SM-PRINCETON NORTH 82 I/9 A

COPY FILE

EXPLORATION REPORT NO. 1

The 1980 Rotary Drilling Program

on

C.L. 5216 to 5243 incl. held by Cominco Ltd.

Similkameen M.D. NTS #92 H/9

Kamloops, Yale, and Similkameen Divisions of Yale Land District

British Columbia

N. Lat. 49° 27' to 49° 36'

W. Long. 120° 26' to 120° 35'

Program Operator: Fording Coal Limited
205 Ninth Ave. S.E.
Calgary, Alberta
T2G 0R3

Work done: July 2, 1980 to July 15, 1980

Report submitted: September 2, 1980

3M- PRINCETON NORTH 80(1)A

CONFIDENTIAL

INTRODUCTION

Location and Access

The study area (see enclosed map) covers a total of approximately 75 square kilometers in South-Central British Columbia, and extends in a north-easterly direction, with the town of Princeton bordering the southern limit. Excellent access is provided by Highways 3 and 5, the Jura Road to the northeast, the Coalmont, Tulameen road to the west, and numerous secondary roads.

History and Previous Work

Coal first gained economic significance in the Princeton Basin as early as 1909, with numerous small scale mines in operation up until 1951. The peak annual output was attained in 1942, with 125,213 tons being produced. It is notable that the total production of the Princeton coalfield exceeded 2 million tons.

Production in the north basin was limited to the United Empire Mine (see enclosed map) which in 1913, produced 2,000 tons. Only minor subsurface exploration has been done. Only one or two coal outcrops are known to exist.

During September of 1977, a Cominco Exploration hole (U.P. #1) which was drilled to test the Eocene Allenby sediments for possible uranium mineralization, intersected several thin coal seams and interbedded mudstones-siltstones. This coal zone was analyzed at 40.7% ash and 5472 BTU/lb. on an air dried basis over an interval of 12.2 meters.

Information gained from the following references coupled with the above work, resulted in application being made for coal licenses and the current exploration program.

References

Hills, L.V. (1962) Glaciation, Structures, and Micropalaeontology of the Princeton Coalfield, B.C.; M.Sc. Thesis; Dept. of Geology, U.B.C.

Hughes, E.R. (1947) The Princeton Coalfield; The Canadian Institute of Mining and Metallurgy. Trans. Vol. L 1947 pp.656-676

Shaw, W.S. (1952) The Princeton Coalfield; The Dept. of Mines and Technical Surveys, Geological Society of Canada.

General Geology

The Princeton Coalfield is underlain by rocks of Oligocene Age, and is one of the pockets of generally small, isolated Tertiary lake basins found in the interior of British Columbia. Resting unconformably on the Nicola group are a series of volcanic and sedimentary rocks which are treated as three individual rock units.

The Tertiary volcanics occur both above and below stratified rocks and in some cases, they have been thrust over the younger measures. Resting between these are the Allenby sediments, mainly of fluviatile and lacustrine origin, and consisting of predominantly massive, cross-bedded granule and pebble conglomerate, sandstone, thinly bedded shale with intercalated beds of coal, carbonaceous siltstones and shales, and minor layers of bentonitic clays.

The basin can be geographically and geologically divided into two separate basins with the town of Princeton separating the North Basin from the South. The bulk of our work is concentrated on the north which has been interpreted as a composite basin made up of two related synclinal basins separated by an anticline which crosses the basin about 1 mile north of the town of Princeton. Flanked by the bounding Nicola group rocks, the strata within the basin dip from 8 degrees to 30 degrees, and locally up to 65^{o} degrees towards the edges, with much faulting and folding interpreted within the basin.

The Tertiary volcanics are not entirely absent, but their presence is less noticeable than in the Southern area. Coal outcrops, although rare, have been observed in the Summers Creek area to the north and the Deer Valley creek area to the East.

A map compiled from the various references mentioned was provided by R.J. Nicholson of Cominco Ltd. This is the DRILL HOLE LOCATION map included in the Appendices.

Current Drilling Program

Drilling commenced on the fourth of July with a dual wall, reverse circulation, Gardner-Denver 1700, truck mounted seismic type rig. The program consisted of 4, rotary drilled, reverse circulation drill holes, averaging 110 m in depth of which geophysical logs were obtained on all but U.P. #3. No coal was encountered in any of the holes although, samples with 3 meter intervals were taken from U.P. #3, U.P. #4 and U.P. #5 for possible U_3O_8 content. Casing was set through to bedrock in each of the 4 holes with one hole, U.P. #3, having to be abandoned due to the casing unthreading while reaming out the hole. It is suspected that gravel falling in at a joint caused this. Due to the large thickness of surficials encountered while attempting to set casing, problems arose with trying to determine the correct viscosity of the drilling mud being used. Returns from the hole were being circulated through the mud pumps, resulting in loss of priming fluid and circulation, which could only be remedied by cleaning the pumps and mixing new mud. Once the required depth to bedrock had been reached and the casing installed, the method of drilling was changed to reverse circulation using air with minor water injection. The sediments encountered generally had from 20% to 40% clay minerals forming the matrix which when circulated through the dual wall pipe would severely plug the system, resulting in having to trip out of the hole and remove the debris. Along with this loss of production time, approximately 20 hours were lost due to breakdown.

Due to prior commitments, S.D.S. found it necessary to bring in another crew to work a double shift, which started on the 9th of July and continued through to Sunday, 13th of July.

Technical Information

Number of Holes:	4
Total Drilled Footage:	351.3 meters
Total Logged Footage:	300.5 86%
Number of Working Hours:	125.5 hours
Drilling Rate:	2.79m/hr.

Applicable licenses where drilling done

UP-2,3	C.L. 5222	L.1507
UP-4	C.L. 5228	L. 966
UP-5	C.L. 5233	L.1520

Summary of Results

No coal was encountered in any of the holes drilled although, some minor carbonaceous mudstone beds, only a few centimeters thick, were intersected in hole U.P. #2.

The stratigraphy mainly consisted of medium to coarse grained arkosic sandstone of a friable nature. Normally the grains were held together by a clayey paste, mostly kaolinite which formed the matrix. Minor beds of loosely consolidated conglomerates were also located in U.P. #2.

In hole U.P. #5 at a depth of 69 meters, a "knob" of volcanic rock was encountered, interpreted to be equivalent to rocks described by Shaw as the Upper Volcanics and by Hills as Lower Volcanics. Close observation and use of a previously reported criteria for lithologically distinguishing the two formations would suggest it to be Upper Volcanic due to its highly vesicular to amygdaloidal structure containing abundant olivine phenocrysts. A very definite contact was found between the sedimentary and volcanic rocks as shown in the geophysical log, thus indicating the hole penetrated below the coal bearing strata.

Report submitted by Bill Carpenter

W.F. Carpenter

Approved A.C. Taplin

A.C. Taplin P. Eng. Chief Geologist

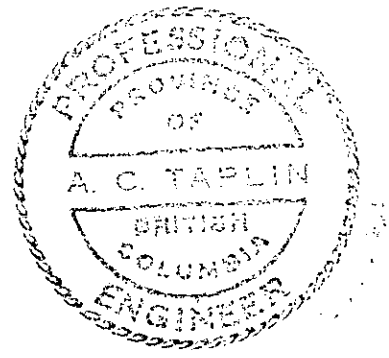
Statement of Qualification

This report has been prepared by, and is based upon the results of field work supervised by W.F. Carpenter, Geological Technologist, employed by Fording Coal Limited.

I hereby certify that W.F. Carpenter is a very competent technologist who is a June 1976 graduate from N.A.I.T.'s Coal Resources Technology program. He was employed as a geological technologist and field drilling supervisor for Luscar Ltd. from August 1976 to October 1978, and after obtaining further coal geology experience in Australia, he joined Fording Coal in December, 1979. I personally organized the drilling program and arranged for the drilling and geophysical contractors, as well as touring the area with Carpenter and selecting the general drilling locations. He was in daily contact with me via telephone during the course of the drilling program.

Signed A.C. Taplin

A.C. Taplin P. Eng.



APPENDICES

Geological Logs	Holes UP-2,3,4,5
Geophysical Logs	Holes UP-2,3,4,5
DRILL HOLE LOCATION MAP	Scale 1:20,000
Certification of Expenditures	
Contractors invoices, copies	

5m PRINCETON NORTH 30-3-8 W1 UP-2

ROKE

SIDEWALL DENSILOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 194 (L1)

LSD
SEC
TWP
RGE
W____M

COMPANY FORDING COAL LIMITED

WELL UP-2

LOCATION

FIELD PRINCETON

PROVINCE BRITISH COLUMBIA

Other Services: GRN, SP- RES

Permanent Datum GROUND LEVEL Elev. K.B.
Log Measured from GROUND LEVEL Above Perm. Datum CSG
Well Depths Measured from GROUND LEVEL G.L.

Run. No.	ONE
Date	12 JULY 1980
First Reading	87 M
Last Reading	0
Footage Logged	87
Depth Reached	88
Depth Driller	103.6
Casing Roke	56.6
Casing Driller	56.6
Fluid Type	MUD/WATER
Liquid Level	
Min. Diam.	12.7 CM
Operating Time	0.5 HOUR
Truck No.	130

Recorded By WAML Witnessed By CARPENTER

GENERAL: RUN NO. 1; DEPTHS FROM 0 / 56; TO 56 / 87; SPEED M/MIN 8 / 8; T.C. SEC.

GAMMA RAY: SENS SETTINGS; ZERO DIV.L OR R; API GR. UNITS PER LOG DIV.

SIDEWALL DENSILOG: T.C. SEC. 0.5 / 0.5; SENS SETTINGS 5000 / 5000; ZERO DIV.L OR R 260 R / 242 R; CPS/DIV 88.6 / 192.6

REMARKS: DRILL HOLE LARGER THAN CASING. DENSITY TOOL # 5623 A1

DEPTHS

BULK DENSITY (GRAMS/CC): 2.80, 2.70, 2.60, 2.50, 2.40, 2.30, 2.20, 2.10, 2.00, 1.90, 1.80, 1.70, 1.60, 1.50, 1.40, 1.30, 1.20, 1.10, 1.00

0 20 8 80 FR

AT 56 M. SCALE CHANGE FOR CASING

SHIFT 242 DIV 2

5000 CPS

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.
LSD
SEC
TWP
RGE
M

COMPANY FORDING COAL LIMITED
WELL UP-2
LOCATION
FIELD ERICKSON

PROVINCE BRITISH COLUMBIA

Permanent Datum
Log Measured from
Drill Depths Measured from

Elev.
Above Perm. Datum
K.B.
D.F.
G.L.

Other Services: DENS., SP, RES

Run No. ONE
Date 12 JULY 1980
First Reading 89 M
Last Reading 0
Footage Logged 89
Depth Reached 89.7
Depth Driller 103.6
Casing Rake 56.6
Casing Driller 56.6
Fluid Type MUD/WATER
Liquid Level 13
Max. Diam. 12.7 CM
Min. Diam.
Elev. @

Operating Time 1 HOUR
Truck No. 130

Recorded By HAHL
Witnessed By CARPENTER

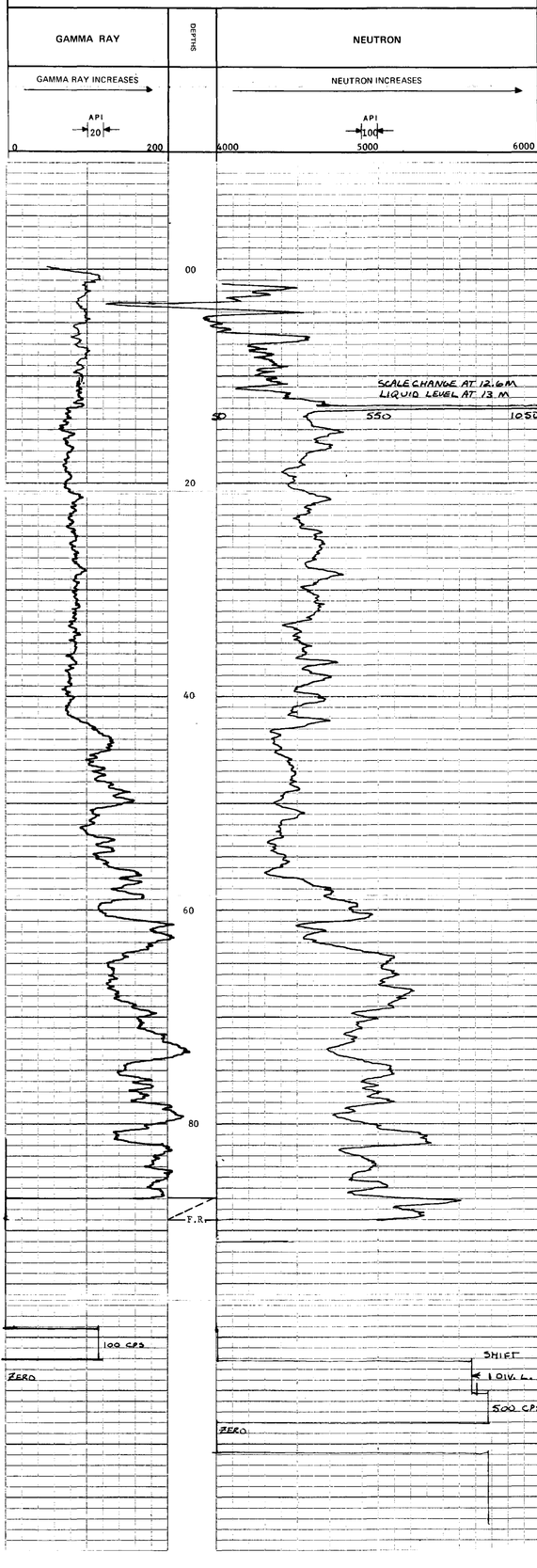
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	32 MM	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	32 MM
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	102 MM	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2.1 M	LENGTH	152 MM
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.	130	SERIAL NO.	265
INSTRUMENT TRUCK NO.	130	SPACING	43 CM
TOOL SERIAL NO.	R-GRN 125A002	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

GENERAL					GAMMA RAY			NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/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.
ONE	0	12.6	4	3	100	0	20	3	1000	40 L	100 API
ONE	12.6	89	4	3	100	0	20	3	500	1 L	50 API

REMARKS



ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.	194 (13)
COMPANY	FORDING COAL LIMITED
WELL	UP-4
LOCATION	
FIELD	PRINCETON
PROVINCE	BRITISH COLUMBIA
LSD / SEC / TWP / RGE	W M
Permanent Datum	GROUND LEVEL Elev.
Log Measured from	GROUND LEVEL Above Perm. Datum
Well Depth Measured from	GROUND LEVEL
Other Services:	DENS, SP-RES
K.B. / D.F. / G.L.	
Run No.	ONE
Date	12 JULY 1980
First Reading	113 M
Last Reading	0
Footage Logged	113
Depth Reached	113.5
Depth Driller	113.5
Casing Roke	42.0
Casing Driller	42.0
Fluid Type	MUD/WATER
Liquid Level	FULL
Min. Diam.	12.7
Rm @	
Operating Time	1.0 HRS
Truck No.	130
Recorded By	KALUGIN
Witnessed By	CARPENTER

EQUIPMENT DATA

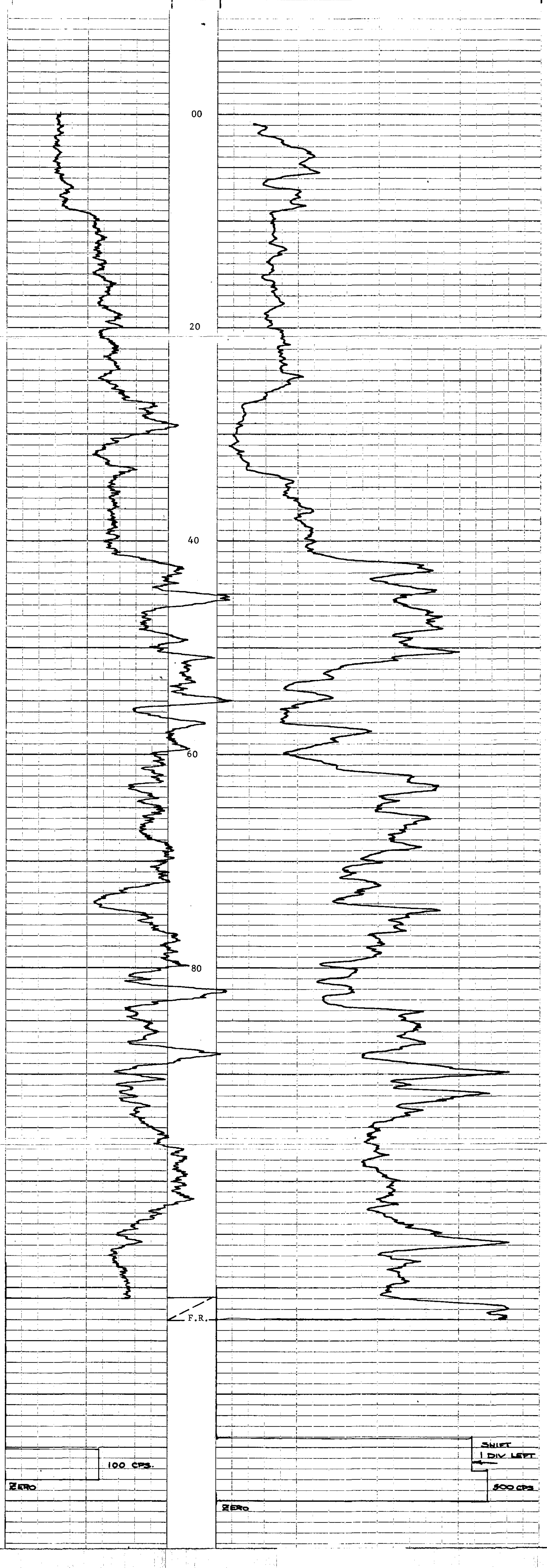
GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	32 MM	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	32 MM
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	102 MM	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2.1 M	LENGTH	152 MM
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
		SERIAL NO.	265
HOIST TRUCK NO.	130	SPACING	43 CM
INSTRUMENT TRUCK NO.	130	TYPE	AmBe
TOOL SERIAL NO.	R-GRN 125A002	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/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.
ONE	0	113	4	3	100	0	20	3	500	1 L	50 API

REMARKS WELL FLOWING WHEN LOGGED

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 20		API 50
0 — 200		50 — 550 — 1050



Sm: PRINCETON NORTH 80 (3*) A *(1) UP-2

ROKE

RESISTANCE LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 194 (LH)

LSD
SEC
TWP
RGE
W M

COMPANY FORDING COAL LIMITED

WELL UP-2

LOCATION

FIELD PRINCETON

PROVINCE BRITISH COLUMBIA

Other Services: DENS, GRN

Permanent Datum GROUND LEVEL Elev. K.B.

Log Measured from GROUND LEVEL Above Perm. Datum CSG

Well Depths Measured from GROUND LEVEL G.L.

Run. No.	ONE		
Date	12 JULY 1980		
First Reading	89.5 M		
Last Reading	56.0		
Footage Logged	33.5		
Depth Reached	90.0		
Depth Driller	103.6		
Casing Roke	56.6		
Casing Driller	56.6		
Fluid Type	MUD/WATER		
Liquid Level			
Min. Diam.	12.7 CM		
Rm @ °			
Operating Time	1 HOUR		
Truck No.	130		

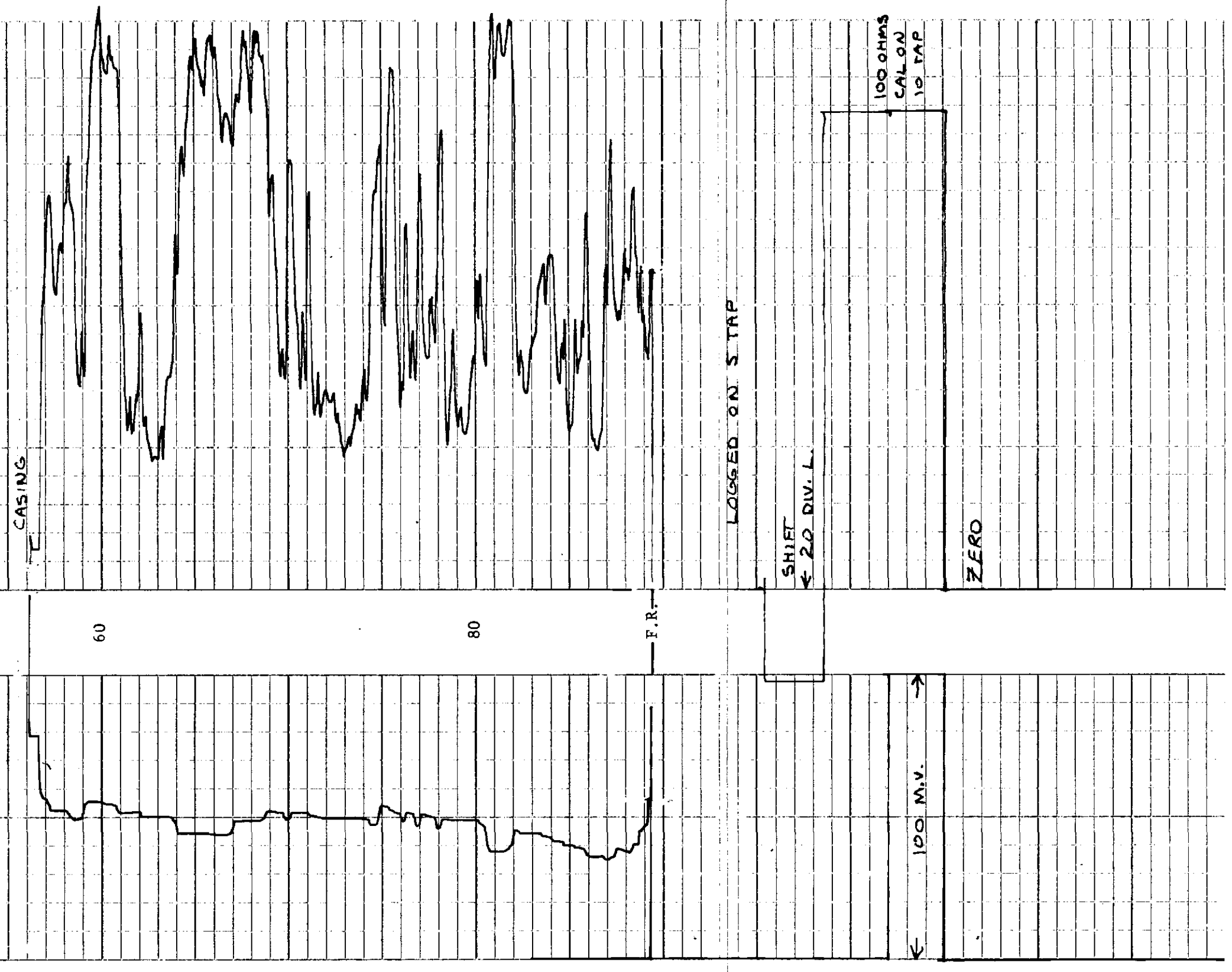
Recorded By WAHL Witnessed By CARPENTER

Remarks SP-RES #13
MUD FISH R= 260Ω

RESISTANCE
OHMS 120 30 60

Depths

SPONTANEOUS - POTENTIAL
(MILLIVOLTS)
SP + 5 -



SP-PRINCETON NORTH 80(3)P 71 UP-4

ROKE

RESISTANCE LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. 194 (5)

LSD
SEC
TWP
RGE
W_____M

COMPANY FORDING COAL LIMITED

WELL UP-4

LOCATION

FIELD PRINCETON

PROVINCE BRITISH COLUMBIA

Other Services: GRN, DENS

Permanent Datum GROUND LEVEL Elev. K.B.

Log Measured from GROUND LEVEL Above Perm. Datum CSG

Well Depths Measured from GROUND LEVEL G.L.

Run. No.	ONE		
Date	12 JULY 1980		
First Reading	112.5 M		
Last Reading	41.0		
Footage Logged	71.5		
Depth Reached	113		
Depth Driller	113.5		
Casing Roke	42		
Casing Driller	42		
Fluid Type	MUD/WATER		
Liquid Level	FULL		
Min. Diam.	12.7 CM		
Rm @ °			
Operating Time	1 HOUR		
Truck No.	130		

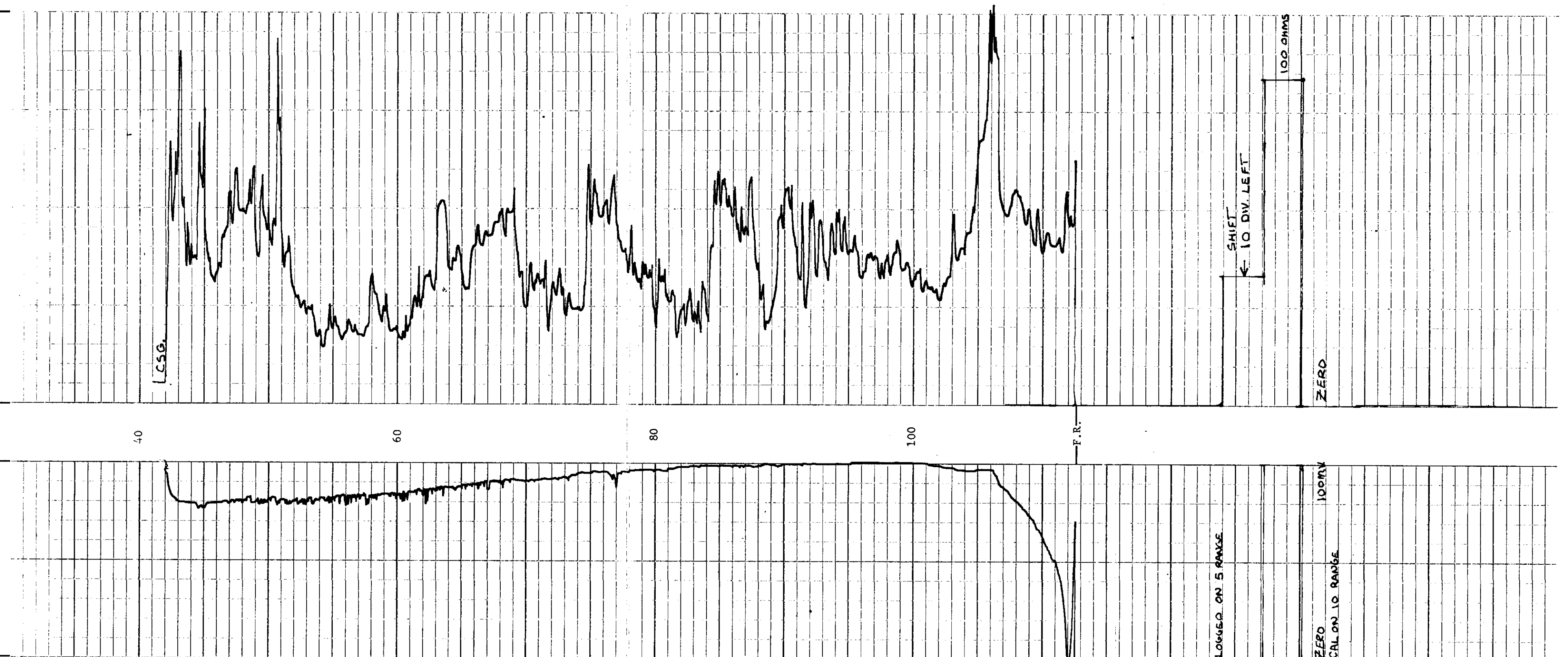
Recorded By KALUGIN Witnessed By CARPENTER

Remarks: MUD FISH ≥ 100 Ω; SP-RES TOOL #13; WELL WAS FLOWING WHEN LOGGED

RESISTANCE — OHMS — 180 — 120 — 60

Depths

SPONTANEOUS - POTENTIAL (MILLIVOLTS) SP − 5 +



ROKE

SIDEWALL DENSILOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.

LSD
SEC
TWP
RGE
M

COMPANY FORDING COAL LIMITED

WELL UP-4

LOCATION

FIELD PRINCETON

PROVINCE BRITISH COLUMBIA

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

K.B.
C.S.G.
G.L.

Other Services
GRN - SP - RES

194

Recorded By KAUNTH

Witnessed By CARPENTER

Run. No.	ONE
Date	12 JULY 1980
First Reading	111.5 M
Last Reading	0
Footage Logged	115.5
Depth Reached	112.5
Depth Driller	113.5
Casing Rate	42
Casing Driller	42
Fluid Type	MUD/WATER
Liquid Level	FULL
Rm. Dens.	12.7 CM
Operating Time	0.5 HOUR
Truck No.	130

GENERAL				GAMMA RAY				SIDEWALL DENSILOG			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/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	CPS/ DIV
ONE	0	42	8					.5	5 K	2.60	88.64
ONE	42	111.5	8					.5	5 K	2.42	190.60

REMARKS DENS TOOL # 663AS
CONSIDERATION MUST BE GIVEN TO INTERPRETATION OF DENSITY IN CASING
LARGE AIR SPACE BETWEEN CSG AND DRILLHOLE WALL

DEPTHS

BULK DENSITY
(GRAMS/CC)

1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00

40

60

80

100

F.R.

SCALE CHANGE FOR CASING AT 42 M

SHIFT
2.42 DIV.R →
5000 CPS

ZERO

SM-PRINCETON NORTH 80 (3*)A *(1)

UP-5

ROKE

RESISTANCE LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.	COMPANY	FORDING COAL LIMITED
LSD	WELL	UP-5
SEC		194 (L7)
TWP	LOCATION	
RGE	FIELD	PRINCETON
W ___ M	PROVINCE	BRITISH COLUMBIA

Other Services: DENS, GRN

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

Log Measured from GROUND LEVEL Above Perm. Datum CSG ______

Well Depths Measured from GROUND LEVEL G.L. ______

Run. No.	ONE		
Date	12 JULY 1980		
First Reading	105 M		
Last Reading	5		
Footage Logged	100		
Depth Reached	105.5		
Depth Driller	105.5		
Casing Roke	7.0		
Casing Driller	7.0		
Fluid Type	MUD/WATER		
Liquid Level	FULL		
Min. Diam.	12.7 CM		
Rm @ °			
Operating Time	1.5 HOUR		
Truck No.	130		

Recorded By WAHL

Witnessed By CARPENTER

Remarks WELL FLOWING WHEN LOGGED MUDFISH 130 Ω

SP-RES TOOL #13

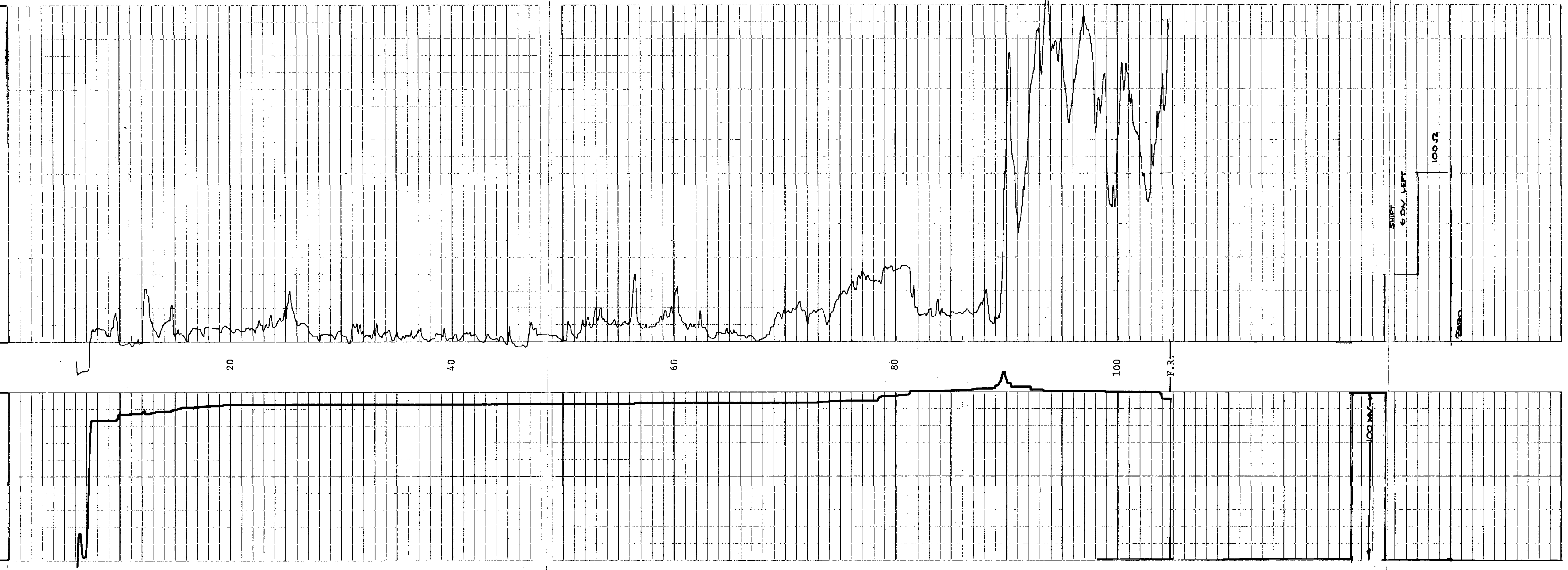
SPONTANEOUS - POTENTIAL (MILLIVOLTS) − SP + 5

Depths

RESISTANCE

OHMS 10 160

60 260



ROKE

GAMMA RAY NEUTRON LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

5m PRINCETON NORTH 60 (3A)B

FILE NO. 194 (L8)

LSD
SEC
TWP
RGE
W ____ M

COMPANY FORDING COAL LIMITED

WELL UP-5

LOCATION

FIELD PRINCETON

PROVINCE BRITISH COLUMBIA

Other Services: DENS, SP-RES

Permanent Datum	GROUND LEVEL	Elev.	K.B.
Log Measured from	GROUND LEVEL	Above Perm. Datum	C.S.G.
Well Depths Measured from	GROUND LEVEL		G.L.

Run. No.	ONE		
Date	12 JULY 1980		
First Reading	105 M		
Last Reading	0		
Footage Logged	105		
Depth Reached	105.5		
Depth Driller	105.5		
Casing Rake	7.0		
Casing Driller	7.0		
Fluid Type	MUD/WATER		
Liquid Level	FULL		
Min. Diam.	12.7 CM		
Rm @			
Operating Time	1.0 HOURS		
Truck No.	130		

Recorded By WAIL Witnessed By CARPENTER

EQUIPMENT DATA

	GAMMA RAY	NEUTRON
RUN NO.	ONE	ONE
LOG TYPE		NEUTRON/NEUTRON
TOOL MODEL NO.		
DIAMETER	32 MM	32 MM
DETECTOR MODEL NO.		SCINTILLATION
TYPE		PROPORTIONAL
LENGTH		102 MM
DISTANCE TO N. SOURCE		2.1 M
SOURCE MODEL NO.		MRC-N-SS-W
SERIAL NO.		265
SPACING		43 CM
TYPE		Am Be
STRENGTH		3 CURIES

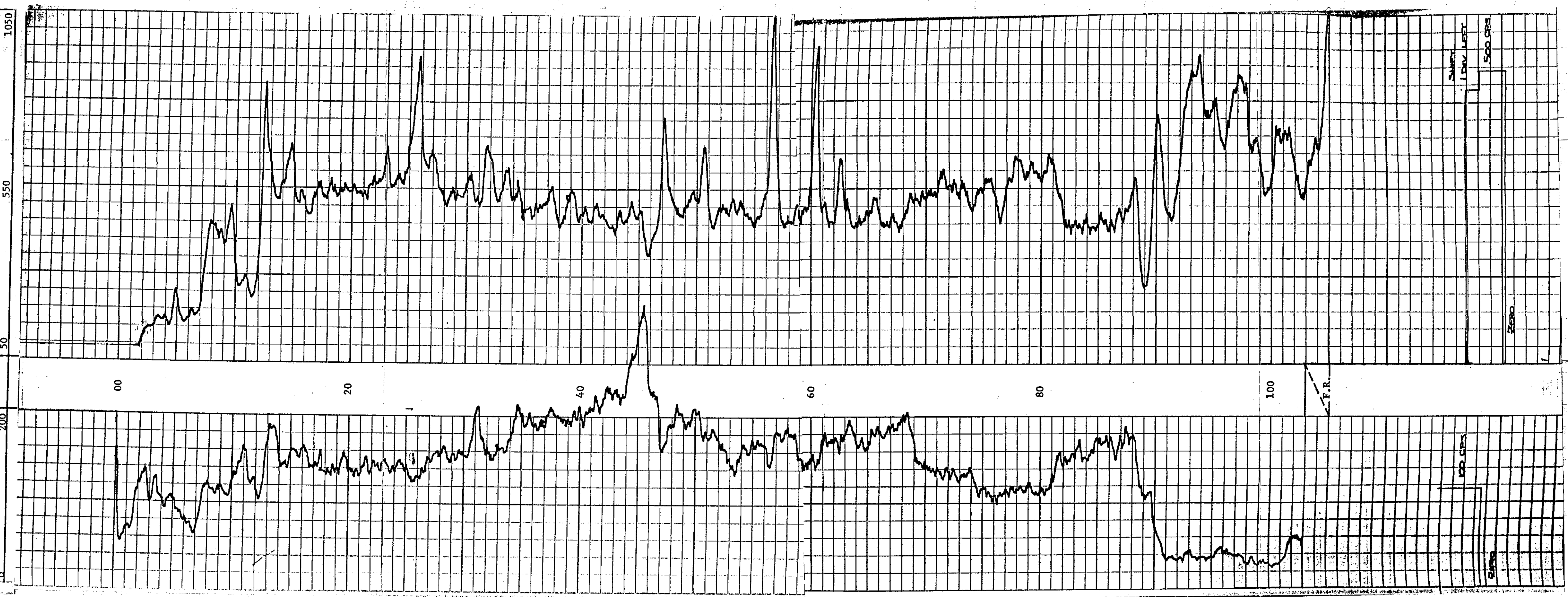
GENERAL

MOBILE TRUCK NO.	130
INSTRUMENT TRUCK NO.	130
TOOL SERIAL NO.	R-GRN 125A002

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/MIN	SPEED SEC.	T.C.	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.
ONE	0	115	4	3		100	0	20	3	500	L	50 API

REMARKS: WELL FLOWING WHEN LOGGED



ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

SIDEWALL DENSILOG

FILE NO.

COMPANY FORDING COAL LIMITED

WELL UP-5 194 (L9)

LOCATION

FIELD PRINCETON

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.

CSG.

G.L.

Other Services: GRN, SP-RES

LSD SEC TWP RGE W M

Run No. ONE

Date 13 JULY 1980

First Reading 91 M

Last Reading 0

Footage Logged 91

Depth Reached 91.85

Depth Driller 105.5

Casing Driller 7.10

Casing Rake 7.10

Fluid Type MUD/WATER

Fluid Level FULL

Rm. Dens. 12.7 GM

Operating Time 0.5 HOUR

Truck No. 130

Recorded By MAHL

Witnessed By CARPENTER

GENERAL				GAMMA RAY				SIDEWALL DENSILOG			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/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	CPS/ DIV
ONE	0	91	8					0.5	5 K	2.42	190.60

REMARKS DENS TOOL #663AS

WELL WAS FLOWING WHEN LOGGED

DEPTHS

BULK DENSITY (GRAMS/CC)

100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280

00

20

40

60

80

F.R

SHIFT 2.42 DIV. R.

5000 CPS

ZERO

FORDING COAL LIMITED

CORE HOLE LOG

3m-PRINCETON NORTH 80(3*)A *(1)

PAGE

LOGS RUN ETC.

LOGS RUN BY ROKE

Gamma Dens Res FBL
Other

COLLAR LOCATION On West side of N.S. Road on Eastern Side of Daniel Dodds Property - Lot 1507

HOLE NO. Princton U.P. 82

Date July 6th, 1980

Logged by B. Carpenter

Elevation Approx 3200 ft.

Casing left in hole

To 60 meters

Core Cut

Reverse Circulation

Sampling Record No samples taken

PROXIMATE ANALYSIS

194

RON	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
0	43	Casing sand & gravel, numerous granite boulders											
		encountered, minor clay bands thru-out.											
43	46	Clay, soft, gradually becoming more silty with depth											
46	64.5	Sandstone, med. gr., lgt grey, loose, grading to siltstone											
64.5	72.0	Conglomerate, minor sand & pebbles											
72.0	78.0	Sandstone, fine - med. gr., Soft, Lgt Grey, large dk.											
—	———	grey quartz pebbles, loosely consolidated, minor basalt chips											
78.0	88.5	Conglomerate											
88.5	89.8	Conglomerate Loosely consolidated - minor clay & sand											
89.8	104.5	Sandstone Med-Fine Gr. Lgt Grey Banded											
		T.D. = 104.5											
		Casing to 60.0 m											
		No Coal											

FORDING COAL LIMITED

CORE HOLE LOG

Sm- PRINCETON NORTH 80 (3F)A *(1)

PAGE

PLUGS RUN ETC.	LOGS RUN BY Gamma Dens Res FBL Other Neutron	COLLAR LOCATION On N.W. side of D.R. Dodds property, approx 300' N. of South Border. Fence in a slight depression located between two groves of poplar trees. Ler 1501 Elevation Approx. 2950	HOLE NO. Princeton U.P. #3 Date July 9th, 1980 Logged by B. Carpenter
Casing left in hole 0-17	Core Cut Reverse Circulation (3m) Samples	Sampling Record	PROXIMATE ANALYSIS

194

FROM	TO	Representative 3m sample are taken for possible U_3O_8 content. Starting @ 17 m	SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
0	14	Casing Set, Glacial O.B. Angular - Surrounded	2685	17	20	3							
		Pebbles, very clean, minor clay partings toward	2686	20	23	3							
		bottom. Very bad drilling conditions continuous	2687	23	26	3							
		sluffing in off wall											
14	17.2	Casing Set, Sandstone Loosely cemented lgt.	2688	26	29	3							
		Grey, Medium Fine Gr., 30% Clay, Soft.											
17.2	30.8	Sandstone as above Dry											
		T.D. = 30.8											
		Abandoned Hole Due to Casing Twisting off.											
		Unable to continue drilling											
		NO COAL											
		DRY HOLE											

7

FORDING COAL LIMITED

CORE HOLE LOG

Sm- PRINCETON NORTH 80(3×)A *(1)

PAGE

PLUGS RUN ETC.	LOGS RUN BY ROKE Gamma x Dens x Res x FBL Other Neutron	COLLAR LOCATION Lot 966 70' past locked gate giving access to old abandoned farm. Elevation Approx. 2600 ft.	HOLE NO. U.P. #4 Date July 10th, 1980 Logged by B. Carpenter
Casing left in hole 0-42 m	Core Cut	Sampling Record	PROXIMATE ANALYSIS

194

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
0	36	Glacial till, Gravel & Boulder, Minor Sand, Loose,	2689	42	45								
		Unconsolidated	2690	45	48								
36	39.5	Clay, Lgt Grey, Sandy, Soft, Minor Gravel Chips	2691	48	51								
			2692	51	54								
39.5	41.3	Sandstone Hard, Banded, Lgt & Dr. Grey	2693	54	57								
		Fine - Med Gr.	2694	57	60								
41.3	44.0	Sandstone, Fine Gr., Hard, Lgt Brown	2695	60	63								
44.0	44.7	Siltstone, Lgt. Brown, Soft	2696	63	66								
44.7	50.9	Sandstone, Coarse Gr., Lgt Grey	2697	66	69								
		Hard	2698	69	72								
50	53	Sandstone, Fine Gr., Lgt Brown	2699	72	75								
		Soft, Banded	2700	75	78								
53	56	Mudstone, Dr. Brown, Clayey, Soft	2701	78	81								
		Slightly Carbonaceous	2702	81	84								
56	113	Sandstone, Lgt Grey, Minor Clay	2703	84	87								
		Sands thru-out, Med Coarse Gr.	2704	87	90								
			2705	90	93								
			2706	93	96								
		T.D. = 113	2707	96	99								
		No Coal Hole is flowing @ approx. 3 gal/min.	2708	99	102								

FORDING COAL LIMITED

CORE HOLE LOG

PAGE

PLUGS RUN ETC.	LOGS RUN BY Gamma Dens Res FBL Other	COLLAR LOCATION Elevation	HOLE NO. U.P. #4 Date Logged by
Casing left in hole	Core Cut	Sampling Record	PROXIMATE ANALYSIS

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
			2709	102	105								
			2710	105	108								
			2711	108	111								
			2712	111	113								

SM - PRINCETON NORTH 80(3×)A *(1)

FORDING COAL LIMITED

CORE HOLE LOG

PAGE

PLUGS RUN ETC.	LOGS RUN BY Rokos Gamma✓ Dens✓ Res✓ FBL Other Neutron	COLLAR LOCATION 50' West of Highway No. 5 North to Merrit. On West Side of Lot 1520 Elevation Approx. 2380	HOLE NO. U.P. #5 Date July 11th, 1980 Logged by B. Carpenter
Casing left in hole CASING SET TO 7 m	Core Cut Reverse Circulation	Sampling Record	PROXIMATE ANALYSIS

194

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
0	5.8	Glacial Till, Boulders, Gravel, Sand	2713	7	10								
5.8	8.0	Sandy Clay, Lgt Grey, Soft, Sticky, Med. Gr.	2714	10	13								
8.0	24	Sandstone, Soft, Lithic, Lgt Grey, Fine-Med. Gr	2715	13	16								
			2716	16	19								
24	25.6	Sandstone Coarse Gr. Quartz Grains, Lgt. Grey	2717	19	22								
			2718	22	25								
25.6	87.0	Sandstone, Fine Grained, Lithic, Lgt Grey,	2719	25	28								
		Soft, Minor Clay Bands Thru-out	2720	28	31								
87	102	Lower Volcanic? Highly Vesicular - Amygdaloidal	2721	31	34								
		Greenstone, Olivine Phenocrysts, Minor Breccias	2722	34	37								
			2723	37	40								
		TD = 102	2724	40	43								
		No coal	2725	43	46								
		Flowing hole approx .5 Gal/min.	2726	46	49								
		3.79 meters Depth	2727	49	52								
			2728	52	55								
			2729	55	58								
			2730	58	61								
			2731	61	64								
			2732	64	67								

FORDING COAL LIMITED

CORE HOLE LOG

PAGE

LOGS RUN ETC.	LOGS RUN BY Boke Gamma Dens Res FBL Other	COLLAR LOCATION Elevation	HOLE NO. U.P. #5 Date Logged by
Casing left in hole	Core Cut	Sampling Record	PROXIMATE ANALYSIS

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
			2733	67	70								
			2734	70	73								
			2735	73	76								
			2736	76	79								
			2737	79	82								
			2738	82	85								
			2739	85	88								
			2740	88	91								
			2741	91	94								
			2742	94	97								
			2743	97	100								
			2744	100	103								


Fording COAL LIMITED
PRINCETON
DRILL HOLE LOCATION MAP
SHOWING SURFACE OWNERSHIP
AUTHOR W.F.C.
DATE 7 25 80
SCALE 1:20,000
DRWG #
LEGEND:
UNITED EMPIRE MINE
DRILL HOLE
INTERPRETED OUTLINE OF SEDIMENTARY BASIN
M1
194
Princeton
PRINCETON VILLAGE MUN
PRINCETON PROV PARK
KAMLOOPS DIVISION OF YALE DIST
L42 YALE
W. SELLERS
L 43 YALE
D.D.H. U.P. 1
D.H. U.P. 2
D.H. U.P. 3
D.H. U.P. 4
D.H. U.P. 5
VAUGHN & RUSSEL FARM LTD.
J.K. RUSSEL
J. HILTON
W.G. ALLEN
D.R. DODDS
R.E. ROBSON
H. TREHEARNE
L.G. MAYNARD
G. KENDRICK
S.H. THOMAS
A. CAPPOS
C. HARDWICK
G. ATKINSON
S. ATKINSON
J.D. CURRIE
R.L. BEALE
JAMES D. CURRIE
C.E. HARDWICK
S.M. NECHIEFMAN
D.S. COOK
G.B. ATKINSON
S.D. ATKINSON
H.F. LOGAN
S. WOYCENKO
H.D. ALLISON
E.I. HAFFEY
B.J. COOK
E.M. CURRIE
J. CHARLES
LIND
KARLSSON BERNDT
WEYERHAEUSER CANADA LTD.
J.C. HUEY
DAWNEX
A.H. SHOPSHIRE
L2421 HOLDINGS
MOUNT MINER
SUBDIVIDED
Gas Pipeline
Radio Towers
Golf Course
Ski Tow
Tailings
Power House
Water Tank
Tunnel
Television
Gravel Pit
Princeton (airfield)
Allison Creek
Deer Valley Creek
Hardwick Creek
Summers Ck
Asp Creek
Shister Ck
Separation Lakes
Gladys L.
Wayne Lake
Gould Lake
Rainbow L.
Jura
5491000
5490000
5486000
5485000
5484000
5483000
679000
680000
681000
682000
683000

FORDING COAL LIMITED

CORE HOLE LOG

PAGE

8m- PRINCETON NORTH 80(3*)A *(1)

PLUGS RUN ETC.	LOGS RUN BY Roke Gamma✓ Dens✓ Res✓ FBL Other NEUTRON	COLLAR LOCATION 50' West of Highway No. 5 North to Merrit. On West Side of Lot 1520 Elevation Approx. 2380	HOLE NO. U.P. #5 Date July 11th, 1980 Logged by B. Carpenter
Casing left in hole CASING SET TO 7 m	Core Cut Reverse Circulation	Sampling Record	PROXIMATE ANALYSIS

194

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
0	5.8	Glacial Till, Boulders, Gravel, Sand	2713	7	10								
5.8	8.0	Sandy Clay, Lgt Grey, Soft, Sticky, Med. Gr.	2714	10	13								
8.0	24	Sandstone, Soft, Lithic, Lgt Grey, Fine-Med. Gr	2715	13	16								
			2716	16	19								
24	25.6	Sandstone Coarse Gr. Quartz Grains, Lgt. Grey	2717	19	22								
			2718	22	25								
25.6	87.0	Sandstone, Fine Grained Lithic, Lgt Grey,	2719	25	28								
		Soft, Minor Clay Bands Thru-out	2720	28	31								
87	103	Lower Volcanic? Highly vesicular - Amygdaloidal	2721	31	34								
		Structure, Olivine Phenocrysts, Minor Breccia	2722	34	37								
			2723	37	40								
			2724	40	43								
		TD = 103											
		No coal	2725	43	46								
		Flowing hole approx .5 Gal/min.	2726	46	49								
		@ 79 meters Depth	2727	49	52								
			2728	52	55								
			2729	55	58								
			2730	58	61								
			2731	61	64								
			2732	64	67								

FORDING COAL LIMITED

CORE HOLE LOG

PAGE

LOGS RUN ETC.	LOGS RUN BY Roke Gamma Dens Res FBL Other	COLLAR LOCATION Elevation	HOLE NO. U.P. #5 Date Logged by
Casing left in hole	Core Cut	Sampling Record	PROXIMATE ANALYSIS

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
			2733	67	70								
			2734	70	73								
			2735	73	76								
			2736	76	79								
			2737	79	82								
			2738	82	85								
			2739	85	88								
			2740	88	91								
			2741	91	94								
			2742	94	97								
			2743	97	100								
			2744	100	103								

FORDING COAL LIMITED

CORE HOLE LOG

5m - PRINCETON NORTH 80731A *(1)

PAGE

LOGS RUN ETC.	LOGS RUN BY ROKE Gamma Dens Res FBL Other	COLLAR LOCATION On West side of N.S. Road on Eastern Side of Daniel Dodds Property - Lot 1507 Elevation Approx 3200 ft.	HOLE NO. Princton U.P. #2 Date July 6th, 1980 Logged by B. Carpenter
asing left in hole To 60 meters	Core Cut Reverse Circulation	Sampling Record No samples taken	194

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	PROXIMATE ANALYSIS VM	ASH	FC	S	BTU/lb	SEAM
0	43	Silica sand & gravel, numerous granite boulders											
		encountered, minor clay bands thru-out.											
43	46	Clay, soft, gradually becoming more silty with depth											
46	54.5	Sandstone, red. gr., lgt grey, loose, grading to siltstone											
54.5	72.0	Conglomerate, minor sand & pebbles											
72.0	78.0	Sandstone, fine - med. gr., Soft Lgt Grey, large dk.											
		grey quartz pebbles, Loosely consolidated, minor bone & chips.											
78.0	88.5	Conglomerate											
88.5	89.8	Conglomerate Loosely consolidated - minor clay & sand											
89.8	104.5	Sandstone Med-Fine Gr. Lgt Grey Banded											
		T.D. = 104.5											
		Casing to 60.0 m											
		No Coal											

TORDING COAL LIMITED

CORE HOLE LOG

3m - PRINCETON NORTH 80(3M)A A(1)

PAGE

PLUGS RUN ETC.	LOGS RUN BY Gamma Dens Res FBL Other Neutron	COLLAR LOCATION On N.W. side of D.R. Dodds property, approx 300' N. of South Border. Fence in a slight depression located between two groves of poplar trees. Elevation Approx. 2950	HOLE NO. Princeton U.P. #3 Date July 9th, 1980 Logged by B. Carpenter
Casing left in hole 0-17	Core Cut Reverse Circulation (3m) Samples	Sampling Record	PROXIMATE ANALYSIS

194

FROM	TO	Representative 3m sample are taken for possible U_3O_8 content. Starting @ 17 m	SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
0	14	Casing Set, Glacial O.B. Angular - Surrounded	2685	17	20	3							
		Pebbles, very clean, minor clay partings toward	2686	20	23	3							
		bottom. Very bad drilling conditions continuous	2687	23	26	3							
		sluffing in off wall											
14	17.2	Casing Set. Sandstone Loosely cemented lgt.	2688	26	29	3							
		Grey, Medium Fine Gr., 30% Clay, Soft.											
30.5	30.8	Sandstone as above Dry											
		T.D. = 30.8											
		Abandoned Hole Due to Casing Twisting off.											
		Unable to continue drilling											
		NO COAL											
		DRY HOLE											

FORDING COAL LIMITED

CORE HOLE LOG

3m PRINCETON NORTH 80(3A)A 2(1)

PAGE

PLUGS RUN ETC.	LOGS RUN BY ROKE Gamma x Dens x Res x FBL Other Neutron	COLLAR LOCATION Lot 966 70' past locked gate giving access to old abandoned farm. Elevation Approx. 2600 ft.	HOLE NO. N.P. #4 Date July 10th, 1980 Logged by R. Carpenter
Casing left in hole 0-42 m	Core Cut	Sampling Record	PROXIMATE ANALYSIS

194

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IM	VM	ASH	FC	S	BTU/lb	SEAM
0	36	Glacial Till, Gravel & Boulder, Minor Sand, Loose,	2689	42	45								
		Unconsolidated	2690	45	48								
36	39.5	Clay, Lgt Grey, Sandy, Soft, Minor Gravel Chips	2691	48	51								
			2692	51	54								
39.5	41.3	Sandstone Hard, Banded, Lgt & Dr. Grey	2693	54	57								
		Fine - Med Gr.	2694	57	60								
41.3	44.0	Sandstone, Fine Gr., Hard, Lgt Brown	2695	60	63								
44.0	44.7	Siltstone, Lgt. Brown, Soft	2696	63	66								
44.7	50.0	Sandstone, Coarse Gr., Lgt Grey	2697	66	69								
		Hard	2698	69	72								
50	53	Sandstone, Fine Gr., Lgt Brown	2699	72	75								
		Soft, Banded	2700	75	78								
53	56	Mudstone, Dr. Brown, Clayey, Soft	2701	78	81								
		Slightly Carbonaceous	2702	81	84								
56	113	Sandstone, Lgt Grey, Minor Clay	2703	84	87								
		Bands thru-out, Med Coarse Gr.	2704	87	90								
			2705	90	93								
			2706	93	96								
		T.D. = 113	2707	96	99								
		No Coal Hole is flowing @ approx. 3 gal/min.	2708	99	102								

FORDING COAL LIMITED

CORE HOLE LOG

PAGE

PLUGS RUN ETC.	LOGS RUN BY Gamma Dens Res FBL Other	COLLAR LOCATION Elevation	HOLE NO. U.P. #4 Date Logged by
Casing left in Hole	Core Cut	Sampling Record	PROXIMATE ANALYSIS

FROM	TO		SAMPLE NO.	FROM	TO	WIDTH	% H_2O IN	VM	ASH	FC	S	BTU/lb	SEAM
			2709	102	105								
			2710	105	108								
			2711	108	111								
			2712	111	113								

Fording COAL LIMITED

200, 205 Ninth Avenue S.E., Calgary, Alberta T2G OR4 / (403) 264-1063 / Telex 03-825846

27 August 1980

Cominco Ltd.
200 Granville Square
Vancouver, B.C. V6C 2R2

RE: Princeton Coal Prospect

Dear Sirs:

The following represents the total costs incurred by Fording Coal on the Princeton Project. We have also enclosed copies of contractor's invoices for drilling costs and logging of the core drilled.

Field supervision and report preparation		$ 5,535.67
Contract work - Drilling Service	$26,046.72	
Logging Services	3,353.69	
5% administration costs	1,470.00	30,870.41
Employee expense - travelling, etc.		2,040.00
Reproduction services - bluelines, etc.		41.92
		$38,488.00

Yours very truly,

W.E. Steele
Accountant

cak/
enclosures

194

ROKE OIL ENTERPRISES LTD.

516 MORAINE ROAD N.E., CALGARY, ALBERTA T2A 2P2 • TELEPHONE 273-5553

TO: Fording Coal Limited,
205 - 9th Avenue S,E.,
Calgary,
Alberta.

INVOICE № 1940

DATE July 28, 1980

SERVICES RENDERED			
Re: Princeton Field - Service Order #4626 - Dated July 12, 1980			
Total Logging Charges		$ 2,198.34	
Mileage: 1640 km @ .60/km		984.00	
Accommodation: 3 nights		91.35	
Meals: 4 @ 20.00		80.00	
			$ 3,353.69

FORDING COAL LIMITED
EXTENSIONS O.K. ✓
MATERIAL REC'D. ✓
PAYMENT APPROVED
A.C. Taylor
CHARGE
C-488 $3353.69

INVOICE

S D S DR LING

DIVISION OF S D S INDUSTRIES LTD.
4636 FIRST STREET S.E.
CALGARY, ALBERTA T2G 2L3
PHONE (403) 287-1460

Invoice № 1233

Date July 23, 1980

Client - Project No FCL-100-206

SDS - Job No PROJECT 237
RIG 601-04

Fording Coal Limited,
205 Ninth Avenue South East,
CALGARY, Alberta,
T2G 0R4.
Attention: Mr. A. C. Taplin.

Billing Period July 3, 1980 To July 13, 1980 Location Princeton, B. C.

Mobilization and demobilization - lump sum		$ 2,500 00
Drilling - 125.0 hours @ $125.00 per hour		15,625 00
Crew Travel - 7.0 Hours @ $40.00 per hour		280 00
Living allowance - 57 man days @ $35.00 per day		1,995 00
CHARGEABLE SUPPLIES		
3 only 7 7/8P retip bits @ $250.00 each		750 00
3 only 5" WM tricone bits @ $190.92 each		572 76
34 only bags gel @ $7.45 each		253 30
80 feet 6 5/8" casing @ $5.75 per foot		460 00
300 feet 5 9/16" casing @ $4.90 per foot		1,470 00
B. C. Sales Tax, 4% on $3,506.06		140 25
Plus 10% Handling		364 63
MOBILIZATION OF SECOND CREW		
Air fares, Marlin Travel Invoice No. 011303	$ 191.10	
Crew Travel Time		
V. Theriault 10.0 hours @ $92.0 ~~per hour~~	92.00	
B. Wolf 8.0 hours @ $6.00 per hour	48.00	
J. Doblee 6.0 hours @ $6.00 per hour	36.00	
M. Pinnette 8.0 hours + 8.5 O. T. = 20.34 Hours @ $6.75	140.07	
	$ 316.07	
Benefits 20%	63.22	
Pick-up - 550 miles @.$0.45 per mile	247.50	
TOTAL ONE WAY	$817.89	817 89
Demobilize second crew		817 89

FORDING COAL LIMITED
EXTENSIONS O.K. B. Caplin
MATERIAL REC'D B. Caplin
PAYMENT APPROVED
CHARGE

Terms:
Payment due 30 days from receipt
Interest charged at 2% per month over 30 days
Make cheques payable to above address

TOTAL $ 26,046 72