

MOUNT KLAPPAN COAL PROJECT
LOST - FOX AREA
GEOLOGICAL REPORT
1984

APPENDIX V
1984 ROTARY DRILL HOLE DATA
VOLUME I
KPNLRRDH84001 TO KPNLRRDH84012



GULF CANADA RESOURCES INC.
COAL DIVISION

709

APPENDIX V

VOLUME I

LOST-FOX AREA

1984 ROTARY DRILL HOLE DATA

KPNLRRDH84001

to

KPNLRRDH84012

APPENDIX V

VOLUME I

LOST-FOX AREA

1984 ROTARY DRILL HOLE DATA

KPNLRRDH 84001

KPNLRRDH 84002

KPNLRRDH 84003

KPNLRRDH 84004

KPNLRRDH 84005

KPNLRRDH 84006

KPNLRRDH 84007

KPNLRRDH 84008

KPNLRRDH 84009

KPNLRRDH 84010

KPNLRRDH 84011

KPNLRRDH 84012

(For each where available)

Data Source Summary

Descriptive Log

Stratigraphic Log

Geophysical Logs

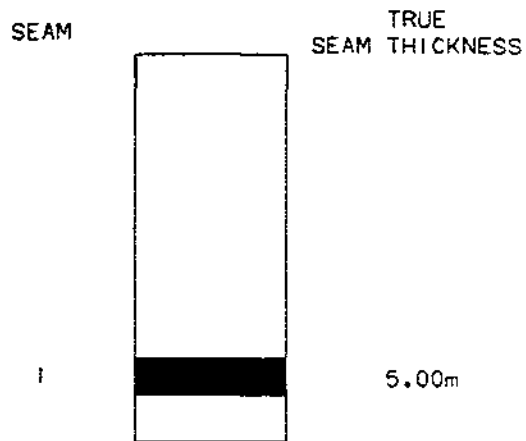
Deviation Survey

1:10 000 Drill Hole Location Map

		VALID COMPONENT DESCRIPTION CODES			
MODIFIER		GRAIN SIZE		COLOR	
ROCK (PBL)	PEBBLY	(CBL)	COBBLE	(BLK)	BLACK
(SSY)	SANDY (PYR)	(PBL)	PEBBLE	(BN)	BROWN
	(SLTY)	(GRAN)	GRANULAR	(BF)	BUFF
	(CLYY)	(VCG)	VERY COARSE GRAINED	(GN)	GREEN
	(CARB)	(CG)	COARSE GRAINED	(GY)	GREY
	(GYP)	(MG)	MEDIUM GRAINED	(MAR)	MAROON
	(FER)	(FG)	FINE GRAINED	(ORNG)	ORANGE
COAL (C-1,C-2,C-3)		(VFG)	VERY FINE GRAINED	(PURP)	PURPLE
	(C-4,C-5,C-6)			(YEL)	YELLOW
SED STRUCTURES		BEDDING		(TAN)	TAN
(XBDG)	CROSS BEDDED	(MAS)	MASSIVE	(BLU)	BLUE
(WRMBUR)	WORM BURROW	(VTHKB)	VERY THICK	(WH)	WHITE
(RIPMK)	RIPPLE MARKS	(THKB)	THICK	COLOR MOD	
(BIOTRB)	BOITURBATED	(MB)	MEDIUM	(LT)	LIGHT
(RTB)	ROOTLET BED	(THNB)	THIN	(M)	MEDIUM
(SSD)	SOFT SED.DEF.	(VTHNB)	VERY THIN	(DK)	DARK
		(LAM)	LAMINATED	(LT-M)	
SORTING		CORE STATE		(M-DK)	
(VPR)	VERY POOR	(PWRD)	POWDERED	(LT-DK)	
(PR)	POOR	(VSHRD)	VERY SHEARED	(S-P)	SALT/PEP
(MOD)	MODERATE	(SHRD)	SHEARED	(WEATH)	WEATHERED
(WEL)	WELL	(VBRKN)	VERY BROKEN		
(VWEL)	VERY WELL	(BRKN)	BROKEN (SLD)		SOLID

KPNLRRDH 84001

MOUNT KLAPPAN COAL PROPERTY
LOST-FOX AREA
ROTARY DRILL HOLE
KPNLRRDH84001



TRUE THICKNESS BASED ON CORE
TAKEN FROM TWIN HOLE

SCALE 1:1000

GULF CANADA RESOURCES INC.
12/13/84



- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRRDH84001

DATE - 12/02/84

- HISTORY -

START DATE - 06/24/84

END DATE - 06/25/84

CONTRACTOR - DENHAM DRILLING

OPERATOR - GCRI

GEOLOGIST - DUFORDJENNER

SURVEYOR -

REMARKS - LOGGED TO 59.0m COAL INTERVAL: 41.56m TO 46.64m (5
.08M) : 1 SEAM OVERBURDEN: 1.07M; DESCRIPTIVE LOG
INTERVAL THICKNESSES ADJUSTED TO COAL TOPS ON GEOP
HYSICAL LOGS; BCA: 80 AVERAGE (TAKEN FROM TWINNED
and cored hole rdh84011)

- LOCATION -

PROVINCE - BC

ZONE - 9

ELEVATION - 1825.00

NORTHING - 6344140.00

EASTING - 505964.00

LICENCE/LEASE NUMBER - 7152

LATITUDE - 571432

LONGITUDE - 1285404

- ORIENTATION -

LENGTH - 54.60

INCLINATION - 79.5

AZIMUTH - 248.3

HOLE SIZE - 120.7

CEMENT - N

CASING DEPTH (M) - 4.57

PLUG - N

AQUIFER DEPTHS (M) - 0.00

PIEZ -

0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

*** NOTE *** 0 INDICATES NO VALUE

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KPMLRRDH 84001

DESCRIPTIVE LOG

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84001

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
80	0.00	1.52	1.52			TOPSOIL	DK.BN LOAMY. CORE STATE DUE TO DRILL MECHANIC S (DRILL CHIPS).
80	1.52	2.43	0.91			OVERBURDEN	PBL.DK.BN
* 80	2.43	3.04	0.61			SILTSTONE	M.GY WHITE MUD ASSOCIATED WITH SILTSTONE; WEATHERED .
80	3.04	4.26	1.22			SILTSTONE	M.GY
80	4.26	5.78	1.52			SANDSTONE	FG.M-DK.GY
80	5.78	7.30	1.52			SILTSTONE	M.GY WEATHERED AND IRON STAINED; MODIFIED COLOUR
80	7.30	8.82	1.52			SANDSTONE	VFG.LT.GY WEATHERED AND IRON STAINED; MODIFIED COLOUR

* DENOTES MEASURED BCA

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84001

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
80	8.82	10.34	1.52			SANDSTONE	SLTY.VFG.M.GY ALMOST A SILTSTONE.
80	10.34	11.86	1.52			SANDSTONE	SLTY.VFG.M.GY WEATHERED; MODIFIED COLOUR; GRITTY; ALMOST A SILTSTONE.
80	11.86	13.38	1.52			SANDSTONE	VFG.M.GY SULFIDE PRESENT IN SOME CHIPS; METALLIC SHINEY LUSTRE; SOME FINE GRAINED SANDS TONE CHIPS
80	13.38	14.90	1.52			SANDSTONE	SLTY.VFG.LT.GY SOME IRON STAINING; ALMOST A SILTSTONE
80	14.90	16.42	1.52			SANDSTONE	FG.M.GY SOME WEATHERING AND COLOUR MODIFICATION ; VERY MINOR FLAKES; OXIDIZED SULFIDES.
80	16.42	17.94	1.52			SANDSTONE	FG.LT.BN BROWN-GRAY COLOUR; VERY FINE GRAINED TO FINE GRAINED SANDSTONE; IRON STAINING AND WEATHERING
80	17.94	19.46	1.52			SANDSTONE	FG.LT.GY.LAM VERY FINE LAMINATIONS; VERY FINE GRAINE D TO FINE GRAINED ALTERNATING

* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84001

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	80	19.46	20.98	1.52		SANDSTONE	VFG.M.GY WEATHERED AND IRON STAINED; ALSO FINE GRAINED AND MEDIUM GRAINED CHIPS PRESENT
	80	20.98	22.50	1.52		SANDSTONE	SLTY.VFG.LT.GY WEATHERING MODIFIES COLOUR; ALMOST SILTSTONE
	80	22.50	24.02	1.52		SANDSTONE	MG.LT.GY FINE GRAINED TO MEDIUM GRAINED SANDSTONE; COLOUR MODIFIED BY WEATHERING
	80	24.02	25.54	1.52		SANDSTONE	FG.LT-M.GY GRAY-BROWN COLOUR; FINE GRAINED TO VERY FINE GRAINED SANDSTONE; VERY GRITTY; IRON STAINING PRESENT
	80	25.54	27.06	1.52		SANDSTONE	FG.LT.BN FINE GRAINED TO VERY FINE GRAINED SANDSTONE; BROWN-GRAY COLOUR
	80	27.06	28.58	1.52		SANDSTONE	SLTY.VFG.LT.GY VERY FINE GRAINED SANDSTONE AND SILTSTONE CHIPS; MORE WEATHERING
	80	28.58	30.10	1.52		SILTSTONE	SSY.LT-M.GY VERY FINE GRAINED SANDSTONE TO SILTSTONE

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84001

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	80	30.10	31.62	1.52		SANDSTONE	FG.LT.BN BROWN TO GRAY COLOUR; RED TINGE; IRON STAINING; FINE TO MEDIUM GRAINED SANDSTONE
	80	31.62	33.14	1.52		SILTSTONE	SSY.LT.GY MIXTURE OF VERY FINE GRAINED SANDSTONE TO SILTSTONE
	80	33.14	38.52	5.38		ROCK LOSS	CUTTINGS NOT RECOVERED.
	80	38.52	40.04	1.52		SILTSTONE	SSY.M.GY VERY FINE GRAINED SANDSTONE TO SILTSTONE
	80	40.04	41.56	1.52		SILTSTONE	M.GY SOME CLAYSTONE CHIPS PRESENT.
	80	41.56	43.08	1.52	I	COAL	C-2 ALMOST BLACK IN COLOUR. VARIABLE GRADES OF COAL (C1/C2/C3). CONCHOIDAL FRACTURE. SILTSTONE AND CARBONACEOUS CLAYSTONE PRESENT.
	80	43.08	44.60	1.52	I	COAL	C-1.BLK VERY SHINEY COAL CHIPS (C1/C2/C3). CONCHOIDAL FRACTURE. IRON STAINED SILTSTONE CHIPS.

* DENOTES MEASURED BCA

DRM 4001

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84001

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
80	44.60	46.64	2.04			COAL LOSS	
80	46.64	48.16	1.52			ROCK LOSS	NO CUTTINGS RECOVERED.
80	48.16	49.68	1.52			SILTSTONE	DK.GY SOME COAL CHIPS PRESENT (C-2); VERY FINE LAMINATIONS ON SOME CHIPS.
80	49.68	51.20	1.52			SILTSTONE	SSY.M.GY FINE GRAINED SILTSTONE TO FINE GRAINED SANDSTONE CHIPS PRESENT; SOME COAL CHIPS; BROWN WEATHERED CHIPS; MODIFIED COLOR
80	51.20	52.72	1.52			SANDSTONE	FG.M.GY FINE GRAINED TO MEDIUM GRAINED SANDSTONE; SOME VERY FINE GRAINED SANDSTONE TO SILTSTONE CHIPS
80	52.72	54.24	1.52			SANDSTONE	FG.M.GY FINE GRAINED TO MEDIUM GRAINED SANDSTONE; INDIVIDUAL GRAINS EASILY VISIBLE.
80	54.24	54.60	0.36			ROCK LOSS	

* DENOTES MEASURED BCA NEWPAGE

GULF CANADA RESOURCES INC.
 COAL DIVISION
 KLAPPAN PROJECT
 STRATIGRAPHIC LOG
 KPN LR RDH84001

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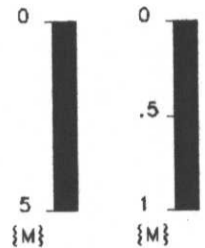
GEOLOGIST : DUFORDJENNER

DATE : DEC 04/84

DRAWING NO. :

LITHOLOGIC SYMBOLS

SCALE : 1:200 1:40

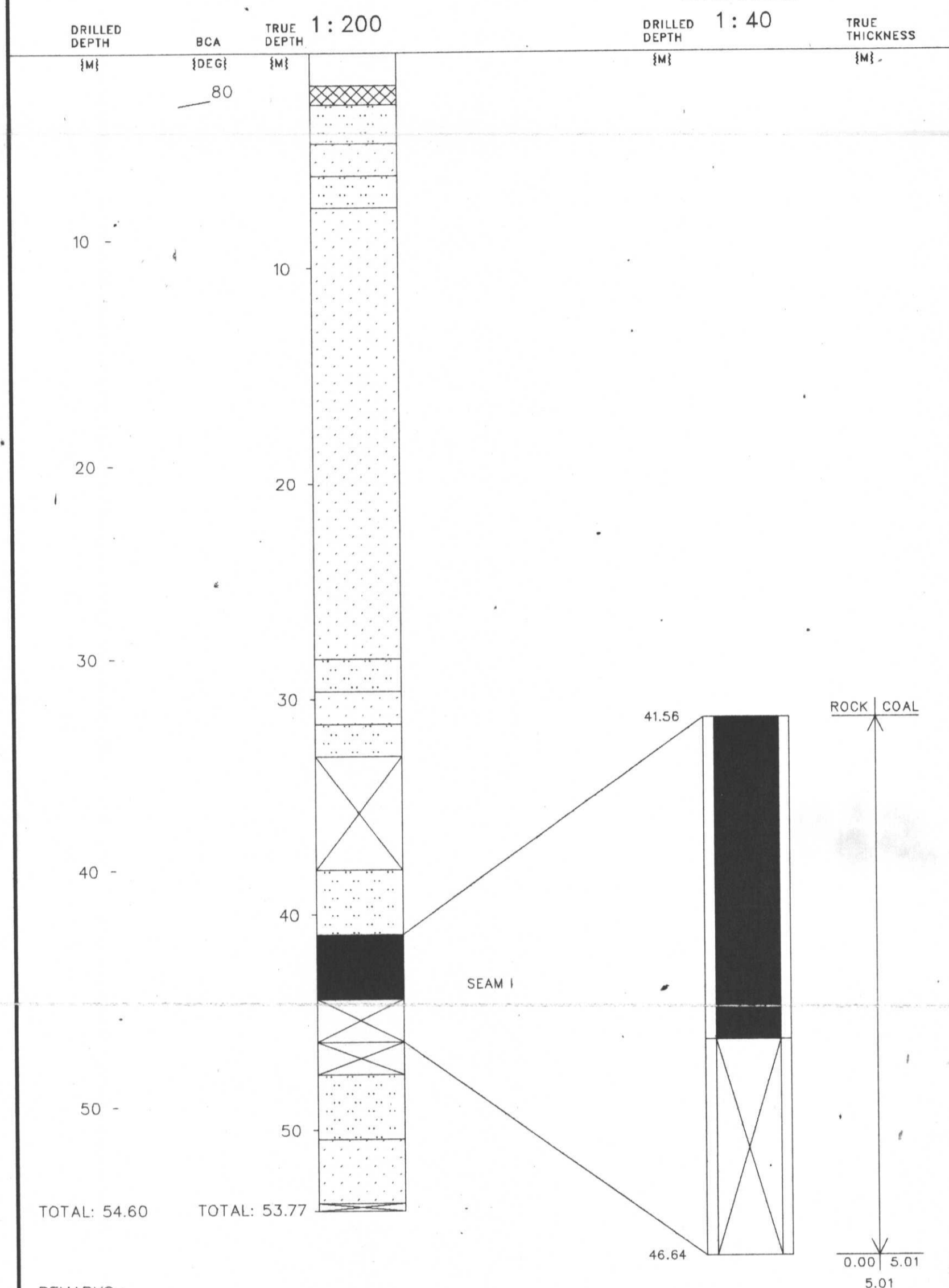


NORTHING: 6344140.0 N
 EASTING: 505964.0 E

INCLINATION: 79.5°
 BEARING: 248.3°

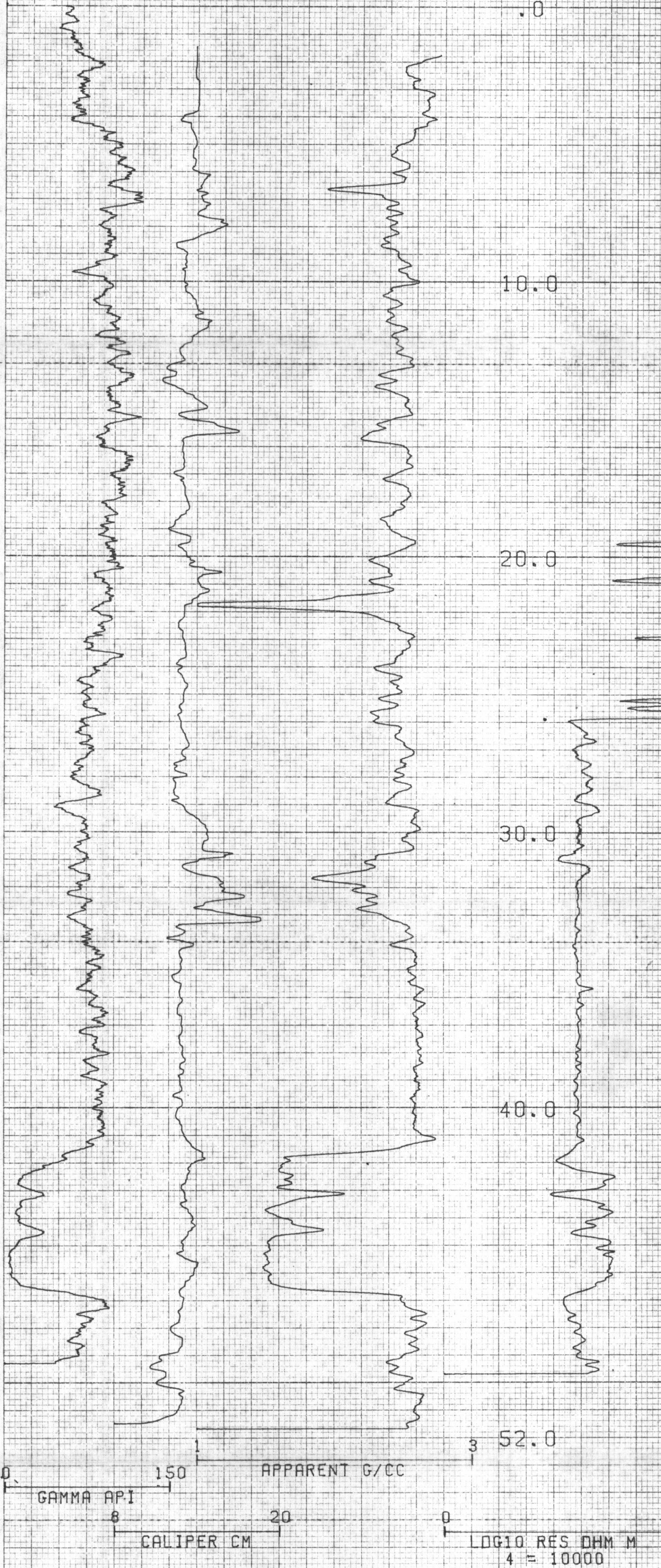
	SANDSTONE		BENTONITE
	SILTSTONE		BRECCIA
	COAL		CARBONACEOUS
	OVERBURDEN		QUARTZ
	MUDSTONE, CLAYSTONE		PYRITE
	TUFF		FERRUGINOUS
	LIMESTONE		CONGLOMERATE
	CORE LOSS		FOSSIL BED

SEAM DETAIL



REMARKS :

TRUE THICKNESS BASED ON CORE BCA OF TWIN HOLE KPNLRDH84011



COMPU-LOG V8L2 PLOT 06-25-84

RDH-84-001-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

HOLE DIAMETER : 12.1
 PROBE # 9030A - 418
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = -24
 DATA V8L2B TRUCK # P811
 D. BDMBACK APPL.#1029L1

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SR Mount Klappan 84(3)A

VERTICAL DEVIATION

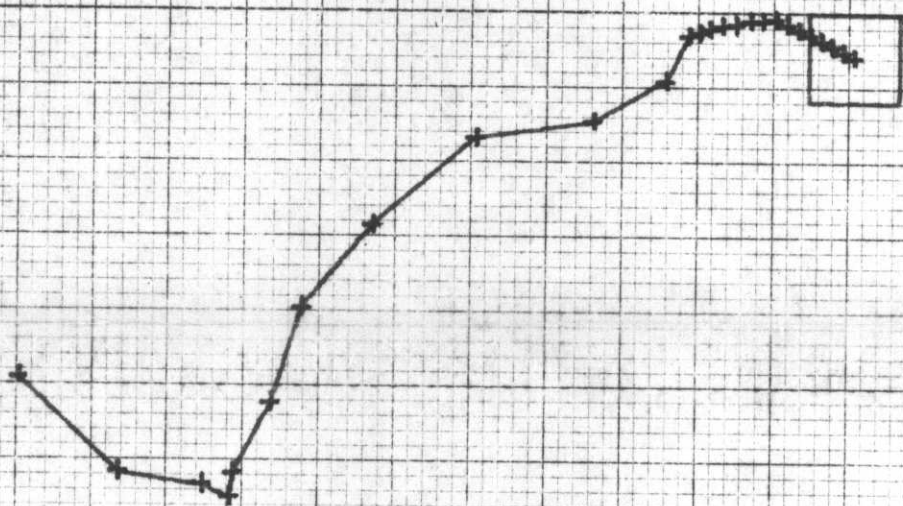
COMPU-LOG V8L1 DEVIATION
DATA FROM : V8L2B

CLIENT : GULF CANADA RES. INC.
LOCATION : MT. KLAPPAN
HOLE ID : RDH-84-001-OPEN
DATE OF LOG : 06-25-84
PROBE : 9055A 0245

SCALE: .75 M/DIV
MAG DECL: 29.5
TRUE DEPTH: 48.0 M
AZIMUTH: 248.3
DISTANCE: 8.88 M

+ = 2.0 M INCR
Δ = TOP OF ZONE
◊ = BOTTOM OF ZONE

TRUE NORTH ↑



709



GR-Mount Klappan 84(3)A



CENTURY GEOPHYSICAL CORPORATION

Tulsa, Oklahoma

COMPANY

Gulf Canada Resources Inc.

BOREHOLE

RDH-84-001--OPEN

AREA

Mt. Klappan

ELEVATION

COUNTY

STATE

British Columbia

SECTION

TOWNSHIP

RANGE

HOLE DATA

TOTAL DEPTH - DRILLER	54.6 m	BIT SIZE	12.1 cm
TOTAL DEPTH - LOGGER	52.0 m	CASING - TYPE & SIZE	steel
TOTAL FOOTAGE LOGGED	52.0 m	CASING DEPTH	4.3 m
LOGGING SPEED	9.0m/min	BOREHOLE FLUID	Air & H ₂ O
REFERENCE LEVEL	Ground	FLUID RESISTIVITY	----- @ #F
PROBE NO.	9030A-418	SOFTWARE LEVEL	8.2*A
		SCALE SELECTION	<input checked="" type="checkbox"/> OPERATOR <input type="checkbox"/> CLIENT
			Tape 5 TK1

REMARKS:

EXPANDED 1:40

Smoothing 7,5,5

BOREHOLE

RDH-84-001

DATE

06-25-84

UNIT/OPERATOR

P811/D. Bomback

FIELD OFFICE

Calgary

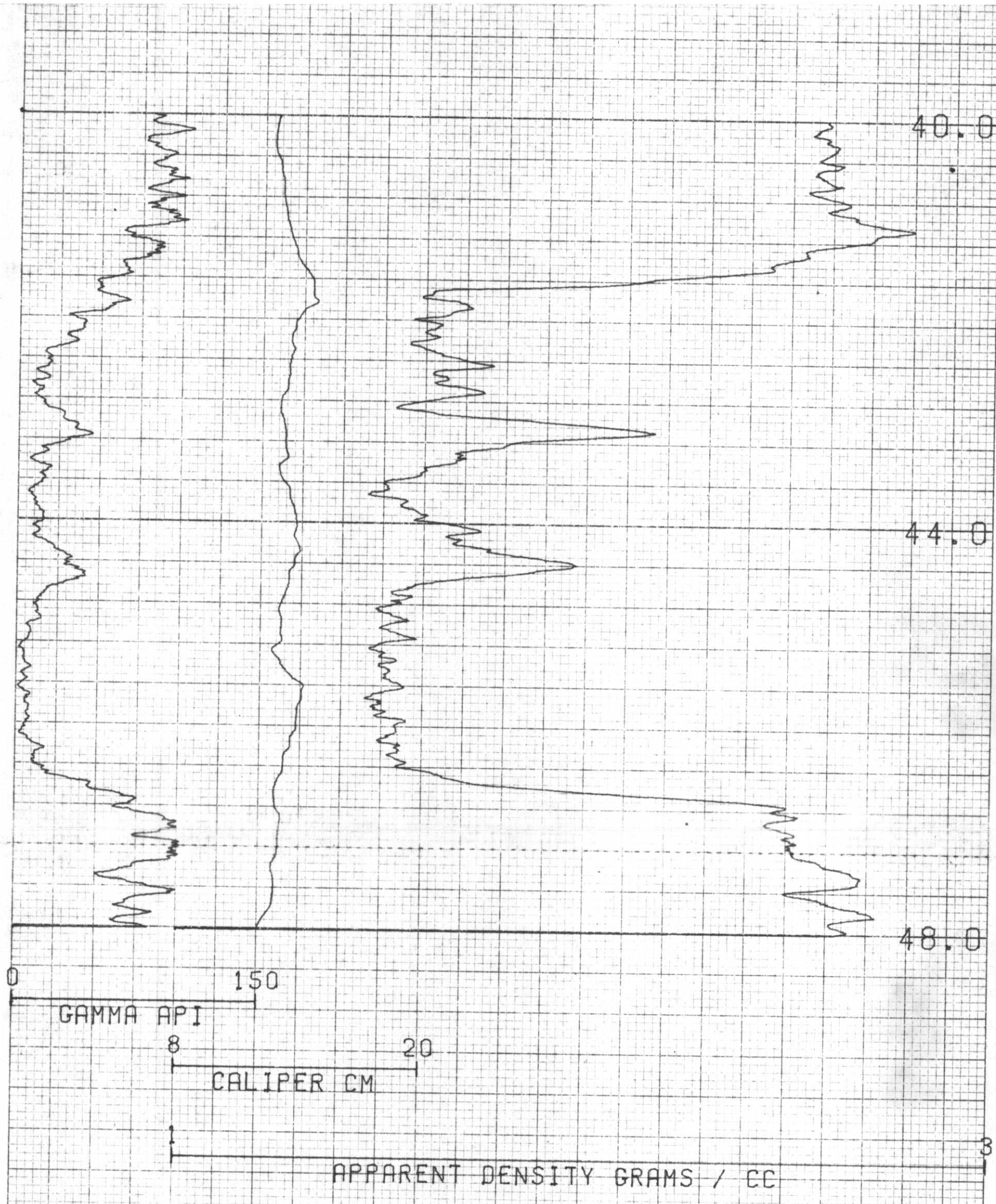
EQUIPMENT DATA

PROBE MODEL	9010	9020	9020S	9060
PROBE DIAMETER	1.8"	2.0"	1.8"	1.8"
DETECTOR TYPE	NaI	NaI	NaI	NaI
DETECTOR SIZE	8.75" x 1.25"	1.125" x 1.5"	8.75" x 4.0"	5" x 3.125"
STD. K FACTOR	1.50 x 10 ⁻¹	---	5.50 x 10 ⁻¹	1.82 x 10 ⁻¹
STD. DEADTIME	1.12 sec	---	1.10 sec	1.12 sec
CALIB. MODEL LOG	---	---	---	---
CALIB DATE	---	---	---	---
K FACTOR x 10 ⁻¹	---	---	---	---
DEADTIME	1.12 sec	---	---	---
TEST READINGS	---	---	---	---
WATER FACTOR	---	---	---	---
CASING FACTOR	---	---	---	---
DETECTOR TYPE	---	NaI	---	NaI
DETECTOR SIZE	---	3" x 1.5"	---	3" x 1.5"
SOURCE TYPE	---	Ca ²²²	---	Ca ²²²
SOURCE NO.	---	V1-1-283	---	---
SOURCE STRENGTH	---	125mCi	---	---
SOURCE SPACING	---	10 cm	---	---
Cal Std	---	6588	---	---
Cal Run	---	7127	---	---
DETECTOR TYPE	---	---	He ³	---
DETECTOR SIZE	---	---	1.0" x 6.0"	---
SOURCE TYPE	---	---	AmBe	---
SOURCE NO.	---	---	---	---
SOURCE STRENGTH	---	---	---	---
SOURCE SPACING	---	---	---	---
SIDE PT RESISTANCE	1.4" x 2.5"	---	1.4" x 2.5"	1.1" x 2.5"
RESISTIVITY	---	8" FOCUSED	---	---
SELF POTENTIAL	YES	---	YES	YES
TEMPERATURE	---	---	YES	---
DEVIATION	---	---	NO / YES	---
CALIPER	---	YES	---	---

NATURAL GAMMA

DENSITY

NEUTRON



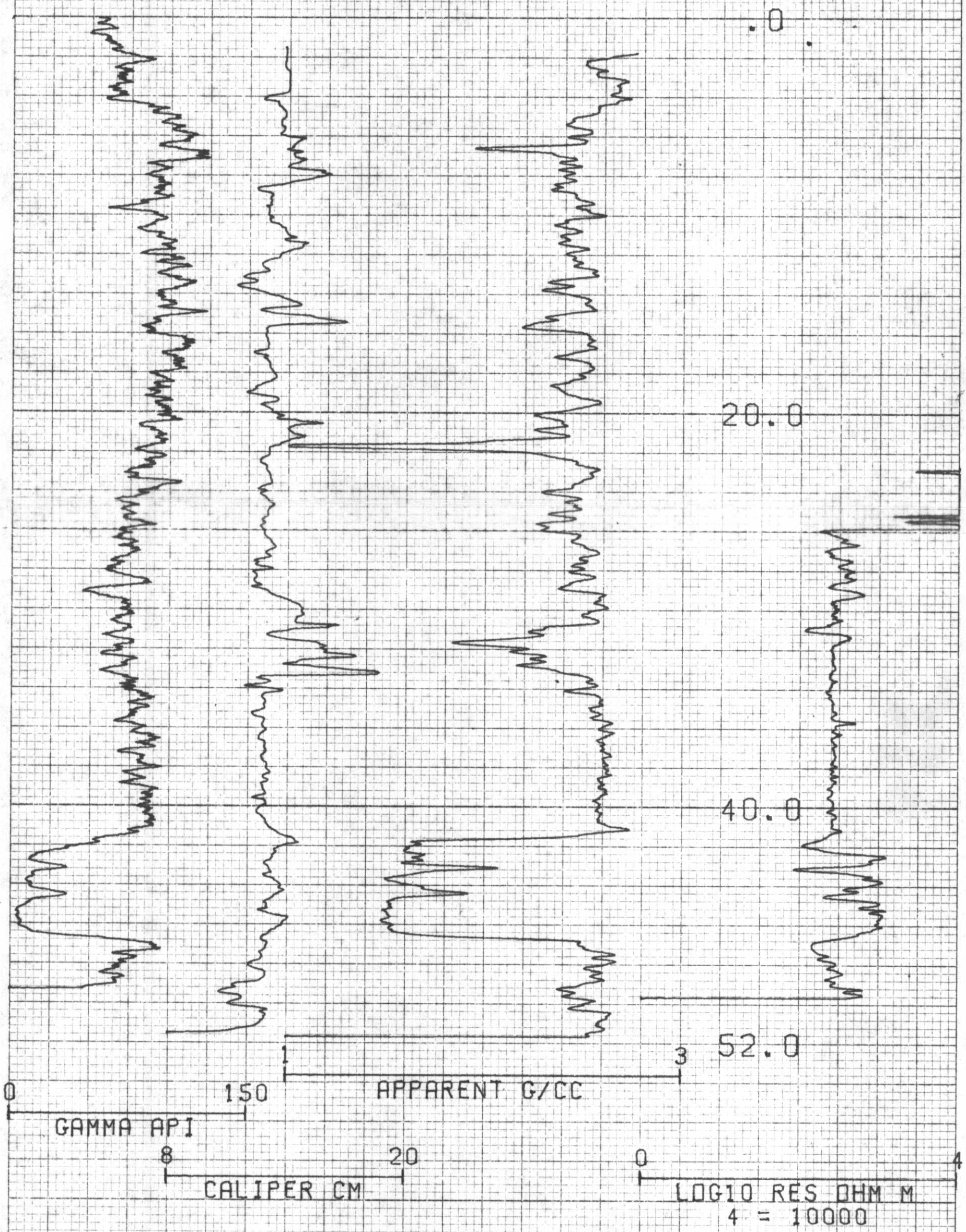
159

CDMPU-LDG V8L2 PLOT 06-25-84
 RDH-84-001-OPEN
 GULF CANADA RES. INC.
 MT. KLAPPAN
 HOLE DIAMETER : 12.1
 PROBE # 9030A - 418
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = -24
 DATA V8L2B TRUCK # P811
 D. BDMBACK APPL.#3703L1

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G.R-Mount Klappan 84(3)A

COPY
EXPANDED
SCALE



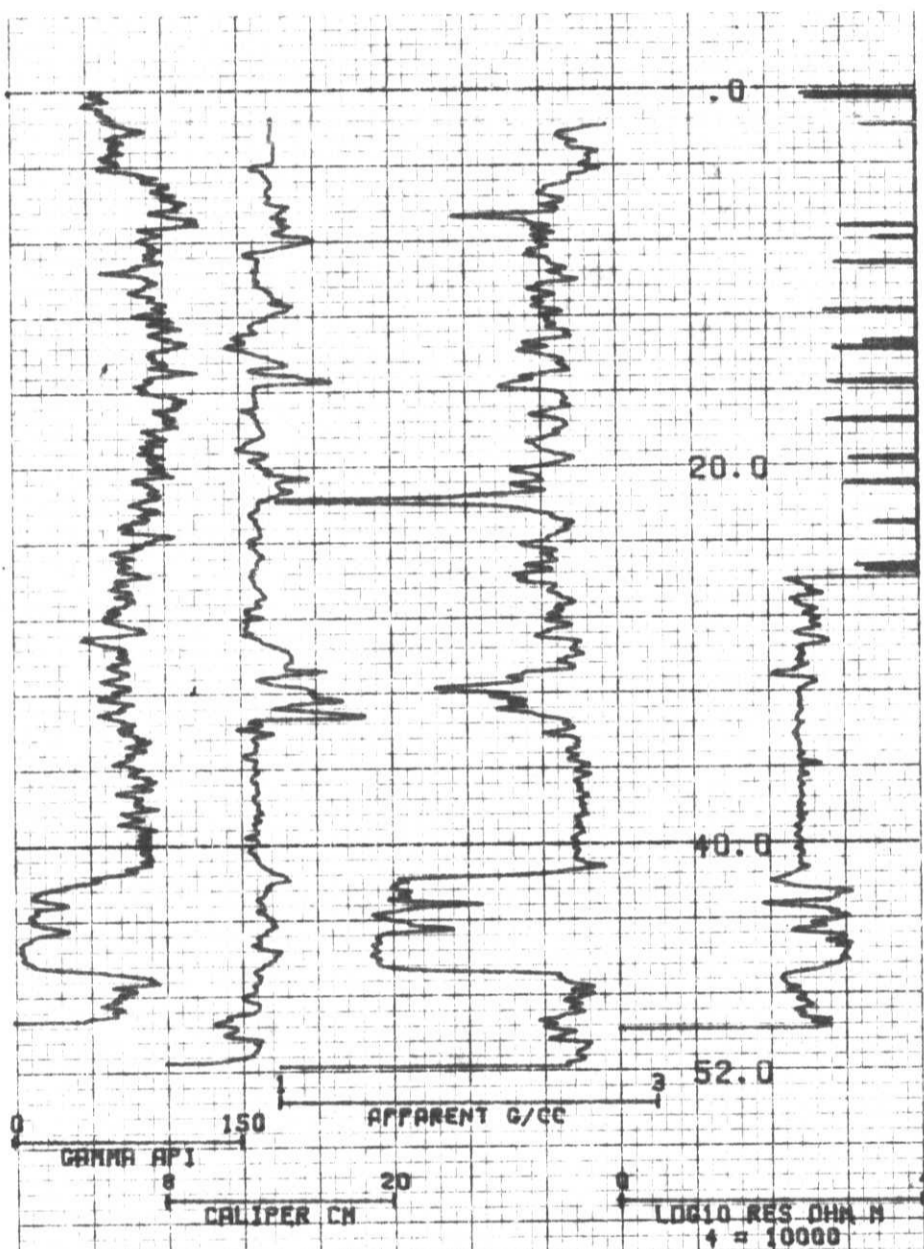
COMPU-LDG V8L2 PLOT 06-25-84

RDH-84-001-OPEN
 GULF CANADA RES. INC.
 MT. KLAPPAN

HOLE DIAMETER : 12.1
 PROBE # 9030A - 418
 SENSDR #4 CAL STD CPS = 6588
 SENSDR #4 CAL RUN CPS = 7127
 SENSDR #4 CAL BIAS = -24
 DATA V8L2B TRUCK # P811
 D. BDMBACK APPL.#2029L1

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~~805~~

GR-Mount Klappan 84(3)A
 REDUCED SCALE
 COPY



CENTURY GEOPHYSICAL CORP. PART NO. 786-0038

COMPU-LOG V8L2 PLOT 08-25-84

RDH-84-001-OPEN
 GULF CANADA RES. INC.
 MT. KLAPPAN

WOLE DIAMETER = 12.1
 PROBE # 8030R - 478
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = -24
 DATA VOL28 TRUCK # P811
 D. SCHWACK APPL. #29 LT

CENTURY

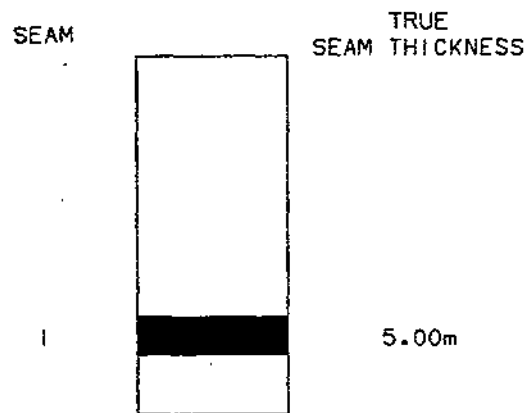
GR Mount Klappan 84(3)A

REDUCED
 SCALE
 COPY

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KPNLRRDH 84002

MOUNT KLAPPAN COAL PROPERTY
LOST-FOX AREA
ROTARY DRILL HOLE
KPNLRRDH84002



TRUE THICKNESS BASED ON
CORE TAKEN IN TWIN HOLE
RDH84005

SCALE 1:1000

GULF CANADA RESOURCES INC.
14/12/84



- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRRDH84002

DATE - 12/02/84

- HISTORY -

START DATE - 06/25/84
 END DATE - 06/26/84

CONTRACTOR - DENHAM DRILLING
 GEOLOGIST - DUFORDJENNER

OPERATOR - GCRI
 SURVEYOR -

REMARKS - LOGGED TO 64.5m (SPLIT LOG DUE TO TOOL MALFUNCTION
) COAL INTERVAL: 48.6M TO 55.6M (6.0M): 1 SEAM.OV
 ERBURDEN: 1.0M.THERMISTOR STRING INSTALLED TO 36M
 (7 POINTS);DESC LOG INT THK ADJUSTED TO COAL PICKS
 on geophs logs. bca 45 (taken from twin:rdh84005)

- LOCATION -

PROVINCE - BC
 ELEVATION - 1833.80

ZONE - 9
 NORTHING - 6344145.00
 EASTING - 505799.00

LICENCE/LEASE NUMBER - 7152

LATITUDE - 571432
 LONGITUDE - 1285414

- ORIENTATION -

LENGTH - 68.60

INCLINATION - 0.0
 AZIMUTH - 0.0

HOLE SIZE - 120.7

CEMENT - N
 PLUG - N
 PIEZ -

CASING DEPTH (M) - 3.05
 AQUIFER DEPTHS (M) - 0.00
 0.00
 LOST CIRC. DEPTHS (M) - 0.00
 0.00

*** NOTE *** O INDICATES NO VALUE

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KPNLRRDH 84002

DESCRIPTIVE LOG

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84002

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
45	0.00	1.07	1.07			TOPSOIL	VFG.LT-M.BN OVERBURDEN MUD
* 45	1.07	3.05	1.98			SILTSTONE	M.GY SOME WEATHERING; FAINT LAMINATIONS; GRITTY
45	3.05	4.42	1.37			SILTSTONE	CLYY.M.GY LESS GRITTY.. WEATHERED. IRON STAINED.
45	4.42	5.79	1.37			SILTSTONE	M.GY BROWN CHIPS DUE TO WEATHERING.
45	5.79	7.16	1.37			SILTSTONE	M.GY IRON STAINED DUE TO WEATHERING.
45	7.16	8.53	1.37			SILTSTONE	M.GY IRON STAINED. SOME SAND SIZE GRAINS IN SOME CHIPS.
45	8.53	9.90	1.37			SILTSTONE	CLYY.M.GY IRON STAINED
45	9.90	11.27	1.37			SILTSTONE	SSY.M.GY IRON STAINED; VERY FINE GRAINED SAND
45	11.27	12.64	1.37			SILTSTONE	SSY.M.GY IRON STAINED; VERY FINE GRAINED SAND

* DENOTES MEASURED BCA

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84002

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
45	12.64	14.01	1.37			SILTSTONE	M.GY IRON STAINED; VERY FINE GRAINED SAND; GRITTY.
45	14.01	15.38	1.37			SILTSTONE	M.GY IRON STAINED BUT TO A LESS DEGREE. GRITTY.
45	15.38	16.75	1.37			SILTSTONE	M.GY MINOR IRON STAINING. GRITTY.
45	16.75	18.12	1.37			SILTSTONE	CLYY.M.GY MINOR IRON STAINING. GRITTY. LARGER QUARTZ GRAINS.
45	18.12	19.49	1.37			SILTSTONE	DK.GY IRON STAINING. GRITTY.
45	19.49	20.86	1.37			SILTSTONE	CLYY.DK.GY IRON STAINING. GRITTY.
45	20.86	22.23	1.37			SILTSTONE	CLYY.GY.LAM IRON STAINED AND WEATHERED. GRITTY. MINOR LAMINATIONS IN SOME CHIPS.
45	22.23	23.60	1.37			SILTSTONE	CLYY.M.GY MINOR IRON STAINING; GRITTY; VERY FINE GRAINED SULFIDE GRAINS; LIKELY PYRITE; SOME IRON STAINING

* DENOTES MEASURED BCA

FORM 4000-1

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PK

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84002

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP ID	SEAM ID	LITHOLOGY	DESCRIPTION
	23.60	24.97	1.37			SILTSTONE	CLYY.GY SOME IRON STAINING.
	24.97	26.34	1.37			SILTSTONE	M.GY ALMOST NO IRON STAINING. GRITTY.
	26.34	27.71	1.37			SILTSTONE	M.GY MINOR WEATHERING AND IRON STAINING.
	27.71	29.08	1.37			SILTSTONE	CLYY.GY WEATHERING AND IRON STAINING PRESENT. GRITTY.
	29.08	30.45	1.37			SILTSTONE	GY GRITTY. MINOR AMOUNTS OF CLAY SIZE GRAINS ON CHIPS. UNIDENTIFIED METALLIC FRAGMENTS; POSSIBLY OXIDIZED PYRITE; VERY MINOR.
	30.45	31.82	1.37			SILTSTONE	CLYY.M.GY MINOR IRON STAINING. MINOR QUARTZ VEINING.
	31.82	33.19	1.37			SILTSTONE	CLYY.M.GY MINOR WEATHERING.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84002

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP ID	SEAM ID	LITHOLOGY	DESCRIPTION
	33.19	34.56	1.37			SILTSTONE	CLYY.M.GY SOMEWHAT WEATHERED AND IRON STAINED. GRITTY. QUARTZ VEINING PRESENT ON SOME CHIPS.
	34.56	35.93	1.37			SILTSTONE	M.GY MINOR WEATHERING. QUARTZ VEINING PRESENT. GRITTY.
	35.93	37.30	1.37			SILTSTONE	CLYY.M.GY SOME IRON STAINING.
	37.30	38.67	1.37			SILTSTONE	M.GY NO WEATHERING OR STAINING PRESENT. GRITTY.
	38.67	40.04	1.37			SILTSTONE	CLYY.GY MINOR WEATHERING AND STAINING.
	40.04	41.41	1.37			SILTSTONE	CLYY.M.GY GRITTY. SOME MINOR WEATHERING.
	41.41	42.78	1.37			SILTSTONE	CLYY.M-DK.GY SOME QUARTZ CHIPS PRESENT. IRON STAINING PRESENT.
	42.78	44.15	1.37			SILTSTONE	CLYY.M.GY MINOR WEATHERING. GRITTY.

* DENOTES MEASURED BCA

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84002

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	44.15	45.52	1.37			SILTSTONE	CLYY.H.GY GRITTY. NO WEATHERING PRESENT.
	45.52	47.03	1.51			SILTSTONE	CARB.M-DK.GY.LAM COAL CHIPS PRESENT (C2/C3). NO WEATHERING. G. LAMINATIONS IN SOME COAL CHIPS.
	47.03	48.55	1.52			CLAYSTONE	CARB.DK.GY CONCoidal FRACTURE ON COAL CHIPS. COAL CHIPS ABOUT 50% C3/C4. COAL IS FAIRLY D ULL ON SOME FACES.
	48.55	50.07	1.52	I		COAL	C-3.DK.BLK.LAM VERY FINE LAMINAE. VERY POWDERY. NO WEAT HERING IN UNCLEAN SAMPLE.
	50.07	52.81	2.74	I		COAL	C-4.DK.BLK VERY POWDERY IN CLEANED SAMPLE. NO WEAT HERING. BORDERLINE C4/C5. POSSIBLY C2 I N VERY CLEAN CHIP. MODERATELY ROUNDED C HIPS. TRUE SURFACE COVERED IN FINE GRAI NED MACEROLES
	52.81	55.62	2.81	I		COAL LOSS	

* DENOTES MEASURED BCA

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 6

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84002

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	55.62	57.45	1.83			CLAYSTONE	CARB.DK.BLK.LAM VERY FINE LAMINAE. COAL STRINGERS IN CL AY. SOME COAL CHIPS C3. NO WEATHERING.
	57.45	58.97	1.52			CLAYSTONE	CARB.DK.GY COAL STRINGERS AND MACEROLES IN CLAY. N O WEATHERING. SOME COAL CHIPS WITH CONC OIDAL FRACTURE. C3 C3 CLAYSTONE BREAKS BREAKS APART EASILY IN WATER.
	58.97	60.49	1.52			SILTSTONE	CARB.DK.GY.LAM SOME QUARTZ VEINING PRESENT. NO WEATHER ING. SOME COAL CHIPS PRESENT-C3 FINE LA MINAE IN COAL CHIPS. GRITTY.
	60.49	62.01	1.52			SILTSTONE	CLYY.H-DK.GY SOME IRON STAINING. SOME COAL CHIPS IN A UNCLEAN SAMPLE (C4).
	62.01	63.53	1.52			SILTSTONE	CLYY.H.GY SOME WEATHERING. IRON STAINING. SOME QU ARTZ VEINING PRESENT. SOME COAL CHIPS P RESENT-C3. CEMENTED BY CLAY TO SILTSTON E.
	63.53	65.05	1.52			SILTSTONE	CLYY.H.GY SOMEWHAT GRITTY. WEATHERED AND IRON STA INED.

* DENOTES MEASURED BCA

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 7

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84002

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	45 65.05	66.57	1.52			SILTSTONE	CLYY. M. GY SOME QUARTZ VEINING PRESENT. GRITTY.
	45 66.57	68.60	2.03			ROCK LOSS	

* DENOTES MEASURED BCA
NEWPAGE

709 ~~875~~

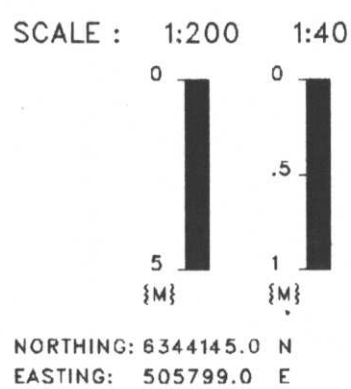
GULF CANADA RESOURCES INC.
 COAL DIVISION
 KLAPPAN PROJECT
 STRATIGRAPHIC LOG
 KPN LR RDH84002

GEOLOGIST : DUFORDJENNER

DATE : DEC 05/84

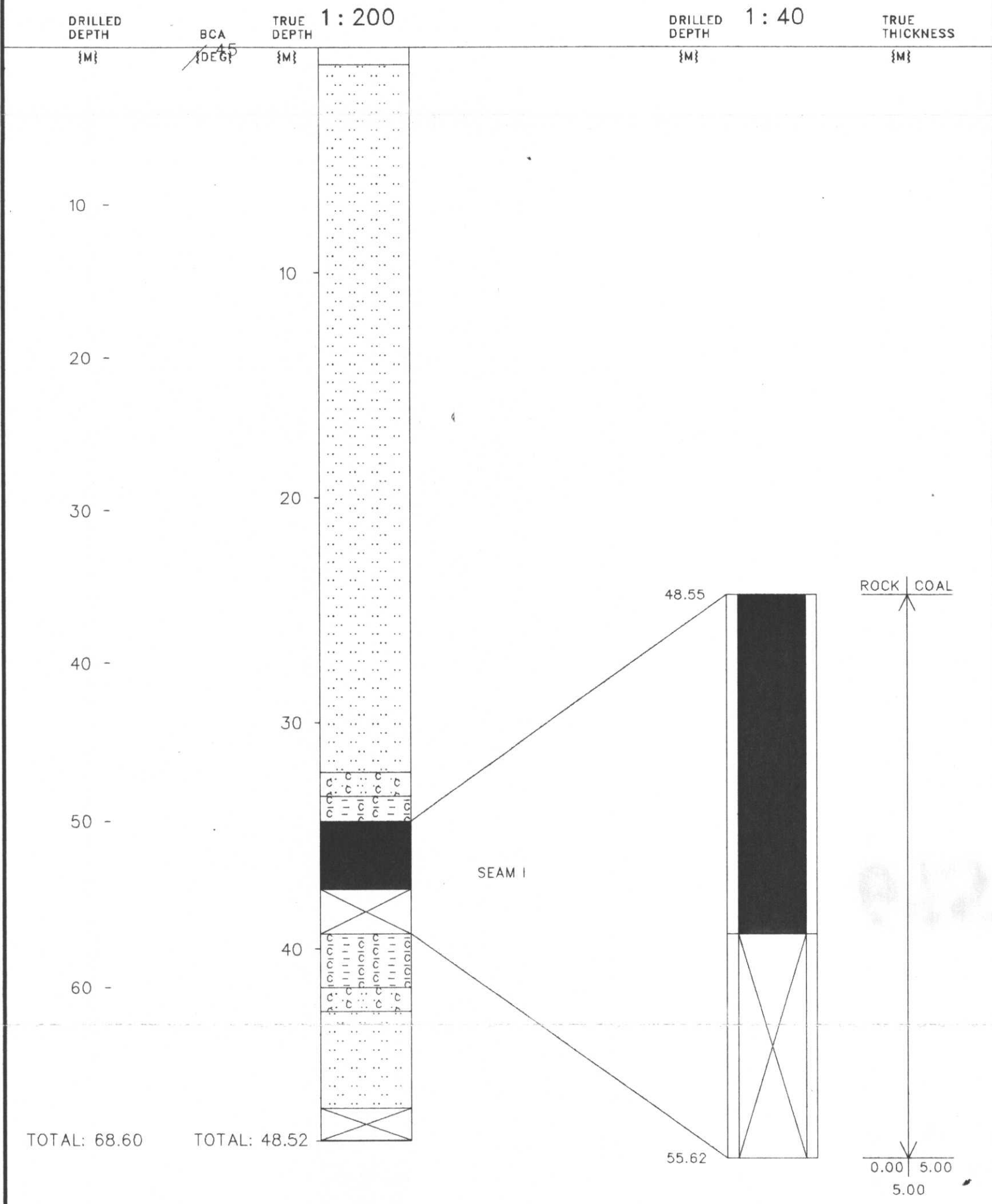
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LITHOLOGIC SYMBOLS

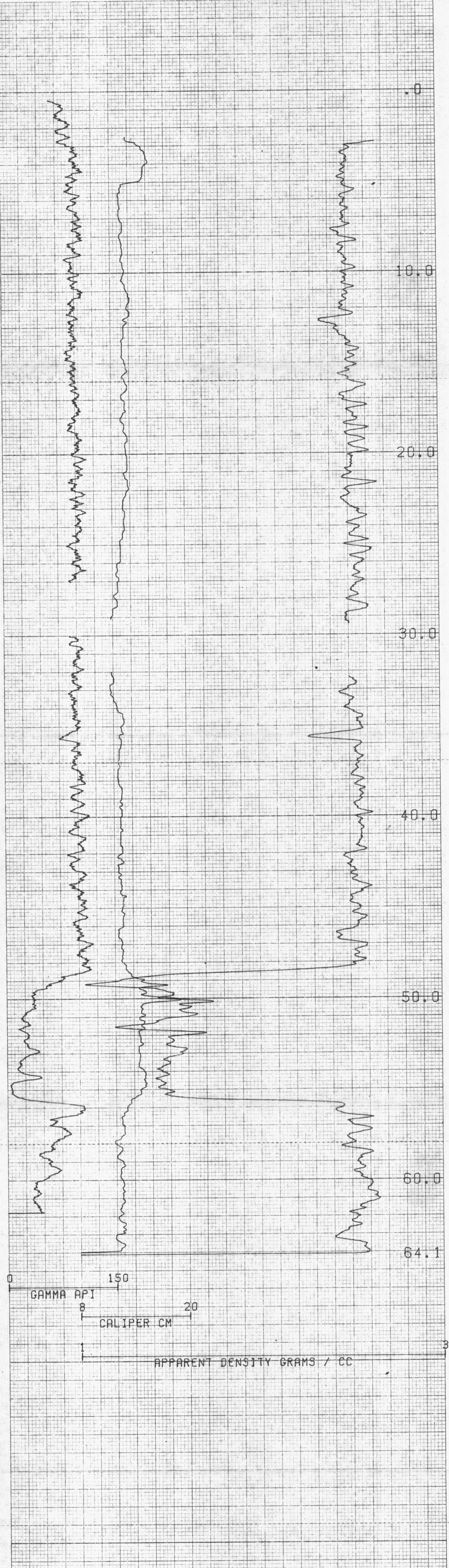


	SANDSTONE		BENTONITE
	SILTSTONE		BRECCIA
	COAL		CARBONACEOUS
	OVERBURDEN		QUARTZ
	MUDSTONE, CLAYSTONE		PYRITE
	TUFF		FERRUGINOUS
	LIMESTONE		CONGLOMERATE
	CORE LOSS		FOSSIL BED

SEAM DETAIL



REMARKS :
 TRUE THICKNESS BASED ON CORE TAKEN
 IN TWIN HOLE RDH84005



COMPU-LOG V8L2 PLOT 06-26-84

RDH-84-002-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

HOLE DIAMETER : 12.1
 PROBE # 9830A - 454
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = 42
 DATA V8L2 TRUCK # P011
 D. BOOMBACK APPL. #1703L1

607

GR-Mount Klappan 84(3)A

30

30

30

30

87

68

.0

10.0

20.0

30.0

40.0

50.0

60.0

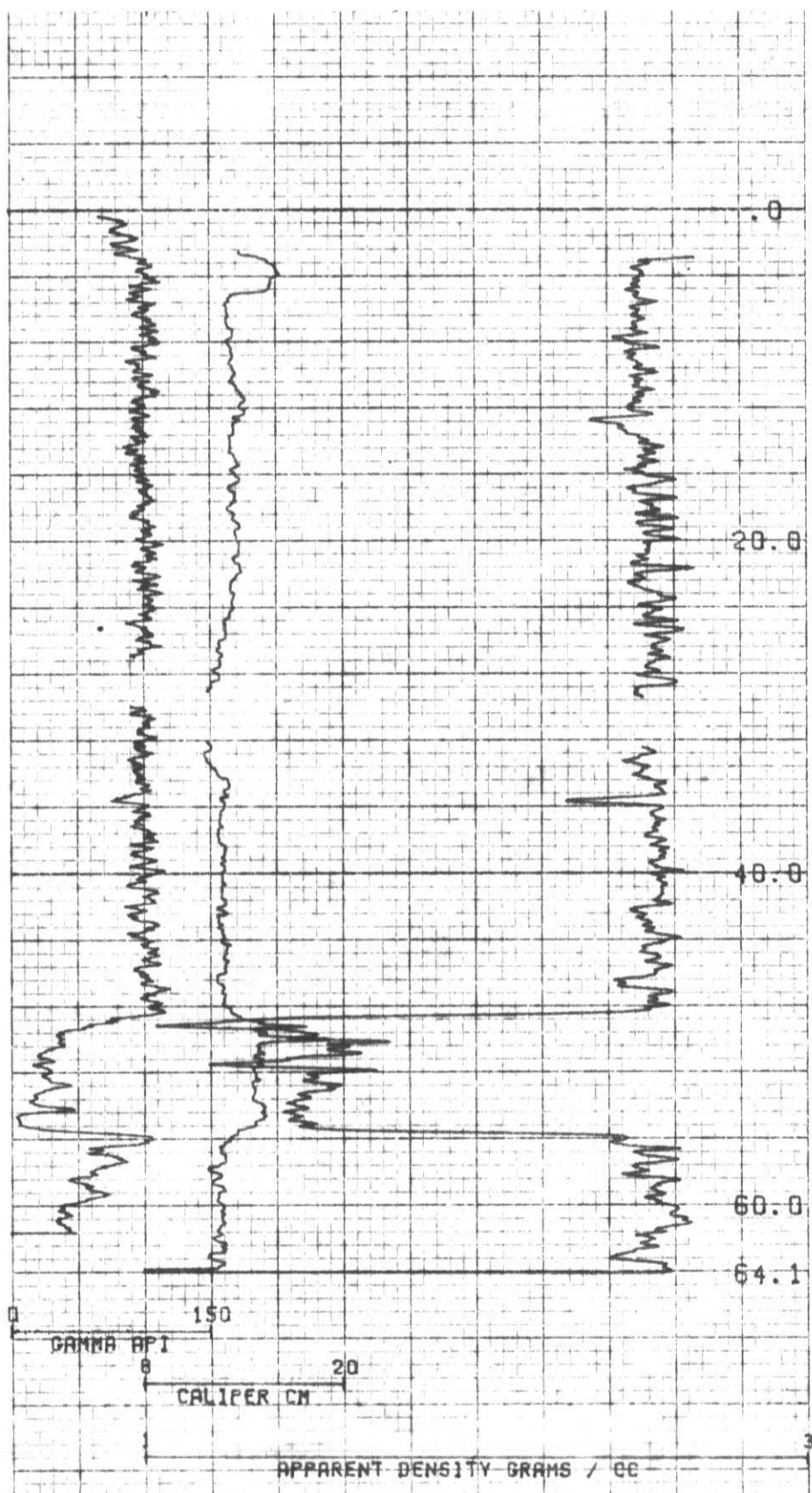
64.1

GAMMA API

CALIPER CM

APPARENT DENSITY GRAMS / CC

COPY
REDUCED
SCALE



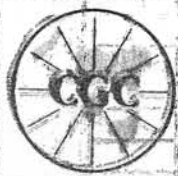
CONPU-LDG VBL2 PLOT 06-26-84
RDH-84-002-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN
HOLE DIAMETER = 12.1
PROBE = 8030A - 454
SENSOR #4 CAL STD CFS = 6588
SENSOR #4 CAL RUN CFS = 7127
SENSOR #4 CAL GRS = 42
DATA VBL2 TRUCK # P811
D-8030ACK APPL. #703 L1

ART NO. 786-0038

CENTURY GEOPHYSICAL CORP. PART NO. 786-0038

~~709~~
709

GR-Mount Klappan 84(3)A



CENTURY GEOPHYSICAL CORPORATION

Tulsa, Oklahoma

COMPANY

Gulf Canada Resources Inc.

BOREHOLE

RDH-84-002--Open

AREA

Mt. Klappan

ELEVATION

COUNTY

STATE

British Columbia

SECTION

TOWNSHIP

RANGE

HOLE DATA

TOTAL DEPTH - DRILLER	68.6 m	BIT SIZE	12.1 cm
TOTAL DEPTH - LOGGER	64.1 m	CASING - TYPE & SIZE	steel
TOTAL FOOTAGE LOGGED	64.1 m	CASING DEPTH	3.0m
LOGGING SPEED	6.0m/min	BOREHOLE FLUID	Air & H ₂ O
REFERENCE LEVEL	Ground	FLUID RESISTIVITY	----- @ °F
PROBE NO.	9030A-418	SOFTWARE LEVEL	8.2*A
		SCALE SELECTION	<input checked="" type="checkbox"/> OPERATOR <input type="checkbox"/> CLIENT
			Tape 5 TK 2

REMARKS:

EXPANDED 1:40 Smoothing 7,5,5

BOREHOLE

RDH-84-002

DATE

06-26-84

UNIT/OPERATOR

P811/D. Bomback

FIELD OFFICE

Calgary

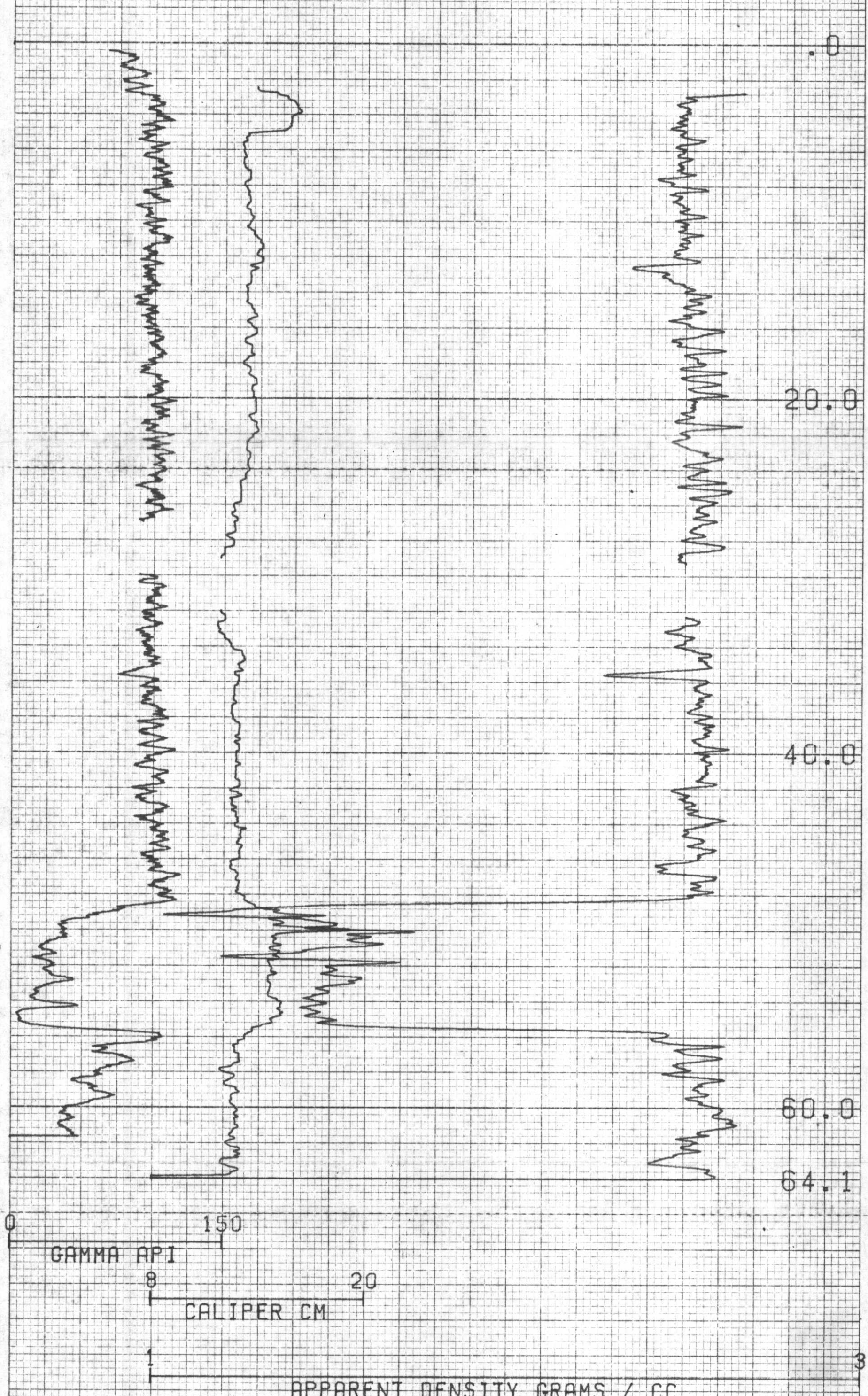
EQUIPMENT DATA

	9810	9820	9825S	9830
PROBE MODEL				
PROBE DIAMETER	1.87	2.0	1.87	1.75
DETECTOR TYPE	NaI	NaI	NaI	NaI
DETECTOR SIZE	8.75 x 1.25	1.75 x 4.5	8.75 x 4.0	5 x 3.0
STD. K FACTOR	1.50 x 10 ⁻⁴		5.00 x 10 ⁻⁴	1.02 x 10 ⁻⁴
STD. DEADTIME	1/1000		1.00/1000	1/1000
CALIB. MODEL/LOC.				
CALIB. DATE				
K FACTOR x 10 ⁻⁴				
DEADTIME /1000				
TEST READINGS				
WATER FACTOR				
CASING FACTOR				
DETECTOR TYPE		NaI		NaI
DETECTOR SIZE		5 x 1.5		5 x 3.0
SOURCE TYPE		Ca ¹³⁷		Ca ¹³⁷
SOURCE NO.		VL-1-283		
SOURCE STRENGTH		125mCi		
SOURCE SPACING		19 cm		
Cal Std		6588		
Cal Rub		7427		
DETECTOR TYPE			NaI	
DETECTOR SIZE			1.0 x 0.0	
SOURCE TYPE			AmBe	
SOURCE NO.				
SOURCE STRENGTH				
SOURCE SPACING				
SNGL. PT RESISTANCE	14" D x 25'		14" D x 25'	11" D x 25'
RESISTIVITY			5" FOCUSED	
SELF POTENTIAL	YES		YES	YES
TEMPERATURE			YES	
DEVIATION			NO/YES	
CALIPER		YES		

NATURAL GAMMA

DENSITY

NEUTRON



COPY
REDUCED SCALE

COMPU-LOG V8L2 PLOT 06-26-84

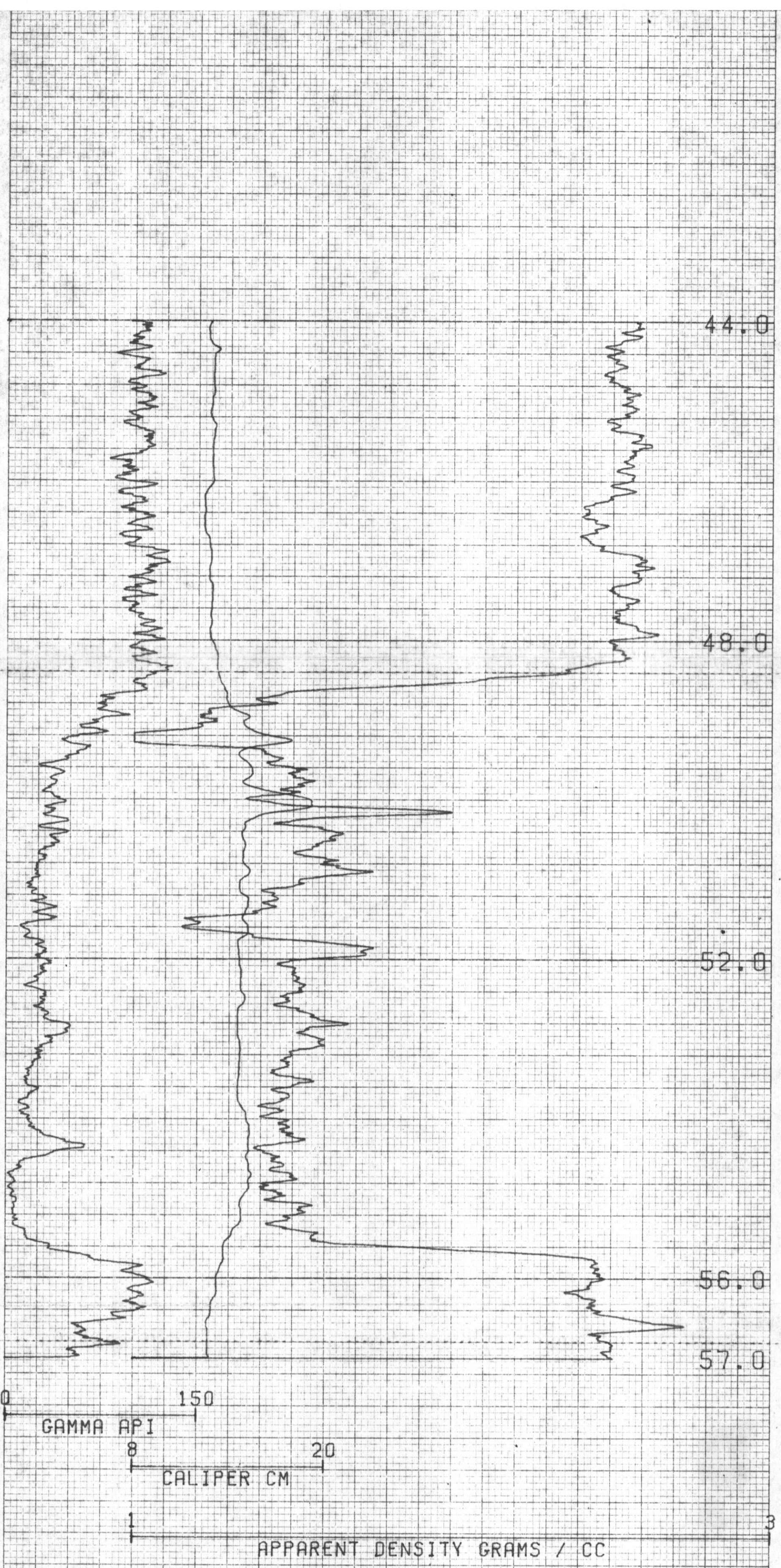
RDH-84-002-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

HOLE DIAMETER : 12.1
 PROBE # 9030A - 454
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = 42
 DATA V8L2 TRUCK # P811
 D. BOMBACK APPL. #2703L1

607

GR-Mount Klappan 84(3)A

COPY EXPANDED SCALE



COMPU-LOG V8L2 PLOT 06-26-84

RDH-84-002-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

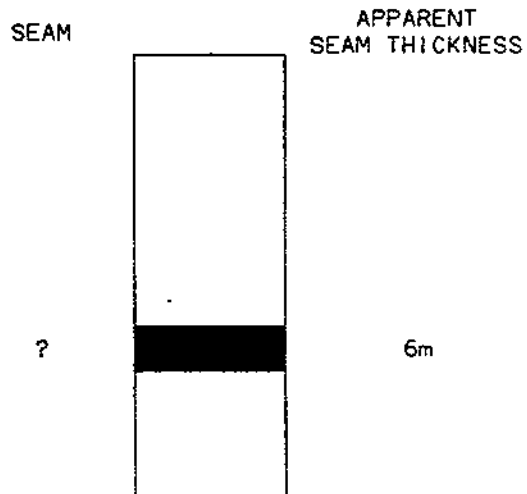
HOLE DIAMETER : 12.1
 PROBE # 9030A - 454
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = 42
 DATA V8L2 TRUCK # P811
 D. BEMBACK APPL. #3703L1

602

GR Mount Klappan 5/13/84

KPNLRRDH 84003

MOUNT KLAPPAN COAL PROPERTY
LOST-FOX AREA
ROTARY DRILL HOLE
KPNLRRDH84003



THICKNESSES ARE APPARENT
NO CORE TAKEN

SCALE 1:1000

GULF CANADA RESOURCES INC.
14/12/84



- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRRDH84003

DATE - 12/02/84

- HISTORY -

START DATE - 06/26/84

END DATE - 06/27/84

CONTRACTOR - DENHAM DRILLING
GEOLOGIST - DUFORDJENNER

OPERATOR - GCRI
SURVEYOR - /

REMARKS - WASTE DUMP SITE LOGGED TO 53.4m INTERVALS: 17.21m
TO 17.80M ; 36.15M TO 41.78M; UNCONSOLIDATED TO T.
D.? DESCRIPTIVE LOG INTERVAL THICKNESSES ADJUSTED
TO COAL TOPS ON GEOPHYSICAL LOGS. THICKNESSES ARE
APPARENT.

- LOCATION -

PROVINCE - BC
ELEVATION - 1651.88

ZONE - 9
NORTHING - 6342342.00
EASTING - 504693.00

LICENCE/LEASE NUMBER - 7148

LATITUDE - 0
LONGITUDE - 0

- ORIENTATION -

LENGTH - 59.43

INCLINATION - 82.2
AZIMUTH - 297.3

HOLE SIZE - 120.7

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 0.00
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE

=====

KPNLRRDH 84003

DESCRIPTIVE LOG

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84003

①

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
* 90	0.00	1.39	1.39			SILTSTONE	FG.DK.GY.LAM SOIL; ROOTS ALSO PRESENT .
90	1.39	3.55	2.16			SILTSTONE	FER.DK.GY POORLY CONSOLIDATED.
90	3.55	5.55	2.00			SILTSTONE	DK.GY
90	5.55	6.94	1.39			SILTSTONE	CARB.DK.GY.LAM VERY FINE COAL STRINGERS.
90	6.94	8.33	1.39			ROCK LOSS	CUTTINGS NOT RECOVERED.
90	8.33	9.72	1.39			SILTSTONE	M.GY
90	9.72	11.11	1.39			SILTSTONE	LT.GY SOME SHELL FRAGMENTS. POORLY CONSOLIDATED.
90	11.11	12.50	1.39			SILTSTONE	LT.GY ALSO MINOR QUARTZ VEINING.
90	12.50	13.89	1.39			SILTSTONE	M.GY ALSO MINOR QUARTZ VEINING.
90	13.89	15.28	1.39			SILTSTONE	LT.GY

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84003

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
90	15.28	16.67	1.39			SILTSTONE	M.GY ALSO MINOR QUARTZ VEINING.
90	16.67	18.06	1.39			SILTSTONE	CARB.DK.GY MASSIVE WITH MINOR COAL.
90	18.06	19.45	1.39			SILTSTONE	CARB.DK.GY HIGH COAL CONTENT. MINOR QUARTZ VEINING
90	19.45	20.84	1.39			SILTSTONE	DK.GY
90	20.84	22.23	1.39			SILTSTONE	DK.GY
90	22.23	23.62	1.39			SILTSTONE	DK.GY
90	23.62	25.01	1.39			SILTSTONE	DK.GY MINOR QUARTZ VEINING.
90	25.01	26.40	1.39			SILTSTONE	PYR.M.GY POORLY CONSOLIDATED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84003

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
90	26.40	27.79	1.39			SILTSTONE	DK.GY POORLY CONSOLIDATED
90	27.79	29.18	1.39			SILTSTONE	M.GY
90	29.18	30.57	1.39			SILTSTONE	M.GY.LAM FINE LAMINATIONS.
90	30.57	31.96	1.39			SILTSTONE	M.GY MINOR QUARTZ VEINING.
90	31.96	33.35	1.39			SILTSTONE	M.GY
90	33.35	34.74	1.39			SILTSTONE	M.GY POORLY LITHIFIED.
90	34.74	36.15	1.41			SILTSTONE	CARB.DK.GY HIGH COAL CONTENT.
90	36.15	37.67	1.52			COAL	C-1.M.BLK BRIGHT. CONCHOIDAL FRACTURE. SOME SILTS TONE.
90	37.67	41.78	4.11			COAL LOSS	
90	41.78	42.71	0.93			ROCK LOSS	NO CUTTING RECOVERED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84003

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
90	42.71	44.23	1.52			SILTSTONE	CARB.DK.GY SOME COAL
90	44.23	45.75	1.52			SILTSTONE	CARB.DK.GY SOME COAL.
90	45.75	47.27	1.52			SILTSTONE	CARB.M.GY MINOR COAL.
90	47.27	48.79	1.52			SILTSTONE	CARB.M.GY POORLY CONSOLIDATED. MINOR COAL.
90	48.79	50.31	1.52			SILTSTONE	M.GY POORLY CONSOLIDATED.
90	50.31	51.83	1.52			SILTSTONE	PYR.M.GY SCATTERED SMALL PYRITE CRYSTALS.
90	51.83	53.35	1.52			SILTSTONE	PYR.M.GY SCATTERED PYRITE COAL
90	53.35	54.87	1.52			SILTSTONE	CARB.M.GY MINOR COAL.
90	54.87	56.39	1.52			SILTSTONE	M.GY
90	56.39	57.91	1.52			SILTSTONE	M.GY

* DENOTES MEASURED BCA

84/12/06

GULF CANADA RESOURCES, INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84003

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
90	57.91	59.43	1.52			SILTSTONE	LT. GR

* DENOTES MEASURED BCA
NEWPAGE

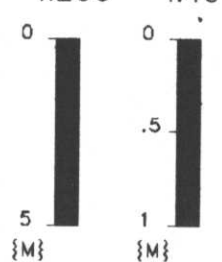
GULF CANADA RESOURCES INC.
 COAL DIVISION
 KLAPPAN PROJECT
 STRATIGRAPHIC LOG
 KPN LR RDH84003

GEOLOGIST : DUFORDJENNER

DATE : DEC 05/84

DRAWING NO. :

SCALE : 1:200 1:40



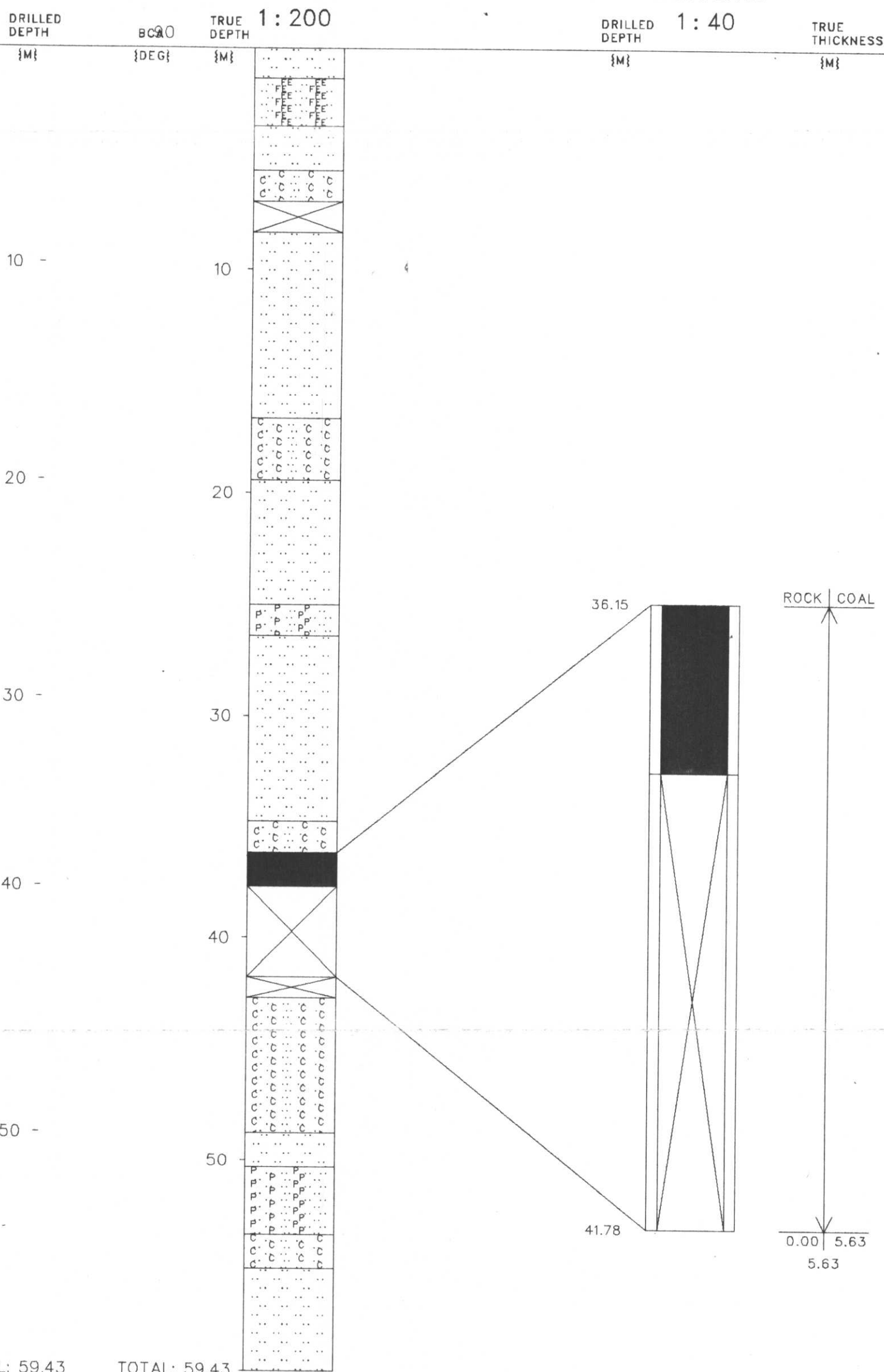
NORTHING: 6342342.0 N
 EASTING: 504693.0 E

INCLINATION: 82.2°
 BEARING: 297.3°

LITHOLOGIC SYMBOLS

	SANDSTONE		BENTONITE
	SILTSTONE		BRECCIA
	COAL		CARBONACEOUS
	OVERBURDEN		QUARTZ
	MUDSTONE, CLAYSTONE		PYRITE
	TUFF		FERRUGINOUS
	LIMESTONE		CONGLOMERATE
	CORE LOSS		FOSSIL BED

SEAM DETAIL



REMARKS :
 THICKNESSES ARE APPARENT DUE TO NO CORE TAKEN
 AND NO NEARBY OUTCROPS AVAILABLE

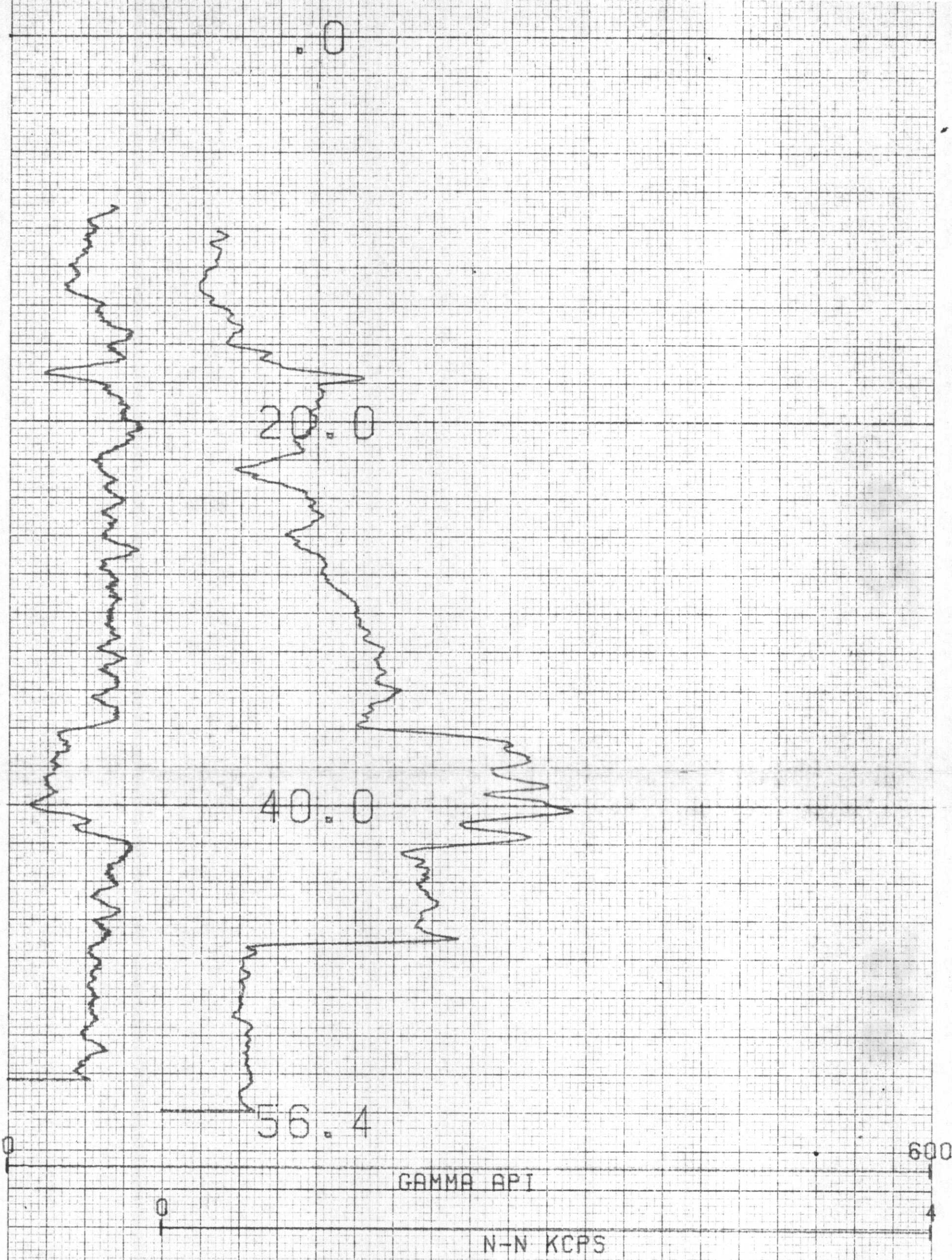
GR-Mount Klappan 84(3)A
 709

GR-Mount Klappan 84(3)A

200

COPY REDUCED SCALE

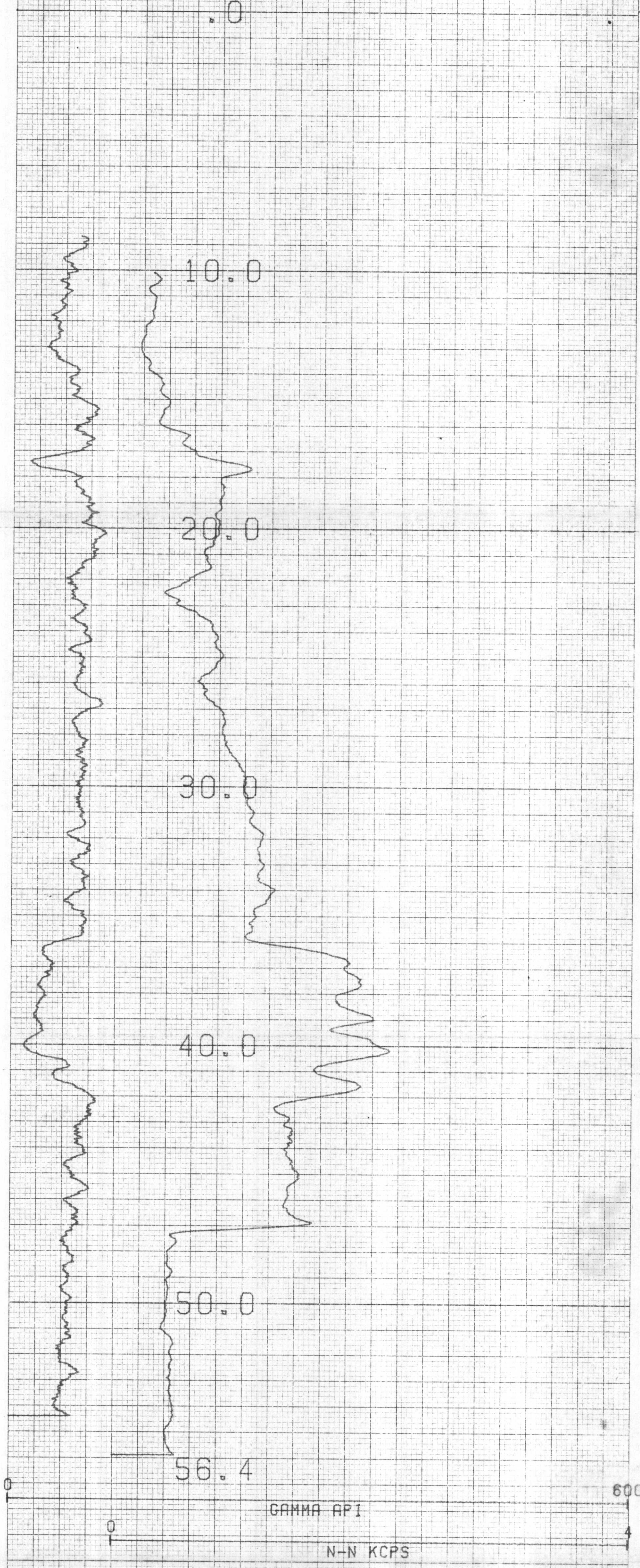
~~55~~
709



COMPU-LDG V8L2 PLOT 06-26-84

RDH-84-003-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

HOLE DIAMETER :	12.1
PROBE #	9055A - 005
SENSOR #4 CAL STD CPS =	152
SENSOR #4 CAL RUN CPS =	237
SENSOR #4 CAL BIAS =	0
DATA V8L26	TRUCK # P811
D. BEMBACK	APPL.#1007L1



COMPU-LOG V8L2 PLOT 06-26-84

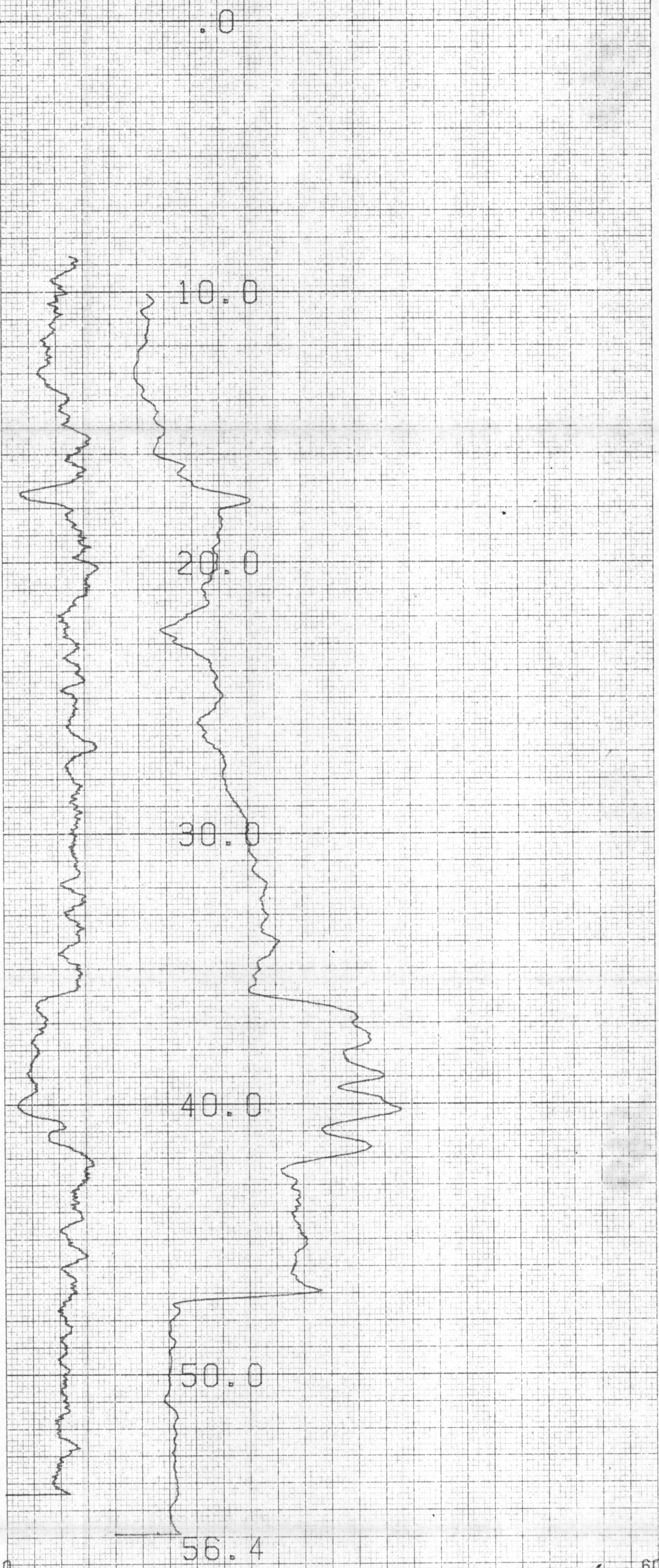
RDH-84-003-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

HOLE DIAMETER = 12.1
 PROBE # 9055A 005
 SENSOR #4 CAL STD CPS = 152
 SENSOR #4 CAL RUN CPS = 237
 SENSOR #4 CAL BIAS = 0
 DATA V8L2B TRUCK # P611
 D. BOMBACK APPL. #1007L1

64-Mount Klappan 84(3)A

~~709~~
709

GR Mount Klappan 84(3)A



0 100
 GAMMA API
 N-N KCPS

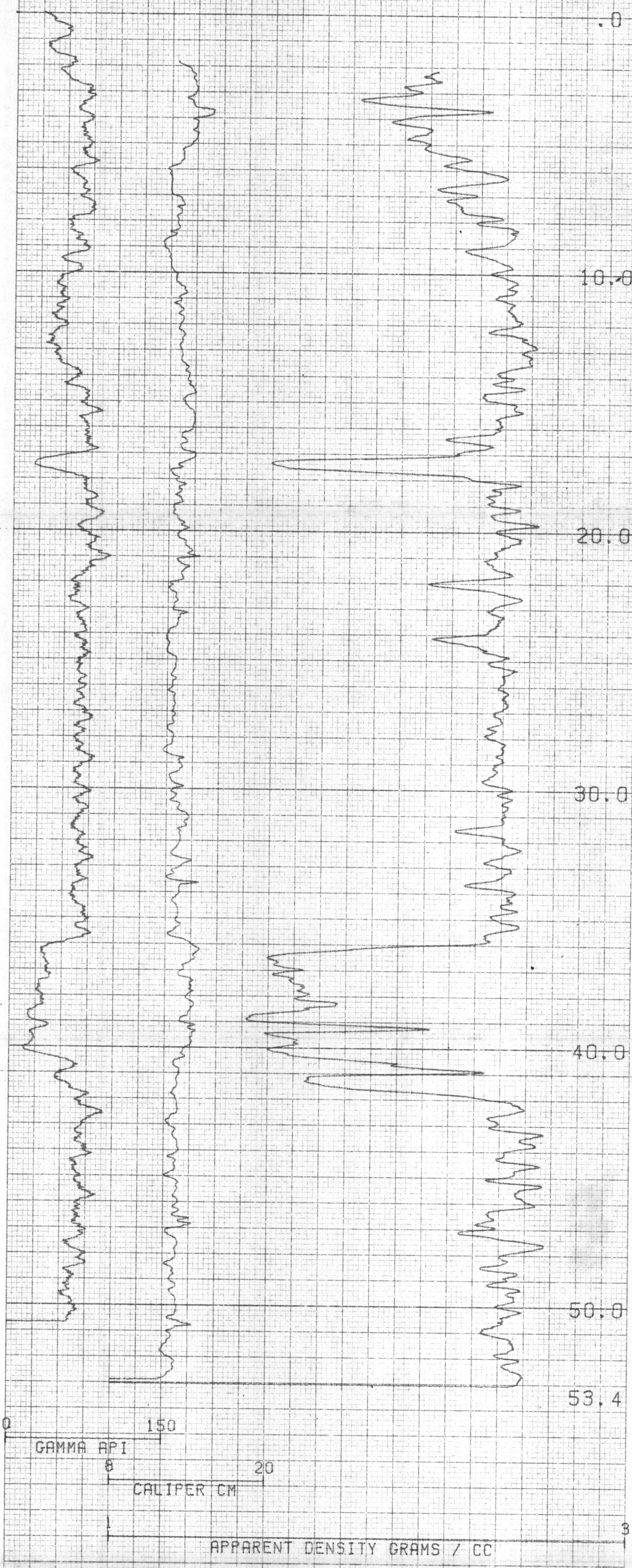
COMPU-LDG V8L2 PLOT 06-26-84
 RDH-84-003-OPEN
 GULF CANADA RES. INC.
 MT. KLAPPAN
 HOLE DIAMETER : 12.1
 PROBE # 9055A - 005
 SENSOR #4 CAL STD CPS = 152
 SENSOR #4 CAL RUN CPS = 237
 SENSOR #4 CAL BIAS = 0
 DATA V8L28 TRUCK # P811
 D. BDMBACK APPL.#1007L1

MS 709

463

461

GR-Mount Klappan 84(3)A



COMPU-LOG V8L2 PLDT 06-27-84
 RDH-84-003-OPEN
 GULF CANADA RES. INC.
 MT. KLAPPAN

HOLE DIAMETER : 12.1
 PROBE # 9030A - 418
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = -24
 DATA V8L2B TRUCK # P811
 D. BOMBACK APPL. #3703L1

~~709~~
709

479

475

VERTICAL DEVIATION

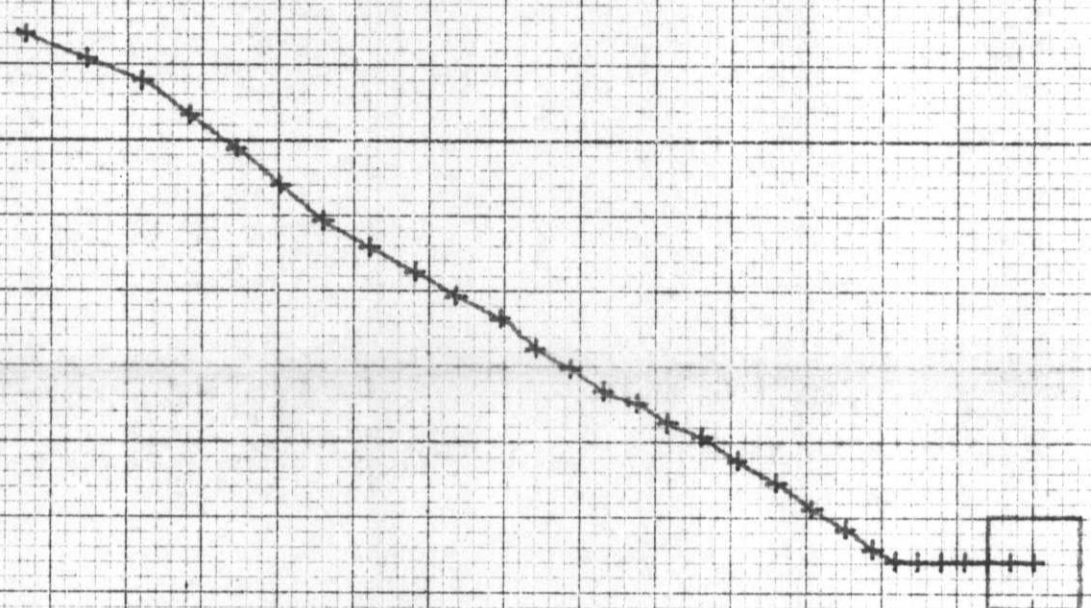
COMPU-LOG V8L1 DEVIATION
DATA FROM : V8L2B

CLIENT : GULF CANADA RES. INC.
LOCATION : MT. KLAPPAN
HOLE ID : RDH-84-003-OPEN
DATE OF LOG : 06-26-84
PROBE : 9055A 0005

SCALE: .50 M/DIV
MAG DECL: 29.5
TRUE DEPTH: 55.7 M
AZIMUTH: 297.3
DISTANCE: 7.59 M

+ = 2.0 M INCR
Δ = TOP OF ZONE
○ = BOTTOM OF ZONE

TRUE NORTH ↑



709

GR Mount Klappan 84(3)A

455



CENTURY GEOPHYSICAL CORPORATION

Tulsa, Oklahoma

BOREHOLE

RDH-84-003

DATE

06-27-84

UNIT/OPERATOR

P811/D. Bomback

FIELD OFFICE

Calgary

COMPANY

Gulf Canada Resources Inc.

BOREHOLE

RDH-84-003--Open

AREA

Mt. Klappan

ELEVATION

COUNTY

STATE

British Columbia

SECTION

TOWNSHIP

RANGE

HOLE DATA

TOTAL DEPTH - DRILLER	: 59.4 m	BIT SIZE	: 12.1 cm
TOTAL DEPTH - LOGGER	: 53.4 m	CASING - TYPE & SIZE	: -----
TOTAL FOOTAGE LOGGED	: 53.4 m	CASING DEPTH	: -----
LOGGING SPEED	: 6.0m/min	BOREHOLE FLUID	: Air & H2o
REFERENCE LEVEL	: Ground	FLUID RESISTIVITY	: ----- @ °F
PROBE NO.	: 9030A-418	SOFTWARE LEVEL	: 8.2*A
		SCALE SELECTION	: <input checked="" type="checkbox"/> OPERATOR <input type="checkbox"/> CLIENT
		Tape 1 TK1	

REMARKS:

EXPANDED 1:40

Smoothing 7,5,5

EQUIPMENT DATA

PROBE MODEL	9010	9020	9050/55	9060
PROBE DIAMETER	1.87"	2.0"	1.87"	1.6"
DETECTOR TYPE	NaI	NaI	NaI	NaI
DETECTOR SIZE	8.75" x 1.25"	1.125" x 4.5"	8.75" x 4.0"	5" x 3.0"
STD. K FACTOR	1.90 x 10 ⁻⁴	---	3.60 x 10 ⁻⁴	1.02 x 10 ⁻⁴
STD. DEADTIME	1 μsec	---	1.10 μsec	1 μsec
CALIB. MODEL LOC.	---	---	---	---
CALIB. DATE	---	---	---	---
K FACTOR x 10 ⁻⁴	---	---	---	---
DEADTIME μsec	---	---	---	---
TEST READING	---	---	---	---
WATER FACTOR	---	---	---	---
CASING FACTOR	---	---	---	---
DETECTOR TYPE	---	NaI	---	NaI
DETECTOR SIZE	---	5" x 1.5"	---	5" x 3.0"
SOURCE TYPE	---	Co ⁶⁰	---	Co ⁶⁰
SOURCE NO.	---	VL-1-283	---	---
SOURCE STRENGTH	---	125mCi	---	---
SOURCE SPACING	---	19 cm	---	---
Cal STD	---	6588	---	---
Cal Run	---	7127	---	---
DETECTOR TYPE	---	---	NaI	---
DETECTOR SIZE	---	---	1.0" x 6.0"	---
SOURCE TYPE	---	---	AmBe	---
SOURCE NO.	---	---	---	---
SOURCE STRENGTH	---	---	---	---
SOURCE SPACING	---	---	---	---
SINGL. PT. RESISTANCE	1.4" D x 2.5" L	---	1.4" D x 2.5" L	1.1" D x 2.5" L
RESISTIVITY	---	0" FOCUSED	---	---
SELF POTENTIAL	YES	---	YES	YES
TEMPERATURE	---	---	YES	---
DEVIATION	---	---	NO / YES	---
CALIPER	---	YES	---	---



CENTURY GEOPHYSICAL CORPORATION

Tulsa, Oklahoma

BOREHOLE

DATE

RDH-84-003

06-27-84

UNIT/OPERATOR

P811/D. Bomback

FIELD OFFICE

Calgary

COMPANY

Gulf Canada Resources Inc.

BOREHOLE

RDH-84-003--Open

AREA

Mt. Klappan

ELEVATION

COUNTY

STATE

British Columbia

SECTION

TOWNSHIP

RANGE

HOLE DATA

TOTAL DEPTH — DRILLER	: 59.4 m	BIT SIZE	: 12.1 cm
TOTAL DEPTH — LOGGER	: 56.4 m	CASING — TYPE & SIZE	: -----
TOTAL FOOTAGE LOGGED	: 56.4 m	CASING DEPTH	: -----
LOGGING SPEED	: 6.0m/min	BOREHOLE FLUID	: Air & H2o
REFERENCE LEVEL	: Ground	FLUID RESISTIVITY	: ----- @ °F
PROBE NO.	: 9055A-005	SOFTWARE LEVEL	: 8.2*A
		SCALE SELECTION	: <input checked="" type="checkbox"/> OPERATOR <input type="checkbox"/> CLIENT
		Tape 1 TK 2	

REMARKS:

EQUIPMENT DATA

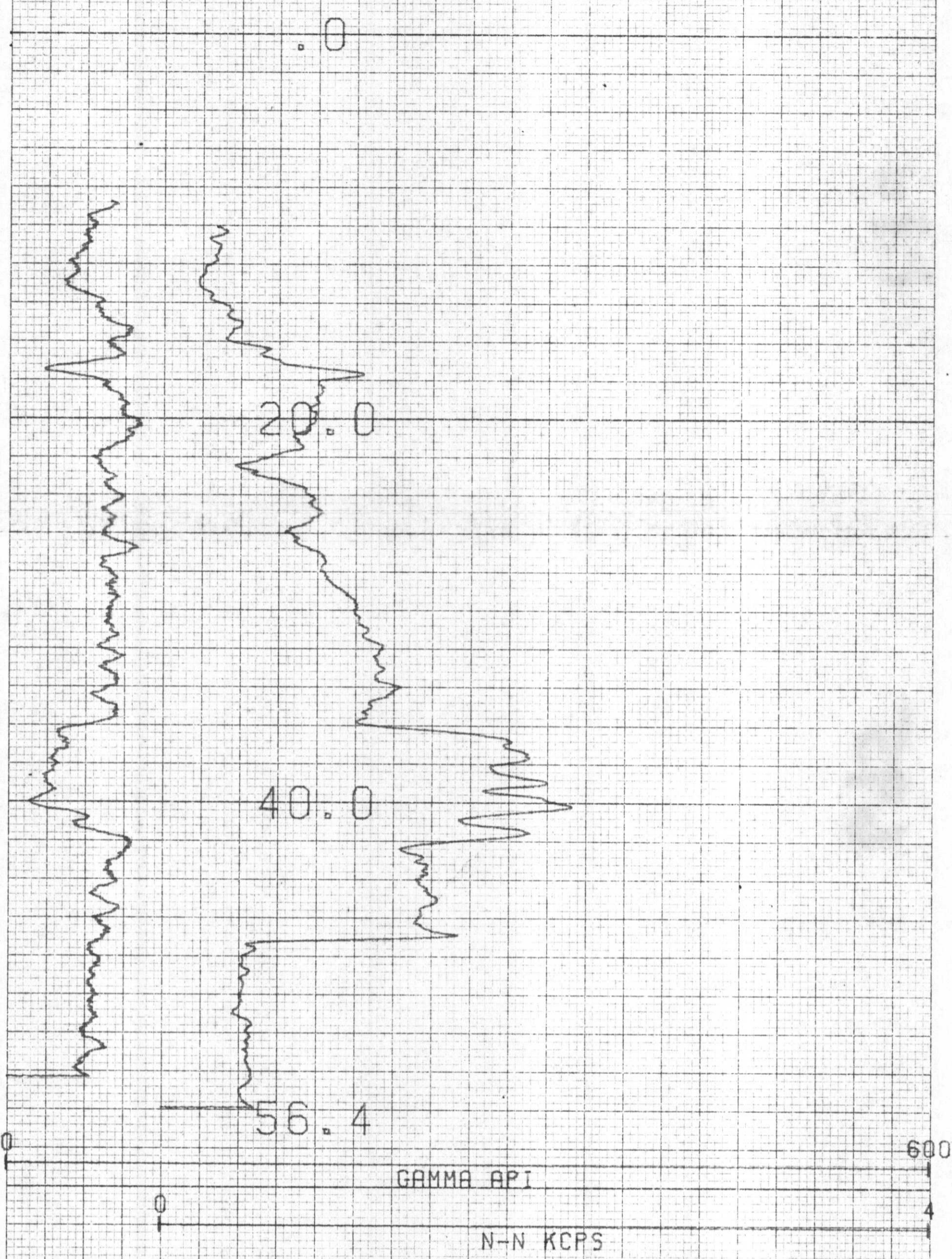
PROBE MODEL	9010	9030	9050/55	9060
PROBE DIAMETER	1.87"	2.0"	1.87"	1.4"
DETECTOR TYPE	Nal	Nal	Nal	Nal
DETECTOR SIZE	.875" x 1.25"	1.125" x 4.5"	.875" x 4.0"	.5" x 3.0"
STD. K-FACTOR	1.50 x 10 ⁻⁵	—	550 x 10 ⁻⁵	1.62 x 10 ⁻⁵
STD. DEADTIME	1.22 sec	—	1.10 μsec	1.22 sec
CALIB. MODEL LOC.	—	—	—	—
CALIB DATE	—	—	—	—
K-FACTOR x 10 ⁻⁵	—	—	—	—
DEADTIME μsec	—	—	—	—
TEST READING	—	—	—	—
WATER FACTOR	—	—	—	—
CASING FACTOR	—	—	—	—
DETECTOR TYPE	—	Nal	—	Nal
DETECTOR SIZE	—	5" x 1.5"	—	5" x 3.0"
SOURCE TYPE	—	Cs ¹³⁷	—	Cs ¹³⁷
SOURCE NO.	—	—	—	—
SOURCE STRENGTH	—	—	—	—
SOURCE SPACING	—	—	—	—
DETECTOR TYPE	—	—	He ³	—
DETECTOR SIZE	—	—	1.0" x 6.0"	—
SOURCE TYPE	—	—	AmBe	—
SOURCE NO.	—	—	1-1-264	—
SOURCE STRENGTH	—	—	1 Ci	—
SOURCE SPACING	—	—	45.7 cm	—
Ca1 Std	—	—	152	—
Ca1 Run	—	—	237	—
SNGL. PT RESISTANCE	1.4"D x 2.5'L	—	1.4"D x 2.5'L	1.1"D x 2.5'L
RESISTIVITY	—	8" FOCUSED	—	—
SELF POTENTIAL	YES	—	YES	YES
TEMPERATURE	—	—	YES	—
DEVIATION	—	—	NO / YES	—
CALIPER	—	YES	—	—

NATURAL GAMMA

DENSITY

NEUTRON

GR Mount Klappan 84(3)A



COMPU-LOG V8L2 PLDT 06-26-84

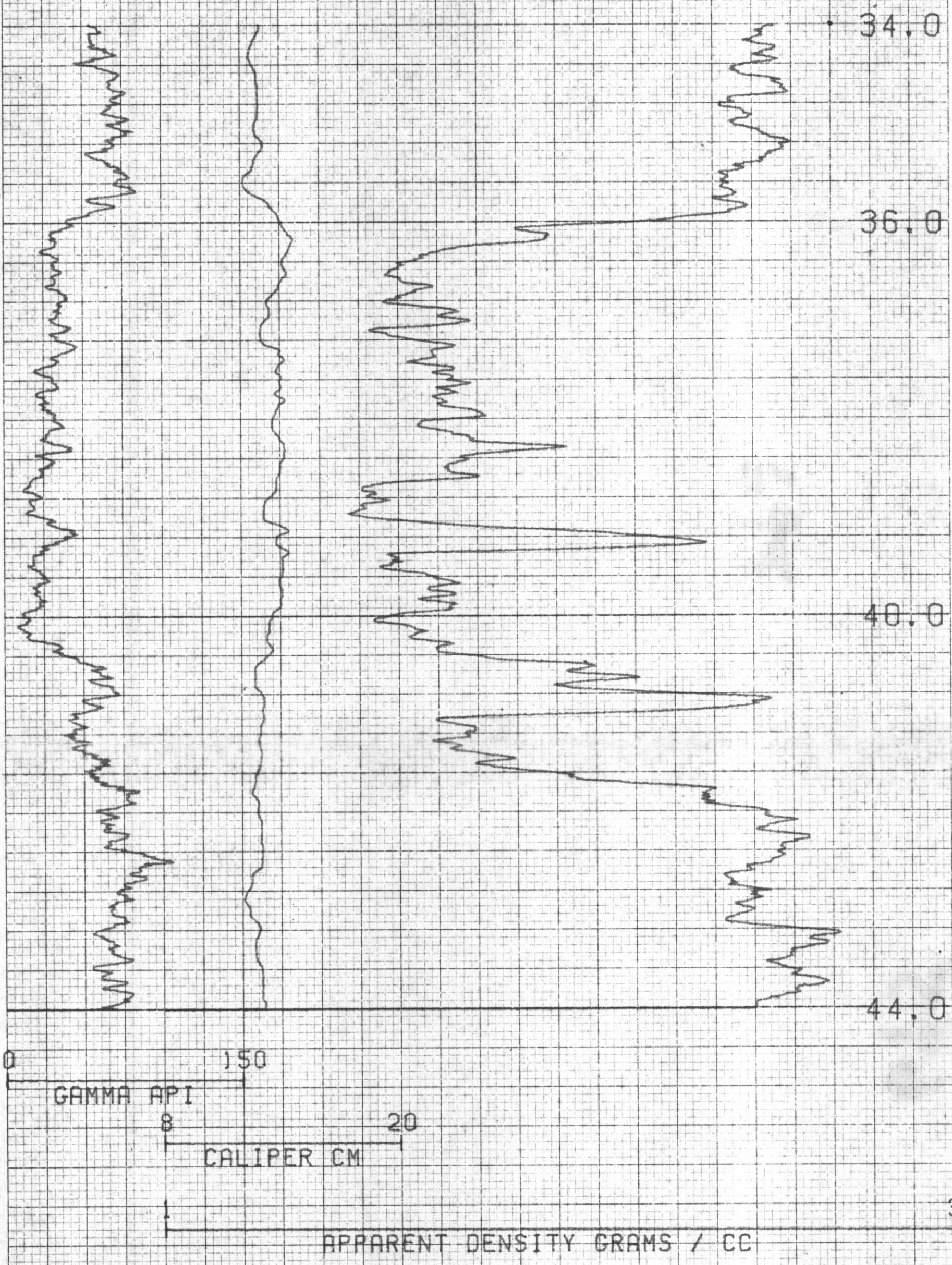
RDH-84-003-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

HOLE DIAMETER : 12.1
 PROBE # 9055A - 005
 SENSOR #4 CAL STD CPS = 152
 SENSOR #4 CAL RUN CPS = 237
 SENSOR #4 CAL BIAS = 0
 DATA V8L2B TRUCK # P811
 D. BOMBACK APPL. #1007L1

~~55~~
709

GR-Mount Klappan 84(3)A

COPY - EXPANDED SCALE



COMPU-LOG V8L2 PLOT 06-27-84

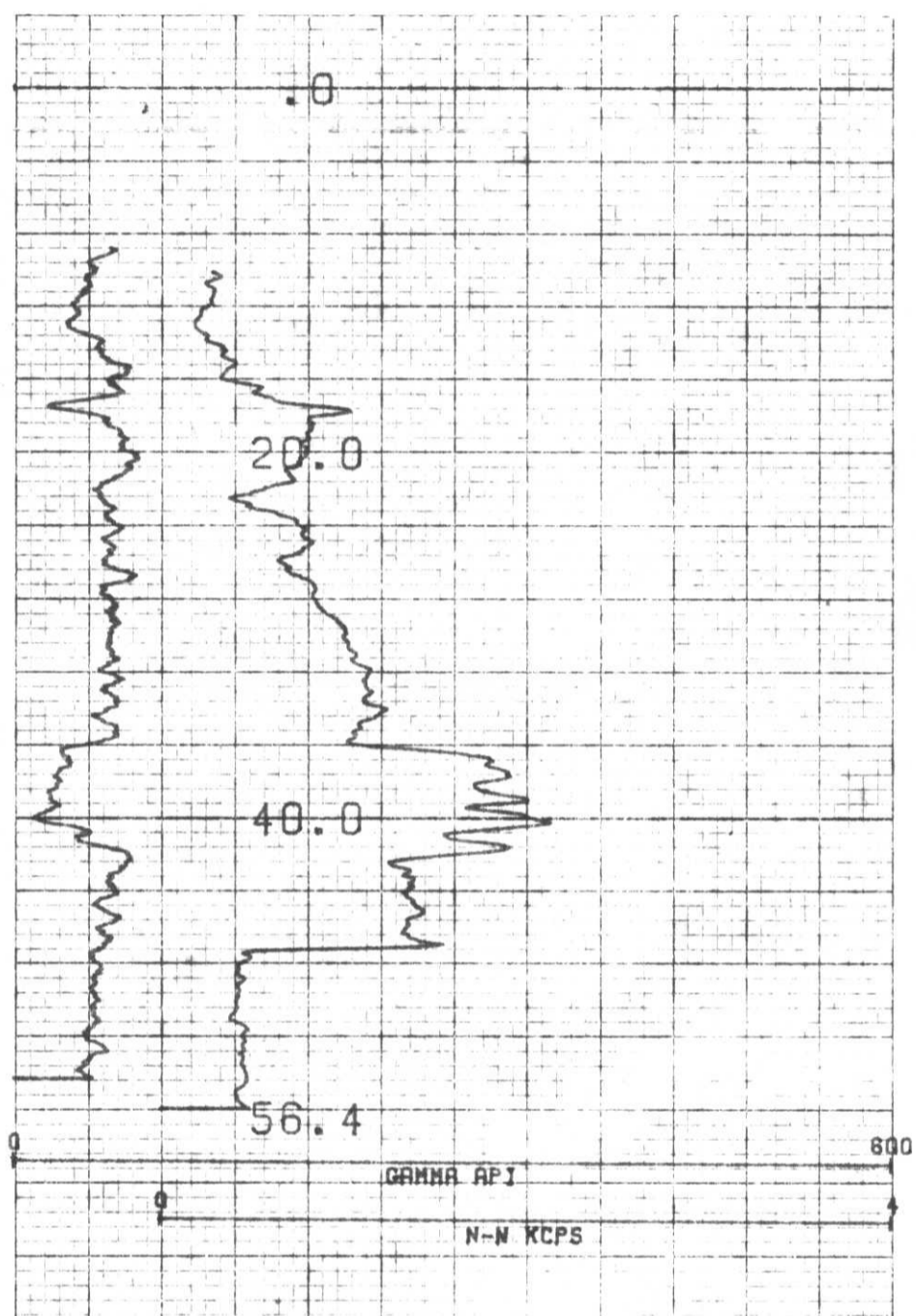
RDH-84-003-OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

HOLE DIAMETER : 12.1
 PROBE # 9030A - 410
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = -24
 DATA V8L2B TRUCK # P011
 D. BOMBACK APPL. #3703L1

SMOOTHING 7, 5, 5

~~575~~ 709

475



CDRPU-06 Vol 2 PLOT 00-26-84

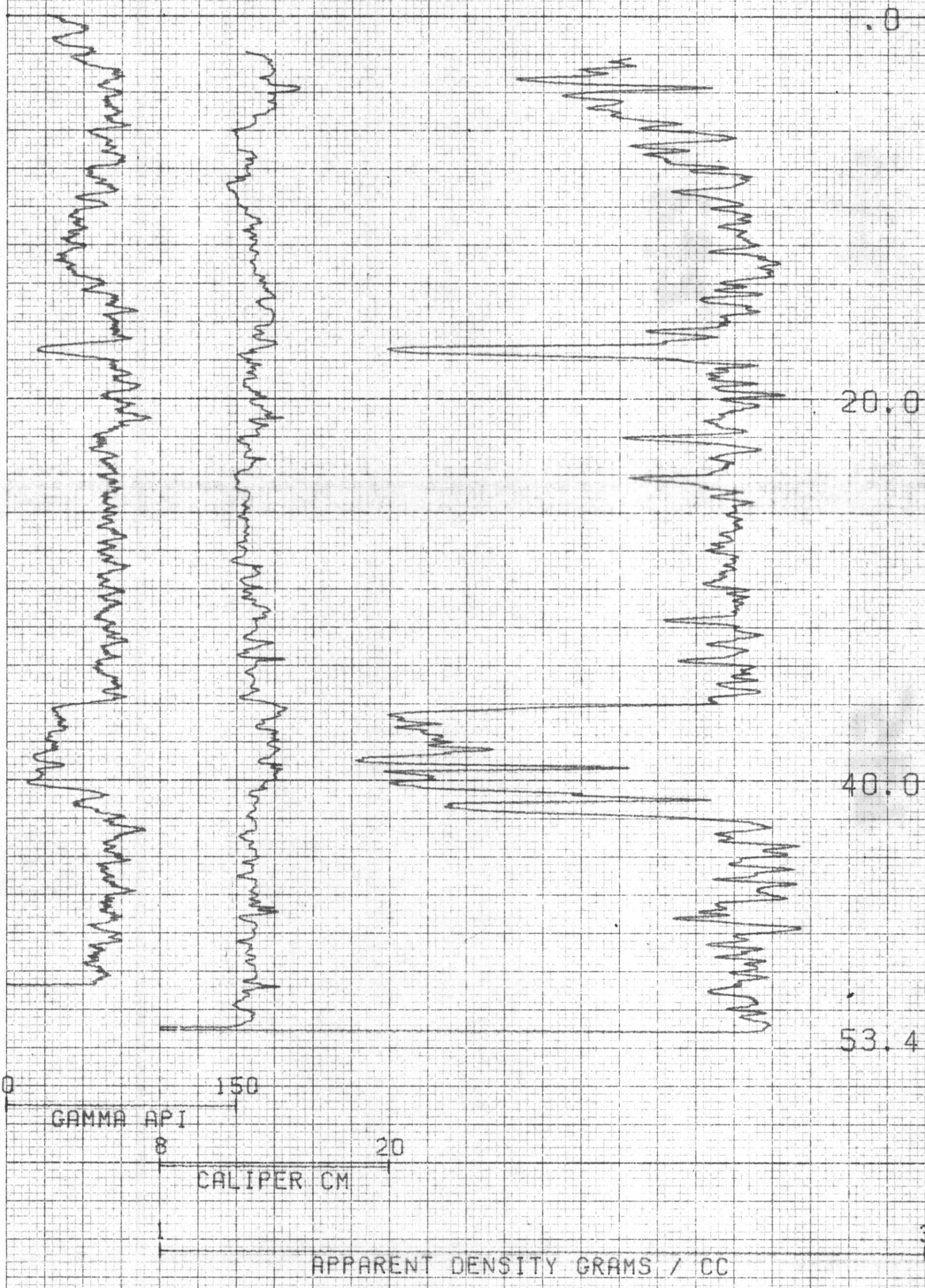
RDH-84-003-OPEN
 GULF CANADA RES. INC.
 MT. KLAPPAN

WELL DIAMETER 12.1
 PROBE - 9058A - 005
 SENSOR #1 CAL STD CPS = 152
 SENSOR #1 CAL RUN CPS = 237
 SENSOR #1 CAL BIAS = 0
 DATA VOL 26 TRUCK # P011
 D. SANDRICK APPL#10071

GR-Mount Klappan 84(3)A

~~88~~ 709

COPY - REDUCED SCALE



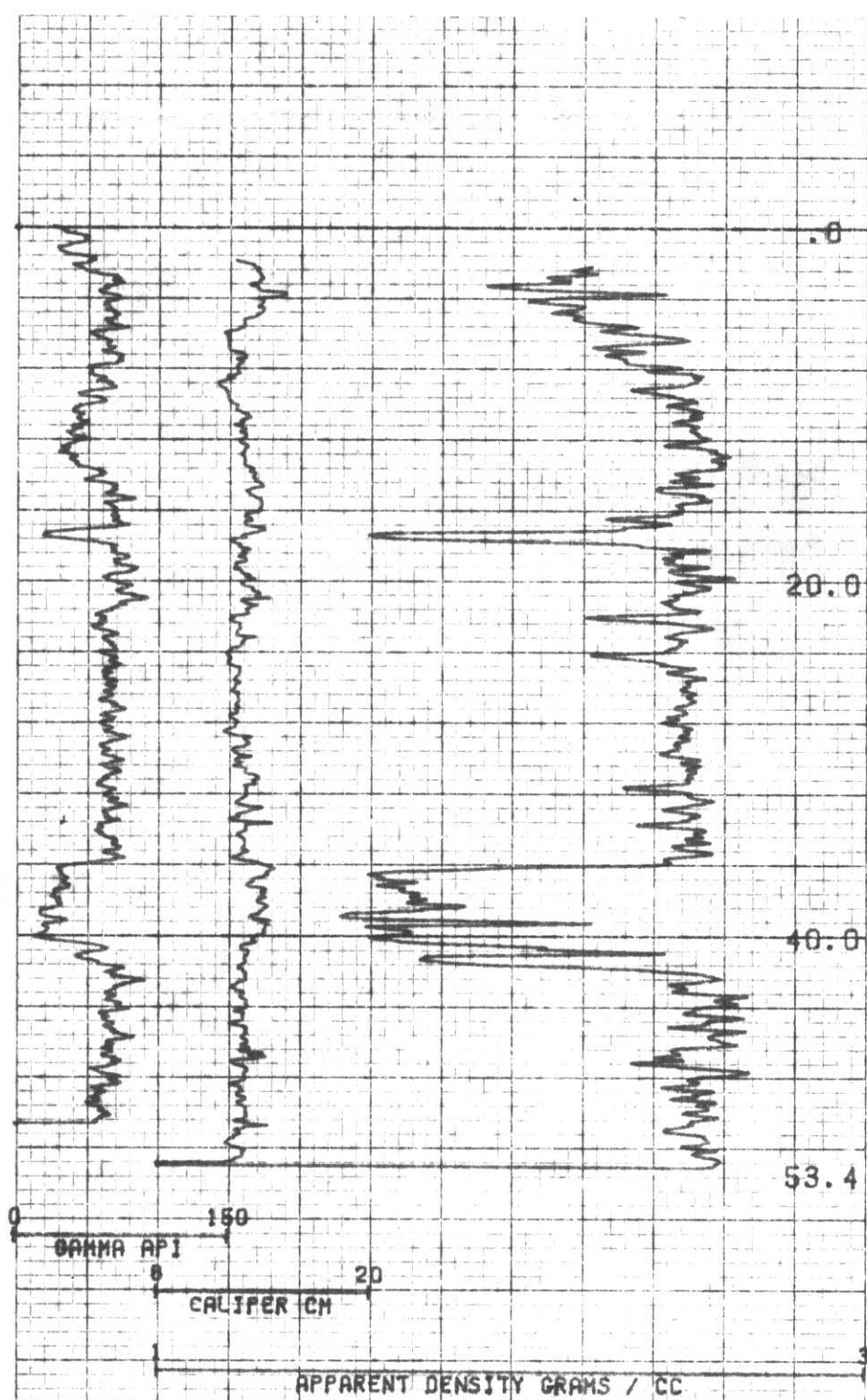
COMPU-LOG V8L2 PLDT 06-27-84

RDH--84--003--OPEN
GULF CANADA RES. INC.
MT. KLAPPAN

HOLE DIAMETER : 12.1
 PROBE # 9030A - 418
 SENSOR #4 CAL STD CPS = 6588
 SENSOR #4 CAL RUN CPS = 7127
 SENSOR #4 CAL BIAS = -24
 DATA V8L2B TRUCK # P811
 D. BOMBACK APPL. #3703L1

~~709~~
709

455



CRP-U-1.00 VOL2 PLOT 08-27-84

RDH-84-003-OPEN
 GULF CANADA RES. INC.
 MT. KLAPPAN

HOLE DIAMETER : 12.1
 PADDC # 80308 - 418
 SENSOR #1 CAL STD CPS = 6588
 SENSOR #1 CAL RUN CPS = 7127
 SENSOR #1 CAL BIAS = -24
 DATA VOL28 TRUCK # F011
 D. SONDRICK APPL. # 703 LI

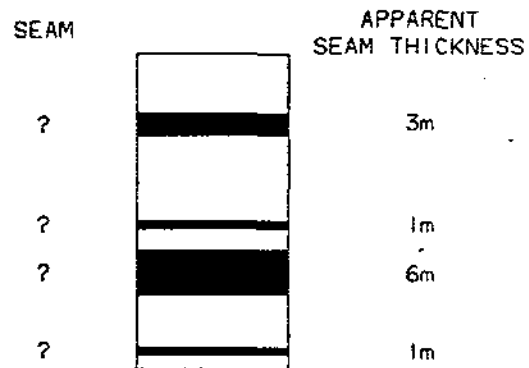
GR-Mount Klappan 84(3)A

~~709~~
 709

COPY
 REDUCED
 SCALE

KPNLRRDH 84004

MOUNT KLAPPAN COAL PROPERTY
LOST-FOX AREA
ROTARY DRILL HOLE
KPNLRRDH84004



THICKNESSES ARE APPARENT
NO GEOPHYSICAL LOGS RUN

SCALE 1:1000

GULF CANADA RESOURCES INC.
12/12/84



- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRRDH84004

DATE - 12/02/84

- HISTORY -

START DATE - 06/28/84
 END DATE - 06/28/84

CONTRACTOR - DENHAM DRILLING OPERATOR - GCR1
 GEOLOGIST - DUFORDJENNER SURVEYOR -

REMARKS - ALTERNATE WASTE DUMP SITE. FAILED ATTEMPT TO LOG D
 UE TO CAVING MINOR COALY STRINGERS. CASING LEFT IN
 HOLE. THICKNESSES ARE APPARENT.

- LOCATION -

PROVINCE - BC	ZONE - 9
ELEVATION - 1707.32	NORTHING - 6342797.00
LICENCE/LEASE NUMBER - 7149	EASTING - 504315.00
	LATITUDE - 0
	LONGITUDE - 0

- ORIENTATION -

LENGTH - 44.20	INCLINATION - 0.0
	AZIMUTH - 0.0
HOLE SIZE - 120.7	

CEMENT - N	CASING DEPTH (M) - 4.57
PLUG - N	AQUIFER DEPTHS (M) - 0.00
PIEZ -	0.00
	LOST CIRC. DEPTHS (M) - 0.00
	0.00

*** NOTE *** 0 INDICATES NO VALUE



KPNLRRDH 84004

DESCRIPTIVE LOG

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84004

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	1.52	1.52			CLAYSTONE	LT.BN TOPSOIL. ROOTS PRESENT. SOME IRON STAINING. POORLY CONSOLIDATED.
	1.52	3.04	1.52			CLAYSTONE	LT.BN WEATHERED.
	3.04	4.56	1.52			SILTSTONE	CLYY.M.GY MINOR WEATHERING.
	4.56	6.08	1.52			CLAYSTONE	M.GY POORLY CONSOLIDATED CLAY; VERY FINE GRAIN SHINEY METALLIC GRAIN - UNKNOWN IDENTITY
	6.08	7.60	1.52			CLAYSTONE	SLTY.M.GY MODERATE TO WELL CONSOLIDATED. VERY FINE COAL CHIPS INCORPORATED IN CLAYSTONE. SOME CARBONACEOUS CLAYSTONE CHIPS.
	7.60	9.12	1.52			CLAYSTONE	SLTY.DK.GY SOME COAL CHIPS PRESENT; SOME IRON STAINING; SOME CARBONACEOUS CLAYSTONE; VERY FINE GRAIN; PRISMATIC SNOWFLAKE SHAPED CARBONATES ON CLAYSTONE

* DENOTES MEASURED BCA

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84004

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	9.12	10.64	1.52			COAL	C-3.DK.BLK.LAM CALCITE VEINING AND CRYSTALS PRESENT ON COAL. FINE LAMINATIONS ON COAL. COAL (C1/C3) VARYING GRADES OF COAL. CONCHOIDAL FRACTURE.
	10.64	12.16	1.52			COAL	C-3.M.BLK SOME CARBONACEOUS CLAYSTONE PRESENT. PYRITE PRESENT ON SOME CHIPS. VARYING GRADES OF COAL (C1/C4). QUARTZ VEINING. CALCITE CRYSTALLIZATION PRESENT.
	12.16	13.68	1.52			CLAYSTONE	CARB.DK.GY COAL CHIPS PRESENT (C3/C4). COAL STRINGER PRESENT. QUARTZ VEINING AND CARBONATE CRYSTALLIZATION PRESENT.
	13.68	15.20	1.52			CLAYSTONE	CARB CARBONATE CRYSTALLIZATION AND QUARTZ PRESENT; VERY FINE COAL CHIPS PRESENT
	15.20	16.72	1.52			CLAYSTONE	M.BLK COAL CHIPS (C4) AND STRINGERS PRESENT IN COAL. SOME CARBONATE CRYSTALLIZATION PRESENT.

* DENOTES MEASURED BCA

2

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84004

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	16.72	18.24	1.52			CLAYSTONE	CARB.M.BLK SOAPY FEELING WHEN WET. COAL CHIPS AND STRINGERS IN CLAYSTONE. CARBONATE CRYSTALLIZATION PRESENT. PYRITE ALSO PRESENT ASSOCIATED WITH CALCITE AND QUARTZ.
	18.24	19.76	1.52			CLAYSTONE	CARB.M.GY.LAM CARBONATES. FINE LAMINAE. COAL CHIPS PRESENT (C2/C3). CARBONATES MODIFIED. COLOUR
	19.76	21.28	1.52			CLAYSTONE	CARB.DK.GY.LAM SOAPY WHEN WET; SMALL NUMBER OF COAL CHIPS PRESENT (C-3); FINE LAMINAE
	21.28	22.80	1.52			CLAYSTONE	CARB.DK.GY MODERATE TO POORLY CONSOLIDATED CLAYSTONE. SOME COAL CHIPS PRESENT.
	22.80	24.32	1.52			COAL	C-5.M.BLK CARBONATES PRESENT ON C-5 COAL CHIPS. ALSO CARBONACEOUS CLAY PRESENT.
	24.32	25.84	1.52			CLAYSTONE	CARB.M.BLK CARBONATE; COAL CHIPS C-2/C-5 AND CARBONACEOUS CLAYSTONE PRESENT.
	25.84	27.36	1.52			CLAYSTONE	CARB.DK.GY COAL CHIPS C-3 PRESENT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84004

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	27.36	28.88	1.52			COAL	C-4.M.BLK LESS SHINEY; DULLER SURFACE; CARBONATE CRYSTALLIZATION ALSO PRESENT.
	28.88	30.40	1.52			COAL	C-4.M-DK.BLK 50% COAL; 50% CARBONACEOUS CLAYSTONE. COAL-C3/C4.
	30.40	31.92	1.52			CLAYSTONE	CARB.LT-M.BLK COAL CHIPS ALSO PRESENT-C3. COAL STRINGERS ALSO PRESENT. MAJOR AMOUNTS OF CARBONATE CRYSTALLIZATION.
	31.92	33.44	1.52			COAL	C-3.BLK CARBONACEOUS CLAYSTONE AND CARBONATES PRESENT.
	33.44	34.96	1.52			COAL	C-4.BLK ABUNDANT PYRITE ON COAL CHIPS; VERY DULL LUSTRE COAL; 50% VERY FINE GRAIN SILTSTONE; GRITTY; CARBONATE CRYSTALS ON COAL
	34.96	36.48	1.52			SILTSTONE	CLYY.M.BLK 50% PYRITE COAL AND ABUNDANT CARBONATE CRYSTALLIZATION.

* DENOTES MEASURED BCA

FORM 4001

84/12/06

GULF CANADA RESOURCES INC. - COAL DIVISION - DESCRIPTIVE LOG

PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: RDH84004

BCA	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	36.48	38.00	1.52			SILTSTONE	M.BLK 50% COAL CHIPS SOME CALCITE CRYSTALLIZATION. C1/C4 SHINEY TO DULL COAL CHIPS ONE LARGE PYRITE FRAGMENT.
	38.00	39.52	1.52			SILTSTONE	LT-M.BLK PYRITE CHIPS PRESENT. CALCITE PRESENT. 50% COAL CHIPS(C1/C3). GRITTY SILTSTONE
	39.52	41.04	1.52			COAL	C-3.M.BLK COAL CHIPS (C-2/C-3); SILTSTONE CHIPS ; SOME WEATHERING AND IRON STAINING
	41.04	42.56	1.52			SILTSTONE	M-DK.GY.LAM CARBONATE CRYSTALLIZATIONS. IRON STAINING. 25% COAL CHIPS-C3. MINOR LAMINAE AND BANDING.
	42.56	44.08	1.52			ROCK LOSS	NO CUTTINGS RECOVERED.

* DENOTES MEASURED BCA
NEWPAGE

GR-Mount Klappan 84(3)A

709 ~~575~~

GULF CANADA RESOURCES INC.
 COAL DIVISION
 KLAPPAN PROJECT
 STRATIGRAPHIC LOG
 KPN LR RDH84004

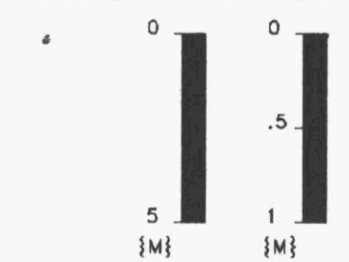
GEOLOGIST : DUFORDJENNER

DATE : DEC 04/84

DRAWING NO. :

LITHOLOGIC SYMBOLS

SCALE : 1:200 1:40



NORTHING: 6342797.0 N
 EASTING: 504315.0 E

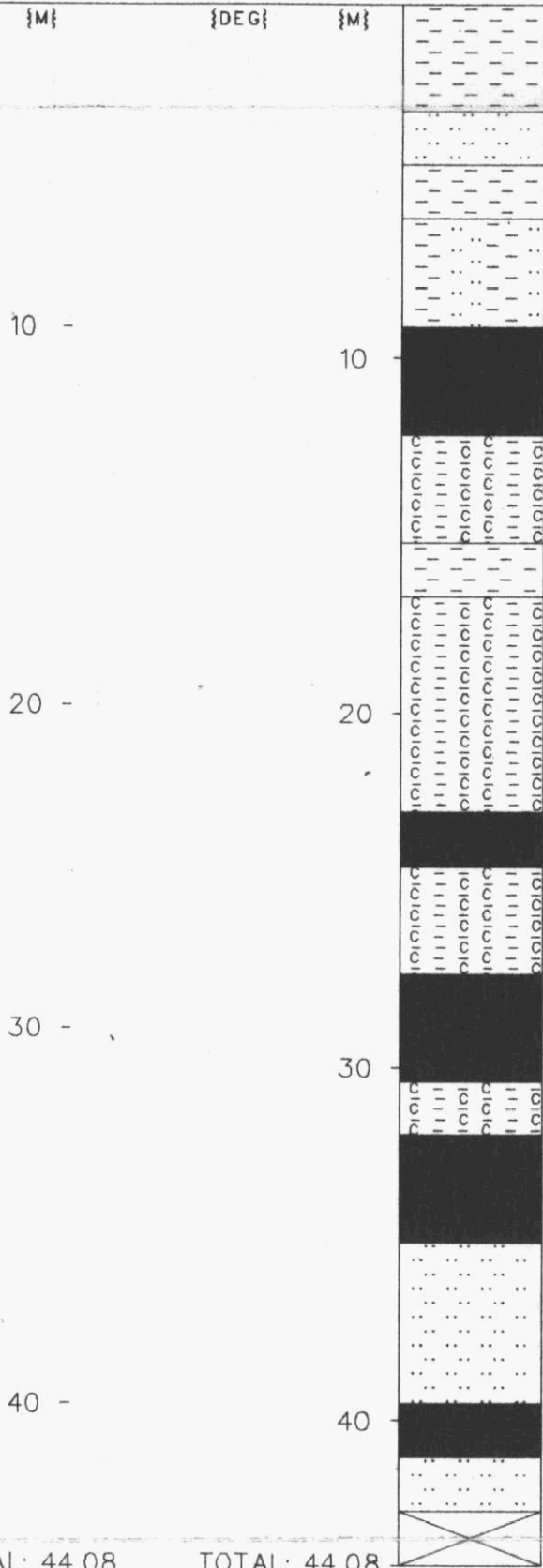
	SANDSTONE		BENTONITE
	SILTSTONE		BRECCIA
	COAL		CARBONACEOUS
	OVERBURDEN		QUARTZ
	MUDSTONE, CLAYSTONE		PYRITE
	TUFF		FERRUGINOUS
	LIMESTONE		CONGLOMERATE
	CORE LOSS		FOSSIL BED

DRILLED DEPTH
 {M}

BCA
 {DEG}

TRUE DEPTH
 {M}

1:200



TOTAL: 44.08 TOTAL: 44.08

REMARKS :
 NO GEOPHYSICAL LOGS RUN.

KPNLRRDH 84005

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRRDH84005

DATE - 12/02/84

- HISTORY -

START DATE - 06/28/84
END DATE - 06/28/84

CONTRACTOR - DENHAM DRILLING
GEOLOGIST - DUFORDJENNER

OPERATOR - GCRI
SURVEYOR -

REMARKS - TWINNED TOP OF RDH84002 . CORED 2.74m TO 5.49m - B
CA APPROXIMATELY 45 DEGREES. NO LOGS RUN.

- LOCATION -

PROVINCE - BC
ELEVATION - 1832.50

ZONE - 9
NORTHING - 6344137.00
EASTING - 505803.00

LICENCE/LEASE NUMBER - 7152

LATITUDE - 571432
LONGITUDE - 1285414

- ORIENTATION -

LENGTH - 5.49

INCLINATION - 82.0
AZIMUTH - 308.0

WOLE SIZE - 130.2

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 3.05
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE

=====

KPNLRRDH 84006

===== GULF CANADA RESOURCES INC. =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRRDH84006

DATE - 12/02/84

- HISTORY -

START DATE - 06/28/84

END DATE - 06/29/84

CONTRACTOR - DENHAM DRILLING

GEOLOGIST - DUFORDJENNER

OPERATOR - GCRI

SURVEYOR -

REMARKS - ATTEMPTED TO CORE AND TWIN RDH84001. FAILED DUE TO SEVERE HOLE DEVIATION. NO LOGS RUN. OVERBURDEN 1.07 M.

- LOCATION -

PROVINCE - BC
ELEVATION - 1825.50

ZONE - 9
NORTHING - 6344147.00
EASTING - 505965.00

LICENCE/LEASE NUMBER - 7152

LATITUDE - 571432
LONGITUDE - 1285404

- ORIENTATION -

LENGTH - 36.57

INCLINATION - 0.0

AZIMUTH - 0.0

HOLE SIZE - 130.2

CEMENT - N

PLUG - N

PIEZ -

CASING DEPTH (M) - 3.05

AQUIFER DEPTHS (M) - 0.00

0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

*** NOTE *** 0 INDICATES NO VALUE

=====

KPNLRRDH 84007

MOUNT KLAPPAN COAL PROPERTY
LOST-FOX AREA
ROTARY DRILL HOLE
KPNLRRDH84007

SEAM

1



APPARENT
SEAM THICKNESS

3m

THICKNESSES ARE APPARENT
NO GEOPHYSICAL LOGS RUN

SCALE 1:1000

GULF CANADA RESOURCES INC.
13/12/84



- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRRDH84007

DATE - 12/02/84

- HISTORY -

START DATE - 06/29/84
 END DATE - 06/29/84

CONTRACTOR - DENHAM DRILLING OPERATOR - GCR1
 GEOLOGIST - DUFORDJENNER SURVEYOR -

REMARKS - HOLE APPARENTLY DRILLED SLUMP FEATURES; OVERBURDEN
 TO 28.95m COALY INTERVAL: 1.52m TO 3.35m. COAL AT
 28.89M TO 29.86M. ABANDONED DUE TO CAVING. UNCONSO
 LIDATED SAND AT 9.14m. NO LOGS RUN. THICKNESSES ARE
 APPARENT.

- LOCATION -

PROVINCE - BC	ZONE - 9
ELEVATION - 1780.16	NORTHING - 6344094.00
	EASTING - 506095.00
LICENCE/LEASE NUMBER - 7151	LATITUDE - 571430
	LONGITUDE - 1285356

- ORIENTATION -

LENGTH - 29.86	INCLINATION - 0.0
	AZIMUTH - 0.0
HOLE SIZE - 120.7	
CEMENT - N	CASING DEPTH (M) - 6.10
PLUG - N	AQUIFER DEPTHS (M) - 0.00
PIEZ -	0.00
	LOST CIRC. DEPTHS (M) - 0.00
	0.00

*** NOTE *** 0 INDICATES NO VALUE

