LEXCO TESTING LTD

DRILLHOLE REPORT

AL FIELD: Campbell River DATE: Feb. 16,1977

COMPANY: Lexco lTesting

HOLE NO.: QU-77-26

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 45+00 8880 Lt of B/L

ELEVATION: 1194

DRILLER: D.. Broen

FROM	TO	LOG	REMARKS
0	5	boulders	
[illegible]	33	sandstne	
33	37	coal	
37	49	brown shale	
49	58	brown sandstone	
58	102	brown shale	
102	117	coal	
117	135	brown shale	
135	141	brown sandstone	
141	164	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

Ex-Quinsam 76/81

CANADIAN ARCTIC SURVEY SYSTEMS LTD.
708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU 77-26

FIELD QUINSAM LAKE

PROVINCE BRITISH COLUMBIA

Location: 88.8 S.C. Lt

Permanent Datum: G.L. Elev. 1129'

Log measured from: G.L. 11. above perm. Datum

Drilling measured from: G.L.

Elev. K.B. —
D.F. —
G.L. —

Other Services

Date	16 Feb 77		
Run No.	One		
Type Log	Natural	Ra.	
Depth - Driller	164'		
Depth - Logger	164'		
Bottom Logged Interval	162'		
Top Logged Interval	6		
Type Fluid in Hole	Water		
Salinity, PPM Cl.	N/A		
Density	1.0		
Level	Full		
Max. rec. temp. deg. F.	30		
Equipment No. and Location	Tape		
Recorded By	G. Sandblad L.S.		
Witnessed By	Schachar		

BORE-HOLE RECORD

Run No.	Bit From	Bit To	Size	Wgt.	Type Fluid in Hole	Fluid Loss
1	Surf.	T.D.	3 7/8"			

CASING RECORD

	Size	Wgt.	Grade	Type Joint	Top	Bottom
1	2 3/8"				Surf.	162'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

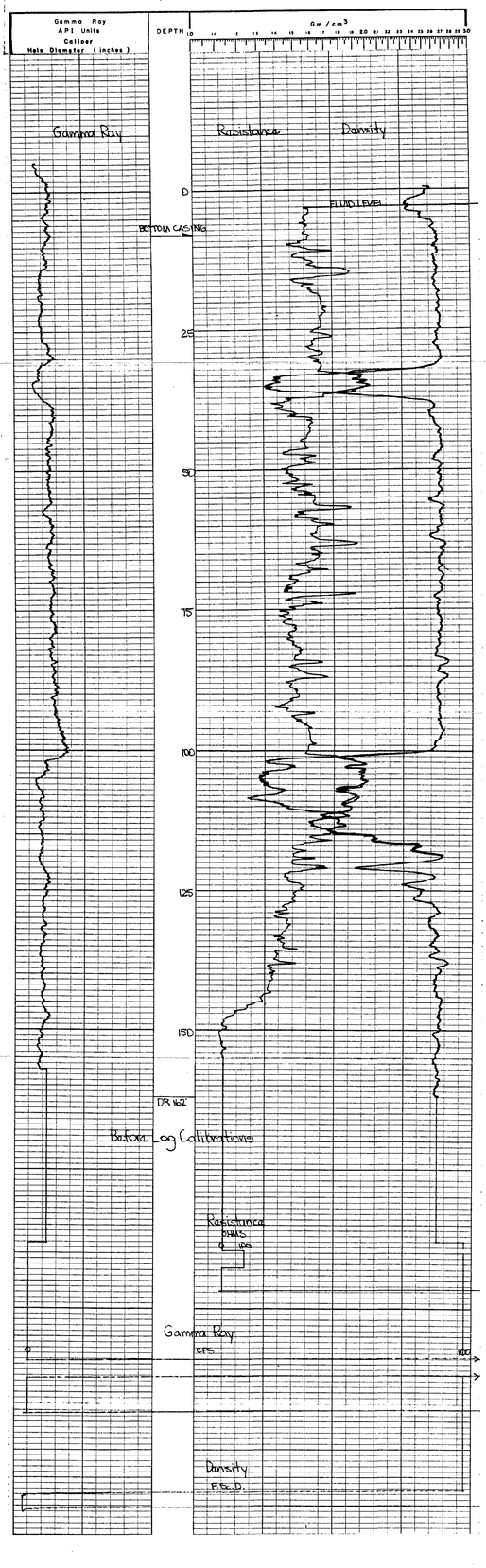
Gamma Ray		Resistance		Density		Caliper
Run No.	One	Run No.	One	Tool Model No.	1-103	
Tool Model No.	1-103	Tool Model No.	1-103	Diameter	2 1/8	
Diameter	2 1/8	Diameter	2 1/8	Detector Model No.	CDES16	
Detector Model No.	CDES16	Type	MF	Type	Scint.	
Type	Scint.	Spacing	5"	Length	1.5	
Length	1.5	Length	5"			
		Horiz. Scale	66 ft/div			
		Rm @ °F	N/A			
General		Source Model				
Hoist Truck No.	1	Serial No.		HDVP		
Inst. Truck No.		Isotope		687		
Location	Campbell River	Strength		Cs 137		
				125 mC		

LOGGING DATA

General				Gamma Ray					Density				
Depths			Speed	T.C.	Sens.	Zero	API G.R. Units		T.C.	Sens.	Zero		
Run No.	From	To	Ft./Min.	Sec.	Settings	Div. L or R	per Log Div.		Sec.	Settings	Div. L or R		
1	162'	0	10	4	100	2R	5.4		1	1K	.51		

Reference Literature: N/A

Remarks: D. Braun



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: Feb. 16, 1977

COMPANY: Lexco Testing

HOLE NO.: Qu-77-27

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 3978 8464.7 Lt

ELEVATION: 1178.6'

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	7	till	
7	56	grey sandstone	
56	62	coal	
62	65	carbonaceous shale	
65	70	grey sandstne	
70	81	brown shale	
81	90	grey sandstone	
90	106	brown shale	
106	116	coal	
116	123	carbonaceous shale	
123	140	grey sandstone	
140	180	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

Ex Gunsam 72 (3)a

CANADIAN ARCTIC SURVEY SYSTEMS LTD.

GAMMA DENSITY & RESISTANCE

703 - 35 A STREET N.W. CALGARY - ALTA.

COMPANY LEKO TESTING LTD.

WELL DRILLHOLE GU 71-21

FIELD GUNSAM 331-28

PROVINCE BRITISH COLUMBIA

Other Services

Permanent Datum G.L. Elev. N.B.

Log Measured from G.L. ft. above perm. Datum D.F.

Drilling Measured from G.L. G.L.

Date	16 Feb. 71		
Run No.	One		
Depth - Driller	1800		
Depth - Logger	1792		
Bottom Logged Interval	1792		
Top Logged Interval	0		
Type Fluid in Hole	Water		
Salinity PPM Cl.	N/A		
Density	1.04		
Level	Full		
Max. rec. temp. Deg. F	N/A		
Equipment No.	75m		
Location	Kamloops		
Recorded by	G. Sandbeck		
Witnessed by			

BORE-HOLE RECORD

RUN No.	BIT From	BIT To	Size	CASING RECORD Wgt.	From	To
1	0	1800	7 7/8"			

Fold Here

This Heading and Log Conforms to API RP 33 .

EQUIPMENT DATA

Gamma Ray		Resistance	Density	Caliper
Run No.	One	One	One	
Tool Model No.	L-103	L-103	L-103	
Diameter	2⅛"	2⅛"	2⅛"	
Detector Model No.	CP-514	MF	F	
Type	Scint.			
Length	15	15	15	

	Resistance	Density	Caliper
Run No.	One	One	
Tool Model No.	L-103	L-103	
Diameter	2⅛"	2⅛"	
Type	MF	F	
Spacing		15	
Length	5'		
Horiz. Scale	5in/div.		
Rm @ 9°	N/A		
Source Model		HDVP	
Serial No.		687	
Isotope		Cs 137	
Strength		125 mC	

General

Hoist Truck No.	1
Inst. Truck No.	
Location	Campbell River

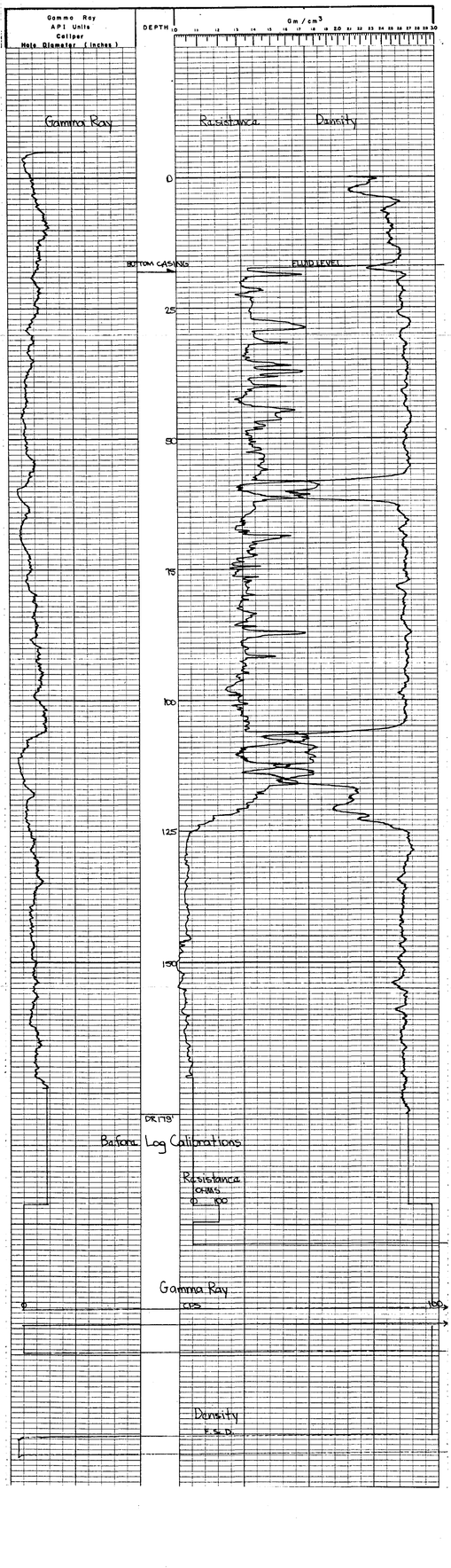
LOGGING DATA

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.	Density T.C. Sec.	Density Sens. Settings	Density Zero Div. L or R
1	179'	0	10	4	600	2R	54	1	1K	.5L

Reference Literature: N/A

Remarks: H. Vincatt



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: Feb. 17, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-28

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 51+95 7441.1 Lt

ELEVATION: 1141.4

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	7	till	
7	59	grey sandstone	
59	64	coal	
64	66	carbomceous shale	
66	110	brown shale	
110	128	siltstone	
128	147	coal	
147	149	carbonaceous shale	
149	156	brown shale	
156	158	carbonaceous shale	
158	175	brown shale	
175	180	white sandstone	
180	212	green sandstone	
212	220	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

CANADIAN WELL LOGGING SOCIETY SURVEY

GAMMA DENSITY & RESISTANCE

Re Alliance 22 Gale

COMPANY LEXCO DESIGNS LTD.
WELL 204 - 324 - 8 STREET N.W. CALGARY, ALTA.
FIELD BRUNHAM CREEK
PROVINCE BRITISH COLUMBIA

Location: Twp. Rge. W
Permanent Datum: G.L. Elev. 4,000 ft
Log Measured from: K.B. 10 ft above perm. datum
Drilling Measured from: K.B.

Date: 7-8-81
Run No.: ONE
Depth-Driller: 200
Depth-Logger: 200
Bottom Logged Interval: 200
Top Logged Interval: 0
Type Fluid in Hole: WATER
Salinity, PPM Cl: 0
Density: 8.5
Level: FULL
Max. Rec. Temp. Deg. F: 50
Equipment No. & Location: 2 CALGARY
Recorded By: H. VOWELL
Witnessed By: MR. SCHMIDT

Casing Record: 1 | 8 5/8 | 0 | 10 | 4.00 | 2.28 | 0.8 | 1 | 1K | 0.4

Remarks: RUN 1 - GAMMA RAY, RESISTANCE & DENSITY

Field Area | This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

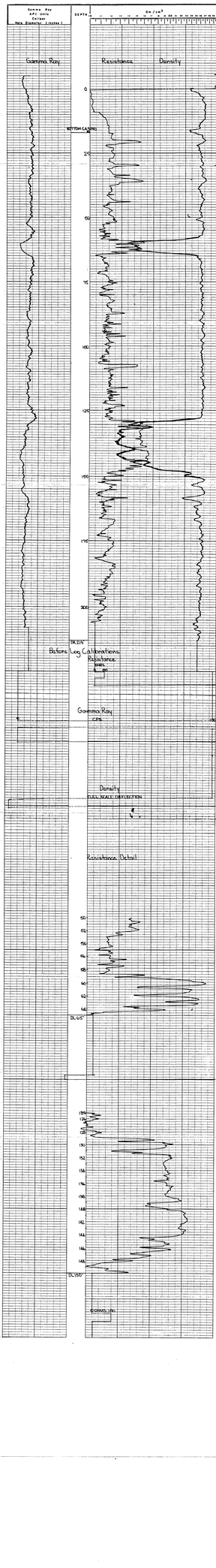
Gamma Ray		Resistance	Density	Caliper
Run No.	ONE	Run No.	ONE	ONE
Detector No.	1	Detector No.	2 DCL	2 DCL
Thickness	1.5	Electrode	16"	16"
Detector Meter No.	2 CAL	Type	NO	F
Type	DUAL	Spacing		1%
Length	1.6'	Length	6'	
Source		Conc. Source	66 Ci Cs 137	
Holder Type No.	1	Source Holder		M.G.P.
Inst. Truck No.	1	Detect. No.		ABS
Location	CAMPBELL RIVER	Location		CA 137
		Remarks		66 mCi

LOGGING DATA

Gamma Ray								Resistance			Density		
Run No.	Detector No.	From	To	Speed Ft./Min.	T.C. Setting	Sens. Zero	API GR Units per Log Div.	Sens. Setting	T.C. Setting	Sens. Zero Dis.	Sens. Setting	T.C. Setting	Sens. Zero Dis.
1	2CAL	0	10	4	2.28	0.8	1	1K		0.4			

Reference Ultraviolet N/A

Remarks: H. Vowell



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: Feb. 19,1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-29

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 55+00 7487 Lt. of B/L

ELEVATION: 1108

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	7	sand and boulders	
7	52	brown shale	
52	70	coal	
70	73	brown shale	
73	84	sandstone	
84	106	brown shale	
106	111	green sandstone	
111	121	brown sandstone	
121	129	red shale	
129	210	green sandstone	
210	224	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

ex-QUINSAM 77 (3)e

CANADIAN ARCTIC SURVEY SYSTEMS LTD. 708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU 77-29

FIELD QUINSAM 55+00 7487 (L4)

PROVINCE BRITISH COLUMBIA

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Permanent Datum G.L. Elev. 1108'

Log measured from G.L. ___ ft. above perm. Dat.

Drilling measured from G.L.

Other Services: Resistance Detail

Elev. K.B. ___ D.F. ___ G.L. ___

Date	19 Feb. '77	
Run No.	One	
Type Log	Nuclear	Res.
Depth - Driller	220'	
Depth - Logger	214'	
Bottom logged interval	214'	
Top logged interval	0	
Type fluid in hole	Water	
Salinity, PPM Cl.	N/A	
Density	N/A	
Level	0	
Max. rec. temp. deg. F.		
Operating rig time	1.5hrs.	
Recorded by	G. Sanchuck Jr.	
Witnessed by	S. Gardner	

BORE-HOLE RECORD				CASING RECORD			
RUN No.	Bit	From	To	Size	Wgt.	From	To
1	6½"	Surf.	8'	5"		Surf.	8'
	4"	8'	T.D.				

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

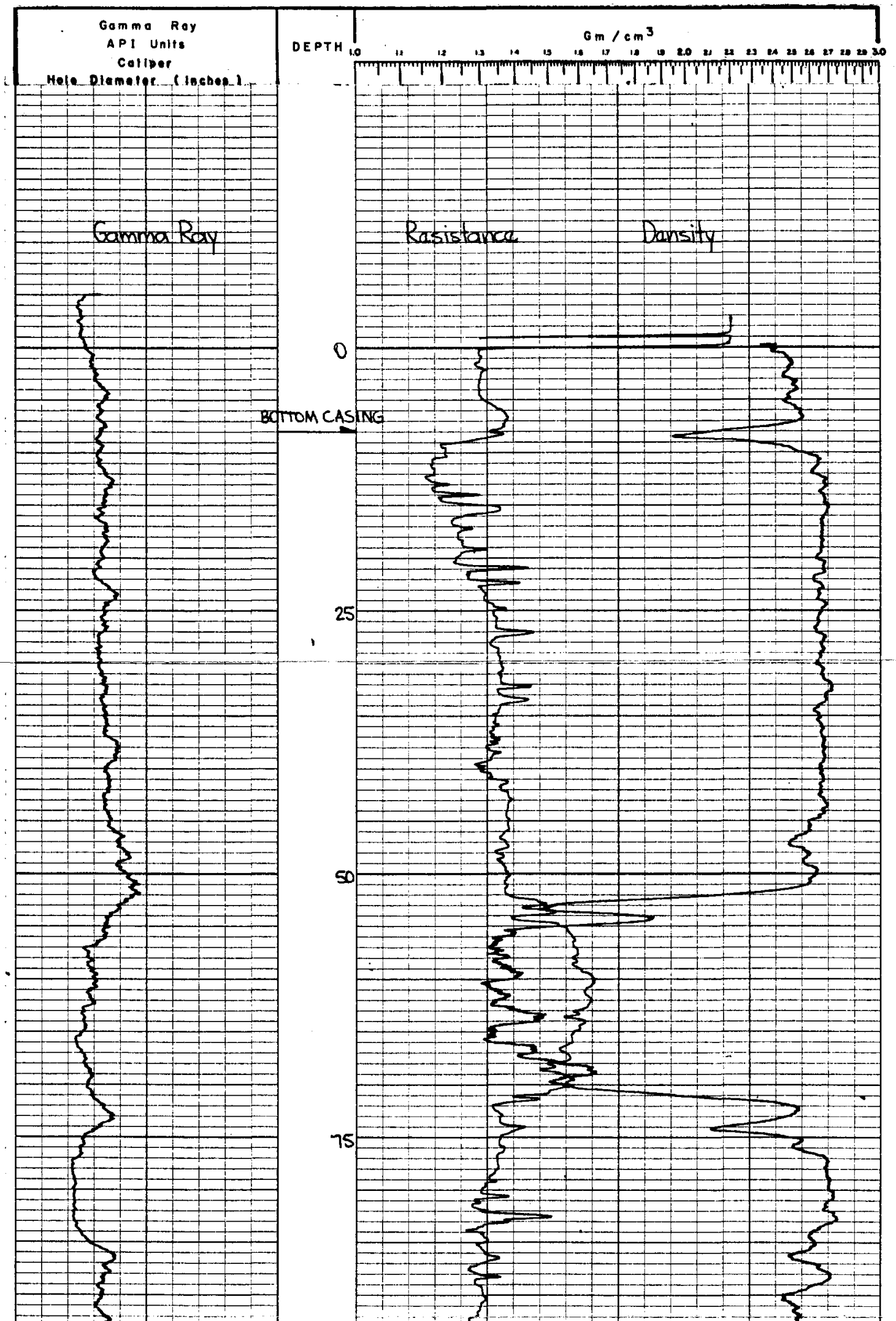
Gamma Ray					Resistance	Density	Resistance Detail
Run No.	One			Run No.	One	One	Two
Tool Model No.	L-103			Tool Model No.	L-103	L-103	L-103
" Diameter	2⅛"			Diameter	2⅛"	2⅛"	2⅛"
Detector Model No	CP-514			Type	ME	F	ME
Type	Scint.			Spacing		13"	
Length	1.5"						
				Length	.5"		.5"
				Horiz. Scale	66.6Ω/div		33.3Ω/div
General				Rm @ °F	N/A		N/A
Hoist Truck No.	1			Source Model		HDVP	
Inst. Truck No.	1			Serial No.		687	
Location	Campbell River			Isotope		Cs 137	
				Strength		125 mC	

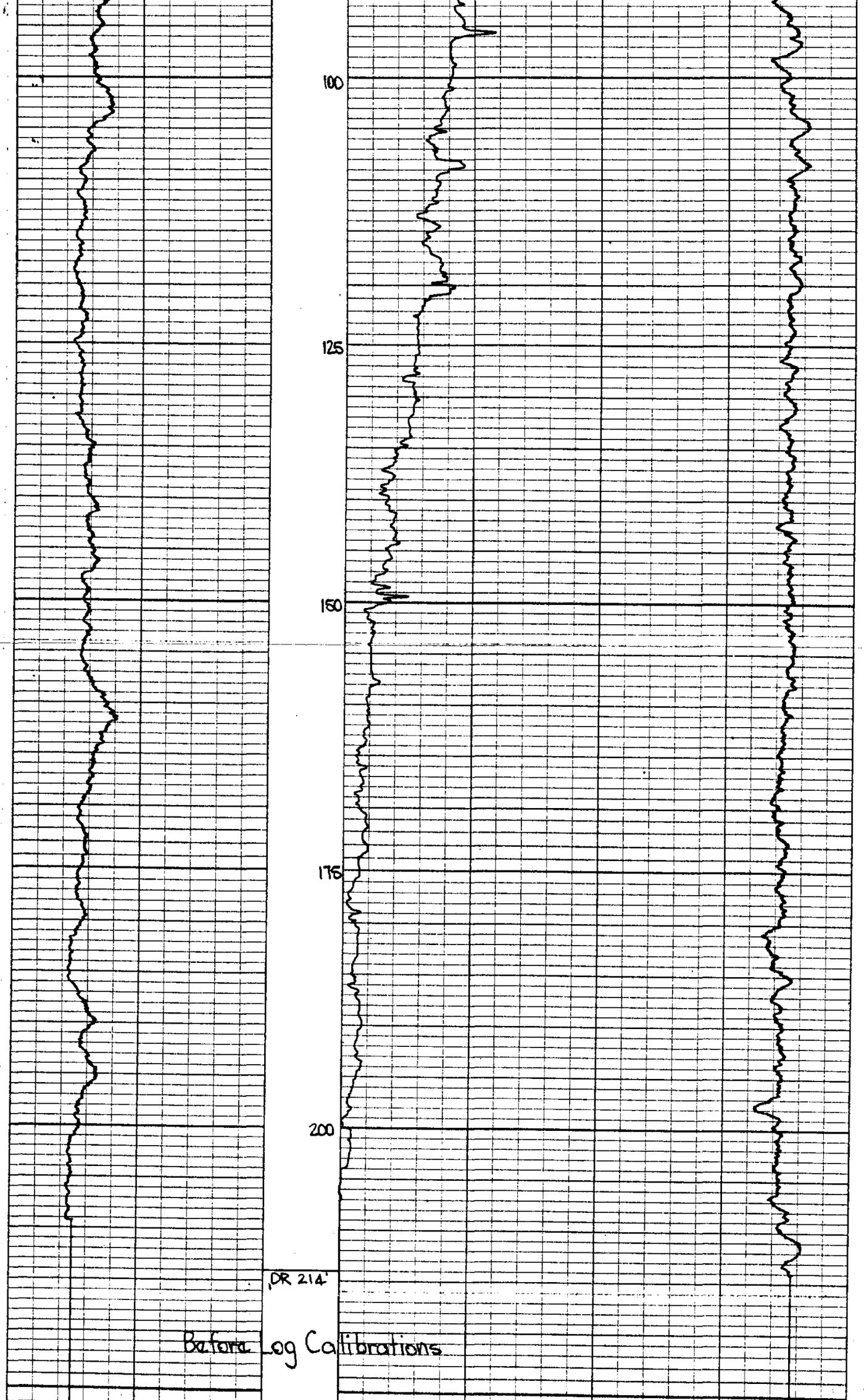
LOGGING DATA

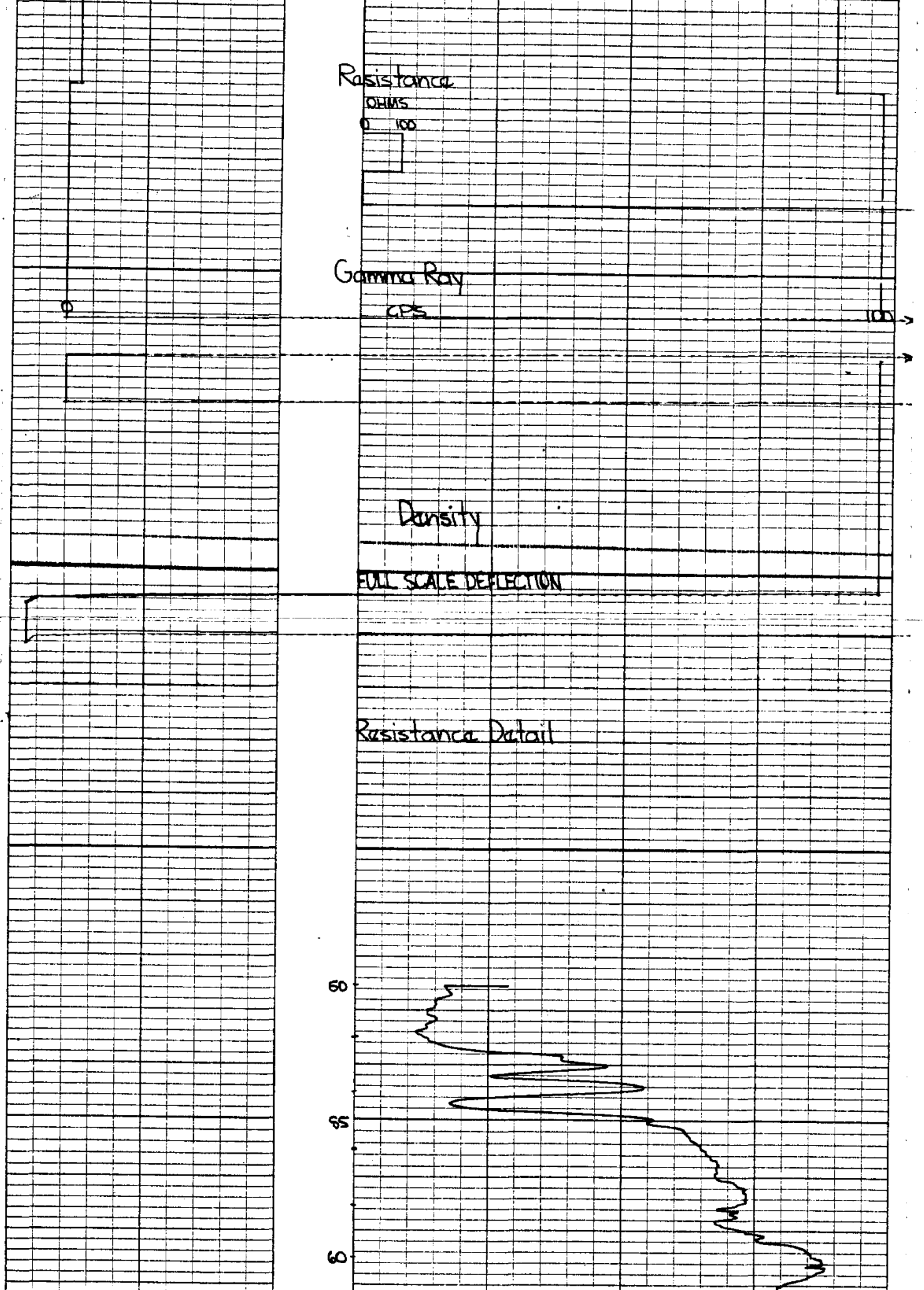
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
1	214'	0	10	4	100	2R	5.4	1	1K	.5L	

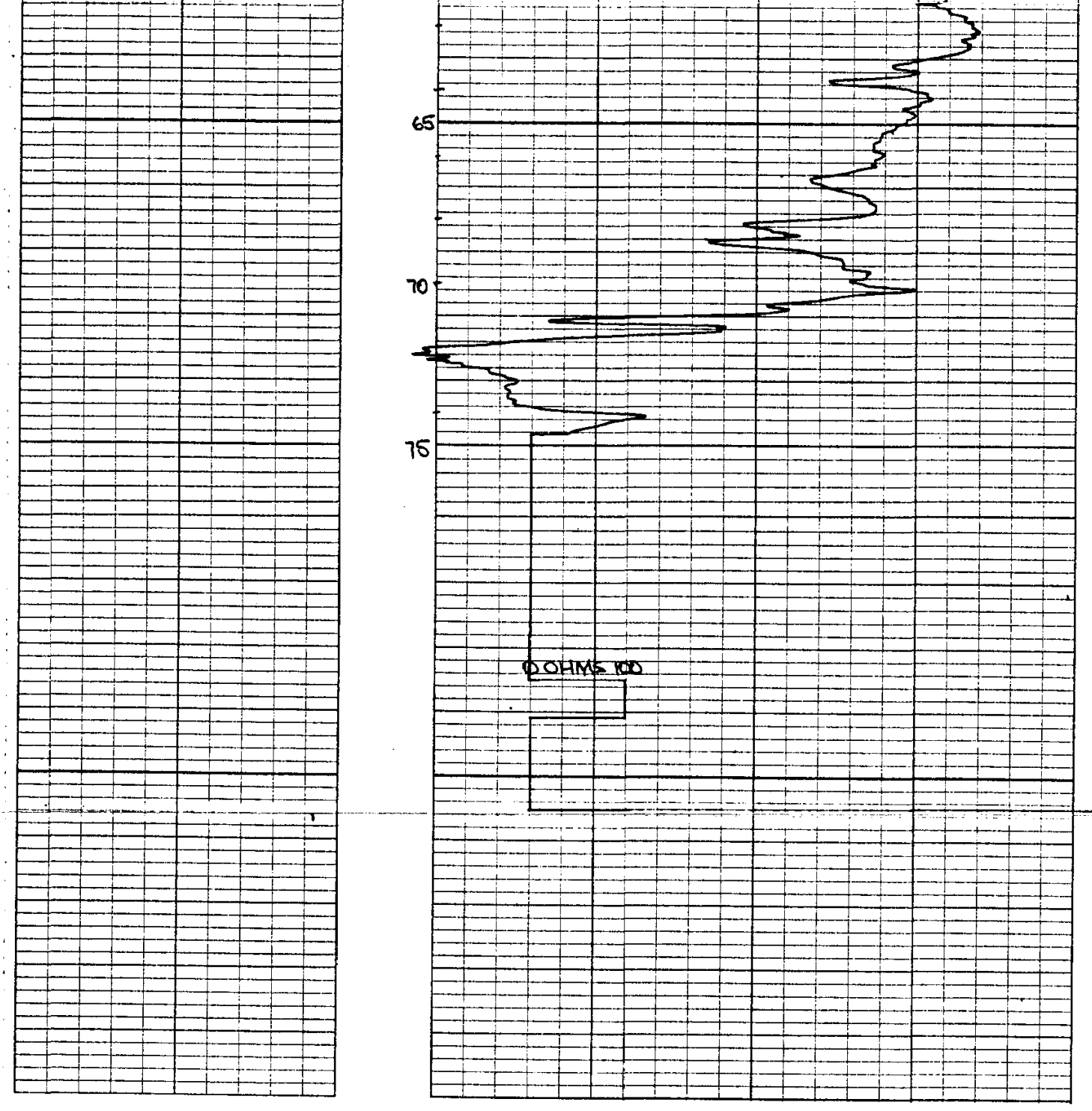
Reference Literature: N/A

Remarks: D. Brown
Fluid loss; tight zones


Gamma Ray
API Units
Caliper
Hole Diameter (inches)
DEPTH
Gm / cm3
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2.0
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3.0
Gamma Ray
Resistance
Density
0
BOTTOM CASING
25
50
75


100
125
150
175
200
DR 214'
Before Log Calibrations


Resistance
OHMS
0 100
Gamma Ray
CPS
0
100
Density
FULL SCALE DEFLECTION
Resistance Detail
50
55
60


65
70
75
0 OHMS 100

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: February 20,1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-30

APPROX. LOCATION: SEC. TWP. RGE. W.

SURVEYED LOCATION: 55+00 6993' left

ELEVATION: 1100'

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	11	sandstone	
11	15	shale	
15	20	coal	
20	84	grey shale	
84	98	coal	
98	120	brown sandstone	
120	170	grey sandstone	
170	184	basalt	

COMMENTS

WATER HORIZON FT.

Dr Gibson Title

CANADIAN ARCTIC SURVEY SYSTEMS LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXO TESTING LTD.
WELL DRILLHOLE NO. 11-30
FIELD BENGHAM 52-20
PROVINCE BRITISH COLUMBRIA

Loc. Sec. Twp. Rge. W

Elev.: K.B. 6,693.3 ft.
G.L. —

Permanent Datum: G.L.
Log Measured from: K.B.
Drilling Measured from: K.B.

Run No.	Date	Depth-Driller	Depth-Logger	Bottom Logged Interval	Top Logged Interval	Casing-Driller	Casing-Logger	Bit Size	Type Fluid in Hole	Density	Viscosity	pH	Fluid Loss	Source of Sample	Rm @ Meas. Temp.	Rmf @ Meas. Temp.	Rmc @ Meas. Temp.	Source of Rmf / Rmc	Rm @ BHT	Time Since Circ.	Max. Rec. Temp.	Equip. Location	Recorded By	Witnessed By
ONE	5/8/84	6,693	6,693	6,693	SURF.	6,693	SURF.	7 7/8"	GEL CHEM	9.6	40	9.5	6.4	MUD PIT	1.25 @ 68°F			MEAS.		4 HRS.	68°F	PRINCE GEORGE	R. CHAMBERS	
TWO	5/8/84	6,693	6,693	6,693	SURF.	6,693	SURF.	7 7/8"	GEL CHEM	9.6	40	9.5	6.4	MUD PIT	1.25 @ 68°F			MEAS.		4 HRS.	68°F	PRINCE GEORGE	R. CHAMBERS	

Field Remarks: 1.5 Percent Calcium Chloride Gel Chem Mud

Field Area: BENGHAM

Date: 5/8/84

Run No.: ONE

Depth-Driller: 6,693

Depth-Logger: 6,693

Bottom Logged Interval: 6,693

Top Logged Interval: SURF.

Type Fluid in Hole: GEL CHEM

Density: 9.6

Viscosity: 40

pH: 9.5

Fluid Loss: 6.4

Source of Sample: MUD PIT

Rm @ Meas. Temp.: 1.25 @ 68°F

Rmf @ Meas. Temp.:

Rmc @ Meas. Temp.:

Source of Rmf / Rmc: MEAS.

Rm @ BHT:

Time Since Circ.: 4 HRS.

Max. Rec. Temp.: 68°F

Equip. Location: PRINCE GEORGE

Recorded By: R. CHAMBERS

Witnessed By:

Run No.: TWO

Depth-Driller: 6,693

Depth-Logger: 6,693

Bottom Logged Interval: 6,693

Top Logged Interval: SURF.

Type Fluid in Hole: GEL CHEM

Density: 9.6

Viscosity: 40

pH: 9.5

Fluid Loss: 6.4

Source of Sample: MUD PIT

Rm @ Meas. Temp.: 1.25 @ 68°F

Rmf @ Meas. Temp.:

Rmc @ Meas. Temp.:

Source of Rmf / Rmc: MEAS.

Rm @ BHT:

Time Since Circ.: 4 HRS.

Max. Rec. Temp.: 68°F

Equip. Location: PRINCE GEORGE

Recorded By: R. CHAMBERS

Witnessed By:

Permanent Datum: G.L.
Log Measured from: K.B.
Drilling Measured from: K.B.

Elev.: K.B. 6,693.3 ft.
G.L. —

Fold Here

This Heading and Log Conforms to API. RP 33.

EQUIPMENT DATA

	Gamma Ray			Resistance		Density	
Run No.	One			One		One	Two
Tool Model No.	L-414			L-815		L-104	L-104
Diameter	2 1/8"			2 1/8"		2 5/8"	2 5/8"
Detector Model No.	CP-514			N/E		N/E	N/E
Type	Scint.					1.7c	
Length	1.5						
Spacing							
Length				10'		10"	
Horiz. Scale				66 ft/div		100,50,25	
Rm @ °F				N/A		N/A	
Source Model				N.G.V.P.			
Serial No.				687			
Isotope				Cs-137			
Strength				125 mC			

General																			
Run No.	Logging 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						
1	100		0		6	4	100	2R	N/A		1	1W	0L						

Gamma Ray

Run No.	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
1	100	0	6	4	100	2R	N/A	1	1W	0L

Density

References: Literature: N/A

Remarks: 1.5 Percent Calcium Chloride Gel Chem Mud

Gamma Ray
API Units
Caliper
Hole Diameter (Inches)

DEPTH

gm/cm3

Gamma Ray

Resistance

Density

0

BOTTOM CASING

25

FLUID LEVEL

50

75

100

125

150

175

DR 183

Before Log Calibrations

Resistance
OHMS
100

Gamma Ray
CPS
0
100

Density
FULL SCALE DEFLECTION

Resistance Detail

85

90

95

100

105

© ELGINS LTD.

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: Feb 22, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-31

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 49+31 4987. Lt

ELEVATION: 1079.2

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	108	grey sandstone	
108	125	brown shale	
125	128	coal	
128	133	carbonaceous shale	
133	135	coal	
135	158	carbonaceous shale	
158	165	brown sandstone	
165	195	white sandstone	
195	205	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

CANADIAN ARCTIC SURVEY SYSTEMS LTD.
700 - 33 A STREET N.W. CALGARY - ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXO TESTING LTD.
WELL DRILLHOLE GDJ 12-21 / 4787 / 44
FIELD QUINSAM
PROVINCE BRITISH COLUMBIA

Lsd. Sec. Twp. Rge. W
Elev.: K.B. 222.2 ft. above perm. datum
G.L.

Other Services

Permanent Datum: G.L.
Drilling measured from: G.L.

Date: 22 Feb 77
Run No.: One
Type Log: Natural
Depth - Driller: 204'
Depth - Logger: 202'
Bottom logged interval: 202'
Top logged interval: Surface
Type Fluid in Hole: Water
Salinity, PPM Cl: N/A
Density: N/A
Level: Full
Max. rec. temp. deg. F: 68°
Operating rig time:
Recorded By: S. Schmidt
Witnessed By: L. Dyer

RUN No. | BIT | CASING RECORD | BORE-HOLE RECORD
From | To | Size | Wgt. | Grade | From | To
A | 6¾" | Surf. | 202' | 7" | N/A | N/A | Surf. | 202'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

	Gamma Ray		Resistance	Density	Caliper
Run No.	One	Run No.	One	One	
Tool Model No.	L-104	Tool Model No.	L-104	L-104	
Diameter	2 1/8"	Diameter	2 1/8"	2 1/8"	
Detector Model No	CP-514	Type Spacing	ME	E	
Type	Scint.			1.5"	
Length	1.5"	Length	5"		
		Horiz. Scale	16" N/M		
		Rm @ °F	N/A		
General		Source Model		HDVP	
Hoist Truck No.	1	Serial No.		687	
Inst. Truck No.	1	Isotope		Cs 137	
Location	Campbell River	Strength		125 mC	

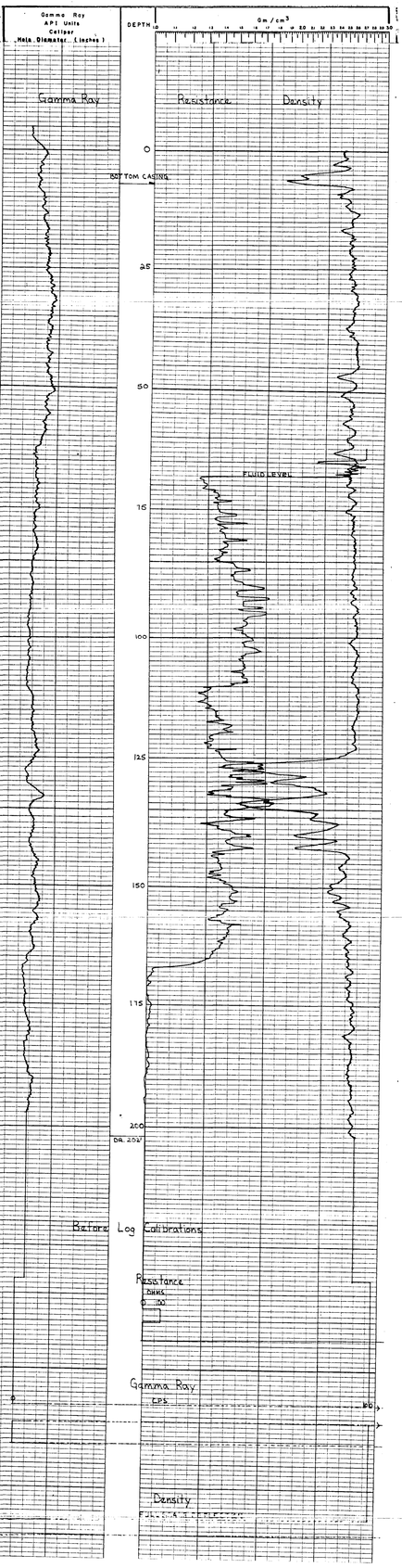
LOGGING DATA

General

Run No.	Depths From	Depths To	Speed Ft/Min	T.C. Sec.	Gamma Ray Sens. Settings	Gamma Ray Zero Dn. L or R	Gamma Ray API G.R. Units per Log Div.	Resistance T.C. Sec.	Resistance Sens. Settings	Density Zero Dn. L or R
1	202	0	10	4	100	2R	5.4	1	1K	.5L

Reference Literature: N.A.

Remarks: D. Braun



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: Feb 22, 1977

COMPANY: Lexco Testing

HOLE NO.: Line 55 QU-77-32

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 55+00 7645 Lt

ELEVATION: 1093'

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	8	Till	
8	29	gray sandstone	
29	45	coal	
45	51	brown shale	
51	55	gray sandstone	
55	80	brown shale	
TD	80'		

COMMENTS _____

WATER HORIZON _____ FT. _____

LUSCAR LTD.
CORE HOLE LOG

HOLE NO. QU-77-32

PAGE 1 OF 1

Line 55+00 7645 It. February 24, 1977

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION (LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION)
1	30	39	9.0			
				.9		siltstone; med.grey; massive; hard;
				5.1		coal; bright; blocky; massive; med.hard; abundant disseminated pyrite;
				.4		shale; med.brown; fissile; broken up coaly
				4.8		coal; bright; blocky; massive; med.hard; abundant disseminated
				.85		coal; soft; crushed; mil by coring action
2	39	45				
				2.25		coal; badly crushed; badly milled by coring action; lost core
3	45	54				
			8.0			
				1.0		Lost core
				1.0		siltstone; badly milled; loose in core tube; med.grey; fissile;
				2.1		siltstone; massive but fractured; med. grey; coaly laminae;
				1.7		shale; badly milled; coaly bands; dark grey to black
				1.3		siltstone; med greyish brown; massive; hard; fractured at 20° to core axis; coaly lenses
				.95		siltstone; soft; crushed; coaly lenses; fissile
				1.1		siltstone; massive; hard; med.greyish brown coaly lenses

TRUE DEPTH

LITH. COLUMN 1" = 10'

TRUE DEPTH | LITH. | SEC.

SAMPLE #3

#4

SAMPLE #5

TOTALS ÷ X100 = % REC. SEAM

÷ X100 = % TOT. REC. SEAM(S)

Re-Evaluation 77/12/...

CANADIAN ARCTIC SURVEY SYSTEMS LTD.

700 - 13 A STREET, N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEKO TESTING LTD.

WELL DRILLSOLE 80-31-52

FIELD GUINSAM

PROVINCE BRITISH COLUMBIA

Permanent Datum: Grd. Elev. 2425 ft. Above Perm. Datum

Log measured from: G.L. 16 ft. above perm. Datum

Drilling measured from: G.L.

Elev.: K.B. 2441 ft. D.F. — G.L. 2425 ft.

Other Services: Two Resistivity

Date: 27th Feb. '77

Run No.: One

Depth-Driller: 1350

Depth-Logger: 1350

Bottom logged interval: 1350

Top logged interval: Surface

Type fluid in hole: Water

Salinity, PPM Cl: N/A

Density: N/A

Level: Full

Max. rec. temp. deg. F: 55

Equipment location: Lethbridge

Recorded By: G. Sanchuck

Witnessed By: Lionbar

RUN | BIT | CASING | CASING RECORD | BORE-HOLE RECORD

1 | 8 3/4" | Surf. | 8 5/8" | 24 | 1350 | 8 3/4" | 1350

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

	Gamma Ray		Resistance	Density	Resistivity Detail
Run No.	One		One	One	Two
Tool Model No.	L-103		L-103	L-103	L-103
Diameter	2⅜		2⅜	2⅜	2⅜
Detector Model No.	CP-51A		ME	F	ME
Type	Scint				
Length	15		5	15	5
Horiz. Scale			66.66/in		55.56/in
Rm @ °F			N/A		N/A
Source Model				H 20 VP	
Serial No.				687	
Isotope				Cs 137	
Strength				125 mC	

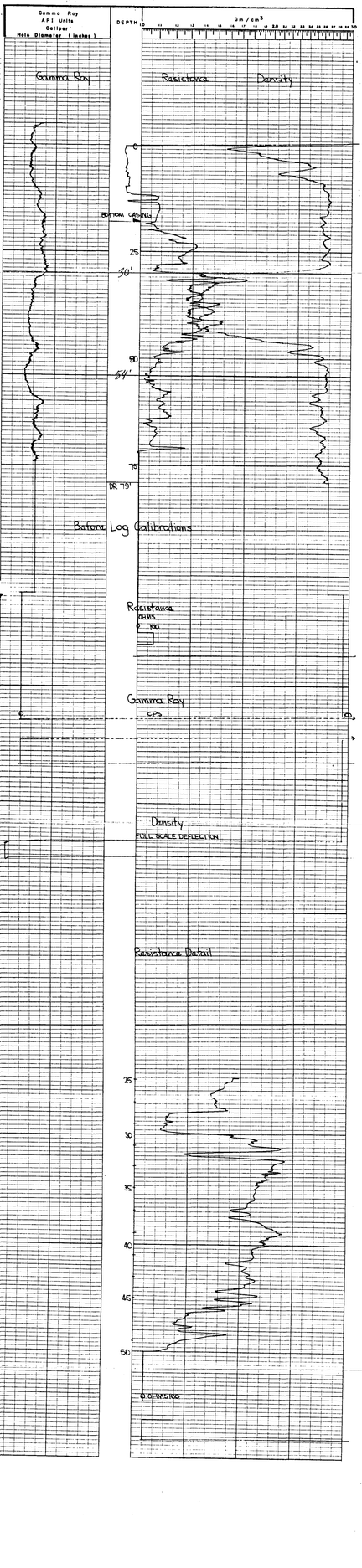
General: Hoist Truck No. 1; Inst. Truck No. 1; Location: Campbell River

LOGGING DATA

General					Gamma Ray				Density		
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
1	150	0	10	1	100	2R	15	1	1R	6L

Reference Literature: N/A

Remarks: H. Viveatt



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: Feb 23, 1977

COMPANY: Lexco Testing

HOLE NO.: Line 45 QU-77-33

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 45+00 9499 T.t

ELEVATION: 1156

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	7	Weathered sandstone	
7	15	grey sandstone	
15	20	siltstone	
20	35	coal	
35	42	brown shale	
42	73	gray shale	
73	168	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

LUSCAR LTD.
CORE HOLE LOG

HOLE NO. QU-77-33

PAGE 1 OF 1

45+00 9499 Lt. Feb 24, 1977

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION (LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION)	TRUE DEPTH
1	19	27	8.0				
				2.0'		Siltstone; med grey; soft; fissile; abundant coal laminae; no visible bedding; top 3 inches milled by coring action.	
				.7		coal; bright; blocky; massive; disseminated Med. hard; calcite on cleats	
				.05		shale; coaly; hard but fissile; bedding angle N 10° to core axis	
				5.25		coal; as above; bright; blocky; calcite on cleat surfaces; med hard; massive; disseminated pyrite.	
2	27	35	8.1				
				.85		coal; as above; fractured horizontally every .05 ft. approximately;	
				.30		coal; soft; crushed;	
				4.05		coal; bright; blocky; massive; med. hard disseminated pyrite; calcite on cleats	
				2.9		coal; platy; dullbands; disseminated pyrite	
3	35	43	7.4				
				2.4		coal; dull and bright banded; no visible pyrite; fractured; med. hard;	
				.55		siltstone; crushed; med. brown; soft	
				.2		coal; massive; bright and dull banded	
				.9		silt stone; med. brown; massive; med. hard coaly laminae;	
				1.4		coal; bright and dull banded; shaly; fractured	
				2.0		siltstone fractured; med. brown; crushed coaly laminae;	

LITH. COLUMN 1" = 10'

SAMPLE #1

#2

TOTALS

÷ X100 = % REC. SEAM

÷ X100 = % TOT. REC. SEAM(S)

Ck- Gunsan 72/8/2

CANADIAN ARCTIC SURVEY SYSTEMS LTD.

GAMMA DENSITY & RESISTANCE

COMPANY: ESSO RESOURCES CANADA LTD.

WELL: DRILLSITE G-71-35 (A-6) (L.S. 13)

FIELD: SUNRAY

PROVINCE: BRITISH COLUMBIA

DRILLING RECORD

Run No.	Bit From	Bit To	Size	Type	Fluid in Hole	Density	Visc.	Fluid Loss
1	Surf.	1311	12¼	Rock	Water			
			8¾					

Permanent Datum: G.L. Elev. 1055
Log measured from: G.L. 11 ft. above perm. Datum
Drilled: Depth-Driller 1311, Depth-Logger 1311, Bottom Logged Interval 1310, Top Logged Interval Surf.
Casing: Type Surface, Size 9⅝, Wgt. & Grade 36#, Depth-Driller 1311, Depth-Logger 1311, Bottom Logged Interval 1310, Top Logged Interval Surf.
Type Fluid in Hole: Water
Max. rec. temp. deg. F: N/A
Equipment Location: Campbell River
Recorded By: G. Sanchez
Witnessed By: Scantlebury

Sec. Twp. Rge. W4
Elev.: K.B. 1055, D.F., G.L.

Rob Dubiel
Rob Dubiel

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

	Gamma Ray			Resistance	Density	Density
Run No.	One		Run No.	One	One	One
Tool Model No.	L705		Tool Model No.	L705	L705	L705
Diameter	2⅛"		Diameter	2⅛"	2⅛"	2⅛"
Detector Model No.	CP-5N		Type	NE	NE	NE
Type	Scint		Spacing		15"	
Length	N/A		Length	5'		5'
			Horiz. Scale	50"/div.		50"/div.
			Dm @ FF	N/A		N/A
General						
Hotel Truck No.	1		Source Model		H.D.V.P.	
Insr. Truck No.	1		Serial No.		687	
Location	Campbell River		Leakage		Cs. 137	
			Strength		125 mC	

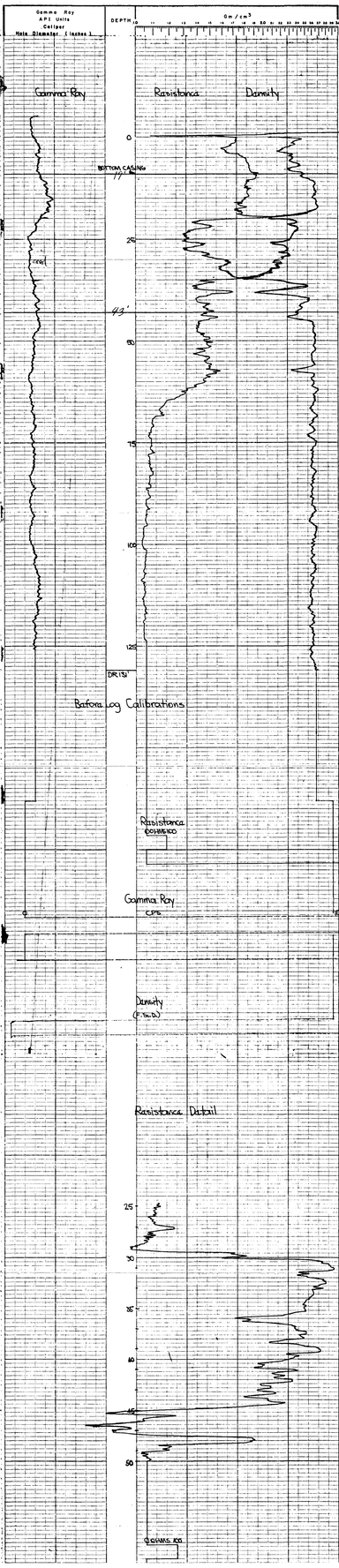
LOGGING DATA

Gamma Ray

Run No.	Depths From	Depths To	Speed Ft./Min.	T.C. Sec.	Sens. Settings	Zero Dis. L or R	API G.R. Units per Log Div.	T.C. Sec.	Density Sens. Settings	Density Zero Dis. L or R
1	1311	0	10	4	100	28	50	1	1R	5L

Reference Literature: N/A

Remarks: H. Vincent



LEXCO TESTING LTD.

DRILL HOLE REPORT

COALFIELD: Campbell River DATE: March9/77

COMPANY: Lexco

HOLE NO.: _____ Core Hole Qu-77-34 C

APPROX. LOCATION: _____ SEC. ____ TWP. ____ RGE. ____ W. ____

SURVEYED LOCATION: 45+00 7987.8' Lt. of B/L

ELEVATION: 1165.2'

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	6	Boulders	Core #1-50-58
6	107	Sandstone	Core #2-58-62
107	117	Coal	Core #3-62-65.5
117	130	Brown Shale	Core #4-65.5-72
130	136	Sandstone	Core #5-72-81
136	167	Brown Shale	Core #6-81-90
167	176	Coal	Core #7-90-99
176	186	Shale with coal stringers	Core #8-101-110
186	200	Sandstone	Core #9-110-119
			Drilled from 119-164
			Core # 10-164-171.5
			" " # 11-171.5-176.5
			" " # 12-176.5-185.5
			" " " 13-185.5-191
			" " # 14-191-200

COMMENTS _____

WATER HORIZON _____ FT. _____

LUSCAR LTD.
CORE HOLE LOG

HOLE NO. QU-77-34

PAGE 1 OF 2

45+00 8000 Lt.. Mar,10/77

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION (LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION)	TRUE DEPTH
1	50	58					
				7.8		sandstone;med grained;med greenish grey; massive; RQD n 100%	
2	58	62					
				5.3		sandstone; as above;grading into coarser grained near bottom	
3	62	65.6		3.3		sandstone; as above	
4	65.6	72		6.6		sandstone; as above	
5	72	80		7.5		sandstone; as above	
6	80	90		9.2		sandstone; as above	
7	90	99		7.7		sandstone; as above	
8	101	110		9.7			
				.8		sandstone; broken up; milled by coring action; lost core; med grained; as above	
				6.2		sandstone; med greenish grey; medium grained; massive; RQD =100% becoming coarser at base	
				.2		siltstone; dark grey; sandy coaly lenses horizontal bedding; med hard; some fissility; greenish siltstone crossbeds	
				.25		siltstone; as above but much soalier	
				1.2		coal; bright and blocky but with some thin greenish-black siltstone laminae; dish shaped bedding indicating bad stress coal is med hardness; small amounts of pyrite visible on cleats	
				1.1		coal; bright and blocky; massive; med hard; more abundant evidence of pyrite in this zone; some thin dirt bands evident near base .05 ft.	
9	110	119	8.7				
				1.55		coal; bright; blocky; soft; badly broken up and crushed; massive pyrites on cleats	
				.2		mudstone;v. soft plastic;med brown to black;coal fragments throughout	
				.25		coal;dirty;abundant massive pyrite;	
				.55		mudstone;med grey;coaly lenses;fissile; fairly soft	
				.1		coal;dirty;blocky;massive pyrite;	
				6.1		mudstone-shale;med grey;medium hard; coaly lenses at top;massive but fissile	

TOTALS ÷ X100 = % REC. SEAM

÷ X100 = % TOT. REC. SEAM(S)

LITH. COLUMN 1" = 10'

TRUE DEPTH | LITH. | SEC.

LUSCAR LTD.
CORE HOLE LOG

HOLE NO. QU-77-34

PAGE 2 OF 2

45+00 7987.8 Lt March 6/77

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION (LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION)	TRUE DEPTH
10	164	171	1.5				
			6.7	2.5		coal; bright blocky; badly fractured; med hard; abundant pyrite;	
				3.7		coal; bright; soft; pyrite visible massive calcite on cleats and fractures;	
				.55		coal; bright; platy; dull bands; pyrite visib	
11	171.5	176.5					
			5.1	1.4		coal; as above	
				.45		coal; soft; crushed; milled by coring action pyrite visible	
				2.05		coal; bright; platy; some dull bands pyrite visible;	
				1.1		mudstone-shale; med brown; fissile; coaly lenses; med hard	
12	176.5	185.5					
			9.1	1.3		mudstone-shale; as above	
				.4		coal; dirty; shaly; soft; crushed	
				.7		mudstone; soft; fissle; coaly	
				3.2		siltstne; hard; med greenish grey; massive	
				.6		mudstone; soft; fissile; coaly	
				.15		coal; soft; dirty; crushed	
				2.75		shale; hard; fissile; coaly laminae med greyish green;	
13	185.5	191.5	7				
				.5		siltstone; med grey-brown; shaly; hard; massive	
				.5		siltstone; as above but badly crushed	
				.2		siltstone; coaly; soft; shaly; med brown to black	
				3.35		siltstone; med brown to buff; hard; massive shaly	
				.2		coal; soft; dirty; shaly	
				.55		siltstone; massive; med brown; hard	
				.15		coal; as above	
				.2		shale; med grey to dark grey; fissile; med hard;	

LITH. COLUMN 1" = 10'

TRUE DEPTH | LITH. | SEC.

TOTALS			÷ X100 = % REC.	SEAM
			÷ X100 = % TOT. REC.	SEAM(S)

Canadian Arctic Surveys Ltd.

GAMMA DENSITY & RESISTANCE

COMPANY: LE NOD TESTING LTD.
WELL: CORE HOLE GA-73-36
FIELD: DRUMSEAM
PROVINCE: BRITISH COLUMBIA

Permanent Datum: G.L. Elev. 0 ft. Above Perm. Datum
Log Measured From: G.L. 0 ft. Above Perm. Datum
Date: 10 Nov. 73
Run No.: One
Depth-Driller: 180
Depth-Logger: 180
Bottom Logged Interval: 180
Top Logged Interval: Surface
Type Fluid in Hole: Water
Salinity, PPM Cl: N/A
Density: N/A
Level: Full
Max. Rec. Temp. Deg. F: 50
Equipment No. & Location: 85 Spec. Mobile Condenser
Recorded By: R. Brown
Witnessed By: Core Driller

Elev. K.B. 0 ft.
Elev. D.F. 0 ft.
Elev. G.L. 0 ft.

Other Services: None

97

Fold Here — This Heading and Log Conforms to API RP 33 — Fold Here

EQUIPMENT DATA

Gamma Ray			Resistance	Density	Caliper
Run No.	One		One	One	
Tool Model No.	L-103		L-103	L-103	
Diameter	2 1/8"		2 1/8"	2 1/8"	
Detector Model No.	CE-514				
Type	Scint.				
Length	1.5				

Gamma Ray			Resistance	Density	Caliper
Run No.	One		One	One	
Tool Model No.	L-103		L-103	L-103	
Diameter	2 1/8"		2 1/8"	2 1/8"	
Type					
Spacing			13"		
Length			10'		
Mode, Scale, Rm @ °F			3.1 Ω/div N/A		
Source Model				H.D.V.P.	
Serial No.				687	
Isotope				Ca. 137	
Strength				175 mC	

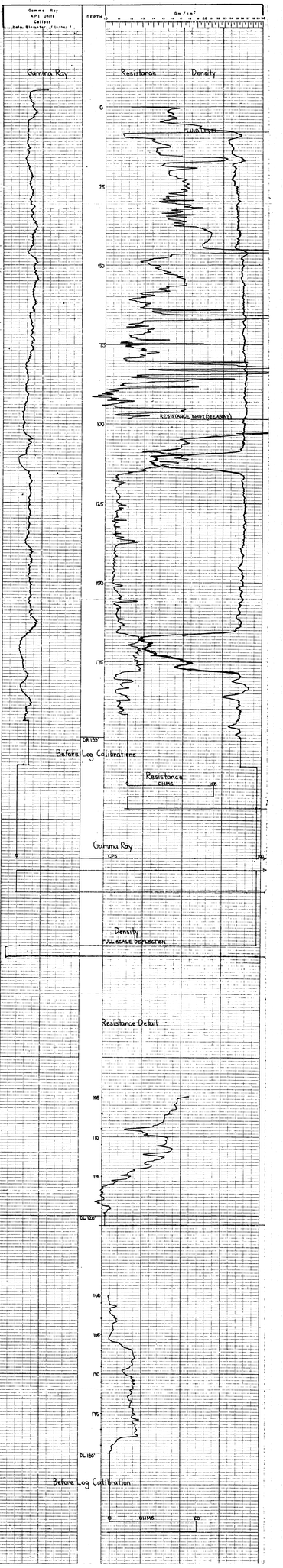
General	
Hotel Truck No.	
Seat. Truck No.	
Location	Campbell River

LOGGING DATA

General					Gamma Ray					Density			
Run No.	Depths From	Depths To	Speed Ft./Min.	T.C. Sec.	Sens. Settings	API: G.R. Units per Log Div. L or R	T.C. Sec.	Sens. Settings	Cave Div. L or R
1	1198	0	10	4	100	25	5.4	1	1K	6L

Reference Literature: N/A

Remarks: R. Brown
Note large resistance scale and salinity change in fluid
Sound nib in hole
Resistance curve shifted 25 divisions left @ 98'



CANADIAN ARCTIC SURVEY SYSTEMS LTD.

GAMMA DENSITY & RESISTANCE

7108 - 32 A STREET N.W. CALGARY, ALTA.

C.K. Gustafson 77 Cole

COMPANY LEXCO TESTING LTD.

WELL CORE HOLE DRILLHOLE QU 4ft 800' LL

FIELD QUINSAM 45°00' 122°28' 44

PROVINCE BRITISH COLUMBIA

Other Services

Permanent Datum: G.L. Elev. 0 ft.

Log Measured From: G.L. 10 ft. Above Perm. Datum

Drilling Measured From: G.L.

Elev.: K.B. — D.F. — G.L. —

Date: 10 Mar. 77

Type Log: Gamma

Depth-Driller: 199'

Depth-Logger: 199'

Bottom Logged Interval: 199'

Top Logged Interval: Water

Type Fluid in Hole: N/A

Salinity, PPM Cl: N/A

Density: 10

Level: Full

Max. Rec. Temp. Deg. F.: —

Equipment Location: Campbell River

Recorded By: G. Lowe

Witnessed By: Spectator

RUN NO. | BIT NO. | CASING RECORD | BORE HOLE RECORD

RUN NO.	BIT NO.	From	To	Size	Wgt.	From	To	From	To
1	5 7/8	Surf.	T.D.						

Fold Here

This Heading and Log Conforms to API RP 31

EQUIPMENT DATA

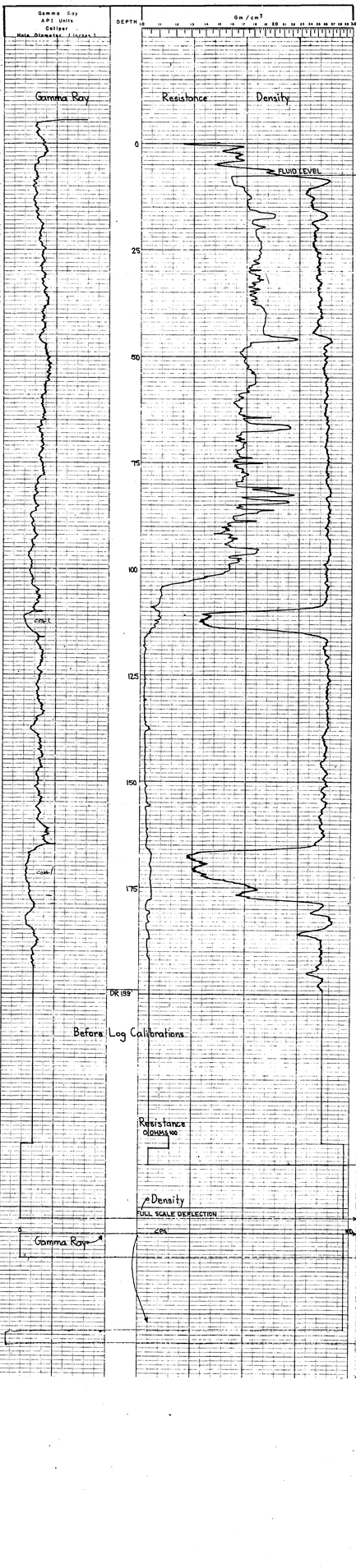
	Gamma Ray			Resistance	Density	Caliper
Run No.	One		Run No.	One	One	
Tool Model No.	L-103		Tool Model No.	L-103	L-103	
Diameter	2 3/8		Diameter	2 1/4	2 3/8	
Detector Model No.	CP-514		Type	ME	F	
Type	Scint.		Spacing		13	
Length	1.5		Length	6		
			Horiz. Scale Rm @ °F	50 A/div. N/A		
General			Source Model		H.O.V.P.	
Hoist Truck No.	1		Serial No.		687	
Inst. Truck No.	1		Isotope		Cs 137	
Location	Campbell River		Strength		125 mC	

LOGGING DATA

	General			Gamma Ray				Density		
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
1	199'	0	10	4	100	2R	5.4	1	1K	5L

Reference Litesolure: N/A

Remarks: D. Brown
First run in hole



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 13, 1977

COMPANY: Lexco Testing

HOLE NO.: 77-35 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,129,430 N 1,068,725 E

ELEVATION: 2091

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	5	till	
5	12	grey sandstone	
12	14	coal	
14	30	brown shale	
30	120	grey sandstone	
120	142	siltstone	
142	170	grey sandstone	
170	227	siltstone	
227	282	grey sandstone	
282	325	siltstone	
325	537	grey sandstone	
537	545	basalt	

COMMENTS _____

WATER HORIZON 25 FT. 30 gal

Ex-Gunsam 77(3)a

CANADIAN ARCTIC SURVEY SYSTEMS LTD. 708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE CH.CR. 77-35 79

FIELD CHUTE CREEK

PROVINCE BRITISH COLUMBIA

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Other Services

Permanent Datum G.L. Elev. ___ Elev. K.B. ___

Log measured from G.L. ___ ft. above perm. Dat. D.F. ___

Drilling measured from G.L. G.L. ___

Date	13 Mar. '77
Run No.	One
Type Log	Nuclear Res.
Depth - Driller	545'
Depth - Logger	498'
Bottom logged interval	498'
Top logged interval	0
Type fluid in hole	Water
Salinity, PPM Cl.	N/A
Density	N/A
Level	22.9'
Max. rec. temp. deg. F.	
Operating rig time	1.25 hrs.
Recorded by	G. Sanchuck Jr
Witnessed by	S. Gardner

BORE-HOLE RECORD

RUN No.	Bit	From	To
1	6"	Surf.	17'
	4"	17'	T.D.

CASING RECORD

Size	Wgt.	From	To
5"		Surf.	17'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

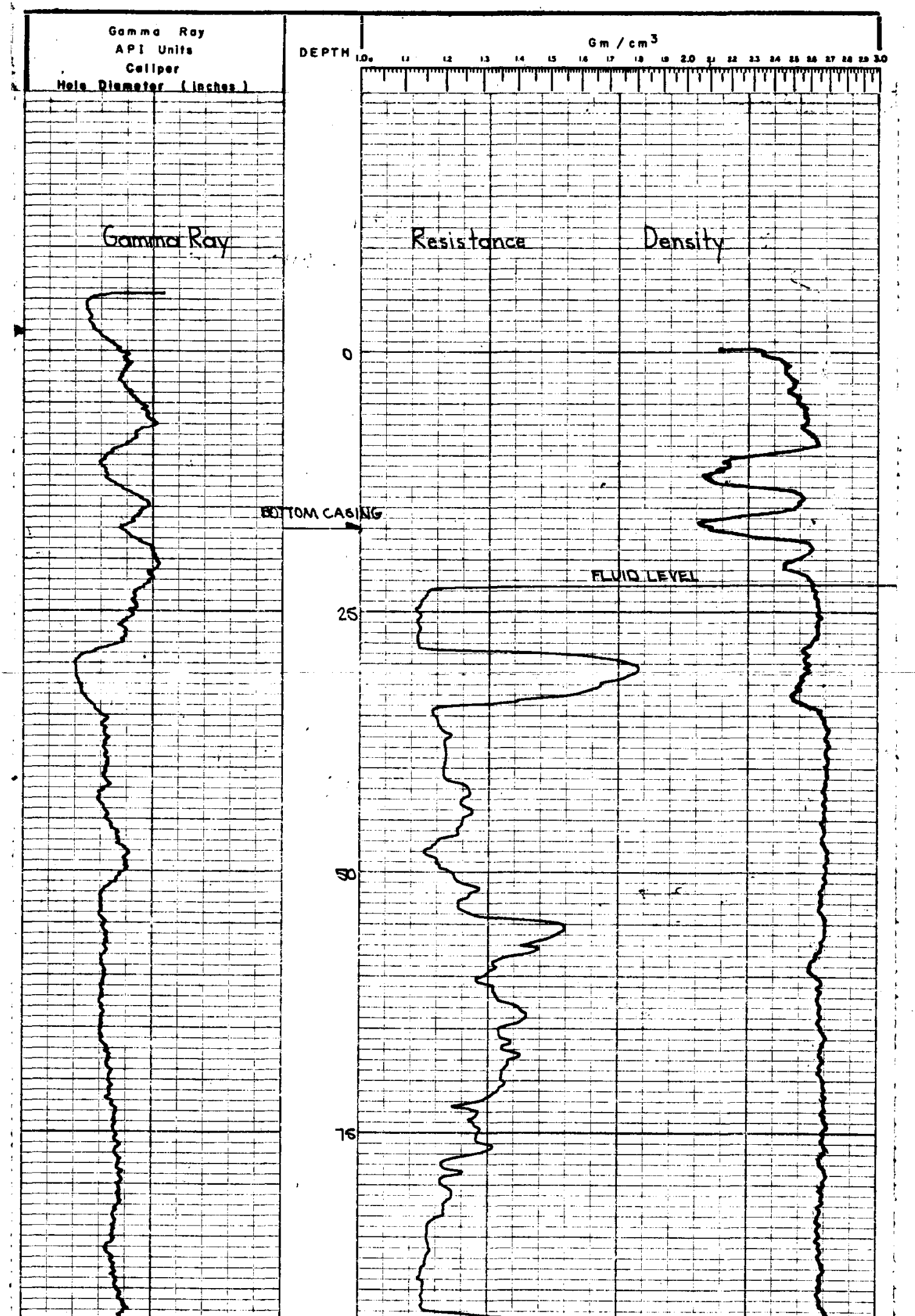
Gamma Ray					Resistance	Density	Caliper
Run No.	One			Run No.	One	One	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2 1/8"			Diameter	2 1/8"	2 1/8"	
Detector Model No	CP-514			Type	ME	F	
Type	Scint.			Spacing		13"	
Length	1.5"						
				Length	.5"		
				Horiz. Scale	50 Ω/div.		
General				Rm @ °F	N/A		
Hoist Truck No.	1			Source Model		HDVP	
Inst. Truck No.	1			Serial No.		687	
Location	Campbell River			Isotope		Cs 137	
				Strength		125 mC	

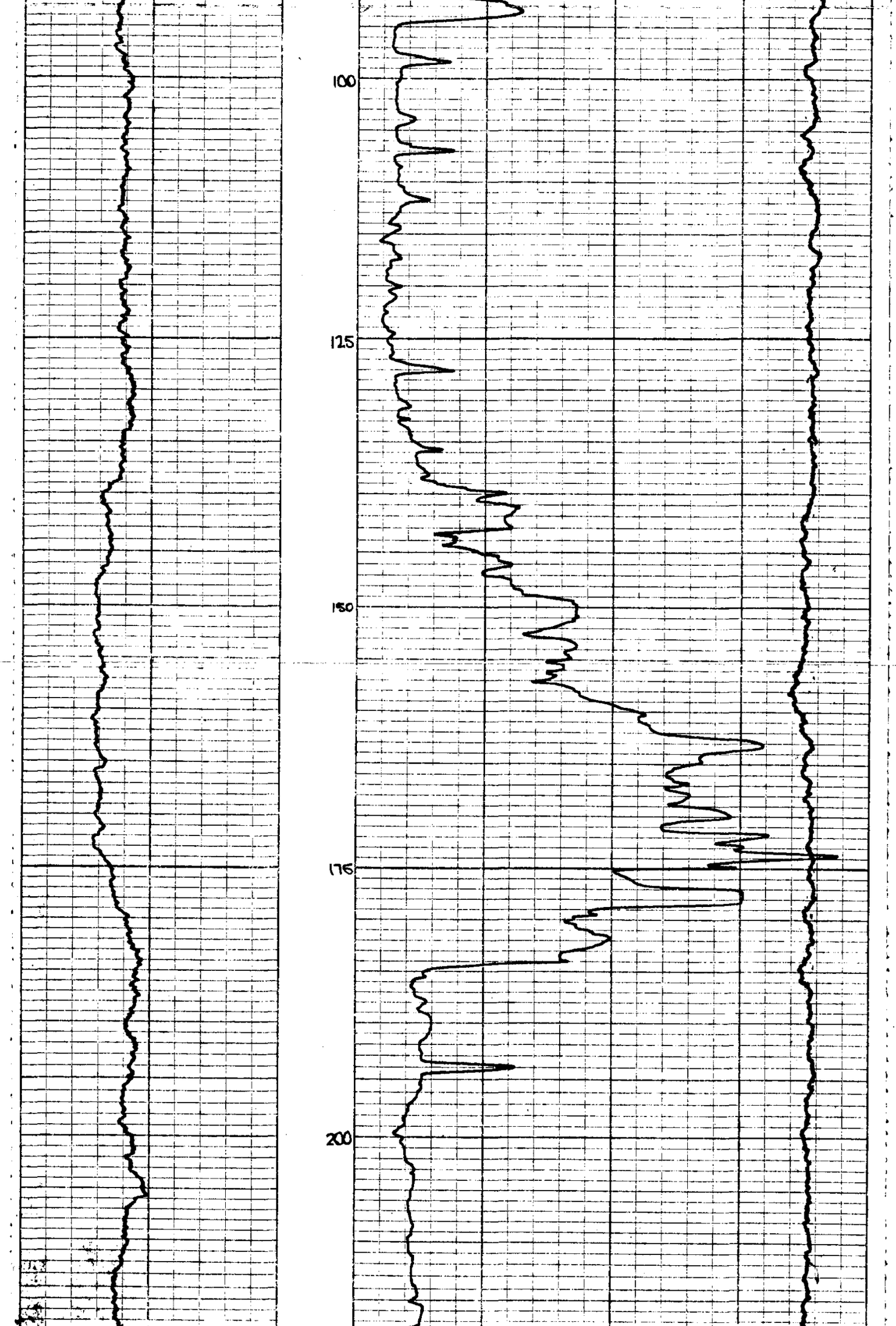
LOGGING DATA

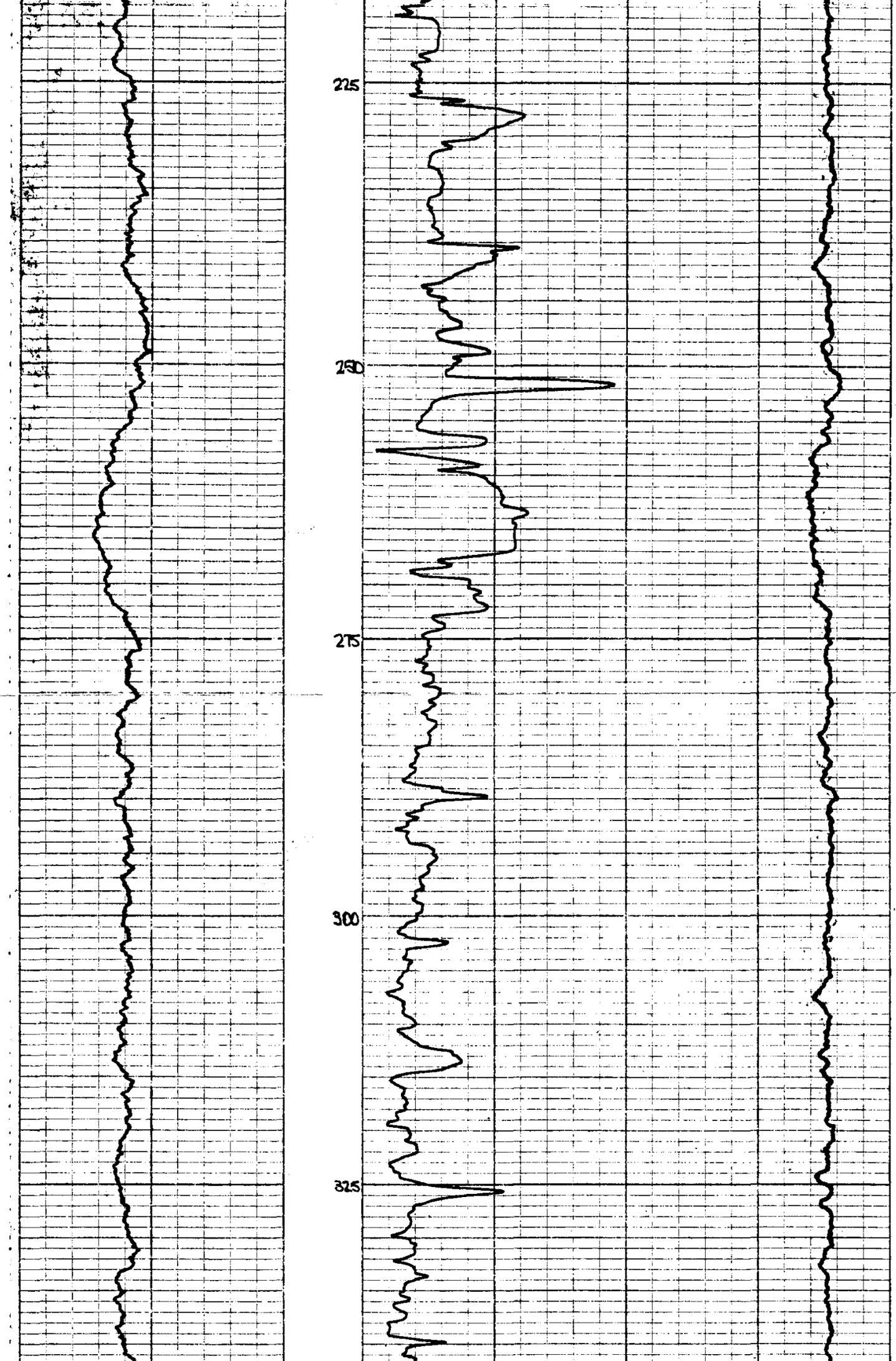
General				Gamma Ray				Density			
	Depths		Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero	
Run No.	From	To	Ft./Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R	
1	498'	0	10	4	100	2R	5.4	1	1K	.5L	

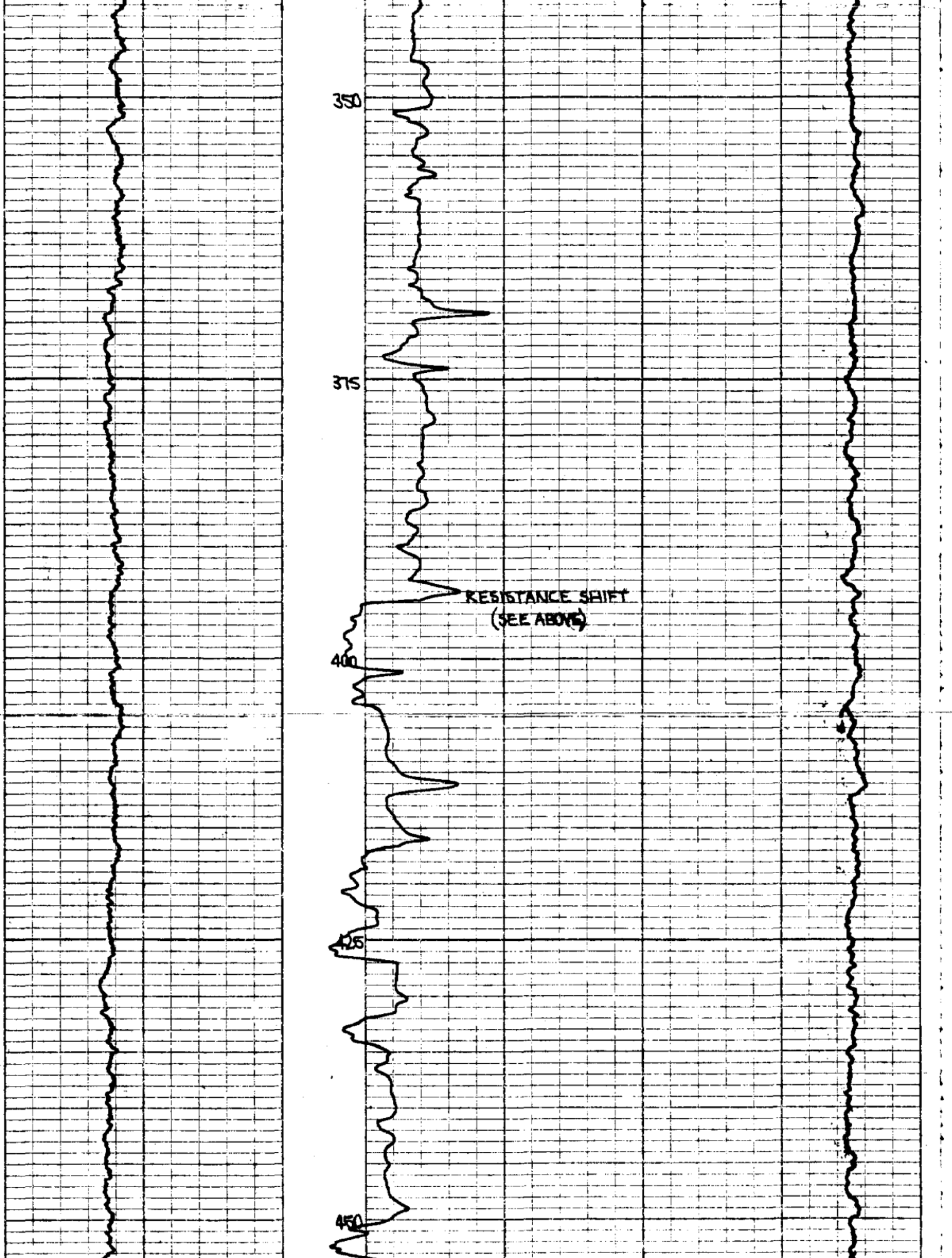
Reference Literature: N/A

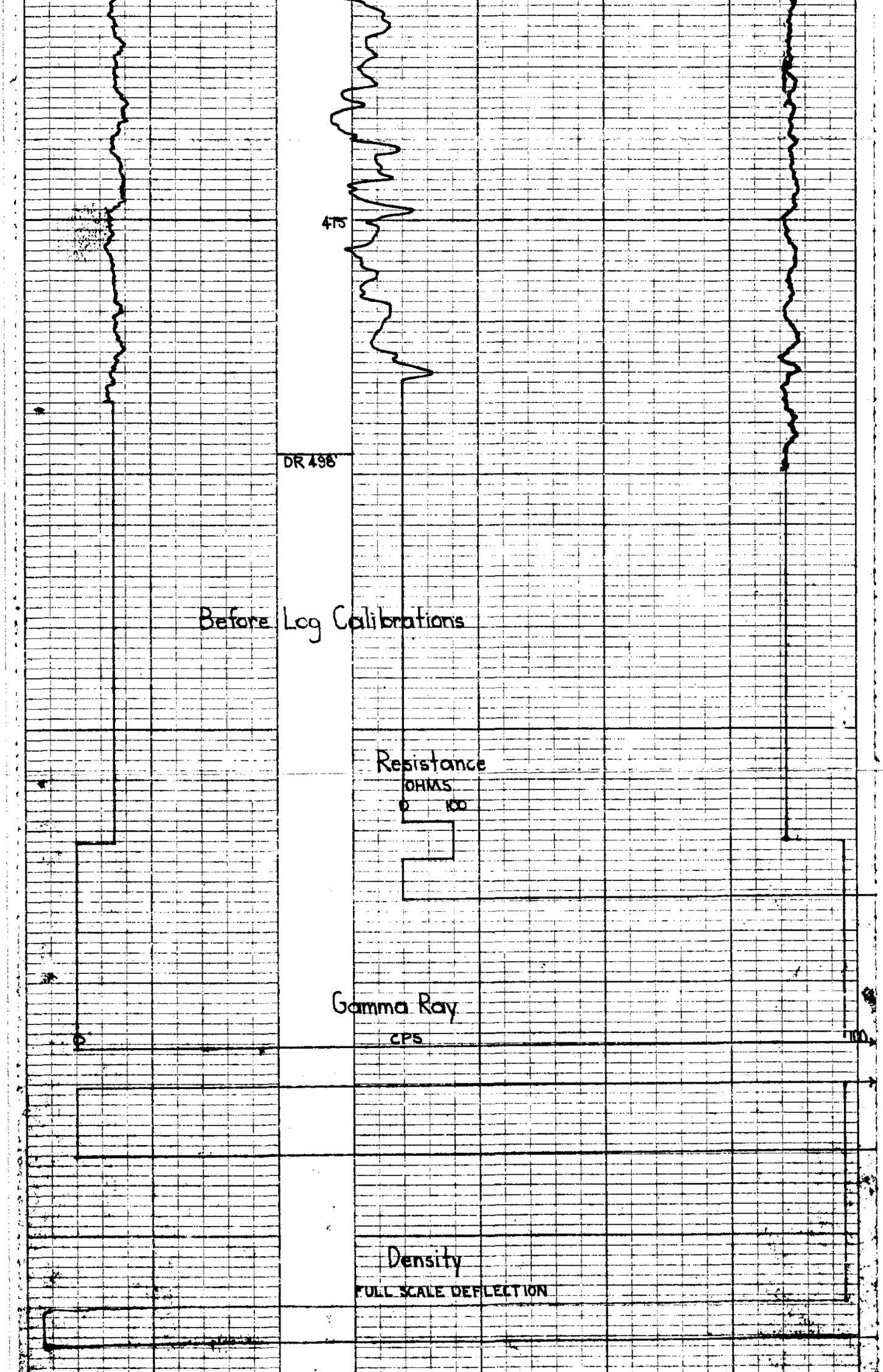
Remarks: H. Vincett
Hole bridged @ 498.5'; logged from bridge
Resistance curve shifted 2 divisions right @ 395'


Gamma Ray
API Units
Caliper
Hole Diameter (inches)
DEPTH
Gm / cm3
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0
Gamma Ray
Resistance
Density
0
BOTTOM CASING
FLUID LEVEL
25
50
75


100
125
150
175
200


225
250
275
300
325


350
375
RESISTANCE SHIFT
(SEE ABOVE)
400
425
450


475
DR 498
Before Log Calibrations
Resistance
OHMS
0
100
Gamma Ray
CPS
0
100
Density
FULL SCALE DEFLECTION

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 16, 1977

COMPANY: Lexco Testing

HOLE NO.: 77-36 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,137,883 N 1,069,541 E

ELEVATION: 1678

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	20	till	
20	27	brown shale	
27	29	coal	
29	36	brown shale	
36	38	coal	
38	45	brown shale	
45	90	grey sandstone	
90	106	brown shale	
106	108	grey sandstone	
108	124	brown shale	
124	126	coal	
126	205	brown shale	
205	226	grey sandstone	
226	230	brown shale	
230	236	siltstone	
236	340	brown shale with some thin coal partings	
340	400	grey sandstone	

COMMENTS _____

WATER HORIZON 30 FT. 20 gal

ex-Gunsam 77(3)e.

CANADIAN ARCTIC SURVEY SYSTEMS LTD.

708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE C.H.C.R. 77-36 L/A

FIELD CHUTE CREEK

PROVINCE BRITISH COLUMBIA

67

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Other Services

Permanent Datum G.L. Elev. ___

Log measured from G.L. ___ ft. above perm. Dat.

Drilling measured from G.L.

Elev. K.B. ___ D.F. ___ G.L. ___

Date	16 Mar '77
Run No.	One
Type Log	Nuclear
Depth - Driller	400'
Depth - Logger	398'
Bottom logged interval	398'
Top logged interval	0
Type fluid in hole	Water
Salinity, PPM Cl.	N/A
Density	N/A
Level	23'
Max. rec. temp. deg. F.	
Operating rig time	2.0hrs.
Recorded by	G.Samchuck Jr.
Witnessed by	S.Gardner

BORE-HOLE RECORD

Run No.	Bit	From	To
1	4"	Surf.	T.D.

CASING RECORD

Size	Wgt.	From	To

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

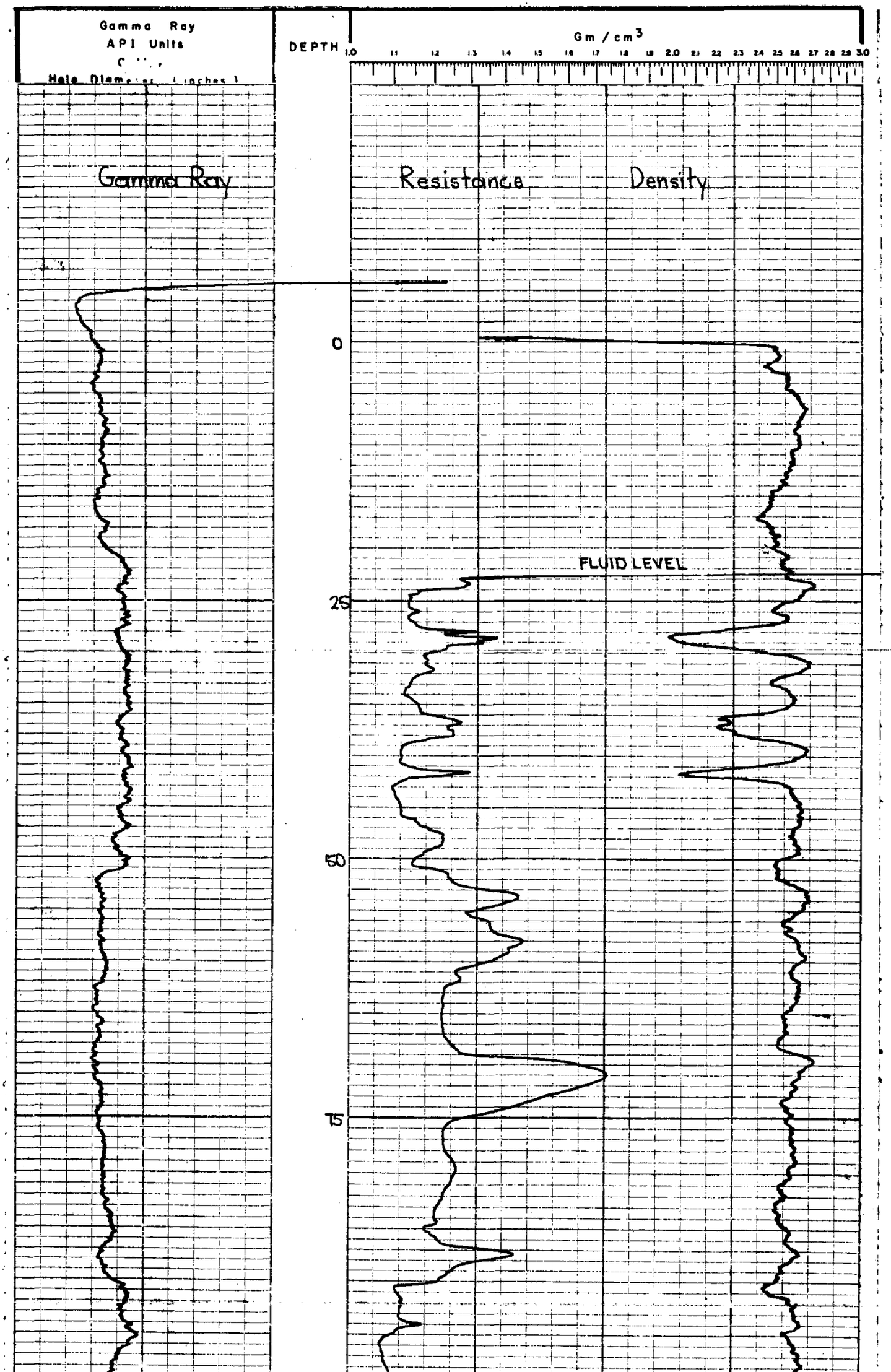
Gamma Ray					Resistance	Density	Caliper
Run No.	One			Run No.	One	One	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2⅛"			Diameter	2⅛"	2⅛"	
Detector Model No	CP-514			Type	ME	F	
Type	Scint.			Spacing		13"	
Length	1.5"						
				Length	.5"		
				Horiz. Scale	40Ω/div.		
General				Rm @ °F	N/A		
Hoist Truck No.	1			Source Model		HDVP	
Inst. Truck No.	1			Serial No.		687	
Location	Campbell River			Isotope		Cs 137	
				Strength		125 mC	

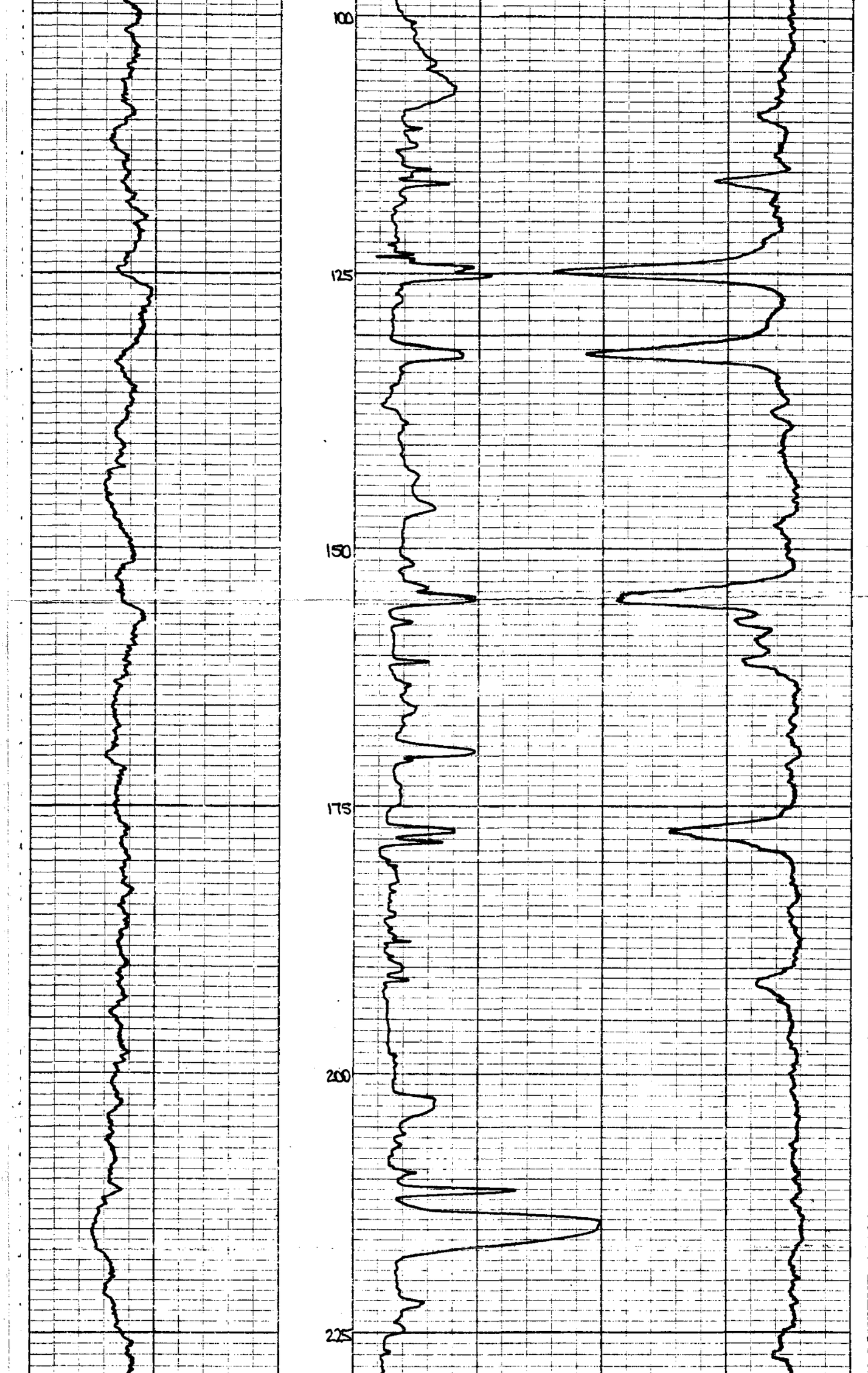
LOGGING DATA

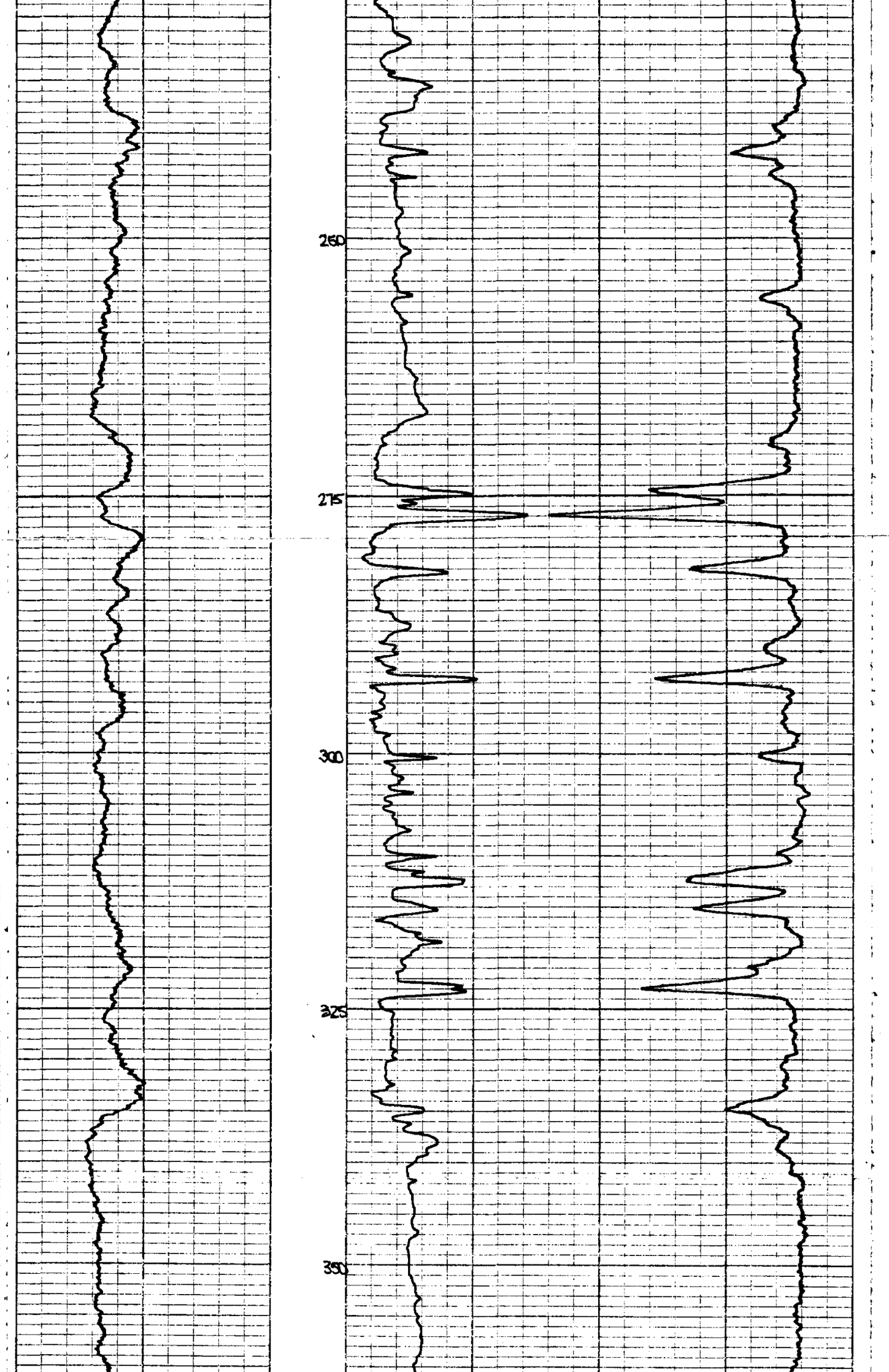
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
1	398'	0	10	4	100	2R	5.4	1	1K	.5L	

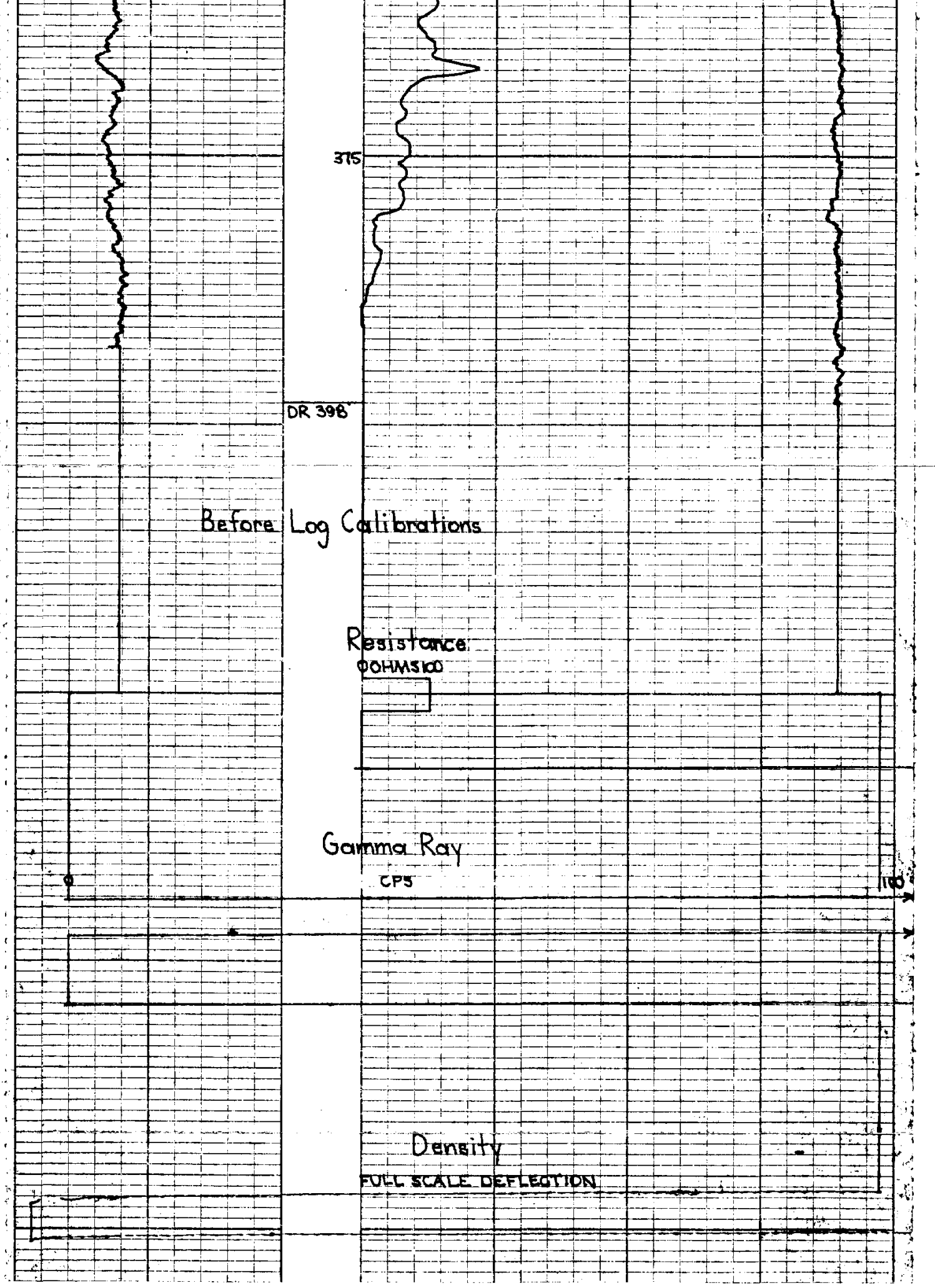
Reference Literature: N/A

Remarks: H. Vincett


Gamma Ray
API Units
Hole Diameter (inches)
DEPTH
Gm / cm3
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0
Gamma Ray
Resistance
Density
0
25
50
75
FLUID LEVEL


100
125
150
175
200
225


250
275
300
325
350


375
DR 398
Before Log Calibrations
Resistance
OOHMS100
Gamma Ray
CPS
0
100
Density
FULL SCALE DEFLECTION

LEXCO TESTING LTD

DRILLHOLE REPORT

DAL FIELD: Campbell River DATE: March 17,1977

COMPANY: Lexco

HOLE NO.: 77-37 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,144,755 N 1,068,221 E

ELEVATION: 1410

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	17	till	Water at 30 ft app.10 gal pm.
17	38	brown shale	
38	45	carbonaceous shale	
45	74	brown shale	water at 265 20 gals a min.
74	86	sandstone	
86	125	grey sandstone	
125	187	brown sandstone	
187	345	grey sandstone	

COMMENTS _____

WATER HORIZON _____ FT. _____

ex-Quinsam 77C3Jc.

CANADIAN ARCTIC SURVEY SYSTEMS LTD.

708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE CH.CR. 77-37 (L13)

FIELD CHUTE CREEK

PROVINCE BRITISH COLUMBIA

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Other Services

Permanent Datum G.L. Elev. ___

Log measured from G.L. ___ ft. above perm. Dat.

Drilling measured from G.L.

Elev. K.B. ___ D.F. ___ G.L. ___

Date	17 Mar. '77
Run No.	One
Type Log	Nuclear
Depth – Driller	345'
Depth – Logger	343'
Bottom logged interval	343'
Top logged interval	0
Type fluid in hole	Water
Salinity, PPM Cl.	N/A
Density	N/A
Level	105'
Max. rec. temp. deg. F.	
Operating rig time	1.0 hr.
Recorded by	G. Samchuck Jr.
Witnessed by	S. Gardner

BORE-HOLE RECORD

Run No.	Bit	From	To
1	8¾"	Surf.	19.9'
	6"	19.9'	T.D.

CASING RECORD

Size	Wgt.	From	To
7"		Surf.	19.9'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

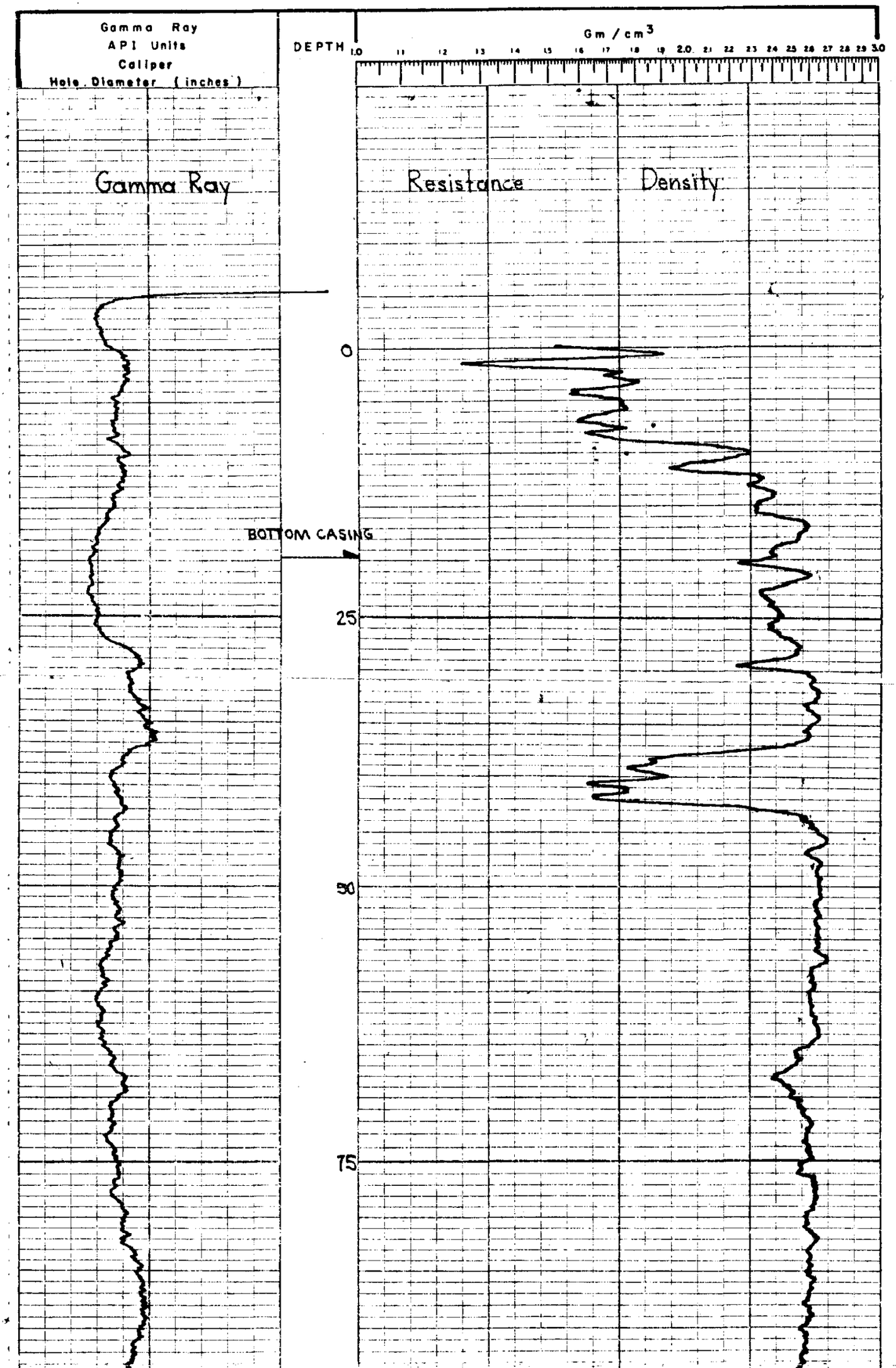
Gamma Ray				Resistance	Density	Caliper
Run No.	One			One	One	
Tool Model No.	L-103			L-103	L-103	
Diameter	2⅛"			2⅛"	2⅛"	
Detector Model No	CP-514			ME	F	
Type	Scint.				13"	
Length	1.5"					
				Length	.5"	
				Horiz. Scale	25Ω/div.	
				Rm @ °F	N/A	
General						
Hoist Truck No.	1			Source Model		HDVP
Inst. Truck No.	1			Serial No.		687
Location	Campbell River			Isotope		Cs 137
				Strength		125 mC

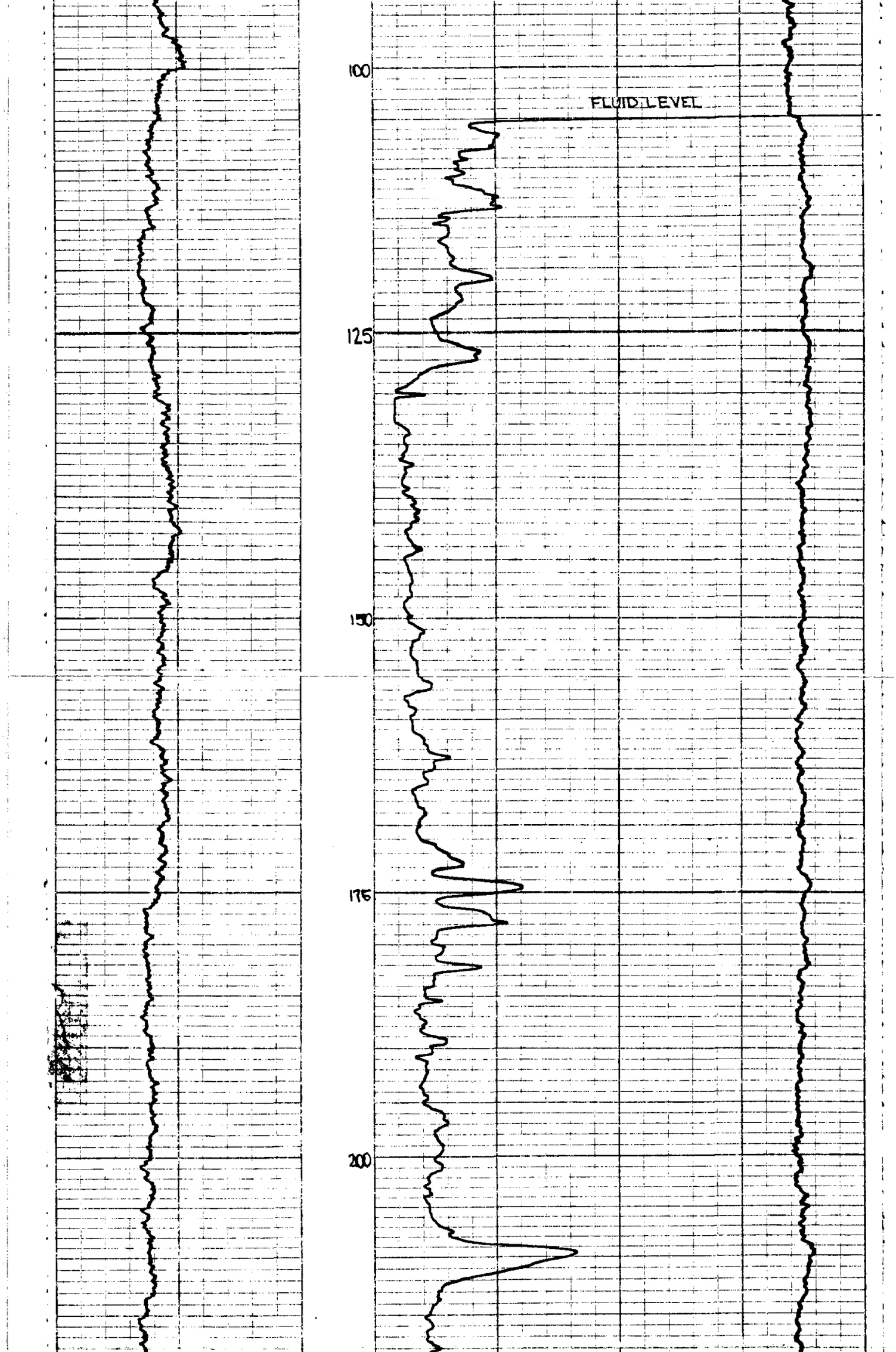
LOGGING DATA

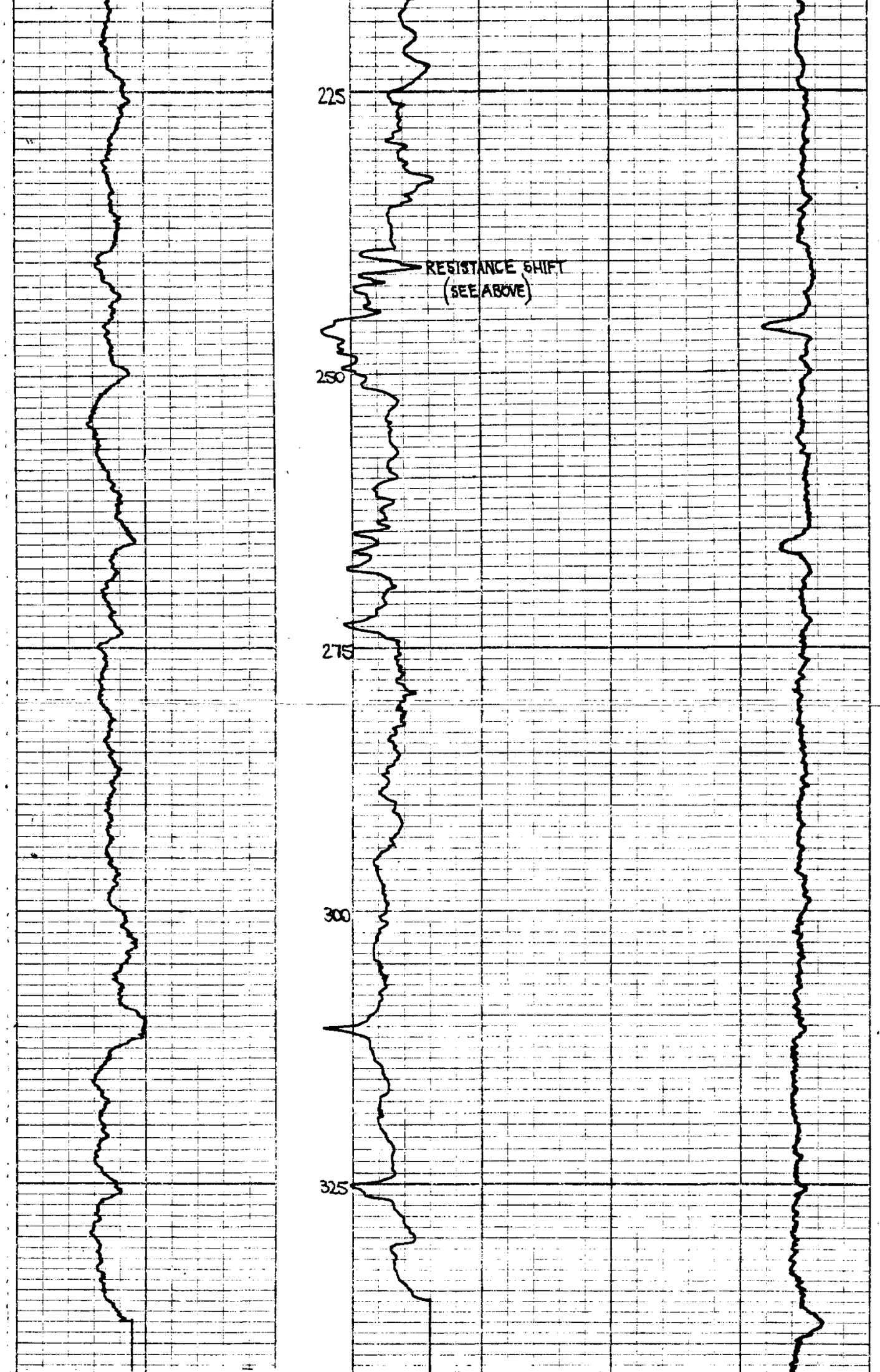
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
1	343'	0	10	4	100	2R	5.4	1	1K	.5L	

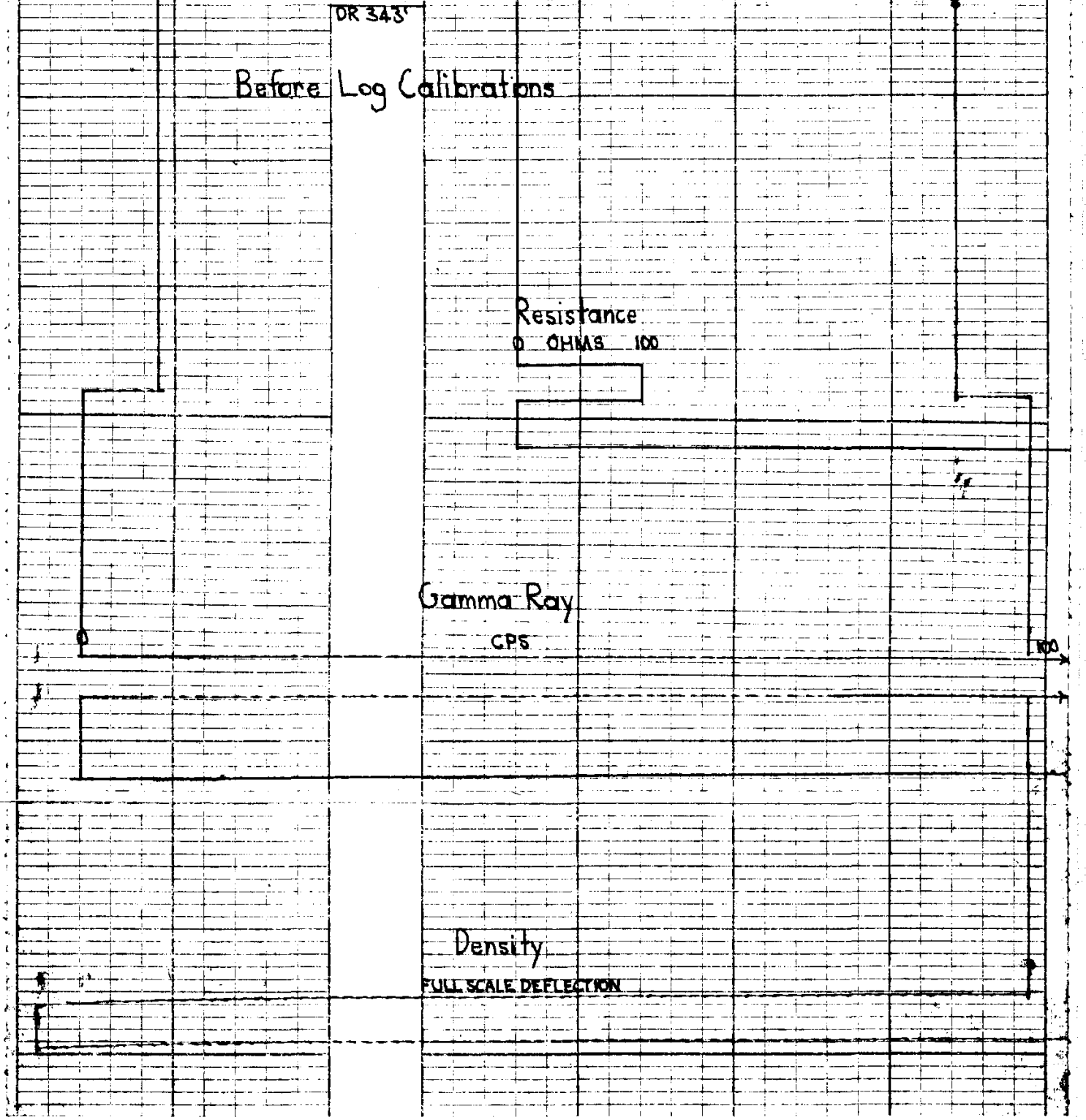
Reference Literature: N/A

Remarks: D. Broen
Resistance curve shifted 1 division right @ 241'


Gamma Ray
API Units
Caliper
Hole Diameter (inches)
DEPTH
Gm / cm3
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0
Gamma Ray
Resistance
Density
BOTTOM CASING
0
25
50
75


100
FLUID LEVEL
125
150
175
200


225
RESISTANCE SHIFT
(SEE ABOVE)
250
275
300
325


DR 343'
Before Log Calibrations
Resistance
0 OHMS 100
Gamma Ray
CPS
0
100
Density
FULL SCALE DEFLECTION

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 20,1977

COMPANY: Lexco Testing

HOLE NO.: 77-38 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,138,030 N 1,061,340 E

ELEVATION: 1603

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	110	grey sandstone	
110	124	green sandstone	
124	137	grey sandstone	Water at 120 ft. app 10 gal
137	163	siltstone	per min.
163	183	green sandstone	
183	238	grey sandstone	
238	269	brown shale	
269	312	grey shale	
312	322	coaly shale	
322	367	green sandstone	
367	384	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

CANADIAN ARCTIC SURVEY SYSTEMS LTD.
704 - 324 STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.
WELL CRILLHOLE CHCR. TT-38
FIELD CHUTE CREEK
PROVINCE BRITISH COLUMBIA

Permanent Datum G.L. Elev.
Log Measured From K.B. Ft. Above Perm. Datum
Drilling Measured From K.B.

Date 20 Dec. 71
Run No. ONE
Depth-Driller 1015
Depth-Logger 1015
Bottom Logged Interval 1015
Top Logged Interval Surface
Type Fluid in Hole Water
Salinity, PPM Cl Nil
Density 8.34
Level Full
Max. rec. temp. deg. F. 50°F
Equip. No. & Location 3 Kelowna
Recorded By L. Schmaltz
Witnessed By Mr. Lexco

Rge. W
Twp.
Sec.
Elev.: K.B. G.L.

Other Services

CASING RECORD

No.	Size	Wgt.	From	To
1	8 5/8	24#	Surface	20'
2	5 1/2	15.5#	Surface	1015'

Field Area This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray		Resistivity	Density	Caliper
Run No.	One	Run No.	One	One
Tool Model No.	4-104	Tool Model No.	L-305	L-305
Diameter	3 3/8"	Diameter	3 1/8"	3 1/8"
Detector Model No.	CD-314	Spacing	16"	15"
Type	Scint.	Length		
Length	15'	Hard. Scale	50.5 Rdkw	
		Rm @ °F	N/A	
General		Source Model		H.V.P.
Hotel Truck No.		Serial No.		607
Test Truck No.		Isotope		Co 137
Location	Campbell River	Strength		105 m.c.

LOGGING DATA

General					Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec. &	Sens. Settings	API G.R. Units per Log Div. Cps	T.C. Sec.	Sens. Settings	Zero On, L or R	Sens. Settings	Zero On, L or R
1	Surf	0	10	2	100	25	5	5		W	CAL

References: Literature: N/A

Remarks: 1) Base Resistance curve shifted 15 divisions left @ 34'

Gamma Ray API Units
Caliper Hole Diameter (Inches)

DEPTH Gm/cm³

Gamma Ray | Resistance | Density

FLUID LEVEL

RESISTANCE SHIFT (SEE ABOVE)

DR 371

Before Log Calibrations

Resistance Ω OHMS 100

Gamma Ray CPS 0 100

Density FULL SCALE DEFLECTION

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 18, 1977

COMPANY: Lexco Testing

HOLE NO.: 77-39 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,129,755 N 1,071,155 E

ELEVATION: 2082

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	2	till	
2	27	grey sandstone	
27	50	brown shale	
50	52	coal	
52	93	brown shale	
93	200	grey sandstone	
200	240	siltstone	
TD	240'		

COMMENTS _____

WATER HORIZON 30 FT. 15 gals

ex - Gunsam 77 (s)2

CANADIAN ARCTIC SURVEY SYSTEMS LTD.
709 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LESCO TESTING LTD.
WELL DRUMHOLE GAS CO. 77-25
FIELD CHARTE CREEK
PROVINCE BRITISH COLUMBIA

Permanent Datum: G.L. Elev. K.B. ___
Log measured from G.L. ___ ft. above perm. Datum D.F. ___
Drilling measured from G.L. G.L. ___

Run No.	Bit From	Bit To	Size	Type Fluid in Hole	Density	Visc.	pH	Fluid Loss	Source of Sample	Rm @ Meas. Temp.	Rmf @ Meas. Temp.	Rmc @ Meas. Temp.	Source of Rmf and Rmc	Rm @ BHT	Time Since Circ.	Max. Rec. Temp. Deg. F.	Equip. Location	Recorded By	Witnessed By
1	0	225	7 7/8	Water	8.4	26	7.0	N/A	Mud Pit	.75 @ 70°F	.56 @ 70°F		Measured	.56 @ 70°F	4 hrs	70°F	Campbell River	S. Vincent	

Log Run No. 1 Bottom 225 Ft. Top 0 Ft.
Casing Record: Size 7" Wgt. 20 Ft. 225 To Surface
Bore-Hole Record: Bit From 0 To 225
Type Log: Gamma Density Resistance
Depth - Driller 225
Depth - Logger 225
Bottom Logged Interval 225
Top Logged Interval 0
Type Fluid in Hole Water
Salinity, PPM Cl N/A
Density 8.4
Level Full
Max. rec. temp. deg. F. 70°F
Equip. No. & Location 1 Unit Campbell River
Recorded By S. Vincent
Witnessed By R. Ross

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

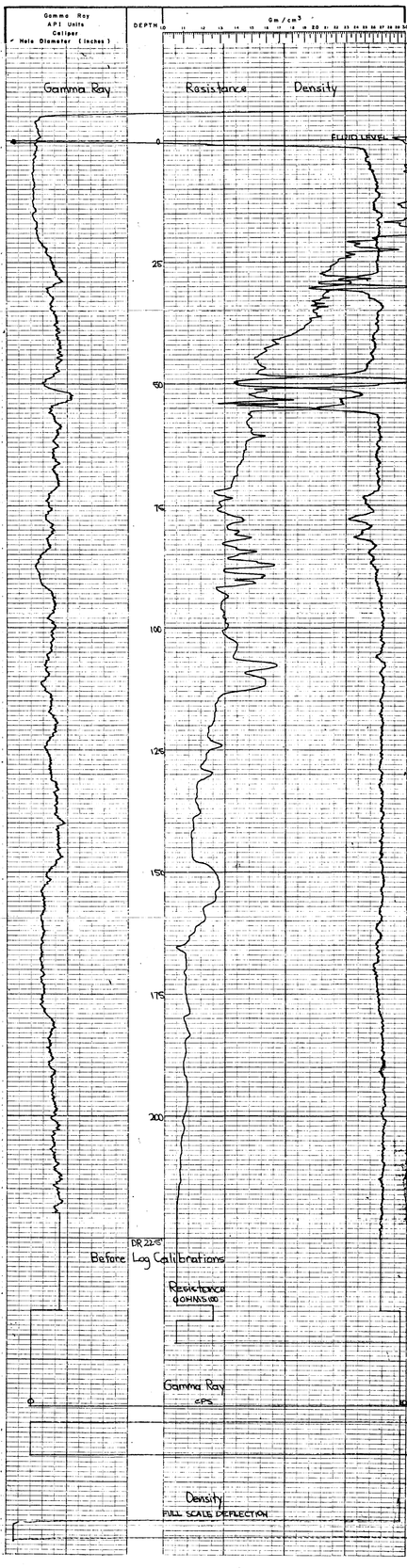
Gamma Ray			Resistance		Density	Caliper
Run No.	One		Run No.	One	One	
Tool Model No.	L-103		Tool Model No.	L-103	L-103	
Diameter	3 5/8		Diameter	2 5/8	2 5/8	
Detector Model No.	CP-514		Type	ME	E	
Type	Scint.		Spacing	16"	12"	
Length	16		Length	5'		
			Horiz. Scale	100 Ω/div.		
			Res. @ °F	N/A		
General			Source Model		H.D.V.P	
Hoist Truck No.	1		Serial No.		607	
Inst. Truck No.			Isotope		Cs .137	
Location	Campbell River		Strength		125 mC	

LOGGING DATA

General Depths Run No.	From	To	Speed Ft/Min	T.C. Sec.	Gamma Ray Sens. Settings	Gamma Ray Zero Dis. L or R	Gamma Ray API G.R. Units per Log Div.	Density T.C. Sec.	Density Sens. Settings	Density Zero Dis. L or R
1	225	0	16	4	100	2R	5.4	1	1K	5L

Reference Literature: N/A

Remarks: H. Vincent



DR 22-5

Before Log Calibrations:

Resistance
OHMS Ω

Gamma Ray
CPS

Density
FULL SCALE DEFLECTION

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 20, 1977

COMPANY: Lexco Testing

HOLE NO.: 77-40 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,144,143 N 1,087,106 E

ELEVATION: 1463.9

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	8	till	
8	25	brown shale	
25	47	grey sandstone	
47	60	siltstone	
60	86	brown shale	67'+73 coal stringers
86	87	coal	
87	127	brown shale	117' coal stringer
127	137	grey sandstone	
137	170	brown shale	
170	458	grey sandstone	

COMMENTS _____

WATER HORIZON 337 FT. 15 gal per min

CANADIAN ARCTIC GAS STUDY LIMITED

GAMMA DENSITY & RESISTANCE

COMPANY: ATLAS TESTING LTD. 400 - 444 - 5th AVENUE S.W. CALGARY, ALTA.

WELL: DRILLPIPE CACH 77-61

FIELD: CAPLIE CREEK

PROVINCE: BRITISH COLUMBIA

Other Services: Sonic

Permanent Datum: G.L. Elev.: 0 ft. Above Perm. Datum

Log Measured From: K.B. 16 ft. Above Perm. Datum

Drilling Measured From: K.B.

Date: 1-11-77

Run No.: One

Depth-Driller: 1000 ft.

Depth-Logger: 1000 ft.

Bottom Logged Interval: 1000 ft.

Top Logged Interval: 0 ft.

Type Fluid in Hole: Water

Salinity, PPM Cl: 0

Density: 9.0 lb/gal

Level: Full

Max. Rec. Temp.: 50 °F

Equipment No. & Location: 1K

Recorded By: Scott

Witnessed By: Campbell

Rig No.: Rig 1

Type Log: Gamma Ray Density Resistance

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 22, 1977

COMPANY: Lexco Testing

HOLE NO.: 77-41 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,129,470 N 1,074,035 E

ELEVATION: 2076

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	7	till	
7	29	brown shale	
29	32	coal	water at 225' app. 5 gal per mi
32	44	brown shale	
44	265	grey sandstone	

COMMENTS _____

WATER HORIZON _____ FT. _____

ex-Gulkam 77 (3)c.

CANADIAN ARCTIC SURVEY SYSTEMS LTD. 708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE CH.CR. 77-41

FIELD CHUTE CREEK

PROVINCE BRITISH COLUMBIA

67

L 14

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Permanent Datum G.L. Elev. ___

Log measured from G.L. ___ ft. above perm. Dat.

Drilling measured from G.L.

Elev. K.B. ___ D.F. ___ G.L. ___

Other Services

Date	22 Mar. '77
Run No.	One
Type Log	Nuclear
Depth - Driller	264'
Depth - Logger	260'
Bottom logged interval	260'
Top logged interval	0
Type fluid in hole	Water
Salinity, PPM Cl.	N/A
Density	N/A
Level	5.2
Max. rec. temp. deg. F.	
Operating rig time	1.5 hrs.
Recorded by	G. Samchuck
Witnessed by	S. Gardner

BORE-HOLE RECORD

Run No.	Bit	From	To
1	8 3/4"	Surf	10'
	6"	10'	T.D.

CASING RECORD

Size	Wgt.	From	To
7"		Surf.	10'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

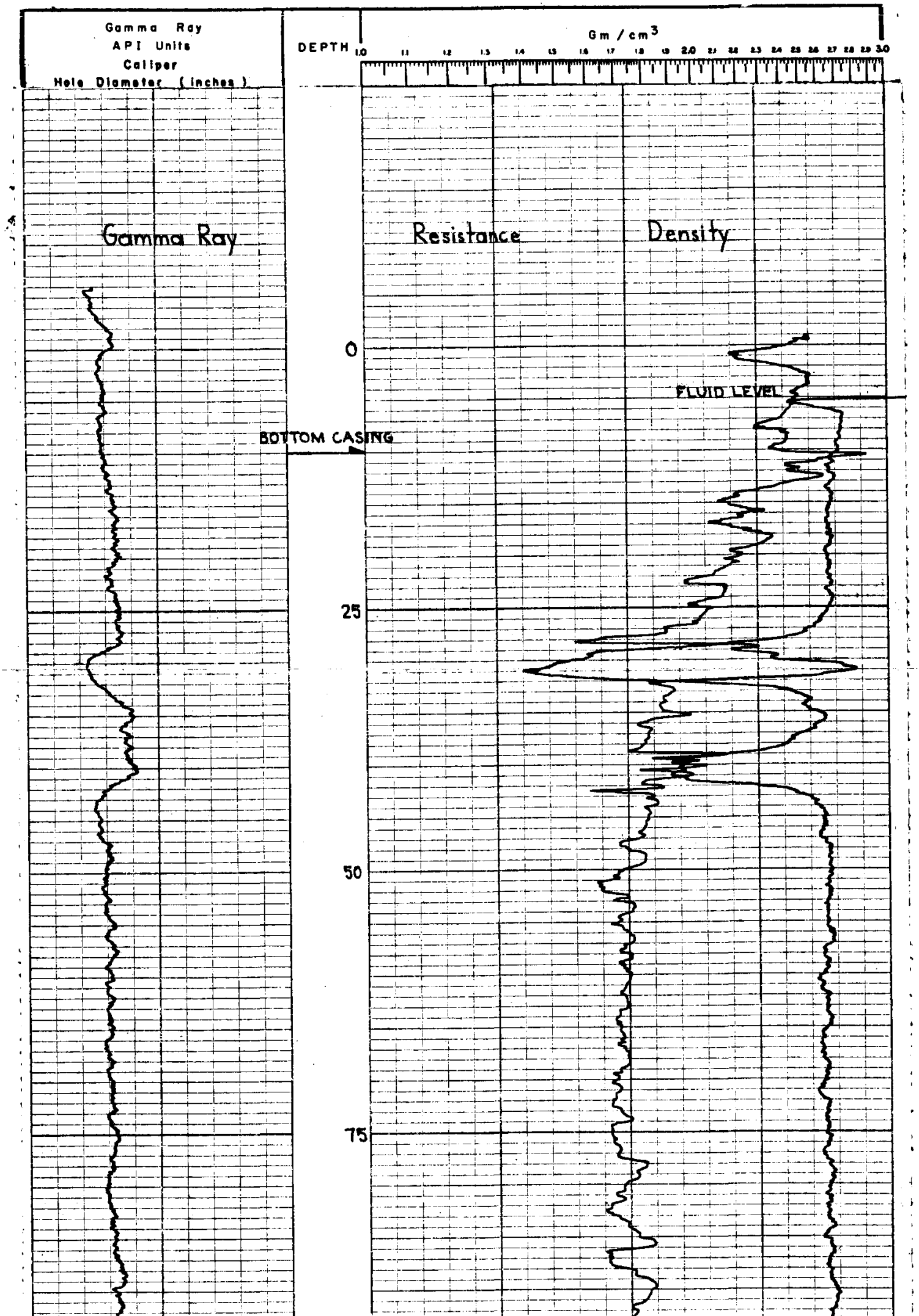
Gamma Ray					Resistance	Density	Caliper
Run No.	One			Run No.	One	One	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2 1/8"			Diameter	2 1/8"	2 1/8"	
Detector Model No	CP-514			Type	ME	F	
Type	Scint.			Spacing		13"	
Length	1.5"						
				Length	.5"		
				Horiz. Scale	50 Ω/div.		
General				Rm @ °F	N/A		
Hoist Truck No.				Source Model		HDVP	
Inst. Truck No.				Serial No.		687	
Location	Campbell	River		Isotope		Cs 137	
				Strength		125 mC	

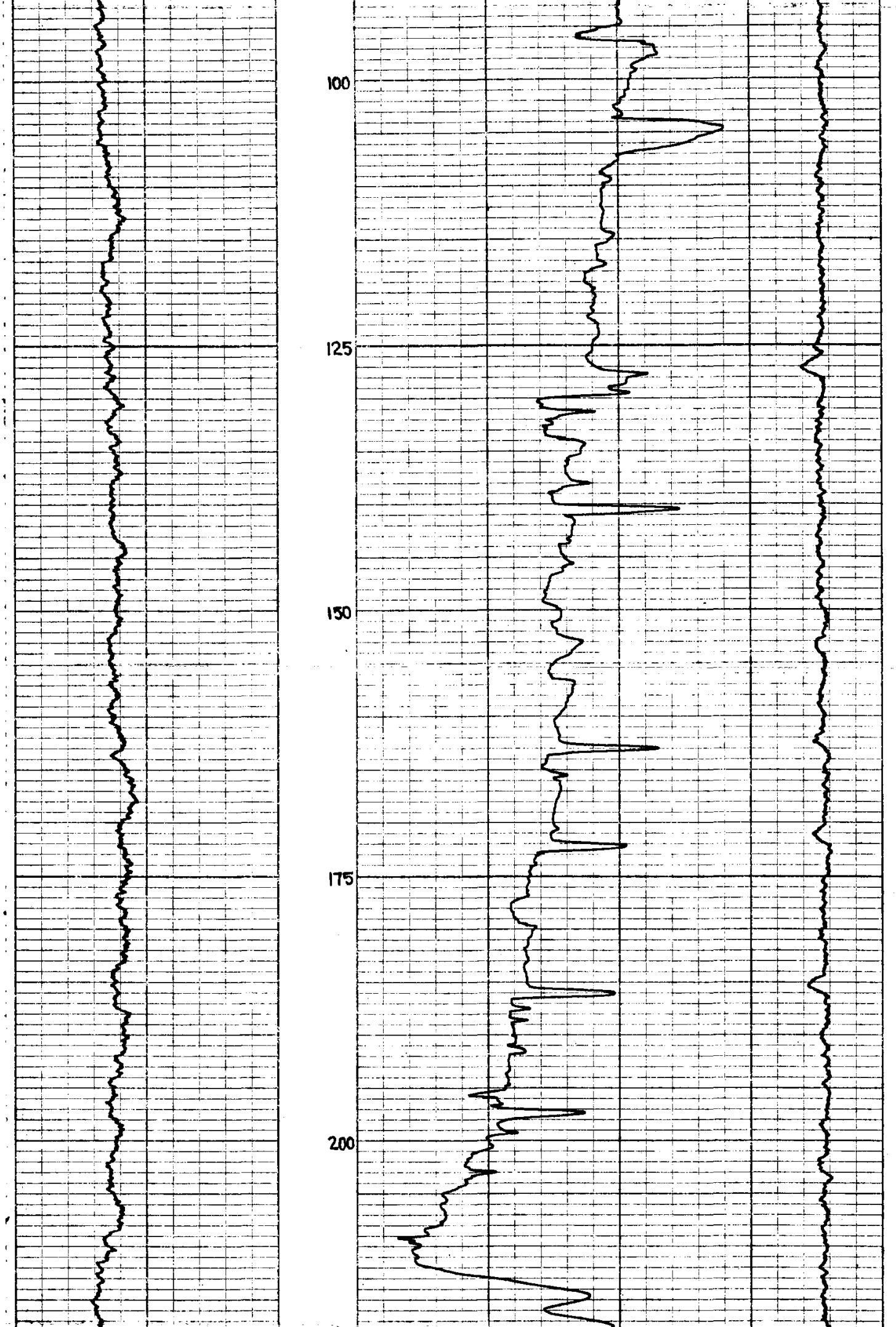
LOGGING DATA

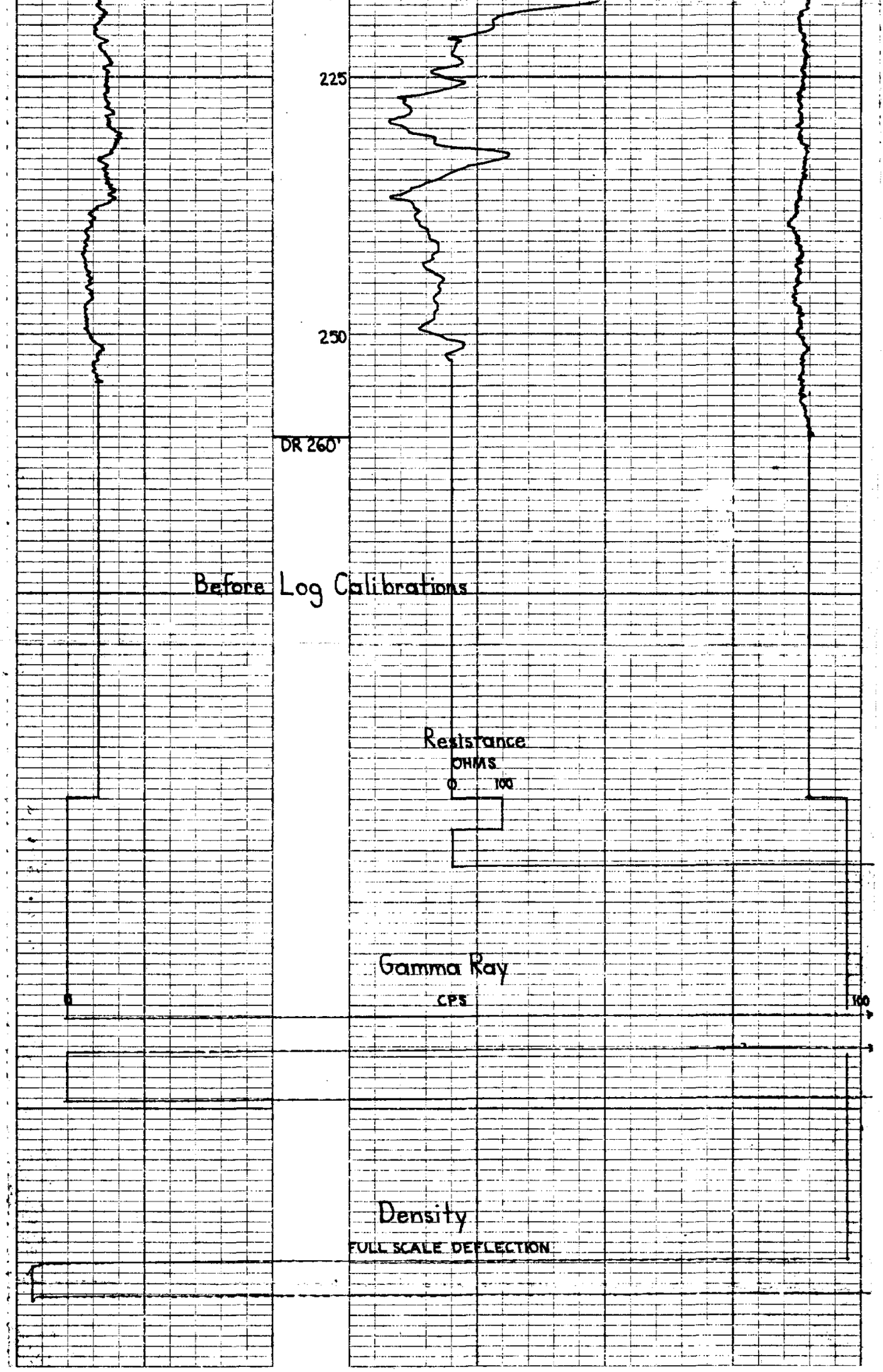
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
1	260'	0	10	4	100	2R	5.4	1	1K	.5L	

Reference Literature: N/A

Remarks: D. Broen


Gamma Ray
API Units
Caliper
Hole Diameter (inches)
DEPTH
Gm / cm3
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0
Gamma Ray
Resistance
Density
0
25
50
75
FLUID LEVEL
BOTTOM CASING


100
125
150
175
200


225
250
DR 260'
Before Log Calibrations
Resistance
OHMS
0
100
Gamma Ray
CPS
0
100
Density
FULL SCALE DEFLECTION

LEXCO TESTING LTD.

DRILL HOLE REPORT

COALFIELD: Campbell River DATE: March 27, 1977

COMPANY: Lexco Testing

HOLE NO.: 77-42 Chute Creek

APPROX. LOCATION: _____ SEC. _____ TWP. _____ RGE. _____ W. _____

SURVEYED LOCATION: 18,144,151 N 1,070,591 E

ELEVATION: 1548

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	32	till	
32	65	grey sandstone	
65	95	siltstone	
95	99	brown shale	
99	101	Coal 2'	
101	136	brown shale	
136	156	siltstone	
156	180	brown shale	
180	200	siltstone	
200	207	brown shale 7'	
207	210	grey sandstone	
210	230	siltstone	
230	240	brown shale	
240	242	coal 2'	
242	265	brown shale 23'	
265	280	siltstone	
280	282	Coal 2'	
282	285	carbonaceous shale	
285	300	brown shale	
300	312	siltstone 12'	
312	320	grey sandstone	
320	326	siltstone	
326	328	coal - 2'	
328	332	carbonaceous shale 4'	
332	335	coal 3'	
335	338	carbonaceous shale	
338	372	brown shale	
372	480	grey sandstone	

COMMENTS _____

WATER HORIZON 370 FT. 50 gals

Ex-Gunsam 77(3)a.

CANADIAN ARCTIC SURVEY SYSTEMS LTD. 708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD. 67

WELL DRILLHOLE CH.CR.77-42 L18

FIELD CHUTE CREEK

PROVINCE BRITISH COLUMBIA

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Other Services

Permanent Datum G.L. Elev. ___ Elev. K.B. ___

Log measured from G.L. ___ ft. above perm. Dat. D.F. ___

Drilling measured from G.L. G.L. ___

Date	26 Mar. '77
Run No.	One
Type Log	Nuclear
Depth - Driller	480'
Depth - Logger	478'
Bottom logged Interval	478'
Top logged Interval	0
Type fluid in hole	Water
Salinity, PPM Cl.	N/A
Density	N/A
Level	34'
Max. rec. temp. deg. F.	
Operating rig time	2.75hrs.
Recorded by	G.Samchuck jr.
Witnessed by	S.Gardner

BORE-HOLE RECORD

RUN No.	Bit	From	To
1	6 3/4"	Surf	34'
	4"	34'	T.D.

CASING RECORD

Size	Wgt.	From	To
4 1/2"		Surf	34'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

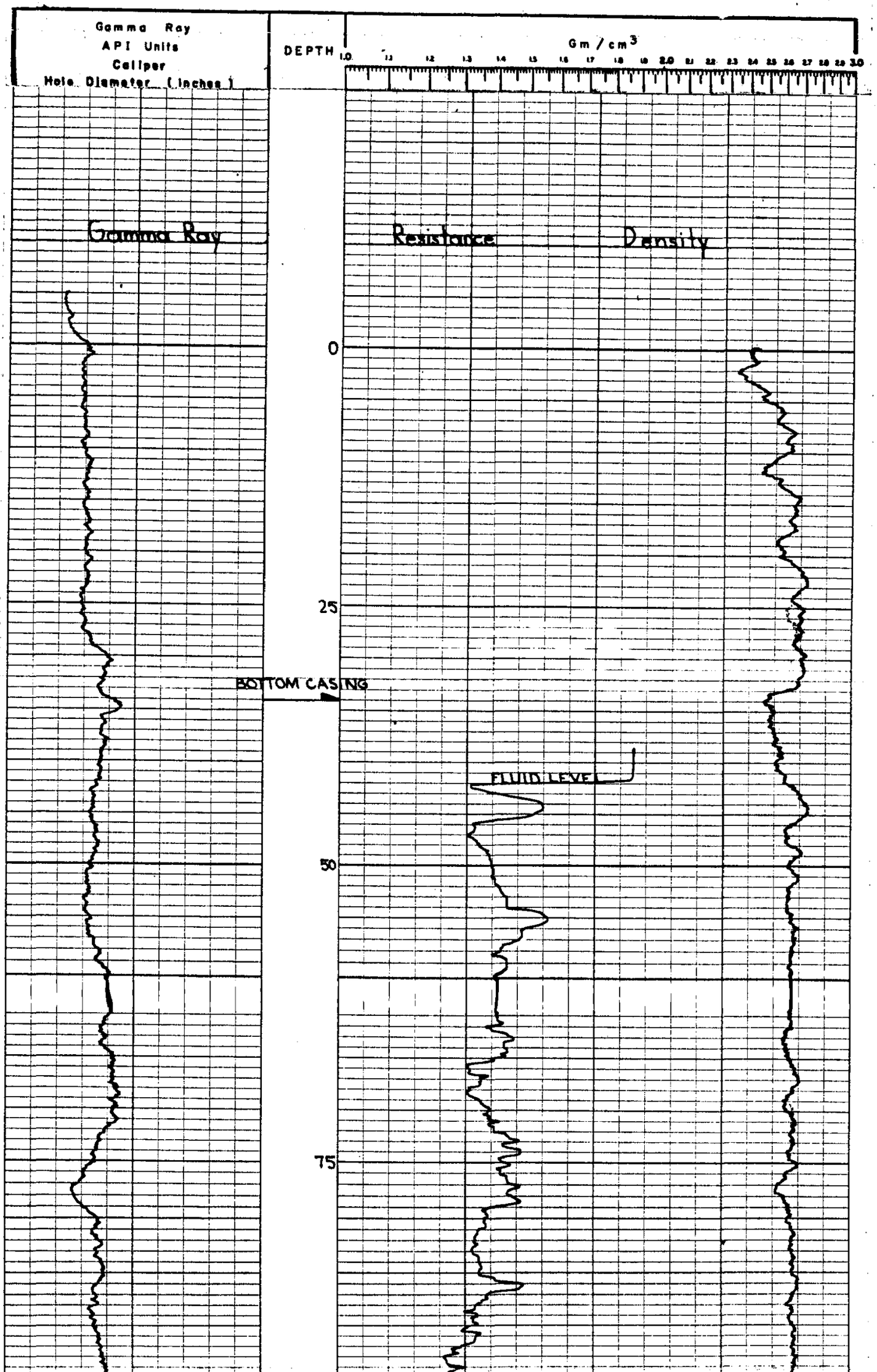
Gamma Ray					Resistance	Density	Caliper
Run No.	One			Run No.	One	One	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2 1/8"			Diameter	2 1/8"	2 1/8"	
Detector Model No.	CP-514			Type	ME	F	
Type	Scint.			Spacing		13"	
Length	1.5"						
				Length	.5"		
				Horiz. Scale	100 c/div.		
General				Rm @ °F	N/A		
Hoist Truck No.				Source Model		HDVP	
Inst. Truck No.				Serial No.		687	
Location	Campbell River			Isotope		Cs 137	
				Strength		125 mC	

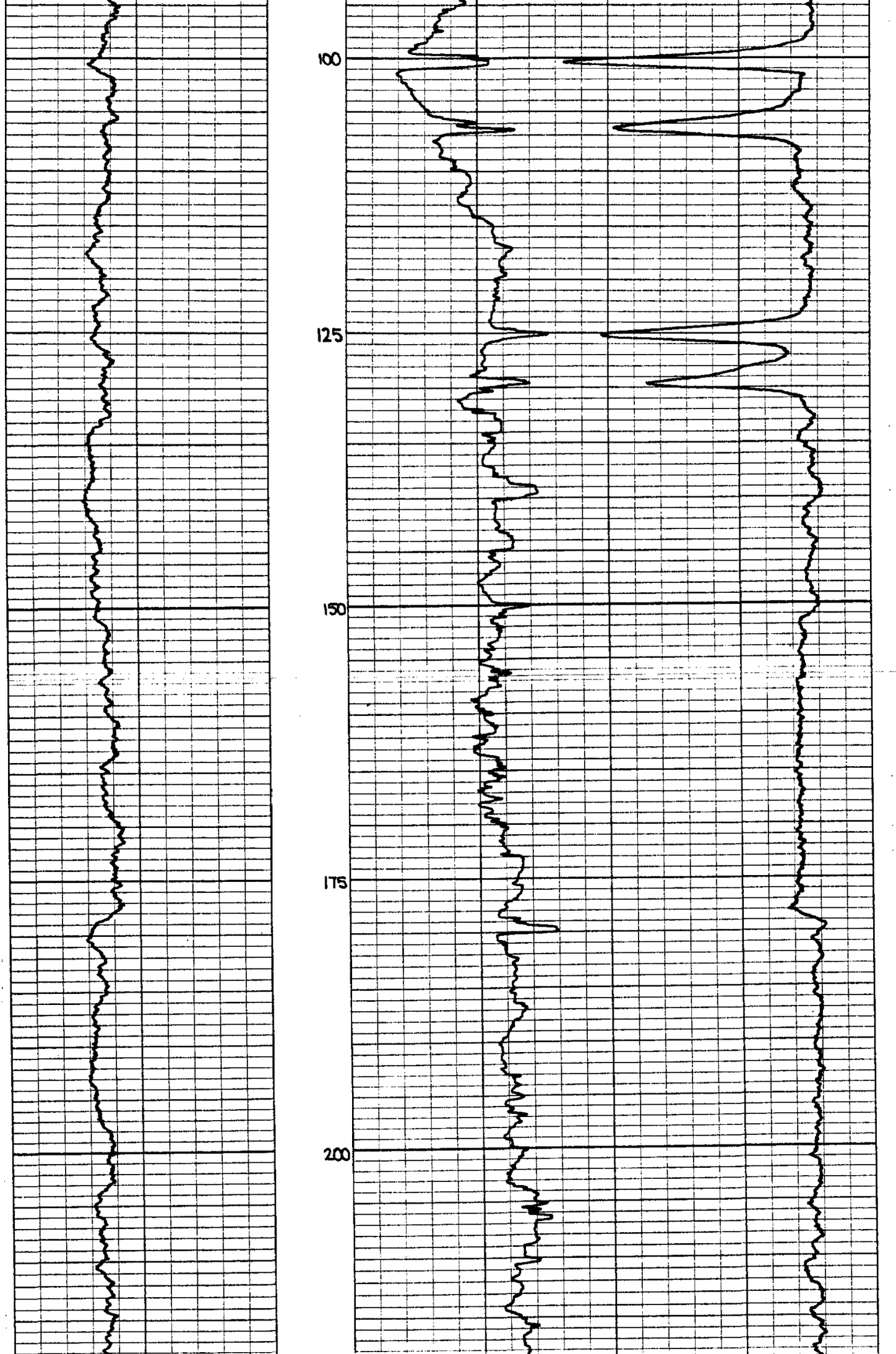
LOGGING DATA

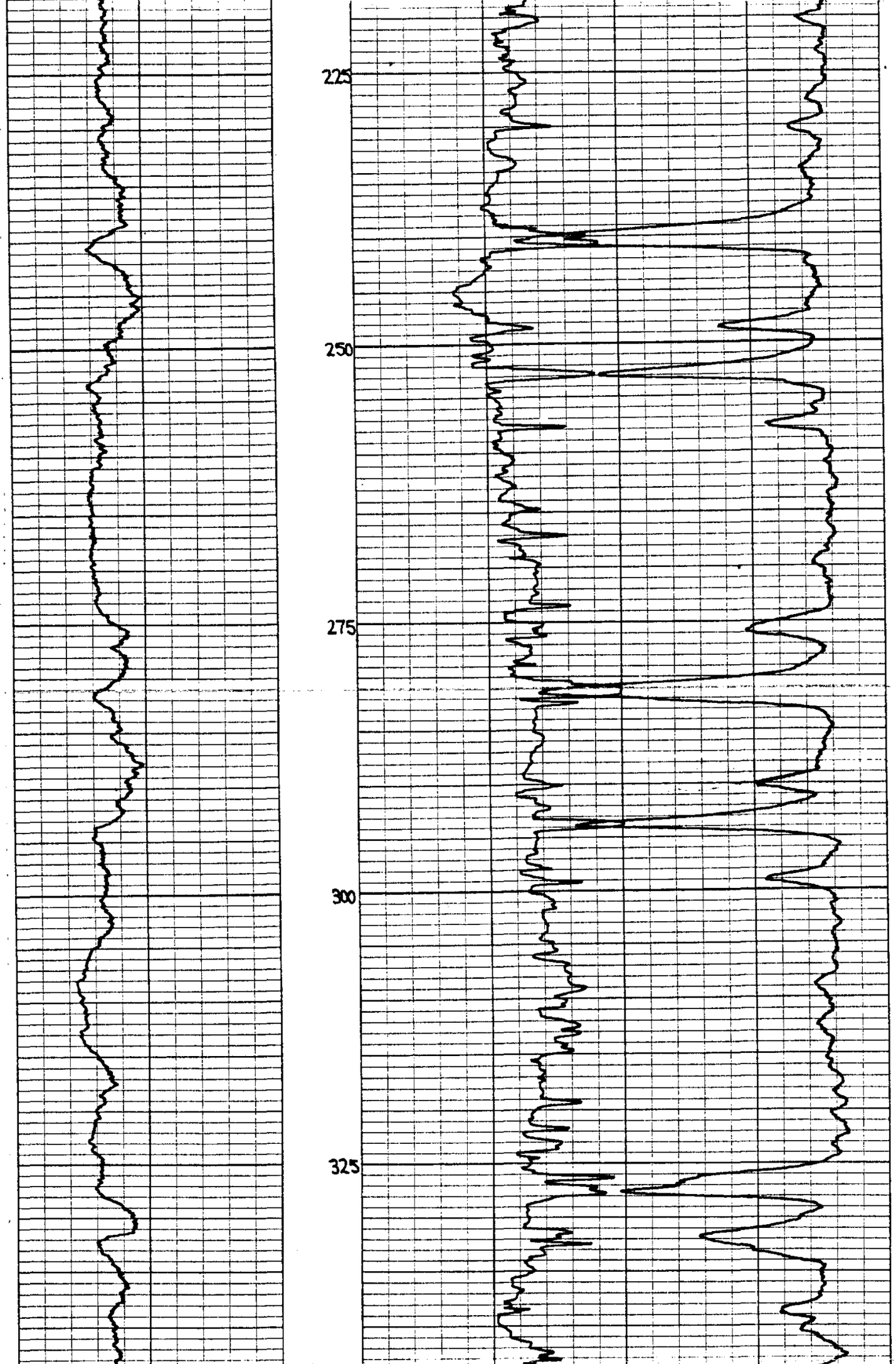
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
1	478'	0	10	4	100	2R	5.4	1	1K	.5L	

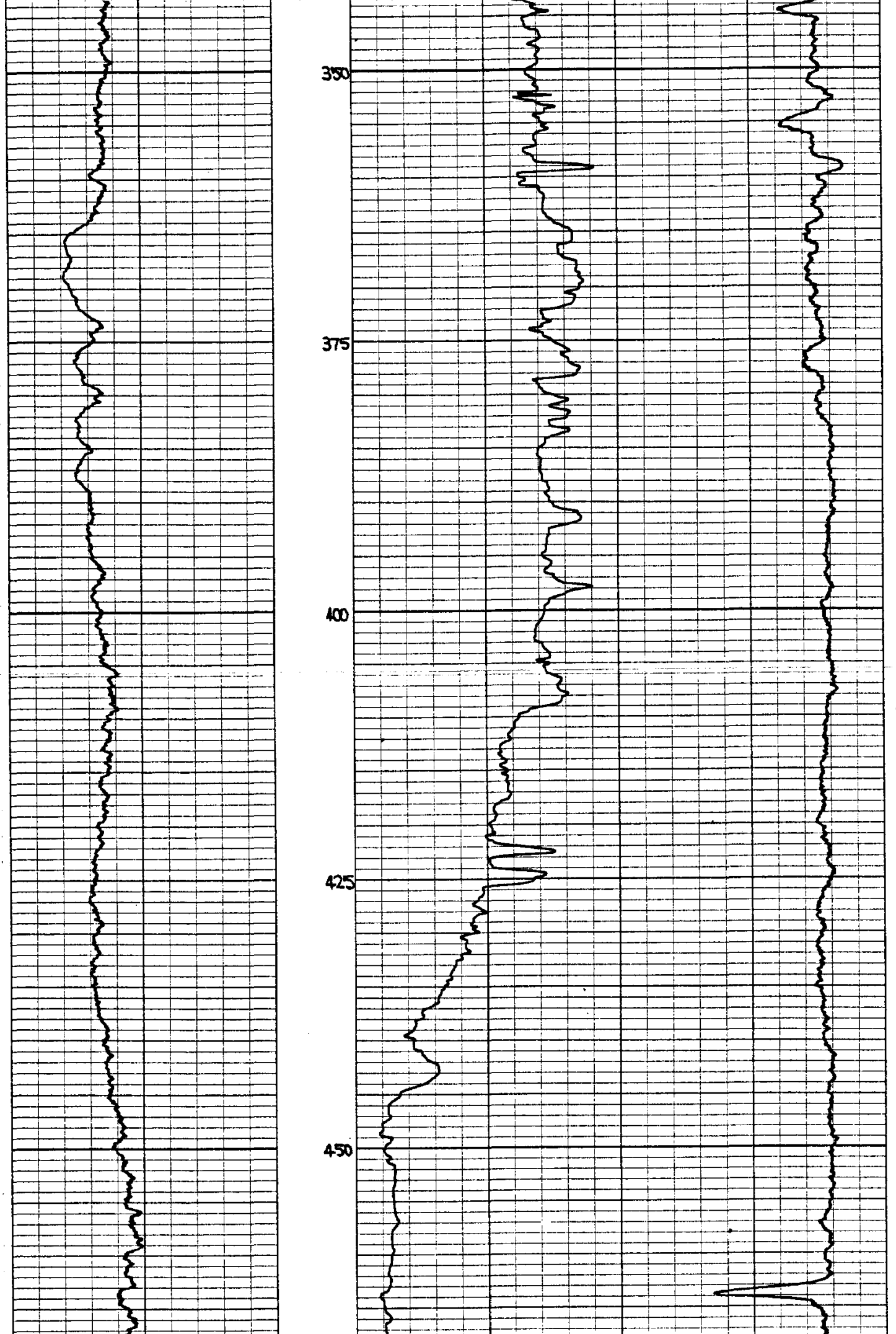
Reference Literature: N/A

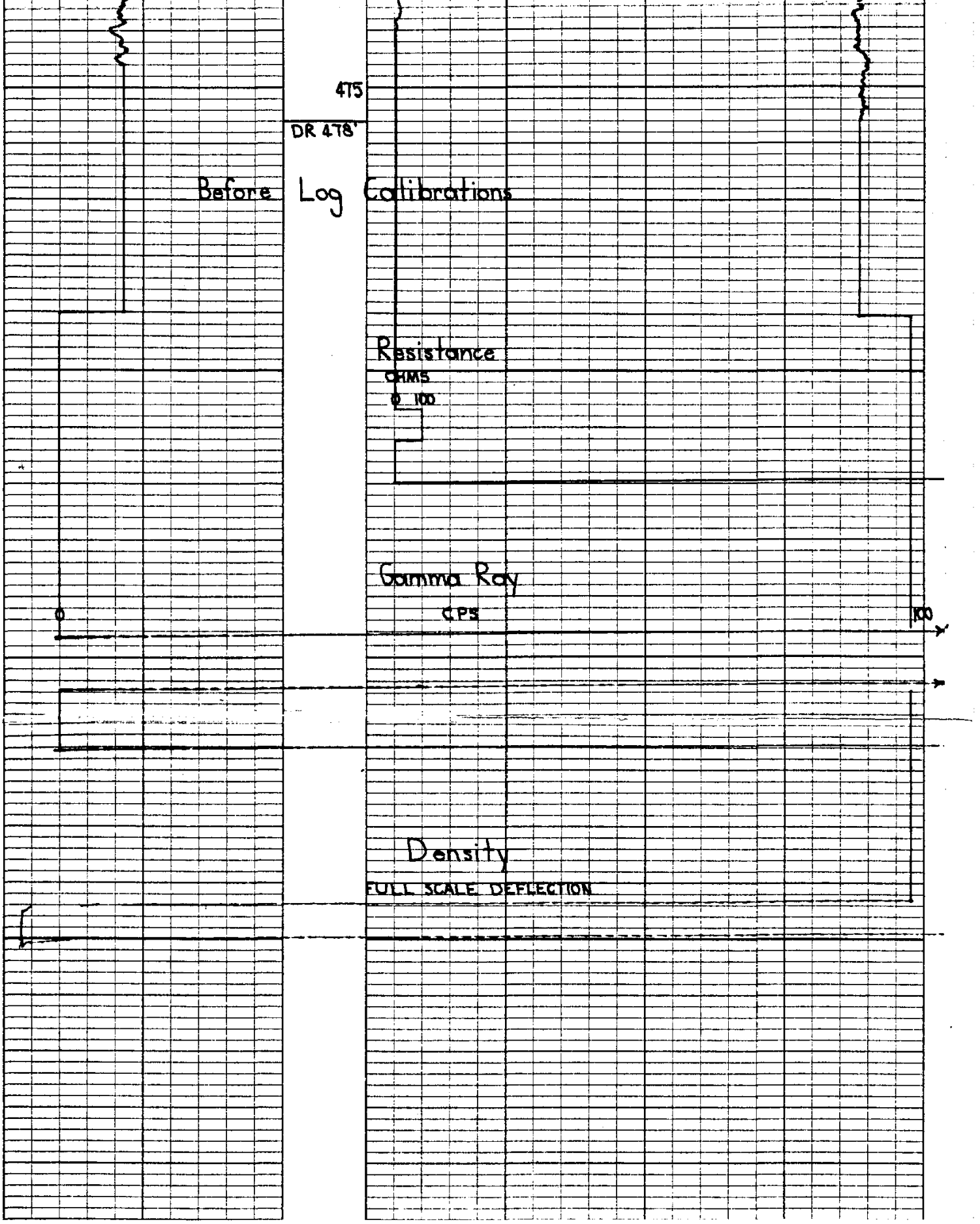
Remarks: H. Vincett


Gamma Ray
API Units
Caliper
Hole Diameter (Inches)
DEPTH
Gm / cm3
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2.0
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3.0
Gamma Ray
Resistance
Density
0
25
BOTTOM CASING
FLUID LEVEL
50
75


100
125
150
175
200


225
250
275
300
325


350
375
400
425
450


475
DR 478'
Before Log Calibrations
Resistance
OHMS
0 100
Gamma Ray
CPS
0
100
Density
FULL SCALE DEFLECTION

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 24, 1977

COMPANY: Lexco Testing

HOLE NO.: 77-43 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,129,270 N 1,076,770 E

ELEVATION: 2073

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	6	till	
6	50	grey sandstone	
50	72	brown shale	water at 96'app. 40 gal per mi
72	81	brown sandstone	
81	87	brown shale	
87	88	coal	
88	93	brown shale	
93	140	grey sandstone	
140	170	brown shale	
170	175	red shale	
175	205	grey sandstone	
205	216	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

Ex-Gunsan 77(3)c.

CANADIAN ARCTIC SURVEY SYSTEMS LTD.

708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE CH.CR. 77-43 (L19)

FIELD CHUTE CREEK

PROVINCE BRITISH COLUMBIA

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Other Services

Permanent Datum G.L. Elev. ___ Elev. K.B. ___

Log measured from G.L. ___ ft. above perm. Dat. D.F. ___

Drilling measured from G.L. G.L. ___

Date	24 Mar. '77
Run No.	One
Type Log	Nuclear
Depth - Driller	216'
Depth - Logger	215'
Bottom logged interval	215'
Top logged interval	0
Type fluid in hole	Water
Salinity, PPM Cl.	N/A
Density	N/A
Level	54.8'
Max. rec. temp. deg. F.	
Operating rig time	1.5hrs.
Recorded by	G.Samchuck
Witnessed by	S.Gardner

BORE-HOLE RECORD

RUN No.	Bit	From	To
1	8¾"	Surf.	9.5'
	6"	9.5'	T.D.

CASING RECORD

Size	Wgt.	From	To
7"		Surf.	9.5'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

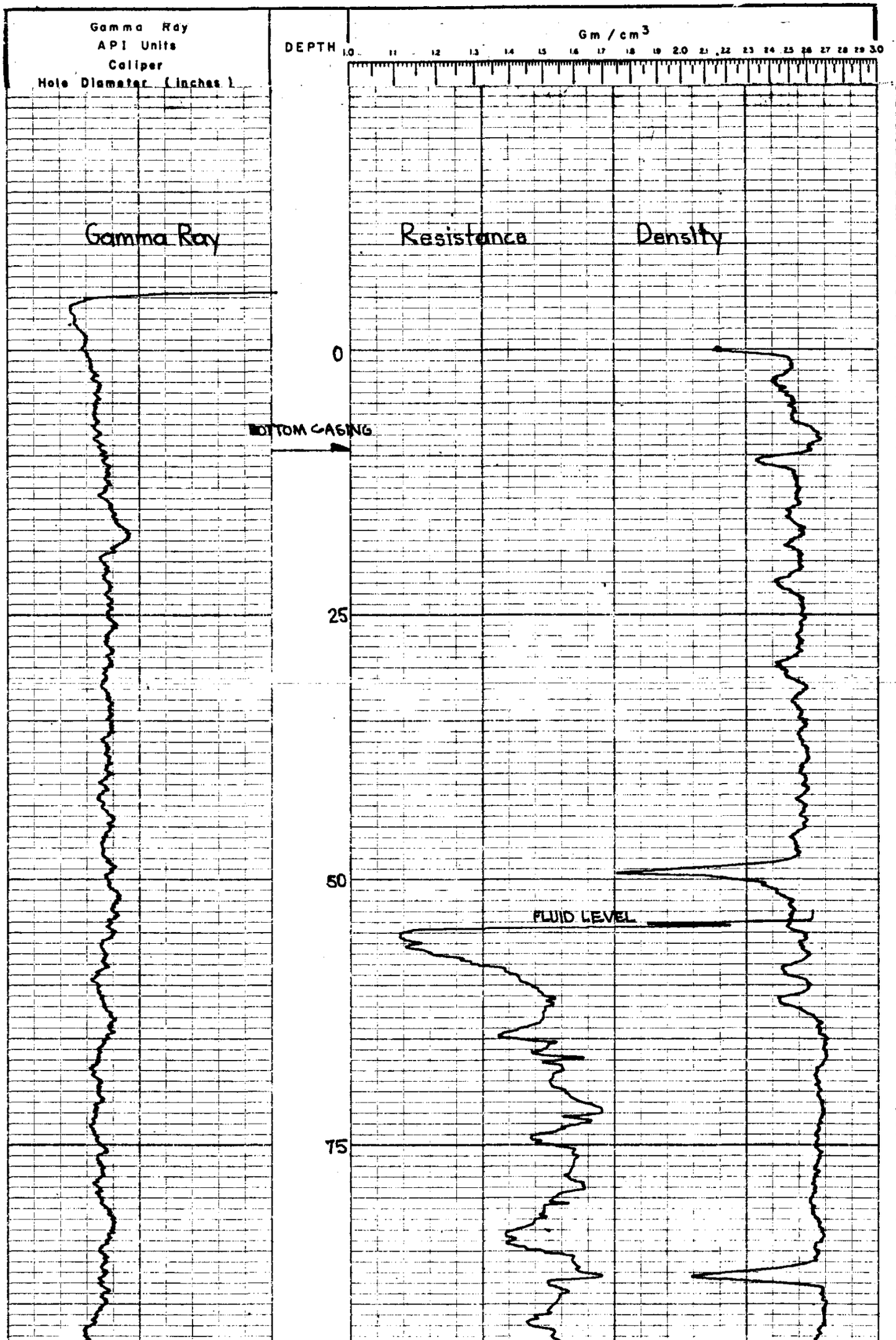
Gamma Ray					Resistance	Density	Caliper
Run No.	One			Run No.	One	One	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2⅛"			Diameter	2⅛"	2⅛"	
Detector Model No	CP-514			Type	ME	L	
Type	Scint.			Spacing		13"	
Length	1.5"						
				Length	.5"		
				Horiz. Scale	100Ω/div.		
General				Rm @ °F	N/A		
Hoist Truck No.	1			Source Model		HDVP	
Inst. Truck No.	1			Serial No.		687	
Location	Campbell River			Isotope		Cs 137	
				Strength		125 mC	

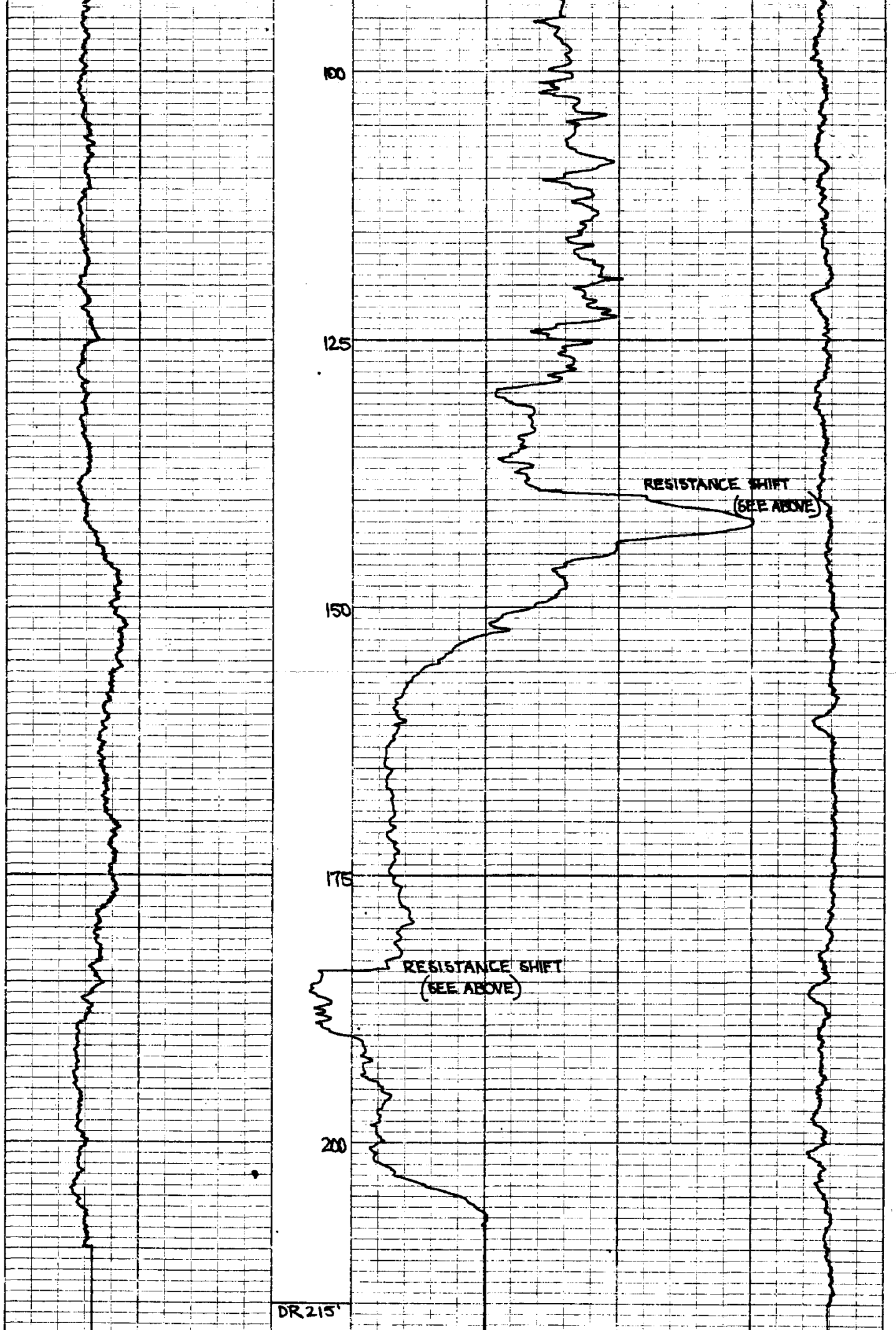
LOGGING DATA

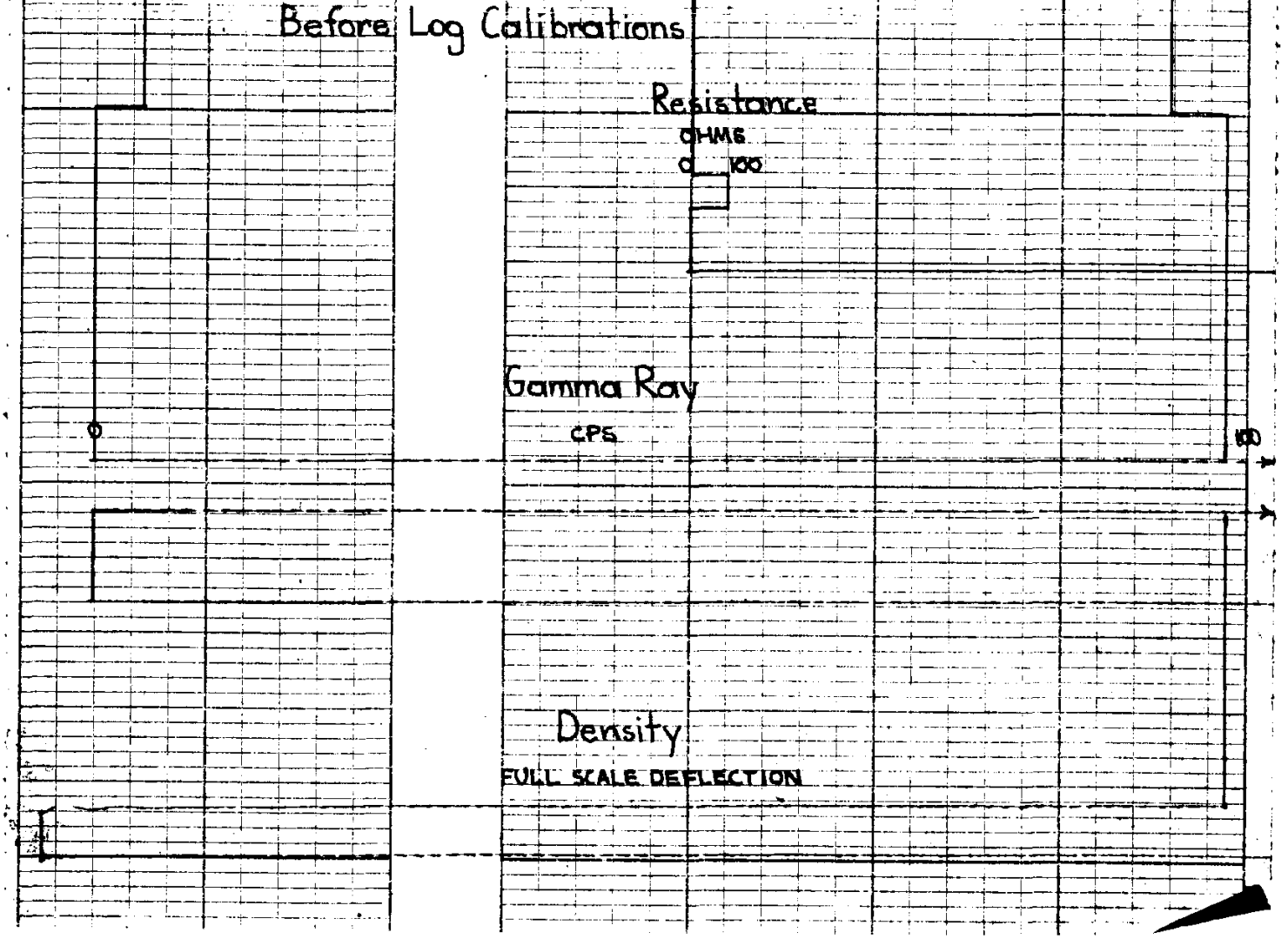
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft./Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
1	215'	0	10	4	100	2R	5.4	1	1K	.5L	

Reference Literature: N/A

Remarks: D. Broen
Resistance curve shifted 3 divisions right @ 184' & 4 left @ 139.5'


Gamma Ray
API Units
Caliper
Hole Diameter (inches)
DEPTH
Gm / cm3
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0
Gamma Ray
Resistance
Density
0
BOTTOM CASING
25
50
FLUID LEVEL
75


100
125
150
175
200
RESISTANCE SHIFT
(SEE ABOVE)
RESISTANCE SHIFT
(SEE ABOVE)
DR 215'


Before Log Calibrations
Resistance
OHMS
0
100
Gamma Ray
CPS
0
50
Density
FULL SCALE DEFLECTION

LEXCO TESTING LTD

DRILLHOLE REPORT

AL FIELD: Campbell River DATE: March 27,1977

COMPANY: Lexco Testing

HOLE NO.: 77-44 Chute Creek

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,132,620 N 1,059,500 E

ELEVATION: 1782.4

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	8	till	
8	52	brown shale	
52	62	grey sandstone	
62	65	red shale	
65	95	grey sandstone	
95	158	green sandstone	
158	185	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

ex-Gunsam 7134.

CANADIAN ARCTIC SURVEY SYSTEMS LTD.
708 - 35A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.
WELL DRILLHOLE CH.CR.77-1
FIELD CHUTE CREEK
PROVINCE BRITISH COLUMBIA

Permanent Datum G.L. Elev.
Log measured from G.L. ft. above perm. Datum
Drilling measured from G.L. Elev. K.B. D.F. G.L.

Other Services

Sec. Twp. Rge. W

Date 20 Mar 77
Run No. One
Type Log Gamma Density
Depth - Driller 181'
Depth - Logger 180'
Bottom logged interval 180'
Top logged interval 0
Type fluid in hole Water
Salinity, PPM Cl. N/A
Density N/A
Max. rec. temp. deg. F.
Operating rig time
Recorded By S. Schmidtke
Witnessed By D. Breen

CASING RECORD
Size 4½" Wgt. Surf. To 20'

BORE RECORD
Bit No. From
Size 8¾" Surf.
Type
Wgt. Rm. 20
Visc. F.L. 20

Field Here

This Hecding and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray			Resistance	Density	Caliper
Run No.	One	Run No.	One	One	
Tool Model No.	L-103	Tool Model No.	L-103	L-103	
Diameter	2⅛"	Diameter	2⅛"	2⅛"	
Detector Model No.	CP-518	Type	ME		
Type	Scint.	Spacing		15"	
Length	15"	Length	6"		
		Holiz. Scale	N/A		
		Rm @ °F	N/A		

General	
Hoist Truck No.	
Inst. Truck No.	
Location	Campbell River

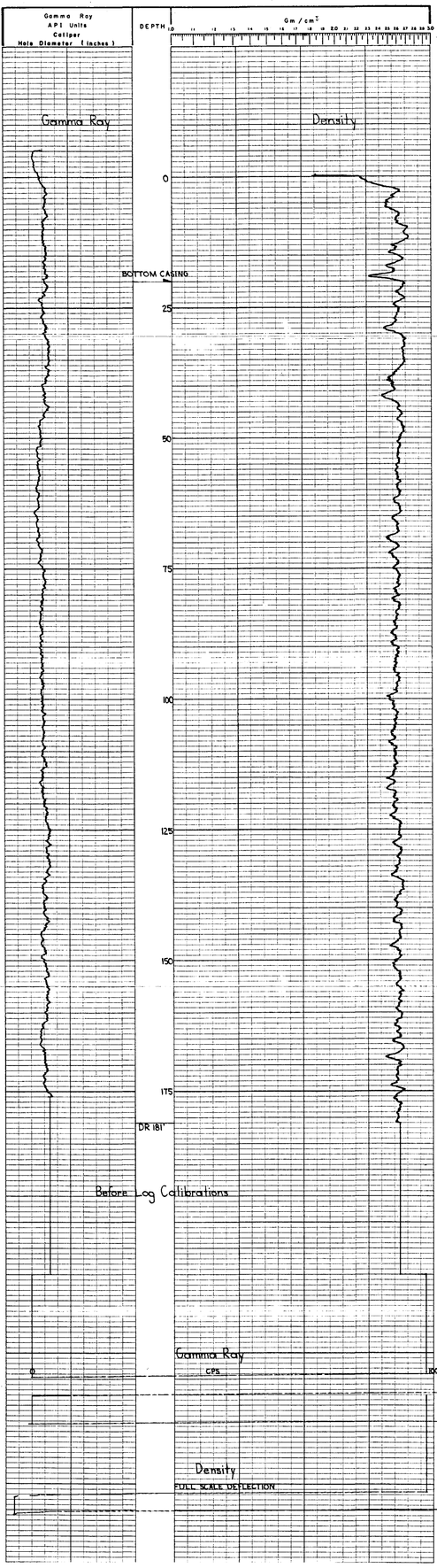
Source Model	H.D.V.P
Serial No.	687
Isotope	Cs 137
Strength	125 mC

LOGGING DATA

General			Gamma Ray					Density			
Depths		Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero
Run No.	From	To	Ft./Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R
1	181'	0	10	4	100	2R	5.4	1	1K	5L

Reference Literature: N/A

Remarks: D. Breen
No fluid in hole



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 29, 1977

COMPANY: Lexco Testing

HOLE NO.: 77-45

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,152,335.0 N 1,069,290 E

ELEVATION: 1064

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	24	Till	
24	244	Grey and white sandstone	Pockets of soft red shale at 60'

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: March 30, 1977

COMPANY: Lexco Testing

HOLE NO.: Chute Creek 77-46

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,135,745 N 1,063,425 E

ELEVATION: 1808

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	225	Grey sandstone	
225	235	Brown shale	
235	365	Green sandstone	
365	380	Red shale	

COMMENTS _____

WATER HORIZON _____ FT. _____

CX-Gunson 72(3)c.

CANADIAN ARCTIC SURVEY SYSTEMS LTD.

708 - 35 A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE CH.CR. 77-46

FIELD CHUTE CREEK

PROVINCE BRITISH COLUMBIA

67

L 21

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Permanent Datum G.L. Elev. ___

Log measured from G.L. ___ ft. above perm. Dat.

Drilling measured from G.L.

Elev. K.B. ___ D.F. ___ G.L. ___

Other Services

Date	30 Mar. '77
Run No.	One
Type Log	Nuclear
Depth - Driller	380'
Depth - Logger	379'
Bottom logged interval	379'
Top logged interval	0
Type fluid in hole	Water
Salinity, PPM Cl.	N/A
Density	N/A
Level	12'
Max. rec. temp. deg. F.	
Operating rig time	1.75 hrs.
Recorded by	G. Samchuck Jr.
Witnessed by	S. Gardner

BORE-HOLE RECORD

RUN No.	Bit	From	To
1	8 3/4"	Surf.	4'
	6 1/4"	4'	T.D.

CASING RECORD

Size	Wgt.	From	To
7"		Surf.	4'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

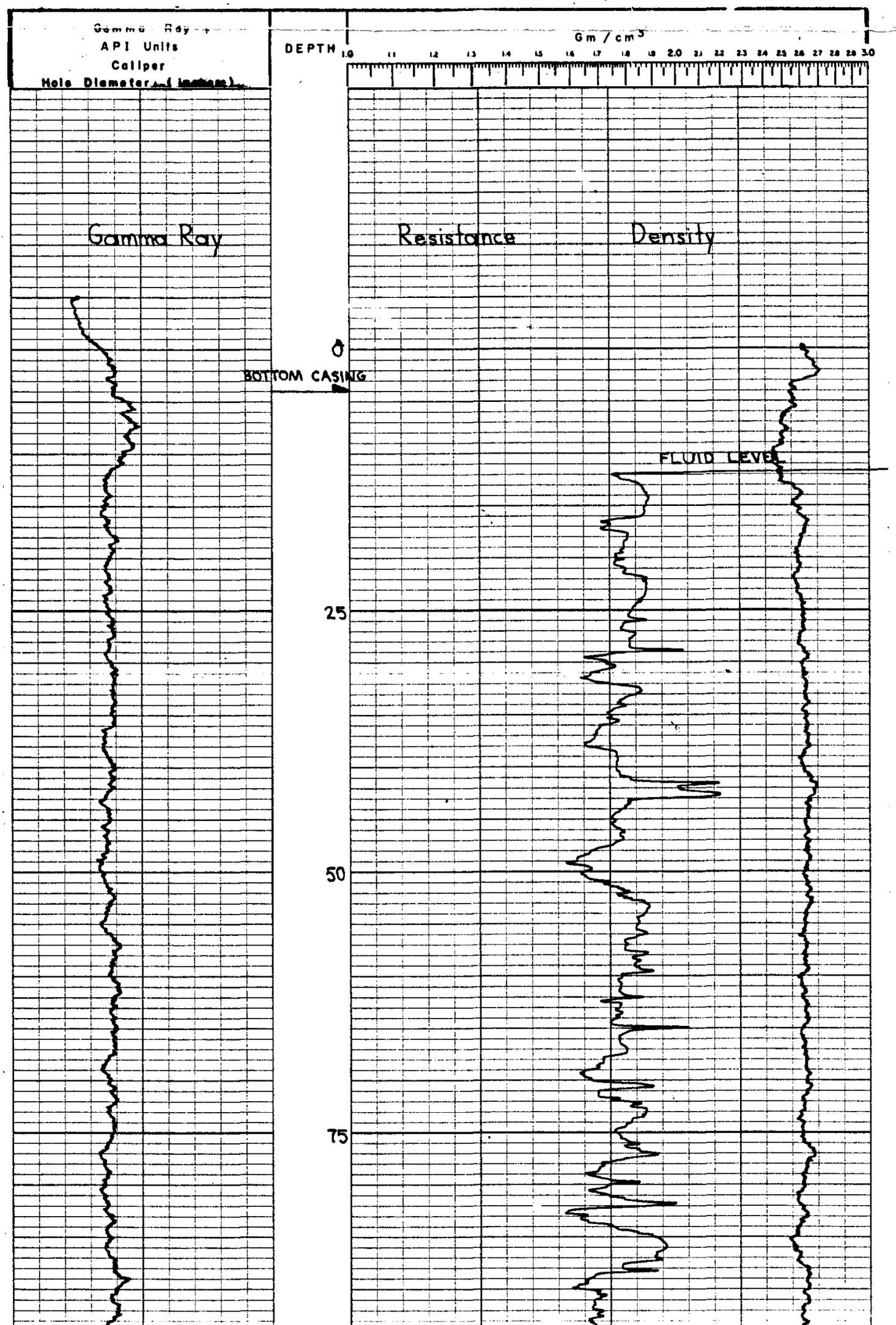
Gamma Ray					Resistance	Density	Caliper
Run No.	One			Run No.	One	One	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2 1/8"			Diameter	2 1/8"	2 1/8"	
Detector Model No	CP-514			Type	ME	F	
Type	Scint.			Spacing		13"	
Length	1.5"						
				Length	5"		
				Horiz. Scale	66.6 Ω/div.		
General				Rm @ °F	N/A		
Hoist Truck No.	1			Source Model		HDVP	
Inst. Truck No.	1			Serial No.		687	
Location	Campbell River			Isotope		Cs 137	
				Strength		125 mC	

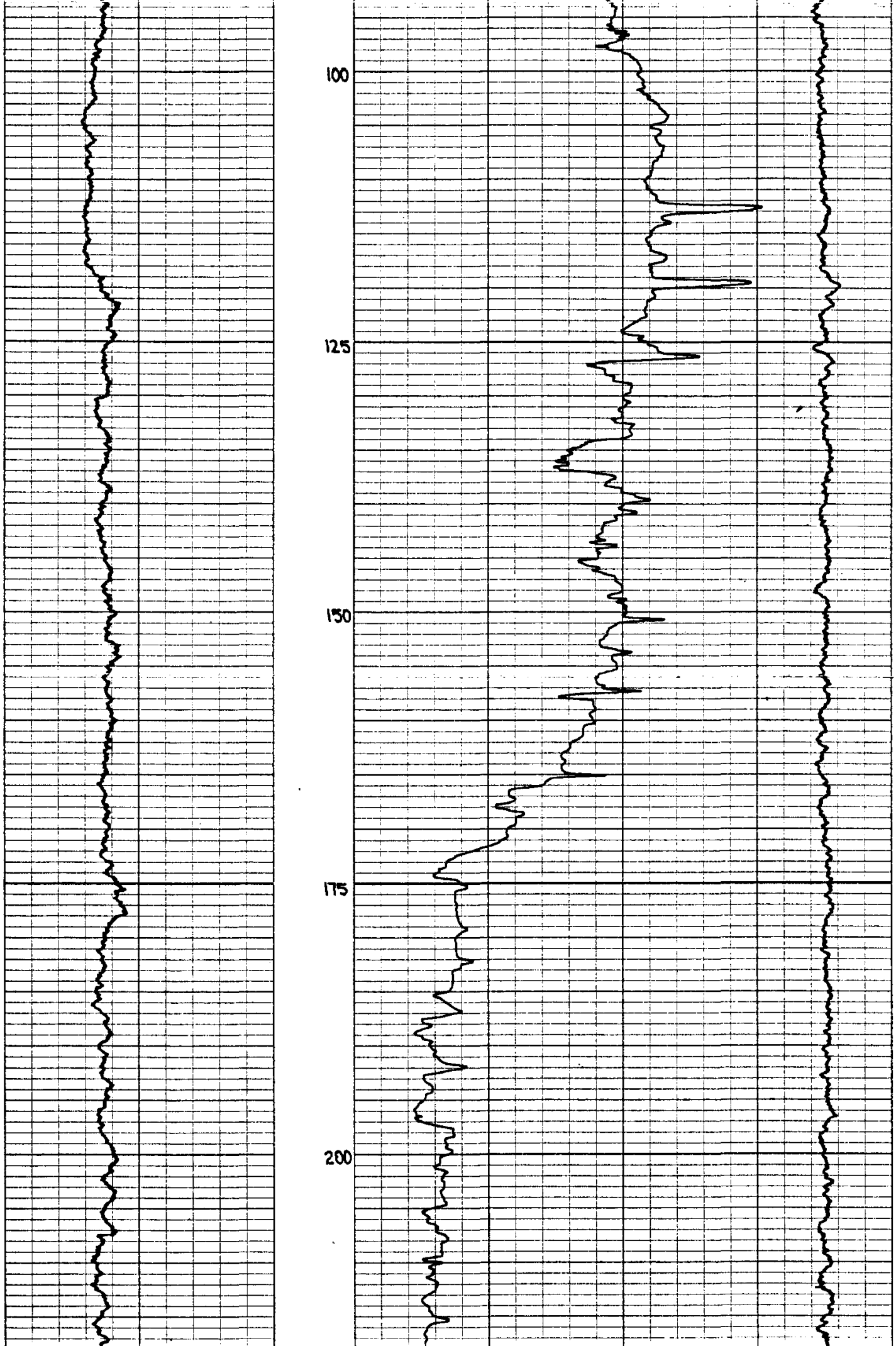
LOGGING DATA

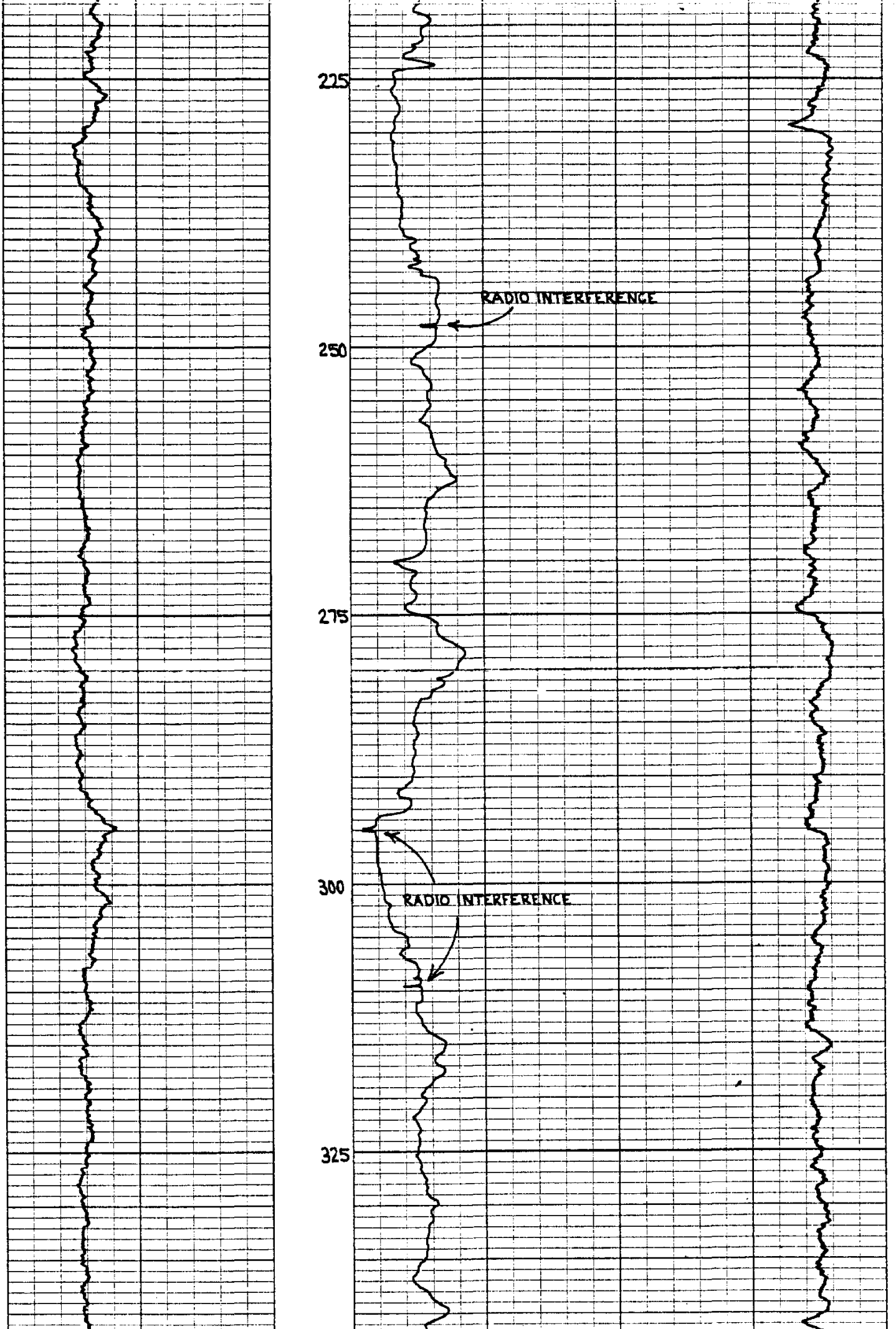
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
1	379'	0	10	4	100	2R	5.4	1	1K	.5L	

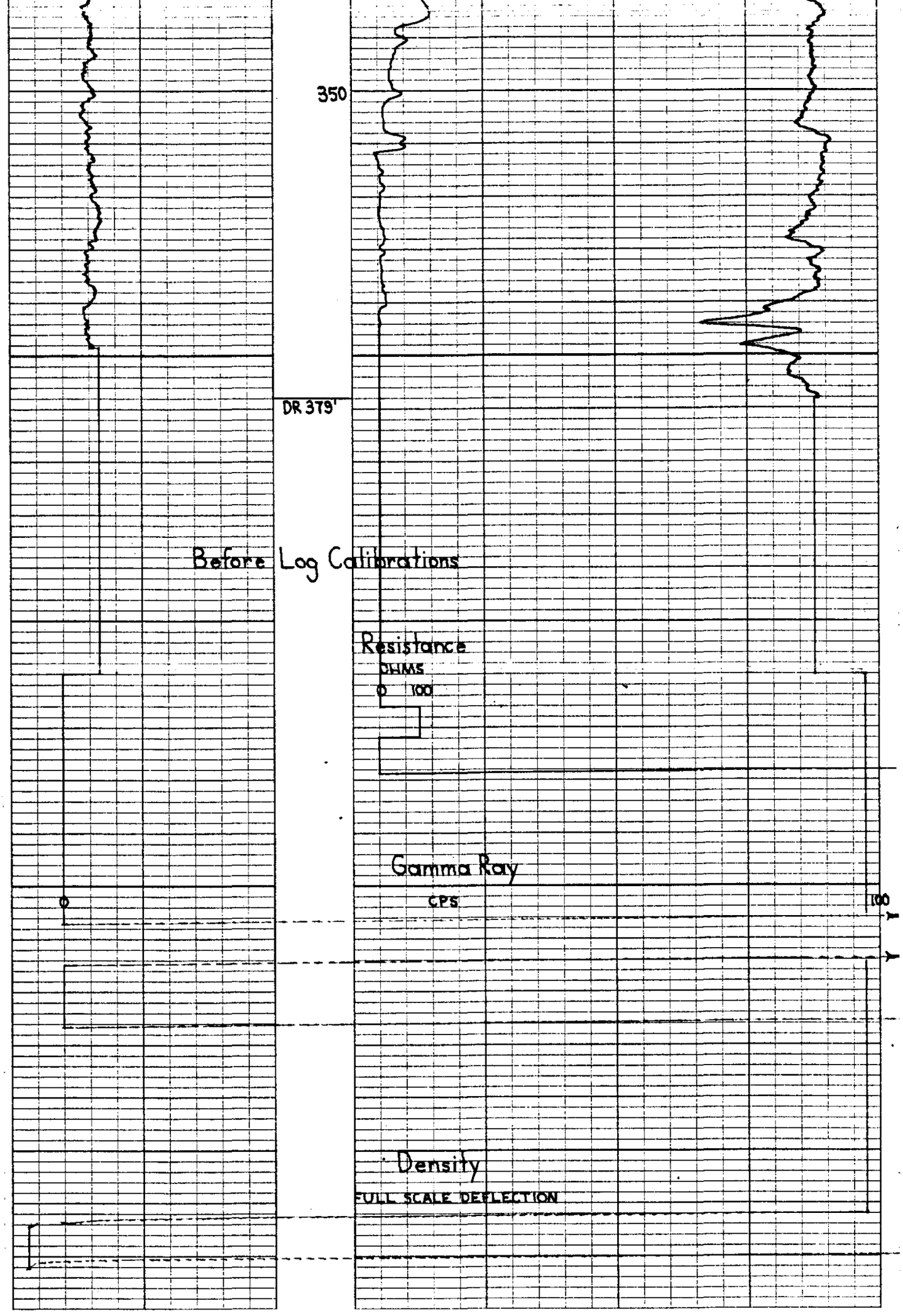
Reference Literature: N/A

Remarks: D. Broen


Gamma Ray
API Units
Caliper
Hole Diameter (inches)
DEPTH
Gm / cm³
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0
Gamma Ray
Resistance
Density
0
BOTTOM CASING
FLUID LEVEL
25
50
75


100
125
150
175
200


225
250
275
300
325
RADIO INTERFERENCE
RADIO INTERFERENCE


350
DR 379'
Before Log Calibrations
Resistance
OHMS
0
100
Gamma Ray
CPS
0
100
Density
FULL SCALE DEFLECTION

CANADIAN ARCTIC SURVEY SYSTEMS LTD.
7008 - 52A STREET N.W. CALGARY, ALTA.

GAMMA DENSITY & RESISTANCE

AK-Gunnison-7818

COMPANY LEXCO TESTING LTD.
WELL DRILLHOLE GHCR-77-45
FIELD CHUTE CREEK
PROVINCE BRITISH COLUMBIA

(4.25) 97

Permanent Datum: G.L. Elev. 0.0 ft. Above Perm. Datum
Log measured from G.L. 0.0 ft. Above Perm. Datum
Drilling measured from G.L. 0.0 ft. Above Perm. Datum

Run No. One | Two | Three
Depth-Driller 243 ft.
Depth-Logger 243 ft.
Bottom Logged Interval 243 ft.
Top Logged Interval None | Surface | Surface
Casing-Driller 2.38 in. @ 771 ft. | @ ft. | @ ft.
Casing-Logger None | Surface | Surface
Bit Size 2 3/4 in. | in. | in.
Type Fluid in Hole Water | | |
Density lb/gal N/A | | |
Level Full | | |
Max. Rec. Temp. deg. F Recs. | | |
Operating Rig Time
Recorded By S. Lisack
Witnessed By Scandrett

Other Services

RUN	BIT RECORD			CASING RECORD		
No.						
From	Surface			Surface		
To	771			243		
Size	3 7/8			2 3/8		
Type						
Weight				4.7		

Field Here — This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray		Resistance	Density	Caliper
Run No.	One			
Tool Model No.	L-103	L-103	L-103	
Diameter	2 3/4	2.75	2.75	
Detector Model No	CP-514	ME	19	
Type	Scint			
Length	1.8			

Length	5'
Horiz. Scale	100 ft/div
Rm @ °F	N/A

General	
Hoist Truck No.	
Test. Truck No.	
Location	Campbell River

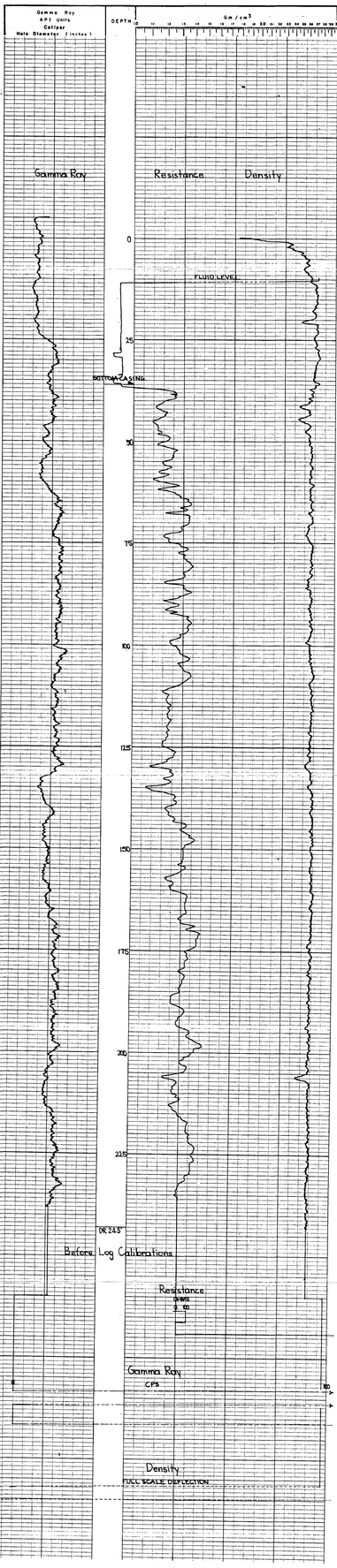
Source Model	H.D.V.P
Serial No.	687
Isotope	Cs 137
Strength	125 mC

LOGGING DATA

General				Gamma Ray			Density			
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
1	243	0	10	4	100	2R	5.4	1	1K	.5L

Reference Literature: N/A

Remarks: H. Vincett



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: April 12, 1977

COMPANY: Lexco Testing

HOLE NO.: DH-77-47

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 47+78 9551' Lt of B/L

ELEVATION: 1161'

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	4	till	
4	45	brown shale	
45	61	coal	
61	65	brown shale	
65	88	grey sandstone	water at 120 ft app. 20 gal
88	104	red shale	per min.
104	125	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

Ex Aquitaine 77 (3)2

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU-77-47

FIELD QUINSAM 47-7R 955 L4

PROVINCE ALBERTA B.C.

Permanent Datum G.L. Elev. 1161'

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L.

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

Other Services

Date	12 APRIL 77
Run No.	ONE
Type Log	Nuclear
Depth - Driller	124'
Depth - Logger	124'
Bottom Logged Interval	124'
Top Logged Interval	0'
Type fluid in hole	WATER
Salinity, PPM Cl.	—
Density	—
Level	Full
Max. rec. temp. deg. F	72°
Operating rig times	0.75 HR
Recorded by	K.KRUEGER
Witnessed by	S.GARDNER

RUN No.	BIT	BORE-HOLE RECORD From	To	Size	Wgt.	CASING RECORD From	To

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

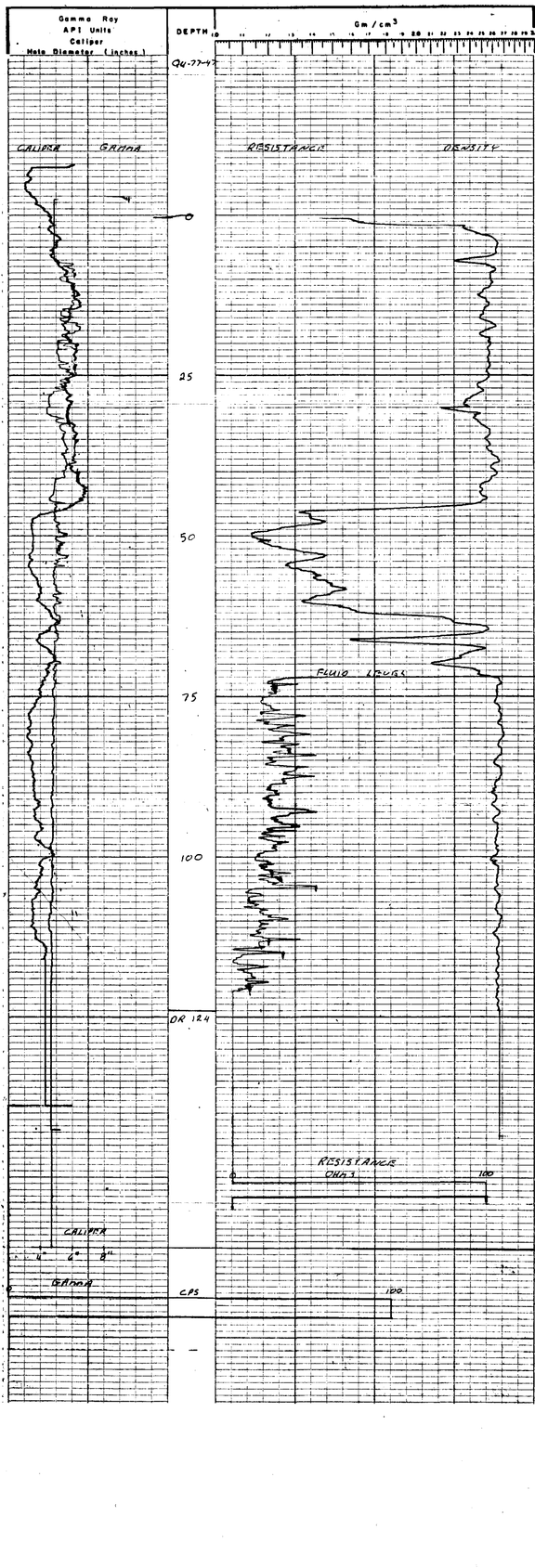
Gamma Ray				Resistance	Density	Caliper
Run No.	ONE			ONE	ONE	ONE
Tool Model No.	L-103			L-103	L-103	L-103
Diameter	2 1/8"			2 1/8"	2 1/8"	2 1/8"
Detector Model No.	CP-516			ME	F	EM
Type	SCINT			Type	Spacing	13"
Length	3'			Length	5"	
				Horiz. Scale	6.25 a/DIV	
General				Rm @ °F	-	
Hoist Truck No.	2			Source Model		HDVP
Inst. Truck No.	2			Serial No.		687
Location	CAMPBELL RIVER			Isotope		Cs 137
				Strength		125 mC

LOGGING DATA

General				Gamma Ray				Density		
Run No.	Depths From	To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API GR Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R
1	124'	0'	12	4	100		10	1	1K	0.5L

Reference Literature:

Remarks: D. BROEN



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: April 14, 1977

COMPANY: Lexco Testing

HOLE NO.: 77 - 77 - 48

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 36+39 9008' Tt of B/T.

ELEVATION: 1174'

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	24	till	
24	41	sand	
41	50	coal	
50	75	brown shale	
75	80	green sandstone	

COMMENTS _____

WATER HORIZON _____ FT. _____

Ex- Quinsam 77 (3) C.

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

97

L 23

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU-77-48

FIELD QUINSAM ~~3437 9998 Et.~~

PROVINCE B.C.

LINE 36+81 9475' Lt of B/L

Other Services

Log ___ Sec. ___ Twp. ___ Rge. ___ W. ___

Permanent Datum G.L. Elev. 1175' Elev. K.B. ___

Log measured from G.L. ___ ft. above perm. Datum D.F. ___

Drilling measured from G.L. G.L. ___

RUN	BIT	BORE-HOLE RECORD From	To	CASING RECORD Size	Wgt.	From	To
No.							
1	6 3/4" 5 5/8"	0' 18'	18' TD	5 1/2"		0	18'

Fold Here — This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

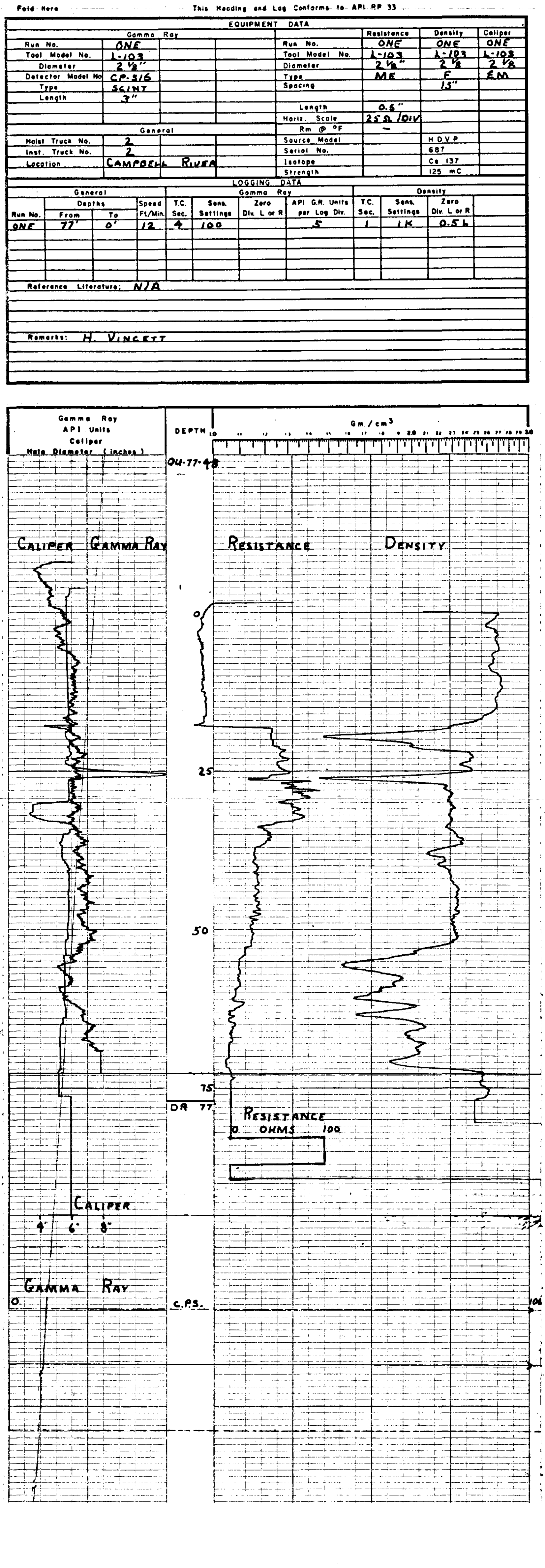
Gamma Ray					Resistance	Density	Caliper
Run No.	ONE			Run No.	ONE	ONE	ONE
Tool Model No.	L-103			Tool Model No.	L-103	L-103	L-103
Diameter	2 1/8"			Diameter	2 1/8"	2 1/8	2 1/8
Detector Model No	CP-516			Type	ME	F	EM
Type	SCINT			Spacing		13"	
Length	3"						
				Length	0.5"		
				Horiz. Scale	25Ω/DIV		
General				Rm @ °F	—		
Hoist Truck No.	2			Source Model		HDVP	
Inst. Truck No.	2			Serial No.		687	
Location	CAMPBELL RIVER			Isotope		Cs 137	
				Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density			
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	
ONE	77'	0'	12	4	100		5	1	1K	0.5L	

Reference Literature: N/A

Remarks: H. VINCETT



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: April 15, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-49

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 36+81 9475' Lt of B/L

ELEVATION: 1125'

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	10	till	
10	33	green sandstone	
33	40	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILL HOLE GH-77-49

FIELD Quinsam Lake

PROVINCE B.C.

LOCATION 36.73S 33W LE of B/L

Other Services

Permanent Datum G.L. Elev. 1174'

Log measured from G.L. ft. above perm. Dat.

Drilling measured from G.L. Elev. K.B. D.F. G.L. 1174'

Date 15 APRIL 77

Run No. 1

Type Log GAMMA DENS

Depth—Driller 38

Depth—Logger 38

Bottom logged interval 38

Top logged interval 0

Type fluid in hole CASING

Salinity, PPM Cl. 0

Density CASING

Level n/a

Max. rec. temp. deg. F. CASING

Equip. location n/a

Recorded by LEE MCKENZIE

Witnessed by S. GARRIOCH

BORE-HOLE RECORD

Run No.	Bit From	Bit To	Size
1	5 3/8	38	
	38	TD	3 1/2

CASING RECORD

Size	Wgt.	From	To
		0	20

Ex-Quinsam 77(3)12

49

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

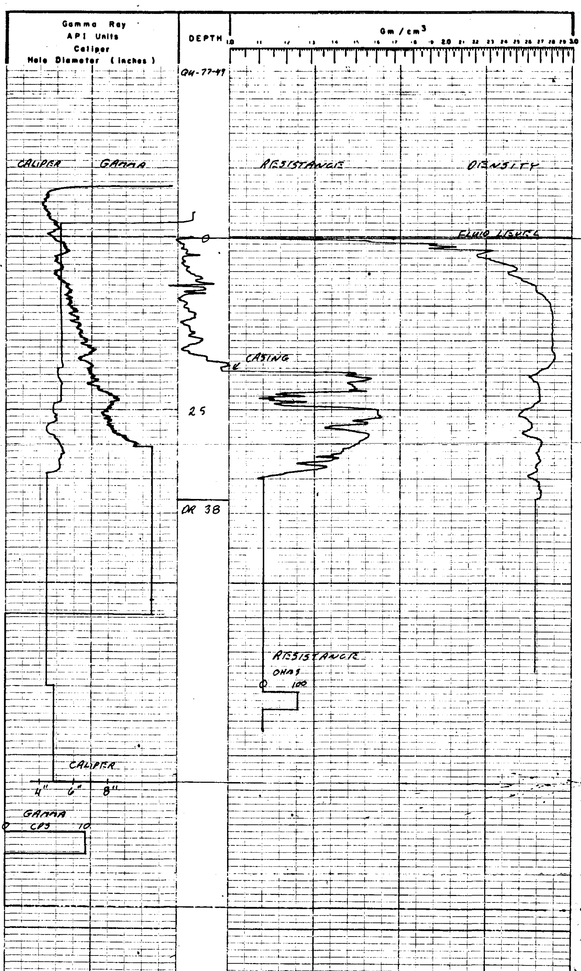
	Gamma Ray				Resistance	Density	Caliper
Run No.	1			Run No.	1	1	1
Tool Model No.	L-103			Tool Model No.	L-103	L-103	L-103
Diameter	2 1/8			Diameter	2 1/8	2 1/8	2 1/8
Detector Model No.	CP-516			Type	N.G.	IC	Cam
Type	SCINT			Spacing		13"	
Length	3'						
				Length	1"		
				Horiz. Scale	50 & 10/in		
General				Rm @ °F			
Hoist Truck No.	2			Source Model		HDVP	
Inst. Truck No.	2			Serial No.		687	
Location	CAMPBELL RIVER			Isotope		Cs 137	
				Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density		
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
1	38	0	12	4	100		5	1	1K	.5 L

Reference Literature:

Remarks: H. VINIATT



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: April 14, 1977

COMPANY: Texco Testing

HOLE NO.: QU-77-50

APPROX. LOCATION: 0+00 1300' Pt of B/L SEC.___ TWP.___ RGE.___ W.___

SURVEYED LOCATION:

ELEVATION: 958'

DRILLER: D Broen

FROM	TO	LOG	REMARKS
0	26	till	
26	58	grey sandstone	
58	60	coal	
60	63	brown shale	
63	65	coal	
65	67	brown sandstone	
67	86	coal	
86	91	brown sandstone	
91	94	coal	
94	120	brown shale	
120	235	brown sandstone	
235	265	white sandstone	
265	300	green sandstone	
300	330	basalt	

COMMENTS fault at 315

WATER HORIZON ___ FT. ___

LUSCAR LTD. corehole log

HOLE NO. QU-77-50

PAGE 1 OF 2

Line 9+00 1300 Rt of B/L April 24/77

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION : LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION.	TRUE DEPTH
1	55	63	7.2				
				7.20		sandstone;med to coarse grained; med to light grey; salt and pepper; breaks easily poorly cemented;fractures at 60° to core axis; massive	
2	63	71	8.6				
				2.50		sandstone;med grained;greenish grey;somewhat harder;massive	
				.60		sandstone;med grained; greenish grey;hard fractured and broken;	
				.30		mud;clayey;plastic;soft;greenish;brown; no evidence of bedding	
				.55		sandstone;med-grained;massive;fairly soft salt and pepper;	
				.25		siltstone;dark grey;fractured and broken;	
				1.10		sandstone;as above;coaly lenses;bedding at n20° to core axis;massive	
				.35		sandstone dark grey; coaly;shalebands; broken up;	
				.90		coal;soft;broken up;massive pyrite on cleats;bright and blocky	
				.40		sandstone;50% coal content;bright coaly bands with abundant pyrite on bedding planes; bedding at n20'to core axis	
				.25		coal;as above	
				.35		sandstone;50% coaly;as above	
				.20		sandstone;med grained;coaly lenses; hard; massive;	
3	71	75	3.0				
				.15		sandstone; 50% coaly material;hard;	
	TOTALS					÷ X 100 = % REC. SEAM	
						÷ X 100 = % TOT. REC. SEAM(S)	

LUSCAR LTD. corehole log

HOLE NO. QU-87-50

PAGE 2 OF 2

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION : LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION.	TRUE DEPTH
				2.85		coal;soft;broken upl bright and blocky	
						abundant massive pyrites on cleat surfaces	
						abundant calcite	
4	77	79	1.75			coal;bright and blocky;massive;light;	
						pyrite and calcite in abundance	
5	79	87	8.65				
				3.45		coal;loaded and rolled in places;massive;	
						as above;20° bedding	
				.45		sandstone;med grained;carbonaceous;very	
						hard;	
				2.40		coal;massive; as above 20° bedding	
				.90		coal;silty matrix;hard 75% coaly	
				.15		siltstone;;sandy;med brown;coal lenses	
7	95	104	8.1				
				.40		siltstone;coaly;hard;cross bedded at 20°	
						to core axis;sandy;dark brown to black;	
				2.80		siltstone;hard;massive;med brown;coaly	
						lenses;	
				.70		coal;soft;broken up;massive pyrite and	
						calcite; 20% bedding	
				.70		siltstone; as above	
				1.60		coal; as above;soft;dirty	
				.35		mudstone;soft;plastic;crushed coal frag-	
						ments;med brown	
				1.50		siltstone;sandy highcoal content;crossbed-	
						ding;	
				.35		siltstone;medium grey;calcite infills;	
						very hard;massive	
TOTALS						÷ X 100 = % REC.	SEAM
						÷ X 100 = % TOT. REC.	SEAM(S)

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

Re Grandcast 2216 Inc

Company LEXCO TESTING LTD.

Well GRANDCAST 2216 Inc

Field GRANDCAST

Province ALBERTA

Location: Twp. 22 Rge. 16 W 4 Mer.

Permanent Datum: G.L. Elev. 0 ft. above Perm. Datum

Log Measured From: G.L. 0 ft. above Perm. Datum

Drilling Measured From: G.L.

Date: 1-2-84

Run No. 1

Depth-Driller 330

Depth-Logger 330

Bottom Logged Interval 330

Top Logged Interval 0

Type Fluid in Hole FRESH

Salinity, PPM Cl

Density 9.2

Level FULL

Max. rec. temp. deg. F

Equip. No. & Location 1105 EDM

Recorded By K. GRANDCAST

Witnessed By

CASING RECORD

	Size	Wgt.	From	To
Surface String	8 5/8"	20	0	30
Prod. String	4 1/2"	9.5	0	330

BORE HOLE RECORD

	Bit No.	From	To
	1	0	330

Type Fluid in Hole: FRESH

Density: 9.2

Viscosity: 45

pH: 8.5

Fluid Loss: 8.4

Source of Sample: SURFACE

Rm @ Meas. Temp: .65 @ 68°F

Rmf @ Meas. Temp: .52 @ 68°F

Rmc @ Meas. Temp: .78 @ 68°F

Source of Rmf & Rmc: CALC.

Rm @ BHT: .39 @ 120°F

Time Since Circ.: 4 HRS.

Max. Rec. Temp. Deg. F: 120°F

Equip. No. & Location: 1105 EDM

Recorded By: K. GRANDCAST

Witnessed By:

Lost Hole: Yes / No

Date: 1-2-84

Run No. 1

Depth-Driller 330

Depth-Logger 330

Bottom Logged Interval 330

Top Logged Interval 0

Type Fluid in Hole FRESH

Salinity, PPM Cl

Density 9.2

Level FULL

Max. rec. temp. deg. F 120°F

Equip. No. & Location 1105 EDM

Recorded By K. GRANDCAST

Witnessed By

Primary Service

Run No. 1

Date 1-2-84

Type Log GAMMA DENSITY

Depth-Driller 330

Depth-Logger 330

Bottom Logged Interval 330

Top Logged Interval 0

Type Fluid in Hole FRESH

Salinity, PPM Cl

Density 9.2

Level FULL

Max. rec. temp. deg. F 120°F

Equip. No. & Location 1105 EDM

Recorded By K. GRANDCAST

Witnessed By

Field Area

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray		Resistance	Density	Caliper
Run No.	1	1	1	1
Tool Model No.	1-107	1-107	1-107	1-107
Diameter	2 1/8	2 1/8	2 1/8	2 1/8
Detector Model No	12 3/4	7/8	1"	5/8
Type	SCINT.		13	
Length	3"			
		Length	1"	
		Horiz. Static Res. @ 72	200 OHM	

General

Hoist Truck No.	2	Source Model	HDVP
Inst. Truck No.	1	Serial No.	887
Location	CRANDELL ALTA	Isotope	Cs 137
		Strength	100 MC

LOGGING DATA

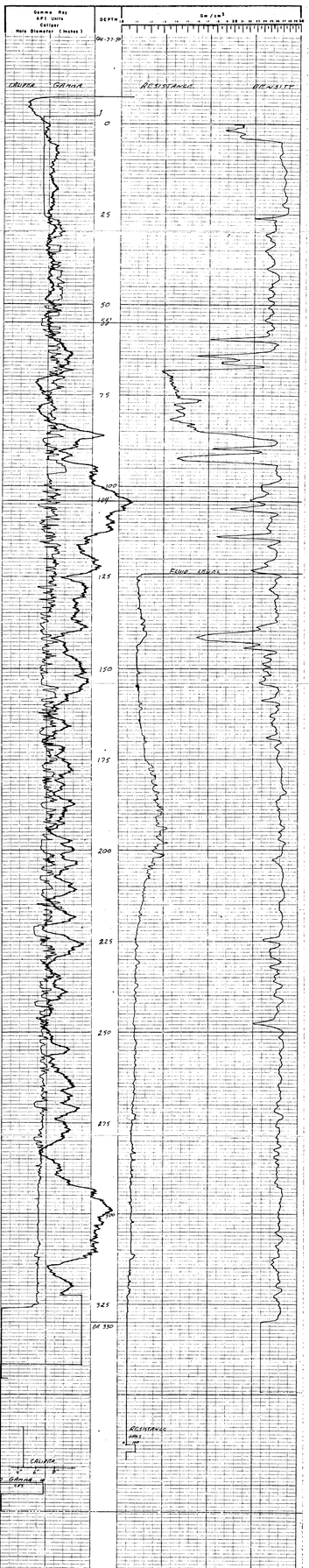
Gamma

Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	API GR Units per Log Div.	T.C. Sec.	Density Sens. Settings	Density Zero Div. L or R
1	330	0	15	4	100	C	1	1K	24

Reference Literature:

Remarks: D. GRON

ATTEMPTED TO TAG OLD HOLE - WOULD NOT TAKE WATER



LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

Company LEXCO TESTING LTD.

Well DRILLSHOLE LQ-77-1

Field LOWER QUINSAM

Province ALBERTA B.C.

Location: Lat. Sec. Twp. Rge. W.

Permanent Datum G.L. Elev.

Log measured from K.B. ft. above perm. Datum

Drilled Depth 303 Ft.

Date 6-Dec-77

Run No. ONE

Type Log GAMMA DENSITY

Depth-Driller 303

Depth-Logger 303

Bottom Logged Interval 303

Top Logged Interval SURFACE

Type Fluid in Hole WATER

Salinity, PPM Cl

Density 1.0

Level FULL

Max. Rec. Temp. Deg. F.

Equipment No. & Location

Recorded By R. EVANS

Witnessed By S. GRIESDALE

RECORDED BY

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

Other Services

67

Ex Quinsam file.

Field Rate

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray				Resistance		Density	Caliper
Run No.	ONE			Run No.	ONE	ONE	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2 7/8"			Diameter	2 7/8"	2 7/8"	
Detector Model No	C.P.-314			Type	MD	F	
Type	SCINT.			Spacing		13"	
Length	3'			Length	1'		
				Horiz. Scale	25 ft./DIV.		
				API GR #			
General				Source Model		HVP	
Hoist Truck No.	2			Serial No.		687	
Inst. Truck No.	2			Isotope		Cs 137	
Location	CAMPBELL RIVER			Strength		125 mC	

LOGGING DATA

General			Speed	T.C.	Sens.	Zero	Gamma Ray		T.C.	Density	
Run No.	Depths From	To	FL/Min	Sec.	Settings	Div. L or R	API GR Units per Log Div.		Sec.	Sens. Settings	Zero Div. L or R
ONE	303	0	12	4	100		2		1	1X	8.94

Reference, Literature:

Remarks: Howard

Gamma Ray
API Units
Caliper
Hole Diameter (inches)

DEPTH m

Gm/cm³

GAMMA RAY

RESISTANCE

DENSITY

FLUID LEVEL

DR 303

RESISTANCE
0 OHMS 100

GAMMA RAY
0 CPS 10

PROGRESS REPORT OF
COAL EXPLORATION ON
THE QUINSAM PROPERTY, VANCOUVER ISLAND

January - June 1977

CX QUINSAM-77 (1) C

Stephen Gardner

July 15, 1977

TABLE OF CONTENTS

ALSO REFER TO: CONFIDENTIAL ANALYSIS DATA

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* * *

INTRODUCTION

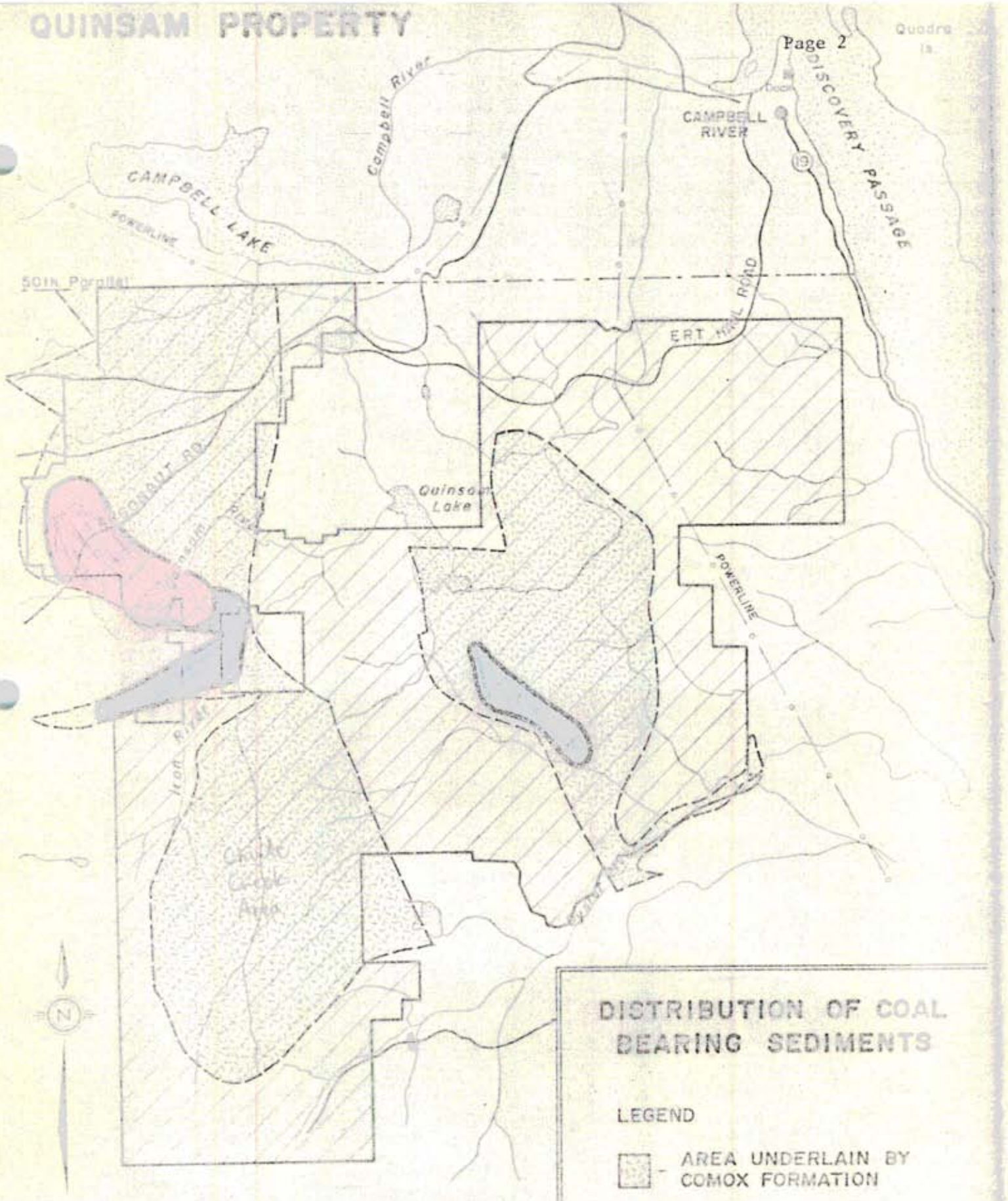
This report outlines the continuing program of coal exploration which was initiated in September of 1976, in the Quinsam Lakes region near Campbell River, Vancouver Island, British Columbia. During the period of September through December, 1976, a recoverable coal reserve in the order of 13.25 million tons was outlined in the Middle Quinsam Lake area (see previous report entitled Geology and Coal Reserves of the Quinsam Property, Vancouver Island, Phase I Report, by R. Engler). The 1977 program was designed around an expansion of this reserve in a southerly direction and as well the exploration and assessment of two separate sedimentary basins, one in the Chute Creek area and one in the Lower Quinsam Lake area, as outlined in the Phase I Exploration Agreement between Weldwood of Canada Ltd. and Luscar Ltd.

Map 1 illustrates in red the extent of the coal reserve as outlined by the 1976 drilling. The southern expansion is shown blue and the only other economic coal reserve which is in the Lower Quinsam sedimentary basin, is also shown in blue. The remainder of the Comox sediments in the Quinsam Lakes area appears to be barren of economic coal.

Because of the dissimilarity of the geology of the three basins, this report will examine each area separately; then, in a regional geologic framework, combine the areas in order to construct a depositional model for the whole region.

SUMMARY AND CONCLUSIONS

A total of 100 testholes were drilled in the first six months of 1977, for a total drilled footage of 24,000 feet. This drilling was focused on three particular areas of interest, as laid out in the Phase I exploration agreement between Weldwood of Canada Ltd. and Luscar Ltd.:


QUINSAM PROPERTY
Campbell River
CAMPBELL RIVER
DISCOVERY PASSAGE
CAMPBELL LAKE
POWERLINE
50th Parallel
ERT HAUL ROAD
Quinsam Lake
POWERLINE
Iron River
Oyster River Area
N
DISTRIBUTION OF COAL BEARING SEDIMENTS
LEGEND
AREA UNDERLAIN BY COMOX FORMATION
PHASE I STUDY AREA
SCALE
0 1 2 4
1" = 2 Miles
MAP I

the Middle Quinsam area, the Lower Quinsam area, and the Chute Creek area.

Drilling in the Middle Quinsam area aimed at expansion of the previous 1976 proven total in place reserve of 13.25 million tons. This expansion involved two specific areas: The line 85+00 area in the Middle Block, and the Southern Extension Block in the Long Lake area, south of Middle Quinsam Lake. 1.07 million tons of proven in place reserve was added in the Line 85+00 area. 5.91 million tons, with an average overburden to coal ratio of 9.34:1, of proven in place reserve was added in the Southern Extension Block. In place proven reserves in the Middle Quinsam Mining Block were increased by 6.98 million tons in the first six months of 1977 to an overall total of 20.23 million tons.

Drilling in the Lower Quinsam Lake Area outlined a block of in place strippable reserve referred to as the Quinsam East Block. This Block has proven in place reserves of 6.88 million tons, at an average overburden to coal ratio of 14.06:1, with an additional probable reserve of 2.97 million tons at 18.35:1, for a total of 9.85 million tons in place. Coal here is dirty and split into three major tongues and it is estimated that mining recoveries will be low.

The Chute Creek area was explored for economic coal and results were unfavorable. Coal licenses were subsequently dropped in this area.

Coal quality in the Southern Extension Block was similar to the other blocks in the Middle Quinsam Mining Block. 8 holes were cored in the Southern Extension Block, for a total cored footage of 329 feet. Laboratory results of the clean coal float at 1.8 S.G. are as follows:

TABLE 1: Average Results - Clean Coal Float - Southern Extension Block

SEAM	RECOVERY %	ASH %	SULPHUR %	BTU/LB.	
#1	84%	11.7	.96	11,660	
#2	88%	8.1	3.50	12,536	averages
#3	77%	10.2	2.15	12,175	

Two holes were cored in the Quinsam East Block, for a total cored footage of 86 feet. Coal quality here varies considerably in a vertical direction within the seam itself as well as in a lateral direction. The lower tongues are of poor quality: higher in ash and sulphur values. The values for clean coal float at 1.8 S.G. are as follows:

TABLE II: Average Results - Clean Coal Float - Quinsam East Block at 1.8 S.G. (½" X 28 Mesh fraction)

Hole No.	Location	Interval	Recovery %	Ash%	Sulphur %	BTU/lb.
LQ - 77 - 91	Seam #1 Lower Quinsam Seam (Sample 1)	110.25 - 114.75	90.4	9.05	0.65	12,653
LQ - 77 - 91	Lower Quinsam Seam (Sample 2)	129.35 - 136.6	67.0	12.52	1.88	12,291
LQ - 77 - 91	Lower Quinsam Seam (Sample 3)	147.00 - 151.45	87.7	14.73	2.91	11,969
LQ - 77 - 74	Lower Quinsam Area (Sample 2)	57.75 - 63.75	65.1	13.39	1.38	12,098

It can be concluded that the total in place strippable coal reserve has been adequately defined in the Quinsam area according to the Phase I exploration agreement. Refinements in the reserve figures as development drilling is undertaken are inevitable, but the total in place strippable reserve figures, especially for the Middle Quinsam Mining Block, will not vary to any great degree. The Quinsam East Block requires some further drilling before a final figure can be arrived at, but the reserve boundaries have been adequately defined.

Underground reserves are beyond the scope of this report, however, underground potential in the Middle Quinsam Block appears favorable.

TECHNICAL INVESTIGATIONS

The following table lists the total number of drillholes and coreholes that were completed in each of the areas from January 1 to June 26, 1977.

	Middle Quinsam	Chute Creek	Lower Quinsam	Totals
Holes Drilled	67	12	21	100
Footage Drilled	14,450	4,150	5,400	24,000
Holes Cored	8	--	2	10
Footage Cored	329	--	86	415

TABLE III: Footage Breakdown -- 1977 Drilling and Coring

In the Middle Quinsam Area, holes were spaced in the pattern laid out at the beginning of exploration in 1975 -- holes spaced at 500 foot intervals where possible, on 500 offset lines from the original base-line.

In the Chute Creek Area, holes were located on existing access roads and trails.

In the lower Quinsam Area, holes were located on existing accesses as much as possible, but some new lines were cut.

Drilling was undertaken with Lexco Testing's Rigs 06 and 07, with all coring performed by Rig 06. All holes were geophysically logged using the standard gamma-density resistance curve. Canadian Arctic Survey Systems were under contract until the end of March, when they were replaced with Lexco Testing's own logging unit.

A wireline coring system was employed for all coring operations, with the cores logged on site and stored, except for the coal samples, which were shipped to the Lexco Lab in Edmonton for analysis.

EXPLORATION IN THE CHUTE CREEK AREA

LOCATION AND PHYSIOGRAPHY

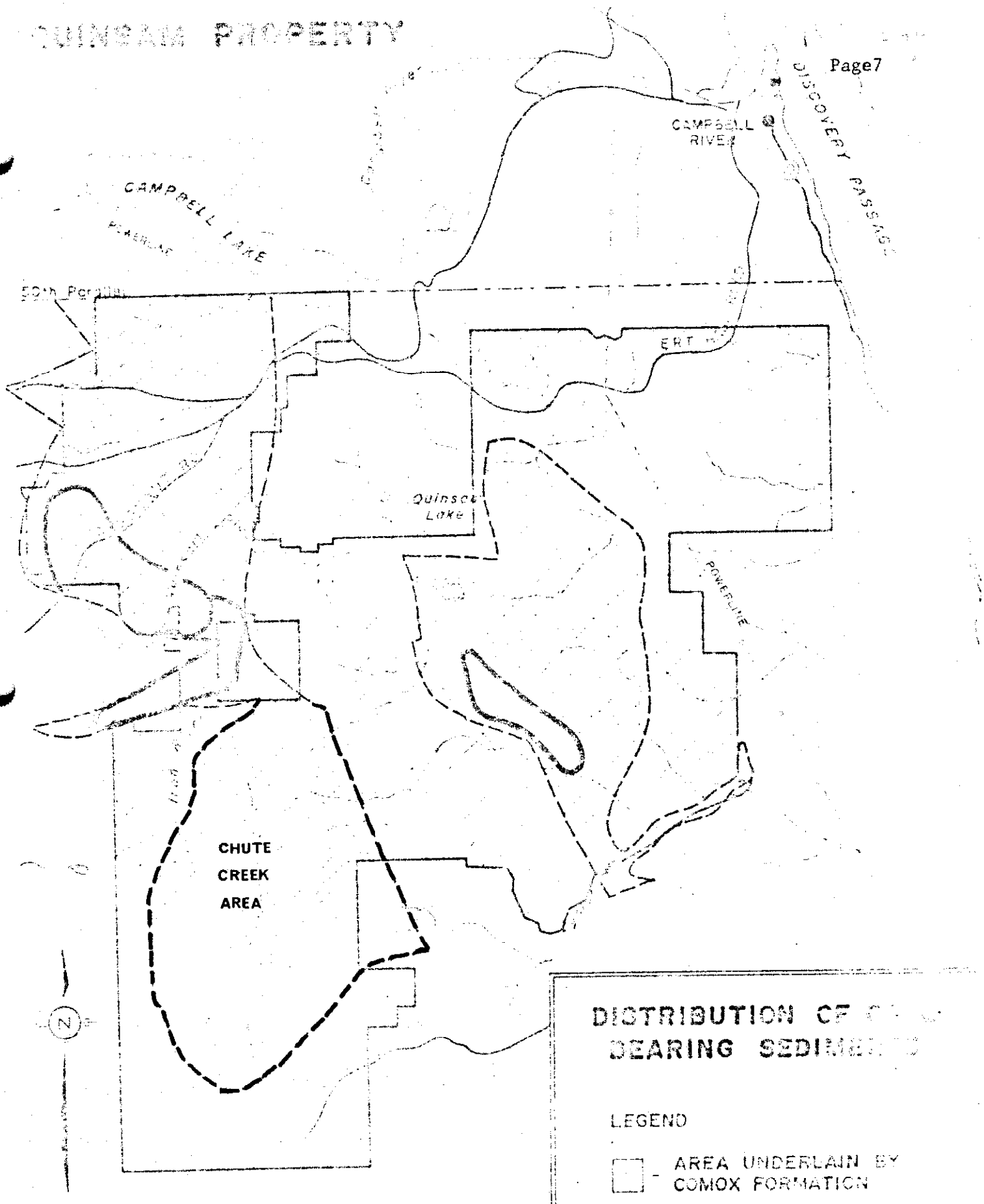
The Chute Creek area is located approximately one mile south of the Middle Quinsam Area (See Map 2). These two areas are geographically separated by the Iron River, which flows in a north-easterly direction. The twenty square mile area runs south from the Iron River to the Oyster River. It is bounded on the east by a basaltic high, which separates it from the Lower Quinsam area, and on the west by granitic mountains.

The Chute Creek area is a plateau with swampy lands, periodically drained by small creeks. Local topography varies up to 150 feet along these creeks. The area is approximately 2500 feet a.s.l. at its southwestern margin. It falls away rapidly to the north where it descends to the 1000 foot elevation in the vicinity of the Iron River.

DESCRIPTION OF WORK

1. Surface Mapping: A preliminary mapping program of the Chute Creek Area was undertaken by Bayrock and Reimchen Surfical Geology Ltd. in February 1977. This study involved mapping the structure and geology of the surfical glacial deposits as well as the bedrock. Because of poor accessibility and heavy snow conditions, the southwestern one-third of the basin was not mapped. This area was traversed in early May after drilling was completed.

2. Drilling: 12 testholes were drilled in the Chute Creek area, for a total of 4150 feet of drilling. Drilling was aligned in general east-west patterns in order to explore across the strike of the formation as determined by the surface mapping program.



DISTRIBUTION OF [illegible] BEARING SEDIMENTS

LEGEND

- AREA UNDERLAIN BY COMOX FORMATION
- PHASE I STUDY AREA

MAP 2

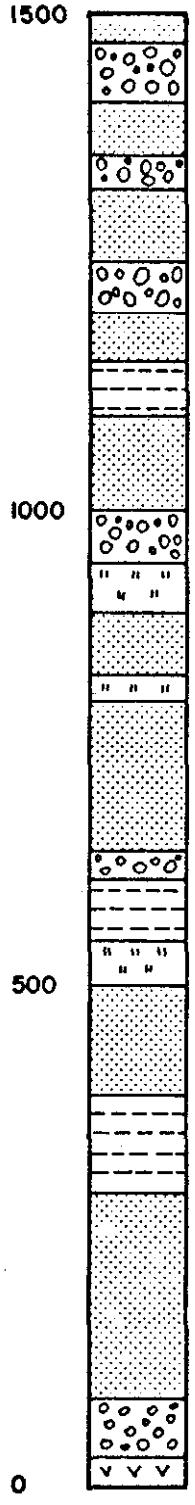
GEOLOGY OF THE CHUTE CREEK AREA

The Chute Creek area contains at least 1500 feet of sediments which are illustrated on the following figure (Figure 1) a generalized stratigraphic section from the area. This section is constructed from drillhole data combined with a traverse down the length of Balsam Creek, located on the western side of the basin. The section is composed of a rather monotonous series of sandstones, shales and conglomerates resting unconformably on the Vancouver metavolcanics. The only coal occurrences in the complete sequence occur in the basal 500 feet of the section. Most of these coal lenses were 2 to 4 inches thick, the largest being a thin coal seam occurring near the top of a shale section directly under a massive conglomerate. This seam measured 8 to 10 inches in thickness. Above this thin coal seam, no other coal occurences were observed in the rest of the section.

Drillholes on the western margin of the basin corroborated this evidence. Further to the east, a coal seam was intersected in holes CH-77-35, CH-77-39, and CH-77-41, as shown in Figure 2. Over the total section it appears that this seam averages three to four feet thick and is of poor quality.

STRUCTURE OF THE CHUTE CREEK AREA

Faulting does not appear to be as intense in the Chute Creek area as compared to the Middle Quinsam area to the north. This may be due to the heavily forested nature of the area, which makes air photo interpretations difficult. The major fault in the area is the north-north-west to south-south-east trending fault that passes by the western tip of Wowo Lake. This large fault feature serves as the eastern boundary of the sedimentary basin. It was generated by a large basaltic uplift on the east. This large fault has several small secondary faults that run sub-parallel to it. In traversing Balsam Creek, several east-west trending faults were apparent.



SANDSTONE: GREYISH GREEN, MEDIUM TO COARSE GRAINED, VOLCANIC PARENT MATERIAL.

CONGLOMERATE: BASALT PEBBLES, COARSE GRAINED SANDSTONE MATRIX.

SANDSTONE: GREYISH GREEN, MEDIUM TO COARSE GRAINED, VOLCANIC PARENT MATERIAL.

CONGLOMERATE: BASALT PEBBLES, COARSE GRAINED SANDSTONE MATRIX.

SANDSTONE: GREYISH GREEN, MEDIUM TO COARSE GRAINED.

CONGLOMERATE: BASALT PEBBLES, COARSE GRAINED SANDSTONE MATRIX.

SANDSTONE: GREYISH GREEN, MEDIUM TO COARSE GRAINED, MASSIVE.

SHALE: BROWN, SOFT, THIN SHALY COAL BAND UP TO 3 FEET THICK.

SANDSTONE: GREYISH GREEN, MEDIUM TO COARSE GRAINED, MASSIVE, MEDIUM HARD.

CONGLOMERATE: GREYISH GREEN, MEDIUM TO COARSE GRAINED.

SILTSTONE: GREY TO DARK BROWN, MEDIUM HARD.

SANDSTONE: GREY TO BUFF, COARSE GRAINED TO MEDIUM GRAINED.

SILTSTONE: GREY TO MEDIUM HARD.

SANDSTONE: GREY TO BUFF, COARSE GRAINED TO MEDIUM GRAINED.

CONGLOMERATE: BASALT PEBBLES, COARSE GRAINED SANDSTONED MATRIX.

SHALE: GREY TO BROWN, SOFT, CARBONACEOUS, COAL STRINGER 1 TO 2 FEET IN THICKNESS NEAR TOP OF SECTION.

SILTSTONE: GREEN TO BUFF COLOURED, HARD.

SANDSTONE: GREY TO GREEN, FINE TO COARSE GRAINED, SILTSTONE NODULES.

SHALE: GREY TO BROWN, SOFT, FISSILE, THIN CARBONACEOUS BANDS LESS THAN 1 FOOT THICK.

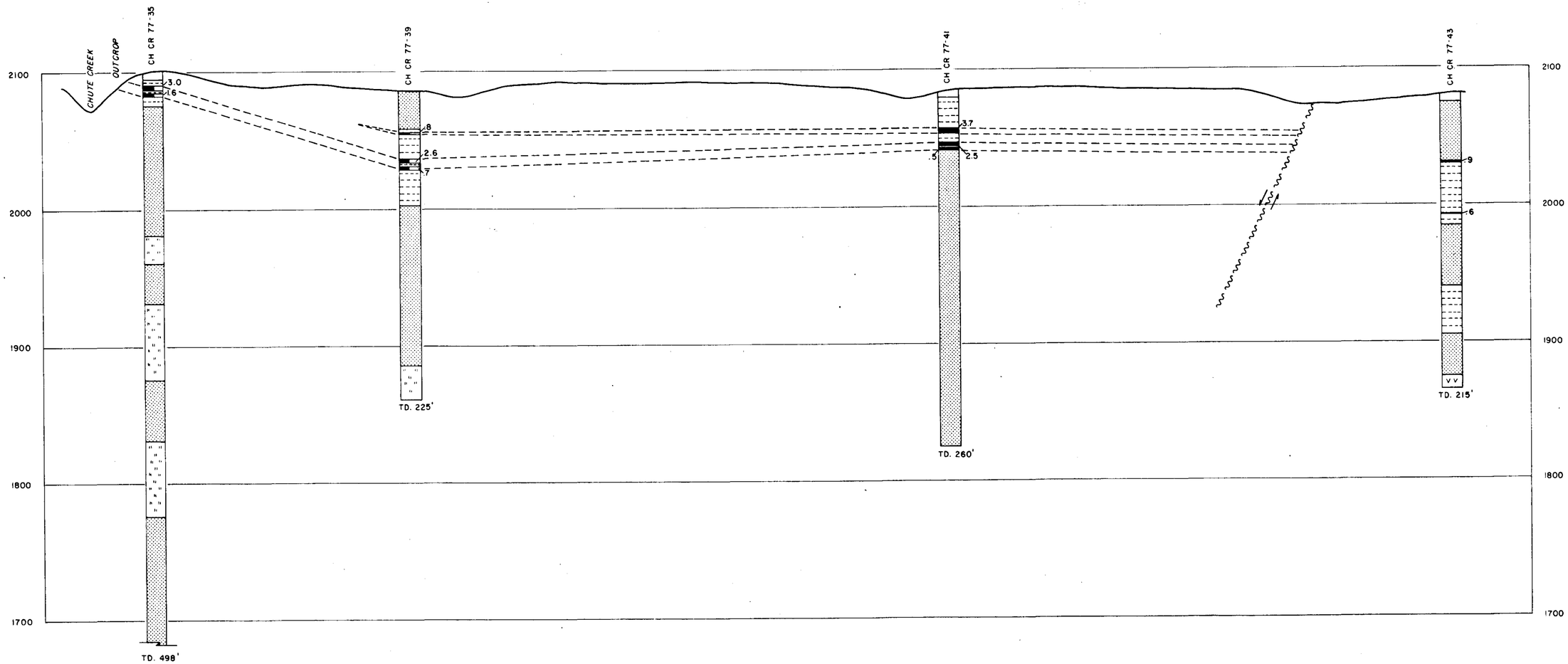
SANDSTONE: MEDIUM GRAINED TO COARSE GRAINED, PEBBLY GREEN COLOURED, VOLCANIC PARENT MATERIAL, MASSIVE.

BASAL CONGLOMERATE COMOX FORMATION.

VANCOUVER GROUP METAVOLCANICS AND BASALTS.

GENERALIZED STRATIGRAPHIC SECTION

	SCALE 1" = 200'		TITLE FIGURE 1	DRAWING NO.
		BY	DATE	
	DRAWN	D. L.	8/7/77	CHUTE CREEK AREA
QUINSAM PROPERTY	CHECK			
				ISSUE



CHUTE CREEK CROSS-SECTION

QUINSAM PROPERTY

FIGURE 2

SCALE: HORIZONTAL 1"= 400'
VERTICAL 1"= 50'

DATE: JULY 7/77

00067(3)

(M1)

The general dip of the formation in the basin is to the northeast, and ranges from 3^{o} to 12^{o}. In some instances Bayrock reports dips to the west. This is along the eastern margin and can be explained by the basaltic uplift. Bayrock's report states"

"Working with, rather than around, available structural data, an interpretation may be made where a north-north-west to south-south-east trending fold belt and several small domal structures exist. Similar trends in the coal outcrop pattern are to be expected."

We have never encountered any indications of folding in the Middle or Lower Quinsam areas and it would be very surprising to find such a radical change from the usual block faulting type of structure. Local warping or doming may exist to a limited extent in areas were the sediments are influenced by post depositional granitic upwellings. The absence of any major coal seams in the Chute Creek area can be directly related to environmental factors that were prevalent during deposition.

DEPOSITION

In studying the deposition in the Chute Creek area, several facts present themselves:

1. There was at least one cycle of erosion and deposition evidenced by impregnated coal clasts up to 6 inches across in lower sandstone members.

2. A marginal continental environment of deposition is indicated by the presence of shoreline sandstone members through the section.

3. The environment of deposition was one of high energy and rapid fluctuations, because the continental sandstones are mostly medium to coarse grained, and because of the existance of numerous conglomerate beds, particularly higher up in the stratigraphic section.

These facts supply the basis of two theories that may explain the absence of any significant coal zones in the Chute Creek area:

a) Non-deposition of coaly material: a foreshore or marginal shelf environment could certainly have occurred here. This type of environment is not conducive to the rapid accumulation of plant material needed to generate coal seams.

b) Deposition and subsequent erosion: A continual fluvial environment may have generated local accumulations of coal, but subsequent isostatic uplift and sea regression may have caused an erosional reworking of the coal seams and sediments, and a shifting of the type of environment conducive to the entrapment of plant debris.

EXPLORATION IN THE MIDDLE QUINSAM AREA

DESCRIPTION OF WORK

Drilling: 61 testholes were drilled in the Middle Quinsam area, for a total of 4150 feet of drilling. Drilling was concentrated in the southern extension block south of the Quinsam River, and also in the vicinity of Line 85+00, in the middle block. The southern extension block was explored on 500 foot drill spacings over most of the area, right to the maximum extent of coal occurrance on the west and south. Line 85+00 was extended to the left, and drilling outlined an additional one million tons to the in place reserve of the Middle Block.

Coring: 8 coreholes were undertaken in the Southern Extension block of the Middle Quinsam area, for a total cored footage of 329 feet. Coreholes were positioned over a wide area in the southern extension block in order to gain a complete overview of coal quality in the area.

COAL RESERVES OF THE SOUTHERN EXTENSION BLOCK

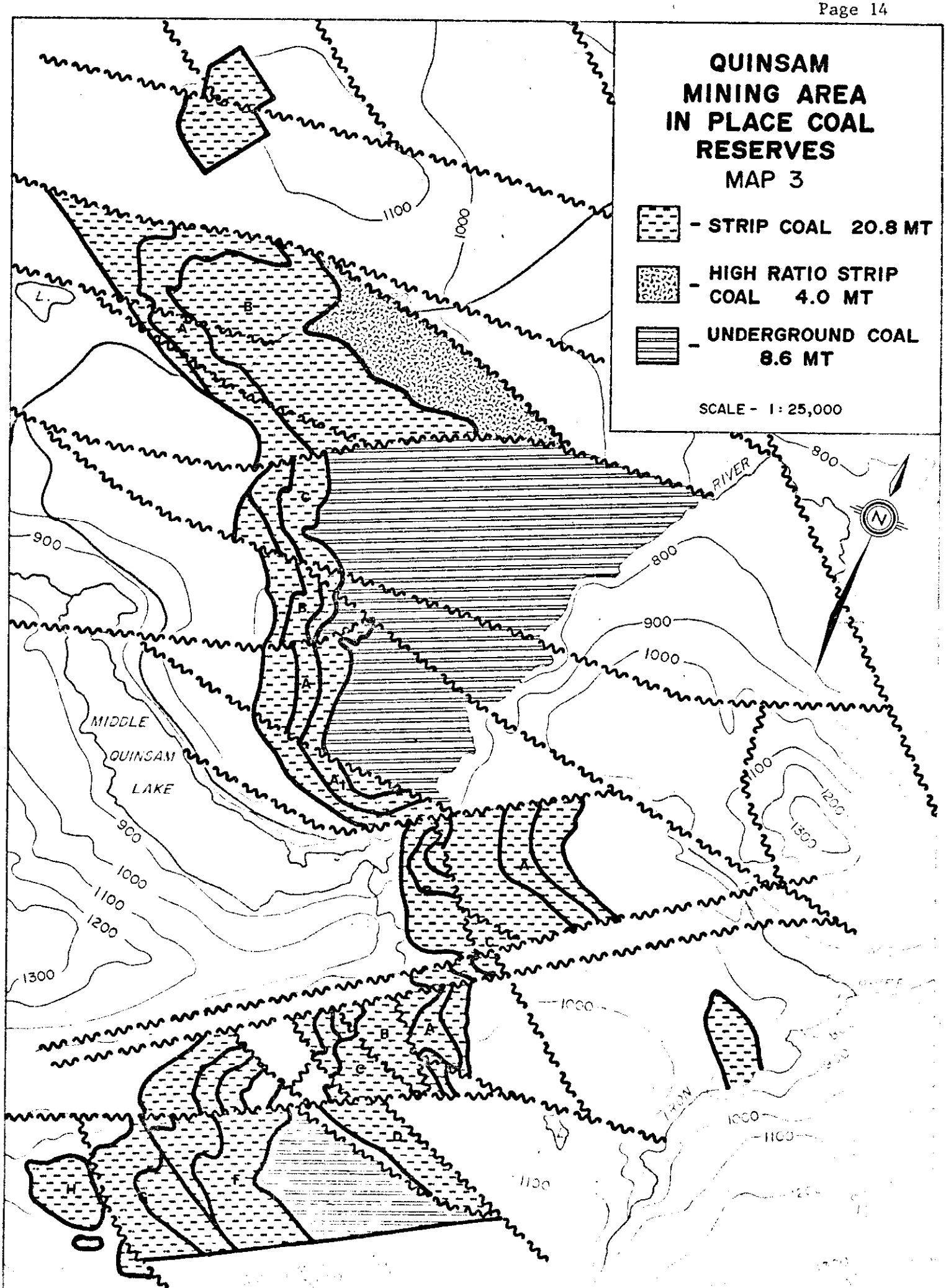
Reserve Parameters: The reserve parameters for the Middle Quinsam Block as set forth by R. Engler in his 1976 report apply to all reserves in the Middle Quinsam Block delineated in 1977. These parameters are:

1. The maximum radius of influence for each drill hole or outcrop is 500 feet. In some cases, confidence limits are extended beyond this 500 foot radius if the structure appears favorable.

2. Coal seam thickness are based on raw coal within each seam, excluding partings and shaley or dirty coal that assumes a bulk density of 2.05 gm/cm^3 or greater, according to the geophysical logs.

3. The in place density of the raw coal is 90 lbs/cu. ft or 1.2 tons/cu. yd.

4. Coal seams less than 3.0 feet in thickness are not considered


QUINSAM
MINING AREA
IN PLACE COAL
RESERVES
MAP 3
- STRIP COAL 20.8 MT
- HIGH RATIO STRIP COAL 4.0 MT
- UNDERGROUND COAL 8.6 MT
SCALE - 1 : 25,000
MIDDLE
QUINSAM
LAKE
RIVER
TRANS
800
900
1000
1100
1200
1300
N

to be economically recoverable unless they overlie thicker seams.

5. Recoverable in place coal volumes are presented in three categories based on the following maximum depths of overburden:

120 feet: single pass dragline stripping
160 feet: dragline stripping with rehandle
200' feet: shovel and truck stripping

METHOD OF CALCULATION

Overburden Isopach maps on a 1" = 200' scale (see Appendix Maps, 2, 3, and 4) were constructed to illustrate the 120, 160 foot and 200 foot overburden thicknesses that are found above the recoverable seams in each of the structural blocks. Areas were calculated with the aid of a planimeter. Volumes were calculated by taking the average overburden thickness of a particular block and mulipying it by the area, then converting to cubic yards. The same holds true for computing the tonnages of coal; the average seam thickness was multipied by the specific gravity factor of 1.2 in order to convert to tons.

The preceding map (map 3) illustrates the strippable reserves that have been added to the original 13.25 M tons that are outlined in R. Engler's 1976 report, Geology and Coal Reserves of the Quinsam Property, Vancouver Island, Phase I Report. The area shown north of Middle Quinsam Lake (Block A_1) contains 1.07 M tons. The Southern Extension Block, shown to the south of Middle Quinsam Lake contains an additional 5.91 M tons. These two areas combined result in a total of 6.98 M tons of strippable coal reserve delineated by 1977 drilling. Added to the previous year's total of 13.25 M. tons, the combined overall total in place strippable reserve for the Middle Quinsam Mining Block is 20.23 M. Tons. The following table (TableIV) is a summary of the strippable in place reserves of the Southern Extension block, as shown on Map 3, broken down according to overburden limits and seam classification.

TABLE IV

SOUTHERN EXTENSION BLOCK

IN PLACE RESERVES IN MILLIONS OF TONS

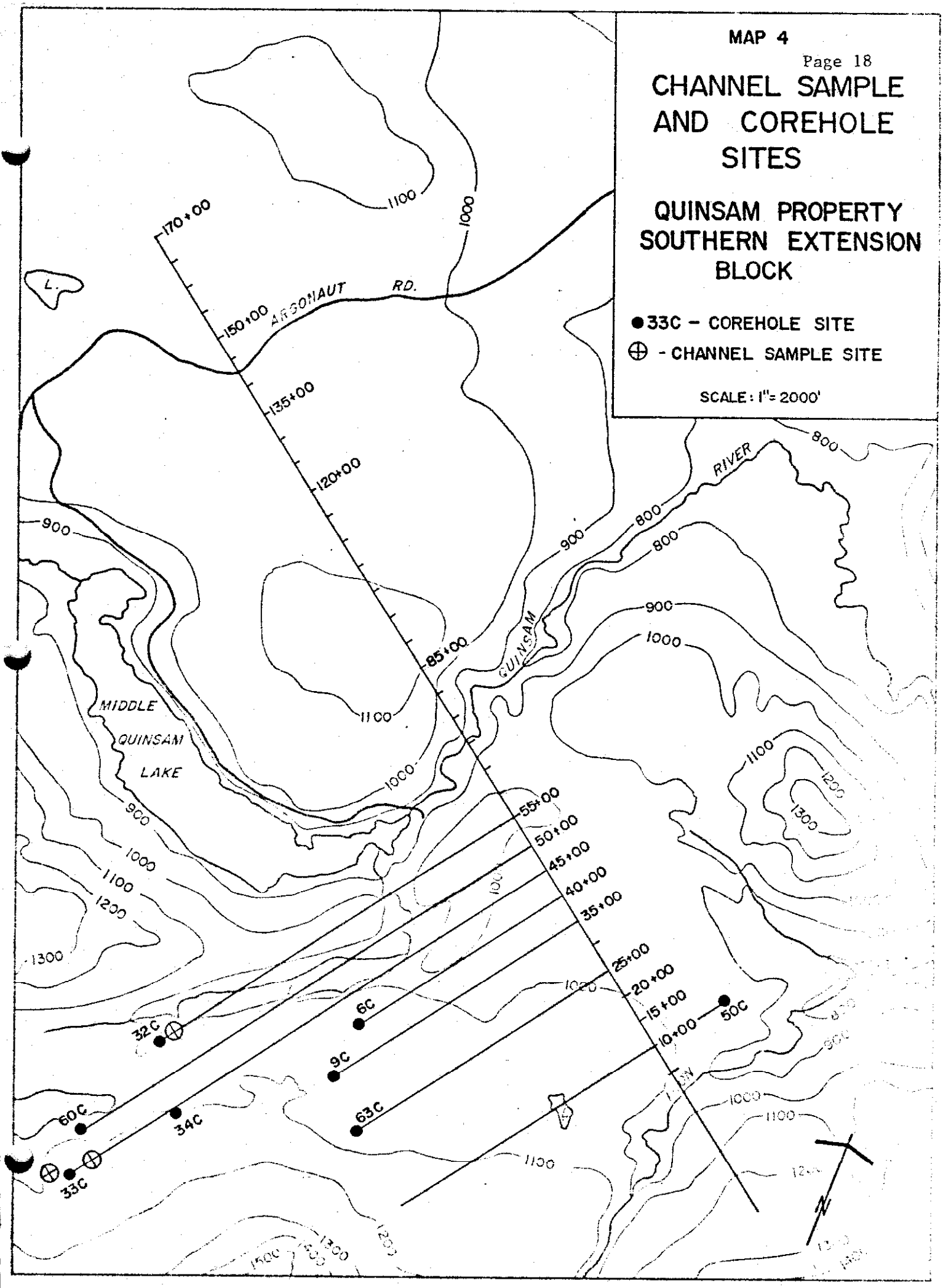
BLOCK	DEPTH	SEAM #1	SEAM #2	SEAM #3	RATIO
A	0' - 120'	---	---	.093	5.59 to 1
A	120' - 160'	---	---	.165	15.70 to 1
A	160' - 200'	---	---	.218	20.18 to 1
B	0' - 120'	---	---	.300	6.67 to 1
B	120' - 160'	---	---	.127	18.77 to 1
B	160' - 200'	---	---	.074	23.87 to 1
C	0' - 120'	---	---	.217	8.59 to 1
C	0' - 120'	---	.013	---	9.46 to 1
C	120' - 160'	---	.120	---	17.35 to 1
C	160' - 200'	---	.222	---	29.08 to 1
D_1	0' - 120'	---	---	.361	10.00 to 1
D_2	0' - 120'	---	---	.035	9.85 to 1
E	0' - 120'	.496	---	---	3.91 to 1
E	120' - 160'	.244	---	---	9.14 to 1
E	160' - 200'	.290	---	---	12.92 to 1
E	0' - 130'	---	.225	---	---
F	0' - 120'	.042	---	---	4.51 to 1
F	120' - 160'	.141	---	---	10.64 to 1
F	160' - 200'	.617	---	---	13.63 to 1
F	0' - 130'	---	.086	---	---
G	0' - 120'	.710	---	---	4.19 to 1
G	120' - 160'	.188	---	---	9.81 to 1
G	0' - 130'	---	.195	---	---
H	0' - 120'	.466	---	---	4.02 to 1
I	0' - 120'	---	---	.130	
I	120' - 160'	---	---	.053	18.76 to 1
I	160' - 200'	---	---	.085	
	TOTALS	3.19	.86	1.86	

TOTAL IN PLACE TONNAGE FOR THE SOUTHERN EXTENSION BLOCK:

5.91 Million Tons

Combined Overburden to Coal Ratio:

9.34 to 1


MAP 4
CHANNEL SAMPLE AND COREHOLE SITES
QUINSAM PROPERTY SOUTHERN EXTENSION BLOCK
●33C – COREHOLE SITE
⊕ - CHANNEL SAMPLE SITE
SCALE: 1"= 2000'
ARGONAUT RD.
QUINSAM RIVER
MIDDLE QUINSAM LAKE
170+00
150+00
135+00
120+00
85+00
55+00
50+00
45+00
40+00
35+00
25+00
20+00
15+00
10+00
32C
6C
9C
63C
60C
34C
33C
50C

STRUCTURE OF THE SOUTHERN EXTENSION BLOCK

The structure of the Southern Extension Block is similar to that of the areas north of Middle Quinsam Lake, but it appears much more complex:

1. Faults are much more numerous and more closely spaced.

2. A large basement high in the middle of the block has interrupted coal seam deposition and has effectively created a detached area of seam deposition.

The structure is characterized by two major transverse faults running parallel to the two small elongated lakes to the south of Middle Quinsam Lake. These two major faults are inter-connected by a series of six closely-spaced sub-parallel normal faults. Displacement on these faults vary between 10 and 40 feet.

The intensity of faulting can be explained by the following theories:

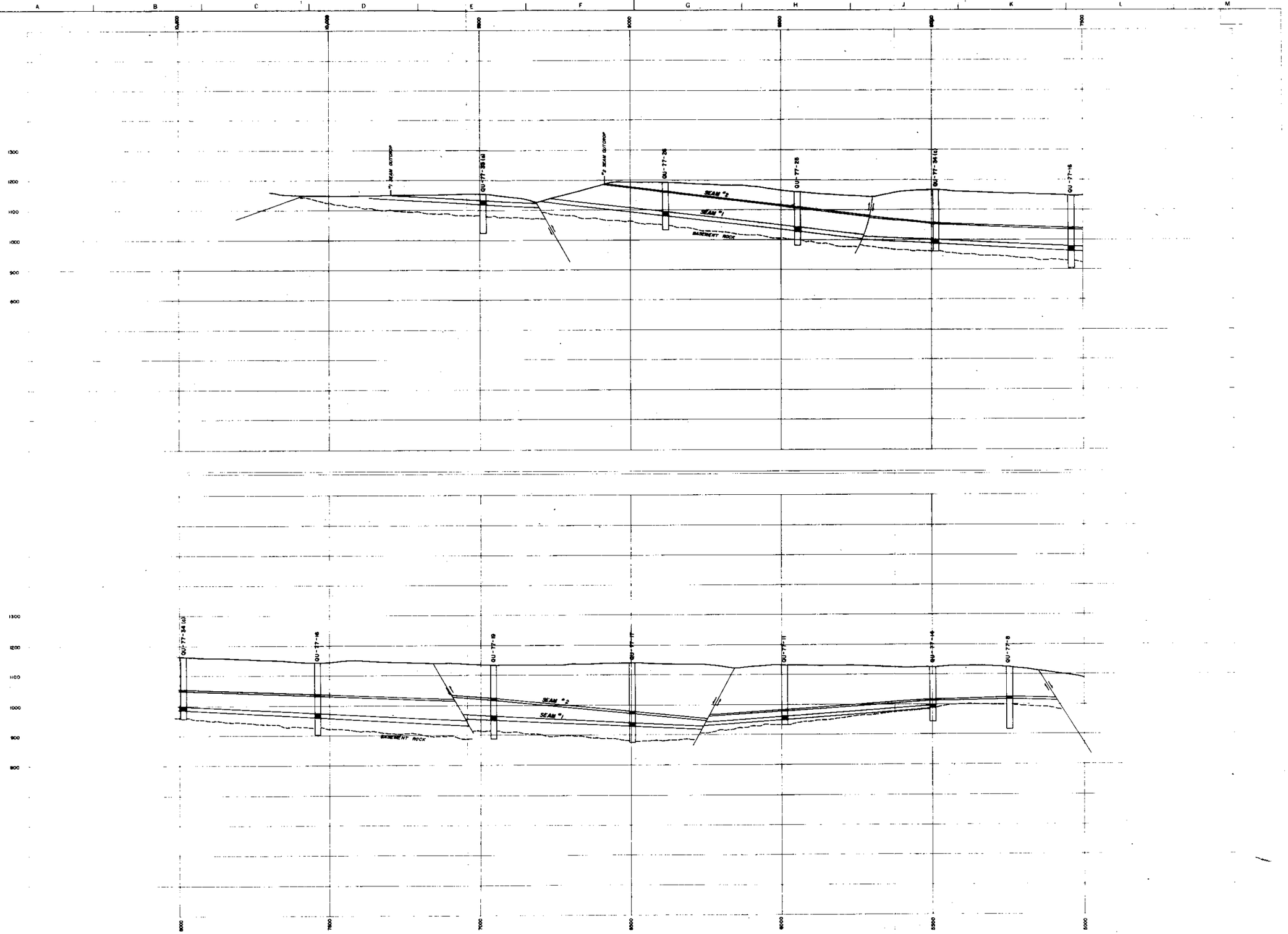
1. An actual shifting to the west of the entire sedimentary section by a general wrenching action, with the sediments attached to the volcanic basement. This would involve large tectonic forces related to the implacement of granitic batholiths.

2. A post-depositional basement uplift, resulting in an intense radial fracturing of the overlying sediments.

The cross-section of Line 45+00 (Figure 3) serves as a typical section across the strike of the formation. It illustrates all of the structural characteristics of the Southern Extension Block.

Dips range from 3° to 12° in this area, with the average dip being about 8°. Strikes are generally in the familiar north-west to south-east alignment.

The southern extension block is bounded on all sides by the



REFERENCE DRAWINGS	ISSUE	DATE	INIT'L	REVISIONS	ISSUE	DATE	INIT'L	REVISIONS

LUSCAR LTD.

QUINSAM PROPERTY

SCALE 100 50 0 100 FEET	BY	DATE
DRAWN	D.L.	JUNE 28/77
CHECKED		
APPROVED		
1st ISSUED		

TITLE

QUINSAM CROSS-SECTIONS

X-SECTION No. 45+00

DRAWING NO.

-

ISSUE

granodiorites of the Island Intrusive sequence, except for its northeast end, where it joins onto the Southern Block between the Iron and the Quinsam Rivers.

The complete sequence of cross-sections for the southern extension block is found in Appendix II.

DEPOSITION IN THE SOUTHERN EXTENSION BLOCK

Because the total thickness of sediments is only 300 feet at maximum, the complete sequence of coal seams is not found in any single location in the Southern Extension block. However, all three seams are present in the area, in a similar pattern of deposition that R. Engler's Stratigraphic Column of the Comox Formation (Quinsam) illustrates (See Figure 4).

The seam characteristics are generally the same as in the other areas, with some minor alterations:

-- The No. 1 rider has been directly incorporated into the No. 1 seam, and a 3 to 4 foot dull and bright banded section has been added to the base of the No. 1 seam on its western margins in the Southern Extension block. This additional zone has increased the overall thickness of the No. 1 seam to over 17 feet of raw coal in some locations, with an average of 13.5 feet on the western edge, just south of Long Lake.

-- The No. 2 seam is generally between 3.5 and 5 feet thick in the southern Extension block, with two thin mudstone partings of one to two inches in thickness. It displays the typical massive sandstone roof and mudstone floor.

-- The No. 3 seam has become dirtier and more shaley in the southern Extension block. Coal appears in the cores as the dull and bright banded shaley variety, and the partings have increased in number and thickness.

Stratigraphic Column
Comox Formation
Quinsam

Depth		Unit	Thickness	Lithology
0		Glacial Till	0–150'	Compacted and cemented clay w/ boulders.
	UPPER CYCLE			Sandstone, m.–gr., arkosic.
		No. 3 Seam	12'–15'	6.0'–10.0' coal w/ 3 partings.
			100'–130'	Sandstone m.– cs. gr. arkosic massive, minor siltstone and mudstone partings.
100				
		No. 2 Seam	5'–1'	4.5'–1.0' coal w/ 1 parting.
			60'–80'	Interbedded dk. grey siltstone w/greenish grey sandstone.
200	LOWER CYCLE	No. 1 Rider	2.0'–1.0'	1.5'–1.0' coal.
				Mudstone.
		No. 1 Seam	10'–16'	6.5'–12.0' coal w/ 3 minor partings.
			0–60'	Primarily dk. grey siltstone w/green sandstone lenses, red siltstone at base.
		Vancouver Gp.		Metavolcanics argillites.
300				

The depositional history of the southern Extension Block is in all respects identical to the rest of the Middle Quinsam area. The general environment of deposition for the first cycle was a quiet, low energy back-shore estuarine or lagoonal sequence that permits rapid and steady accumulation of plant debris, with a minimum of disturbance and subsequent rapid burial. Occasional basement highs interrupted debris accumulation in local situations, resulting in discontinuities in the No. 1 seam.
The environment of deposition for the upper cycle must have been a more turbid, high energy situation in which depositional changes were rapid and unstable. This indicates a fluviatile continental sequence of deposition, as indicated by the rapid changes evident in the No. 3 seam.

EXPLORATION IN THE MIDDLE BLOCK

Line 85+00

6 of the 67 drillholes undertaken in the Middle Quinsam area in the first 6 months of 1977 were positioned across a previously unexplored basement high in the Line 85+00 area to the left of the baseline. Figure 5 illustrates total drilling to date of Line 85+00, including the 1976 drilling from the baseline to 1500 feet left. The 1977 drillholes are numbered QU-77-76, QU-77-78, and QU-77-79. These holes, plus 3 other holes running at right angles to Line 85+00 delineated a new zone across the fault that is shown on the section, as well as Appendix Map 4.

Line 85+00 Area -- Additional Reserves; Block A

Assuming 10 ft. raw coal thickness:

0 - 120 feet overburden limits

Area: 1.023 M sq. ft.

Volume: 1.023 M sq. ft X 10 ft. ÷ 27
= .379 M cu. yds.

Tonnage: .379 M cu. yds. X 1.2 tons/cu. yd.
= .455 M. Tons

Overburden: 1.023 M sq. ft. X 60 ft. ÷ 27
= 2.273 M. cu. yds.

Ratio: 6.0:1

120 - 160 feet overburden limits

Area: .841 M sq. ft.

Volume: .841 M. sq. ft. X 10 ft. ÷ 27
= .311 M. cu. yds.

Tonnage: .311 M cu. yds. X 1.2 Tons/cu. yd.
= .374 M Tons

Overburden: .841 M. sq. ft. X 140 ft. ÷ 27
= 4.361 M cu. yds.

Ratio: 14.023:1

160 - 200 feet overburden limit

Area: .550 M. sq. ft.

Volume: .550 M. sq. ft. X 10 ft. ÷ 27
= .204 M. cu. yds.

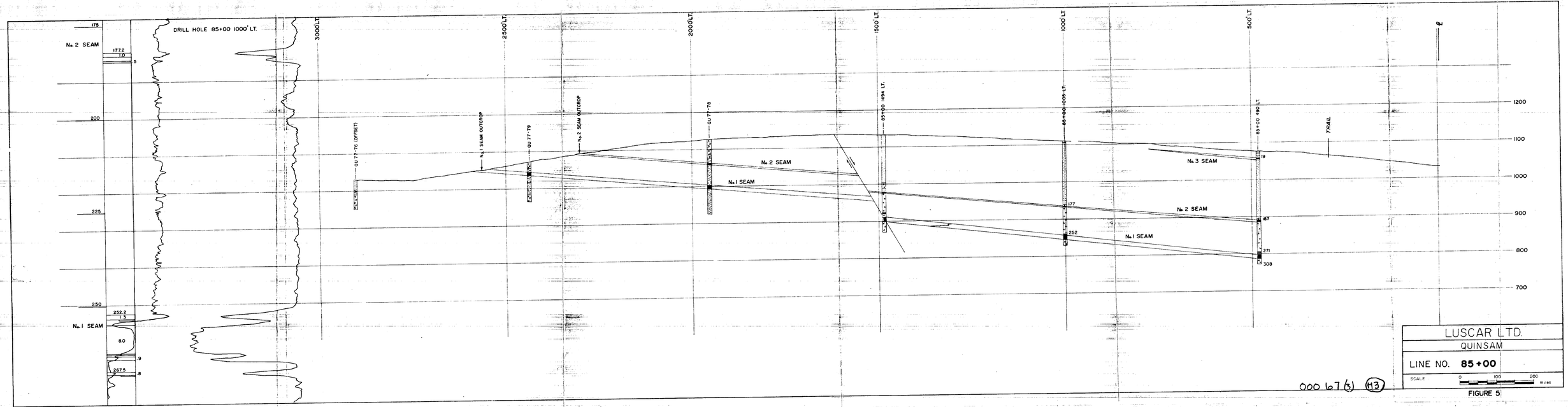
Tonnage: .204 M. cu. yds. X 1.2 Tons/cu. yd.
= .245 M Tons

Overburden: .550 M sq. ft X 180 ft. ÷ 27
= 3.667 M cu. yds.

Ratio: 18.0:1

Additional Reserves Block A : 1.07 M. Tons

Average overburden to Coal ratio: 11.5:1



LUSCAR LTD.

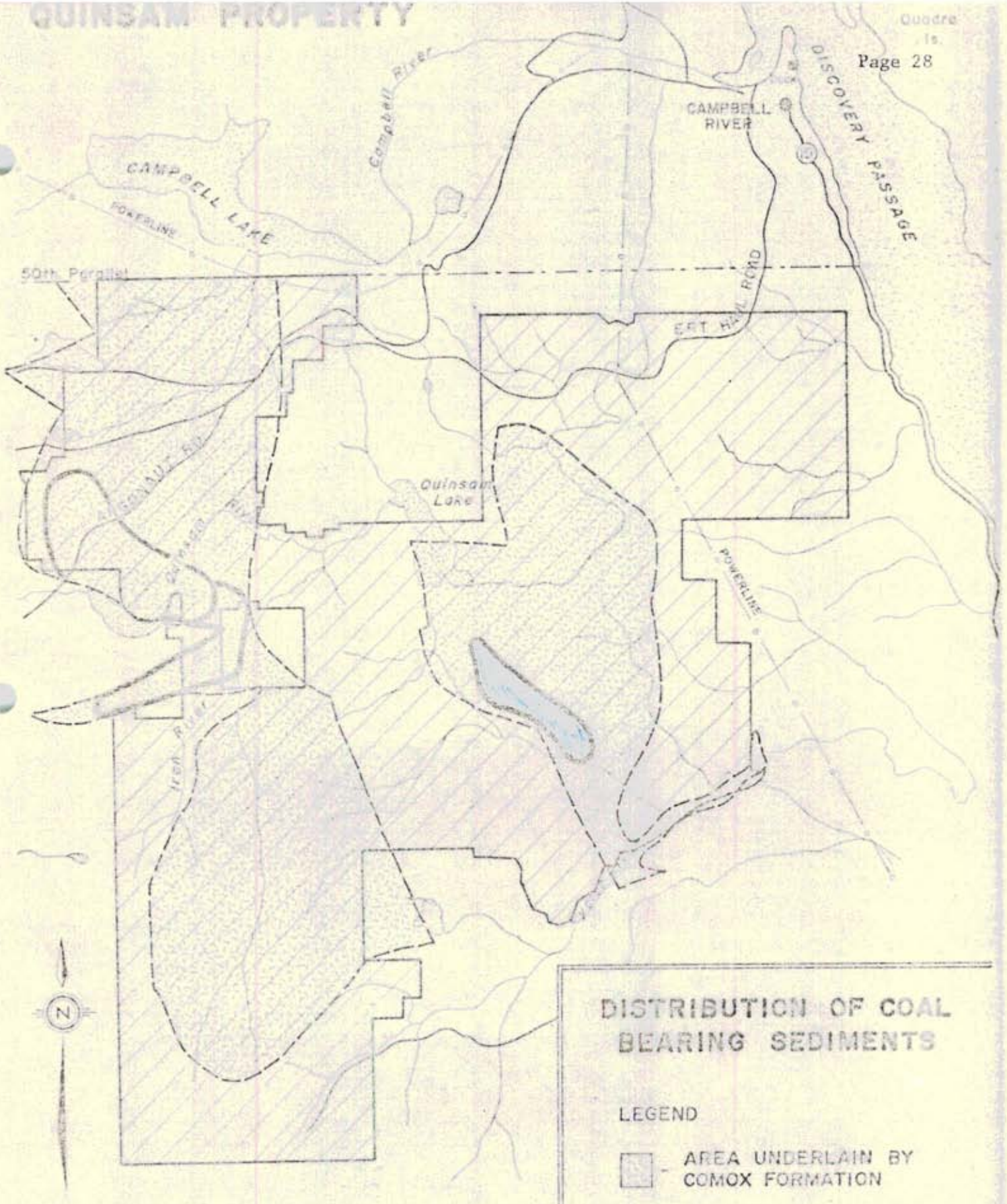
QUINSAM

LINE NO. **85+00**

SCALE 0 100 200 miles

000 67 (3) (M3)

FIGURE 5



DISTRIBUTION OF COAL BEARING SEDIMENTS

LEGEND

- AREA UNDERLAIN BY COMOX FORMATION
- PHASE I STUDY AREA

MAP 5

THE LOWER QUINSAM LAKE AREA

Quinsam East

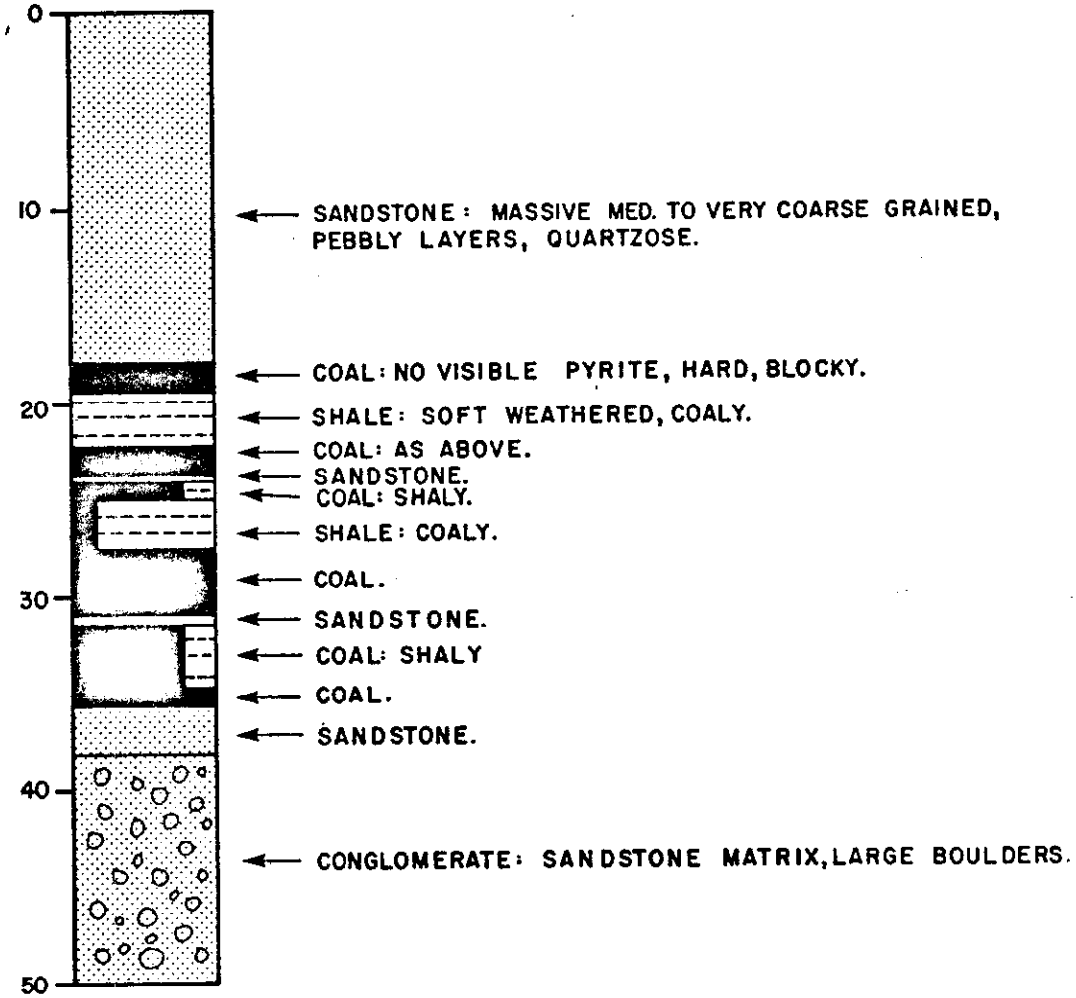
INTRODUCTION:

The final area under the terms of the Phase I Exploration Program was explored in the months of May and June 1977. This is the Lower Quinsam Lake Area, a basin of about 16 square miles that lies about 4 miles east and south of the Middle Quinsam Area. Exploration in this basin resulted in the defining of a substantial amount of in-place strippable coal, called the Quinsam East Reserve Block (See Map 5).

The observance of a coal outcrop (See Figure 6) in the south-western part of the basin, and subsequent drilling that focussed around this outcrop outlined over 10 million tons of strippable in place coal reserve as shown in Appendix Map 5. The northeastern half of the basin has been previously explored and available information effectively rules out the possibility of expanding the Quinsam East Block in that direction. To the southwest, the seam has been defined almost to the basaltic high which forms the western boundary of the basin. Drillhole results to date indicate that the seam has thinned and pinched to below the mineable limit of 4.5 feet of raw coal at either end of the linear body as shown. So the limits have been effectively defined and future drill programs should be aimed at refining the structural interpretations set forth in this report.

DESCRIPTION OF WORK

A total of 21 drillholes were completed in the Lower Quinsam Lake area, for a total drilled footage of 5400 feet. In addition to this, two holes were cored, for a total cored footage of 415 feet. This exploration was carried out on existing access where possible, but it was necessary to cut two lines in order to get a complete cross-section at right angles to the strike of the formation.



	SCALE 1" = 10 FEET		TITLE	DRAWING NO.
	BY	DATE	WOODHUS CREEK OUTCROP	
	DRAWN D.L.	7/7/77		
	CHECK			

Once a section across the strike of the formation was obtained, the program was aimed at following the strippable coal along strike in northwest and southeast directions, in order to trace its maximum area of extent.

STRUCTURE

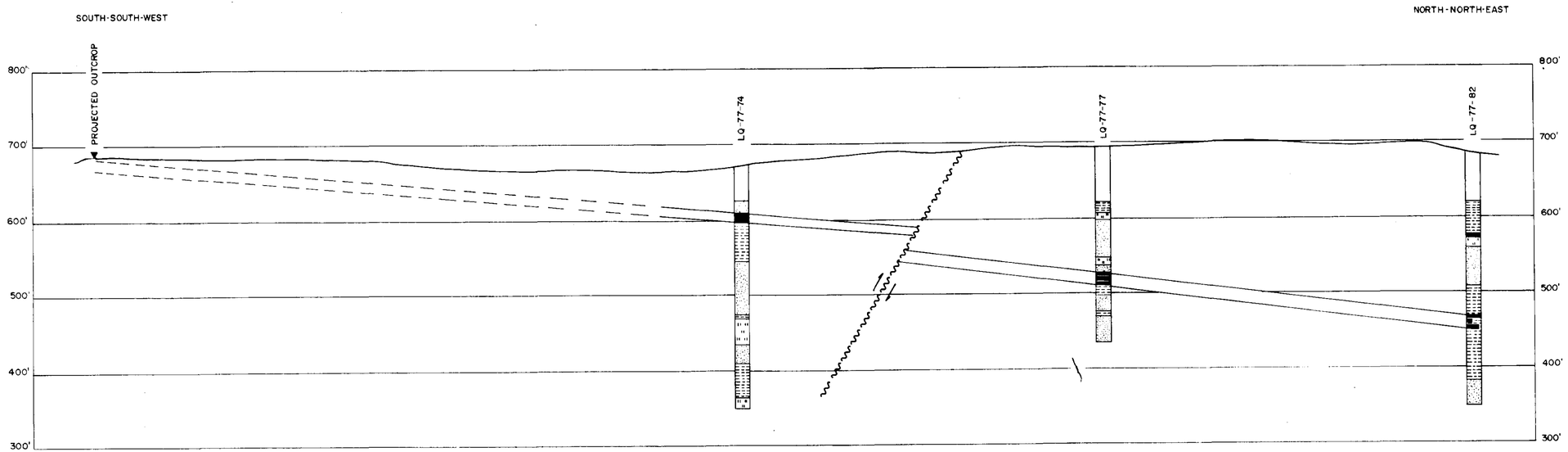
The major structural characteristics are a series of sub-parallel northwest to southeast trending normal faults that step away from the basaltic uplift to the west, parallel to the strike of the sediments. There may be minor cross faults associated with these major faults, but limited drillhole information permits only a generalized structural interpretation at this point in time.

The basaltic uplift that separates the Lower Quinsam basin from the Chute Creek and Middle Quinsam basins may have triggered the faulting action. Fault blocks have a northeasterly dip of between 5 and 10 degrees. The faults in this area have displacements in the order of tens of feet.

Figure 7 illustrates the section at right angles to the strike of the formation in the Quinsam East block. The fault shown in this section causes a displacement of about 30 feet.

DEPOSITION

Glacial Deposition: Glacial Action in the Lower Quinsam area is generally greater than that in the Middle Quinsam area. The probable direction of ice advance was to the southeast. Glacial deposition occurred to a great degree in the structurally low areas. Because of their linear character the structural downthrows became the catchment areas for the great quantities of run off associated with the glacial epochs. This precipitated large gravel and till deposits. In the downthrown areas these deposits vary in thickness from 40 to over 100 feet. The nature of the till provides an environment for artesian aquifers, and this condition is found in a number of locations (holes LQ-77-74, LQ-77-81, LQ-77-93, and LQ-77-91)



WOODHUS CREEK
CROSS-SECTION
QUINSAM PROPERTY
QUINSAM EAST

FIGURE 7

SCALE: HORIZONTAL 1"=100'
VERTICAL 1"=100'

DATE: JULY 14/77

000 67(3) (M4)

PREGLACIAL DEPOSITION

While the environment of deposition in the Middle Quinsam Block yielded 3 coal seams and at least 2 cycles of deposition, only one coal seam was deposited in the Lower Quinsam Area. This probably corresponds to the last cycle of deposition (ie. the No. 3 seam or later) of the Middle Quinsam area.

The coal seam in the Quinsam East Block of the Lower Quinsam area has been deposited sporadically into three distinct tongues of coal which are separated by sandstone interfingerings. The tongues themselves are split by numerous thin dirt bands. These facts point to a high energy, rapidly changing environment of deposition -- an environment that one would expect to result from a fluvial deltaic foreshore situation. Figure 8 illustrates the sequence in a cross-section that parallels the strike of the formation for approximately 2 miles. The three tongues of coal separate rapidly in a southeasterly direction. This is probably a result of the rapid deposition of the foreset beds in a prograding deltaic situation.

COAL QUALITY

From the available information it is clear that the quality of the coal in the Quinsam East Block varies greatly. The quality of each separate tongue differs: The middle and lower tongues are usually of poorer quality and higher in ash content. The sulphur content increases downward: the top tongue has sulphur values of approximately 0.5%, the middle tongue has sulphur values of about 1.5% and the bottom tongue has sulphur values of over 3%. Figure 9 illustrates coal quality according to laboratory results on an air dried basis, from the two coreholes which are approximately one mile apart.

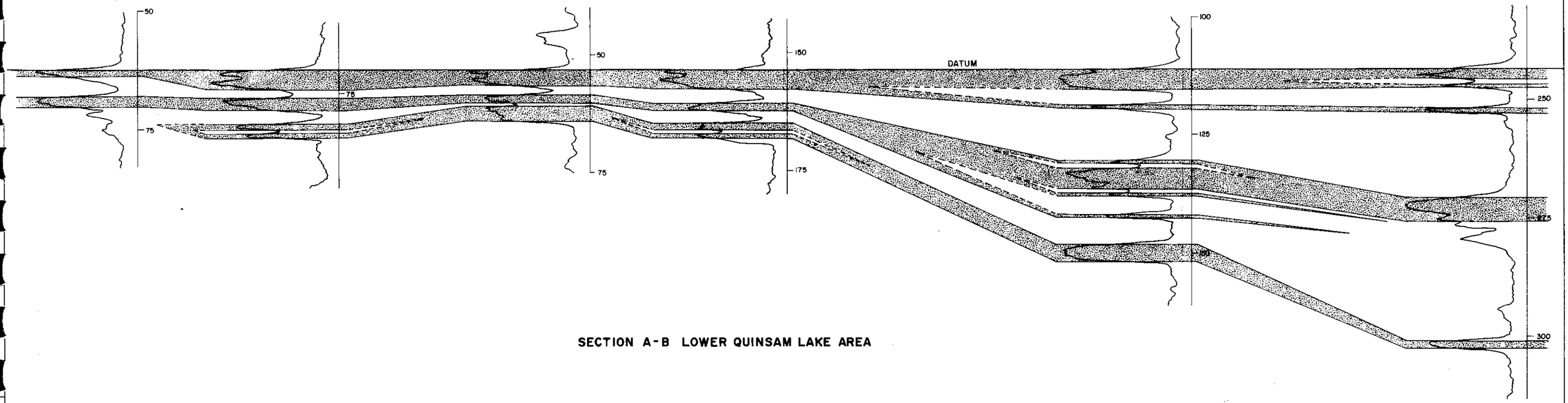
COREHOLE NO.	SAMPLE NO.	INTERVAL	THICKNESS	MOISTURE %	ASH %	SULPHUR %	BTU/lb.
LQ-77-74C	1	53.65' - 55.95'	2.3	1.49	26.19	0.75	9,757
	2	57.75' - 63.75'	6.0	1.25	34.89	0.92	8,547
LQ-77-91C	1	110.25' - 114.75'	4.5	1.89	15.88	0.46	11,635
	2	129.35' - 136/60'	7.25	1.51	32.37	1.48	9,101
	3	147.0 ' - 151.45'	4.45	1.47	17.16	3.30	11,701

TABLE VII: As received Coal Qualities, Quinsam East Block

* * *

NORTH - WEST

SOUTH - EAST



SECTION A-B LOWER QUINSAM LAKE AREA

REFERENCE DRAWINGS	ISSUE	DATE	INIT'L	REVISIONS

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QUINSAM PROPERTY

LEGEND:

COAL

50 - DEPTH

DATUM - TOP OF COAL ZONE

SCALE 1" = 800' HORIZONTAL
1" = 10' VERTICAL

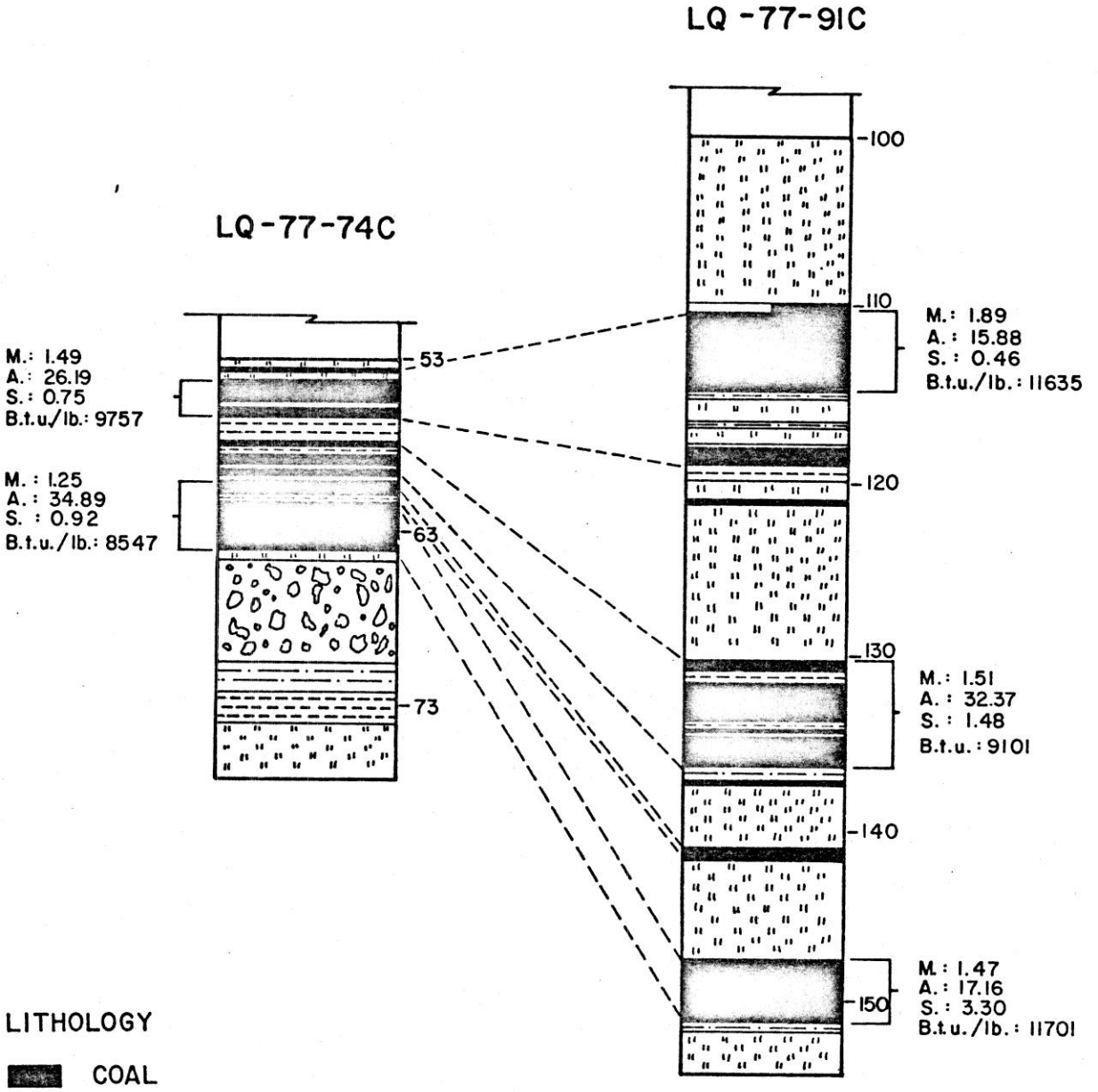
	BY	DATE
DRAWN	D. L	JUNE 22/77
CHECKED		
APPROVED		
1st ISSUED		

TITLE

SECTION A-B
LOWER QUINSAM LAKE AREA
FIGURE 8

DRAWING NO.

ISSUE



NOTE: RESULTS ON AIR DRY BASIS.

	SCALE 1" = 10'			TITLE	DRAWING NO.
		BY	DATE	COAL QUALITY FIGURE 9	
	DRAWN	D. L.	JULY/77		
QUINSAM EAST	CHECK				ISSUE
	APPR'				

REVISIONS

COAL RESERVES IN THE QUINSAM EAST BLOCK

PARAMETERS

Reserves were calculated with the aid of a planimeter. Coal reserve boundaries are the standard 200 foot overburden limit and the outcrop edge, with the block subdivided into the 0 to 100 foot overburden limits and the 100 to 200 foot overburden catagories. The reserve was cut off at an arbitrary 4.5 foot minimum thickness of raw coal. The seam has been averaged out at an 8 foot raw coal thickness in the Quinsam East Block.

CALCULATIONS

0 - 100 foot overburden limits

Area:		7.27 M. sq. ft.
Volume:		7.27 M. sq. ft. X 8 ft. ÷ 27
	=	2.15 M. cu. yds.
Tonnage:		2.15 M. cu. yds. X 1.2 Tons/cu. yd.
	=	2.58 M. Tons.
Overburden:		7.27 M. sq. ft. X 50 ft. ÷ 27
	=	13.46 M. cu. yds.
Ratio:		6.26:1

100 - 200 foot overburden limits

Area:		12.08 M. sq. ft.
Volume:		12.08 M. sq. ft. X 8 ft. ÷ 27
	=	3.58 M. cu. yds
Tonnage:		3.58 M. cu. yds. X 1.2 Tons/cu. yd.
	=	4.30 M. Tons
Overburden:		12.08 M. sq. ft. X 150 ft. ÷ 27
	=	67.11 M. cu. yds.
Ratio:		18.75:1

Total In Place Tonnage : 6.88 M. Tons

Average Ratio : 14.06:1

ADDITIONAL INFERRED TONNAGE (Probable)

This tonnage results from a downthrown block to the west of the main reserve which has only one drillhole located on it (LQ-77-95). Due to this deficiency of information, these reserves are not placed in the proven category. The seam thickness here must be assumed to be 5.5 feet.

0 - 100 Foot Overburden Limits

Area: 6.0 M. sq. ft.

Volume: 6.0 M. sq. ft X 5.5 ft. ÷ 27
= 1.22 M. cu. yds.

Tonnage: 1.22 M. cu. yds. X 1.2 tons/cu. yd.
= 1.46 M. Tons

Overburden: 6.0 M. sq. ft. X 50 ft. ÷ 27
= 11.11 M. cu. yds.

Ratio: 9.11:1

100 - 200 Foot Overburden Limits

Area: 6.2 M. sq. ft.

Volume: 6.2 M sq. ft. X 5.5 ft. ÷ 27
= 1.26 M. cu. yds.

Tonnage: 1.51 M. Tons

Overburden: 6.2 M. sq. ft. X 150 ft. ÷ 27
= 34.4 M. cu. yds.

Ratio: 27.3:1

Additional Probable Tonnage: 2.97 M. tons

Average Ratio : 18.35:1

REGIONAL GEOLOGY OF THE QUINSAM LAKES AREA

The following discussion is an attempt at reconstructing the depositional sequence that resulted in the accumulation of Comox sediments in the Quinsam Lakes area. The three areas involved are the Middle Quinsam area, the Lower Quinsam area, and the Chute Creek area. At the present time, the Lower Quinsam area is separated from the other areas by a large basalt high. This uplift must have occurred after deposition of the sediments was complete. In essence, at the time of the Comox sedimentation, the three areas were part of the same large basin. But while all three areas were part of the same large basin, their environments of deposition were very different. Beginning at the time of the No. 1 seam deposition, a reasonable model of the sequence resulting in the variance in character of each coal measure can be reconstructed.

As previously stated, the No. 1 seam was deposited at a time of quiesence, in a low energy, backshore lagoonal or estuarine environment. A sea transgression from the east and south resulted in a shoreline reaching the Iron River area at the time of No. 1 seam deposition. This shoreline continued along the length of the Iron River, south along the west side of the Chute Creek area as far as or further than the Oyster River. The major drainage at this time was probably from the northeast of the Middle Quinsam area. As time passed the sea transgressed even further northwest to the Campbell Lake area. At some point between the No. 1 seam and No. 2 seam deposition, uplifting triggered a reversal; the sea began regressing to the southeast. The No. 2 seam was then laid down over much of the same area as the No. 1, although it was more widespread. After the No. 2 seam deposition occurred and the sea regressed even farther, the basin was subjected to rapid fluvial deposition, resulting in the accumulation of massive medium to coarse grained arkosic sandstone. It was in the later stages of this regression that a large swampy delta was formed in the area, creating the environment necessary for the generation of the No. 3 seam. Deposition ended with final implacement of the Insular mountains and the corresponding tectonics that separated the Lower Quinsam area from the other areas.

REFERENCES

1. Coal Resource Study of Comox Basin, Nanaimo Series, Vancouver Island, British Columbia

   by Michele P. Curcio, Coal Consultant
   Weldwood of Canada, October 1975

2. Geology and Coal Resources of the Quinsam Property, Vancouver Island, Phase I Report

   by R. F. Engler, Chief Geologist
   Luscar Ltd.

COAL QUALITY IN THE SOUTHERN EXTENSION BLOCK

Map 4 represents the 8 locations that were cored in the Southern Extension Block in the first 6 months of 1977. It also illustrates sites that were channel sampled for lab analysis.

All three seams were core sampled in the Southern Extension block. The sampling method used was selective in that partings or splits greater than 1 inch in thickness were removed prior to analysis. The sample was then crushed to minus 1 inch, screened and split. Proximate analyses were conducted on one portion on an "air dried basis" and the remainder was analyzed for washability performance. The washability trials were conducted over a number of specific gravities ranging from 1.30 to 1.90, increasing by .05 S.G. increments. Additionally, ash fusion tests and mineral analysis of the ash product were conducted on selected samples. The results are summarized as follows:

SEAM		INHERENT MOISTURE %	ASH %	SULPHUR %	BTU/LB.
1	Average	2.12	21.3	1.07	10,647
	Range	1.33 - 2.53	17.47 - 28.82	.49 - 1.68	10,129 - 11,482
2	Average	2.29	16.1	4.26	11,500
	Range	1.59 - 3.14	14.02 - 17.97	3.74 - 4.91	10,670 - 12,246
3	Average	2.17	28.9	3.00	9,714
	Range	1.50 - 2.77	18.73 - 40.65	2.14 - 3.54	7,875 - 11,260

TABLE V *[1] : Proximate Analyses on Raw Coal (Air Dry Basis)
Southern Extension Block

* * *

Washability Results*[2]

The following clean coal analyses are based on two assumptions:

1. The total moisture was assumed to be 6%. This indicates a surface moisture content ranging from 3% to 3½%.

2. To optimize recovery and remain within a 10% ash restriction on the clean product, a cut point of 1.8 specific gravity was selected for the cumulative clean float.

SEAM		RECOVERY	ASH %	SULPHUR %	BTU/LB.
1	Average	84%	11.7%	.96	11,660
	Range	75 - 88%	9.1 - 15.8	0.45 - 1.89	10,967 - 12,251
2	Average	88%	8.1	3.50	12,536
	Range	87 - 90%	8.0 - 8.3	3.1 - 4.9	12,463 - 12,610
3	Average	77%	10.2	2.15	12,175
	Range	75 - 85%	9.1 - 10.7	1.01 - 4.0	12,090 - 12,222

TABLE VI: Clean Coal Float, Southern Extension Block

* * *

A detailed account of coal quality for the southern Extension Block has been prepared by Mr. Ali Khair-Eldin, head of Lab Services, Lexco Testing Ltd. It is presented as Appendix III: A Study of quality -- Southern Extension Block, Middle Quinsam Area.

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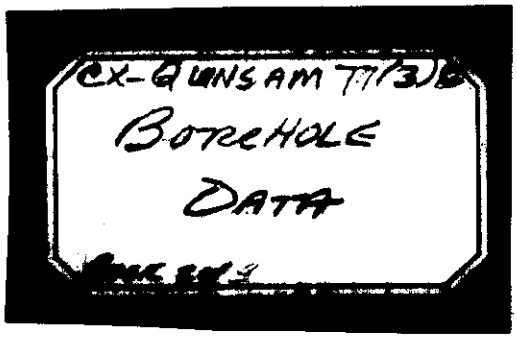
1 and 2* Data extracted from Quinsam Coal Project Feasibility Study, Appendix B -- Quality Summary by R. Engler



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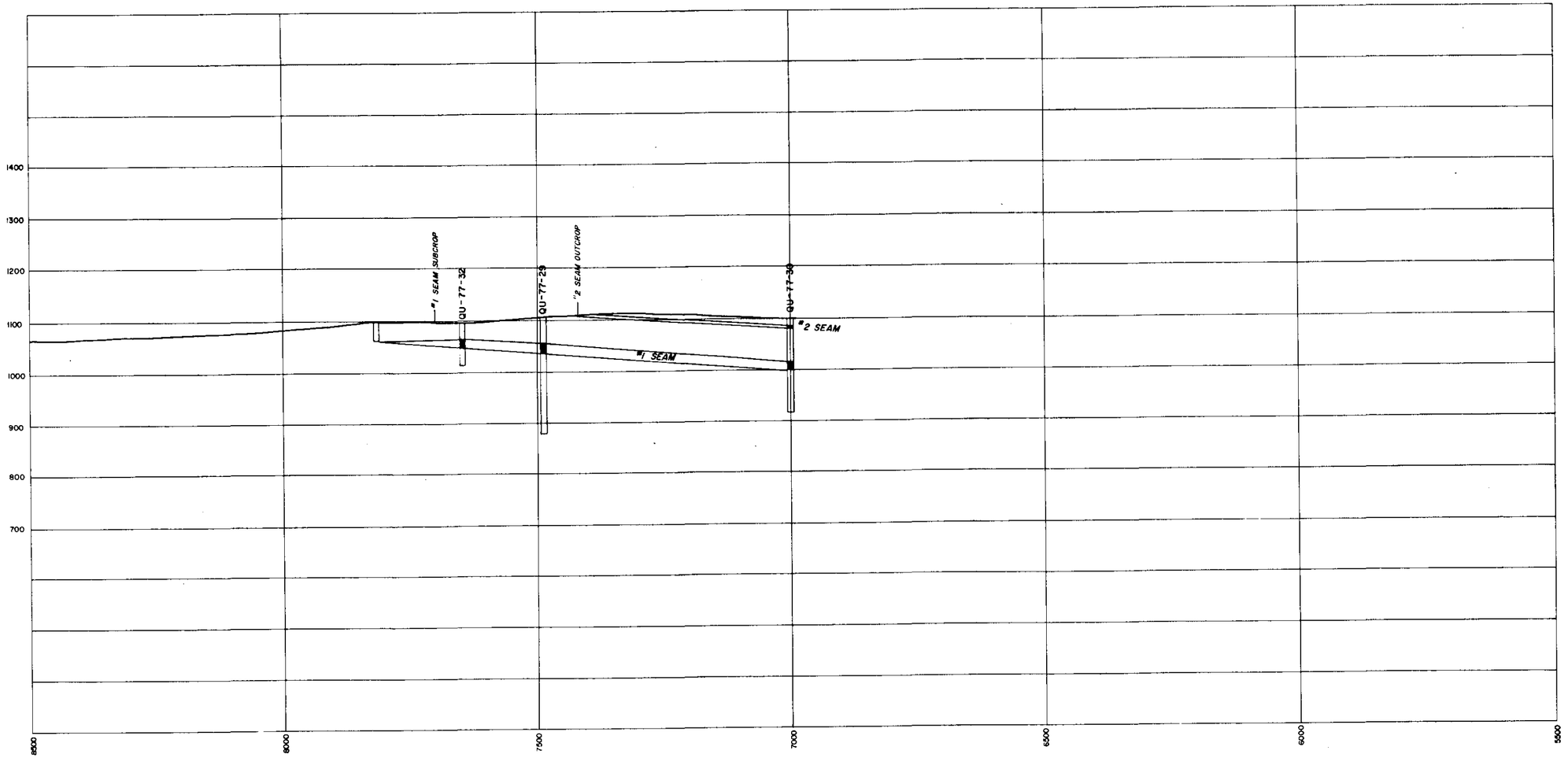

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REFERENCE DRAWINGS	ISSUE	DATE	INIT'L	REVISIONS

LUSCAR LTD.

QUINSAM PROPERTY

SCALE 0 50 100 HORIZONTAL & VERTICAL		
	BY	DATE
DRAWN	D.L	JUNE 23/77
CHECKED		
APPROVED		
1st ISSUED		

TITLE

QUINSAM CROSS-SECTIONS

X-SECTION No. 55+00

cr-Quinsam 77(2)C.

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ISSUE

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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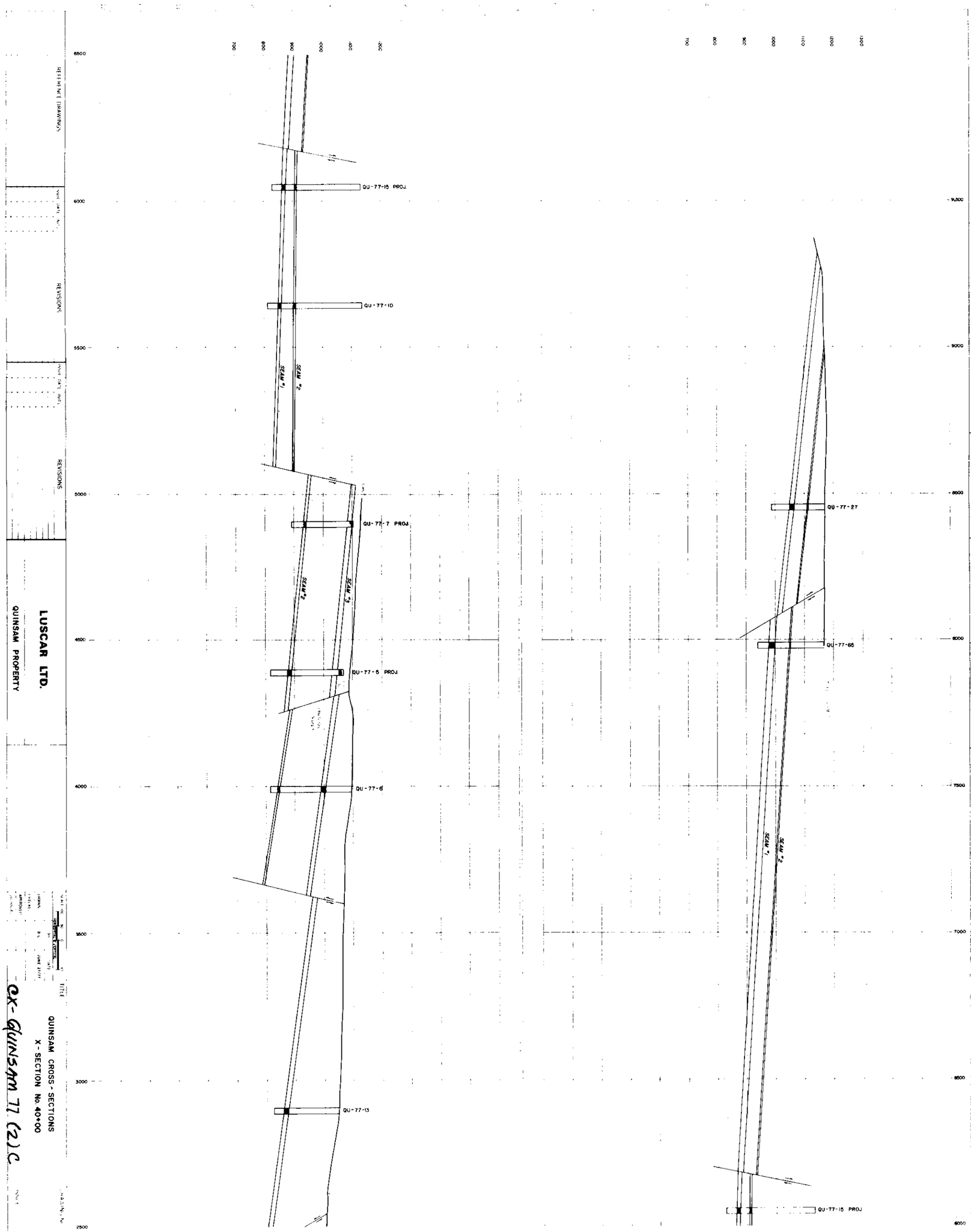

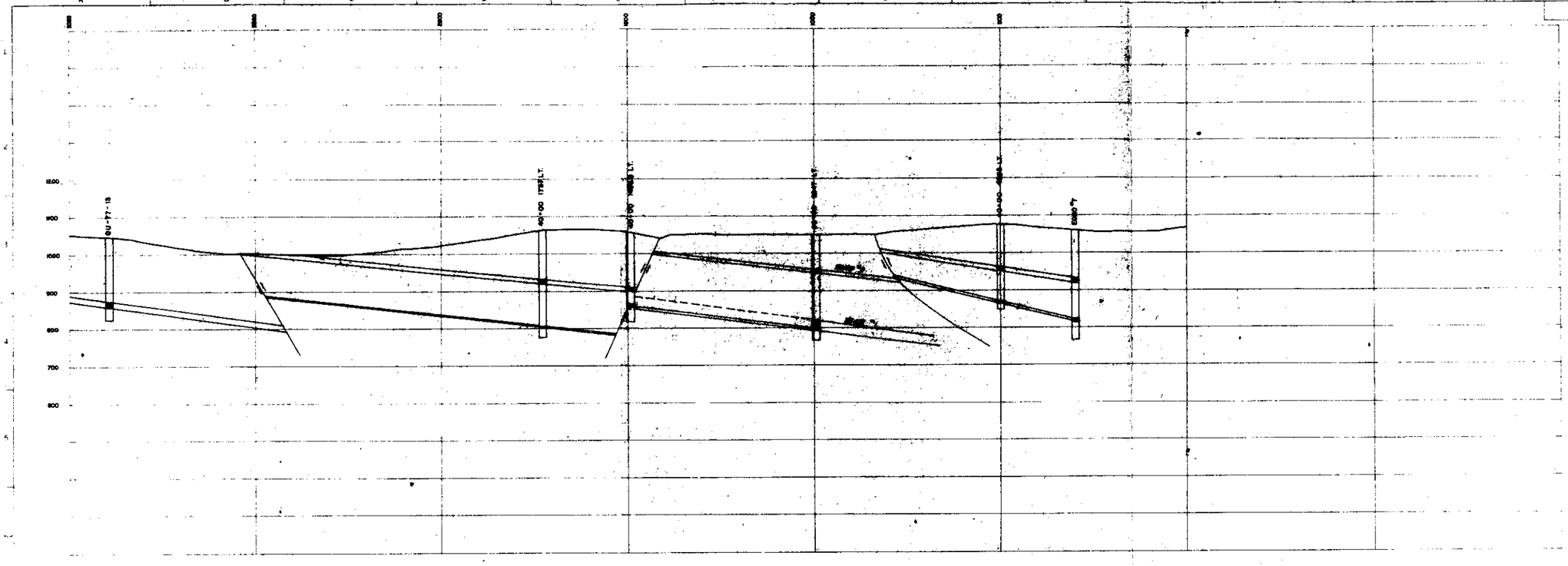

REFERENCE DRAWINGS	ISSUE	DATE	INIT'L	REVISIONS	ISSUE	DATE	INIT'L	REVISIONS

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QUINSAM PROPERTY

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DRAWN	B.C.	JUNE 07/77
CHECKED		
APPROVED		
AS ISSUED		

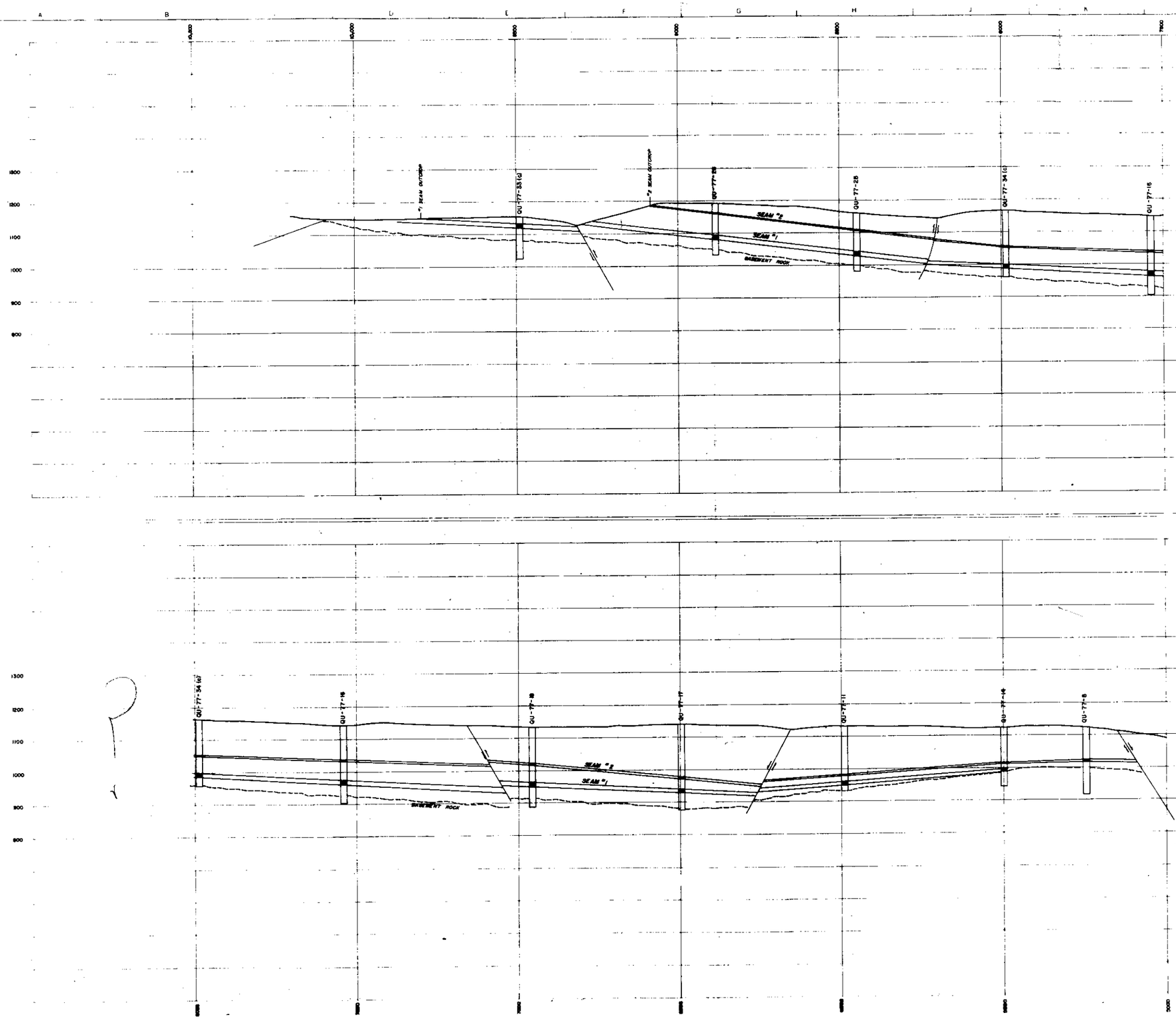
TITLE

QUINSAM CROSS - SECTIONS
X - SECTION No. 40+00

CX-QUINSAM 77(2)C

DRAWING NO

ISSUE



REFERENCE DRAWINGS	ISSUE	DATE	INIT.

REVISIONS	ISSUE	DATE	INIT.

REVISIONS	ISSUE	DATE	INIT.

LUSCAR LTD.

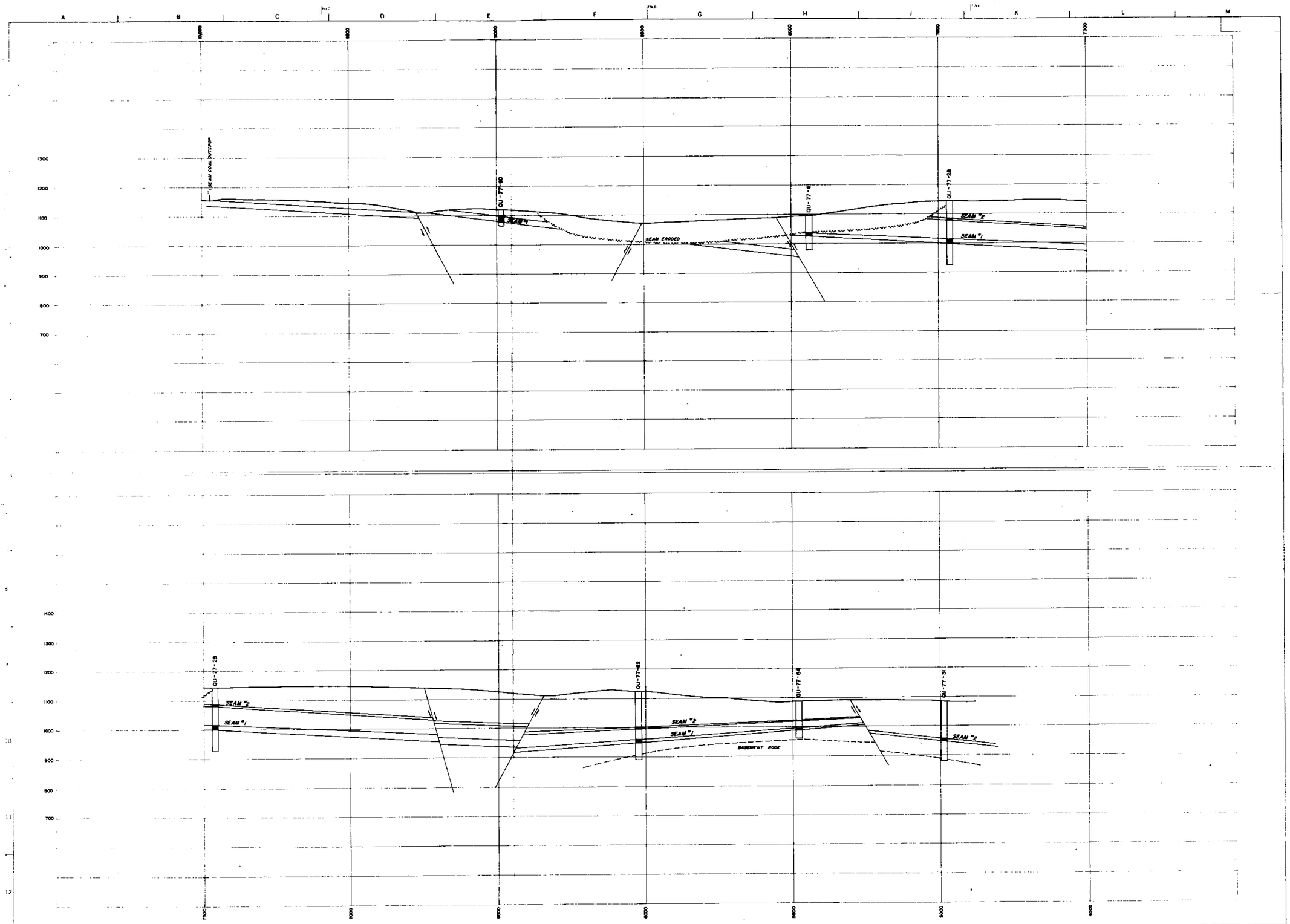
QUINSAM PROPERTY

TITLE

QUINSAM CROSS-SECTIONS
X-SECTION No. 48+00

DRAWING NO

ex-QUINSAM 77(2)C.



REFERENCE DRAWINGS	ISSUE	DATE	INIT'L	REVISIONS	ISSUE	DATE	INIT'L	REVISIONS

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QUINSAM PROPERTY

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DRAWN	D.L.	JUNE 23/77
CHECKED		
APPROVED		
1st ISSUED		

TITLE

QUINSAM CROSS-SECTIONS

X-SECTION No. 50+00

ex-Quinsam 77(2)c

DRAWING NO

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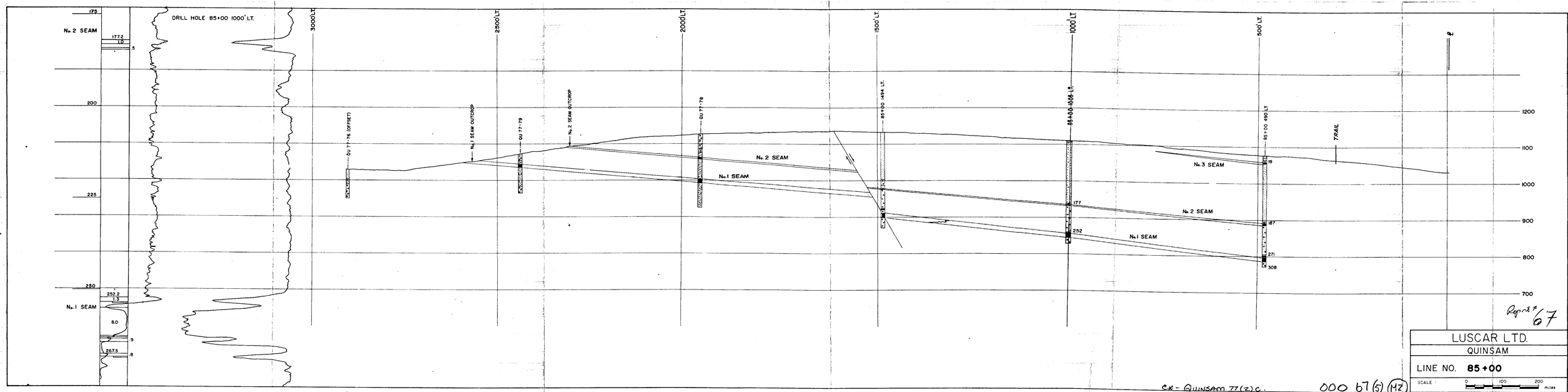


Report # 67

LUSCAR LTD.

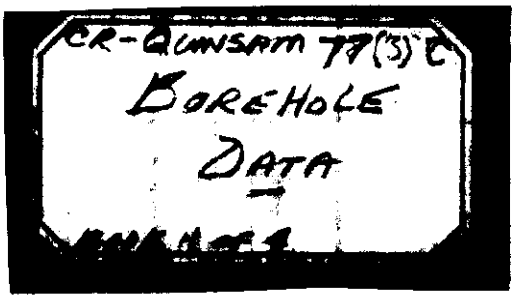
QUINSAM

LINE NO. **85+00**

SCALE : 0 100 200 miles

SK - QUINSAM 77(2)C. 000 67(5) MZ

FIGURE 5



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LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River, B.C. DATE: May 16, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-73

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,144,915.88 N 1,087,254.4 E

ELEVATION: 739.2

DRILLER: ~~H. Vincett~~

FROM	TO	LOG	REMARKS
0	8	gravel till	
8	57	grey sandstone	
57	75	grey siltstone	
75	92	brown grey shale	
92	93	coal	
93	135	red brown shale	
135	193	grey brown shale	
193	308	green siltstone	
308	312	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD

DRILLHOLE REPORT

JAL FIELD: Campbell River DATE: May 18, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-74

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,146,143.4 N 1,088,092.9

ELEVATION: 670.0

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	43	till	hard grey clay
43	64	grey sandstone	
64	74	coal	
74	127	brown shale	sandstone ledges
127	131	siltstne	
131	194	grey sandstone	
194	202	grey siltstone	
202	245	green siltstone	
245	251	green sandstone	
251	256	green sandstone	
256	272	grey sandstone	
272	283	green brown shale	
283	285	green siltstone	
285	307	green brown shale	
307	319	green siltstnne	

COMMENTS _____

WATER HORIZON _____ FT. _____

LUSCAR LTD. corehole log

June 19, 1977

LQ-77-74

HOLE NO. LQ-77-74

CORE	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION (LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION.)	TRUE DEPTH
1	53	61	8.15				
				0.15		Siltstone; dark grey, hard, some carbonaceous material, massive	
				0.1		Coal; blocky, clean, fractured	
				0.4		Sandstone; dark grey, to black, coarse grained soft, high carbon content	
				1.7		Coal; blocky, bright, clean, abundant massive pyrite on cleats, calcite also	
				0.1		Sandstone; medium brown, fine grained, hard, impregnated with coaly material	
	SAMPLE No. 1						
				0.5		Coal; as above	
				1.8		Shale; medium brown, soft, fissile, some carbon content	
				0.85		Coal; as above	
				0.1		Shale; dark greyish brown, hard fractured	
				0.9		Coal; as above	
				0.4		Shale; soft, medium brown, some coal content	
				0.3		Coal; as above	
				0.1		Sandstone; medium grained, hard, high carbon content	
				0.70		Coal; as above	
	SAMPLE No. 2			0.05		Shale; dark grey carbonaceous, thin coaly bands	
2	61	69	7.8				
				0.25		Coal; boney, hard, thin clean coal bands throughout	
				0.6		Coal; blocky, bright clean, crushed broken	
				0.5		Coal; shaley, dirty, soft, flaggy	
				0.7		Coal; bright, blocky, clean, some visible pyrite massive	
				0.55		Coal; bright, blocky, clean, crushed and broken	
	TOTALS			÷	X 100 =	% REC.	SEAM
				÷	X 100 =	% TOT. REC.	SEAM(S)

LUSCAR LTD. corehole log

June 19, 1977

LQ-77-74

HOLE NO. LQ-77-74

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION (LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION.)	TRUE DEPTH
2	continued from previous page...						
				0.35		Siltstone; medium brown, crushed	
				4.8		Conglomerate; fractured at 60° to core axis, medium to coarse grained sandstone, matrix coarsening downward, large quarter and chut pebbles	
3	69	77	7.5				
				1.8		Conglomerate; as above, fewer and smaller pebbles	
				1.35		Mudstone; medium brown, crushed	
				0.35		Mudstone; medium brown, silty, very soft, plastic	
				2.05		Shale; medium brown, medium hard, flaggy, fissle	
				1.25		Siltstone; medium brown, medium hard	
				.6		Siltstone; medium brown, medium hard, massive abundant plant fragments and leaf molds, coaly bands	
	TOTALS			÷	X 100 =	% REC.	SEAM
				÷	X 100 =	% TOT. REC.	SEAM(S)

ex- Gunsam. 77 (3) c

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE CALIPER

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LD-77-74C (L1)

FIELD LOWER QUINSAM

PROVINCE BRITISH COLUMBIA

17,196,443.4N 1,084,092.7E		Other Services
Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___		
Permanent Datum G.L. Elev. 620.0		Elev. K.B. ___
Log measured from G.L. ___ ft. above perm. Dat.		D.F. ___
Drilling measured from G.L.		G.L. ___

Date	17 JUNE '77		
Run No.	ONE		
Type Log	NUCLEAR	RES.	CAL.
Depth - Driller	78'		
Depth - Logger	76'		
Bottom logged interval	76'		
Top logged interval	0'		
Type fluid in hole	WATER		
Salinity, PPM Cl.	-		
Density	-		
Level	25		
Max. rec. temp. deg. F.	-		
Operating rig time	0.75 HR		
Recorded by	R. LEDUC		
Witnessed by	S. GARDNER		

RUN	BORE - HOLE RECORD			CASING RECORD		
No.	Bit	From	To	Size	Wgt.	From	To
1	8 3/8"	0'	44'	7"		0'	44'
	6"	0'	TD				

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

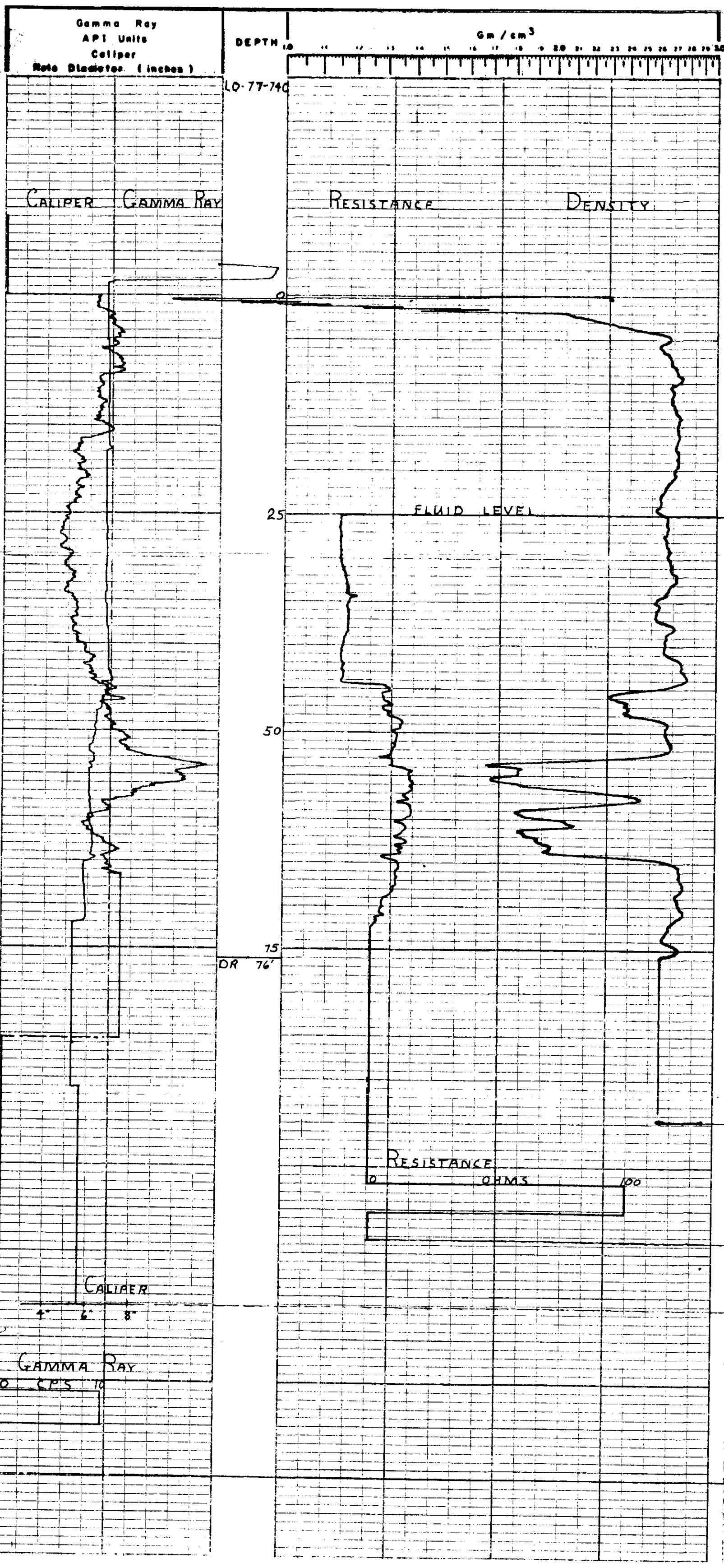
Gamma Ray					Resistance	Density	Caliper
Run No.	ONE			Run No.	ONE	ONE	ONE
Tool Model No.	L-103			Tool Model No.	L-103	L-103	L-103
Diameter	2 1/8"			Diameter	2 1/8"	2 1/8"	2 1/8"
Detector Model No	CP-516			Type	ME	F	F M
Type	SCINT.			Spacing		13"	
Length	3"						
				Length	1"		
				Horiz. Scale	8.33 Ω /DIV		
General				Rm @ °F	—		
Hoist Truck No.	2			Source Model		HDVP	
Inst. Truck No.	2			Serial No.		687	
Location	CAMPBELL	RIVER		Isotope		Cs 137	
				Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density			
	Depths		Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero	
Run No.	From	To	Ft/Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R	
ONE	76'	0'	12	4	100		5	1	1K	0.5L	

Reference Literature:

Remarks: DENNIS COREHOLE



LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

Cat. Borehole 77-6(b)

COMPANY LEXCO TESTING LTD.

WELL Cat. Borehole 6(b)-22-77

FIELD Coal Gasification

PROVINCE Alberta

67

Permanent Datum: G.L. Elev. 2,200.0

Log Meas. from: K.B. Elev. ——

Drill Meas. from: G.L. Elev. ——

Other Services

Run No.	Date	Depth-Driller	Depth-Logger	Btm. Log Interval	Top Log Interval	Casing-Driller	Casing-Logger	Bit Size	Type Fluid in Hole	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.	Max. Rec. Temp. Deg. F.	Equip. Location	Recorded By	Witnessed By
ONE	6-12-77	1,198'	1,197'	1,197'	SURFACE	6"	6"	5 7/8"	GEL CHEM	9.2	38	9.5	8.8	MUD PIT	.65 @ 70°	.49 @ 70°	.85 @ 70°	MEASURED	.35 @ 120°	3 HRS.	120°	CAMROSE	M. CLEMETT	

CASING RECORD

No.	Size	Wgt.	Grade	From	To
1	6"			0	1,197'

Field Area: CAMROSE

County: CAMROSE

Location: 6-22-46-20-W4

Well: Cat. Borehole 6(b)

Field: Coal Gasification

Province: Alberta

Other Services: NIL

Witnessed By: M. CLEMETT

Recorded By: M. CLEMETT

Time Since Circ.: 3 HRS.

Max. Rec. Temp. Deg. F.: 120°

Equip. Location: CAMROSE

Rm @ BHT: .35 @ 120°

Rmc @ Meas. Temp.: .85 @ 70°

Rmf @ Meas. Temp.: .49 @ 70°

Source of Rmf & Rmc: MEASURED

Rm @ Meas. Temp.: .65 @ 70°

Source of Sample: MUD PIT

Fluid Loss: 8.8

pH: 9.5

Visc.: 38

Dens.: 9.2

Type Fluid in Hole: GEL CHEM

Bit Size: 5 7/8"

Casing-Logger: 6"

Casing-Driller: 6"

Btm. Log Interval: 1,197'

Top Log Interval: SURFACE

Depth-Logger: 1,197'

Depth-Driller: 1,198' (1)

Date: 6-12-77

Run No.: ONE

Paid Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray			Resistance	Density	Caliper
Run No.			Run No.		
Tool Model No.	L-103		Tool Model No.	L-103	L-104
Diameter	2 7/8		Diameter	2 1/8	2 1/8
Detector, Model No.	GM-126		Type	MAG	
Type	SCINT		Spacing		13"
Length	3'		Length	11"	
			Matrix, Scale Run @ 1/2	5234 AMPS	
General					
Hotel Track No.	2		Source, Model		H.D.V.P. 687
Isot. Track No.	2		Serial No.		
Location	CAMROSE, ALTA.		Isotope		Cs 137
			Strength		125 m.c.

LOGGING DATA

General				Gamma Ray				Density			
Depths		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
Run No.	From	To							
1	916	0	12	4	10th	5	1	1K	5K

Reference, Literature:

Remarks: FAIRLY NOISY

H. Clemett

Gamma Ray API Units Caliper Hole Diameter (inches)

DEPTH

Gm/cm³

6-12-77

GAMMA

RESISTANCE

DENSITY

FAIRLY LEVEL

CASING

0

25

50

75

100

125

150

175

200

225

250

275

300

DA 316

RESISTANCE

GAMMA

CPS

LEXCO TESTING LTD

DRILLHOLE REPORT

AL FIELD: Campbell River DATE: May 19, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-75

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,146,028.85 N 1,082,857.61 E

ELEVATION: 872.3

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	16	till	
16	123	brown shale	
123	140	grey sandstone	
140	156	green sandstone	
156	160	grey shale	
160	210	brown shale	
210	244	red shale	
244	265	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DELLWOOD 10-17-75

FIELD JOHNSTS CROSSING

PROVINCE B.C.

Permanent Datum: G.L. Elev. 2242.3 Other Services

Log measured from: G.L. ft. above perm. Datum

Drilling measured from: G.L. Elev. K.B. D.F. G.L.

Run No.	Bit From	Bit To	Size	Type Fluid in Hole	Density	Viscosity	Fluid Loss	Source of Sample	Rm @ Meas. Temp.	Rmf @ Meas. Temp.	Rmc @ Meas. Temp.	Source of Rmf & Rmc	Rm @ BHT	Time Since Circ.	Max. Rec. Temp. Deg. F.	Equip. Location	Recorded By	Witnessed By
ONE	0	239	7 7/8	GEL CHEM	9.2	40	8.4	MUD PIT	.68 @ 70				.52 @ 70	12 HRS	70	100 MILE HOUSE	C. GARDAGE	

Run No.	Bore-Hole Record From	Bore-Hole Record To	Size	Wgt.	Casing Record From	Casing Record To
ONE	0	239	7"	17	0	239

Depth-Driller 239'

Depth-Logger 237'

Bottom Logged Interval 237'

Top Logged Interval SURFACE

Type Fluid in Hole GEL CHEM

Salinity, PPM Cl —

Density 9.2

Level FULL

Max. rec. temp. deg. F. 70

Equipment Location 100 MILE HOUSE

Recorded By C. GARDAGE

Witnessed By —

Run No. ONE

Type Log NUCLEAR

Depth-Driller 239'

Depth-Logger 237'

Bottom Logged Interval 237'

Top Logged Interval SURFACE

Type Fluid in Hole GEL CHEM

Salinity, PPM Cl —

Density 9.2

Level FULL

Max. rec. temp. deg. F. 133

Equipment Location 100 MILE HOUSE

Recorded By C. GARDAGE

Witnessed By —

Run No. ONE

Type Log DUAL INDUCTION LATEROLOG

Depth-Driller 239'

Depth-Logger 237'

Bottom Logged Interval 237'

Top Logged Interval SURFACE

Type Fluid in Hole GEL CHEM

Salinity, PPM Cl —

Density 9.2

Level FULL

Max. rec. temp. deg. F. 133

Equipment Location 100 MILE HOUSE

Recorded By C. GARDAGE

Witnessed By —

(13)

Field Rece

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray		Resistance	Density	Caliper
Run No.	ONE	ONE	ONE	
Tool Model No.	L-103	L-103	L-103	
Diameter	2 3/4"	2 3/4"	2 3/4"	
Detector Model No.	CP-511		P	
Type	SCINT.		19"	
Length	3"			
		Length	1"	
		Horiz. Scale per ft.	20 Ω/DIV.	
		Source Model		HDVP
		Serial No.		687
		Isotope		Cs 137
		Strength		125 mC

General		
Hoist Truck No.	2	
Inst. Truck No.	2	
Location	CAMPBELL	RIVER

LOGGING DATA

General Depths Run No.	From	To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Gamma Ray Zero Dis. L or R	API G.R. Units per Log Div.	Density T.C. Sec.	Sens. Settings	Zero Dis. L or R
ONE	239	0	12	4	100		5	1	1K	OEL

Reference Literature:

Remarks: DENNIS

Gamma Ray API Units Caliper Hole Diameter (inches)

DEPTH

gm/cm³

10-17-75

GAMMA RAY

RESISTANCE

DENSITY

0

25

50

75

100

125

FLUID LEVEL

150

175

200

225

DR 239

RESISTANCE OHMS

GAMMA RAY CPS

LEXCO TESTING LTD

DRILLHOLE REPORT

OAL FIELD: ~~Campbell River~~ DATE: May 20, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-76

APPROX. LOCATION: Line 85+00 n2500 lt. SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 86+25 2916 Lt. of B/L

ELEVATION: 1032.2

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	25	sandstone	
25	27	brown shale	
27	35	green siltstone	
35	40	brown shale	
40	80	basalt	

COMMENTS

WATER HORIZON FT.

CK- QUINSAM 77(3)c.

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU-77-76

FIELD QUINSAM

PROVINCE B.C.

Grid Block 86+25 2910'E

Lsd. Sec. Twp. Rge. W.

Permanent Datum G.L. Elev. 1032'

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L.

Elev. K.B.

D.F.

G.L.

Other Services

Date	20 MAY '77	
Run No.	ONE	
Type Log	NUCLEAR	RES
Depth - Driller	80'	
Depth - Logger	65'	
Bottom logged interval	65'	
Top logged interval	0'	
Type fluid in hole	WATER	
Salinity, PPM Cl.	-	
Density	-	
Level	0'	
Max. rec. temp. deg. F.	-	
Operating rig time	0.5 HR.	
Recorded by	R. LEQUE	
Witnessed by	S. GARDNER	

BORE - HOLE RECORD

RUN No.	Bit	From	To

CASING RECORD

Size	Wgt.	From	To

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

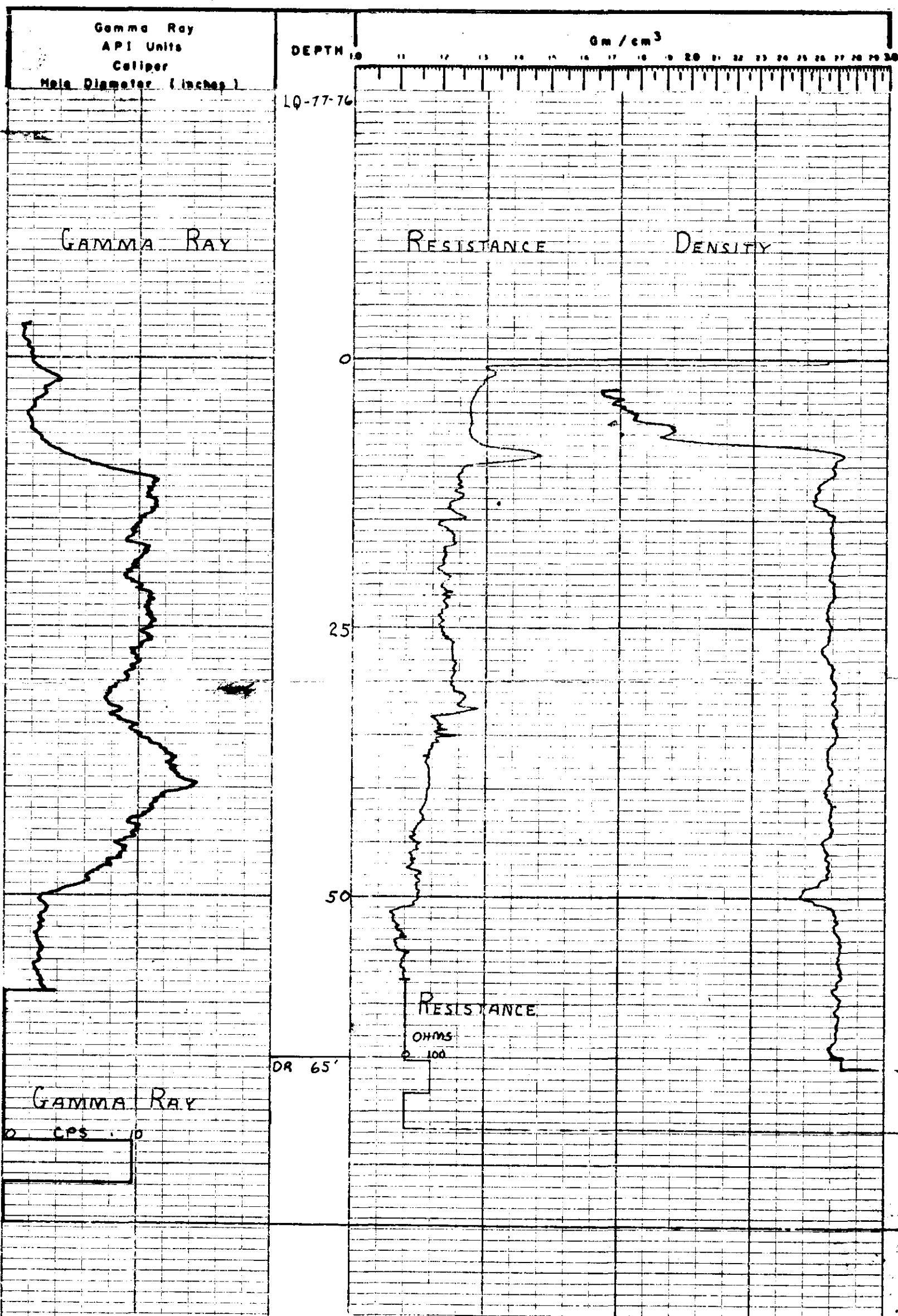
Gamma Ray					Resistance	Density	Caliper
Run No.	ONE			Run No.	ONE	ONE	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2 1/8			Diameter	2 1/8	2 1/8	
Detector Model No	CP-516			Type	ME	F	
Type	SCINT.			Spacing		13"	
Length	3"						
				Length	1"		
				Horiz. Scale	100 Ω /DIV		
General				Rm @ °F	-		
Hoist Truck No.	2			Source Model		HDVP	
Inst. Truck No.	2			Serial No.		687	
Location	CAMPBELL	RIVER		Isotope		Cs 137	
				Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density			
	Depths		Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero	
Run No.	From	To	Ft/Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R	
1	65'	0'	12	4	100		5	1	1K	0.5L	

Reference Literature:

Remarks: DENNIS: BRIDGED AT 65'



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: May 22, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-77

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,146,570.0 N 1,088,770.0 E

ELEVATION: 694.1

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	70	till	
70	71	coal	
71	82	brown shale	
82	83	coal	
83	87	brown shale	
87	95	siltstone	
95	259	grey sandstone	
TD	259		

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-77

FIELD LOWER QUINSAM

PROVINCE B.C.

Permanent Datum G.L. Elev. 678'

Log Measured from K.B. 11' above perm. Datum

Drilling Measured from K.B.

Date 22 MAR. 77

Run No. ONE

Type Log GAMMA

Depth—Driller 255'

Depth—Logger 255'

Bottom Logged Interval 249'

Top Logged Interval SURFACE

Type Fluid in Hole WATER

Salinity, PPM Cl. —

Density 1.0

Level FULL

Max. rec. temp. deg. F —

Equipment No. & Location

Recorded By R. LEIER

Witnessed By S. SKAGGERUD

RUN | BIT | CASING RECORD | SIZE | WGT. | FROM | TO

ONE | 8 3/4" | SURFACE | 8" | 20 | 0' | 100'

ONE | 8 3/4" | PRODUCTION | 6" | 15.5 | 0' | 170'

Elev.: K.B. — D.F. — G.L. —

Other Services

Field Office Record

Type | From | To

Gc- Quinsam 7/16/c.

67

(LS)

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

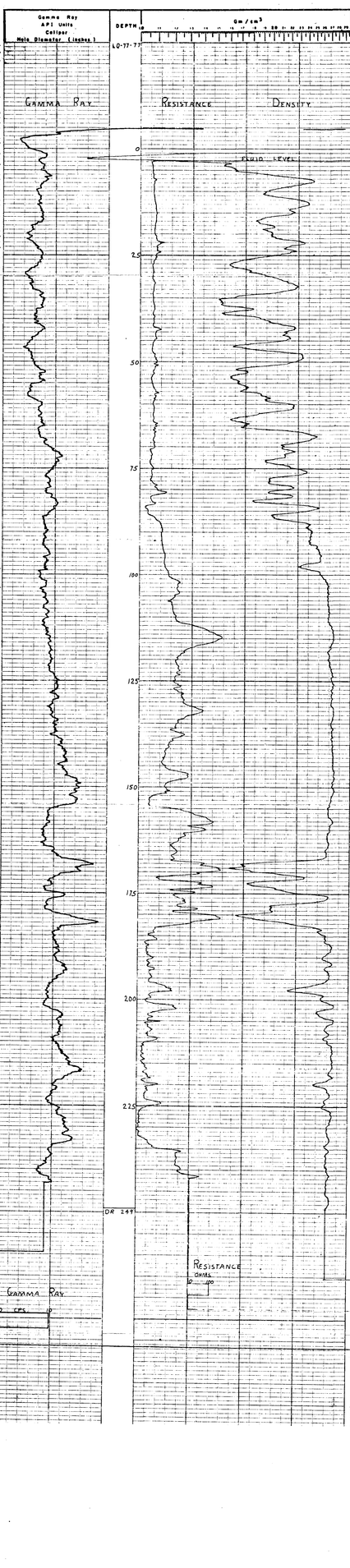
	Gamma Ray			Resistance	Density	Caliper
Run No.	ONE		Run No.	ONE	ONE	
Tool Model No.	L-103		Tool Model No.	L-103	L-103	
Diameter	2 3/8		Diameter	2 1/4	2 3/8	
Detector Model No.	L-2-56		Type	NIE	2	
Type	SCINT		Spacing		13"	
Length	3'		Length	1"		
		3	Horiz. Scale	500 / DIV		
General			Rm @ °F	—		
Hoist Truck No.	2		Source Model		H.D.V.P	
Inst. Truck No.	7		Serial No.		687	
Location	CAMPBELL RIVER		Isotope		Cs 137	
			Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density			
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
ONE	249'	0'	12	4	100		5	1	14	0.5 L

Reference Literature:

Remarks: HOWARD



LEXCO TESTING LTD

DRILLHOLE REPORT

OAL FIELD: Campbell River, B.C. DATE: May 21, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-78

APPROX. LOCATION: 85+00 2,000 Lt. SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 85+00 1968.5 Lt.

ELEVATION: 1127.1

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	51	grey sandstne	
51	63	brown shale	
63	65	coal	
65	124	brown shale	
124	133	coal	
133	138	brown shale	
138	142	green sandstone	
142	151	brown shale	
151	155	green sandstne	
155	200	red shale	

COMMENTS

WATER HORIZON FT.

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

ex-Gunnar 72686

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU-77-28

FIELD QUINSAM

PROVINCE B.C.

Permanent Datum G.L. Elev. ——

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L.

Date 2 MAR 78

Run No. ONE

Depth - Driller 200

Depth - Logger 198

Btm. Log Interval 198

Top Log Interval 0

Type Fluid in Hole WATER

Salinity, PPM Cl. ——

Density 8.5

Level Full

Max. Rec. Temp. Deg. F ——

Operating Rig Time ——

Recorded By LHR

Witnessed By ——

Location: Sec. —— Twp. —— Rge. —— W. of 6

Elev.: K.B. 1327 D.F. —— G.L. ——

Other Services

BORE-HOLE RECORD

RUN No.	Bit From	Bit To	Size
1	0	6	6 3/4"
2	6	8	5 1/2"
3	8	10	5"

CASING RECORD

Size	Wgt.	From	To
7"	17#	0	8'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

	Gamma Ray		Resistance	Density	Caliper
Run No.	ONE		ONE	ONE	
Tool Model No.	L-103		L-103	L-103	
Diameter	2 1/8"		2 1/8"	2 1/8"	
Detector Model No.	CD-514		M.E.	5"	
Type	Scint			13"	
Length	3'				
Length			1"		
Horiz. Scale			100 Ω / div		
Rm @ °F			-		
Source Model				H.D.V.P.	
Serial No.				687	
Isotope				Cs 137	
Strength				125 mC	

General

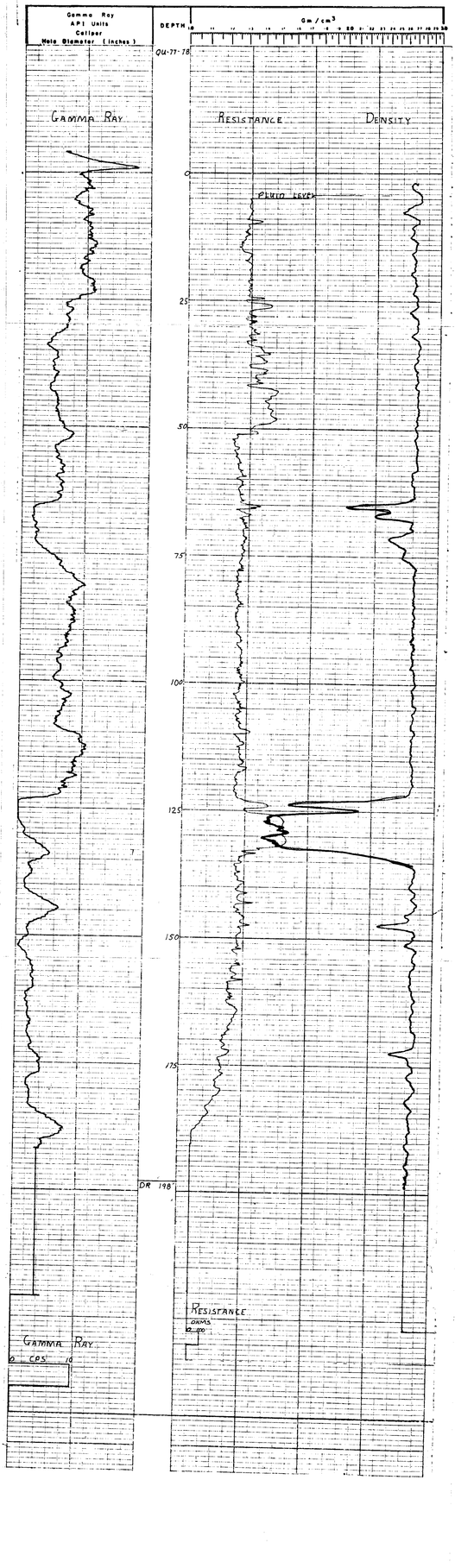
Hoist Truck No.	2
Inst. Truck No.	2
Location	CAMPBELL RIVER

LOGGING DATA

General Depths Run No.	From	To	Speed Ft/Min.	T.C. Sec.	Gamma Ray Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	Density T.C. Sec.	Density Sens. Settings	Density Zero Div. L or R
ONE	198	0	12	4	100		5	1	1K	0.5L

Reference Literature:

Remarks: DENNIS



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River, B.C. DATE: May 22, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-79

APPROX. LOCATION: 85+00 2500 Lt. SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 85+00 2440.2 Lt.

ELEVATION: 1073.9

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	16	till	
16	25	brown shale	
25	27	coal	
27	28	brown shale	
28	37	coal	
37	52	brown shale	
52	65	green sandstone	
65	87	red shale	
87	105	basalt	

COMMENTS

WATER HORIZON FT.

Ex- Quinsam 77 Cable.

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU-77-79 (L4)

FIELD QUINSAM

PROVINCE B.C.

Other Services

Elev. K.B. ____

D.F. ____

G.L. ____

Permanent Datum G.L. Elev. 1074'

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L.

Date	23 MAY 77
Run No.	ONE
Type Log	NUCLEAR
Depth - Driller	N/A
Depth - Logger	103'
Bottom logged interval	103'
Top logged interval	0'
Type fluid in hole	WATER
Salinity, PPM Cl.	-
Density	-
Level	7'
Max. rec. temp. deg. F.	-
Operating rig time	0.5 HR
Recorded by	R. LEDUC
Witnessed by	S. GARDNER

RUN No.	BORE - HOLE RECORD Bit	From	To	CASING RECORD Size	Wgt.	From	To

Paste Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray					Resistance	Density	Caliper
Run No.	ONE			Run No.	ONE	ONE	
Tool Model No.	L-103			Tool Model No.	L-103	L-103	
Diameter	2 1/8"			Diameter	2 1/8"	2 1/8"	
Detector Model No.	CP-516			Type	ME	F	
Type	SCINT			Spacing		13"	
Length	3"						
				Length	1"		
				Horiz. Scale	100 Ω / DIV		
General				Rm @ °F	-		
Hoist Truck No.	2			Source Model		HDVP	
Inst. Truck No.	2			Serial No.		687	
Location	CAMPBELL	RIVER		Isotope		Cs 137	
				Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density			
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	
ONE	103'	0'	12	4	100		5	1	1K	0.5L	

Reference Literature:

Remarks: DENNIS

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River, B.C. DATE: May 24, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-80

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 100+00 1994.8 Lt.

ELEVATION: 1082.7

DRILLER: _____

FROM	TO	LOG	REMARKS
0	6	till	
6	18	sandstone	
18	21	brown shale	
21	24	coal	
24	85	brown shale	
85	86	coal	
86	88	brown shale	
88	100	coal	
100	128	brown shale	
128	173	red shale	
173	185	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

CK-Gunsam 77-81-C

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU-77-80

FIELD QUINSAM

PROVINCE B.C.

Location: Lat. 100 N Sec. Twp. Rge. W

Permanent Datum G.L. Elev. 183.2 Other Services

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L. Elev. K.B. D.F. G.L.

Run No.	ONE		
Type Log	DENSITY	RES.	
Depth - Driller	185'		
Depth - Logger	183'		
Bottom Logged Interval	183'		
Top Logged Interval	0		
Salinity, PPM Cl.	WATER		
Density			
Level	FULL		
Max. rec. temp. deg. F.	8°		
Operating rig time			
Recorded by	R. ERIKSEN		
Witnessed by			

RUN No.	BIT From	BIT To	CASING RECORD Size Wt.	CASING RECORD From	CASING RECORD To
1	0	7	7½	0	7
⅝"	7	10			

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

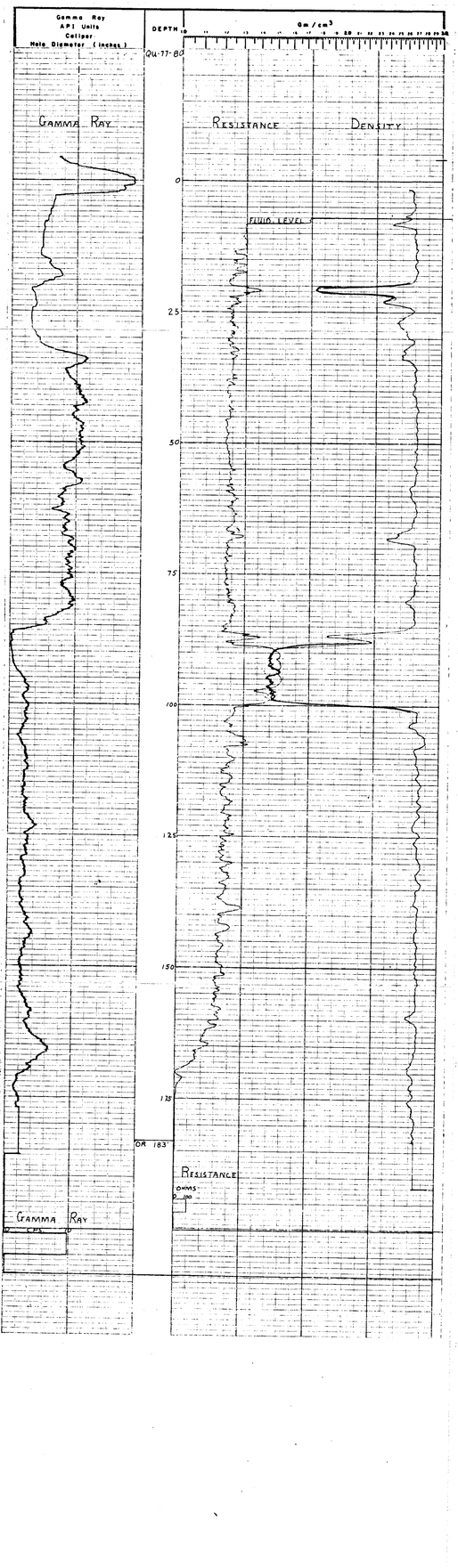
	Gamma Ray			Resistance	Density	Caliper
Run No.	ONE		Run No.	ONE	ONE	
Tool Model No.	L-103		Tool Model No.	L-101	L-101	
Diameter	2⅛		Diameter	2⅛	2⅛	
Detector Model No.	CP-514		Type	ME	F	
Type	SCINT.		Spacing		13"	
Length	3'		Length	1'		
			Horiz. Scale	100 Ω /DIV		
			Rm @ °F	-		
General			Source Model		H.D.V.P	
Hoist Truck No.	2		Serial No.		687	
Inst. Truck No.	2		Isotope		Cs 137	
Location	CAMPBELL RIVER		Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density		
Depths			Speed	T.C.	Sens.	Zero		T.C.	Sens.	Zero
Run No.	From	To	Ft./Min.	Sec.	Settings	Div. L or R	API G.R. Units per Log Div.	Sec.	Settings	Div. L or R
ONE	183'	0	12	4	100		5'	1	1K	0 SL

Reference Literature:

Remarks: DENNIS



LEXCO TESTING LTD

DRILLHOLE REPORT

'AL FIELD: Campbell River DATE: May 25, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-81

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 76+67 1968.5 Lt.

ELEVATION: 1121.2

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	6	Till	
6	81	sandstone	
81	86	brown shale	
86	87	coal	
87	143	brown shale	
143	144	coal	
144	146	brown shale	
146	154	coal	
154	197	brown shale	
197	215	green sandstone	
215	230	red shale	
230	245	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD
WELL DRILLHOLE QU-77-81
FIELD QUESNEL
PROVINCE B.C.
LOC 76°42'S 52°49'W
Sec Twp Rge W of 6th
Elev. K.B. 1424.2 ft
Perm. Datum G.L.
Log Measured from K.B. 1.5 ft above perm. Datum
D.F. G.L.

Other Services

Date 15-Dec-77
Type Log GAMMA
Depth-Driller 244
Depth-Logger 244
Bottom Logged Interval 244
Top Logged Interval SURFACE
Casing-Driller 6" @ 0 ft
Casing-Logger 12'
Bit Size 5 7/8"
Type Fluid in Hole WATER
Salinity, PPM Cl. —
Density lb/gal —
Level FULL
Max. Rec. Temp. deg. F.
Operating Rig Time
Recorded By J. LEGISSA
Witnessed By

RECORDED MEASUREMENTS

Run No.	Bit From	Bit To	Size	Wt.	Type Fluid in Hole	Salinity, PPM Cl.	Density lb/gal	Level	Max. Rec. Temp. deg. F.	Source Strength	Source Type
ONE	0	244	7 7/8"	8.2	WATER	—	—	FULL	—	125 mC	Cs 137

CASING RECORD

Run No.	Size	Wt.	From	To
ONE	6"	0	0	6

67

GA-Gunnison 72 Sale.

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

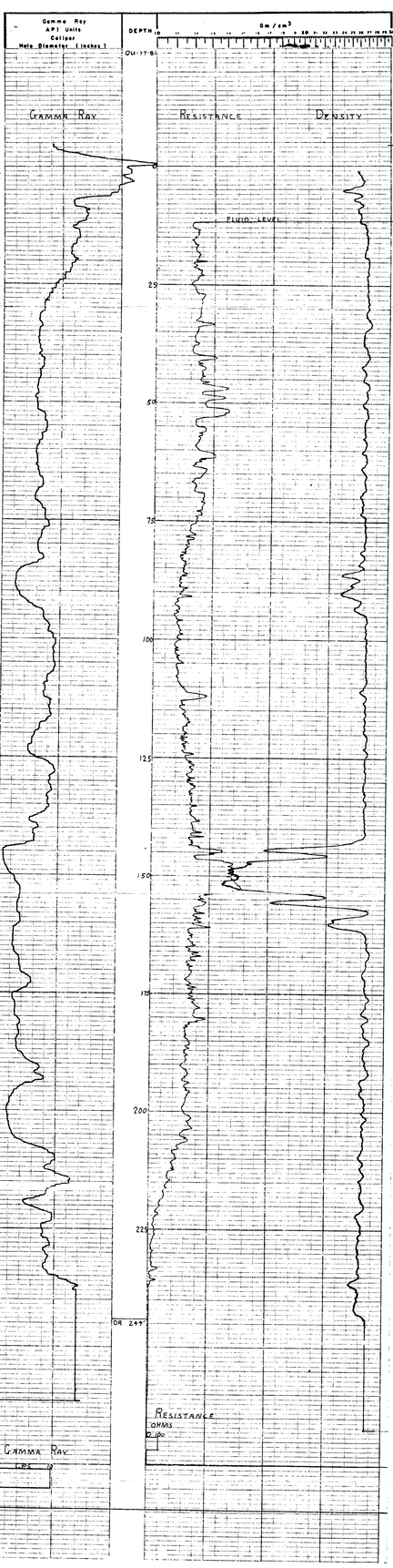
	Gamma Ray			Resistance	Density	Caliper
Run No.	ONE		Run No.	ONE	ONE	
Tool Model No.	L-104		Tool Model No.	L-104	L-104	
Diameter	2 ¼"		Diameter	2 ¼"	2 ¼"	
Detector Model No.	CP-104		Type	NE	P	
Type	SCINT		Spacing		13"	
Length	3'					
			Length	1'		
			Horiz. Scale	100 Ω /DIV		
			Rm @ °F			
General			Source Model		HDVP	
Hoist Truck No.	2		Serial No.		687	
Inst. Truck No.	2		Isotope		Cs 137	
Location	CAMPBELL RIVER		Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density		
Depths		Speed	T.C.	Sens.	Zero	API GR Units	T.C.	Sens.	Zero
Run No.	From	To	Ft/Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R
ONE	244	0	12	3	100		5"	1	1K	0.5L

Reference Literature:

Remarks: OMNIA



LEXCO TESTING LTD

DRILLHOLE REPORT

AL FIELD: Campbell River DATE: May 26, 1977

COMPANY: Lexco Testing

HOLE NO.: LQU -77-82

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,147,013.1 N 1,088,590.0 E

ELEVATION: 682

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	59	till	
59	72	brown shale	
72	109	red shale	
109	122	siltstone	
122	179	grey sandstone	
179	205	green grey sandstone	
205	209	coal	
209	228	brown shale	
248	252	coal	
252	275	brown shale	
275	305	grey shale	
305	334	green sandstne	
TD	334		

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

OK Gunsberg 71816

COMPANY LEXCO TESTING LTD.

WELL Dehlsdale LO-77-82

FIELD Lower Gunsberg

PROVINCE B.C.

Location: Lsd Sec Twp Rge W

Permanent Datum G.L. Elev. 822 C

Log Measured From K.B. 6ft. Above Perm. Datum

Drilling Measured From K.B. 6ft. Elev. K.B. — G.L. —

Other Services

Run No. 1

Type Log Gamma Density

Depth-Driller 333

Depth-Logger 333

Bottom Logged Interval 331

Top Logged Interval Surface

Casing-Driller 6" @ 6ft.

Casing-Logger —

Bit Size 5.5" Type Fluid in Hole GAMMA

Density/Viscosity — / —

pH/Fluid Loss —

Source of Sample —

Rm @ Meas. Temp. —

Rmf @ Meas. Temp. —

Rmc @ Meas. Temp. —

Source of Rmf/Rmc —

Rm @ BHT —

Time Since Circ. —

Max. Rec. Temp. Deg. F —

Equip. Location —

Recorded By R. Schwartz

Witnessed By —

RUN NO. | BIT | FROM | TO | CASING RECORD | SIZE | WGT. | FROM | TO

1 | 5.5" | 0 | 333 | 6" | 6.63 | | 0 | 6

Field Area

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

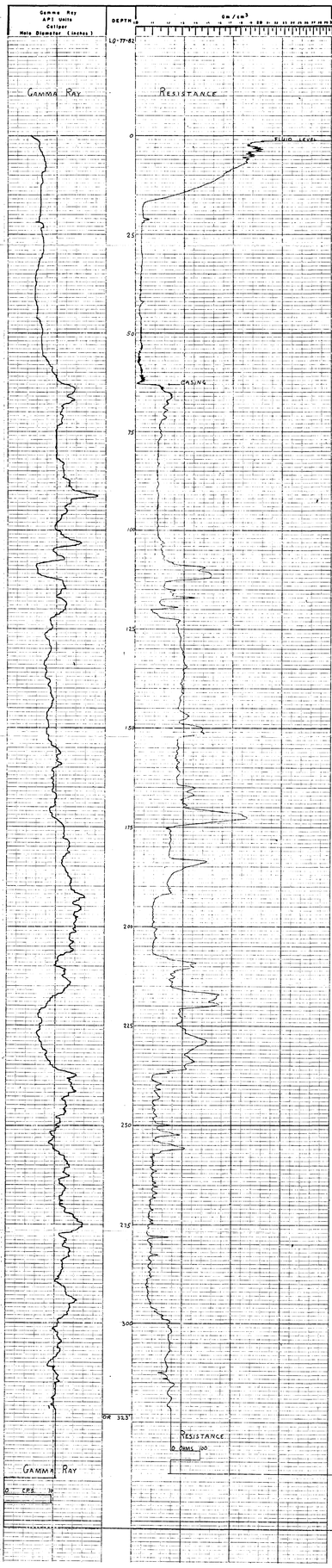
Gamma Ray			Resistance		Density	Caliper
Run No.	ONE		Run No.	ONE		
Tool Model No.	L-103		Tool Model No.	L-101		
Diameter	2 ⅝"		Diameter	2 ⅝		
Detector Model No.	CP-104		Type	ONE		
Type	ONE		Spacing			
Length	3"		Length	1"		
			Horiz. Scale	33.3 D /div		
General			Rm @ 74°	-		
Hotel Truck No.	2		Source Model		HOVP	
Inst. Truck No.	7		Serial No.		687	
Location	Campbell River		Isotope		Cs. 137	
			Strength		175 mC	

LOGGING DATA

General					Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Ohs. L or R	API G.R. Units per Log Ohs.	T.C. Sec.	Sens. Settings	Zero Ohs. L or R
ONE	333	0	12	2	100	3		1	14	0.5 L

Reference Literature:

Remarks: HOUNDD — DENSITY SECTION WAS NOT RECORDED DUE TO MALFUNCTION



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: May 26, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77-83

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 81+65 1968.5 Lt.

ELEVATION: 1135.0

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	80	grey sandstone	
80	143	brown shale	
143	148	coal	
145	146	brown shale	
146	156	coal	
156	172	brown shale	
172	190	sandstone	
190	243	brown shale	
243	255	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

ex Quinsam 77/78

COMPANY LEXCO TESTING LTD.

WELL Dallmore QU-77-83

FIELD Quinsam

PROVINCE B.C.

LINE 8745'S L-7 E/W Other Services

Sec. Twp. Rge. W

Elev. K.B. G.L.

Permanent Datum: G.L. Elev.: 1155' ft. above perm. Datum

Log Measured from: G.L. 6' ft. above perm. Datum

Drilling measured from: G.L.

Date	21 May 78
Run No.	ONE
Type Log	GAMMA
Depth - Driller	253'
Depth - Logger	253'
Bottom logged Interval	253'
Top logged Interval	SURFACE
Type Fluid in Hole	-
Salinity, PPM Cl.	-
Density	-
Level	FULL
Max. Rec. Temp. Deg. F.	-
Operating Rig Time: Hours	4.5
Recorded By	K. SCHLEGER
Witnessed By	A. ANDREASEN

Casing Record

No.	Size	Wgt.	From	To
1	8 5/8"		0	10'
2	6"		0	253'
3	4 1/2"	7.5#	0	253'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

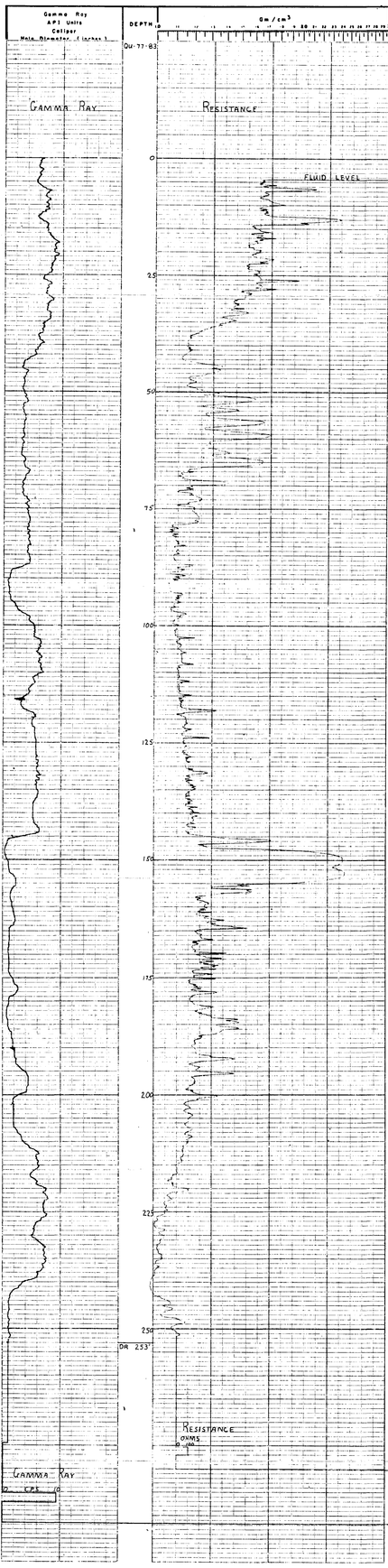
	Gamma Ray			Resistance	Density	Caliper
Run No.	ONE		Run No.	ONE		
Tool Model No.	L-103		Tool Model No.	L-103		
Diameter	2 1/8"		Diameter	2 1/8"		
Detector Model No.	CP-51b		Type Spacing	NYE		
Type	SCINT					
Length	3'		Length	1'		
			Horiz. Scale	100 Ω/DIV		
General			Rm @ °F	-		
Hoist Truck No.	2		Source Model		HDVP	
Inst. Truck No.	2		Serial No.		687	
Location	CAMPBELL RIVER		Isotope Strength		Cs 137 125 mC	

LOGGING DATA

General					Gamma Ray				Density		
Depths		Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero On L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero On L or R		
Run No.	From	To									
ONE	253'	0	12	4	100		5				

Reference Literature:

Remarks: DENNIS - DENSITY TOOL NON-FUNCTIONAL



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River, B.C. DATE: May 27, 1977

COMPANY: Lexco Testing

HOLE NO.: QU-77--84

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 90+00 1968.5 Lt.

ELEVATION: 1128.3

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	6	till	
6	64	grey sandstone	
64	66	brown shale	
66	67	coal	
67	132	brown shale	
132	134	coal	
134	136	brown shale	
136	144	coal	
144	169	brown shale	
169	175	red shale	
175	180	brown shale	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

ex Gunsan 77/3/9.

COMPANY LEXCO TESTING LTD.

WELL Arbutus Gas 22-84 (12)

FIELD Gunsan

LOCATION

PROVINCE BRITISH COLUMBIA

LSD 22-20-20 PMER Lt. of 6 Colonial Survey

Log Sec. Twp. Rge. W.

Elev. K.B. 1128.3'

D.F.

G.L.

Permanent Datum Gl.

Elevation

Drilling measured from G.L.

11' above perm. Datum

Run No.	Bit From	Bit To	Size	Wgt.	Casing Record From	Casing Record To
1						

Date 2 Sept 77

Run No. 1

Type Log Gamma Resist.

Depth - Driller 180

Depth - Logger 179

Bottom Logged Interval 179

Top Logged Interval 0

Type Fluid in Hole GASEOUS

Salinity, PPM Cl. 0

Density 0.5

Level Full

Max. rec. temp. deg. F. 52.5°

Equipment No. 1

Location CAMPBELL RIVER

Recorded By T. McCONNELL

Witnessed By S. BRADSHAW

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

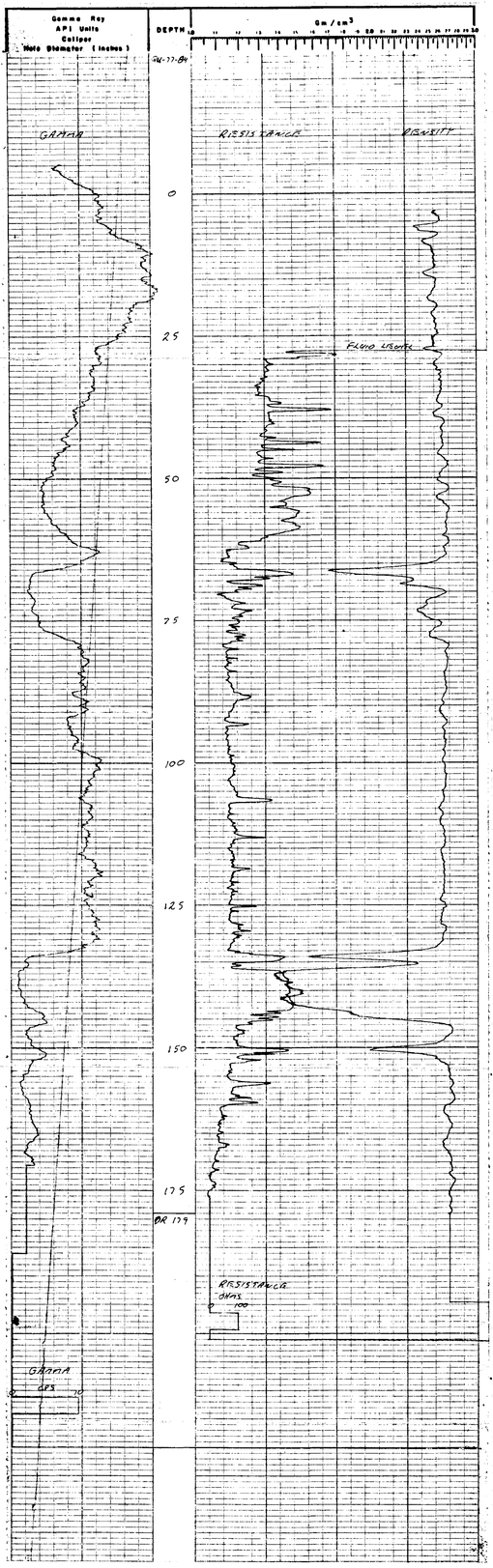
Gamma Ray			Resistance	Density	Caliper
Run No.			1	1	
Tool Model No.	L-103		L-103	L-103	
Diameter	2 1/8		2 1/8	2 1/8	
Detector Model No.	CP516		4½	F	
Type	Scint		Spacing	13"	
Length	3"				
			Length	1"	
General			Horiz. Scale	50 in 10 in	
Hoist Truck No.	2		Rm @ °F		
Inst. Truck No.	2		Source Model		HDVP
Location	CAMPBELL RIVER		Serial No.		687
			Isotope		Cs 137
			Strength		125 mC

LOGGING DATA

General				Gamma Ray				Density		
Depths			Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero
Run No.	From	To	Ft./Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R
1	179	0	12	4	100		5	1	1K	5L

References, Literature:

Remarks: D. BRAUN



LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE QU-77-84 (113)

FIELD QUINSAM

PROVINCE B.C.

Location: Permanent Datum G.L. Elev. 412.8.3' | Log measured from G.L. 0' ft. above perm. Dat. | Drilling measured from G.L. | Elev. K.B. — | D.F. — | G.L. —

Other Services

Log: Sec. Twp. Rge. W. | Line 90°00 | 16 46.5 CL or 67

Date: 27 MAY '77
Run No.: ONE
Type Log: GAMMA
Depth - Driller: 180'
Depth - Logger: 177'
Bottom Logged Interval: 177'
Top Logged Interval: 0'
Type Fluid in Hole: WATER
Salinity, PPM Cl: —
Density: —
Level: FULL
Max. rec. temp. deg. F: 34°
Equipment No. and Location: 0.35 HS
Recorded by: R. LEDUC
Witnessed by: R. ROWLANDS

RUN No.	BIT From	BIT To	BIT Size	CASING RECORD Wgt.	CASING From	CASING To
1	0'	8'	7⅞"		0'	8'
	8'	TD				

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

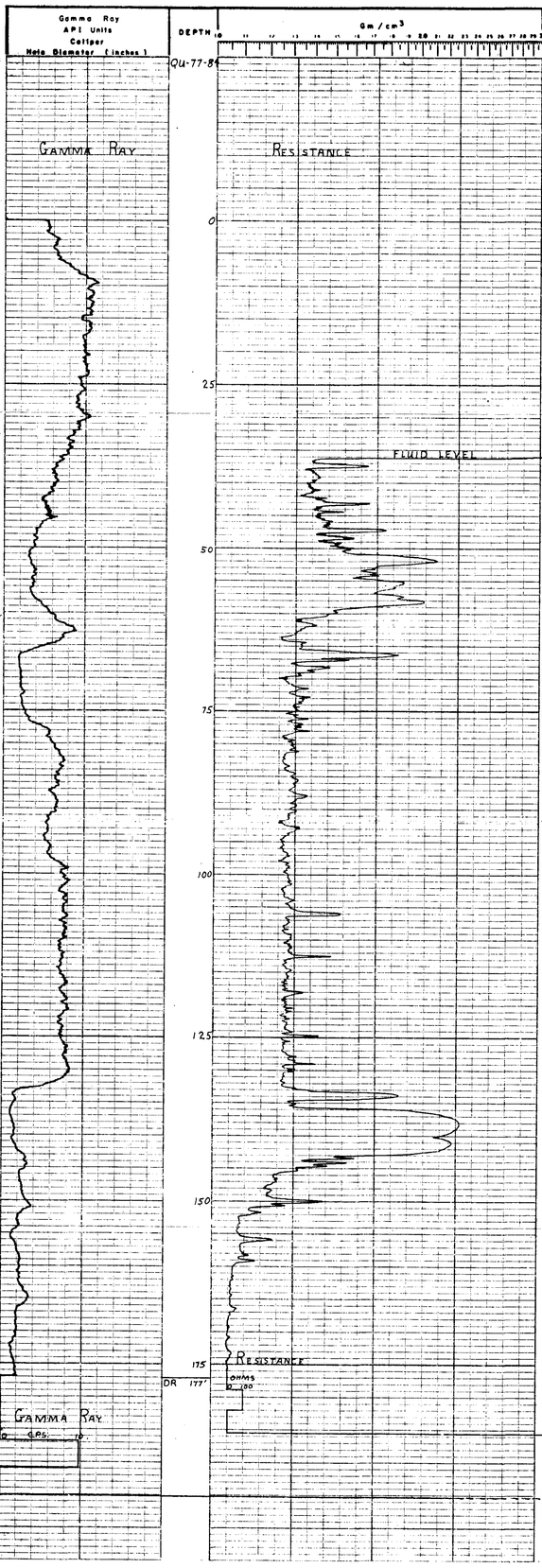
Gamma Ray		Resistance		Density	Caliper
Run No.	ONE	Run No.	ONE		
Tool Model No.	L-103	Tool Model No.	L-103		
Diameter	2⅝"	Diameter	2⅝"		
Detector Model No.	CP-516	Type	ME		
Type	SCINT.	Spacing			
Length	3"				
		Length	1"		
		Horiz. Scale	100 Ω /DIV		
General		Rm @ °F	—		
Hoist Truck No.	2	Source Model		HOVP	
Inst. Truck No.	2	Serial No.		687	
Location	CAMPBELL RIVER	Isotope		Cs 137	
		Strength		125 mC.	

LOGGING DATA

General					Gamma Ray			Density		
Depths		Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero
Run No.	From	To	Ft/Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R
ONE	177'	0'	12	4	100		5			

Reference Literature:

Remarks: DENNIS - DENSITY TOOL NON-FUNCTIONAL



LEXCO TESTING LTD

DRILLHOLE REPORT

OAL FIELD: Campbell River DATE: May 28, 1977

COMPANY: Lexco

HOLE NO.: LQU-77-85

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,146,472.9 N 1,086,912 E

ELEVATION: 685

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	42	till	
42	97	grey sandstone	
97	110	brown shale	
110	117	coal	
117	160	brown shale	
160	194	grey sandstone	
TD	194		

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA-DENSITY & RESISTANCE
SOLIDS

COMPANY LEXCO TESTING LTD.

WELL DRILL HOLE LQ-77-85

FIELD LOWER QUINAGAMA

PROVINCE BRITISH COLUMBIA

Location: 49°46'42.74" 120°36'42.8"

Permanent Datum: G.L. Elev. 695 C.

Log measured from: G.L. ft. above perm. Dat.

Drilling measured from: G.L.

Elev. K.B. —
D.F. —
G.L. —

Other Services

Run No.	One		
Type Log	Nuclear	Res.	Cal.
Depth - Driller	189'		
Depth - Logger	186'		
Bottom logged interval	183'		
Top logged interval	0'		
Type fluid in hole	Water		
Salinity, PPM Cl.			
Density			
Level	Full		
Max. rec. temp. deg. F.	4°		
Operating rig time			
Recorded by	D. Krueger		
Witnessed by	G. Gardiner		

BIT RECORD

Run	Bit	From	To
1	6¾"	0'	47'
	5⅞"	47'	TD

CASING RECORD

Wt.	Size	From	To
	5¼"	0'	47'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray		Resistance	Density	Caliper
Run No.	ONE	ONE	ONE	ONE
Tool Model No.	L-103	L-103	L-104	L-103
Diameter	2 ¼"	2 ¼"	2 ⅛"	2 ⅛"
Detector Model No.	CP516	ME	P	P.M.
Type	Scint.	Spacing	19"	
Length	3"	Length	1"	
		Horiz. Scale	50 Ω/Div	
		Rm @ °F	—	
		Source Model	HDVP	
		Serial No.	687	
		Isotope	Co 137	
		Strength	125 mC	

General

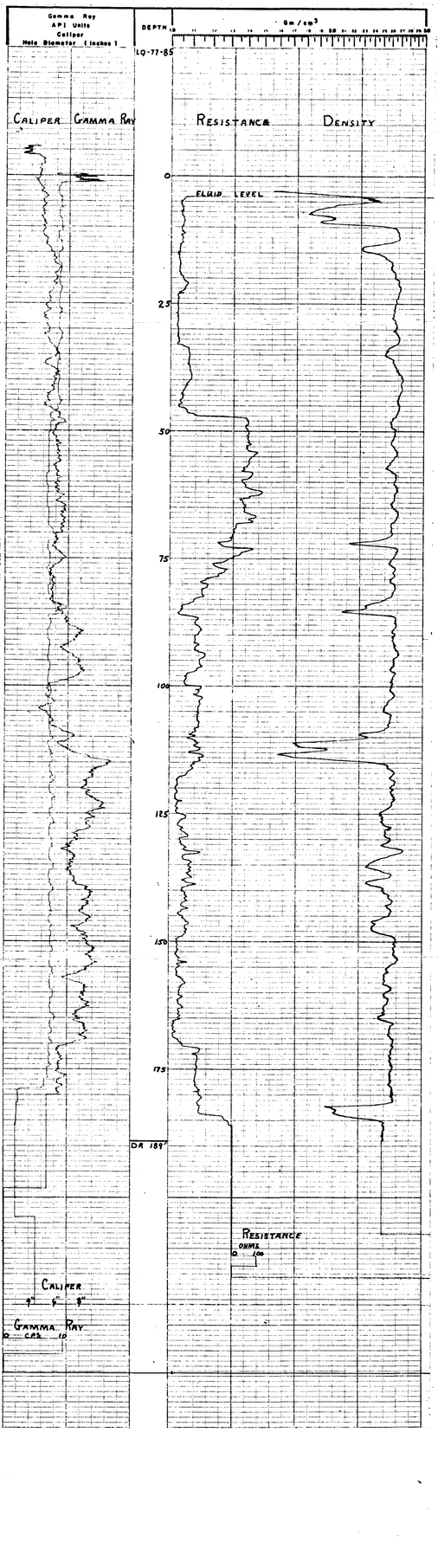
Hoist Truck No.	2
Inst. Truck No.	2
Location	Campbell River

LOGGING DATA

General				Gamma Ray				Density		
Run No.	Depths From	Depths To	Speed Ft./Min.	T.C. Sec.	Sens. Settings	Zero Dis. L or R	API GR Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Dis. L or R
ONE	189'	0'	12	4	100		5	1	1K	0.R1

Reference Literature:

Remarks: Howard



LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-85 (Rerun L15)

FIELD LOWER QUESNEL

PROVINCE BRITISH COLUMBIA

Location: Lat. 53°06'45"N Sec. — Twp. — Rge. — W of — Elev. 695.0 ft. above perm. Dat.

Permanent Datum G.L. Elev. 695.0

Log measured from G.L. ft. above perm. Dat.

Drilling measured from G.L.

Other Services

Elev. K.B. —

D.F. —

G.L. —

Date 17 June 77

Run No. One

Type Log Nuclear Res.

Depth - Driller 194'

Depth - Logger 183'

Bottom logged interval 183'

Type fluid in hole WATER

Salinity, PPM Cl. —

Density 8.5

Level full

Max. rec. temp. deg. F —

Operating rig time 5 hr

Recorded by R. LEDUC

Witnessed by S. CLARKONE

Run No.	Bit From	Bit To	Size	Wgt.	Casing Record From	Casing Record To

Fold Here — This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

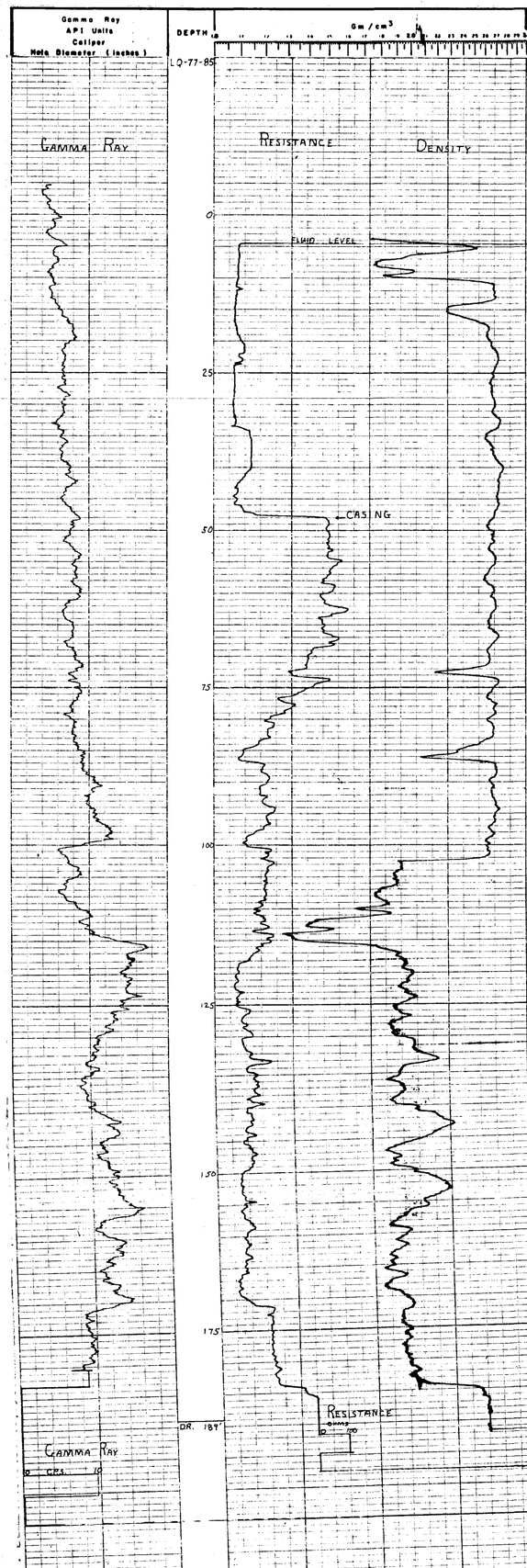
Gamma Ray			Resistance	Density	Caliper
Run No.	ONE		ONE	ONE	
Tool Model No.	L-103		L-103	L-103	
Diameter	2⅛"		2⅛"	2⅛"	
Detector Model No.	CP-516		MR	E	
Type	SCINT.			13"	
Length	3"				
			Length	1"	
			Horiz. Scale	500/DIV	
General			Rm @ °F	—	
Hoist Truck No.	2		Source Model		HDVP
Inst. Truck No.	2		Serial No.		687
Location	CAMPBELL RIVER		Isotope		Cs 137
			Strength		125 mC

LOGGING DATA

General			Gamma Ray					Density			
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
ONE	189'	0'	12	9	100		5	1	1K	0.51

Reference Literature:

Remarks: HOWARD



LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE

ex- Blueskin 77 (9) a.

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-85 (L/6)

FIELD LOWER QUINSAM

PROVINCE B.C.

Permanent Datum G.L. Elev. 650.0

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L.

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

Other Services

Run No.	Bit From	Bit To	Size	Wgt.	Casing Record From	Casing Record To
ONE	0	48	5¾"		0	48

Bore-Hole Record

Type Log: GAMMA

Depth—Logger: 187'

Bottom Logged Interval: 187'

Top Logged Interval: 0

Type Fluid in Hole: WATER

Salinity, PPM Cl-

Density: 1.0

Mud, sec. temp. deg. F

Operating rig time

Recorded By: R. GOODBRAND

Witnessed By:

Run No. ONE

Tool Model No. L-102

Diameter 2⅝"

Detector Model No SP-516

Type SCINT.

Length 3"

Holst Truck No. 2

Inst. Truck No. 2

Location CAMPBELL RIVER

Run No. ONE

Tool Model No. L-102

Diameter 2⅝"

Type NE

Spacing

Length 1"

Horiz. Scale 500 Ω/DIV

Rm @ °F

Source Model H.D.V.P.

Serial No. 687

Isotope Co 137

Strength 125 mC

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray

Run No.	ONE		
Tool Model No.	L-102		
Diameter	2⅝"		
Detector Model No	SP-516		
Type	SCINT.		
Length	3"		

General

Holst Truck No.	2		
Inst. Truck No.	2		
Location	CAMPBELL	RIVER	

Resistance

Run No.	ONE
Tool Model No.	L-102
Diameter	2⅝"
Type	NE
Spacing	
Length	1"
Horiz. Scale	500 Ω/DIV
Rm @ °F	
Source Model	H.D.V.P.
Serial No.	687
Isotope	Co 137
Strength	125 mC

Density

Caliper

LOGGING DATA

General

Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.
ONE	187	0'	12	4

Gamma Ray

Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.
1000		5

Density

T.C. Sec.	Sens. Settings	Zero Div. L or R

Reference Literature:

Remarks: HOWARD - DENSITY TOOL NOW FUNCTIONAL

Gamma Ray
API Units
Caliper
Note Diameter (Inches)

DEPTH

gm/cm³

LQ-77-85

GAMMA RAY

RESISTANCE

FLUID LEVEL

CASING

DR 187'

RESISTANCE
OHMS

GAMMA RAY
CPS

LEXCO TESTING LTD

DRILLHOLE REPORT

(1)

AL FIELD: Campbell River DATE: June 9, 1977

COMPANY: Lexco Testing Ltd.

HOLE NO.: QU-77-86

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: Line 129+95 12' Rt. of B/L

ELEVATION: 1022'

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	170	Till	
170	180	Coal	
180	195	Basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

(2)

E-LOG S. GARDNER

Qu-77-86 168.9
195

		2.3	Coal
#1 Seam 11.7 Clean	.2p		
		9.5	Coal

LEXCO TESTING LTD.

GAMMA-DENSITY & RESISTANCE

O.K. Okanagan 22 E/14

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE OK-22-86 (1-7)

FIELD OKANAGAN

PROVINCE BRITISH COLUMBIA

Permanent Datum G.L. Elev. 1526'

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L.

Other Services

Run No.	Bit From	Bit To	Size	Wgt.	Casing Record From	Casing Record To
1	0	45				
		70				

BORE-HOLE RECORD

CASING RECORD

Recorded By S. GARDINER

Witnessed By

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

	Gamma Ray			Resistance	Density	Caliper
Run No.	1			1		
Tool Model No.	L-103			L-103	L-103	L-103
Diameter	2 7/8			2 7/8	2 7/8	2 7/8
Detector Model No.	CP-316			AC	C	EM
Type	SCINT				13"	
Length	3''					
Horiz. Scale				10 Ω/in		
Rm @ °F						
Source Model					HDVP	
Serial No.					687	
Isotope					Cs 137	
Strength					125 mC	

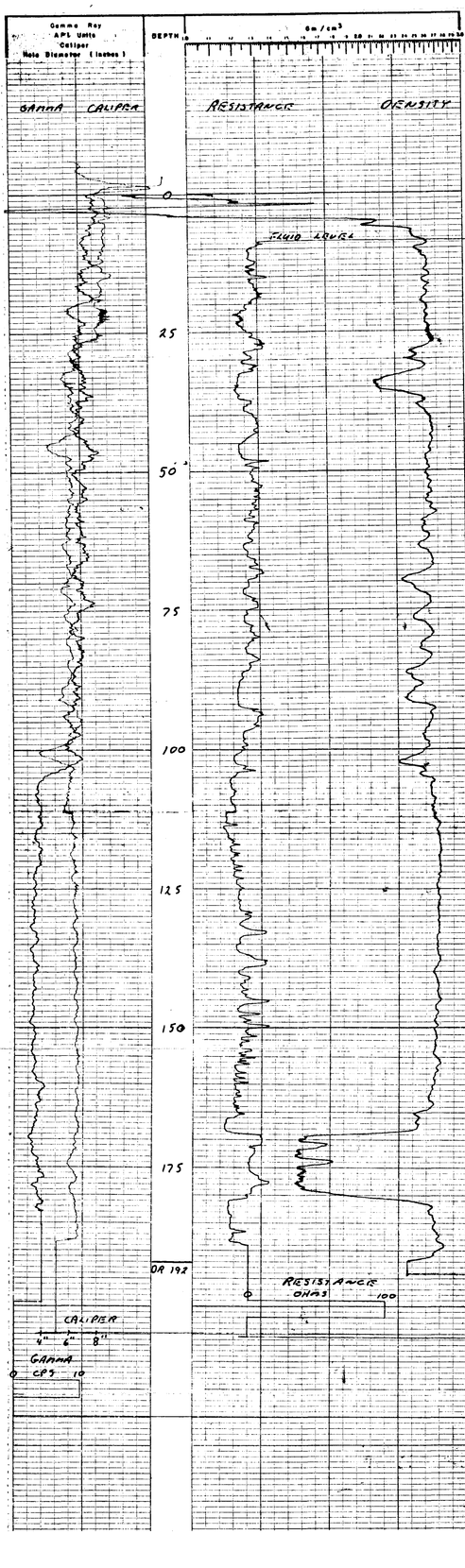
General	
Hoist Truck No.	2
Inst. Truck No.	2
Location	CRANBROOK, B.C.

LOGGING DATA

	General				Gamma Ray				Density			
	Depths		Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero	
Run No.	From	To	Ft./Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R	
1	198	0	12	4	100		5	1	1K	.56	

Reference Literature:

Remarks: O ABOVE



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 9, 1977

COMPANY: Lexco

HOLE NO.: QU-77-87

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,145,646.5 N 1,088,895.6 E

ELEVATION: 663.3

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	36	till	
36	73	grey sandstone	coal stringers
73	78	carbonaceous shale	
78	85	siltstone	
85	154	grey sandstone	
154	157	coal	
157	159	siltstone	
159	164	carbonaceous shale	coal partings
164	169	coal	shale stringers
169	184	grey shale	
184	247	brown shale	
247	300	grey sandstone	
300	324	grey shale	
324	346	grey red shale	
346	350	green sandstone	
350	480	red grey shale	

COMMENTS _____

WATER HORIZON _____ FT. _____

ex-Quinsam 77(3)c.

LEXCO TESTING LTD.

GAMMA DENSITY & RESISTANCE
CALIPER

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-87 (67)

FIELD LOWER QUINSAM (L18)

PROVINCE BRITISH COLUMBIA

Lsd. ___ Sec. ___ Twp. ___ Rge. ___ W. ___

12,145,646.5 N 1,088,895.6 E

Other Services

Permanent Datum G.L. Elev. 663.3

Log measured from G.L. ___ ft. above perm. Dat.

Drilling measured from G.L.

Elev. K.B. ___ D.F. ___ G.L. ___

Date	9 JUNE '77	
Run No.	ONE	
Type Log	NUCLEAR	RES.
Depth - Driller	480'	C.BL.
Depth - Logger	478'	
Bottom logged interval	478'	
Top logged interval	0'	
Type fluid in hole	WATER	
Salinity, PPM Cl.	-	
Density	-	
Level	-	
Max. rec. temp. deg. F.	-	
Operating rig time	1.0 HR	
Recorded by	R. LEDUC	
Witnessed by	S. GARDNER	

BORE-HOLE RECORD

RUN No.	Bit	From	To
1	4"	0'	42'
		42'	TD

CASING RECORD

Size	Wgt.	From	To
5 1/2"		0'	42'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

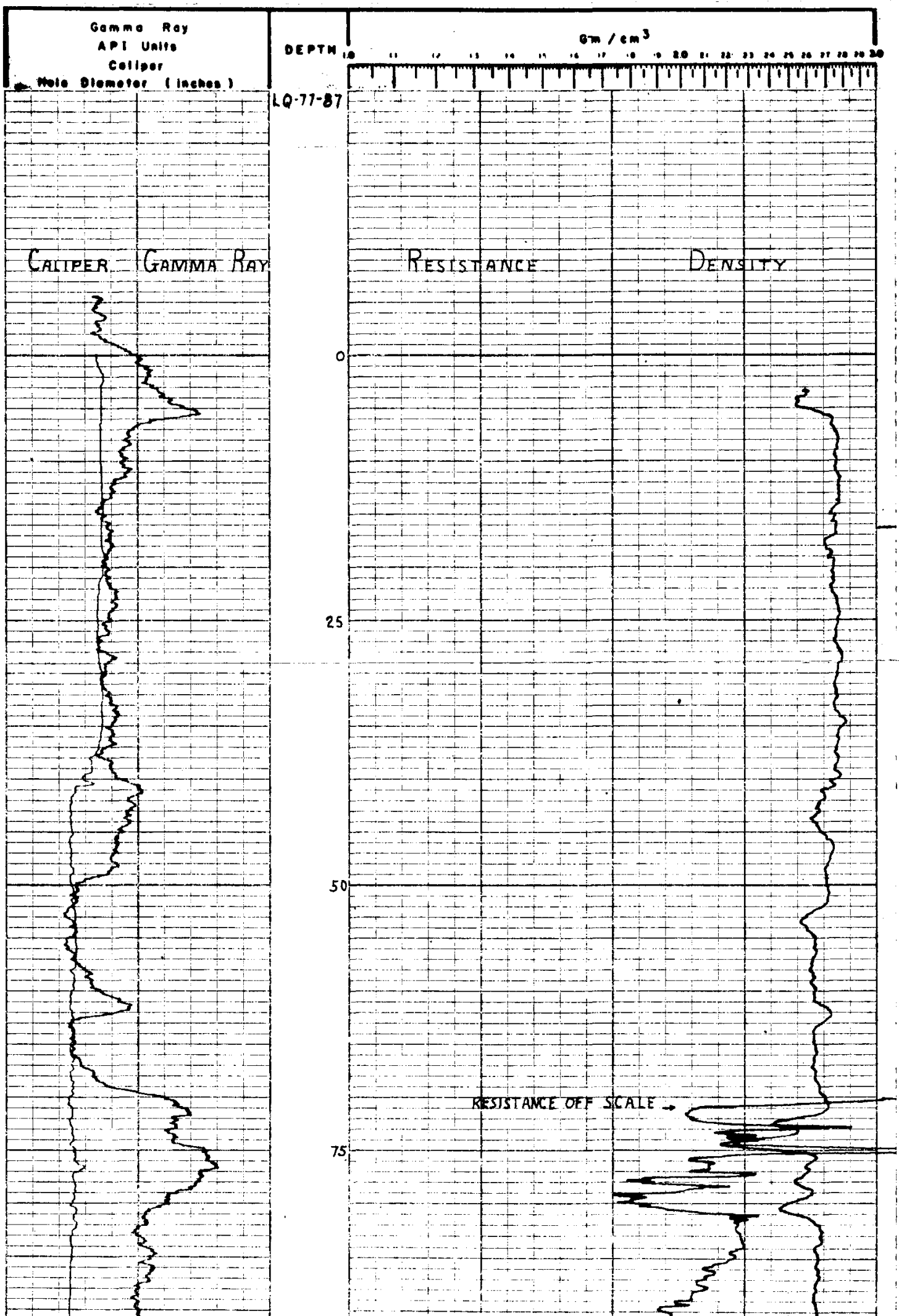
Gamma Ray					Resistance	Density	Caliper
Run No.	ONE			Run No.	ONE	ONE	ONE
Tool Model No.	L-103			Tool Model No.	L-103	L-103	L-103
Diameter	2 1/8"			Diameter	2 1/8"	2 1/8"	2 1/8"
Detector Model No	CP-516			Type	ME	F	EM
Type	SCINT.			Spacing		13"	
Length	3"						
				Length	1"		
				Horiz. Scale	50 Ω/DIV		
General				Rm @ °F	—		
Hoist Truck No.	2			Source Model		HDVP	
Inst. Truck No.	2			Serial No.		687	
Location	CAMPBELL	RIVER		Isotope		Cs 137	
				Strength		125 mC	

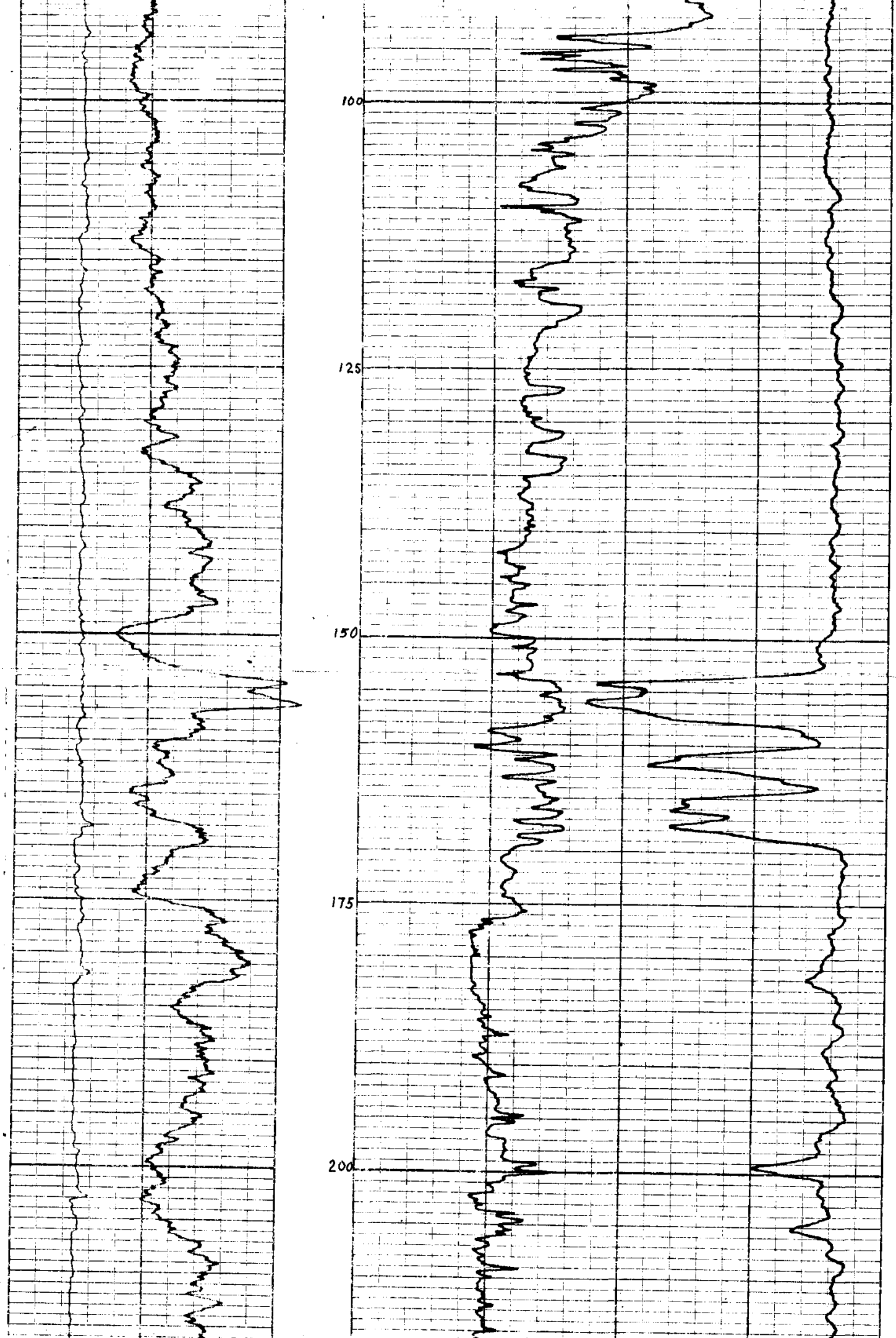
LOGGING DATA

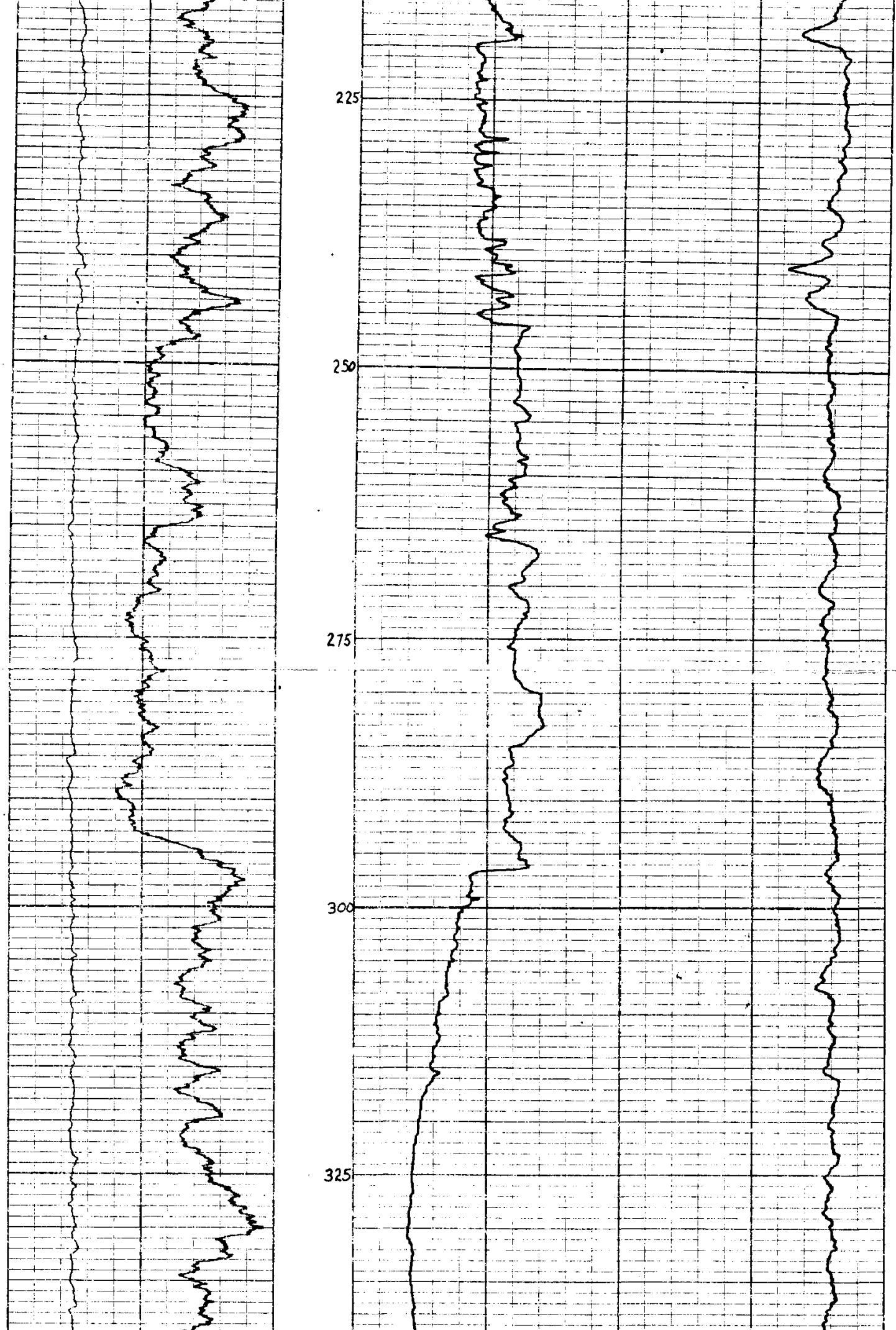
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
ONE	478'	0'	12	4	100		5	1	1000	0.5L	

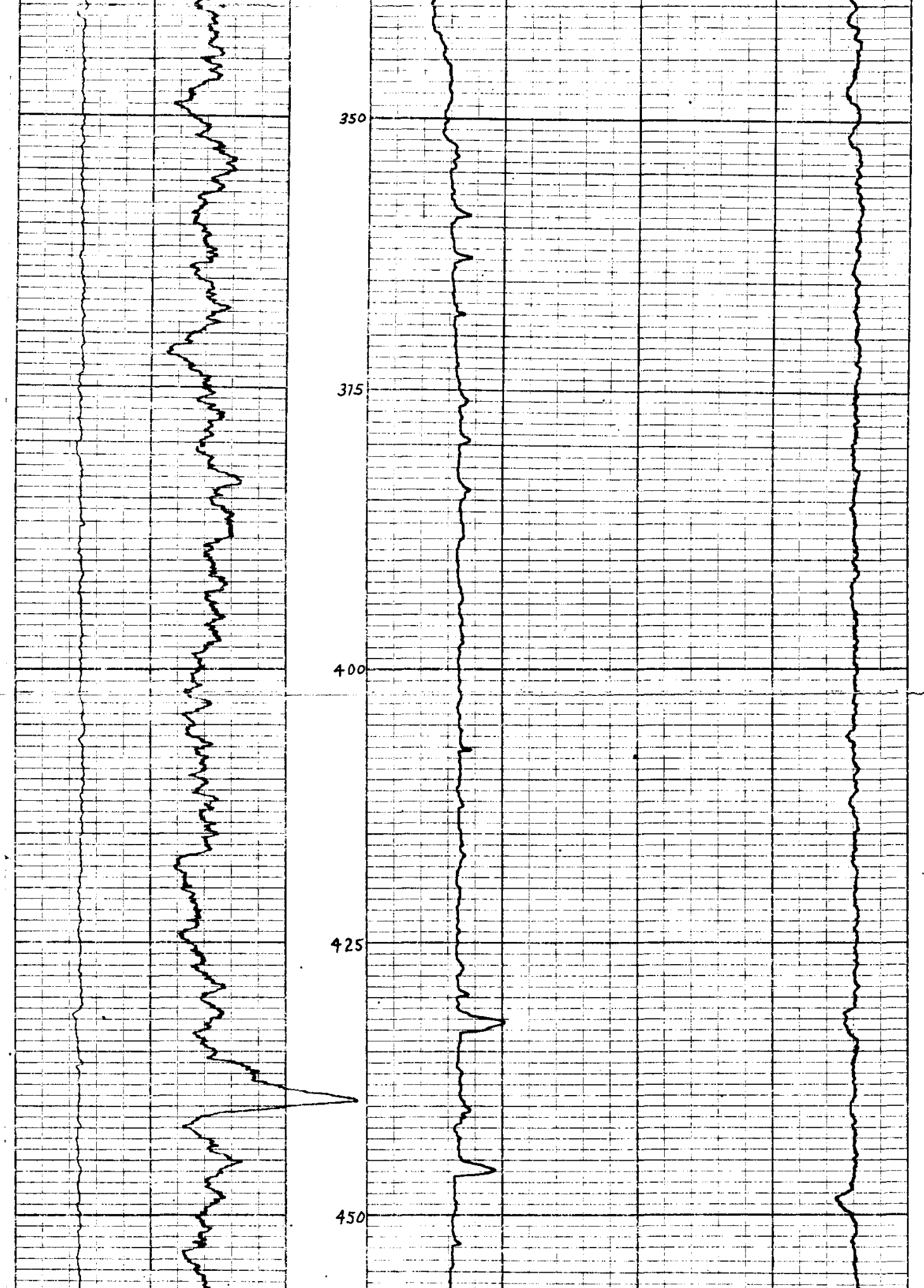
Reference Literature:

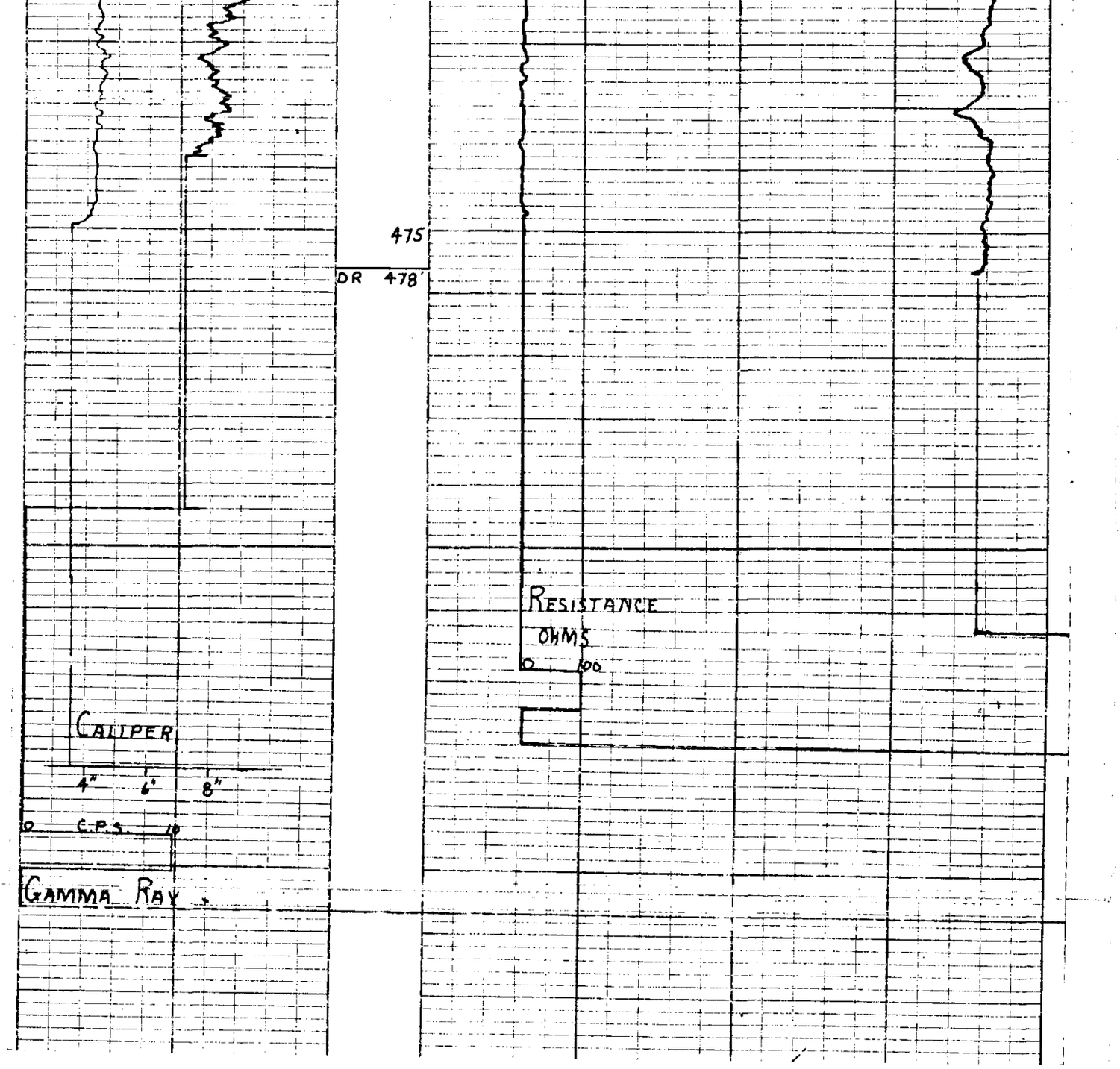
Remarks: HOWARD


Gamma Ray
API Units
Caliper
Hole Diameter (inches)
DEPTH
Gm / cm3
LQ-77-87
CALIPER
GAMMA RAY
RESISTANCE
DENSITY
0
25
50
75
RESISTANCE OFF SCALE


100
125
150
175
200


225
250
275
300
325


350
315
400
425
450


475
DR 478'
RESISTANCE
OHMS
0 100
CALIPER
4" 6" 8"
0 C.P.S. 10
GAMMA RAY

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River, B.C. DATE: June 10, 1977

COMPANY: Lexco

HOLE NO.: QU-77-88

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,146,900.0 N 1,086,187.39 E

ELEVATION: _____

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	8	till	
8	70	grey sandstone	
70	73	coal	
73	78	carbonaceous shale	Coal partings
78	80	siltstone	
80	84	coal	
84	87	brown shale	
87	95	grey sandstone	
95	155	brown shale	
145	224	grey sandstone	
224	240	siltstone	
140	268	grey shale	
268	278	green sandstone	
278	280	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA - DENSITY & RESISTANCE GAUGES

ex Gunston 72 Cole

COMPANY LEXCO TESTING LTD.

WELL DALLISADE LO-77-88 (19)

FIELD LOWER QUILLSEAM

PROVINCE BRITISH COLUMBIA

Lat. 49°16'00"N Long. 121°17'30"W

Sec. — Twp. — Rge. — W

Elev. 662'G.L.

Elev. K.B. —

G.L. —

Other Services

Permanent Datum G.L.

Log Measured from K.B.

Drilling measured from K.B.

Date	10 June '77
Run No.	ONE
Type Log	Induction
Depth - Driller	2800
Depth - Logger	2799
Bottom Logged Interval	2779
Top Logged Interval	SURFACE
Type Fluid in Hole	WATER
Salinity, PPM Cl.	—
Density	—
Level	FULL
Max. Rec. Temp. °F	—
Operating Rig Time	—
Recorded By	R. ALSOP
Witnessed By	G. CAMPBELL

CASING RECORD	Size	Wgt.	From	To
1st String	9 5/8	36	0	21
2nd String				
3rd String				

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

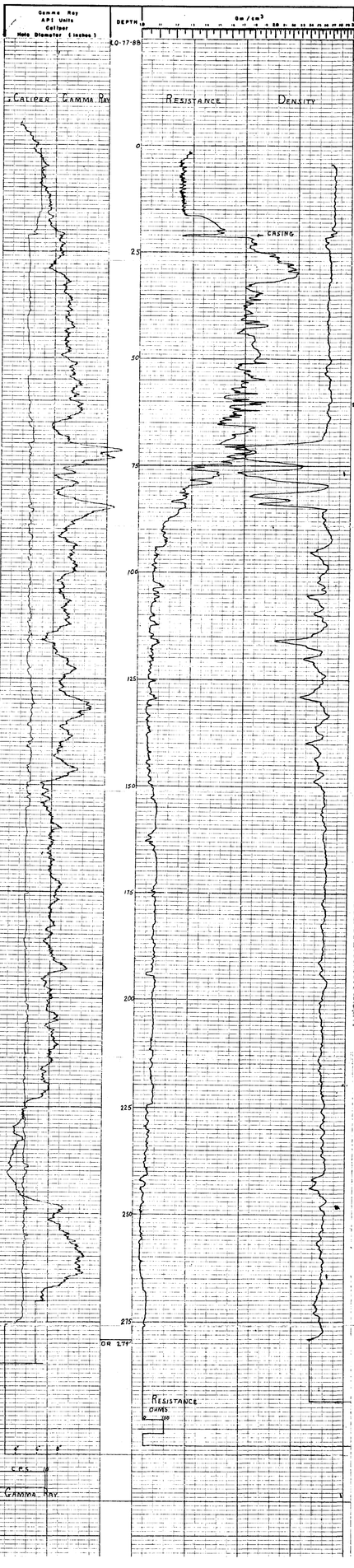
	Gamma Ray			Resistance	Density	Caliper
Run No.	ONE		Run No.	ONE	ONE	ONE
Tool Model No.	L-103		Tool Model No.	L-103	L-103	L-103
Diameter	2 3/4"		Diameter	2 3/4"	2 3/4"	2 3/4"
Detector Model No	CP-516		Type	NE	F	E.M.
Type	SILINT		Spacing		13"	
Length	3'					
			Length	1'		
			Horiz. Scale	50 Ω/DIV		
			Rm @ °F	—		
General			Source Model		HDVP	
Hoist Truck No.	2		Serial No.		687	
Inst. Truck No.	2		Isotope		Cs 137	
Location	CAMPBELL RIVER		Strength		125 mC	

LOGGING DATA

General					Gamma Ray				Density		
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API GR Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R
ONE	2779	0	12	4	100		5	1	1000	0.5L

Reference Literature:

Remarks: HOWARD



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River, B.C. DATE: June 11, 1977

COMPANY: Lexco

HOLE NO.: QU-77-89

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,145,026.03 N 1,092,459.3 E

ELEVATION: 622.7

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	22	till	
22	70	grey sandstone	
70	109	brown shale	
109	134	grey sandstone	
136	150	brown shale	
150	163	grey sandstone	
163	174	brown shale	
174	193	grey sandstone	
193	207	brown shale	
207	212	coal	
212	217	brown shale	
217	220	coal	
220	245	brown shale	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA, DENSITY & RESISTANCE CALIPER

c/c Anderson 7816

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-89

FIELD LOWER OKANAGAN

PROVINCE BRITISH COLUMBIA

Location: 49°15'44.2"N 119°36'39.5"W

Permanent Datum: G.L. Elev. 422.7

Log Measured From: G.L. 11' above perm. Datum

Drilling Measured From: G.L.

Date: 11-JUNE-77

Run No.: ONE

Depth-Driller: 245'

Depth-Logger: 245'

Bottom Logged Interval: 243'

Top Logged Interval: SURFACE

Casing-Driller: 8" @ 21'

Casing-Logger: 8" @ 21'

Bit Size: 7 7/8"

Type Fluid in Hole: WATER

Salinity, PPM Cl: -

Density: -

Level: FULL

Max. Rec. Temp. °F: 68°

Operating Time: 1 HR

Recorded By: R. ANDERSON

Witnessed By: A. GRADISNIK

Other Services: Elev. K.B. —, D.F. —, G.L. —

RECORD OF CASING

No.	Size	Wgt.	From	To
1	8"	20#	0'	21'
2	5½"	14#	0'	243'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

	Gamma Ray			Resistance	Density	Caliper
Run No.	ONE			ONE	ONE	ONE
Tool Model No.	L-103			L-103	L-103	L-103
Diameter	2 ¼"			2 ¼"	2 ¼"	2 ¼"
Detector Model No.	CP-514			ODE	F	EM
Type	SCINT			Type Spacing	18"	
Length	3'			Length	7"	
				Metric Scale	25 Ω/ON	
				Rm @ °F		
General				Source Model		H.O.V.P.
Hotel Truck No.	2			Serial No.		687
Inst. Truck No.	2			Isotope		Cs 137
Location	CAMPBELL RIVER			Strength		125 mC

LOGGING DATA

General			Gamma Ray				Density			
Depths		Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero
Run No.	From	To	Ft/Min	Sec.	Settings	Dis. L or R	per Log Div.	Sec.	Settings	Dis. L or R
ONE	243'	0'	12	4	100		5	1	1000	6 EL

Reference Literature:

Remarks: DENNIS

Gamma Ray API Units Caliper Hole Diameter (inches)

DEPTH

gm/cm³

LQ-77-89

CALIPER GAMMA RAY

RESISTANCE

DENSITY

FLUID LEVEL

RESISTANCE ZERO SHIFT 10 OHM RT

RESISTANCE ZERO SHIFT 10 OHM LT

25

50

75

100

125

150

175

200

225

DR 243'

RESISTANCE 10 OHMS ON

CALIPER

GAMMA RAY 0 CPS IN

LEXCO TESTING LTD

DRILLHOLE REPORT

JAL FIELD: Campbell River, B.C. DATE: June 11, 1977

COMPANY: Lexco

HOLE NO.: LQU-77-90

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,147,164.05 N 1,085,156.0 E

ELEVATION: 682.9

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	6	till	
6	58	grey sandstone	
58	64	coal	shale partings
64	68	shale	
68	73	coal	" "
73	125	brown shale	
125	126	coal	
126	135	brown shale	
135	172	grey sandstone	
172	176	siltstone	
176	210	grey sandstone	
210	240	brown shale	carbonaceous shale stringers
240	250	grey shale	
250	270	green sandstone	
270	272	basalt	

COMMENTS _____

WATER HORIZON _____ FT. _____

CX - QUINSAM 77(3)c.

LEXCO TESTING LTD.

GAMMA - DENSITY & RESISTANCE
CALIPER

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-90

FIELD LOWER QUINSAM

PROVINCE BRITISH COLUMBIA

Lsd. 19,147,164.00 N Sec. 1,085,156.00 E Twp. Rge. W.

Other Services

Permanent Datum G.L. Elev. 682.2 Elev. K.B.

Log measured from G.L. ft. above perm. Dat. D.F.

Drilling measured from G.L. G.L.

Date	11 JUNE '77
Run No.	ONE
Type Log	NUCLEAR
Depth - Driller	272'
Depth - Logger	271'
Bottom logged interval	271'
Top logged interval	0'
Type fluid in hole	WATER
Salinity, PPM Cl.	-
Density	-
Level	FULL
Max. rec. temp. deg. F.	-
Operating rig time	0.75 HR
Recorded by	V. KRUEGER
Witnessed by	S. GARDNER

BORE-HOLE RECORD

RUN No.	Bit	From	To
1	4 1/4"	0'	21'
		21'	TD

CASING RECORD

Size	Wgt.	From	To
5 1/4		0'	21'

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

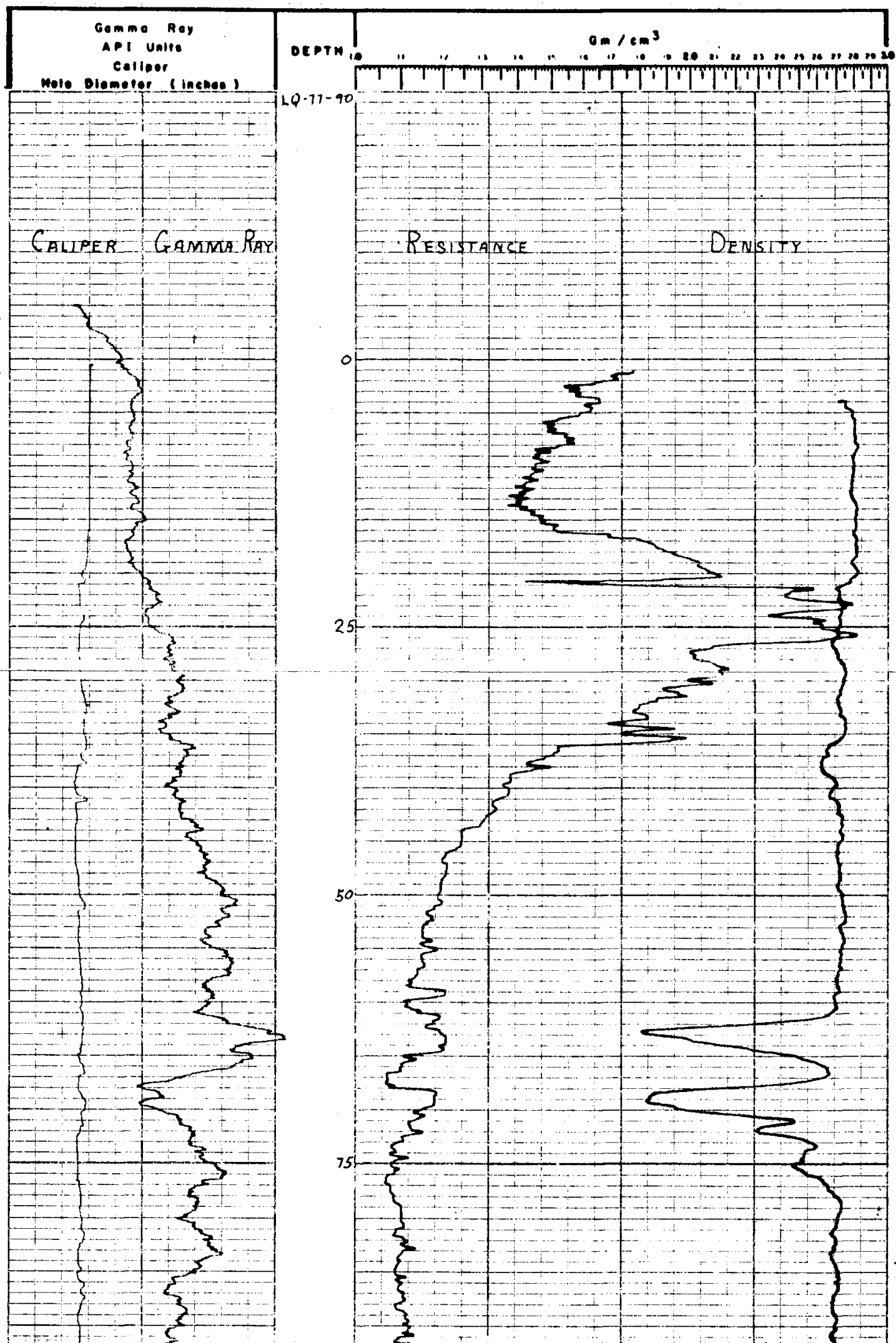
Gamma Ray					Resistance	Density	Caliper
Run No.	ONE			Run No.	ONE	ONE	ONE
Tool Model No.	L-103			Tool Model No.	L-103	L-103	L-103
Diameter	2 1/8			Diameter	2 1/8"	2 1/8"	2 1/8"
Detector Model No	CP-516			Type	ME	F	EM
Type	SCINT			Spacing		13	
Length	3"						
				Length	1'		
				Horiz. Scale	33.3 Ω/DIV		
General				Rm @ °F	—		
Hoist Truck No.	2			Source Model		HDVP	
Inst. Truck No.	2			Serial No.		687	
Location	CAMPBELL	RIVER		Isotope		Cs 137	
				Strength		125 mC	

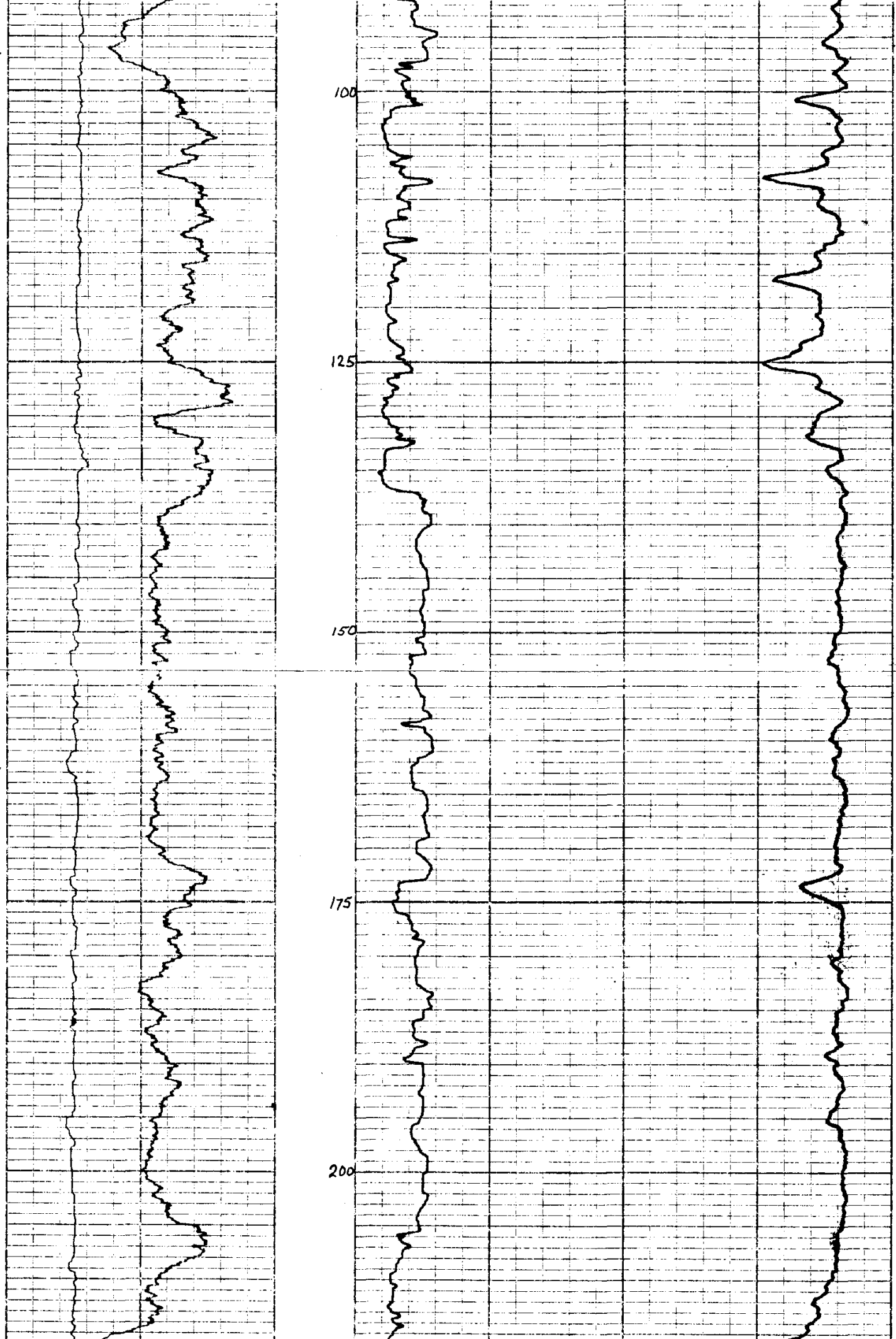
LOGGING DATA

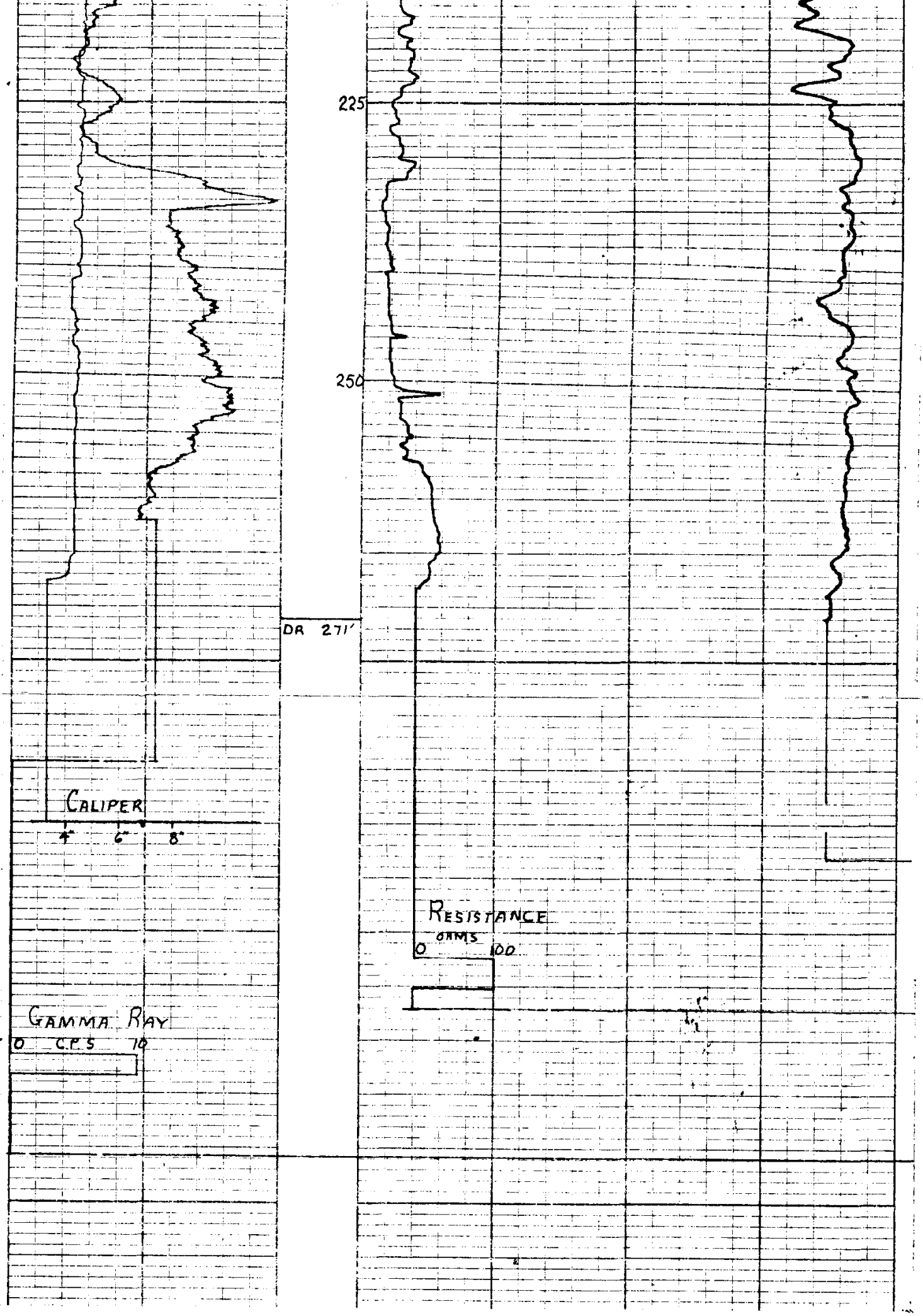
General				Gamma Ray				Density			
Run No.	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	
ONE	271'	0'	12	4	100		5	1	1K	0.5L	

Reference Literature:

Remarks: HOWARD


Gamma Ray
API Units
Caliper
Hole Diameter (inches)
DEPTH
Gm / cm3
LQ-77-90
CALIPER
GAMMA RAY
RESISTANCE
DENSITY
0
25
50
75


100
125
150
175
200


225
250
DR 271'
CALIPER
4"
6"
8"
RESISTANCE
OHMS
0
100
GAMMA RAY
0 C.P.S 10

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 13, 1977

COMPANY: Lexco

HOLE NO.: QU-77-91

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,143,898.7 N 1,092,988.43 E

ELEVATION: 597

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	23	till	
23	50	brown sandstone	
50	92	grey sandstone	
92	98	brown shale	water at 97 ft. app. 15 gpm
98	107	grey sandstone	
107	110	brown shale	
110	116	coal	
116	129	brown shale	
129	148	coal with stringers of shale	
148	165	brown shale	

COMMENTS _____

WATER HORIZON _____ FT. _____

LUSCAR LTD. corehole log

June 16, 1977

LQ-77-91

HOLE NO. LQ-77-91

PAGE 1 OF 3

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION: LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION.	TRUE DEPTH
1	100	105	5.4				
				5.4		Siltstone; med. grey; very hard; massive; some fine grained sandstone laminae; sheared at 45° to core axis.	
2	105	113	8.2				
				3.6		Siltstone; as above, thin coaly lenses	
				2.0		Siltstone; med. grey; med. hard; flaggy thin coaly lenses; crushed.	
				0.3		Coal; soft, crushed, shaly	
				0.7		Coal; Med. hard, bright blocky, massive	
				0.25		Coal; soft dirty, crushed	
				1.5		Coal; med. hard, bright blocky, massive visibled pyrite on cleat surfaces, calcite on cleats, amber	
	SAMPLE No. 1						
3	113	121	7.6				
				1.75		Coal; as above	
				0.45		Mudstone; soft, crushed, coaly, flaggy	
				1.1		Siltstone; med. grey, hard, thin coaly laminae	
				0.4		Mudstone; soft, crushed, high coal content	
				0.75		Siltstone; as above	
				0.2		Mudstone; soft, moist, crushed, greater than 50% coal content	
				0.7		Coal; med. hard, bright, blocky, visible pyrite and calcite on cleat surfaces	
				0.4		Coal; bright, blocky, crushed, abundant pyrite	
				0.5		Shale; dark grey, bright bands of coal, medium hard	
				0.35		Shale; softer, partially milled by core, coaly	
				0.9		Siltstone; med. grey, med. hard, thin coaly lenses	
	TOTALS					÷ X 100 = % REC. massive SEAM	
						÷ X 100 = % TOT. REC. SEAM(S)	

LUSCAR LTD. corehole log

June 16, 1977

LQ-77-91

HOLE NO. LQ-77-91

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION: LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION.	TRUE DEPTH
4	121	129	7.85				
				0.05		Coal; hard, blocky, bright, sloughed	
				3.7		Siltstone: medium grey, hard, fractured, sheared	
						60° to core axis, load marks at shear zone	
						thin coaly lenses.	
				2.6		Siltstone; softer, fractured, brownish grey, 25%	
						coal content, coal in small particles throughout	
				1.4		Siltstone; medium grey, medium hard, fractured	
						but massive, some thin coaly bands	
5	129	138	8.2				
				0.2		Siltstone; medium hard, dark grey, numerous	
						coaly bands	
				0.15		Siltstone; hard, light grey, to buff, massive	
				0.55		Coal; bright, blocky, clean, calcite on cleat	
						surfaces, no visible pyrite	
				0.15		Coal; blocky, bright, abundant, calcite, crushed	
				0.7		Shale; dark grey, flaggy, abundant, thin, coaly	
						laminae	
				0.1		Coal; blocky, bright, broken up	
				0.15		Bone; dull brown, amber, abundant, disseminate	
						pyrite	
	SAMPLE	No. 2		0.5		Coal; shaley broken up, abundant, calcite	
				1.55		Coal; bright, blocky, fractured	
				0.1		Shale; massive, medium brown, coaly, hard	
				0.55		Coal; bright, blocky, fractured, abundant, amber	
				0.45		Mudstone; soft, medium brown, to grey, milled	
						high coal content	
				1.0		Coal; bright, blocky, some pyrite clean, massive	
				0.9		Mudstone; soft, crushed, coal particles throughout	
	TOTALS					÷ X 100 = % REC. SEAM	
						÷ X 100 = % TOT. REC. SEAM(S)	

LUSCAR LTD. corehole log

June 16, 1977

LQ-77-91

HOLE NO. LQ-77-91

CORE NO.	CORE FOOTAGES DRILLED FROM	TO	TOT.	RECOVERED SEC.	TOT.	GEOLOGICAL DESCRIPTION : LITHOLOGY, COLOR, SIZE, TEXTURE, HARDNESS, SHEARING, CONTACTS, BEDDING ANGLE, ALTERATION, WETNESS, CONTAMINATION.	TRUE DEPTH
5	continued from previous page						
	Sample No. 2			0.55		Coal; as above	
				0.45		Siltstone; medium brown, hard, massive	
6	138	146	7.7				
				2.4		Siltstone; as above	
				0.5		Siltstone; medium brown, flaggy, coaly	
				0.95		Coal; bright, blocky, milled by coring calcite on cleats, some pyrite	
				0.35		Shale; medium brown, soft carb. crushed	
				3.45		Siltstone; medium grey, flaggy, medium hard, thin coal bands	
7	146	154	8.6				
				1.0		Siltstone; as above	
				0.55		Coal; blocky, dirty, crushed	
				0.6		Coal; bright, blocky, calcite, or cleats, medium hard, some pyrite	
	Sample No. 3			0.05		Bone; medium hard, calcite	
				1.4		Coal; as above	
				0.05		Bone; as above	
				1.8		Coal; as above, more pyrite	
				.45		Mudstone; soft, crushed, carbonaceous	
				2.5		Siltstone; medium grey, fractured, medium hard thin coaly, laminae	

ex-Gunnsam 77 b/e.

LEXCO TESTING LTD.

GAMMA, DENSITY & RESISTANCE CALIPER

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-91C (LQ-7)

FIELD LOWER QUINSAM

PROVINCE BRITISH COLUMBIA

67

Permanent Datum	Elev. 522.5
Log measured from G.L.	ft. above perm. Datum
Drilling measured from G.L.	

Other Services

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

Loc.	Sec.	Twp.	Rge.	W.
10/55 PPR 7 N			4 STA PPR 4 E	

RUN No.	Bit From	Bit To	Size	Wgt.	Casing Record From	Casing Record To
1	8 5/8" 6"	0' 33'	7 3/4"		0'	33'

Type Log: NUCLEAR
Depth — Driller: 165'
Depth — Logger: 160'
Bottom Logged Interval: 160'
Top Logged Interval: SURF.
Type Fluid in Hole: WATER
Salinity, PPM Cl.: —
Density: —
Level: FULL
Max. rec. temp. deg. F.: 11.5°
Operating rig time: 0.5 HR.
Recorded by: R. LEDUC
Witnessed by: S. GARDNER

Run No.: ONE
Type Log: GR.
Depth — Driller: 165'
Depth — Logger: 160'
Bottom Logged Interval: 160'
Top Logged Interval: SURF.
Type Fluid in Hole: WATER
Salinity, PPM Cl.: —
Density: —
Level: FULL
Max. rec. temp. deg. F.: 11.5°
Operating rig time: 0.5 HR.
Recorded by: R. LEDUC
Witnessed by: S. GARDNER

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

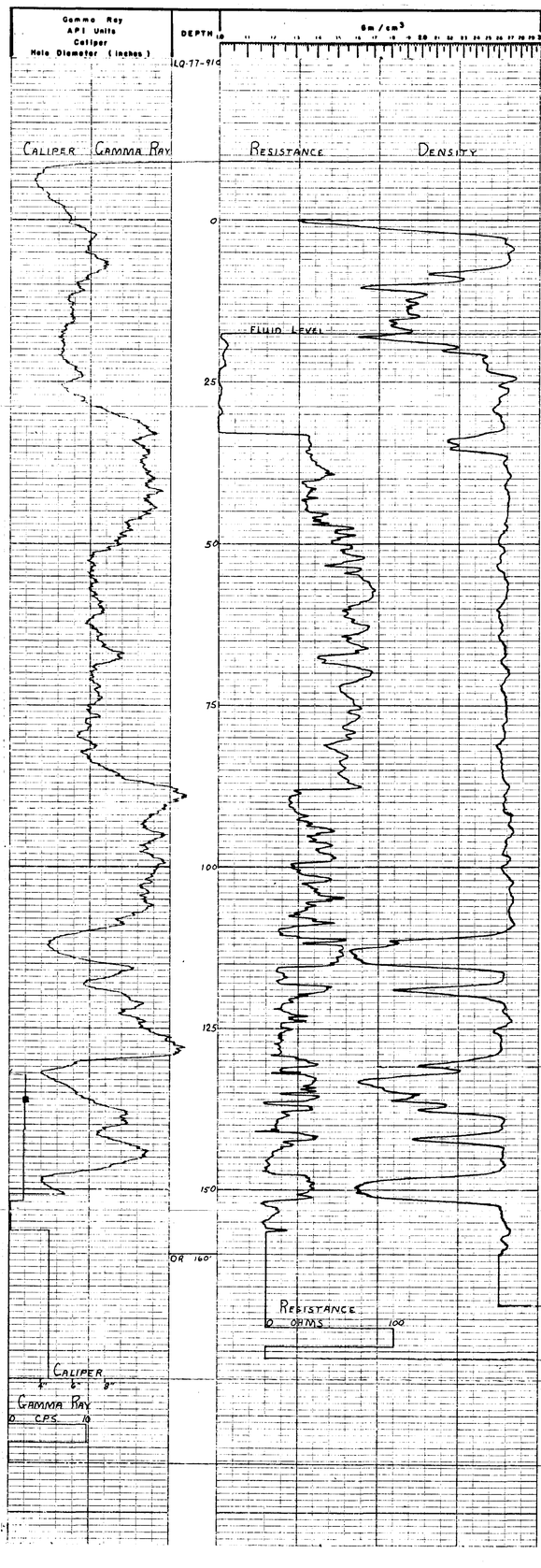
Gamma Ray				Resistance	Density	Caliper
Run No.	ONE			ONE	ONE	ONE
Tool Model No.	L-103			L-102	L-101	L-101
Diameter	2 1/8"			2 1/8"	2 1/8"	2 1/8"
Detector Model No.	CP-516	1		ME	P	EM
Type	SCINT.			Spacing	13"	
Length	3"					
				Length	1"	
				Horiz. Scale	12.5 Ω/DIV	
General				Rm @ °F	—	
Hoist Truck No.	2			Source Model	HDVP	
Inst. Truck No.	2			Serial No.	687	
Location	CAMPBELL RIVER			Isotope	Cs 137	
				Strength	125 mC	

LOGGING DATA

General				Gamma Ray					Density		
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	
ONE	160'	0'	12	4	120		5	1	1K	0.5L	

Reference Literature: DENNIS

Remarks: CALIPER RECORDER PEN NON-FUNCTIONAL



LEXCO TESTING LTD.

GAMMA-DENSITY & RESISTANCE
CALIPER

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-91 (123)

FIELD LOWER QUINSAM

PROVINCE BRITISH COLUMBIA

Location: 15 M.S. P.S. 7 N. 4,072,788.00 E.

Permanent Datum G.L. Elev. 422.5 ft. above perm. Datum

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L.

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

Other Services

Date	13 JUNE '77
Run No.	ONE
Type Log	RES.
Depth-Driller	165'
Depth-Logger	159'
Bottom logged interval	139'
Top logged interval	0'
Type fluid in hole	WATER
Salinity, PPM Cl.	
Density	
Level	FULL
Max. rec. temp. deg. F.	21°
Equip. location	
Recorded by	S. GARDAKER
Witnessed by	

RUN | BIT | From | To

1 | 6 3/4" | 0' | 23'

BORE-HOLE RECORD

Size	Wgt.	From	To
7"		0'	23'

CASING RECORD

Paid Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

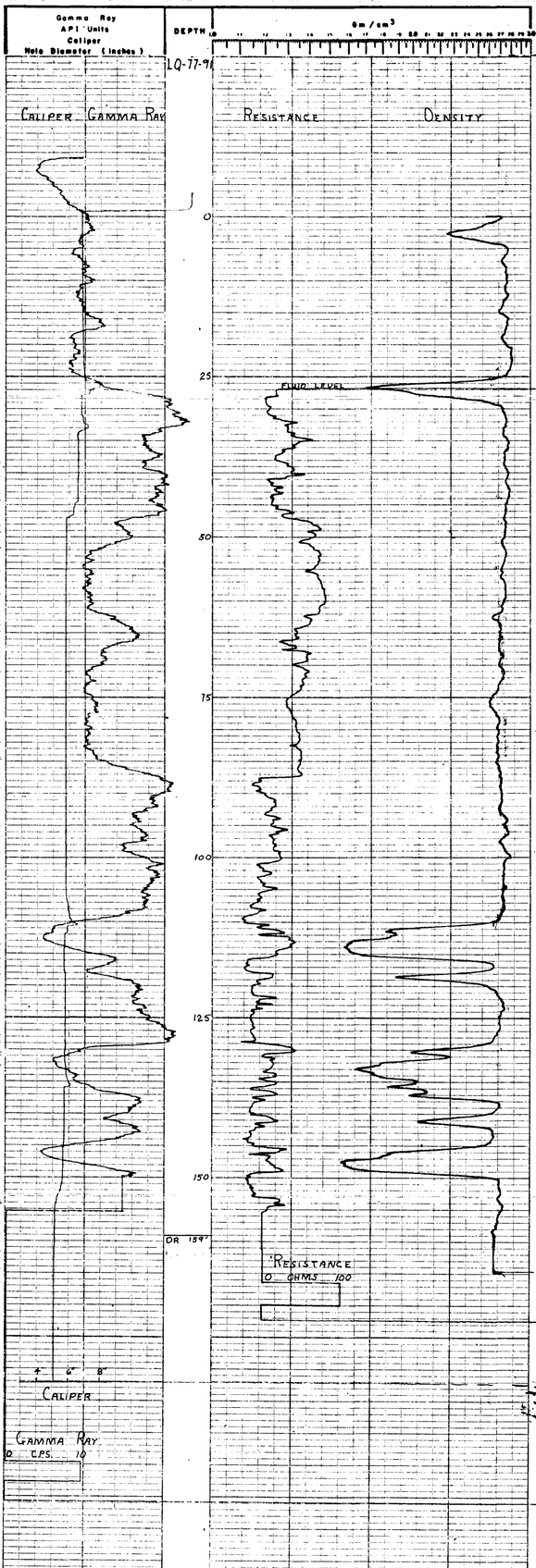
Gamma Ray				Resistance		Density	Caliper
Run No.	ONE			Run No.	ONE	ONE	ONE
Tool Model No.	L-103			Tool Model No.	L-102	L-103	L-103
Diameter	2 1/8"			Diamster	2 1/8"	2 1/8"	2 1/8"
Detector Model No	CP-516			Type	ME	F	EM
Type	SCINT.			Spacing		13"	
Length	3"						
				Length	1"		
				Horiz. Scale	20Ω/DIV		
General				Rm @ °F	—		
Hoist Truck No.	2			Source Model		HDVP	
Inst. Truck No.	2			Serial No.		687	
Location	CAMPBELL RIVER			Isotope		Cs 137	
				Strength		125 mC	

LOGGING DATA

General				Gamma Ray				Density			
Depths			Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero
Run No.	From	To	FT/Min.	Sec.	Settings	Dis. L or R	per Log Div.	Sec.	Settings	Dis. L or R
ONE	159'	0'	12	4	100		5	1	1000	O.E.L

Reference Literature:

Remarks: DENNIS



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 12, 1977

COMPANY: Lexco

HOLE NO.: LQU-92

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,146,866.81 N 1,084,692.94 E

ELEVATION: 766.3

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	5	till	
5	71	grey sandstone	
71	77	coal	shale partings
77	80	grey sandstone	
80	120	brown shale	
T D	120		

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA, DENSITY & RESISTANCE CALIPER

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-92

FIELD Lower Quinsam

PROVINCE BRITISH COLUMBIA

Permanent Datum: G.L. Elev. 766.3 | Other Services

Log Measured from: G.L. ft. above perm. Datum | Elev. K.B. | D.F. | G.L.

Drilling Measured from: G.L.

Date	12 June '77
Run No.	ONE
Type Log	Nuclear
Depth – Driller	120'
Depth – Logger	119'
Bottom Logged Interval	119'
Top Logged Interval	0'
Type Fluid in Hole	Water
Salinity, PPM Cl.	–
Density	–
Level	Full
Max. rec. temp. deg. F	28
Operating rig time	2.75 HR
Recorded by	R. LEDUC
Witnessed by	S. GARDINER

RUN No.	BIT	BORE-HOLE RECORD From	To	CASING RECORD Size	Wgt.	From	To
1	4½"	0	20	5½"		0	20
		20	TD				

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

Gamma Ray				Resistance	Density	Caliper
Run No.	ONE			ONE	ONE	ONE
Tool Model No.	L-103			L-104	L-104	L-104
Diameter	2⅛"			2¾	2¾	2¾
Detector Model No.	CP-516			ME	F	EM
Type	SCINT				13"	
Length	3'					
				Length	1"	
				Horiz. Scale	25 R / Div	
				Rm @ °F	–	

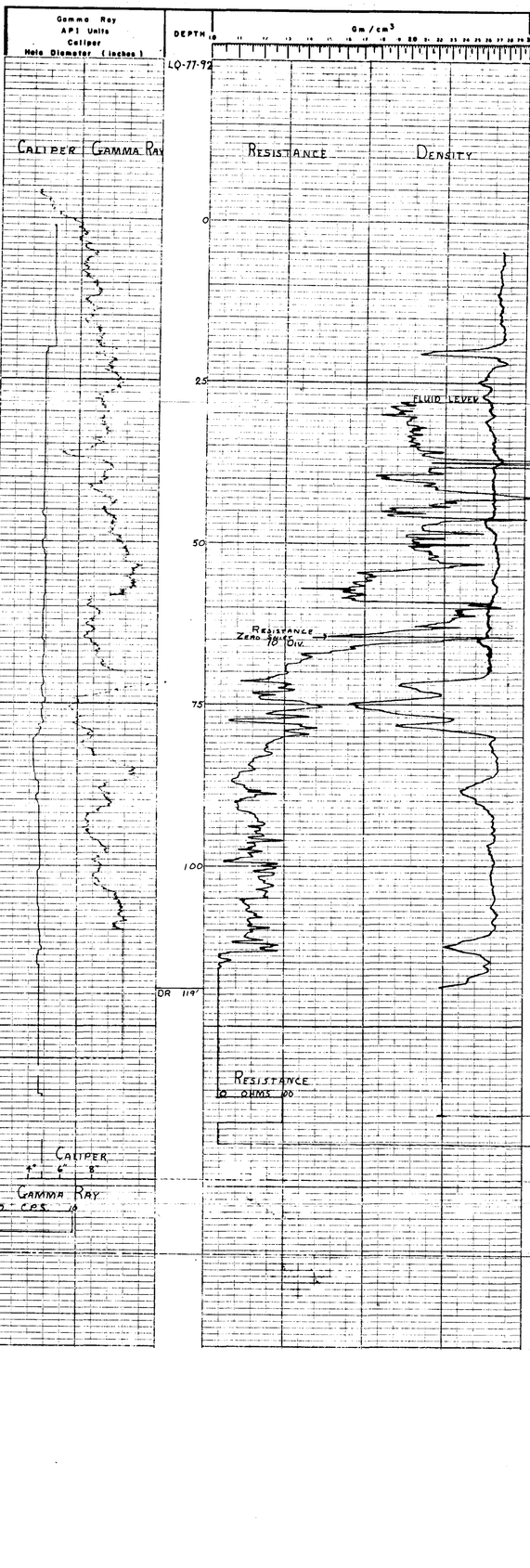
General					
Hoist Truck No.	2			Source Model	HDVP
Inst. Truck No.	2			Serial No.	687
Location	CAMPBELL	RIVER		Isotope	Cs 137
				Strength	125 mC

LOGGING DATA

General				Gamma Ray				Density		
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
ONE	119'	0'	12	4	100		5	1	1000	0.4 L

Reference Literature:

Remarks: HOWARD



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 19,1977

COMPANY: Lexco Testing Ltd.

HOLE NO.: LQU-77- 93

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,144,503.7 N 1,089,608.0 E

ELEVATION: 616.7

DRILLER: _____

FROM	TO	LOG	REMARKS
0	14	Till	
14	26	Grey sandstone	
26	27	Coal	
27	37	Brown shale	
37	112	Grey sandstone	
112	117	Coal	
117	119	Brown shale	
119	122	Coal	
122	145	Brown shale, with stringer of coal	
145	157	Brown sandstone	
157	165	Red shale	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD.

GAMMA, DENSITY & RESISTANCE LOGGING

COMPANY LEXCO TESTING LTD.

WELL DRILL HOLE LO-77-93 (TS)

FIELD LOWER QUINSAM

PROVINCE BRITISH COLUMBI

Permanent Datum G.L. Elev. 466.7 Elev. K.B. —

Log measured from G.L. ft. above perm. Dat. D.F. —

Drilling measured from G.L. G.L. —

Date	18 June '77		
Run No.	ONE		
Type Log	NUCLEAR		RES.
Depth - Driller	165'		
Depth - Logger	165'		
Bottom Logged Interval	164'		
Top Logged Interval	0'		
Salinity PPM Cl.	WATER		
Density	1		
Mags. etc. turns app. F	FULL		
Operating Rig Time			
Recorded By	R. OSLAK		
Witnessed By	S. LEONARD		

BORE - HOLE RECORD

Run	Bit From	To	Size
ONE	0'	165'	7"

CASING RECORD

Size	Wgt.	From	To
12"	—	0'	12'

Other Services

Sec. Twp. Rge. W

LO-77-93 (TS)

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

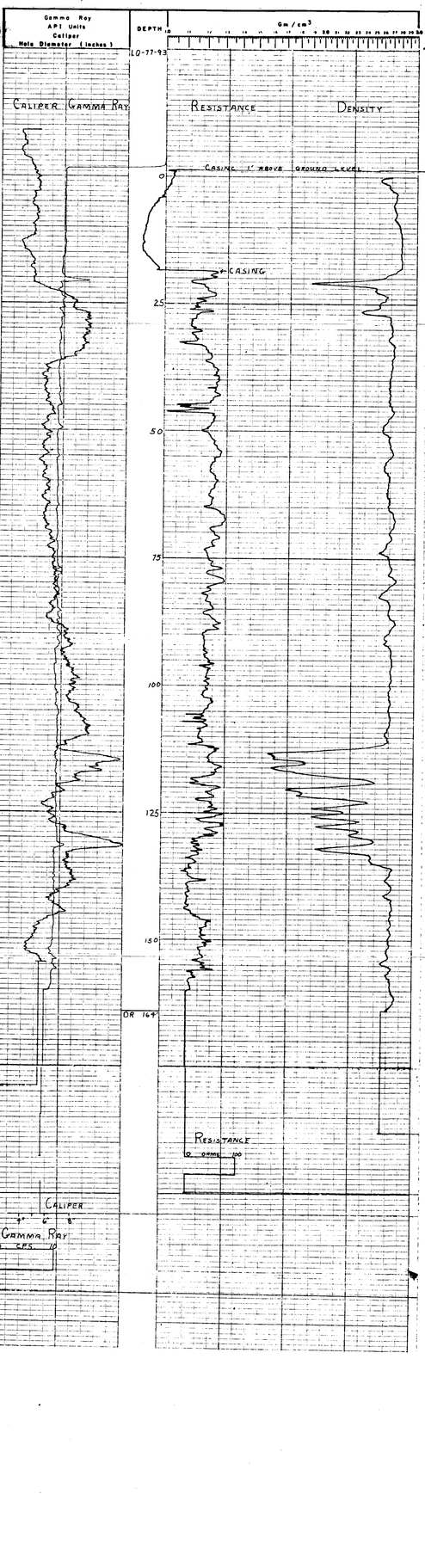
	Gamma Ray	Resistance	Density	Caliper
Run No.	ONE	ONE	ONE	ONE
Tool Model No.	L-103	L-103	L-103	L-103
Diameter	2 3/4"	2 5/8"	2 5/8"	2 3/4"
Detector Model No.	CP-516	ME	F	EM
Type	SCINT.		F	
Length	37"	Spacing	13"	
		Length	1'	
		Horiz. Scale	25 Ω / Div.	
		Rm @ °F	—	
Hoist Truck No.	2	Source Model	HDVP	
Inst. Truck No.	2	Serial No.	687	
Location CAMPBELL RIVER		Isotope	Cs 137	
		Strength	125 mC	

LOGGING DATA

Gamma Ray General								Density			
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
ONE	164'	0'	12	4	100		5	1	1K	0.5L

Reference Literature:

Remarks: DENNIS



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: _____

COMPANY: Lexco

HOLE NO.: LQU -77-94

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,146,014.48 N 1,085,128.0 E

ELEVATION: 801.5

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	4	till	
4	40	brown shale	coal stringer at 7'
40	93	grey sandstone	
93	99	carbonaceous shale	
99	104	siltstone	
104	120	brownshale	
120	130	grey shale	
130	140	green sandstone	

COMMENTS _____

WATER HORIZON _____ FT. _____

Ex Gunsan 77/81c

LEXCO TESTING LTD.

GAMMA-DENSITY & RESISTANCE
CALIPER

COMPANY LEXCO TESTING LTD.

WELL Drill Hole LQ-77-94 (L 25)

FIELD Lower Quinsam

PROVINCE BRITISH COLUMBIA

Permanent Datum G.L. Elev. 202.5 ft. above perm. Datum

Log measured from G.L. ft. above perm. Datum

Drilling measured from G.L.

Elev. K.B. —
D.F. —
G.L. —

Other Services

Rge.	12E
Twp.	
Sec.	
Lsd.	

Date	13 June 77
Run No.	ONE
Type Log	GAMMA
Depth - Driller	140'
Depth - Logger	139'
Bottom logged interval	139'
Top logged interval	0'
Type fluid in hole	WATER
Salinity, PPM Cl.	—
Density	—
Level	FULL
Max. rec. temp. deg. F	8°
Equipment Location	01 HR
Recorded By	R. LEDUC
Witnessed By	S. GARDNER

RUN	BORE-HOLE RECORD BIT	From	To	CASING RECORD Size	Wgt.	From	To
ONE	12"	0'	12'	10"		0'	12'
	4½"	12'	TD	5½"			

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

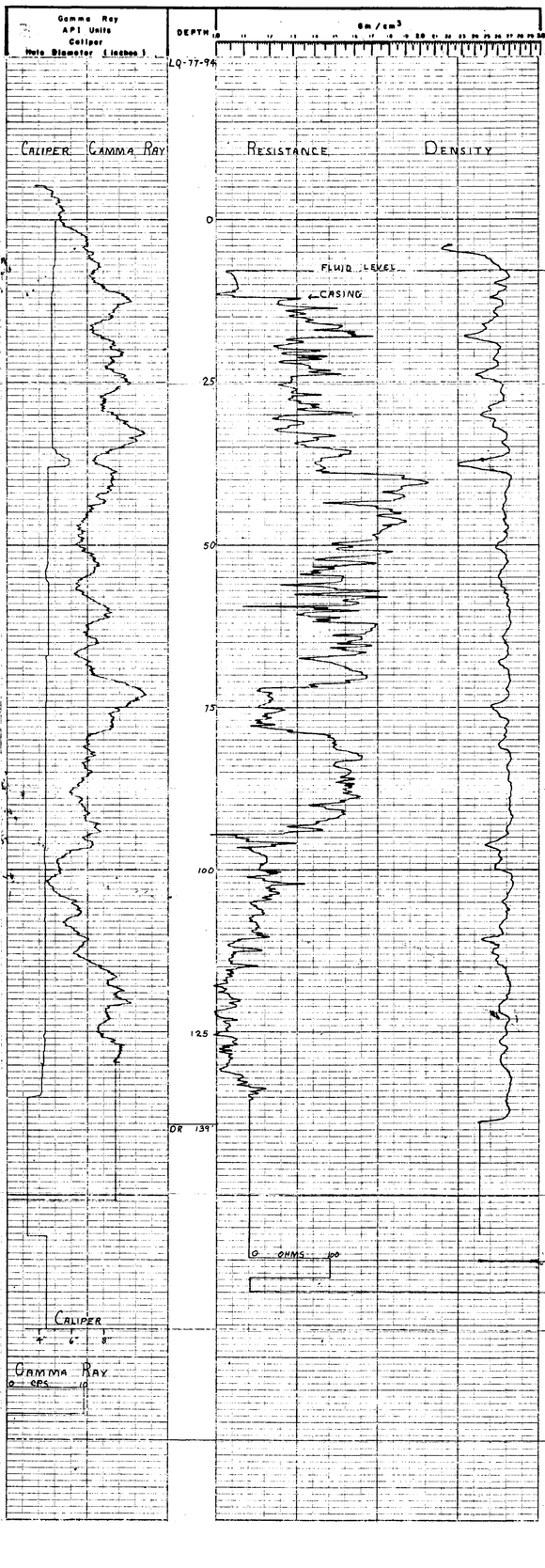
Gamma Ray				Resistance		Density	Caliper
Run No.		ONE		Run No.		ONE	ONE	ONE
Tool Model No.		L-103		Tool Model No.		L-103	L-103	L-103
Diameter		2⅛"		Diameter		2⅛"	2⅛"	2⅛
Detector Model No.		CP-516		Type		ME	F	EM
Type		SCINT		Spacing			13"	
Length		2'						
				Length		1'		
				Horiz. Scale		20Ω / DIV		
General				Rm @ °F		—		
Hoist Truck No.		2		Source Model			HDVP	
Inst. Truck No.		2		Serial No.			687	
Location		CAMPBELL	RIVER	Isotope			Cs 137	
				Strength			125 mC	

LOGGING DATA

General						Gamma Ray			Density		
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
ONE	139'	0'	12	4	100		5	1	1000	0.5 L

Reference Literature:

Remarks: HOWARD



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 22, 1977

COMPANY: Lexco Testing Ltd.

HOLE NO.: LQU-77-95

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,143,819 N 1,090,321 E

ELEVATION: 632

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	22	Till	
22	41	Brown shale	
41	161	Grey sandstone	
161	168	Coal	
168	170	Brown shale	
170	173	Coal	
173	175	Brown shale	
175	178	Coal	
178	205	Brown shale	

COMMENTS _____

WATER HORIZON _____ FT. _____

(2)

E-LOG R. LEDUC

LQ-77-95 162.3
205

			1.2	Shaley coal
			1.6	Coal
			1.0	Shaley coal
			1.9	Coal
5.3 Clean coal	1.4p	.5p	.9	Coal
			.9	Coal
	2.5p			
			.6	Shaley coal
	1.1p			
			.4	Shaley coal
	1.7p			
			.2	Shaley coal

LEXCO TESTING LTD.

GAMMA-DENSITY & RESISTANCE CALIPER

cc Quinsam 77/3/4

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ 77-95 (L 23)

FIELD LOWER QUINSAM

PROVINCE BRITISH COLUMBIA

Loc. Sec. Twp. Rge. W.

Other Services

Permanent Datum G.L. Elev. 452

Log measured from G.L. ft. above perm. datum

Drilling measured from G.L. Elev. K.B. G.L.

Run No.	Bit No.	Bore-Hole Record From	Bore-Hole Record To	Stop Min.	Casing Record From	Casing Record To
ONE	4 1/2	0	73	7	0	23

Date 22 JUNE '77

Run No. ONE

Type Fluid in Hole DENSITY

Dens. - Visc. 10.5 - 38

pH 10.4

Fluid Loss 20.4

Source of Sample RECIRC.

Rm @ Meas. Temp. —

Rmf @ Meas. Temp. —

Rmc @ Meas. Temp. —

Source of Rmf & Rmc —

Rm @ BHT —

Time Since Circ. 4 HR.

Max. rec. temp. deg. F —

Equip. Location —

Recorded By S. GARDNER

Witnessed By R. LARSEN

Location: Sec. Twp. Rge. W.

Permanent Datum: G.L. Elev.: K.B. G.L.

Log measured from: G.L. ft. above perm. datum

Drilling measured from: G.L.

Date: 22 JUNE '77

Run No.: ONE

Type Fluid in Hole: DENSITY

Dens. - Visc.: 10.5 - 38

pH: 10.4

Fluid Loss: 20.4

Source of Sample: RECIRC.

Rm @ Meas. Temp.: —

Rmf @ Meas. Temp.: —

Rmc @ Meas. Temp.: —

Source of Rmf & Rmc: —

Rm @ BHT: —

Time Since Circ.: 4 HR.

Max. rec. temp.: deg. F —

Equip. Location: —

Recorded By: S. GARDNER

Witnessed By: R. LARSEN

Run No.: ONE

Bit No.: 4 1/2

Bore-Hole Record: From 0, To 73

Stop Min.: 7

Casing Record: From 0, To 23

Note Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

	Gamma Ray			Resistance	Density	Caliper
Run No.	ONE			ONE	ONE	ONE
Tool Model No.	L-103			L-103	L-103	L-103
Diameter	2⅝"			2⅝"	2⅝"	2¾"
Detector Model No.	CP-516	1		MR	R	EM
Type	2 UNIT				13"	
Spacing						
Length				1"		
Horiz. Scale				3330/ OHM		
Rm @ °F				—		

General	
Hoist Truck No.	2
Inst. Truck No.	2
Location	CAMPBELL RIVER

	Density
Source Model	HDVP
Serial No.	687
Isotope	Cs 137
Strength	125 mC

LOGGING DATA

General			Gamma Ray					Density			
Depths			Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero
Run No.	From	To	Ft./Min.	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R
ONE	204	0	12	4	100		5	1	16	0.5 L

Reference Literature:

Remarks: DENNIS

Gamma Ray API Units

Caliper Hole Diameter (Inches)

DEPTH

Gm / cm³

LQ-77-95

CALIPER GAMMA RAY

RESISTANCE

DENSITY

0

25

50

75

100

125

150

175

200

DR 204'

RESISTANCE Ω OHMS 100

CALPER

8"

GAMMA RAY

(1)

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 16, 1977

COMPANY: _____

HOLE NO.: LQU-77-96

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,143,111.25 N 1,096,388.24 E.

ELEVATION: 574.1

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	38	Till	
38	42	Brown shale	
42	100	Grey sandstone	
100	232	Grey silkstone	
232	238	Grey shale	
238	243	Brown shale	
243	245	Coal	Shale partings
245	270	Brown shale	
270	278	Coal	
278	320	Brown shale	
320	340	Grey shale	

COMMENTS Flowing hole

WATER HORIZON 60' FT

E-LOG S. GARDNER

LQ-77-96 242.2
340

		.9	Shaley coal	
		.7	Coal	
	2.p			
4.4 Clean		1.2	Coal	
		.9	Shaley coal	
		.7	Coal	
		.9	Coal	
	3.6p			
1.8 clean		1.5	Coal	251.3
		.3	Shaley coal	
	16.7p			
		.9	Shaley coal	269.8
		3.3	Coal	
	.3p			
		1.0	Coal	
	.4p			
		.9	Shaley coal	
6.1 clean				
	.8			
		.8	Carby shale	
	.4p			
		.5	Carby shale	
	.2p			
		.8	Carby shale	
20.1p				
		1.0	Coal	300.2
1.0 Clean	.1p			
		1.0	Coal	

LEXCO TESTING LTD.

GAMMA-DENSITY & RESISTANCE

Company: LEXCO TESTING LTD.
Well: DOUGLAS LO-77-96
Field: LOWER QUAMICHAN
Province: BRITISH COLUMBIA
Location: 49°04'39"N 123°43'39"W
Other Services: —
Elev.: K.B. — D.F. — G.L. —
Permanent Datum: G.L. Elev.: 0.0
Log measured from: G.L. 0.0 ft. above Perm. Datum
Drilling measured from: R.K.B.

Run No.	Date	Depth-Driller	Depth-Logger	Bottom Logged Interval	Top Logged Interval	Casing-Driller	Casing-Logger	Bit Size
ONE	23/7/77	330'	330'	330'	0'	10" @ 0'	10" @ 0'	7 7/8"

Type Fluid in Hole: GEL-CHEM
Density: 9.0 lb/gal
Viscosity: 40 sec
Fluid Loss: 15 cc
Source of Sample: CIRCULATED
Rm @ Meas. Temp.: 1.0 @ 70°F
Rmf @ Meas. Temp.: 0.5 @ 70°F
Rmc @ Meas. Temp.: 1.5 @ 70°F
Source of Rmf & Rmc: CALCULATED
Rm @ BHT: 0.6 @ 100°F
Time Since Circ.: 12 HRS.
Max. Rec. Temp.: 100°F
Equip. Location: CAMPBELL RIVER
Recorded By: R.S.
Witnessed By: CAPTAIN

Run No. ONE — Bit From 0' To 330' — Size 7 7/8" — Type —

Casing Record: Size 10" — Wgt. — Grade — Type Conn. — From 0' — To 10'

Tubing Record: Size — Wgt. — Grade — Type Conn. — From — To —

Paid Here.

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

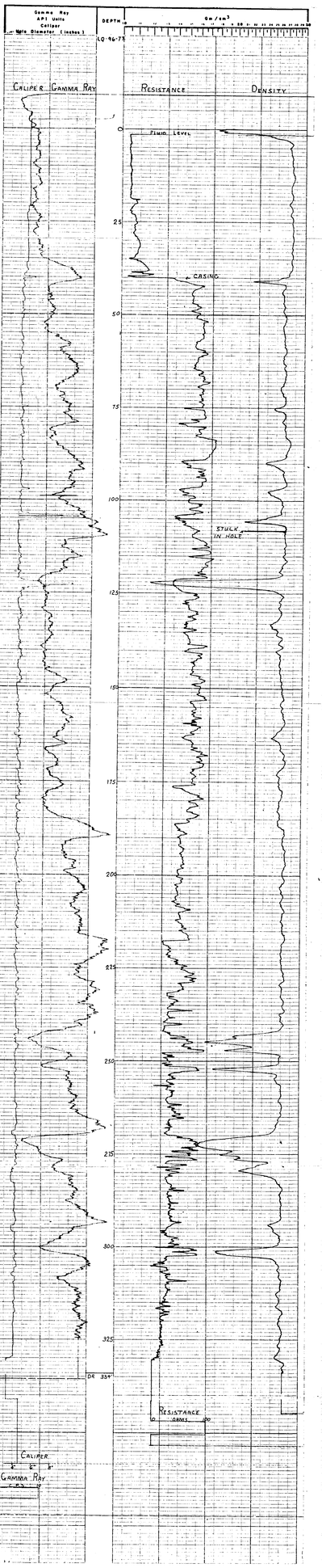
	Gamma Ray			Resistance	Density	Caliper
Run No.	ONE	Run No.		ONE	ONE	ONE
Tool Model No.	L-103	Tool Model No.		L-103	L-103	L-103
Diameter	2 3/4	Diameter		2 3/4	2 3/4	2 3/4
Detector Model No.	CP-3IC	Type		NE	F	F.P.
Type	POINT	Spacing			18"	
Length	17'					
		Length		1'		
		Horiz. Scale Rm @ °F		16.7 Ω/in		
General						
Hoist Truck No.	2	Source Model		-	H.D.V.P.	
Instr. Truck No.	2	Serial No.			687	
Location	CAMPBELL RIVER	Leakage			Cs 137	
		Strength			125 mC	

LOGGING DATA

General				Gamma Ray				Density			
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
ONE	33'+	0'	12	4	100		5'	1	1K	0.24

Reference Literature:

Remarks: HOWARD - POOR HOLE CONDITION 100'-110'



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 18, 1977

COMPANY: Lexco Testing Ltd.

HOLE NO.: LQ-77-97

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,146,307 N 1,091,835.1 E

ELEVATION: 714.6

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	106	Till	

COMMENTS _____

WATER HORIZON _____ FT. _____

(1)

LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 20, 1977

COMPANY: Lexco Testing Ltd.

HOLE NO.: LQU-77-98

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,140,879.8 N 1,097,566.56

ELEVATION: 575.5

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	21	Till	
21	60	Grey sandstone	
60	74	Grey silkstone	
74	76	Grey shale	
76	110	Grey sandstone	
110	197	Grey silkstone	
197	199	Coal	
199	206	Grey silkstone	
206	208	Coal	
208	229	Grey shale	
229	234	Coal	
234	236	Silkstone	
236	240	Carbonaceous shale	
240	330	Brown grey shale	
330	340	Grey sandstone	
T.D.	340		

COMMENTS _____

WATER HORIZON _____ FT. _____

(2)

E-LOG S. GARDNER

LQ-77-98 198.2
340

1.0	Coal	
7.8p		
1.0	Coal	20.70
18.4p		
1.0	Coal	226.4
1.6p		
1.2	Coal	229.0
2.0p		
.6	Coal	232.2
1.2	Carby shale	
1.1p		
.3	Carby shale	235.1
1.6p		
.7	Carby shale	237.0
1.3	Coal	
21.2p		
1.0	Coal	260.2

LEXCO TESTING LTD.

GAMMA, DENSITY & RESISTANCE

CK Gunsten 77 Cole

Company LEXCO TESTING LTD

Well JENNIFER DRILLSITE LQ-77-18 (L-29) 67

Field JENNIFER QUINSAM

Province BRITISH COLUMBIA

Permanent Datum: G.L. Elev. 425.5 ft. A.S.L.

Log measured from G.L. 8 ft. above perm. Datum

Drilling measured from G.L.

Date: June 26-77

Run No.: ONE

Depth-Driller: 340'-0"

Depth-Logger: 337'-0"

Bottom Logged Interval: 337'-0"

Top Logged Interval: SURFACE

Type Fluid in Hole: WATER

Salinity, PPM Cl: —

Density: —

Max. rec. Temp. deg. F.: —

Operating Rig Time: —

Recorded By: R. LEE-HR

Witnessed By: S. GARDENER

Elev.: K.B. 433.5 ft.

D.F. —

G.L. —

Other Services

Run No. | Bit Size | Depth-Driller | Depth-Logger | Bottom Logged Interval | Top Logged Interval | Type Fluid in Hole | Salinity, PPM Cl | Density | Max. rec. Temp. deg. F. | Operating Rig Time | Recorded By | Witnessed By

1 | 7 7/8" | 340'-0" | 337'-0" | 337'-0" | SURFACE | WATER | — | — | — | — | R. LEE-HR | S. GARDENER

CASING RECORD

Run No. | Size | Wgt. | From | To

ONE | 5 1/2" | 15.5# | 0' | 337'-0"

Field Office

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

	Gamma Ray		Resistance	Density	Caliper
Run No.	ONE		ONE	ONE	ONE
Tool Model No.	L-103		L-103	L-103	L-103
Diameter	2 1/8"		2 1/8"	2 1/8"	2 1/8"
Detector Model No.	CP-614		ME	P	E-65
Type	SHORT		Spacing	18"	
Length	1'		Length	1"	
			Meas. Scale	12.5A/DIV	
			Rm @ °F	—	
Hotel Truck No.	2		Source Model	HDVP	
Inst. Truck No.	2		Serial No.	687	
Location	CAMPBELL RIVER		Isotope	Cs 137	
			Strength	125 mC	

LOGGING DATA

Gamma Ray							Density			
Run No.	Depths From	Depths To	Speed FT/Min.	T.C. Sec.	Sens. Settings	Zero On L or R	API GR Units per Log Div.	T.C. Sec.	Sens. Settings	Zero On L or R
ONE	337'	0'	12	4	100	L	5	1	1K	O.EL

References: Literature:

Remarks: HOWARD

Gamma Ray API Units Caliper Hotel Stemwinder 1 inch/page 5

DEPTH

Gm/cm³

LQ-77-18

CALIPER GAMMA RAY

RESISTANCE DENSITY

RESISTANCE LOG SCALE

ZERO SHIFT 150 DIV LEFT

ZERO SHIFT 15 DIV LEFT

DR 337'

RESISTANCE OHMS 0 100

CALIPER

GAMMA RAY 0 CPS 10

LEXCO TESTING LTD

DRILLHOLE REPORT

(1)

COAL FIELD: Campbell River DATE: June 23, 1977

COMPANY: Lexco Testing Ltd.

HOLE NO.: LQU 77-99

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,139,862 N 1,095,917 E

ELEVATION: 578

DRILLER: D. Broen

FROM	TO	LOG	REMARKS
0	34	Grey sandstone	
34	37	Coal	
37	42	Brown shale	
42	44	Coal	
44	60	Brown shale	
60	65	Coal	
65	75	Brown shale	
75	80	Grey sandstone	
80	101	Brown shale	
101	103	Coal	
103	117	Brown shale	
117	120	Coal	
120	145	Brown shale	

COMMENTS _____

WATER HORIZON _____ FT. _____

(2)

E-LOG S. GARDNER

LQ-77-99 34.2
145

	2.0	Coal
5.6p		
	1.2	Coal
16.8p		
	.8	Coal 59.8
.1p		
	.8	Coal
.6p		
	1.6	Coal
.3p		
	.7	Coal
.5p		
	1.1	Coal
.7p		
	.7	Coal
2.2p		
	.9	Shaley coal
.4p		
	.8	Shaley coal
29.2p		
	.3	Coal 101.2
.2p		
	.5	Coal
.1p		
	.7	Coal
13.2p		
	1.1	Coal
.9p		
	1.1	Coal
	.5	Shaley coal
11.0		
	.6	Shaley coal
3.5		
	1.1	Coal
	.4	Shaley coal

LEXCO TESTING LTD.

GAMMA - DENSITY & RESISTANCE
& CALIPER

COMPANY LEXCO TESTING LTD.

WELL DRILLHOLE LQ-77-99 (130)

FIELD Lower Quinsam

PROVINCE BRITISH COLUMBIA

Permanent Datum G.L. Elev. 578'
Log measured from G.L. ft. above perm. Dat.
Drilling measured from G.L.

Other Services

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

RUN No.	Bit	From	To
1	6 3/4"	0'	23'
		23'	TD

BORE-HOLE RECORD

Size	Wgt.	From	To
7"		0	23'

CASING RECORD

Type fluid in hole WATER
Density —
Level Full
Max. rec. temp. deg. F.
Operating rig time
Recorded by R. LEDUC
Witnessed by S. GARDNER

	Run No.	Tool No.	Diameter	Type Log	Depth-Driller	Depth-Logger	Bottom Log Interval	Top Log Interval	Casing-Driller	Casing-Logger	Bit Size	Type Fluid in Hole	Density	Viscosity	Fluid Loss	Source of Sample	Rm @ Meas. Temp.	Rmf @ Meas. Temp.	Rmc @ Meas. Temp.	Source of Rmf & Rmc	Rm @ BHT	Time Since Circ.	Max. Rec. Temp.	Equip. Location	Recorded By	Witnessed By
Gamma Ray	ONE	L-103	2 1/8"	NUCLEAR	145'	144'	144'	0'	23'	—	6 3/4"	WATER	—	—	—	—	—	—	—	—	—	—	—	CAMPBELL RIVER	R. LEDUC	S. GARDNER
Resistance	ONE	L-103	2 1/8"	RES.	145'	144'	144'	0'	23'	—	6 3/4"	WATER	—	—	—	—	—	—	—	—	—	—	—			
Caliper	ONE	L-103	2 1/8"	CAL.	145'	144'	144'	0'	23'	—	6 3/4"	WATER	—	—	—	—	—	—	—	—	—	—	—			

Fold Here

This Heading and Log Conforms to API RP 33

EQUIPMENT DATA

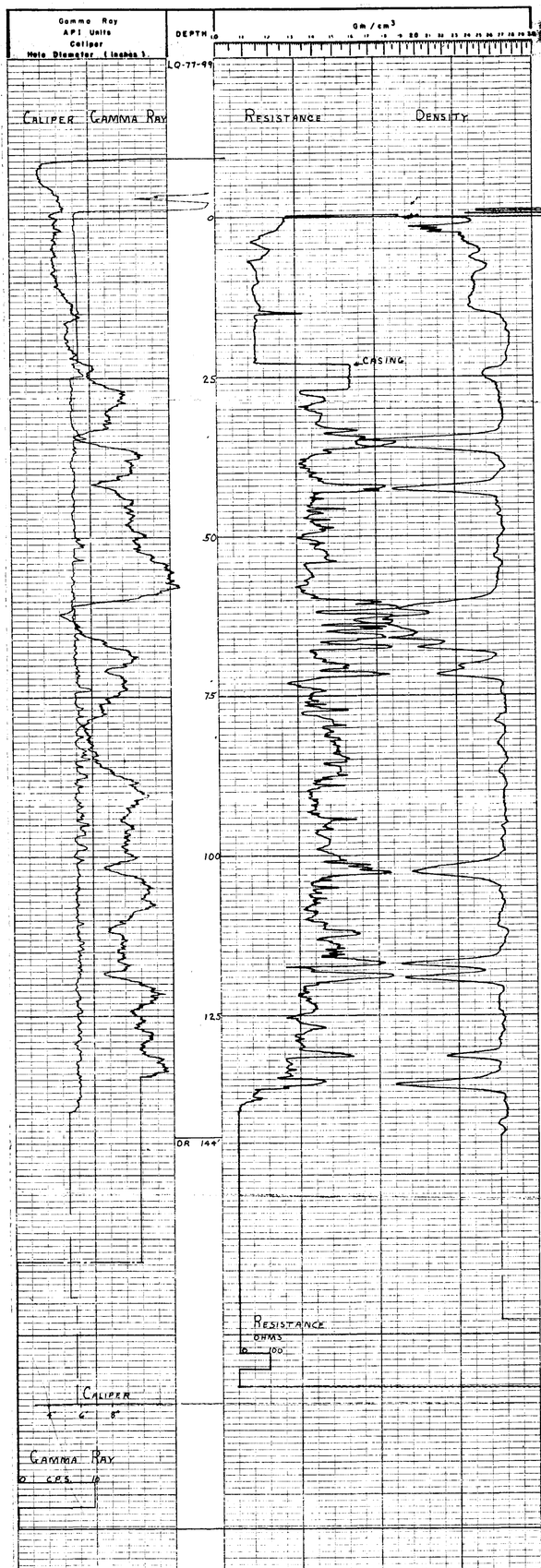
Gamma Ray			Resistance	Density	Caliper
Run No.	ONE		ONE	ONE	ONE
Tool Model No.	L-103		L-103	L-103	L-103
Diameter	2 1/8"		2 1/8"	2 1/8"	2 1/8"
Detector Model No.	CP-516		ME	F	EM
Type	SCINT.			13"	
Length	3"				
			Length	1"	
			Horiz. Scale	50 Ω / Div	
General			Rm @ °F	—	
Hoist Truck No.	2		Source Model		HDVP
Inst. Truck No.	2		Serial No.		687
Location	CAMPBELL RIVER		Isotope		Cs 137
			Strength		125 mC

LOGGING DATA

General				Gamma Ray				Density			
	Depths		Speed	T.C.	Sens.	Zero	API G.R. Units	T.C.	Sens.	Zero
Run No.	From	To	Ft/Min	Sec.	Settings	Div. L or R	per Log Div.	Sec.	Settings	Div. L or R
ONE	144'	0'	12	4	100		5	1	K	0.5 L

Reference Literature:

Remarks: DENNIS



LEXCO TESTING LTD

DRILLHOLE REPORT

COAL FIELD: Campbell River DATE: June 22, 1977

COMPANY: Lexco Testing Ltd.

HOLE NO.: LQ-77-100

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: 18,142,544' N. 1,094,701' E

ELEVATION: 659

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
0	24	Till	
24	98	Grey sandstone	
98	142	Silkstone	
142	144	Coal	
144	160	Silkstone	
160	167	Coal	
167	170	Grey shale	
170	171	Coal	
171	182	Silkstone	
182	190	Coal	
190	217	Brown shale	
217	219	coal	
219	226	Brown shale	
226	228	Coal	
228	258	Brown shale	Coal stringer 245'
258	259	Coal	

COMMENTS _____

WATER HORIZON _____ FT. _____

LEXCO TESTING LTD

DRILLHOLE REPORT

(1)

OIL FIELD: Campbell River DATE: June 22, 1977

COMPANY: _____

HOLE NO.: LQ-77-100

APPROX. LOCATION: _____ SEC. ___ TWP. ___ RGE. ___ W. ___

SURVEYED LOCATION: _____

ELEVATION: _____

DRILLER: H. Vincett

FROM	TO	LOG	REMARKS
259	280	Brown shale	
280	288	Silkstone	
288	300	Red silkstone	
300	320	Grey silkstone	

COMMENTS _____

WATER HORIZON 92 FT. 4 gallons

(2)

E-LOG R. LEDUC

LQ-77-100 160.3
320

		.6	Shaley Coal
		.9	Coal
	4p		
		3.3	Coal
	3.7p	.4	Shaley coal
		.8	Coal
	11.9p		
		.7	Coal 182.3
	.7p		
		1.3	Coal
		.8	Shaley coal
	.4p		
		.8	Coal
	.3p		
		.9	Coal
	2.6p	.8	Shaley coal
		.6	Coal
	25.0p		
		2.0	Coal 217.2
	6.6p		
		.3	Shaley coal

LEXCO TESTING LTD.

GAMMA-DENSITY & RESISTANCE

COMPANY LEXCO TESTING LTD.

WELL DEALDALE LO 77-100

FIELD JAMES C. QUINSAM

PROVINCE BRITISH COLUMBI

Permanent Datum: G.L. Elev. 0

Log measured from G.L. 6 ft. above perm. Datum

Drilling measured from G.L.

Date: 3 June 77

Run No. ONE

Depth-Driller 1100

Depth-Logger 1100

Bottom logged interval 1100

Top logged interval 0

Type fluid in hole WATER

Salinity, PPM Cl 0

Density 8.4

Max. rec. temp. deg. F 84

Equipment Location 8 CARDALE

Recorded By L. LEBLANC

Witnessed By G. GARDINER

Rig No. 5

Elev.: K.B. 0

D.F. 0

G.L. 0

Other Services