260
	50	658	12	5	100	OL	14	3	500	1L	130

REMARKS



ROKE

GAMMA-RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

COMPANY PEABODY COAL LIMITED

WELL 88 - 2012

LOCATION CARBON MOUNTAIN

FIELD PEABODY

PROVINCE BRITISH COLUMBIA

Permanent Datum: GROUND LEVEL — Elev. 4,320 FT. — Above Perm. Datum

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Drill Measured from: GROUND LEVEL — K.B. 0 FT. — G.L. 0 FT.

Other Services: ROKE

Elev.: K.B. 4,320 FT. — G.L. 4,320 FT.

Date: 1-DEC-1977

Run No.: ONE

Depth-Driller: 665

Depth-Logger: 665

Bottom Logged Interval: 665

Top Logged Interval: 0

Casing-Driller: 666

Casing-Logger: 666

Bit Size: 13

Type Fluid in Hole: AIR/WATER

Max. Rec. Temp.: 120

Equip. No. & Loc.: 6

Recorded By: JOHNSON

Witnessed By: ERSKINE

Operating Time: 15 HOURS

Truck No.: 37

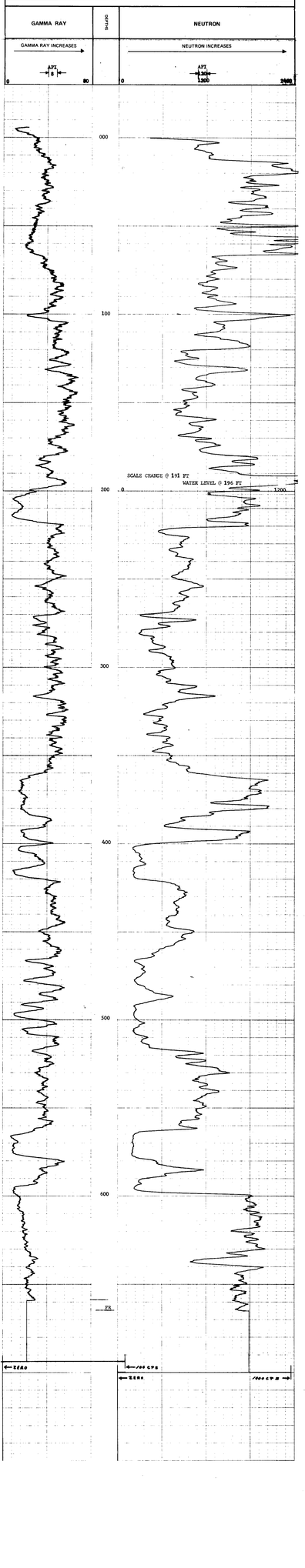
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	4.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTH FROM	DEPTH TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV
1	0	191	12	5	100	OL	8	3	1000	OL	120
	191	665	12	5	100	OL	8	3	500	OL	60

REMARKS: LOGGED THROUGH DOUBLE VALV. DRILL STEM



K-RECORD SINCE 7/69 JA

ROKE

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY: TORQUISE COAL LIMITED

OIL ENTERPRISES LTD CALGARY, ALBERTA

WELL: RR - 3053

FIELD: TORQUISE LOCATION: CARTER MOUNTAIN

PROVINCE: BRITISH COLUMBIA

320

Other Services

SEC TWP RGE

Permanent Datum: GROUND LEVEL Elev.: K.B. D.F. G.L.

Log Measured From: GROUND LEVEL 2 Ft. Above Perm. Datum

Drilling Measured From: K.B.

Date	22 - 10 - 77		
Run No.	ONE		
Depth Driller	2500		
Depth Logger	2502		
Bottom Logged Interval	2501		
Top Logged Interval	850		
Casing Driller	8 5/8 @ 844		
Casing Logger	844		
Bit Size	7 7/8		
Type Fluid in Hole	AIR/WATER		
Max. Rec. Temp.	132		
Equip. No. & Loc.	6176		
Recorded By	CRAFT		
Witnessed By	BROSNAC		

Operating Time: 34 HOURS

Truck No.: 34

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLOMETER	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2998 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	50
HOIST TRUCK NO.	34	SPACING	17 INCH
INSTRUMENT TRUCK NO.	34	TYPE	Amba
TOOL SERIAL NO.	177	STRENGTH	3 CURIES

LOGGING DATA

GENERAL					GAMMA RAY				NEUTRON			
RUN NO.	RECTAL FROM	RECTAL TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	112	12	5	100	OL	15	3	1000	OL	240
	112	862	12	5	100	OL	15	3	500	OL	120

REMARKS

GAMMA RAY	DEPTH	NEUTRON
GAMMA RAY INCREASES → API 150 0		NEUTRON INCREASES → API 2400 1200 0

SCALE CHANGE
LOGGED OF 1000 TAP

WATER LEVEL @ 112 FT

0 2400 4800
0 2400

000
100
200
300
400
500
600
700
800

FR

ZERO 100 CPS

ZERO 500 CPS

K-E 10 X 10 TO THE INCH 46 1510

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LOG TYPE

RUN NO.

COMPANY PEMBINA GAS LIMITED

WELL NO. 320

LOCATION CASTLE MOUNTAIN

FIELD POKER

PROVINCE ALBERTA

Permanent Datum: GROUND LEVEL Elev.

Log Measured From: K.B. Elev. 3696

Drilling Measured From: G.L. Elev. 3676

Other Services

Rec. No.		
Date	24 AUG 1977	
Depth Driller	1200	
Depth Logger	1200	
Bottom Logged Interval	1200	
Top Logged Interval	0	
Casing Driller	830	
Casing Logger	830	
Bit Size	6	
Type Fluid in Hole	GEL CHEM	
Density	9.2	
Viscosity	45	
Fluid Loss	5	
Source of Sample	FLOWLINE	
Rm @ Meas. Temp.	1.25 @ 70	
Rmf @ Meas. Temp.	5	
Rmc @ Meas. Temp.		
Source of Rmf & Rmc		
Rm @ BHT		
Time Since Circ.	3 HOURS	
Time on Bottom	3	
Max. Rec. Temp.		
Equipment No. & Location		
Recorded By	JOHNSON	
Witnessed By	MCKENZIE	

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		TOOL MODEL NO.	NEUTRON/NEUTRON
DIAMETER	1 11/16	DIAMETER	1 11/16
DETECTOR MODEL NO.		DETECTOR MODEL NO.	
TYPE	SCINTILLATION	TYPE	PROPORTIONAL
LENGTH	4 - INCH	LENGTH	6 INCH
DISTANCE TO N. SOURCE	6.7 - FT.	SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	1 GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L ON M	API G. R. UNITS PER LOG DIV	T. C. SEC.	SENS SETTINGS	ZERO DIV. L ON M	API N. UNITS PER LOG DIV
1	0	114	12	5	100	OL	6	3	1000	OL	120
	114	829	12	5	100	OL	6	3	500	OL	60

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM

GAMMA RAY

GAMMA RAY INCREASES

API 0 60

DEPTHS

NEUTRON

NEUTRON INCREASES

API 1200 2400

0

100

200

300

400

500

600

700

800

SCALE CHANGE @ 114 FT

WATER LEVEL @ 120 FT

FT.

K-6804 & 6805-77-S14

ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 320

COMPANY ROKE OIL ENTERPRISES LTD. CALGARY, ALBERTA

WELL RR - 2014

FIELD PORPOISE

LOCATION CARTER MOUNTAIN

PROVINCE BRITISH COLUMBIA

Other Services: 3086

Permanent Datum: G.L. Elev.: K.B. Elev.: CSG.

Log Measured from: CROSSED LAYERS Ft. Above Perm. Datum

Drilling Measured from: CROSSED LAYERS

LSD SEC TWP RGE W. M

Rec. No. ONE

Date 2 AUG 1977

First Reading 522

Last Reading 321

Feet Logged 522

Depth Reached 321

Depth Driller 321

Depth Logger 321

Casing Driller

Casing Logger

Fluid Type AIR/WATER

Liquid Level 56

Max. Temp. 2

Rm @ Rf

Truck No. 37 Operating Time 14 HOURS

Recorded By JOHNSON Witnessed By SHAW

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	53	12	5	100	OL	14	3	1000	6L	260
	53	522	12	5	100	OL	14	3	500	1L	130

REMARKS

GAMMA RAY — DEPTH — NEUTRON

GAMMA RAY INCREASES → API 14 — 0 — 140

NEUTRON INCREASES → API 260 — 2080 — 7280

000

SCALE CHANGE @ 53 FT

130 — WATER LEVEL @ 56 FT — 2730

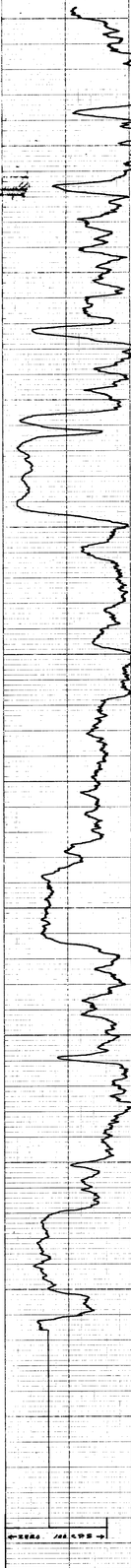
100

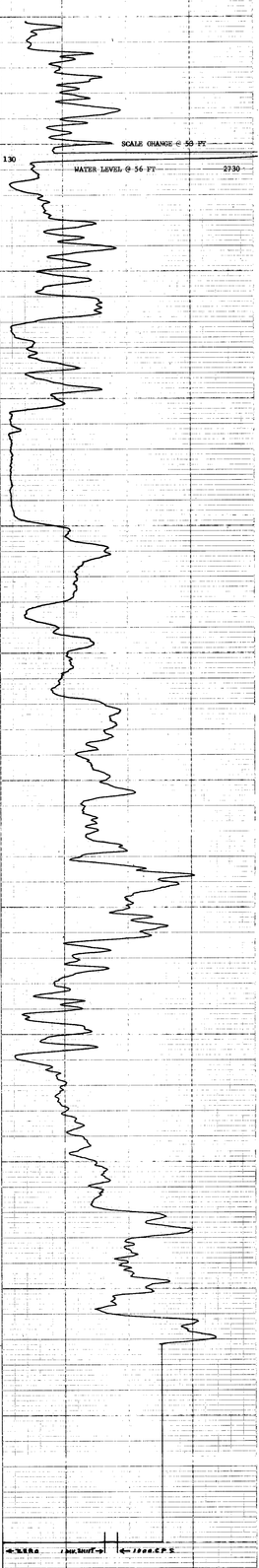
200

300

400

FR





K-FORDING RIVER 77(3)A.

ROKE

[redacted]

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL RH - 2015

LOCATION CASTLE MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum GROUND LEVEL Elev.
Log Measured from GROUND LEVEL Ft. Above Perm. Datum
Well Depths Measured from GROUND LEVEL

K.B.
CSG
G.L.

320

Run. No.	ONE
Date	15 JULY 1977
First Reading	597
Last Reading	0
Footage Logged	597
Depth Reached	598
Depth Driller	602
Casing Roke	
Casing Driller	
Fluid Type	AIR/WATER
Liquid Level	155
Min. Diam.	5
Rm @ °F	
Operating Time	1½ HOURS
Truck No.	37
Recorded By	JOHNSON
Witnessed By	SHAW

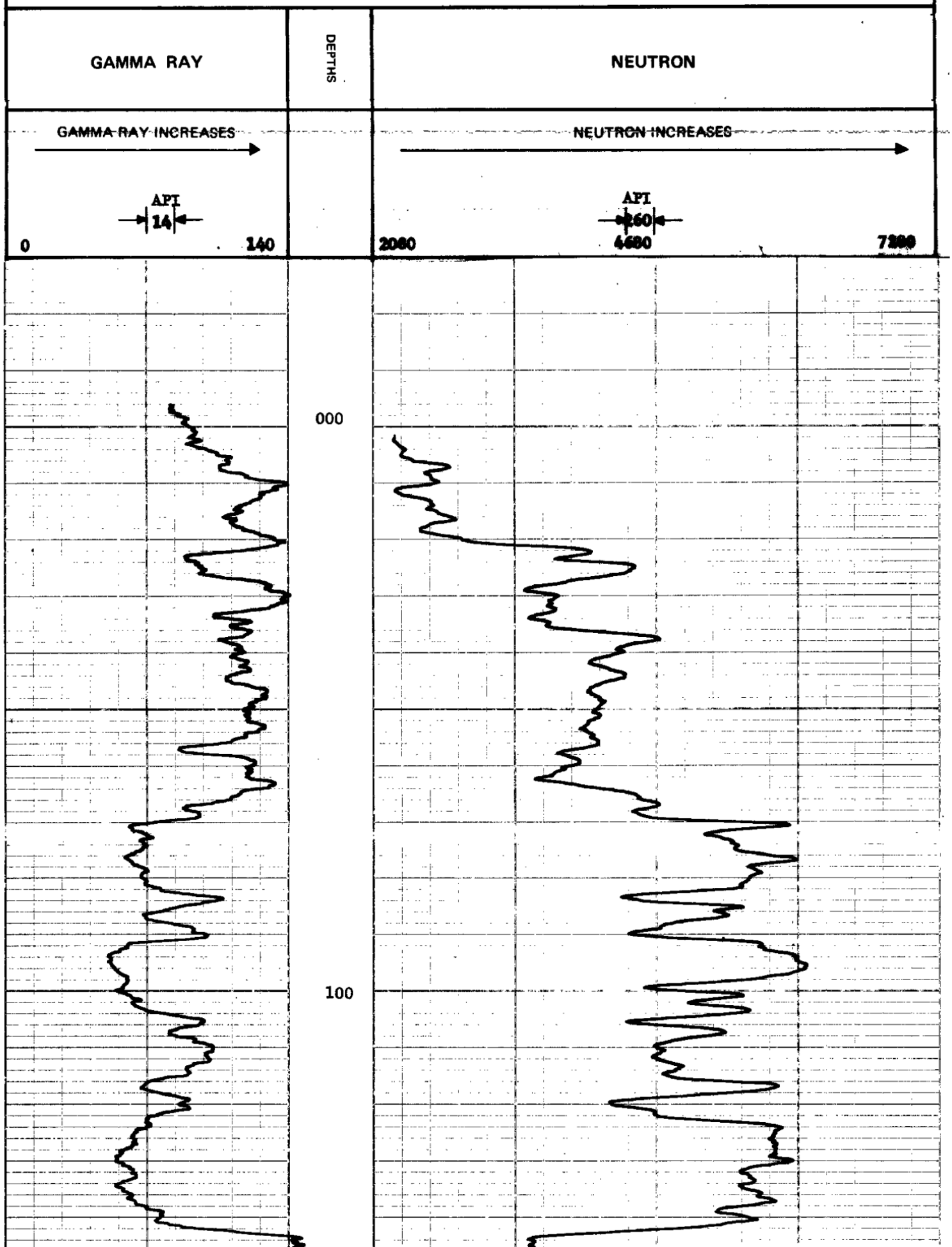
EQUIPMENT DATA

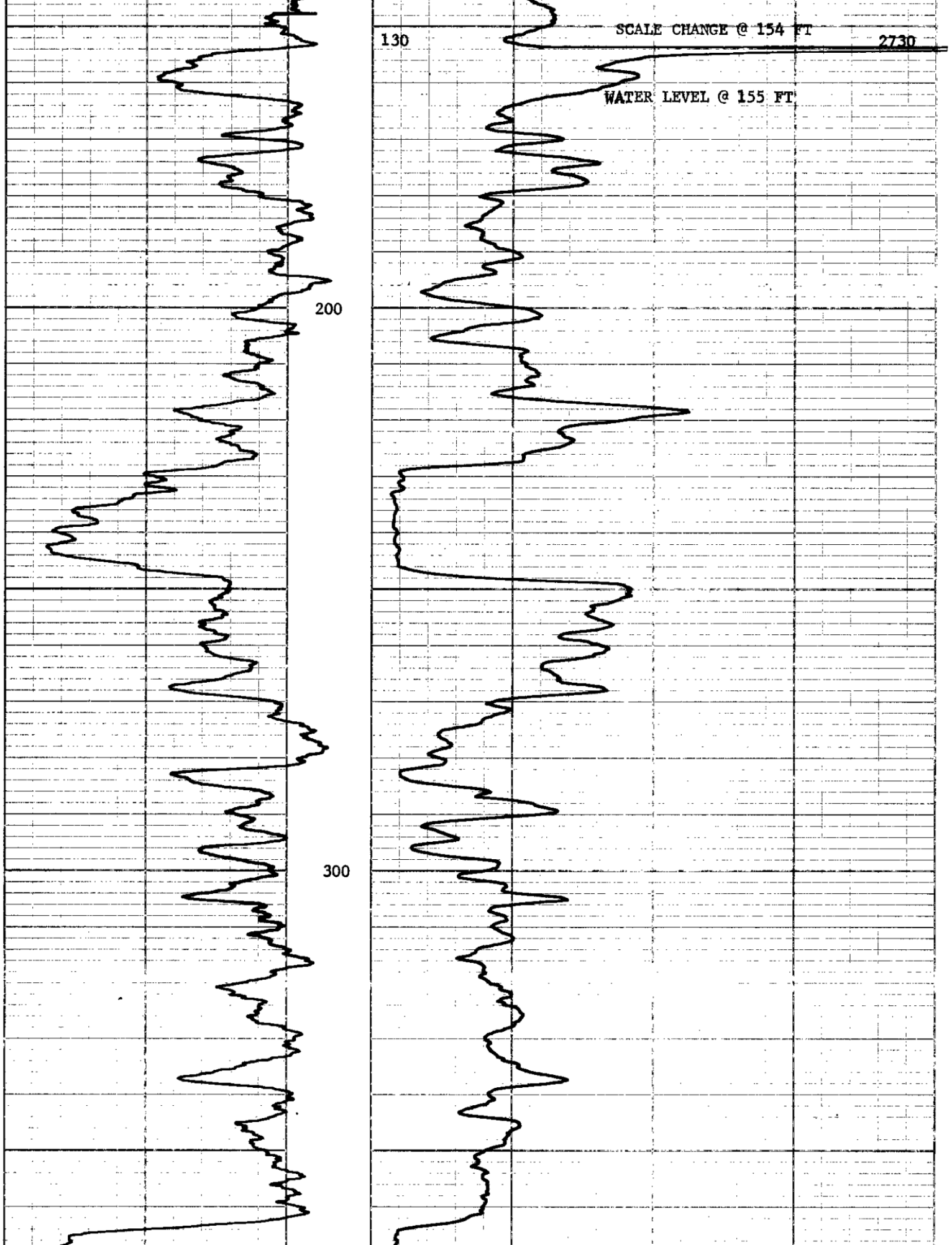
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	$1\frac{11}{16}$	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	$1\frac{11}{16}$
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169-002	STRENGTH	[redacted]

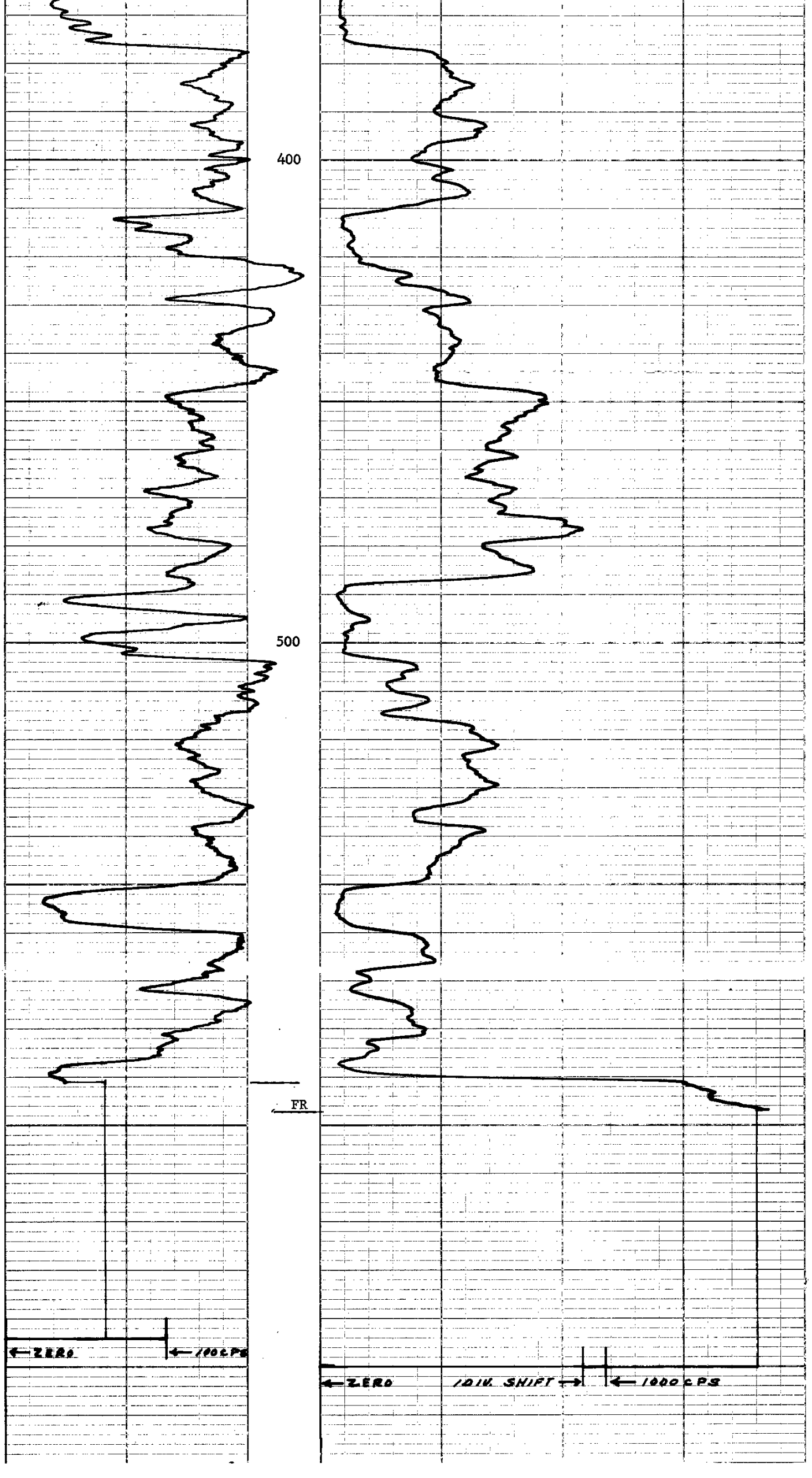
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	154	12	5	100	0L	14	3	1000	8L	260
	154	597	12	5	100	0L	14	3	500	1L	130

REMARKS


GAMMA RAY
DEPTHS
NEUTRON
GAMMA RAY INCREASES
NEUTRON INCREASES
API
14
0
140
API
260
2080
4680
7280
000
100


130
SCALE CHANGE @ 154 FT
2730
WATER LEVEL @ 155 FT
200
300


400
500
FR
ZERO
100 CPS
ZERO
10 IN. SHIFT
1000 CPS

K-FORDING RIVER 77 (3) A.

Widco* WELL LOG

COMPANY

AREA CASTLE MT.

WELL RH 2016

COUNTY STATE

320

COORDINATES:
N
S
ELEVATION:
D F
K B
G L

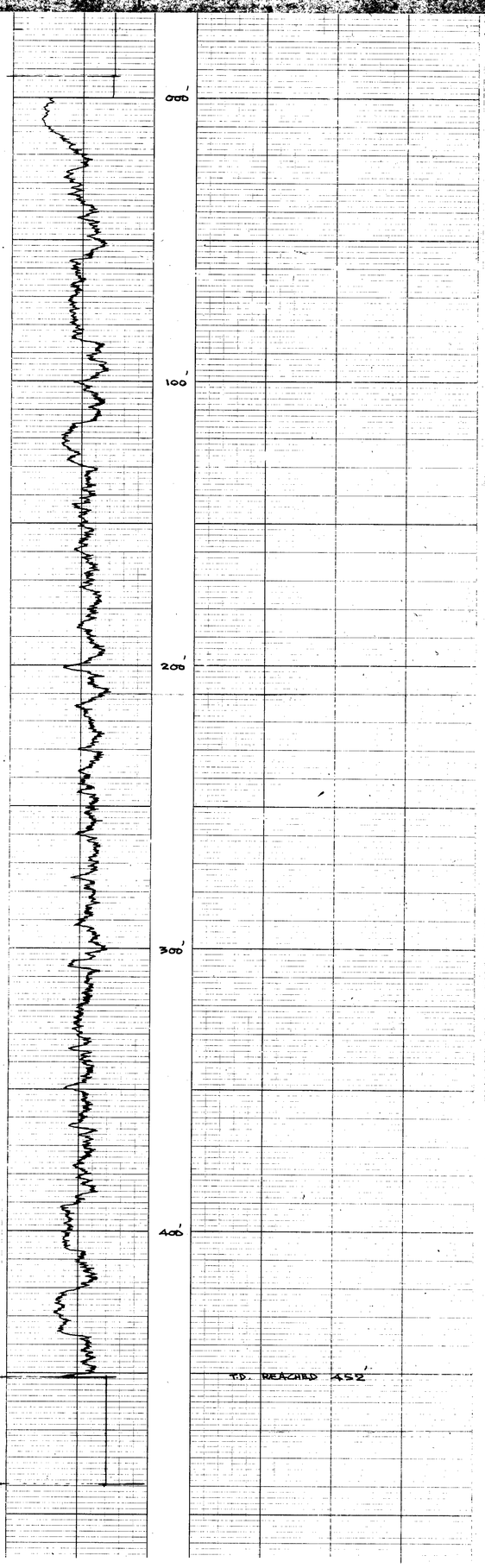
LOCATION: CASTLE MT. COMPANY: RH 2016

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date			Nature		
First Reading			Density		
Last Reading			Viscosity	@ F	@ F
Footage Logged			Resistivity	@ F	@ F
Bottom (Driller)			Res. @ BHT	@ F	@ F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp		
Casing Size			B.H. Temp.		
Bit Size					
Bit Size					
			Logged by	P.M.D.	
			Witnessed by		

REMARKS LOGGED THROUGH DOUBLE WALL DRILL STEM

JUN. 31'77

* Reg. U.S. Pat. Off.



55

K-FOSCHING RIVER 77(3)A.

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO. 320

COMPANY FORDING COAL LIMITED

WELL No. 2017

LOCATION CASTLE MOUNTAIN

FIELD FORDING

PROVINCE BRITISH COLUMBIA

Other Services: NONE

Permanent Datum: GROUND LEVEL — Elev. —

Log Measured from: GROUND LEVEL — Ft. Above Perm. Datum

Drlg. Measured from: GROUND LEVEL — K.B. — D.F. — G.L.

LSD — SEC — TWP — RGE — W — M

Rec. No. 4067

Date 28 - JULY - 1977

First Reading 407

Last Reading 0

Fastest Logged 407

Depth Reached 408

Depth Driller 450

Depth Logger 450

Casing Driller

Fluid Type AIR/WATER

Liquid Level 6

Max. Diam. 4 7/8

Run # 1st

Operating Time 3 HOUR

Truck No. 37

Recorded By JOHNSON

Witnessed By SHAW

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 11/16	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 11/16
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	6.7 - FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	187
HOIST TRUCK NO.	37	SPACING	17 INCH
INSTRUMENT TRUCK NO.	37	TYPE	AmBe
TOOL SERIAL NO.	R GRN 169 - 002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	407	12	5	100	01	14	3	500	01	130

REMARKS