

**KPNLRDDH86027**

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86027

DATE - 02/13/87

- HISTORY -

START DATE - 19/09/86

END DATE - 21/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - BARKER

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1672.19

LICENCE/LEASE NUMBER -

ZONE - 9

NORTHING - 6343060.00

EASTING - 505969.06

LATITUDE - 571357

LONGITUDE - 1285404

- ORIENTATION -

LENGTH - 172.81

CORE SIZE - 0.0

INCLINATION - 90.0

AZIMUTH - 0.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 4.57

AQUIFER DEPTHS (M) - 0.00

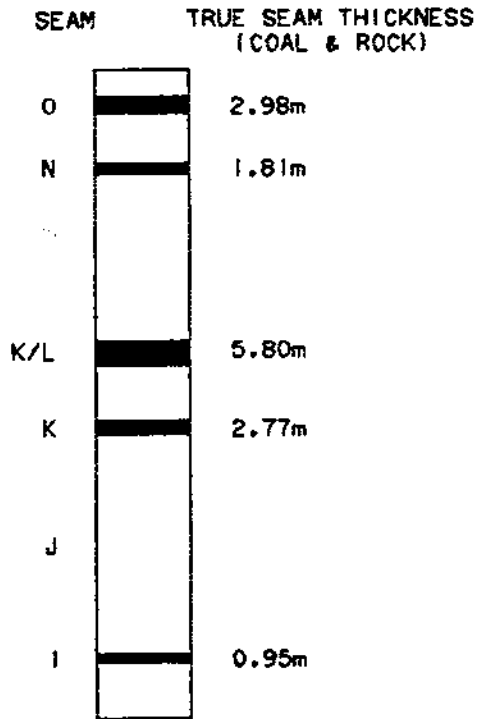
0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

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NOTE:

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86027

GULF CANADA CORPORATION  
11/03/87  
KLAP:[205057]870063027.L06



PROJECT: KPW BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	4.57	4.57	60			OVERBURDEN	CASING
1	4.57	4.83	0.26	60			OVERBURDEN	DK. BN. PHRD MUSH. SLUMP FROM UPHOLE. OCC VITRINITE SPECKS. DVBDN.
1	4.83	8.44	3.61	60			ROCK LOSS	
1	8.44	8.56	0.12	60			MUDSTONE	SLTY. M. GY. VBRKN POORLY CONSOLIDATED.
1	8.56	8.59	0.03	60	0		COAL	C-3. BRKN
1	8.59	9.36	0.77	60	0		COAL LOSS	
1	9.36	9.61	0.25	60	10060	0	MUDSTONE	CARB. DK. GY. VBRKN COALY PLANT FRAGS WITHIN.
1	9.61	9.75	0.14	60	10061	0	COAL	C-3. VBRKN
1	9.75	9.85	0.10	60	10061	0	COAL	C-4. VBRKN C-2. BANDS WITHIN.
1	9.85	9.94	0.09	60	10061	0	COAL	C-5. VBRKN

\* DENOTES MEASURED BCA

PROJECT: KPW BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
1	9.94	10.11	0.17	60	10061	0	ROCK LOSS	
1	10.11	10.25	0.14	60	10061	0	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
1	10.25	10.36	0.11	60	10061	0	COAL	C-2. SHRD PARTIALLY POWDERED.
1	10.36	11.01	0.65	60	10061	0	COAL LOSS	
2	11.01	11.04	0.03	60	10061	0	MUDSTONE	CARB. DK. GY. SLD
2	11.04	11.16	0.12	60	10061	0	COAL	C-3. SHRD 45 DEGREES CONTACT WITH MUDST.
2	11.16	12.00	0.84	60	10061	0	COAL LOSS	MUDDY BANDS THROUGHOUT.
2	12.00	12.15	0.15	60	10062		MUDSTONE	SLTY. DK. GY. SLD QTZ & COALY STRINGERS WITHIN.
2	12.15	12.38	0.23	60	10062		MUDSTONE	CARB. DK. GY. VBRKN SHEARED. UPPER 10CM SAMPLED.
2	12.38	12.67	0.29	60			ROCK LOSS	
2	12.67	12.71	0.04	60			COAL	C-3. SLD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: ODH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
2	12.71	13.03	0.32	60			MUDSTONE	M-DK.GY.BRKN
2	13.03	13.06	0.03	60			ROCK LOSS	
2	13.06	13.20	0.14	60			MUDSTONE	M-DK.GY.BRKN
2	13.20	13.22	0.02	60			COAL	C-4.SLD
2	13.22	13.70	0.48	60			MUDSTONE	CARB.DK.GY.BRKN COALY STRINGERS WITHIN.
2	13.70	13.75	0.05	60			COAL	C-3.SLD
2	13.75	13.90	0.15	60			ROCK LOSS	
3	13.90	14.35	0.45	60			MUDSTONE	DK.GY.MAS.VBRKN POORLY CONSOLIDATED. OCC COALY STRINGER S. NEAR TOP. MINOR QTZ. VEINING.
3	14.35	15.02	0.67	*60			MUDSTONE	M.GY.LAM.VBRKN OCC POORLY CONSOLIDATED BANDS. FINE DAR K ORGANIC-RICH LAMINAE IN SOME AREAS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: ODH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	15.02	15.41	0.39	60			MUDSTONE	DK.GY.MAS.VBRKN POORLY CONSOLIDATED. FINE COALY STREAKS THROUGHOUT. LISTRIC SURFACES.
4	15.41	17.20	1.79	60			MUDSTONE	DK.GY.LAM.VBRKN FINE SILTY LAMINAE THROUGHOUT. NUMEROUS COALY STREAKS THROUGHOUT (ABUNDANT COA LIFIED PLANT WASH).
5	17.20	17.61	0.41	60			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.VBRKN INTERLAYERED MG SAND AND DARK SILT.
5	17.61	18.95	1.34	60			SANDSTONE	SLTY.MG.VPR.M.GY.LAM.VBRKN SILT BANDS ARE V FINE LAMINAE. SAND LAY ERS ARE MOSTLY MG.
6	18.95	19.54	0.59	60			SANDSTONE	SLTY.MG.VPR.M.GY.LAM.BRKN LITH AS ABOVE.
6	19.54	20.42	0.88	60			SILTSTONE	SSY.VPR.DK.GY.VTHNB.BRKN FINE SANDY LAMINAE THROUGHOUT. LESS SAN D DOWNWARD.
6	20.42	20.72	0.30	60			SILTSTONE	DK.GY.MAS.VBRKN LESS SAND THAN ABOVE.
7	20.72	21.82	1.10	60			SILTSTONE	DK.GY.VTHNB.BRKN AS ABOVE BUT WITH FAINT BEDDING VISIBLE.

\* DENOTES MEASURED BCA

87/03/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
7	21.82	22.84	1.02	*60			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. XBDG. BRKN V FINELY LAMINATED THROUGHOUT. NUMEROUS DARK SILTYLAMINAE. FAIRLY SOFT. WILL W EATHER EASILY.
8	22.84	23.23	0.39	62			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. XBDG. BRKN LITH. AS. ABOVE.
8	23.23	24.68	1.45	*65			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. XBDG. YBRKN LITH. AS. ABOVE.
9	24.68	26.08	1.40	66			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BRKN AS ABOVE. BUT WITH SLIGHTLY FEWER SILT L AMINAE.
9	26.08	26.53	0.45	67	10063		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. YBRKN AS ABOVE. LOWER 25CM SAMPLED.
9	26.53	26.57	0.04	67	10064	N	COAL	C-2. BLK. YBRKN
10	26.57	26.85	0.28	67	10064	N	COAL	C-2. YBRKN
10	26.85	26.97	0.12	67	10064	N	COAL	C-3. BRKN
10	26.97	27.48	0.51	68	10064	N	COAL LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
10	27.48	27.67	0.19	68	10064	N	ROCK LOSS	
10	27.67	27.71	0.04	68	10064	N	MUDSTONE	CARB. DK. GY. SLD
10	27.71	27.88	0.17	68	10064	N	COAL	C-4. BRKN C-2. BANDS WITHIN.
10	27.88	28.12	0.24	68	10064	N	COAL	C-2. BRKN 1CM MUDST. BAND WITHIN.
10	28.12	28.15	0.03	68	10064	N	SILTSTONE	M. GY. SLD
10	28.15	28.20	0.05	68	10064	N	ROCK LOSS	
10	28.20	28.32	0.12	68	10064	N	COAL LOSS	
10	28.32	28.35	0.03	68	10064	N	COAL	C-3. SLD
10	28.35	28.48	0.13	69	10064	N	COAL	C-5. SLD BONE COAL WITH MINOR VITRAIN STRINGERS.
10	28.48	28.91	0.43	69	10065		MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS WITHIN. UPPER 25CM SA MPLED.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
10	28.91	29.18	0.27	69		MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS WITHIN. BECOMES SILTY ER IN PLACES.
11	29.18	31.28	2.10	*70		SILTSTONE	SSY. VPR. H. GY. LAM. SLD NUMEROUS FINE SAND LAMINAE THROUGHOUT. FAIRLY UNIFORM BEDDING. NO GOOD TOPS IN DICATORS.
12	31.28	31.48	0.20	68		SILTSTONE	SSY. VPR. H. GY. LAM. VBRKN LITH AS ABOVE.
12	31.48	31.79	0.31	67		ROCK LOSS	
12	31.79	31.96	0.17	67		SANDSTONE	FG. VPR. LT. GY. LAM. VBRKN MUCH LESS SILT THAN ABOVE.
12	31.96	33.53	1.57	*65		SANDSTONE	MG. PR. LT. GY. LAM. SLD ABUNDANT FINE FLAT LAMINAE IN SAND. COA RSENING TO MG SS DOWNWARD. THREE 2-7CM WIDE BANDS OF FINELY LAM SILTSTONE. FG- MG.
13	33.53	34.96	1.43	*65		SANDSTONE	MG. MEL. LT. GY. LAM. SLD FAINT LAMINAE VISIBLE IN MG SS. RARE MU DST RIPUP CLASTS 5-10MM IN DIAMETER.
13	34.96	35.61	0.65	66		SANDSTONE	MG. MEL. LT. GY. LAM. SLD AS ABOVE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	35.61	37.72	2.11	66		SANDSTONE	MG. MEL. LT. GY. THNB. SLD AS ABOVE WITH HARDLY ANY BEDDING VISIBL E. RARE MUDST RIPUP CLASTS 1-5CM IN DIA
15	37.72	37.91	0.19	67		SANDSTONE	MG. MEL. LT. GY. MAS. SLD V. FAINT BEDDING VISIBLE. LITH AS ABOVE.
15	37.91	39.62	1.71	68		SANDSTONE	MG. MEL. LT. GY. MAS. VBRKN OCC TINY MUDST RIPUP CLASTS 1-3MM ACROS S. OTHERWISE, LITH AS ABOVE.
15	39.62	40.26	0.64	68		ROCK LOSS	
16	40.26	41.26	1.00	69		SANDSTONE	MG. MEL. LT. GY. MAS. BRKN LITH AS ABOVE WITH TINY MUDST RIPUP CLA STS AS WELLAS ONE 4CM ACROSS.
16	41.26	42.17	0.91	69		SANDSTONE	MG. MEL. LT. GY. MAS. BRKN LITH AS ABOVE WITH A BAND 14CM WIDE OF NUMEROUS RIPUP CLASTS AT BASE.
17	42.17	43.94	1.77	*70		SANDSTONE	MG. MOD. LT. GY. VTHNB. VBRKN AS ABOVE WITH ABUNDANT BANDS OF MUDST R IPUP CLASTS.
17	43.94	44.31	0.37	70		ROCK LOSS	

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	44.31	44.38	0.07	70			SANDSTONE	MG.MEL.LT.GY.MAS.VBRKN AS ABOVE WITH NO RIPUPS.
18	44.38	44.75	0.37	70			SANDSTONE	MG.MEL.LT.GY.MAS.BRKN AS ABOVE WITH A LARGE MUDST RIPUP AT BASE.
18	44.75	45.73	0.98	70			CONGLOMERATE	VPR.M.GY.VTHNB.BRKN POLYMICTIC. ALTERNATING BANDS OF CLAST- AND MATRIX-SUPPORTED CONGLOMERATE.
18	45.73	46.43	0.70	70			SANDSTONE	PBLY.MG.VPR.M.GY.VTHNB.SLD GRADATIONAL FROM CONGLOM ABOVE TO MASSIVE MG PBLY SS AT BASE.
19	46.43	47.26	0.83	70			SANDSTONE	PBLY.MG.VPR.M.GY.VTHNB.SLD LITH AS ABOVE.
19	47.26	47.36	0.10	70			SANDSTONE	MG.PR.M.GY.MAS.BRKN RIPPED UP COAL STRINGERS 1-3MM ACROSS THROUGHOUT.
19	47.36	48.56	1.20	70			CONGLOMERATE	VPR.M.GY.MAS.SLD POLYMICTIC. RARE COALY STRINGERS. CLAST- SUPPORTED. BENTONITIC PASTE (LIKE TOOTH PASTE) IN VUGS. CLASTS COARSEN DOWNWARD. 1-20MM IN DIA.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	48.56	50.15	1.59	70			CONGLOMERATE	VPR.M.GY.MAS.VBRKN LITH AS ABOVE. OCC COALY CLAST. CORE TH 1ST OFF AT BASE.
20	50.15	50.51	0.36	70			ROCK LOSS	
20	50.51	50.60	0.09	70			CONGLOMERATE	VPR.M.GY.MAS.VBRKN AS ABOVE. SHARP LOWER CONTACT.
20	50.60	50.69	0.09	70			SILTSTONE	DK.GY.MAS.VBRKN FRAC ZONE OR SLUMP FROM UPHOLE? V POORLY CONSOLIDATED & ANGULAR PIECES.
21	50.69	50.91	0.22	*70			SANDSTONE	FG.MOD.M.GY.LAM.VBRKN OCC DARK SILT BANDS. WITH SHARP CONTACT. S. 4CM BANDS AT TOP & BOTTOM OF SLUMP FROM UPHOLE(?) OR GOUGE(?)
21	50.91	51.16	0.25	69			SILTSTONE	DK.GY.MAS.VBRKN OCC SANDY MOTTLES FROM BIOTURBATION? NO GOOD BEDDING VISIBLE.
21	51.16	52.34	1.18	65			ROCK LOSS	
21	52.34	52.91	0.57	*60			SILTSTONE	DK.GY.LAM.VBRKN AS ABOVE WITH V FAINT BEDDING & VERY MINOR COAL STREAKS.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	52.91	53.25	0.34	60			ROCK LOSS	
21	53.25	53.44	0.19	60			SILTSTONE	DK.GY.LAM.BIOTR.BRKN MOTTILING FROM BIOTURBATION. CORE TWIST OFF.
22	53.44	55.02	1.58	*60			SILTSTONE	DK.GY.LAM.VBRKN AS ABOVE. RARE COALIFIED PLANT HASH STR INGERS.
22	55.02	55.68	0.66	63			ROCK LOSS	
23	55.68	55.99	0.31	64			SILTSTONE	DK.GY.LAM.BIOTR.VBRKN AS ABOVE. BIOTURBATION DISRUPTING BEDDI NG.
23	55.99	56.49	0.50	66			SILTSTONE	DK.GY.MAS.VBRKN AS ABOVE. OCC FAINT LAMINAE. DISRUPTED BEDDING.
23	56.49	57.51	1.02	68			ROCK LOSS	
23	57.51	58.09	0.58	*70			SILTSTONE	DK.GY.LAM.SSD.VBRKN NUMEROUS FINE LIGHT GREY SILTY LAMINAE THROUGHOUT. ONE LOAD CAST SHOWS TOPS UP.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	58.09	58.66	0.57	*65			SILTSTONE	DK.GY.LAM.XBDG.VBRKN AS ABOVE. V FINELY LAM. ONE XBDG SHOWS TOPS UP. UNIFORM BEDDING.
24	58.66	59.84	1.18	65			ROCK LOSS	
24	59.84	60.95	1.11	*65			SILTSTONE	DK.GY.LAM.VBRKN AS ABOVE.
24	60.95	61.52	0.57	65			ROCK LOSS	
24	61.52	61.64	0.12	65			SILTSTONE	DK.GY.LAM.VBRKN AS ABOVE.
25	61.64	63.36	1.72	65			SILTSTONE	DK.GY.LAM.SSD.BRKN LITH AS ABOVE. OCC SSD & VERT WRMBURS SH OW TOPS UP.
25	63.36	63.70	0.34	*65			SILTSTONE	DK.GY.LAM.BRKN AS ABOVE.
26	63.70	64.17	0.47	65			SILTSTONE	DK.GY.LAM.VBRKN AS ABOVE.
26	64.17	64.58	0.41	65			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	64.58	65.67	1.09	65			SILTSTONE	DK.GY.LAM.VBRKN AS ABOVE. BECOMES MORE FRACTURED - ALMOST BRECCIATED AT BASE OF INTERVAL.
27	65.67	66.01	0.34	65			SILTSTONE	DK.GY.LAM.BRKN LITH AS ABOVE. V FRACTURED.
27	66.01	67.56	1.55	65			SILTSTONE	DK.GY.LAM.VBRKN LITH AS ABOVE WITH A 6CM BAND OF SILTY CLAY FRACTURE FILL, GOUGE(?) OR SLUMP FROM UPHOLE. NUMEROUS FRACTURES.
27	67.56	68.01	0.45	65			ROCK LOSS	
28	68.01	68.96	0.95	65			SILTSTONE	DK.GY.LAM.XBDG.VBRKN LITH AS ABOVE. FRAC ZONE? HIGHLY FRACTURED WITH MUCH CLAY/GOUGE FILL. SLICKENSIDES.
28	68.96	69.84	0.88	*65			SILTSTONE	DK.GY.LAM.XBDG.BRKN FEWER FRACTURES. LITH AS ABOVE. XBDG SHOWS TOPS UP.
29	69.84	71.88	2.04	*70			SILTSTONE	DK.GY.LAM.XBDG.BRKN LITH AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	71.88	72.01	0.13	70			SILTSTONE	DK.GY.LAM.BRKN LITH AS ABOVE.
30	72.01	72.21	0.20	70			ROCK LOSS	
30	72.21	73.59	1.38	70	10066		SILTSTONE	DK.GY.LAM.VBRKN LITH AS ABOVE WITH SLIGHTLY FEWER SILTY LAMINAE. HIGHLY FRACTURED. SLICKENSIDE S. COAL STREAKS AT BASE. LOWER 25CM SAMPLED.
30	73.59	73.64	0.05	70	10067	K/L	COAL	C-2.BLK.BRKN
30	73.64	73.86	0.22	70	10067	K/L	COAL LOSS	
30	73.86	73.94	0.08	70	10067	K/L	MUDSTONE	CARB.BLK.MAS.VBRKN COALY STRINGERS THROUGHOUT.
31	73.94	74.01	0.07	70	10067	K/L	COAL	C-4.VBRKN

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
31	74.01	74.06	0.05	70	10067	K/L	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
31	74.06	74.13	0.07	70	10067	K/L	COAL	C-5. SLD BONEY.
31	74.13	74.65	0.52	70	10067	K/L	COAL LOSS	
31	74.65	74.92	0.27	70	10067	K/L	COAL	C-2. BRKN
31	74.92	76.15	1.23	70	10067	K/L	COAL	C-2. BRKN MINOR BONEY BANDS WITHIN.
32	76.15	76.34	0.19	70	10067	K/L	COAL	C-2. BRKN
32	76.34	76.55	0.21	70	10067	K/L	COAL	C-2. BRKN
32	76.55	76.63	0.08	70	10068	K/L	COAL	C-3. BRKN
32	76.63	77.53	0.90	70	10068	K/L	COAL	C-2. BRKN BANDS OF C-3 THROUGHOUT.
32	77.53	77.56	0.03	70	10068	K/L	COAL	C-4. SLD

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
32	77.56	77.63	0.07	70	10068	K/L	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS.
32	77.63	77.72	0.09	70	10068	K/L	ROCK LOSS	
32	77.72	77.81	0.09	70	10069	K/L	COAL	C-2. BRKN
32	77.81	77.93	0.12	70	10069	K/L	COAL	C-1. SLD
32	77.93	78.08	0.15	70	10069	K/L	COAL	C-2. BRKN
33	78.08	78.58	0.50	70	10069	K/L	COAL	C-1. SLD
33	78.58	78.78	0.20	70	10069	K/L	MUDSTONE	CARB. DK. GY. SLD ABUNDANT COALY PLANT FRAGS.
33	78.78	78.89	0.11	70	10069	K/L	COAL LOSS	
33	78.89	79.23	0.34	70	10069	K/L	COAL	C-3. BRKN
33	79.23	79.28	0.05	70	10069	K/L	MUDSTONE	CARB. DK. GY. SLD COALY PLANT FRAGS.
33	79.28	79.30	0.02	70	10069	K/L	ROCK LOSS	

\* DENOTES MEASURED BCA

FORM  
4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
33	79.30	79.40	0.10	70	10069 K/L	COAL LOSS	
33	79.40	79.48	0.08	70	10069 K/L	COAL	C-3. SLD
33	79.48	79.65	0.17	70	10069 K/L	COAL	C-3. BRKN QTZ WITHIN.
33	79.65	79.70	0.05	70	10069 K/L	COAL	C-1 MINOR MUDDY BANDS WITHIN. QTZ.
33	79.70	79.76	0.06	70	10069 K/L	COAL	C-4 C-2. BANDS WITHIN.
33	79.76	79.99	0.23	70	10070	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
33	79.99	80.06	0.07	70	10070	COAL	C-4. SLD
33	80.06	80.13	0.07	70		MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
34	80.13	80.91	0.78	70		MUDSTONE	DK. GY. MAS. SLD OCC PLANT FOSSILS. MOSTLY PLANT HASH (IN ILESSONIA TENUICALIS).
34	80.91	81.87	0.96	70		MUDSTONE	DK. GY. VTHNB. SLD V FAINT BEDDING VISIBLE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
34	81.87	81.93	0.06	70		CLAYSTONE	M. GY. MAS. BRKN BENTONITIC? GRADATIONAL LOWER CONTACT, SHARP UPPERCONTACT. UPSIDE DOWN??
34	81.93	82.37	0.44	70		ROCK LOSS	
34	82.37	82.56	0.19	70		MUDSTONE	DK. GY. VTHNB. SLD GRADATIONAL FROM CLAY ABOVE. SAME AS MU DSI. ABOVE.
35	82.56	84.16	1.60	*70		MUDSTONE	SLTY. VPR. DK. GY. LAM. SSD. SLD FINE SILT LAMINAE THROUGHOUT. INCREASIN G DOWNWARD. SSD SHOWS TOPS UP. MUCH PLAN T HASH AT TOP ONLY.
35	84.16	84.60	0.44	70		MUDSTONE	SLTY. VPR. DK. GY. LAM. SSD. SLD AS ABOVE.
36	84.60	86.75	2.15	70		MUDSTONE	SLTY. VPR. DK. GY. LAM. SSD. SLD AS ABOVE WITH MUCH SSD SHOWING TOPS UP. BECOMES SILTIER DOWNWARD.
37	86.75	87.17	0.42	70		SILTSTONE	VPR. DK. GY. VTHNB. SSD. SLD AS ABOVE. SLIGHTLY THICKER SILT LAYERS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	87.17	88.78	1.61	70		SILTSTONE	VPR.DK.GY.THKB.SSD.SLD THICK FINING UPWARD LAYERS 40-70CM THIC K. FG SAND AT BOTTOM, GRADING TO DARK M UD AT TOP. LOADING SHOWS TOPS UP.
38	88.78	90.15	1.37	*70		SILTSTONE	VPR.DK.GY.THKB.SSD.SLD LITH AS ABOVE, THICK GRADED BEDS AS ABO VE. MG SANDAT BASE OF INTERVAL & LOWERM OST BED.
38	90.15	90.81	0.66	70		SANDSTONE	SLTY.MG.VPR.M.GY.THKB.SSD.SLD MUCH SSD AND SLUMPING VISIBLE.
38	90.81	91.09	0.28	70		ROCK LOSS	
39	91.09	92.60	1.51	70		SANDSTONE	SLTY.MG.VPR.M.GY.MAS.SSD.BRKN PREDOMINANTLY MASSIVE SILTY AT TOP. SHA RP LOWER CONTACT. LARGE SCOUR.
39	92.60	92.86	0.26	70		MUDSTONE	SLTY.DK.GY.LAM.SSD.SLD V FINELY LAMINATED MUDST. SCoured BY OV ERLYING SAND.
39	92.86	93.07	0.21	70		MUDSTONE	DK.GY.LAM.SSD.SLD AS ABOVE.
40	93.07	94.72	1.65	*70		MUDSTONE	DK.GY.LAM.SSD.SLD AS ABOVE. SILT LAMINAE INCREASE DOWNWAR D.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
40	94.72	95.17	0.45	70		SILTSTONE	DK.GY.LAM.SSD.SLD MUDDY SILTST. V FINELY LAMINATED. MUCH'S ILTIER THAN ABOVE.
41	95.17	95.83	0.66	*70	10071	MUDSTONE	DK.GY.LAM.SSD.SLD LITH AS ABOVE. LOWER 13CM SAMPLED.
41	95.83	95.95	0.12	69	10071	MUDSTONE	CARB.DK.GY.SLD PYRITE WITHIN LOWER BANDS.
41	95.95	96.18	0.23	69	10072 K	COAL LOSS	
41	96.18	97.31	1.13	68	10072 K	COAL	C-2.BRKN MINOR MUDDY BANDS WITHIN.
42	97.31	97.36	0.05	67	10072 K	COAL	C-3.SLD
42	97.36	97.42	0.06	67	10072 K	MUDSTONE	CARB.DK.GY.SLD
42	97.42	97.52	0.10	67	10072 K	COAL	C-3.SLD
42	97.52	97.54	0.02	67	10072 K	MUDSTONE	CARB.DK.GY.BRKN
42	97.54	97.71	0.17	67	10072 K	COAL	C-2.SLD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	97.71	97.74	0.03	67	10072 K	COAL	C-4.VBRKN
42	97.74	98.07	0.33	67	10072 K	COAL	C-2.VBRKN
42	98.07	98.12	0.05	66	10072 K	MUDSTONE	CARB. DK. GY. SLD COALY PLANT FRAGS WITHIN.
42	98.12	98.26	0.14	66	10072 K	ROCK LOSS	
42	98.26	98.31	0.05	66	10072 K	COAL LOSS	
42	98.31	98.84	0.53	66	10072 K	COAL	C-2.BRKN
42	98.84	98.95	0.11	65	10072 K	COAL	C-4.BRKN
42	98.95	99.17	0.22	65	10073	MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT.
43	99.17	101.02	1.85	63		MUDSTONE	SLTY. VPR. DK. GY. LAM. WRMBU. SLD V FINELY LAM MUDST. NUMEROUS SSD AND HQ RIZ WRMBURS. TALC & CHLORITE ON FRAC SURFACES. PLANT HASH NEAR TOP.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
44	101.02	101.63	0.61	62		MUDSTONE	DK. GY. MAS. SLD MUCH LESS SILT THAN ABOVE. GRADATIONAL INTO SILT BELOW. NO PLANTS.
44	101.63	101.91	0.28	61		SILTSTONE	M. GY. MAS. SLD PREDOMINANTLY MASSIVE.
44	101.91	103.00	1.09	*60		SILTSTONE	SSY. M. GY. VTHNB. BIGTR. SLD GRADES FROM MOTTLED BIOTURBATED SILTSTG NE AT TOP TO VTHNB FG SS AT BASE.
45	103.00	103.47	0.47	70		SANDSTONE	FG. MEL. LT. GY. MAS. SLD SHARP UPPER & LOWER CONTACTS.
45	103.47	103.72	0.25	*75		SILTSTONE	DK. GY. VTHNB. SLD UNIFORM FLAT BEDDING.
45	103.72	105.01	1.29	75		SANDSTONE	MG. MEL. LT. GY. MAS. BRKN MINOR SILT STRINGERS AT TOP. TYPICAL CL EAN SAND ABOVE COASTER ZONE.
46	105.01	107.03	2.02	74		SANDSTONE	MG. MEL. LT. GY. MAS. SLD LITH AS ABOVE.
47	107.03	108.51	1.48	72		SANDSTONE	MG. MEL. LT. GY. MAS. VBRKN LITH AS ABOVE. V FRACTURED. FRACTURE ZONE?

\* DENOTES MEASURED BCA

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## GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
47	108.51	109.27	0.76	72			ROCK LOSS	
47	109.27	109.37	0.10	72			SANDSTONE	MG. MEL. LT. GY. MAS. VBRKN AS ABOVE.
48	109.37	111.35	1.98	71			SANDSTONE	MG. MEL. LT. GY. MAS. BRKN LITH AS ABOVE.
49	111.35	111.44	0.09	70			SANDSTONE	MG. MEL. LT. GY. MAS. BRKN AS ABOVE.
49	111.44	111.59	0.15	70			SANDSTONE	FG. MEL. LT. GY. MAS. SLD AS ABOVE BUT FINER GRAINED.
49	111.59	111.99	0.40	*70			SILTSTONE	SSY. VPR. M. GY. LAM. VBRKN INTERBEDDED SLTST AND FG SS.
49	111.99	112.28	0.29	70			SANDSTONE	FG. MOD. LT. GY. MAS. BRKN AS SAND ABOVE.
50	112.28	114.35	2.07	70			SILTSTONE	SSY. VPR. M. GY. LAM. BRKN INTERBEDDED SLTST AND FG SS. GRADATIONA L CONTACTS. FINELY LAM OVERALL.
50	114.35	114.71	0.36	70			ROCK LOSS	

\* DENOTES MEASURED BCA

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## GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
51	114.71	115.22	0.51	70			SILTSTONE	SSY. VPR. M. GY. LAM. VBRKN AS ABOVE.
51	115.22	115.73	0.51	70			ROCK LOSS	
51	115.73	116.97	1.24	*70			SILTSTONE	SSY. VPR. M. GY. LAM. VBRKN AS ABOVE.
52	116.97	118.65	1.68	*65			SILTSTONE	SSY. M. GY. LAM. BRKN LITH AS ABOVE.
52	118.65	119.00	0.35	67			ROCK LOSS	
52	119.00	119.21	0.21	68			SILTSTONE	SSY. M. GY. LAM. SLD LITH AS ABOVE. SAND CONTENT DECREASES DOWNWARD.
53	119.21	120.51	1.30	*70			SILTSTONE	DK. GY. LAM. SLD RHYTHMITES. COASTER ZONE. V. FINELY LAM. GRADATIONAL FROM SSY SLTST ABOVE. FISS ILE.
53	120.51	121.27	0.76	70			SILTSTONE	DK. GY. LAM. SLD COASTER ZONE AS ABOVE.
54	121.27	123.28	2.01	69			SILTSTONE	DK. GY. LAM. SLD AS ABOVE. COASTER ZONE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	123.28	123.46	0.18	69			SILTSTONE	DK.GY.LAM.SLD AS ABOVE.
55	123.46	125.33	1.87	68			SILTSTONE	DK.GY.LAM.SLD AS ABOVE.
56	125.33	126.24	0.91	*68			SILTSTONE	DK.GY.LAM.BRKN AS ABOVE.
56	126.24	127.21	0.97	68			SILTSTONE	DK.GY.LAM.SLD AS ABOVE.
57	127.21	127.28	0.07	68			MUDSTONE	DK.GY.LAM.BRKN FINER GRAINED THAN COASTER ABOVE.
57	127.28	127.29	0.01	68			BENTONITE	LT.GY.MAS.BRKN THIN BENTONITIC CLAY BAND.
57	127.29	127.76	0.47	68			ROCK LOSS	
57	127.76	127.87	0.11	68			MUDSTONE	DK.GY.LAM.VBRKN QTZ VEINING THROUGHOUT.
57	127.87	127.91	0.04	68			BENTONITE	LT.GY.MAS.BRKN SECOND THIN BENTONITIC CLAY BAND ABOVE J SEAM. AS SEEN ABOVE SEAM J IN OUTCROP

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
57	127.91	127.97	0.06	68	J		COAL	C-1.BLK.SLD QTZ VEINS THROUGHOUT, J SEAM.
57	127.97	127.99	0.02	68	J		MUDSTONE	BLK.MAS.SLD J SEAM.
57	127.99	128.13	0.14	68	J		COAL LOSS	
57	128.13	128.15	0.02	68	J		COAL	C-1.BLK.SLD J SEAM.
57	128.15	129.58	1.43	68			MUDSTONE	CARB.DK.GY.MAS.SLD COALY STRINGERS & PLANT HASH THROUGHOUT J SEAM. MINOR FINE QTZ VEINING.
57	129.58	129.76	0.18	68			MUDSTONE	CARB.DK.GY.MAS.SLD AS ABOVE. COALIFIED PLANT MAT'L THROUGHOUT, J SEAM.
58	129.76	130.55	0.79	68			MUDSTONE	CARB.DK.GY.MAS.SLD AS ABOVE. OCC COALY STRINGERS & COALIFIED PLANT MAT'L THROUGHOUT, MINOR QTZ VEINING, J SEAM.
58	130.55	131.84	1.29	*68			MUDSTONE	DK.GY.LAM.SLD FAINT FINE LAMINAE THROUGHOUT.
59	131.84	132.56	0.72	70			MUDSTONE	DK.GY.LAM.SLD FAINT FINE LAMINAE THROUGHOUT.

\* DENOTES MEASURED BCA



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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
59	132.56	133.90	1.34	71		MUDSTONE	SLTY. DK. GY. LAM. SLD SLIGHTLY SILTIER LAM THAN ABOVE. SILT C ONTENT INCREASES DOWNHOLE.
60	133.90	135.48	1.58	73		SILTSTONE	M. GY. LAM. SSD. SLD IRREGULAR BCA'S DUE TO LOCAL SLUMPING. SILTIER OVERALL THAN ABOVE.
60	135.48	136.02	0.54	*75		SILTSTONE	M. GY. LAM. SLD FINE UNIFORM LAMINAE THROUGHOUT. CORE T WIST OFF ATTOP.
61	136.02	136.88	0.86	75		SILTSTONE	M. GY. LAM. SLD LITH AS ABOVE WITH SLIGHTLY THICKER LAM INAE.
61	136.88	137.02	0.14	75		SILTSTONE	LT. GY. MAS. SLD SLTST WITH CARBONATE RECRYSTALLIZATION S TRUCTURES THROUGHOUT. MARKER WHICH HAS BEEN SEEN PREVIOUSLY 10M BELOW H (?)
61	137.02	137.94	0.92	75		SILTSTONE	M. GY. LAM. YBRKN SLTST AS ABOVE.
61	137.94	138.70	0.76	75		ROCK LOSS	
62	138.70	139.07	0.37	75		SILTSTONE	YPR. M. GY. LAM. HRMBU. SLD LITH AS ABOVE. OCC. HORIZ. HRMBURS. TOPS UP.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
62	139.07	140.77	1.70	75		SILTSTONE	VPR. M. GY. LAM. HRMBU. SLD LAMINAE ARE SLIGHTLY COARSER THAN ABOVE
63	140.77	141.62	0.85	*75		SILTSTONE	VPR. M. GY. LAM. HRMBU. BRKN LITH AS ABOVE.
63	141.62	141.82	0.20	74		ROCK LOSS	
63	141.82	142.73	0.91	73		SILTSTONE	VPR. M. GY. LAM. YBRKN
63	142.73	142.91	0.18	72		ROCK LOSS	
64	142.91	144.86	1.95	71		SILTSTONE	SSY. VPR. M. GY. LAM. SSD. BRKN NUMEROUS WISPY LAMINAE THROUGHOUT. COAR SER THAN ABOVE. INTERLAMINATED MUD AND VFG SAND. SLUMPING EVIDENT IN SOME LAYE RS. HORIZ. HRMBURS.
65	144.86	146.90	2.04	68		SILTSTONE	SSY. VPR. M. GY. LAM. HRMBU. SLD LITH AS ABOVE. OCC. HORIZ. HRMBURS. AND LO ADING SHOWSTOPS UP.
66	146.90	147.60	0.70	66		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. HRMBU. VBRKN WISPY SILT LAMINAE THROUGHOUT. OCC. HORI Z HRMBURS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
66	147.60	147.91	0.31	65			ROCK LOSS	
66	147.91	148.79	0.88	64			SANDSTONE	FG.MEL.LT.GY.MAS.VBRKN CLEANER SAND THAN ABOVE. MINOR 3MM WIDE MUDST RIPUP CLASTS. RARE SILT HISP.VER V FRACTURED.
67	148.79	149.13	0.34	63			SANDSTONE	FG.MEL.LT.GY.MAS.VBRKN V CRUMBLED CORE. LITH AS ABOVE.
67	149.13	149.44	0.31	62			ROCK LOSS	
67	149.44	150.68	1.24	61			SANDSTONE	FG.MEL.LT.GY.MAS.VBRKN AS ABOVE. FINE QTZ VEINS THROUGHOUT.
68	150.68	151.03	0.35	*60			SANDSTONE	FG.MEL.LT.GY.VTHNB.VBRKN V FAINT BEDDING VISIBLE IN FG SS.
68	151.03	151.27	0.24	60			ROCK LOSS	
68	151.27	152.53	1.26	61			SANDSTONE	FG.MEL.LT.GY.VTHNB.VBRKN AS ABOVE. V FAINT BEDDING.
69	152.53	152.59	0.06	62			SANDSTONE	FG.MEL.LT.GY.MAS.VBRKN LITH AS ABOVE. SHARP LOWER CONTACT WITH TUFFITE BELOW.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	152.59	152.74	0.15	62			CLAYSTONE	LT.GY.MAS.VBRKN V LIGHT GREY, EXTREMELY FINE GRAINED AND D HARD. TUFFITE.
69	152.74	153.09	0.35	62			ROCK LOSS	
69	153.09	153.26	0.17	62			CLAYSTONE	LT.GY.LAM.SLD TUFFITE AS ABOVE WITH V FINE DARK LAMIN AE.
69	153.26	153.28	0.02	63			BENTONITE	HH.MAS.VBRKN BENTONITE ABOVE I SEAM. SHARP LOWER CON TACT.
69	153.28	153.33	0.05	63			MUDSTONE	DK.GY.MAS.SLD PIECE OF MUDST SURROUNDED BY BENTONITE.
69	153.33	153.34	0.01	63			BENTONITE	HH.MAS.VBRKN BENTONITE AS ABOVE.
69	153.34	154.21	0.87	63			MUDSTONE	DK.GY.VTHNB.VBRKN UNIFORM DARK MUDST.
69	154.21	154.52	0.31	64			MUDSTONE	DK.GY.VTHNB.VBRKN UNIFORM DARK MUDST.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
70	154.52	156.49	1.97	*65			MUDSTONE	DK.GY.THNB.BRKN OCC FAINTLY LIGHTER GREY MUD SANDS. FAINT BEDDING. NO PLANTS, NO BIVALVES.
71	156.49	156.93	0.44	65			MUDSTONE	DK.GY.LAM.VBRKN FINELY LAMINATED. OTHERWISE AS FINE GRAINED AS ABOVE.
71	156.93	157.22	0.29	65			ROCK LOSS	
71	157.22	158.60	1.38	*65			MUDSTONE	DK.GY.LAM.VBRKN AS ABOVE. SHARP LOWER CONTACT. OCC. COALIFIED PLANT MAT'L AT BASE.
71	158.60	158.65	0.05	66	I		COAL	C-1. BLK. VBRKN CRUSHED CORE. SEAM I.
72	158.65	158.80	0.15	66	I		COAL	C-1. BLK. VBRKN RUBBLE. INCOMPLETE I SEAM.
72	158.80	159.64	0.84	67	I		COAL LOSS	
72	159.64	161.29	1.65	68			SANDSTONE	FG.WEL.LT.GY.MAS.BRKN SHARP FAULTED UPPER CONTACT.
73	161.29	161.71	0.42	69			SANDSTONE	FG.WEL.LT.GY.MAS.SLD LITH AS ABOVE WITH NUMEROUS MUDST RIPUP CLASTS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
73	161.71	161.94	0.23	70			MUDSTONE	DK.GY.MAS.BRKN SHARP LOWER CONTACT.
73	161.94	163.02	1.08	70			SANDSTONE	FG.WEL.LT.GY.MAS.BRKN AS SANDST ABOVE.
73	163.02	163.27	0.25	71			SANDSTONE	FG.WEL.LT.GY.MAS.BRKN AS ABOVE.
74	163.27	164.70	1.43	72			SANDSTONE	FG.WEL.LT.GY.MAS.BRKN AS ABOVE.
74	164.70	165.17	0.47	73			SANDSTONE	SLTY.FG.VPR.LT.GY.LAM.WRMBU.BRKN FINE SILT LAMINAE THROUGHOUT. VERT WRMBURS 1CM IN DIA.
75	165.17	165.61	0.44	74			SANDSTONE	FG.WEL.LT.GY.MAS.VBRKN V FRACTURED. QTZ VEINING. NO SILT LAMINAE.
75	165.61	166.11	0.50	74			SANDSTONE	FG.WEL.LT.GY.MAS.VBRKN CORE TWIST OFF. V FRACTURED CORE. SLICKENSIDES. FAULT ZONE?
75	166.11	166.66	0.55	*75			SILTSTONE	SSY.VPR.H.GY.LAM.VBRKN MUCH MORE SILT THAN ABOVE. SLICKENSIDES WITH TALC.

\* DENOTES MEASURED BCA

FORM  
4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86027

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
76	166.66	168.27	1.61	73			SILTSTONE	SSY. VPR. M. GY. LAM. SSD. VBRKN LOADING & FLAME STRUCTURES SHOW TOPS UP LAMINAE RANGE FROM DARK MUD TO FG SS. V FRACTURED CORE. SLICKENSIDES.
76	168.27	168.42	0.15	71			SILTSTONE	SSY. VPR. M. GY. LAM. SSD. SLD AS ABOVE.
77	168.42	169.91	1.49	*70			SILTSTONE	VPR. DK. GY. LAM. BRKN V FINE UNIFORM LAMINAE THROUGHOUT. EACH LAMINAE FINES UP FROM FG SAND TO DARK MUD. ALMOST AS UNIFORMAS RHYTHMITES/COA STER ZONE. BUT TOO COARSE OVERALL. T.D. = 172.82 M. DRILLER'S MARK. END OF HOL E.

\* DENOTES MEASURED BCA  
NEWPAGE















GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT  
 STRATIGRAPHIC LOG  
 KPN LR DDH86027

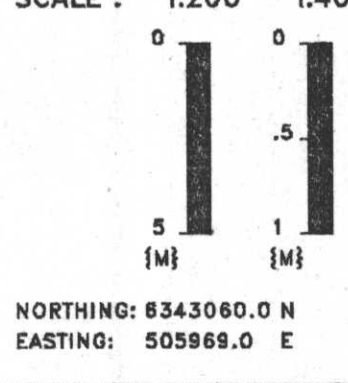
723

GEOLOGIST : BARKER

DATE : FEB 26/87

DRAWING NO. :

LITHOLOGIC SYMBOLS

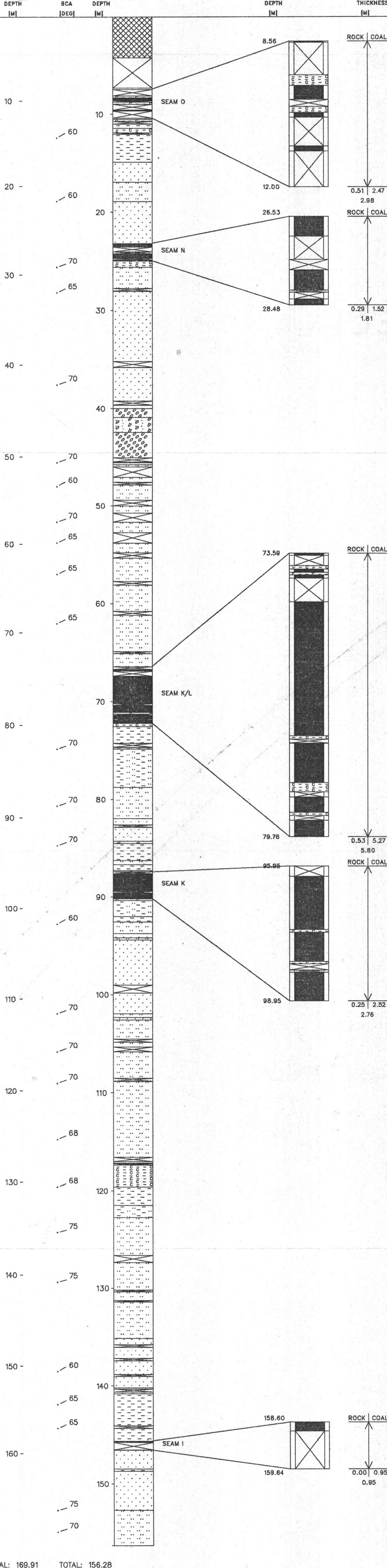


NORTHING: 8343060.0 N  
 EASTING: 505969.0 E

INCLINATION: 90.0°

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

SEAM DETAIL



TOTAL: 169.91      TOTAL: 156.28

# Gulf Canada Corporation Coal Division

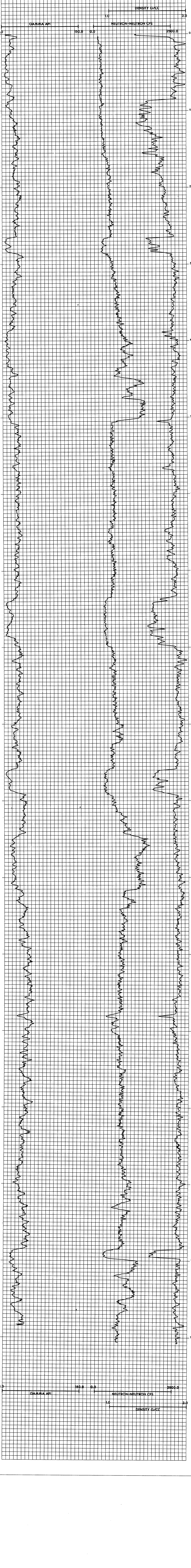
# 723

## Geophysical Log

Datascourc: <b>KPNLRDDH86027</b>	Province: BC	Northing: 6343060.00	Lat: 571357
Log Date: 86-09-21	Zone: 9	Easting: 505969.00	Long: 1285404
Company: CENTURY	Measuring Point:	Elevation: 1672.1	
Geologist: BARKER			

Scale: 1 to 100.0	Comments: 1. LOGGED THROUGH THE RODS 2.
Depth Range: 0.0 to 176.0	
True Thickness: NO	

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



KPNLRDDH86028

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPnlRDDH86028

DATE - 02/13/87

- HISTORY -

START DATE - 19/09/86

END DATE - 22/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - MACLEOD

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC  
ELEVATION - 1366.45

ZONE - 9  
NORTHING - 6346990.00  
EASTING - 506187.50

LICENCE/LEASE NUMBER -

LATITUDE - 571604  
LONGITUDE - 1285351

- ORIENTATION -

LENGTH - 179.21

INCLINATION - 90.0  
AZIMUTH - 0.0

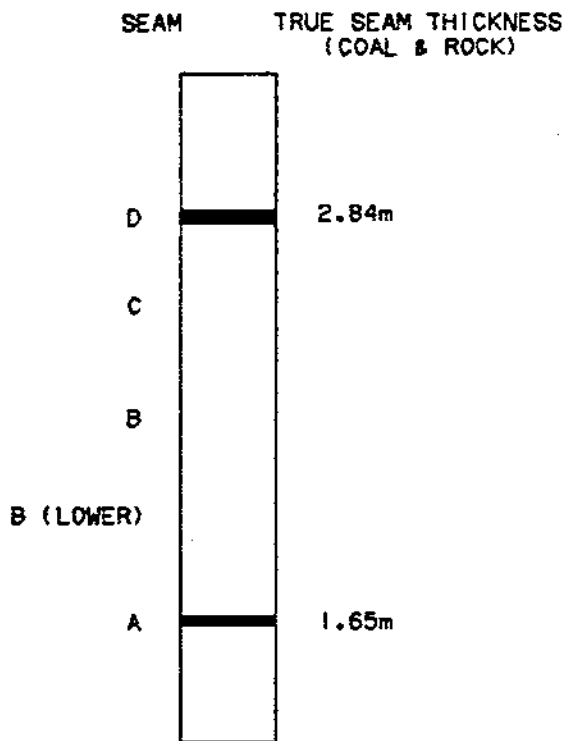
CORE SIZE - 0.0

CEMENT - N  
PLUG - N  
PIEZ - N

CASING DEPTH (M) - 14.32  
AQUIFER DEPTHS (M) - 0.00  
0.00  
LOST CIRC. DEPTHS (M) - 0.00  
0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====



**NOTE:**

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

**FIGURE**  
**MOUNT KLAPPAN ANTHRACITE PROJECT**  
**1986 DIAMOND DRILL HOLES**  
**DDH86028**

GULF CANADA CORPORATION  
11/03/87  
KLAP:12050571870063028.LOG



87/03/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	12.50	12.50	65			OVERBURDEN	CASING
1	12.50	12.75	0.25	65			ROCK LOSS	
1	12.75	14.41	1.66	65			SANDSTONE	FG.M.GY.LAM.BRKN TOP OF HOLE SLUMP WITH BROKEN CORE AND UNCONSOL MUD FROM UPHOLE. FAINTLY LAM Q T2 VEIN 1CM THICK. QTZCEMENTED. POLYMIC TIC.
2	14.41	16.15	1.74	*65			SANDSTONE	FG.M.GY.LAM.BRKN MINOR RIPUP CLASTS UP TO 2CM ARE ANGULAR AND RECTANGULAR TO ROUNDED. SS LITHOLOGICALLY AS ABOVE BUT HAS BLACK ANGULAR TO ROUNDED COMPONENTS UP TO 1MM (MUDST CLASTS?).
3	16.15	16.22	0.07	62			SANDSTONE	FG.M.GY.LAM.SLD SS LITHOLOGICALLY AS ABOVE. GRAIN SIZE COARSENS TOWARDS BOTTOM OF UNIT TO MED GREY.
3	16.22	16.23	0.01	62			MUDSTONE	BLK HAS MUDST PARTING IN SS. ABRUPT UPPER AND LOWER CONTACTS.
3	16.23	17.33	1.10	*60			SANDSTONE	FG.M.GY.BRKN FAINTLY LAM. AS ABOVE.

\* DENOTES MEASURED BCA

87/03/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	17.33	18.15	0.82	*90			SANDSTONE	FG.M.GY.LAM.BRKN UPPER 10CM IS MED GREY, ANGULAR AND V P POORLY SORTED. GRADES OVER 10CM INTO FG SS WHICH IS LITHOLOGICALLY AS ABOVE. FAINTLY LAM WITH MINOR MUDST LAM UP TO 2CM NEAR BOTTOM. MINOR GRAIN SIZE GRADATION FROM FG TO MED GREY.
4	18.15	20.25	2.10	73			SANDSTONE	FG.DK.GY.LAM.WRMBU.BRKN MUDST LAM VARIABLY CONCENTRATED AND VARIABLY WIDE FROM 1MM TO 2CM WITH MUDST HEAVILY CONCENTRATED IN THE BOTTOM .1M TO .3M AND 2M BAND IN THE MIDDLE. ABUNDANT VERTICAL WORM BURROWS INDICATE TOPS UP.
5	20.25	20.43	0.18	*59			SANDSTONE	VFG.M.GY.LAM.WRMBU.SLD INTERLAM WITH DK GY MUDST LAM AND HIGHLY DISTURBED BY BURROWING.
5	20.43	21.39	0.96	*59			SANDSTONE	VFG.M.GY.LAM.WRMBU.BRKN AS ABOVE. WORM BURROWS INDICATE TOPS UP. BEDDING OBSCURED BY BURROWING EXCEPT IN BOTTOM .21M WHERE MUDST LAM ARE UP TO 0.15CM WIDE.
5	21.39	21.52	0.13	62			SANDSTONE	FG.DK.GY.LAM.BRKN FAINTLY LAM WITH MINOR MUDST LAM UP TO 1CM WIDE.

\* DENOTES MEASURED BCA



PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	21.52	22.25	0.73	64			SANDSTONE	VFG. DK. GY. LAM. WRMBU. SLD VARIABLY WIDE DK GY MUDST LAM ARE PLANA R TO HIGHLYMOTTLED BY BURROWING. TOPS U P.
6	22.25	23.42	1.17	*68			SANDSTONE	SLTY. DK. GY. LAM. BRKN DK GY MUDST LAM ARE VARIABLY WIDE AND U NEVENLY SPACED OVER UNIT AS ABOVE. BEDD ING SLIGHTLY DISTURBEDBY SSD (?)
6	23.42	23.96	0.54	*70			SANDSTONE	DK. GY. LAM. BRKN AS ABOVE. HELMINTHOPSIS PRESENT.
7	23.96	25.18	1.22	70			SANDSTONE	DK. GY. LAM. VBRKN MUDST LAM AS ABOVE.
7	25.18	25.43	0.25	70			ROCK LOSS	
7	25.43	25.93	0.50	*70			SILTSTONE	CLYY. DK. GY. LAM. XBDG. VBRKN COMPOSITIONALLY AS ABOVE BUT UNDISTURBE D BIOGENICALLY. X-LAM INDICATE TOPS UP.
8	25.93	26.18	0.25	68			SILTSTONE	CLYY. DK. GY. LAM. BRKN AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	26.18	27.60	1.42	*65			SILTSTONE	CLYY. DK. GY. LAM. WRMBU. BRKN AS ABOVE COMPOSITIONALLY. WORM BURROWS INDICATE TOPS UP. HELMINTHOPSIS PRESENT . BEDDING LOCALLY DISTURBED. BIOGENICALL Y.
9	27.60	29.42	1.82	*65			SILTSTONE	CLYY. DK. GY. LAM. BRKN AS ABOVE. HELMINTHOPSIS PRESENT. ABUNDA NT VERTICAL AND ANGULAR WORM BURROWS IND ICATE TOPS UP. MINOR HORIZ WORM BURROWS . GRADATIONAL LOWER CONTACT.
10	29.42	29.95	0.53	*70			SILTSTONE	CLYY. DK. GY. LAM. BRKN MAY TO PLANAR LAMINATED. GRADATIONAL L OWER CONTACT.
10	29.95	31.10	1.15	*70			SANDSTONE	VFG. M. GY. LAM. VBRKN OCCASIONAL DK GY PLANAR MUDST LAM INCRE ASE TO BOTTOM OF UNIT.
10	31.10	31.30	0.20	75			ROCK LOSS	
11	31.30	32.22	0.92	*79			SILTSTONE	CLYY. DK. GY. LAM. WRMBU. BRKN LAMINATIONS OBSCURED BY ABUNDANT BURROW S INDICATING TOPS UP. X-LAMINATED; MING R SCOURING; HELMINTHOPSIS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
11	32.22	33.29	1.07	*75			SILTSTONE	CLYY, DK. GY. LAM. WRMBU. BRKN COMPOSITIONALLY AS ABOVE. HELMINTHOPSIS PRESENT.
12	33.29	34.95	1.66	*75			SILTSTONE	CLYY, DK. GY. LAM. BRKN AS ABOVE. HELMINTHOPSIS PRESENT.
12	34.95	35.26	0.31	77			SILTSTONE	CLYY, DK. GY. LAM. SLD AS ABOVE.
13	35.26	35.88	0.62	*78	10074		MUDSTONE	DK. GY. SLD CARBONACEOUS NEAR BASE. LOWER 5CM DOMINA NTLY PYRITE. LOHER 25CM SAMPLED.
13	35.88	36.49	0.61	76	10075 D		COAL	C-2. BRKN MINOR C-6 BANDS.
13	36.49	36.53	0.04	75	10075 D		MUDSTONE	CARB. DK. GY. SLD
13	36.53	36.57	0.04	75	10075 D		COAL	C-3. SLD
13	36.57	36.64	0.07	75	10075 D		MUDSTONE	CARB. DK. GY. SLD
13	36.64	36.80	0.16	74	10075 D		COAL	C-3. BRKN

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	36.80	36.86	0.06	74	10075 D		COAL LOSS	
13	36.86	36.89	0.03	74	10075 D		MUDSTONE	CARB. DK. GY. SHRD
13	36.89	36.96	0.07	74	10075 D		COAL	C-3. BRKN
13	36.96	36.98	0.02	74	10075 D		MUDSTONE	SLTY. DK. GY. SLD
13	36.98	37.24	0.26	73	10075 D		COAL	C-3. BRKN
14	37.24	37.33	0.09	73	10075 D		COAL	C-3. VBRKN PARTIALLY SHEARED.
14	37.33	37.61	0.28	72	10075 D		COAL LOSS	
14	37.61	37.85	0.24	71	10075 D		MUDSTONE	CLYY. M. GY. BRKN
14	37.85	37.99	0.14	71	10075 D		COAL	C-3. VBRKN C-2 BANDS WITHIN.
14	37.99	38.16	0.17	70	10075 D		COAL LOSS	
14	38.16	38.23	0.07	70	10075 D		ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	38.23	38.30	0.07	69	10075 D	MUDSTONE	CARB. DK. GY. SHRD
14	38.30	38.52	0.22	69	10075 D	COAL	C-3. BRKN
14	38.52	38.55	0.03	69	10075 D	COAL	C-5. SLD
14	38.55	38.87	0.32	68	10075 D	COAL	C-3. BRKN
14	38.87	38.92	0.05	67	10076	MUDSTONE	CARB. DK. GY. SHRD
14	38.92	39.05	0.13	67	10076	MUDSTONE	CARB. DK. GY. SHRD VERY SHEARED AND COALY THROUGHOUT.
15	39.05	40.28	1.23	*65		MUDSTONE	DK. GY. LAM. VBRKN MUDST IS CARB AT TOP WITH COAL STRINGER S UP TO 1CM. GRADES DOWNWARD TO SILTY MU DST. LISTRIC SHEAR SURFACES NEAR TOP OF UNIT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	40.28	40.58	0.30	65		MUDSTONE	SILTY DK. GY. LAM. BRKN WAVY TO PLANAR LAMINAE. POLISHED SLIP'S SURFACES PARALLEL TO BEDDING. GRADATIONA L UPPER CONTACT AS MUDST LAMINAE DECREA SE IN NUMBER AND WIDTH AND GRAIN SIZE I NCREASES.
15	40.58	40.88	0.30	*65		SILTSTONE	CLYY. DK. GY. LAM. BRKN PARTLY DISTURBED MUDST LAM. GRAIN SIZE INCREASE TOWARDS BASE OF UNIT.
16	40.88	41.31	0.43	64		SANDSTONE	FG. M. GY. MAS. BRKN COMPOSITIONALLY SIMILAR TO SS HIGHER IN SEQUENCE. ABUNDANT QTZ VEINING RANDOML Y ORIENTED. COMPETENT UNIT. QTZ CEMENTE D. POLYMIC TIC.
16	41.31	42.16	0.85	62		SANDSTONE	FG. M. GY. MAS. BRKN AS ABOVE. MINOR MUDST RIPUP CLASTS UP T O 2CM LONG AND MUDST PARTINGS UP TO 0.5 CM.
16	42.16	42.44	0.28	*61		SANDSTONE	FG. M. GY. LAM. VBRKN RUBBLE. MUDST BANDS UP TO 3CM AND ABUND ANT MUDST RIPUPS. GRADATIONAL LOWER CON TACT INTO BANDED SILTST.

\* DENOTES MEASURED BCA

87/03/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	42.44	42.71	0.27	63			ROCK LOSS	
16	42.71	43.06	0.35	*65			SILTSTONE	CLYY.M.GY.LAM.WRMBU.BRKN VARIABLY WIDE MUDST LAM ARE OBSCURED BY BURROWING INDICATING TOPS UP.
17	43.06	44.36	1.30	*60			SANDSTONE	VFG.M.GY.LAM.BRKN MINOR FINE MUDST LAM.
17	44.36	44.97	0.61	*65			SANDSTONE	VFG.M.GY.LAM.BRKN AS ABOVE. MUDST/SS LAMINAE CONTACTS ARE GRADATIONAL. LAMINAE WAVY TO PLANAR.
18	44.97	45.29	0.32	65			SILTSTONE	CLYY.DK.GY.LAM.BRKN DK GY MUDST LAM HAVE GRADATIONAL CONTACTS WITH SLTST.
18	45.29	45.60	0.31	65			SANDSTONE	VFG.M.GY.WAS.SLD SHARP UPPER CONTACT. COMPOSITIONALLY SIMILAR TO OVERLYING SS.
18	45.60	45.87	0.27	*65			SILTSTONE	CLYY.DK.GY.LAM.VBRKN VARIABLY WIDE DK GY MUDST LAM. DISTURBED D BDC (BIOGENIC?). GRADATIONAL UPPER CONTACT.

\* DENOTES MEASURED BCA

87/03/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	45.87	46.12	0.25	64			ROCK LOSS	
18	46.12	46.77	0.65	62			SANDSTONE	VFG.M.GY.LAM.VBRKN FAINT LAMINAE ARE MINOR. BOTTOM HALF OF UNIT IS RUBBLE.
18	46.77	46.88	0.11	61			SILTSTONE	CLYY.DK.GY.LAM.SLD DK GY MUDST LAM ARE VARIABLY WIDE AND DISTURBED. GRADATIONAL CONTACTS BETWEEN MUDST AND SLTST LAM.
19	46.88	47.38	0.50	*60			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN AS ABOVE. ABUNDANT VERTICAL AND ANGULAR WORM BURROWS INDICATE TOPS UP. MINOR FUS UP TO 10CM.
19	47.38	48.75	1.37	64			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN AS ABOVE. ABUNDANT WORM BURROWS INDICATE TOPS UP. BEDDING LOCALLY DISTURBED BY BURROWING OTHERWISE LAMINAE ARE PLANAR TO WAVY AND VARIABLY WIDE.
20	48.75	50.22	1.47	*69			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN AS ABOVE. WORM BURROWS INDICATE TOPS UP. PYRITE BLEB 1CM LONG.

\* DENOTES MEASURED BCA

FORM  
4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	50.22	50.35	0.13	64		ROCK LOSS	
20	50.35	50.48	0.13	64		SILTSTONE	CLYY, DK. GY. LAM. VBRKN RUBBLE. LISTRIC SHEAR SURFACES.
20	50.48	50.58	0.10	63		BRECCIA	DK. GY. SLD VARIABLE SIZED ANGULAR MUDST FRAGMENTS IN SLTST MATRIX. QTZ VEINED.
20	50.58	50.98	0.40	62		SILTSTONE	CLYY, DK. GY. LAM. WRMBU. SLD COMPOSITIONALLY IDENTICAL TO UNIT ABOVE BRECCIA. BEDDING SOMEWHAT OBSCURED BY BURROWING.
21	50.98	52.91	1.93	*55		SILTSTONE	CLYY, DK. GY. LAM. WRMBU. BRKN AS ABOVE. HORIZONTAL BURROWS. ABUNDANT VERTICAL BURROWS INDICATE TOPS UP. HELMINTHOPSIS PRESENT.
22	52.91	54.51	1.60	62		MUDSTONE	SLTY, DK. GY. LAM. BRKN FINER GRAINED THAN ABOVE UNIT AND LESS SLTST LAMINAE. BOG OBSCURED BY BURROWING. HELMINTHOPSIS PRESENT. MINOR BIVALVE FRAGMENTS. UNIT FINES TO BASE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
23	54.51	56.47	1.96	*69		MUDSTONE	BLK. MAS. BRKN VERY FAINT MINOR LAMINAE IN OTHERWISE FEATURELESS BLACK MUDST. MINOR BIVALVE FRAGMENTS.
23	56.47	56.53	0.06	65		MUDSTONE	BLK. MAS. SLD AS ABOVE.
24	56.53	58.63	2.10	61		MUDSTONE	BLK. MAS. BRKN AS ABOVE. BIVALVES PRESENT, OTHERWISE FEATURELESS. LOWER 6CM BRECCIATED.
25	58.63	59.60	0.97	56		SILTSTONE	CLYY, M. GY. 1CM BIVALVE PIECES WITHIN.
25	59.60	60.32	0.72	53 10077		MUDSTONE	SLTY, M. GY. BIVALVE PIECES WITHIN AND TURRITELLID GASTROPODS IN BANDS THROUGHOUT LOWER 20CM. (GASTROPODS 2-4MM). LOWER 25CM SAMPLE D.
25	60.32	60.40	0.08	51 10078 C		COAL	C-4, YBRKN
26	60.40	60.44	0.04	51 10078 C		COAL	C-2 SHRD VERY BROKEN & POWDERED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	60.44	60.58	0.14	51	10078 C	COAL LOSS	
26	60.58	61.23	0.65	49	10078 C	MUDSTONE	CARB. DK. GY. SHRD VERY BROKEN & SHEARED. PARTIALLY MIXED W ITH COAL.
26	61.23	61.33	0.10	48	10078 C	MUDSTONE	LT. GY. YBRKN BRECCIATED WITH QTZ CARB MATRIX.
26	61.33	61.36	0.03	48	10078 C	MUDSTONE	CARB. DK. GY. SLD
26	61.36	61.48	0.12	47	10078 C	COAL	C-1. YBRKN
26	61.48	61.99	0.51	46	10079	MUDSTONE	SLTY. M-DK. GY. BRKN ABUNDANT PLANT FRAGS. UPPER 25CM SAMPLED
26	61.99	62.16	0.17	*45		MUDSTONE	SLTY. M-DK. GY. BRKN ABUNDANT PLANT FRAGS.
27	62.16	62.73	0.57	*62		SILTSTONE	CLYY. DK. GY. LAM. WRMBU. SLD ABUNDANT NORM BURROWS INDICATE TOPS UP. BDG OBSCURED BY BURROWING LOCALLY. GRADATIONAL LOWER CONTACT WITH VFG SS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	62.73	64.10	1.37	*61		SANDSTONE	SLTY. VFG. DK. GY. MAS. BRKN OCCASIONAL VERY FAINT MUOYST LAMINAE. OT HERWISE FEATURELESS.
28	64.10	64.68	0.58	61		SILTSTONE	SSY. DK. GY. MAS. BRKN FEATURELESS.
28	64.68	66.04	1.36	*61		SILTSTONE	SSY. DK. GY. MAS. BRKN AS ABOVE. V FAINTLY LAMINATED. ABUNDANT RANDOMLY ORIENTED QTZ VEINS.
29	66.04	66.89	0.85	*26		SILTSTONE	SSY. DK. GY. LAM. BRKN AS ABOVE. POLISHED SLIP SURFACES.
29	66.89	68.05	1.16	18		SILTSTONE	SSY. DK. GY. LAM. WRMBU. BRKN SLTST WITH FG SS LAMINAE WITH MANY DISTURBED CONTACTS. FOLD AXIS.
30	68.05	69.85	1.80	*05		SILTSTONE	SSY. DK. GY. LAM. WRMBU. BRKN AS ABOVE. RANDOMLY ORIENTED QTZ VEINS.
31	69.85	69.91	0.06	*35		SILTSTONE	SSY. DK. GY. LAM. WRMBU. SLD AS ABOVE.
31	69.91	71.43	1.52	*45		SILTSTONE	SSY. DK. GY. LAM. WRMBU. BRKN AS ABOVE. ABUNDANT NORM BURROWS INDICATE TOPS UP. LOCALLY BIOTURBATED. RANDOMLY ORIENTED QTZ VEINING.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
31	71.43	71.65	0.22		50		SILTSTONE	SSY.DK.GY.LAM.WRMBU.BRKN AS ABOVE.
32	71.65	73.52	1.87	*55			SILTSTONE	SSY.DK.GY.LAM.WRMBU.BRKN AS ABOVE. ABUNDANT QTZ VEINING. BOTTOM 0.2M IS RUBBLE. ABUNDANT LISTRIC SHEAR SURFACES.
33	73.52	74.30	0.78		55		SILTSTONE	SSY.DK.GY.LAM.VBRKN HIGHLY FRACTURED RUBBLE.
33	74.30	74.62	0.32		55		ROCK LOSS	
33	74.62	75.26	0.64		55		SILTSTONE	SSY.DK.GY.LAM.VBRKN AS ABOVE. INTENSELY FRACTURED. LOCALLY BRECCIATED (FAULT ZONE?).
34	75.26	77.43	2.17	*55			SANDSTONE	SLTY.DK.GY.LAM.BRKN HIGHLY FRACTURED WITH QTZ INFILL. DISCONTINUOUS MUDST BANDS UP TO 0.5CM. ABUNDANT MUDST RIPUP CLASTS UP TO 3CM IN THE BOTTOM 0.75M.
35	77.43	77.80	0.37		53		SANDSTONE	SLTY.DK.GY.LAM.VBRKN

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
35	77.80	77.99	0.19		52		ROCK LOSS	
35	77.99	79.79	1.80	*50			SANDSTONE	SLTY.DK.GY.LAM.WRMBU.SLD WORM BURROWS INDICATE TOPS UP. MINOR DK GY MUDST LAM ARE INDISTINCT AND VARIABLY WIDE.
36	79.79	81.01	1.22		56		SANDSTONE	SLTY.DK.GY.LAM.WRMBU.BRKN WORM BURROWS INDICATE TOPS UP. AS ABOVE. MINOR RIPUP CLASTS.
36	81.01	81.66	0.65	*60			SANDSTONE	SLTY.DK.GY.LAM.WRMBU.SLD AS ABOVE EXCEPT LESS BURROWING. LOWER HALF OF UNIT HAS V MINOR MUDST LAMINAE ONLY.
37	81.66	83.84	2.18	*65			SILTSTONE	SSY.DK.GY.LAM.WRMBU.BRKN WORM BURROWS INDICATE TOPS UP. TOP 10CM HIGHLY FRACTURED. MUDST LAM ARE VARIABLY SPACED FROM 1MM TO .25M APART. BURROWING OBSCURES BDG LOCALLY. SOME GRADATIONAL LAMINAE CONTACTS. UNIT FINES TO BASE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	83.84	84.08	0.24	*80			MUDSTONE	SLTY. DK. GY. LAM. WRMBU. BRKN MINOR X-LAMINATIONS. MINOR WORM BURROWS OBSCURE BDG CONTACTS. MUDST LAMINAE Y CLOSELY SPACED.
38	84.08	85.88	1.80	78			MUDSTONE	SLTY. DK. GY. LAM. WRMBU. BRKN AS ABOVE. WORM BURROWS INDICATE TOPS UP
39	85.88	87.06	1.18	*75			MUDSTONE	SLTY. DK. GY. LAM. WRMBU. BRKN SLTST AND MUDST INTERLAMINATIONS HAVE I NDISTINCT BDG CONTACTS DUE TO BURROWING . HELMINTHOPSIS PRESENT.
39	87.06	87.29	0.23	77			MUDSTONE	SLTY. DK. GY. LAM. WRMBU. BRKN AS ABOVE. BIOTURBATED. HELMINTHOPSIS PR ESENT. GRADATIONAL LOWER CONTACT.
39	87.29	87.90	0.61	78			MUDSTONE	BLK. MAS. BRKN FEATURELESS MUDST. FEW BIVALVE FRAGMENT S.
40	87.90	90.03	2.13	81			MUDSTONE	BLK. MAS. BRKN AS ABOVE. MINOR BIVALVE FRAGMENTS.
41	90.03	91.94	1.91	86			MUDSTONE	BLK. MAS. BRKN AS ABOVE. MINOR BURROWING OBSCURES LAMI NATION PRODUCING MASSIVE APPEARANCE PYR ITIZED SHELL FRAGMENT OUTLINES.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	91.94	92.88	0.94	*89			MUDSTONE	BLK. LAM. BRKN AS ABOVE. GASTROPODS AND BIVALVES PRESE NT. WORM BURROWS INDICATE TOPS UP.
42	92.88	93.60	0.72	87			MUDSTONE	SLTY. DK. GY. MAS. VBRKN FEATURELESS. ABUNDANT LISTRIC SHEAR SUR FACES. NEAR BASE.
42	93.60	93.90	0.30	85	B		ROCK LOSS	
43	93.90	95.65	1.75	82	B		MUDSTONE	BLK. MAS. VBRKN AS ABOVE. NUMEROUS COALY AND PYRITE BAN DS UP TO 1CM. LOWER 20CM IS CARB.
43	95.65	95.67	0.02	79	B		COAL	C-3. BLK. VSHRD ABUNDANT LISTRIC SHEAR SURFACES. PART O F SEAM B?
43	95.67	96.00	0.33	79	B		ROCK LOSS	
44	96.00	96.44	0.44	78			MUDSTONE	CARB. BLK. MAS. VBRKN RUBBLE. MINOR THIN COAL LAMINAE.

\* DENOTES MEASURED BCA



PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
44	96.44	97.76	1.32	*75			MUDSTONE	CARB. DK. GY. LAM. BIOTR. BRKN CARB AT TOP WITH MINOR COAL STRINGERS UP TO 0.5CM AND COARSENS DOWNWARDS TO SL TY BANDED MUDST WITH ABUNDANT BURROWING INDICATING TOPS UP. MINOR BIVALVE FRAG MENTS. MINOR PLANT HASH PARALLEL TO BDG PLANES.
45	97.76	97.90	0.14	77			MUDSTONE	SLTY. DK. GY. LAM. BIOTR. BRKN HIGHLY BIOTURBATED. BIVALVE FRAGMENTS, PYRITE BLEBS UP TO 1.5CM. CARBONACEOUS A T TOP AND BASE WITH COAL LAMINAE IMM WI DE AT TOP. POLISHED SLIP SURFACES. COAL IFIED PLANT HASH AT TOP. RARE SLTY LAM.
45	97.90	98.44	0.54	78			MUDSTONE	SLTY. DK. GY. LAM. BRKN CARBONACEOUS AT TOP AND BASE WITH COAL LAMINAE 1 MM WIDE AT TOP. POLISHED SLIP SURFACES AND COALIFIED PLANT HASH AT T OP. RARE SLTY LAM.
45	98.44	99.39	0.95	*80			SILTSTONE	CLYY. DK. GY. LAM. BRKN RARE MUDST LAM. OTHERWISE FEATURELESS.
45	99.39	99.40	0.01	*85			SILTSTONE	CLYY. DK. GY. LAM. BIOTR. BRKN BIOTURBATION OBSCURES BDG LOCALLY. WORM BURROWS INDICATE TOPS UP.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
46	99.40	101.37	1.97	*80			SILTSTONE	CLYY. DK. GY. LAM. HRMBU. BRKN AS ABOVE. WORM BURROWS INDICATE TOPS UP . PLANT HASH PARALLEL TO BDG PLANE. HEL MINTHOPSIS AT BASE. LOCALLY BIOTURBATED
47	101.37	102.12	0.75	*80			SILTSTONE	CLYY. DK. GY. LAM. HRMBU. BRKN AS ABOVE. HELMINTHOPSIS AND RARE BIVALV E FRAGMENTSPRESENT.
47	102.12	103.40	1.28	81			MUDSTONE	DK. GY. BRKN FEATURELESS. THIN COALY STRINGERS UP TO 0.5CM. CARBONACEOUS AT BASE. PYRITE BA NDS UP TO 1CM. GRADATIONAL LOWER Contac T.
47	103.40	103.43	0.03	82		B LOWER	COAL	C-1. BLK. BRKN GOOD CLEAT DEVELOPMENT.
47	103.43	103.49	0.06	82		B LOWER	COAL LOSS	
48	103.49	103.59	0.10	82		B LOWER	COAL	C-3. VBRKN SHEARED.
48	103.59	103.70	0.11	82		B LOWER	COAL	C-2. PHRD.
48	103.70	103.91	0.21	82			MUDSTONE	CARB. DK. GY. SLD ABUNDANT PLANT FRAGS WITHIN.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
48	103.91	105.07	1.16	83		SILTSTONE	M.GY.SLD MUDDY & SAND BANDS WITHIN.
48	105.07	105.37	0.30	84		SILTSTONE	M.GY.SLD
49	105.37	107.51	2.14	*85		SANDSTONE	FG.M.GY.LAM.BRKN FEATURELESS EXCEPT MINOR FAINT LAMINATIONS AND RANDOMLY ORIENTED QTZ VEIN.
50	107.51	108.35	0.84	85		SANDSTONE	FG.M.GY.LAM.SLD AS ABOVE. GRADATIONAL LOWER CONTACT.
50	108.35	109.64	1.29	*85		SANDSTONE	FG.M.GY.LAM.WRMBU.BRKN LITHOLOGICALLY AS ABOVE EXCEPT SLIGHT INCREASE IN VARIABLY WIDE MUDST.LAM. LOCALY BIOTRB.
51	109.64	111.39	1.75	*90		SANDSTONE	SLTY.VFG.M.GY.LAM.SSD.BRKN FAINT MUDST LAMINATIONS. MINOR SSD INDICATES TOPS UP. BOTTOM 20CM OF UNIT IS V BROKEN. POLISHED SLIP SURFACES.
51	111.39	111.61	0.22	85		SANDSTONE	SLTY.VFG.M.GY.LAM.BRKN LITHOLOGICALLY AS ABOVE EXCEPT SLIGHTLY COARSER.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
52	111.61	113.71	2.10	*80		SANDSTONE	FG.M.GY.LAM.BRKN AS ABOVE. MUDST RYPOUP CLAST UP TO 4CM ARE RARE. MINOR SLTST LAM. MINOR FINE QTZ VEINING AT RANDOM ORIENTATION.
53	113.71	114.48	0.77	*78		SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN VARIABLY SPACED MUDST LAM. LOCALY DISTURBED BY BURROWING. POLISHED SLIP SURFACES. HELMINTHOPSIS PRESENT NEAR BASE OF UNIT. FINES TOWARDS BASE.
53	114.48	115.28	0.80	*85		MUDSTONE	SLTY.DK.GY.LAM.WRMBU.BRKN LOCALIZED BURROWING. OBSCURES LAM. UNIT COARSENS TO BASE.
53	115.28	115.78	0.50	82		SANDSTONE	FG.M.GY.MAS.SLD FAINT MUDST WISPS NEAR TOP. OTHERWISE FEATURELESS. EAGLESNEST SS (?)
54	115.78	117.41	1.63	*78		SANDSTONE	FG.M.GY.MAS.BRKN V MINOR FAINT MUDST LAMINATIONS. OTHERWISE FEATURELESS. AS ABOVE.
54	117.41	117.73	0.32	*80		SANDSTONE	FG.M.GY.LAM.BRKN MINOR MUDST LAM UP TO 0.5CM. MINOR LOAD CASTING INDICATES TOPS UP. INCREASE IN MUDST TO BASE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	117.73	119.81	2.08	*82			SANDSTONE	FG.M.GY.LAM.BRKN VARIABLELY WIDE MUDST LAMINAE UP TO 1CM N EAR TOP OF UNIT. 10CM WIDE FUS (M GY SS TO FG SS WITH SHARP BASAL CONTACT) NEA R MIDDLE OF UNIT. LOWER 30CM IS RUBBLE.
56	119.81	120.43	0.62	*72			SANDSTONE	FG.M.GY.LAM.VBRKN AS ABOVE. LOWER HALF OF UNIT IS RUBBLE. MUDST LAMINATIONS ARE FAINT TO ABSENT.
56	120.43	120.89	0.46	75			ROCK LOSS	
56	120.89	122.21	1.32	*80			SILTSTONE	CLYY.DK.GY.LAM.BIOTR.BRKN BIOTURBATION OBSCURES MUDST LAM CONTACT S. HELMINTHOPSIS PRESENT. PYRITE BLEB 3 CM LONG.
57	122.21	123.91	1.70	*79			SILTSTONE	CLYY.DK.GY.LAM.BIOTR.BRKN HIGHLY BIOTURBATED. VERTICAL AND ANGULA R BURROWS INDICATE TOPS UP. HELMINTHOPSIS IS ABUNDANT.
57	123.91	124.02	0.11	81			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE. ANGULAR WORM BURROW 7CM LONG. HELMINTHOPSIS ABUNDANT.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
58	124.02	124.76	0.74	82			MUDSTONE	BLK.MAS.BRKN V MINOR SLTST LAMINAE AND HELMINTHOPSIS . PYRITE BLEBS UP TO 6CM.
58	124.76	126.12	1.36	85			MUDSTONE	BLK.MAS AS ABOVE.
59	126.12	128.14	2.02	*89			MUDSTONE	BLK.MAS.BRKN AS ABOVE.
60	128.14	129.76	1.62	89			MUDSTONE	BLK.MAS.BRKN AS ABOVE BUT PYRITE IS ABSENT. V FINE B IVALVE FRAGMENTS NEAR BASE.
60	129.76	130.05	0.29	90			MUDSTONE	BLK.MAS.BRKN AS ABOVE. FEATURELESS.
61	130.05	131.19	1.14	90			MUDSTONE	BLK.MAS.VBRKN TOP .75M IS RUBBLE AND V HIGHLY SHEARED. MINOR BIVALVE FRAGMENTS IN OTHERWISE FEATURELESS MUDST. ABRUPT LOWER CONTACT (CORE LOSS?).
61	131.19	131.89	0.70	*90			SANDSTONE	FG.M.BLK.MAS.SLD TOP 20CM CORE BROKEN. 6CM BAND OF SAME LITHOLOGY WITH WHITE QTZ CLASTS UP TO 1 MM IN TOP 20CM OF CORE (IDENTICAL BAND A S IN BOX 3 AT 17.37M DRILLER'S MARK). V ERY FAINT MINOR LAMINATIONS.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
62	131.89	132.86	0.97	90		SANDSTONE	FG.M.BLK.MAS.SLD AS ABOVE.
62	132.86	133.96	1.10	*90		SANDSTONE	FG.M.GY.MAS.SLD AS ABOVE.
63	133.96	135.86	1.90	89		SANDSTONE	FG.M.GY.MAS.SLD AS ABOVE.
63	135.86	136.04	0.18	89		SILTSTONE	SSY.DK.GY.LAM.SLD LITHOLOGICALLY AS ABOVE EXCEPT SLIGHTLY FINER. V MINOR MUDST RIPUP BAND AND MINOR MUDST LAM.
64	136.04	138.22	2.18	*88		SILTSTONE	SSY.DK.GY.LAM.SLD AS ABOVE EXCEPT MINOR 20CM BAND IN MIDDLE OF UNIT WHICH HAS WISPY MUDST LAMINAE.
65	138.22	138.86	0.64	*90		SILTSTONE	SSY.DK.GY.LAM.SLD AS ABOVE. OCCASIONAL WISPY MUDST LAMINAE ONLY.
65	138.86	140.34	1.48	*90		SILTSTONE	SSY.DK.GY.LAM.SLD AS ABOVE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
66	140.34	141.90	1.56	*85		SILTSTONE	SSY.DK.GY.LAM.BIOTR.SLD UNIT ABOVE GRADES INTO THIS UNIT WITH AN INCREASE IN MUDST LAMINAE MINOR LOCALIZED BIOTURBATION AND HELMINTHOPSIS.
66	141.90	142.40	0.50	*85		SILTSTONE	CLYY.DK.GY.LAM.BIOTR.SLD ABUNDANT THIN MUDST LAMINAE FREQUENTLY DISRUPTED BY VERTICAL WORM BURROWS INDICATING TOPS UP. BIOTURBATION IS LOCALIZED.
67	142.40	144.54	2.14	*89		SILTSTONE	CLYY.DK.GY.LAM.BIOTR.BRKN AS ABOVE. BIOTURBATION IS LOCALIZED. NO RM BURROWS INDICATE TOPS UP.
68	144.54	144.98	0.44	85		SILTSTONE	SSY.M.GY.SSD.SLD MUDDY LAMINAE WITH MINOR MUDST RIPUPS.
68	144.98	145.20	0.22	84		SILTSTONE	SSY.M.GY.SSD.SLD MUDDY LAMINAE WITH MINOR MUDST RIPUPS.
68	145.20	145.64	0.44	83 10080		MUDSTONE	CARB.DK.GY.SLD COALY PLANT FRAGS THROUGHOUT. MINOR PYRITE NODULES WITHIN. LOWER 25CM SAMPLED.
68	145.64	145.67	0.03	82 10081 A		COAL LOSS	

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
68	145.67	146.25	0.58	81	10081	A	COAL	C-2.VBRKN BROKEN & SHEARED.MINOR THIN MUDDY BANDS WITHIN.
69	146.25	147.01	0.76	79	10081	A	COAL	C-2.VBRKN
69	147.01	147.11	0.10	78	10081	A	COAL	C-5.VBRKN VITRINITE STRINGERS THROUGHOUT.
69	147.11	147.14	0.03	78	10081	A	MUDSTONE	CARB.DK.GY.SLD
69	147.14	147.16	0.02	77	10081	A	COAL	C-4.SLD
69	147.16	147.25	0.09	77	10081	A	COAL	C-2.BRKN
69	147.25	147.32	0.07	77	10081	A	COAL	C-6.SLD C-1 STRINGERS & THIN BANDS THROUGHOUT.
69	147.32	147.50	0.18	77	10082		MUDSTONE	CARB.DK.GY.SLD COALIFIED PLANT FRAGS WITHIN.
69	147.50	147.54	0.04	76	10082		COAL	C-3.VBRKN

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	147.54	147.65	0.11	76	10082		MUDSTONE	CARB.DK.GY.SLD COALY PLANT FRAGS THROUGHOUT. UPPER 3CM SAMPLED.
69	147.65	147.88	0.23	76			MUDSTONE	CARB.DK.GY.SLD COALY PLANT FRAGS THROUGHOUT.
70	147.88	148.00	0.12	*75			MUDSTONE	CARB.DK.GY.SLD ABUNDANT COALY STRINGERS & PLANT FRAGS THROUGHOUT.PYRITE BANDING WITHIN.
70	148.00	148.03	0.03	75			COAL	C-2.SLD
70	148.03	148.08	0.05	75			SILTSTONE	SLD COALY STRINGERS WITHIN.
70	148.08	148.41	0.33	76			MUDSTONE	CARB.DK.GY.SLD PYRITE IN UPPER PORTION.
70	148.41	148.49	0.08	77			COAL	C-2.VBRKN
70	148.49	148.53	0.04	77			MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS.
70	148.53	148.55	0.02	78			COAL	C-2.SLD

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
70	148.55	149.80	1.25	80		MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT.
71	149.80	150.68	0.88	*85		MUDSTONE	BLK. MAS. BRKN AS ABOVE. MONOTONOUS BLACK MUDST WITH A BUNDANT COALIFIED PLANT FOSSILS (CZEKAN OWSKIA RIGIDA, PITYOPHYLLUM NORDENSKIOL DII).
71	150.68	151.89	1.21	85		MUDSTONE	BLK. MAS. BRKN AS ABOVE.
72	151.89	153.62	1.73	*85		MUDSTONE	SLTY. DK. GY. LAM. BIOTR. BRKN GRADATIONAL UPPER CONTACT. LOCALIZED BI OTURBATION OBSCURES SLTST LAMINAE. MINO R COALIFIED PLANT MATERIAL ON 80G PLANE S.
72	153.62	154.15	0.53	80		MUDSTONE	SLTY. DK. GY. LAM. BIOTR. SLD AS ABOVE. LOCALIZED BIOTR. ANGULAR WOR M BURROWS INDICATE TOPS UP. GRADATIONAL BASAL CONTACT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
73	154.15	155.45	1.30	75		SILTSTONE	CLY. DK. GY. LAM. WRMBU. SLD COARSER THAN ABOVE UNIT. VERTICAL WORM BURROWS AND LOAD CASTS INDICATE TOPS UP. LOCALLY BIOTURBATED. MUDST LAMINAE MAY BE PLANAR TO DISTURBED AND INDISTINCT CO NTACTS WITH SLTST. UNIT COARSENS TO BAS E.
73	155.45	156.26	0.81	*70		SANDSTONE	FG. M. GY. LAM. SLD RARE MUDST BANDS UP TO 2CM AND MUDST RI PUP CLASTS. SMALL SCALE FUS (FEW CM) ABO VE MUDST BANDS WHICH DECREASE TOWARDS G RADATIONAL BASAL CONTACTS. EAGLESNEST S ANDSTONE MARKER UNIT.
74	156.26	156.88	0.62	72		SANDSTONE	FG. M. GY. LAM. SLD VERY RARE MUDST LAM. LITHOLOGICALLY AS BOTTOM OF ABOVE UNIT. EAGLESNEST SANDST ONE UNIT.
74	156.88	158.24	1.36	74		SANDSTONE	FG. M. GY. MAS. SLD AS ABOVE. MINOR MUDST RIPUP CLASTS AND QTZ VEINING AT RANDOM ORIENTATIONS. EAGL ESNEST SANDSTONE UNIT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
75	158.24	159.98	1.74	*78			SANDSTONE	FG.M.GY.LAM.BRKN AS ABOVE. RARE MUDST LAMINAE 1MM TO 0.5 CM IN UPPERPART OF UNIT AND ABUNDANT ANGULAR MUDST RIPUP CLASTS UP TO 3CM IN LOWER PART OF UNIT. UNIT FINES TO VFG SS AT BASE. EAGLESNEST SANDSTONE UNIT.
75	159.98	160.30	0.32		77		SANDSTONE	VFG.M.GY UNIT LITHOLOGICALLY SIMILAR TO BASE OF LAST UNIT. EAGLESNEST SANDSTONE UNIT.
76	160.30	162.51	2.21	*75			SANDSTONE	VFG.M.GY.MAS.BRKN AS ABOVE. VERY RARE MUDST BANDS UP TO 1.5CM IN OTHERWISE MONOTONOUS SS. EAGLESNEST SANDSTONE UNIT.
77	162.51	163.74	1.23		77		SANDSTONE	VFG.M.GY.MAS.BRKN AS ABOVE. RANDOMLY ORIENTED FRACTURES & QTZ VEINING. EAGLESNEST SANDSTONE UNIT.
77	163.74	164.48	0.74		79		SANDSTONE	VFG.M.GY.LAM.BRKN AS ABOVE WITH FAINT LAMINATIONS AND AN INCREASE IN MUDST BANDS UP TO 1.5CM TO BASE. EAGLESNEST SANDSTONE UNIT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
78	164.48	165.31	0.83	*80			SILTSTONE	CLY.M.GY.LAM.WRMBU.BRKN ABUNDANT MUDST LAMINAE WITH PLANAR TO B TOGENICALLY DISTURBED CONTACTS. VERTICAL AND ANGULAR WORM BURROWS INDICATE TOPS UP.
78	165.31	166.45	1.14		79		SANDSTONE	FG.M.GY.LAM.BRKN FAINTLY LAMINATED. ABUNDANT QTZ FILLED FRACTURES IN UPPER HALF OF UNIT. OTHERWISE FEATURELESS. EAGLESNEST SANDSTONE UNIT.
79	166.45	167.28	0.83	*79			SANDSTONE	SLTY.FG.M.GY.MAS.BRKN MINOR MUDST RIPUP CLASTS 3MM TO 5CM IN LENGTH AND V MINOR MUDST BANDS UP TO .75CM. EAGLESNEST SANDSTONE UNIT.
79	167.28	168.40	1.12	*76			SANDSTONE	SLTY.FG.DK.GY.LAM AS ABOVE WITH AN INCREASE IN MUDST LAMINAE IN MIDDLE OF UNIT. GRADATIONAL CONTACTS BETWEEN MUDST LAMINAE AND FG SS. EAGLESNEST SANDSTONE UNIT.
80	168.40	169.00	0.60		77		SANDSTONE	SLTY.FG.DK.GY.SLD AS ABOVE WITH FAINT LAMINAE. GRADATIONAL BASAL CONTACT. EAGLESNEST SANDSTONE UNIT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
80	169.00	169.11	0.11		77		SILTSTONE	SLTY. DK. GY. LAM. WRMBU. SLD MUDST LAMINAE CONTACT OBSCURED BY ABUNDANT VERTICAL MORM BURROWS INDICATING TO PS. UP. EAGLESNEST SANDSTONE UNIT.
80	169.11	170.02	0.91		78		SILTSTONE	SLTY. DK. GY. LAM. WRMBU. SLD AS ABOVE. MUDST LAMINAE HAVE WAVY AND GRADATIONAL CONTACTS. LGE LOAD CAST INDICATES TOPS UP. GRADATIONAL BASAL CONTACT.
80	170.02	170.44	0.42		79		SANDSTONE	FG. DK. GY. LAM. SLD GRADATIONAL CONTACTS BETWEEN A SILTY BAND IN MIDDLE OF UNIT AND FG SS. LOAD CAST NEAR BASE INDICATES TOPS UP. EAGLESNEST SANDSTONE UNIT.
81	170.44	170.67	0.23		79		SANDSTONE	FG. M. GY. MAS. BRKN AS ABOVE. EAGLESNEST SANDSTONE UNIT.
81	170.67	170.87	0.20		80		SANDSTONE	FG. M. GY. MAS. EAGLESNEST SANDSTONE UNIT.
81	170.87	171.29	0.42	*	80		SANDSTONE	FG. M. GY. MAS. BRKN FAINT MINOR MUDST LAMINAE BUT OTHERWISE FEATURELESS. EAGLESNEST SANDSTONE UNIT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86028

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
81	171.29	172.37	1.08	*	78		SANDSTONE	SLTY. M. GY. LAM. WRMBU. BRKN GRADATIONAL UPPER CONTACT WITH AN INCREASE IN WAVY TO PLANAR MUDST LAMINAE WHICH ARE LOCALLY BIOTURBATED. NEAR MIDDLE OF UNIT. NUMEROUS VERTICAL AND ANGULAR MORM BURROWS INDICATE TOPS UP. BASAL IS MASSY RARE MUDST LAMINAE. EAGLESNEST SANDSTONE UNIT.
82	172.37	173.79	1.42	*	75		SANDSTONE	VFG. M. GY. LAM. BRKN MASSIVE AT TOP WITH GRADATIONAL CONTACT INTO SILTY BANDED SS. INDISTINCT LAMINAE CONTACTS NEAR BASE OF UNIT. BASE OF EAGLESNEST SANDSTONE UNIT.
82	173.79	174.51	0.72	*	80		SANDSTONE	CLYY. M. GY. LAM. WRMBU. BRKN GRADATIONAL UPPER CONTACT. INDISTINCT LAMINAE CONTACTS DISTURBED BY MINOR SSD AND ABUNDANT BURROWING INDICATING TOPS UP. BASE OF EAGLESNEST SANDSTONE UNIT.
82	174.51	175.91	1.40	*	80		SANDSTONE	CLYY. M. GY. LAM. WRMBU. BRKN AS ABOVE. LOCALLY BIOTURBATED. BASE OF EAGLESNEST SANDSTONE UNIT.
83	175.91	177.91	2.00	*	89		SANDSTONE	CLYY. M. GY. LAM. WRMBU. BRKN AS ABOVE. LOCALLY BIOTURBATED. PYRITE B LBS NEAR BASE. T.D. = 179.21 M. DRILLER'S MARK.

\* DENOTES MEASURED BCA  
NEWPAGE











GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT  
 STRATIGRAPHIC LOG  
 KPN LR DDH86028

723

GEOLOGIST : MACLEOD

DATE : FEB 26/87

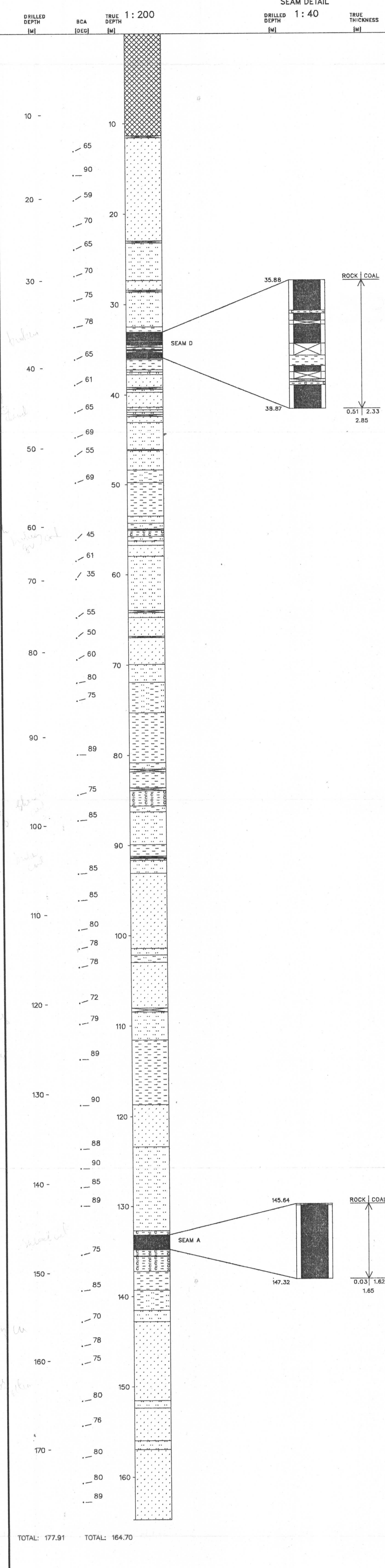
DRAWING NO. :

LITHOLOGIC SYMBOLS

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

SCALE: 1:200 1:40

NORTHING: 6346990.0 N  
 EASTING: 506187.5 E  
 INCLINATION: 90.0°



# Gulf Canada Corporation

## Coal Division

Geophysical Log

# 723

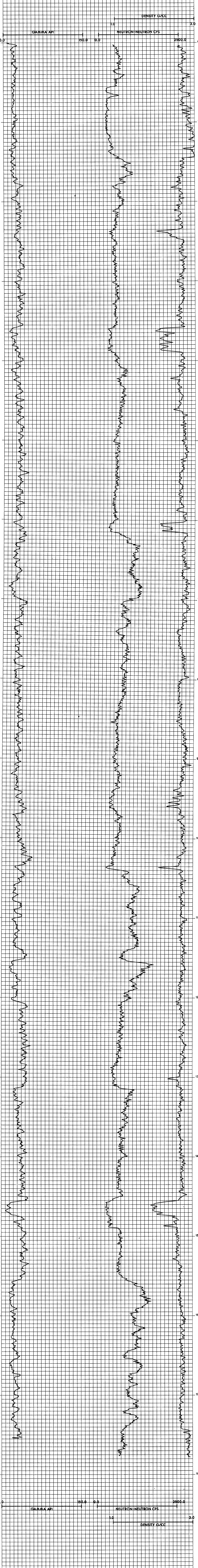
Datasource: **KPNLRDDH86028**  
 Log Date: 86-09-22  
 Company: CENTURY  
 Geologist: MACLEOD

Province: BC    Northing: 6346990.00    Lat: 571604  
 Zone: 9    Easting: 506188.00    Long: 1285351  
 Measuring Point:    Elevation: 1366.4

Scale: 1 to 100.0  
 Depth Range: 0.0 to 183.0  
 True Thickness: NO

Comments:  
 1. LOGGED THROUGH THE RODS  
 2.

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



**KPNLRDDH86029**

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86029

DATE - 02/13/87

- HISTORY -

START DATE - 21/09/86

END DATE - 23/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - MACLEOD

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1690.89

LICENCE/LEASE NUMBER -

ZONE - 9

NORTHING - 6343175.00

EASTING - 505751.56

LATITUDE - 571401

LONGITUDE - 1285417

- ORIENTATION -

LENGTH - 156.36

CORE SIZE - 0.0

INCLINATION - 70.0

AZIMUTH - 300.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 3.66

AQUIFER DEPTHS (M) - 0.00

0.00

LOST CIRC. DEPTHS (M) - 0.00

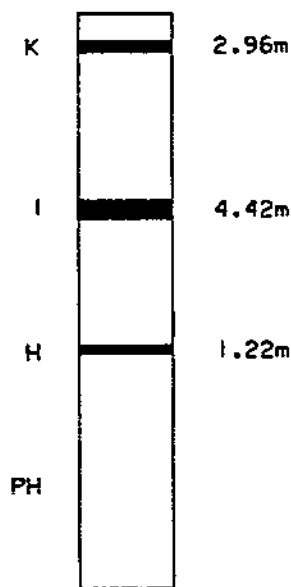
0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====



SEAM            TRUE SEAM THICKNESS  
                                 (COAL & ROCK)



NOTE:

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE    1:2000

FIGURE

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86029

GULF CANADA CORPORATION  
11/03/87  
KLAP: [205057]B70063029.LOG



87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	3.66	3.66	88			OVERBURDEN	CASING
1	3.66	4.76	1.10	88			SANDSTONE	FG.DK.GY.LAM.VBRKN MOSTLY RUBBLE, PROBABLY OVERBURDEN.
1	4.76	5.11	0.35	88			SANDSTONE	FG.DK.GY.LAM.VBRKN RUBBLE, AS ABOVE. SOFT, POORLY CONSOL. FAINTLY LAMINATED.
2	5.11	6.93	1.82	*88			SANDSTONE	FG.DK.GY.LAM.VBRKN POORLY CONSOL AND SOFT AS ABOVE.
3	6.93	7.59	0.66	86			SILTSTONE	SSY.M.GY.BRKN
3	7.59	8.03	0.44	*85	10083		SILTSTONE	SSY.M.GY.VBRKN CORE TWIST OFF WITHIN. LOWER 25CM SAMPL ED.
3	8.03	8.06	0.03	85	10084	K	COAL	C-3.BRKN
3	8.06	8.10	0.04	85	10084	K	COAL	C-2.BRKN

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	8.10	8.12	0.02	85	10084	K	MUDSTONE	SLTY.M-DK.GY.VBRKN
3	8.12	8.16	0.04	85	10084	K	COAL	C-2.VBRKN
3	8.16	8.21	0.05	85	10084	K	COAL	C-3.VBRKN
3	8.21	8.32	0.11	85	10084	K	COAL	C-2.VBRKN
3	8.32	8.35	0.03	85	10084	K	COAL	C-3.VBRKN
3	8.35	8.45	0.10	85	10084	K	COAL	C-2.VBRKN
3	8.45	8.48	0.03	85	10084	K	COAL	C-6.VBRKN

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 3

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	8.48	8.53	0.05	85	10084	K	COAL	C-2.VBRKN
3	8.53	9.34	0.81	85	10084	K	COAL LOSS	
3	9.34	9.39	0.05	85	10084	K	ROCK LOSS	
3	9.39	9.45	0.06	85	10084	K	MUDSTONE	SLTY.M-DK.GY.VBRKN
4	9.45	9.56	0.11	85	10084	K	COAL	C-2.VBRKN RUBBLE.
4	9.56	9.60	0.04	85	10084	K	MUDSTONE	CLYY.M-DK.GY.BRKN POORLY CONSOLIDATED.
4	9.60	9.65	0.05	85	10084	K	ROCK LOSS	
4	9.65	9.95	0.30	85	10084	K	COAL LOSS	
4	9.95	10.09	0.14	85	10084	K	ROCK LOSS	
4	10.09	10.21	0.12	85	10084	K	COAL LOSS	
4	10.21	10.35	0.14	85	10084	K	ROCK LOSS	

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 4

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	10.35	10.62	0.27	85	10084	K	COAL LOSS	
4	10.62	10.67	0.05	85	10084	K	COAL	C-4.BRKN
4	10.67	10.92	0.25	85	10084	K	COAL	C-2.VBRKN
4	10.92	10.93	0.01	85	10084	K	COAL	C-6.SLD BONE COAL.
4	10.93	11.00	0.07	85	10084	K	COAL	C-2.VBRKN
4	11.00	11.12	0.12	85	10085		MUDSTONE	CARB.DK.GY.VBRKN COALY STRINGERS AND THIN BANDS WITHIN.
4	11.12	11.53	0.41	85	10085		ROCK LOSS	
4	11.53	11.93	0.40	85	10085		SILTSTONE	M.GY.VBRKN UPPER 13CM SAMPLED.
4	11.93	12.31	0.38	85			ROCK LOSS	
4	12.31	12.43	0.12	*85			MUDSTONE	SLTY.M-DK.GY.VBRKN
4	12.43	12.95	0.52	83			SILTSTONE	CLYY.M.GY.SLD

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	12.95	14.39	1.44	*78			MUDSTONE	SLTY, DK. GY. LAM. WRMBU. BRKN INDISTINCT SLTST LAMINAE IN OTHERWISE F EATURELESS MUDST NEAR TOP AND GRADES IN TO HIGHLY MOTTLED UNIT NEAR BASE.
5	14.39	14.53	0.14	*75			SILTSTONE	CLYY, DK. GY. LAM. SLD SLIGHTLY COARSER THAN OVERLYING UNIT AS SLTST LAMINAE INCREASE IN WIDTH. SLIGH TLY MOTTLED BDG ALTHOUGH NO DISTINCT MO RM. BURROWS EVIDENT AS IN ABOVE UNIT.
5	14.53	14.55	0.02	77			CLAYSTONE	DK. GY. MAS. SLD SOFT AND PLIABLE. SHARP TOP AND BASAL C ONTRACTS.
5	14.55	14.83	0.28	*80			SILTSTONE	CLYY, DK. GY. LAM. SLD MOTTLED SLTST/MUDST CONTACTS AS ABOVE. LGE PYRITE BLEBS 3CM WIDE AND 6CM LONG NEAR TOP OF UNIT. GRADATIONAL BASAL CON TACT AS SLTST LAM INCREASE IN NUMBER AN D WIDTH.
5	14.83	15.10	0.27	80			SANDSTONE	FG. M. GY. MAS. BRKN SLTST LAMINAE NEAR UPPER GRADATIONAL CO NTACT BUT OTHERWISE FEATURELESS.
6	15.10	16.50	1.40	82			SANDSTONE	FG. M. GY. MAS. VBRKN AS ABOVE. V COMPETENT. QTZ CEMENTED, NEA R VERTICAL FRACTURES ABUNDANT.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 6

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	16.50	17.11	0.61	83			ROCK LOSS	
6	17.11	17.76	0.65	84			SANDSTONE	FG. M. GY. MAS. BRKN AS ABOVE. FEATURELESS CLEAN SS.
7	17.76	19.20	1.44	86			SANDSTONE	FG. M. GY. MAS. BRKN AS ABOVE. QTZ VEINING AT 15 AND 20 DEGR EES IN OTHERWISE MONOTONOUS SS.
7	19.20	19.82	0.62	88			SANDSTONE	FG. M. GY. MAS. BRKN AS ABOVE.
8	19.82	21.09	1.27	*89			SANDSTONE	FG. M. GY. MAS. BRKN COMPOSITIONALLY AS ABOVE WITH V MINOR M UDST LAMINAE NEAR MIDDLE OF UNIT.
8	21.09	21.33	0.24	87			ROCK LOSS	
8	21.33	21.74	0.41	86			SANDSTONE	FG. M. GY. MAS. VBRKN AS ABOVE. EXCEPT COMPLETE RUBBLE.
8	21.74	22.26	0.52	85			ROCK LOSS	
8	22.26	22.67	0.41	84			SANDSTONE	FG. M. GY. MAS. SLD FEATURELESS AS ABOVE.

\* DENOTES MEASURED BCA

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87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 7

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
9	22.67	24.55	1.88	81			SANDSTONE	FG.M.GY.MAS.BRKN AS ABOVE. SINGLE ANGULAR MUDST RIPUP 20 CM LONG. BOTTOM 0.75M IS TOTAL RUBBLE (DUE TO ABUNDANT FRACTURES?).
9	24.55	24.59	0.04	79			SANDSTONE	FG.M.GY.MAS.SLD COMPOSITIONALLY AS ABOVE.
10	24.59	25.84	1.25	78			SANDSTONE	FG.M.GY.MAS.SLD AS ABOVE. MINOR MUDST RIPUPS 1CM LONG NEAR BASE. SHARP BASAL CONTACT.
10	25.84	26.73	0.89	*75			SILTSTONE	CLYY.DK.GY.LAM.BRKN MINOR UNIDENTIFIABLE PLANT HASH PARALLEL TO BDG PLANES. SLTST/MUDST LAMINAE HAVE INDISTINCT GRADATIONAL CONTACTS.
11	26.73	26.80	0.07	78			SILTSTONE	CLYY.DK.GY.LAM.SLD MUDST/SLTST INTERLAMINATION HAVE DISTURBED TO GRADATIONAL CONTACTS.
11	26.80	28.83	2.03	*85			SILTSTONE	CLYY.DK.GY.LAM.BIOTR.SLD BOTH GRADATIONAL AND SHARP SLTST/MUDST LAMINATION CONTACTS. 10CM BIOTURBATED ZONE 0.45M FROM TOP OF UNIT.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 8

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	28.83	29.83	1.00	82			SILTSTONE	CLYY.DK.GY.LAM.BRKN LITHOLOGICALLY AS ABOVE. SILTIER AT TOP OF UNIT WITH AN INCREASE IN MUDST LAM NEAR BASE.
12	29.83	30.45	0.62	*80			SILTSTONE	CLYY.DK.GY.LAM.BRKN MONOTONOUS MUDDY LAMINATED SLTST AS ABOVE. INDISTINCT CONTACTS.
12	30.45	30.75	0.30	78			SILTSTONE	CLYY.DK.GY.LAM.BRKN AS ABOVE. INDISTINCT CONTACTS ON MUDST LAMINAE. UNIT SILTIEST IN MIDDLE WITH AN INCREASE IN MUDST TOWARDS UPPER AND BASAL CONTACTS. COASTER LITHOLOGY.
13	30.75	32.50	1.75	*75			SILTSTONE	CLYY.DK.GY.LAM.BRKN AS ABOVE. SLIGHTLY FINER THAN ABOVE UNIT.
13	32.50	32.68	0.18	73			SILTSTONE	CLYY.DK.GY.LAM.BRKN
14	32.68	32.83	0.15	73			MUDSTONE	SLTY.DK.GY.LAM.VBRKN RUBBLE. DISTINCTLY LAMINATED WITH GRADATIONAL MUDST/SLTST CONTACTS. COASTER LITHOLOGY.

\* DENOTES MEASURED BCA

FORM  
4061

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	32.83	35.55	2.72	70			ROCK LOSS	
14	35.55	36.05	0.50	67			MUDSTONE	SLTY. DK. GY. LAM. VBRKN COMPLETE RUBBLE MIXED WITH UNCONS MUDST . ABUNDANT QTZ.
14	36.05	36.16	0.11	66			ROCK LOSS	
14	36.16	36.39	0.23	66			MUDSTONE	CARB. BLK. VBRKN SOFT AND POORLY CONSOL., HIGHLY SHEARED, FAULTED.
14	36.39	36.69	0.30	65			ROCK LOSS	
14	36.69	37.00	0.31	65			ROCK LOSS	COMPLETE CORE LOSS.
14	37.00	37.21	0.21	64			ROCK LOSS	
14	37.21	37.51	0.30	64			SILTSTONE	M. GY. VBRKN COMPLETE RUBBLE. LAMINATED?
14	37.51	37.93	0.42	63			SILTSTONE	M. GY. LAM. VBRKN UPPER 10CM IS RUBBLE AS ABOVE AND LOWER 0.32M IS HIGHLY BRECCIATED WITH CLAY I NFILL. FAULT ZONE?

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	37.93	38.37	0.44	62			BRECCIA	M. GY. VBRKN AS ABOVE. COMPLETELY BRECCIATED. FAULT ZONE?
15	38.37	38.83	0.46	61			ROCK LOSS	
15	38.83	39.53	0.70	*60			SANDSTONE	VFG. M. GY. LAM. VBRKN UNIT SLIGHTLY COARSER THAN CLASTS IN AB OVE BRECCIA. MUDST LAMINAE ARE PLANAR I O NAVY AND IMM TO 1CM THICK WITH THICKE R LAMINAE NEAR BASE. LOWER .15M COMPLET E RUBBLE.
15	39.53	40.05	0.52	67			ROCK LOSS	
15	40.05	40.40	0.35	72			SILTSTONE	CLYY. DK. GY. LAM. HRMBU. BRKN PARTLY BRECCIATED, PARTICULARLY NEAR TO P OF UNIT. SOFT. UNCONSOL CLAY INFILL. LOWER 0.13M IS HIGHLY BIOTURBATED OBSCU RING LAMINAE CONTACTS. HRMBURS. INDICATE TOPS UP.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	40.40	40.67	0.27	*75			SILTSTONE	CLYY, DK. GY. LAM. WRMBU. SLD LITHOLOGICALLY SIMILAR TO LOWER 10CM OF LAST UNIT WITH ABUNDANT VERTICAL WORM BURROWS INDICATING TOPS UP. BURROWING O BSCURES BDG CONTACTS.
16	40.67	41.92	1.25	75			SILTSTONE	CLYY, DK. GY. LAM. VBRKN MOSTLY RUBBLE. UNIT COARSENS TO BASE WI TH V MINOR MUDST LAMINAE.
16	41.92	42.90	0.98	76			ROCK LOSS	
17	42.90	43.15	0.25	76			SILTSTONE	DK. GY. MAS. VBRKN RUBBLE. LITHOLOGICALLY SIMILAR TO BASE OF UNIT ABOVE.
17	43.15	44.53	1.38	*76			SANDSTONE	SLTY. VFG. DK. GY. LAM. BRKN OCCASIONAL PLANAR MUDST LAMINAE UP TO 1 MM INCREASE TOWARDS BASE. MIDDLE OF UNIT BRECCIATED WITH SOFT, UNCONSOL INFILL F OR 6CM.
18	44.53	45.01	0.48	80			SANDSTONE	SLTY. VFG. DK. GY. LAM. VBRKN MOSTLY RUBBLE. ABUNDANT QTZ VEINING AND MINOR MUDST LAMINAE. GRADATIONAL(?) CO NTACT. TUFFACEOUS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	45.01	45.86	0.85	82			ROCK LOSS	
18	45.86	45.94	0.08	84			MUDSTONE	DK. GY. LAM. VBRKN COMPLETE RUBBLE.
18	45.94	46.10	0.16	84			MUDSTONE	DK. GY. LAM. BRKN LOWER PART OF UNIT IS BRECCIATED.
18	46.10	46.20	0.10	*85			MUDSTONE	DK. GY. LAM. SLD INDISTINCT LAMINAE.
18	46.20	46.31	0.11	83			MUDSTONE	DK. GY. VBRKN COMPLETE RUBBLE. ROUNDED MUDST PEBBLES IN LT. GY. SOFT UNCONSOLIDATED MATRIX.
18	46.31	46.74	0.43	79			ROCK LOSS	
18	46.74	47.44	0.70	71			MUDSTONE	DK. GY. VBRKN FEATURELESS. CORE THIST OFF. AT TOP. OF U NIT.
18	47.44	47.70	0.26	63			MUDSTONE	DK. GY. MAS. BRKN FEATURELESS. AS ABOVE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	47.70	48.55	0.85	*55			MUDSTONE	DK.GY.LAM.VBRKN MUCH OF UNIT IS RUBBLE. INDISTINCT RARE SLTST LAMINAE. GRADATIONAL BASAL CONTACT.
19	48.55	49.54	0.99	61			ROCK LOSS	
19	49.54	50.04	0.50	*65			MUDSTONE	SLTY.DK.GY.LAM.VBRKN SLTST LAMINAE INCREASE TO BASE OF UNIT. BRECCIATED IN MIDDLE OF UNIT WITH SOFT MUDST. INFILL. LOWER 0.30M IS HIGHLY FRACTURED.
20	50.04	50.95	0.91	74	10086		MUDSTONE	SLTY.M-DK.GY.BRKN LOWER 21CM SAMPLED. MINOR CARB PLANT FRAGS WITHIN. BRECCIATED WITH CLAY FRAGS WITHIN.
20	50.95	50.99	0.04	*80	10086		MUDSTONE	CARB.DK.GY.BRKN COAL STRINGERS WITHIN.
20	50.99	51.30	0.31	80	10087 I		COAL	C-2.PHRD VERY BROKEN AND POWDERED INTO A MUSH.
20	51.30	51.48	0.18	80	10087 I		MUDSTONE	CARB.DK.GY.VBRKN POOR, UNCONSOLIDATED MIXTURE OF MUD & COALY FLECKS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	51.48	52.07	0.59	80	10087 I		COAL LOSS	
20	52.07	52.14	0.07	80	10087 I		COAL	C-3.BRKN
20	52.14	52.17	0.03	80	10087 I		MUDSTONE	SLTY.M-DK.GY.BRKN
21	52.17	52.30	0.13	80	10087 I		COAL LOSS	
21	52.30	53.08	0.78	80	10087 I		COAL	C-2.VBRKN VERY BROKEN AND POWDERED IN MOST PLACES
21	53.08	53.10	0.02	80	10087 I		MUDSTONE	SLTY.M-DK.GY.SLD
21	53.10	53.23	0.13	80	10087 I		ROCK LOSS	
21	53.23	53.96	0.67	80	10088 I		COAL LOSS	
21	53.96	53.97	0.07	80	10088 I		COAL	C-2.SLD

\* DENOTES MEASURED BCA



PROJECT: KPN BLOCK: LR DATA SOURCE: DDM86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	53.97	54.03	0.06	80	10088	I	COAL	C-2.BRKN
21	54.03	54.84	0.81	80	10088	I	COAL	C-1.BRKN MINOR THIN MUDDY BANDS WITHIN.
22	54.84	55.06	0.22	80	10088	I	COAL	C-1.BRKN MINOR THIN MUDDY BANDS WITHIN.
22	55.06	55.44	0.38	80	10088	I	COAL	C-1.VBRKN MINOR THIN MUDDY BANDS WITHIN.
22	55.44	55.48	0.04	80	10088	I	COAL	C-4.BRKN VITRINITE BANDS WITHIN.
22	55.48	56.13	0.65	*80	10089		MUDSTONE	CARB.DK.GY.SLD ABUNDANT PLANT FRAGS THROUGHOUT. COALIFIED NEAR TOP OF UNIT. UPPER 25CM SAMPLE D.
22	56.13	56.58	0.45	78			MUDSTONE	CARB.M-DK.GY.SLD ABUNDANT PLANT FRAGS THROUGHOUT. SILTY NEAR BASE.
22	56.58	56.60	0.02	78			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDM86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
23	56.60	58.30	1.70	*75			SANDSTONE	FG.M.GY.MAS.VBRKN TOP OF UNIT HAS SLTY BANDS UP TO 3CM W ITH GRADATIONAL CONTACTS WITH SS. MIDDLE E AND BASE OF UNIT IS FEATURELESS AND M ASSIVE. VERTICAL QTZ VEINS 0.75CM WIDE T HROUGHOUT MUCH OF UNIT AND ABUNDANT FRA CTURES AT 10-20 DEGREES. GRADATIONAL BA SAL CONTACT.
23	58.30	58.36	0.06	75			SANDSTONE	SLTY.FG.M.GY.MAS.SLD ABUNDANT ANGULAR TO ROUNDED MUDST RIPUP CLASTS UP TO 1.5CM LONG.
23	58.36	58.59	0.23	75			SANDSTONE	SLTY.FG.M.GY.MAS.SLD POORLY CONSOLIDATED UNIT. LITHOLOGICALLY AS ABOVE TWO UNITS BUT WITH NO RIPUPS.
24	58.59	59.13	0.54	*75			SANDSTONE	SLTY.FG.M.GY.LAM.VBRKN POORLY CONSOLIDATED. BRECCIATED NEAR TO P. MINOR MUDST LAMINAE NEAR BASE OF UNI T.
24	59.13	59.22	0.09	75			SANDSTONE	FG.M.GY.MAS.SLD ABUNDANT MUDST RIPUP CLASTS. NEAR VERTI CAL QTZ.YEIN.
24	59.22	59.30	0.08	75			MUDSTONE	DK.GY.MAS.SLD SOFT, PLIABLE, UNCONSOL. SHARP UPPER AN D LOWER CONTACTS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	59.30	60.56	1.26	*75			SANDSTONE	FG.M.GY.LAM.VBRKN MINOR MUDST LAMINAE IN OTHERWISE FEATUR ELESS SS. PARTLY RUBBLE.
25	60.56	60.97	0.41	72			SANDSTONE	FG.M.GY.MAS.BRKN AS ABOVE WITHOUT MUDST LAM. RELATIVELY SHARP BASALCONTACT.
25	60.97	61.07	0.10	71			SILTSTONE	CLYY.DK.GY.LAM.SLD INDISTINCT LAMINAE CONTACTS.
25	61.07	61.32	0.25	71			MUDSTONE	SLTY.DK.GY.LAM.VBRKN RUBBLE.
25	61.32	61.45	0.13	70			ROCK LOSS	
25	61.45	62.54	1.09	*68			MUDSTONE	SLTY.DK.GY.LAM.VBRKN INDISTINCT TO DISTINCT PLANAR MUDST/SLT ST CONTACTS. HELMINTHOPSIS PRESENT. UNI T FINES TO BASE. HIGHLY FRACTURED. POLI SHED SLIP SURFACES.
26	62.54	62.83	0.29	67			MUDSTONE	SLTY.DK.GY.MAS.VBRKN FEATURELESS.
26	62.83	62.94	0.11	67			MUDSTONE	SLTY.BLK.MAS.VBRKN HIGHLY SHEARED. COMPLETELY UNCONSOLIDAT ED.SOFT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	62.94	64.00	1.06	67			MUDSTONE	SLTY.BLK.MAS.BRKN FEATURELESS BLACK MUDST AS ABOVE. ABUND ANT POLISHED SLIP SURFACES.
26	64.00	64.50	0.50	66			MUDSTONE	SLTY.DK.GY.SLD COMPLETELY UNCONSOLIDATED MUD WITH 12CM OF BRECCIA(QTZ INFILL OF SLTST CLASTS) NEAR BASE OF UNIT.
27	64.50	64.81	0.31	66			MUDSTONE	SLTY.DK.GY.VBRKN RUBBLE.
27	64.81	64.96	0.15	66			ROCK LOSS	
27	64.96	65.71	0.75	66			MUDSTONE	SLTY.DK.GY.MAS.BRKN FEATURELESS MUDST WITH GRADATIONAL BASA L CONTACT IN FG SS.
27	65.71	66.53	0.82	*65			SANDSTONE	FG.M.GY.MAS.VBRKN COARSENS FROM SLTST NEAR TOP. MASSIVE E XCEPT OCCASIONAL MUDST BANDS UP TO 1.5C M WITH LOAD CASTING INDICATING TOPS UP. LOWER HALF OF UNIT IS RUBBLE.
27	66.53	66.64	0.11	66			ROCK LOSS	

\* DENOTES MEASURED BCA

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## GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
28	66.64	68.14	1.50	57			SANDSTONE	FG.M.GY.MAS.VBRKN FEATURELESS MASSIVE SS.
28	68.14	68.45	0.31	*68			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN SLTST/MUDST LAMINAE CONTACTS INDISTINCT AND LOCALLY OBTSCURED BY BURROWING. SMA RP UPPER CONTACTS.
29	68.45	69.00	0.55	*65			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN AS ABOVE. WORM BURROWS AND LOAD CASTING INDICATE TOPS UP. GRADATIONAL BASAL CO NTACT.
29	69.00	69.46	0.46	65			SANDSTONE	FG.M.GY.MAS.BRKN MASSIVE SS EXCEPT SINGLE 3CM BAND OF EL ONGATE MUDST.RIPUP CLASTS NEAR BASE OF UNIT.
29	69.46	69.60	0.14	65			ROCK LOSS	
29	69.60	70.25	0.65	65			SANDSTONE	FG.M.GY.MAS.VBRKN AS ABOVE.
29	70.25	70.65	0.40	65			SANDSTONE	FG.M.GY.THNB.BRKN AS ABOVE.

\* DENOTES MEASURED BCA

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## GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	70.65	72.70	2.05	*65			SANDSTONE	FG.M.GY.THNB.BRKN THIN BANDED WITH WAVY CONTACTS. VERY BR OKEN AT BASE.
30	72.70	72.79	0.09	64			ROCK LOSS	
31	72.79	73.02	0.23	64			SANDSTONE	FG.M.GY.MAS.VBRKN AS ABOVE. RUBBLE. SHARP BASAL CONTACT.
31	73.02	74.37	1.35	*63			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN INDISTINCT LAMINAE CONTACTS. COARSENS T O BASE WHERE LAMINAE ARE MOST INDISTINC T.
31	74.37	74.60	0.23	*62			SILTSTONE	CLYY.DK.GY.LAM.BRKN DISTINCTLY LAMINATED WITH AN INCREASE I N PLANAR MUDST LAMINAE TO BASE.
32	74.60	76.71	2.11	*60			SILTSTONE	CLYY.DK.GY.LAM.BRKN EVENLY AND DISTINCTLY LAMINATED WITH SH ARP. PLANARMUDST/SLTST CONTACTS. ABUNDA NT QTZ VEINS NEAR TOP.
33	76.71	76.81	0.10	61			SILTSTONE	CLYY.DK.GY.LAM.SLD INDISTINCTLY LAMINATED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
33	76.81	78.73	1.92	*61		SILTSTONE	CLYY, DK, GY, LAM, WRMBU, BRKN INTERLAMINATED SLTST/MUDST WITH PLANAR TO DISTURBED CONTACTS. ANGULAR WORM BURROWS INDICATE TOPS UP. HELMINTHOPSIS PRESENT IN BASAL PART OF UNIT. NUMEROUS BR ECCIATED INTERVALS IN MIDDLE AND NEAR BASE.
34	78.73	80.29	1.56	63		MUDSTONE	DK, GY, MAS, BRKN MONOTONOUS BLACK MUDST WITH MINOR HELMINTHOPSIS IN MIDDLE OF UNIT. LOCALLY BRECCIATED. SHARP BASAL CONTACT.
34	80.29	80.42	0.13	64		SANDSTONE	FG, DK, GY, MAS, SLD MASSIVE. FEATURELESS.
34	80.42	80.62	0.20	64		MUDSTONE	DK, GY, MAS, VBRKN RUBBLE.
35	80.62	82.68	2.06	*65		SILTSTONE	CLYY, DK, GY, LAM, WRMBU, SLD LOCALLY BIOTURBATED. MINOR SSD. LOAD CASTING INDICATES TOPS UP. HELMINTHOPSIS PRESENT.
36	82.68	82.72	0.04	*65		SILTSTONE	CLYY, DK, GY, LAM, SLD AS ABOVE. INDISTINCT LAMINAE. MODERATELY SHARP BASAL CONTACT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
36	82.72	83.29	0.57	65		SANDSTONE	FG, M, GY, MAS, SLD MASSIVE SS WITH V FINE MUDST CLASTS (?) AND FINELY DISSEMINATED ORGANIC MATTER (?)
36	83.29	83.47	0.18	65		SILTSTONE	CLYY, DK, GY, LAM, SLD INDISTINCT, DISTURBED MUDST/SLTST LAMINAE CONTACTS.
36	83.47	84.08	0.61	*65		SANDSTONE	FG, M, GY, THKB, SLD 1CM MUDST LAMINAE INTERRUPT SS EVERY 0.25 METRES. LOAD CASTS INDICATE TOPS UP. GRADATIONAL BASAL CONTACTS AS MUDST LAM INCREASE IN NUMBER.
36	84.08	84.99	0.91	*70		SILTSTONE	CLYY, DK, GY, LAM, WRMBU, SLD DISTINCTLY LAMINATED WITH SHARP TO GRADATIONAL MUDST/SLTST CONTACTS. RARE WORM BURROWS INDICATE TOPS UP. LAMINAE MAY BE TO PLANAR.
37	84.99	85.97	0.98	*65		MUDSTONE	SLTY, DK, GY, LAM, BIOTR, BRKN SLTST LAMINAE AND BIOTURBATION NEAR TOP OF UNIT. GRADES INTO MASSIVE MUDST. MINOR PYRITE BLEBS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	85.97	87.04	1.07	69			MUDSTONE	SLTY. DK. GY. MAS. BRKN MOSTLY MASSIVE AND FEATURELESS EXCEPT NEAR BASE WHERE SLTST LAMINAE ARE MINOR AND INDISTINCT. GRADATIONAL BASAL CONTACT. V THIN COAL LAMINAE 1MM NEARBASE.
38	87.04	89.14	2.10	*75			MUDSTONE	SLTY. DK. GY. LAM. BIOTR. BRKN INDISTINCT AND DISTURBED MUDST/SLTST CONTACTS ARE LOCALLY BIOTURBATED. HELMINTHOPOD IS ABUNDANT.
39	89.14	89.60	0.46	81			MUDSTONE	SLTY. DK. GY. MAS. BRKN FEATURELESS MUDST.
39	89.60	91.17	1.57	*85			MUDSTONE	SLTY. DK. GY. LAM. BRKN MINOR SLTST LAMINAE WITH INDISTINCT AND DISTURBED CONTACTS ARE FOUND PREDOMINANTLY IN MIDDLE OF UNIT ONLY. LOCALIZED BRECCIA ZONE 4CM WIDE 0.4M FROM TOP OF UNIT HAS CLAY INFILL.
40	91.17	91.50	0.33	84			MUDSTONE	DK. GY. BRKN POORLY CONSOLIDATED.
40	91.50	91.66	0.16	84		H	COAL LOSS	
40	91.66	91.92	0.26	84		H	ROCK LOSS	
40	91.92	92.48	0.56	83		H	COAL LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
40	92.48	92.54	0.06	83		H	COAL	C-1. SLD
40	92.54	92.69	0.15	83		H	COAL	C-3. PWRD HIGHLY SHEARED & POWDERED.
40	92.69	92.73	0.04	83		H	COAL	C-2. BRKN
40	92.73	92.92	0.19	83			MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS WITHIN.
40	92.92	93.76	0.84	82			ROCK LOSS	
40	93.76	94.01	0.25	82			MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
40	94.01	94.87	0.86	81			SANDSTONE	FG. PR. LT-M. GY. SLD SMALL MG BANDS WITHIN. SLIGHT BRECCIATION NEAR TOP.
41	94.87	96.79	1.92	*80			SANDSTONE	MG. LT. GY. LAM. BRKN OCCASIONAL DK MUDST LAMINAE AND ROUNDED TO ANGULAR CLASTS UP TO 1CM IN 3CM (MAX) BANDS.
41	96.79	96.89	0.10	85			SANDSTONE	MG. LT. GY. LAM. BRKN AS ABOVE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	96.89	97.59	0.70	*87			SANDSTONE	MG. LT. GY. LAM. BRKN AS ABOVE WITH ABUNDANT RIPUPS IN 5CM WIDE BANDS SCATTERED THROUGHOUT THE SS. OCCASIONAL MUDST LAMINAE. SHARP SCoured BASAL CONTACT WITH LOWER BCM BRECCIATED
42	97.59	98.69	1.10	*88			SILTSTONE	CLYY. DK. GY. LAM. WRMBU. BRKN PLANAR MUDST/SILTST CONTACTS LOCALLY OBSERVED BY WORM BURROWS INDICATING TOPS UP. NUMEROUS BRECCIA ZONES WITH CLAY INFILLS IN MIDDLE AND BASE OF INTERVAL.
43	98.69	99.17	0.48	*71			SILTSTONE	CLYY. DK. GY. LAM. VBRKN AS ABOVE. HELMINTHOPSIS PRESENT. MOSTLY RUBBLE.
43	99.17	99.84	0.67	72			ROCK LOSS	
43	99.84	101.21	1.37	*75			SANDSTONE	SLTY. VFG. DK. GY. LAM. VBRKN SLIGHTLY COARSER THAN ABOVE UNIT. HIGHLY BRECCIATED WITH CLAY INFILL. DISTINCTLY LAMINATED.
43	101.21	101.32	0.11	71			ROCK LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
44	101.32	101.49	0.17	*70			SANDSTONE	SLTY. VFG. DK. GY. LAM. SLD AS ABOVE.
44	101.49	101.60	0.11	69			SILTSTONE	DK. GY. SLD ALL FEATURES OVERPRINTED BY DIAGENETIC RECRYSTALLIZATION OF CARBONATE (MARKER HORIZON).
44	101.60	101.70	0.10	69			SANDSTONE	FG. M. GY. VBRKN RUBBLE. ABUNDANT MUDST. RIPUP CLASTS UP TO 1CM LONG.
44	101.70	101.80	0.10	68			ROCK LOSS	
44	101.80	103.00	1.20	64			SILTSTONE	CLYY. DK. GY. SSD. BRKN SILTST LAMINAE LARGELY DISRUPTED BY ABUNDANT HELMINTHOPSIS TRACES. LOAD CASTING NEAR BASE OF UNIT INDICATE TOPS UP.
44	103.00	103.29	0.29	*60			SILTSTONE	CLYY. DK. GY. LAM. BRKN AS ABOVE. HELMINTHOPSIS PRESENT. PYRITE BLEB 0.5CM WIDE.
45	103.29	105.32	2.03	64			MUDSTONE	DK. GY. MAS. BRKN HELMINTHOPSIS ABUNDANT IN OTHERWISE FEATURELESS MUDST. BASAL 20CM ARE V BROKEN. VERY OCCASIONAL SILTST BANDS 0.5CM WIDE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
46	105.32	105.42	0.10		67		MUDSTONE	DK. GY. MAS. SLD AS ABOVE.
46	105.42	107.38	1.96	*70			MUDSTONE	SLTY. DK. GY. LAM. SLD FAINTLY LAMINATED IN PLACES. MINOR OCCURRENCES OF PYRITE AND BIVALVE FRAGMENTS. BEDDING DISTURBED (BIOGENICALLY?). LOWER 10CM BRECCIATED WITH SOFT UNCONSOLIDATED CLAY INFILL.
47	107.38	108.22	0.84		60		MUDSTONE	SLTY. DK. GY. LAM. BIOTR. BRKN SLTST/MUDST LAMINAE CONTACTS COMPLETELY OBSCURED BY BIOTURBATION.
47	108.22	108.77	0.55	*55			SILTSTONE	CLTY. DK. GY. LAM. BIOTR. BRKN FAINTLY LAMINATED TO BIOTURBATED. MUDST LAMINAE DECREASE TOWARDS GRADATIONAL BASAL CONTACT. QTZ VEINS PARALLEL TO BDG. MUDST/SLTST LAMINAE CONTACTS ARE GRADATIONAL.
47	108.77	109.32	0.55		64		ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
47	109.32	109.57	0.25	*70			SANDSTONE	SLTY. YFG. DK. GY. LAM. BRKN SLTST LAMINAE HAVE GRADATIONAL CONTACTS WITH YFG SS. UNIT IS COARSER THAN ABOVE. GRADATIONAL UPPER CONTACT.
48	109.57	109.89	0.32		67		SANDSTONE	SLTY. YFG. DK. GY. LAM. YBRKN RUBBLE. LITHOLOGICALLY AS ABOVE. LAMINAE WHERE SEEN HAVE GRADATIONAL CONTACTS.
48	109.89	110.19	0.30		64		ROCK LOSS	
48	110.19	110.56	0.37	*61			SANDSTONE	SLTY. YFG. DK. GY. LAM. BRKN MUDST LAMINAE HAVE GRADATIONAL CONTACTS WITH SS. BANDS OF FINE MUDST RIPUP CLASTS LESS THAN 1CM. RANDOMLY ORIENTED QTZ VEINS. SHARP BASAL CONTACTS.
48	110.56	110.60	0.04		63		MUDSTONE	SLTY. DK. GY. LAM. SLD FINES TOWARDS BASE TO CARB MUDST.
48	110.60	110.63	0.03		64		MUDSTONE	CARB. DK. GY. LAM. SLD ABUNDANT VITRAIN LAMINAE UP TO 1MM WIDE
48	110.63	110.66	0.03		64		MUDSTONE	CARB. DK. GY. LAM. SLD HIGHLY BRECCIATED OBSCURING LAMINAE, IF PRESENT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
48	110.66	111.36	0.70	*68			MUDSTONE	SLTY.DK.GY.LAM.BRKN INDISTINCT SLTST LAMINAE. FINES TOWARDS BASE.
48	111.36	111.57	0.21		67		MUDSTONE	CARB.DK.GY.LAM.BRKN VITRAIN LAMINAE UP TO 1MM. SEAM PH? ABU NDANT. QTZ VEINING.
48	111.57	111.71	0.14		67		MUDSTONE	SLTY.DK.GY.LAM.BRKN GRADATIONAL UPPER CONTACT. SLTY LAMINAE HAVE INDISTINCT CONTACT WITH MUDST.
49	111.71	111.75	0.04		67		MUDSTONE	SLTY.DK.GY.SLD
49	111.75	113.61	1.86	*65			SILTSTONE	CLYY.DK.GY.BRKN THICKLY BANDED TO INTERLAMINATED SLTST AND MUDST WITH INDISTINCT PLANAR TO DIS TURBED CONTACTS. BOTTOM 0.3M RUBBLE. UN IT COARSER THAN ABOVE UNIT.
50	113.61	113.67	0.06		61		SILTSTONE	CLYY.DK.GY.BRKN

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
50	113.67	114.29	0.62	*60			SILTSTONE	CLYY.DK.GY.LAM.VBRKN FAINTLY LAMINATED. INTERVAL MOSTLY RUBB LE. HIGHLY BRECCIATED WITH SOFT, UNCONS OL CLAY INFILL.
50	114.29	115.20	0.91		62		ROCK LOSS	
50	115.20	116.00	0.80	*64			SILTSTONE	CLYY.DK.GY.LAM.BRKN FAINTLY LAMINATED WITH INDISTINCT PLANA R CONTACTS BETWEEN SLTST AND DARKER MUD ST.
51	116.00	116.14	0.14	*64			SILTSTONE	CLYY.DK.GY.LAM.VBRKN MUDST/SLTST CONTACTS ARE PLANAR AND GRA DATIONAL.
51	116.14	116.42	0.28		60		ROCK LOSS	
51	116.42	117.13	0.71	*50			SILTSTONE	CLYY.DK.GY.LAM.BRKN MUDST LAMINAE ARE V FINE (1MM) WITH SHA RP TO GRADATIONAL PLANAR CONTACTS. UPPE R 10CM IS RUBBLE.
51	117.13	117.87	0.74	*70			SILTSTONE	CLYY.DK.GY.LAM.BRKN AS ABOVE. UPPER 15CM BRECCIATED ALONG F RACTURE PLANES.

\* DENOTES MEASURED BCA



PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
51	117.87	118.38	0.51	64			ROCK LOSS	
52	118.38	118.88	0.50	*60			SILTSTONE	CLYY.DK.GY.LAM.VBRKN INDISTINCT, POORLY DEFINED MUDST LAMINA E. UNIT PREDOMINANTLY RUBBLE.
52	118.88	119.16	0.28	62			ROCK LOSS	
52	119.16	120.30	1.14	*65			SILTSTONE	CLYY.DK.GY.LAM.VBRKN MOSTLY RUBBLE. PLANAR MUDST LAM HAVE SH ARP. TO GRADATIONAL CONTACTS.
53	120.30	121.15	0.85	*80			SILTSTONE	CLYY.DK.GY.LAM.VBRKN MOSTLY RUBBLE. VERY FAINT INDISTINCT MU DST LAMINAE.
53	121.15	121.65	0.50	80			ROCK LOSS	
53	121.65	122.25	0.60	*80			SILTSTONE	CLYY.DK.GY.LAM.BRKN AS ABOVE. FAINT PLANAR MUDST LAMINAE AR E EVENLY SPACED AND UP TO 1CM WIDE.
54	122.25	122.80	0.55	75			SILTSTONE	CLYY.DK.GY.LAM.BRKN AS ABOVE. LOWER 1CM IS RUBBLE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
54	122.80	123.80	1.00	*69			SILTSTONE	CLYY.DK.GY.LAM.VBRKN AS ABOVE. MUDST LAMINAE DECREASE IN THI CKNESS TOWARDS BASE OF UNIT. NEAR BASE MINOR MUDST LAMINAE ARE LESS THAN 1MM W IDE AND HISPY. GRADATIONAL BASAL Contac T.
54	123.80	124.60	0.80	65			ROCK LOSS	
55	124.60	126.10	1.50	*60			SANDSTONE	SLTY.VFG.DK.GY.LAM.VBRKN OCCASIONAL PLANAR TO HISPY LAMINAE UP T O 1CM.
55	126.10	126.50	0.40	72			ROCK LOSS	
55	126.50	126.95	0.45	78			SANDSTONE	SLTY.VFG.DK.GY.LAM.VBRKN RUBBLE. LITHOLOGICALLY AS ABOVE.
56	126.95	128.21	1.26	*89			SANDSTONE	SLTY.VFG.DK.GY.LAM.VBRKN RUBBLE. LITHOLOGICALLY AS ABOVE WITH MI NOR FAINT MUDST LAM. BRECCIATED IN PART

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
56	128.21	130.15	1.94	77			ROCK LOSS	
56	130.15	130.23	0.08	70			SANDSTONE	SLTY. VFG. DK. GY. LAM. VBRKN AS ABOVE. RUBBLE.
57	130.23	131.58	1.35	*65			SILTSTONE	CLYY. DK. GY. LAM. VBRKN LARGELY RUBBLE. INDISTINCT MUDST/SLYST CONTACTS.
57	131.58	131.63	0.05	66		PH	COAL	C-1. BLK. LAM. VBRKN RUBBLE. MINOR. CARB. MUDST. NEAR BASE.
57	131.63	131.70	0.07	67		PH	COAL LOSS	
57	131.70	131.77	0.07	67			MUDSTONE	BLK. MAS. SLD HIGHLY QTZ VEINED NEAR BASE.
57	131.77	131.96	0.19	67			SILTSTONE	CLYY. DK. GY. VBRKN RUBBLE & SOFT UNCONSOL MUD.
57	131.96	132.01	0.05	67			MUDSTONE	BLK. MAS. SLD HIGHLY QTZ VEINED.
57	132.01	132.30	0.29	68			SILTSTONE	CLYY. DK. GY. LAM. BRKN HIGHLY QTZ VEINED. PARTLY BRECCIATED. M UDST. LAMINAE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
58	132.30	134.40	2.10	*70			SILTSTONE	CLYY. DK. GY. LAM. BRKN HIGHLY FRACTURED AND LOCALLY BRECCIATED WITH SOFT UNCONSOL CLAY INFILL. NUMEROUS SOFT CLAY BANDS UP TO 11CM WIDE. BROKEN NATURE OF CORE AND BRECCIATION MAKE S MORE DETAILED LOGGING IMPOSSIBLE.
59	134.40	136.02	1.62	*80			SILTSTONE	CLYY. DK. GY. LAM. VBRKN INDISTINCT MUDST LAMINAE. LOCALIZED BRECCIA ALONG FRACTURES. TOP AND BOTTOM OF UNIT IS RUBBLE.
59	136.02	136.44	0.42	67			SILTSTONE	CLYY. DK. GY. LAM. BRKN LITHOLOGICALLY AS ABOVE.
60	136.44	136.92	0.48	62			SILTSTONE	CLYY. DK. GY. LAM. VBRKN INDISTINCT LAMINAE. LOWER HALF OF UNIT IS RUBBLE.
60	136.92	138.32	1.40	*50			SILTSTONE	CLYY. DK. GY. LAM. WRNBU. BRKN INDISTINCT AND DISTURBED LAMINAE. ABUNDANT QTZ VEINING, FRACTURING AND BRECCIATION WITH CLAY INFILL. CORE TWIST OFF .14M FROM BASE OF UNIT. WORM BURROWS INDICATE TOPS UP.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 35

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
61	138.32	139.00	0.68	*72		SILTSTONE	CLYY, DK, GY, LAM, HRMBU, BRKN DISTINCTLY PLANAR LAMINATED WITH SHARP MUDST/SLTST CONTACTS. MINOR WORM BURROWS GRADATIONAL BASAL CONTACT.
61	139.00	139.71	0.71	73		SANDSTONE	SLTY, DK, GY, BRKN HISPY MUDST. LAMINAE AT IRREGULAR INTERY ALS.
61	139.71	140.43	0.72	*75		SANDSTONE	SLTY, DK, GY, THKB, SLD 15CM SS BEDS INTERBEDDED WITH 7 TO 20CM BEDS OF INTERLAMINATED MUDST AND SS WI TH SHARP PLANAR CONTACTS.
62	140.43	141.23	0.80	*71		SILTSTONE	CLYY, DK, GY, LAM, VBRKN HIGHLY BRECCIATED WITH CLAY INFILL. QTZ VEINING PARALLEL TO BDG.
62	141.23	141.65	0.42	72		SILTSTONE	CLYY, DK, GY, LAM, BRKN INDISTINCT LAMINAE.
62	141.65	142.55	0.90	73		SILTSTONE	CLYY, DK, GY, LAM, BRKN AS ABOVE. INDISTINCT LAMINAE. HELMINTHO PSIS ABUNDANT.
63	142.55	144.62	2.07	76		MUDSTONE	SLTY, DK, GY, MAS, BRKN Y SMALL PLANT HASH. OTHERWISE FEATURELE SS MASSIVE DK MUDST.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 36

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
64	144.62	144.76	0.14	77		MUDSTONE	SLTY, DK, GY, MAS, VBRKN RUBBLE.
64	144.76	146.63	1.87	*79		MUDSTONE	SLTY, DK, GY, LAM, BRKN INDISTINCTLY LAMINATED NEAR TOP AND DIS TINCTLY ANEVENLY LAMINATED NEAR BASE W ITH GRADATIONAL MUDST/SLTST CONTACTS. L OCALIZED BRECCIATION WITH CLAY INFILL W EAR MIDDLE OF UNIT.
65	146.63	146.98	0.35	69		SILTSTONE	CLYY, DK, GY, LAM, VBRKN RUBBLE. SLIGHTLY COARSER THAN ABOVE, GR ADATIONAL UPPER CONTACT.
65	146.98	148.50	1.52	*60		SILTSTONE	CLYY, DK, GY, LAM, BRKN UNEVENLY LAMINATED WITH GRADATIONAL SLT ST/MUDST CONTACTS AS ABOVE. CORE IS MOS TLY RUBBLE IN TOP 30CM. IN MIDDLE OF UN IT IS A SHEAR ZONE WITH POLISHED SLIP S URFACES AND THIN QTZ VEIN PARALLEL TO B DG.
66	148.50	149.01	0.51	66		MUDSTONE	CARB. BLK. LAM. VBRKN THIN COAL LAMINAE IMM-1CM WIDE.
66	149.01	149.80	0.79	70		SILTSTONE	CLYY, DK, GY, MAS, VBRKN SHARP UPPER CONTACT AND GRADATIONAL BAS AL CONTACT. MOSTLY RUBBLE NEAR BASE. OCC ASIONAL DISTURBED MUDST LAMINAE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
66	149.80	150.45	0.65	*75			SANDSTONE	VFG. M. GY. LAM. BRKN OCCASIONAL DK GY MUDST LAMINAE WITH SHA RP CONTACTS INCREASE TOWARDS BASE OF UNI T. LAST 3 UNITS REPRESENT A FUS. NUMERO US FRACTURES FROM 10 TO 30 DEGREES.
67	150.45	151.35	0.90	*68			SANDSTONE	VFG. M. GY. LAM. BRKN AS ABOVE.
67	151.35	152.30	0.95	69			SANDSTONE	SLTY. VFG. M. GY. LAM. BRKN GRADATIONAL CONTACTS BETWEEN MUDST AND FG SS RESULTING IN FUS AND CUS 12 TO 35 CM WIDE. BOTTOM 26CM HAS NUMEROUS NEAR VERTICAL FRACTURES.
68	152.30	153.97	1.67	*70			SANDSTONE	FG. M. GY. MAS. VBRKN OCCASIONAL MUDST LAMINAE (0.5CM WIDE BU T OTHERWISE MASSIVE. ABUNDANT NEAR VERTI CAL FRACTURES. LOWER 20CM VERY BROKEN W ITH ABUNDANT QTZ VEINING.
68	153.97	154.23	0.26	72			SANDSTONE	FG. M. GY. MAS. VBRKN LITHOLOGICALLY AS ABOVE. RUBBLE.
69	154.23	154.83	0.60	73			SANDSTONE	FG. M. GY. MAS. VBRKN RUBBLE. LITHOLOGICALLY AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86029

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	154.83	156.03	1.20	*75			SANDSTONE	FG. M. GY. MAS. VBRKN OCCASIONAL MUDST BANDS UP TO 1.5CM AND MINOR MUDSTRIPUPS AT TOP IN OTHER WISE FEATURELESS SS AS ABOVE.
69	156.03	156.51	0.48	*78			SANDSTONE	SLTY. VFG. M. GY. LAM. BRKN SLTY. BANDED SS. NEARLY PLANAR MUDST LAM INAE HAVE RELATIVELY SHARP CONTACTS WIT H SS. DECREASE IN NUMBER AND INCREASE I N MUDST LAMINAE SPACING TO BASE.
70	156.51	157.91	1.40	78			SANDSTONE	SLTY. VFG. M. GY. LAM. BRKN AS ABOVE. LOAD CAST INDICATE TOPS UP; O CCASIONAL MUDST RIPUP CLASTS. DRILLER'S MARK T.D. = 156.36 M.

\* DENOTES MEASURED BCA  
NEWPAGE











GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT

STRATIGRAPHIC LOG  
 KPN LR DDH86029

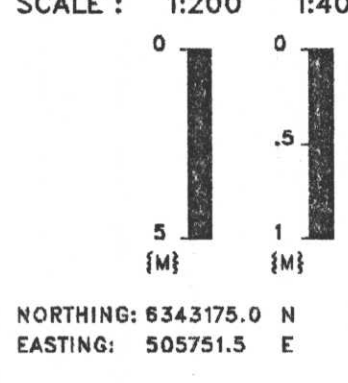
723

GEOLOGIST : MACLEOD

DATE : FEB 26/87

DRAWING NO. :

LITHOLOGIC SYMBOLS

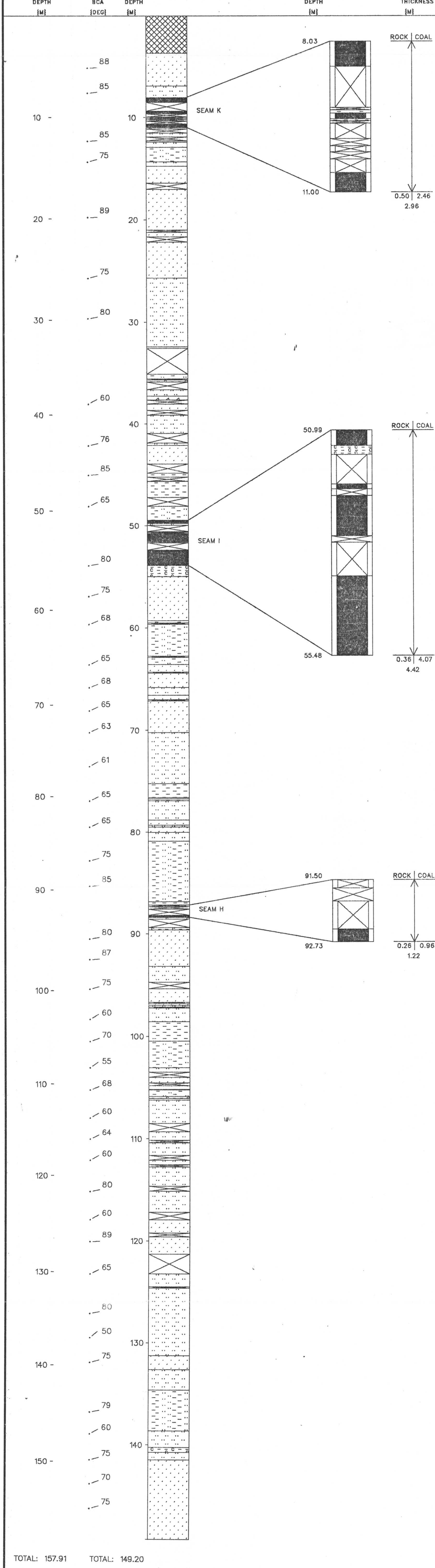


NORTHING: 634375.0 N  
 EASTING: 505751.5 E

INCLINATION: 70.0°  
 BEARING: 300.0°

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

SEAM DETAIL



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# Gulf Canada Corporation Coal Division

# 723

## Geophysical Log

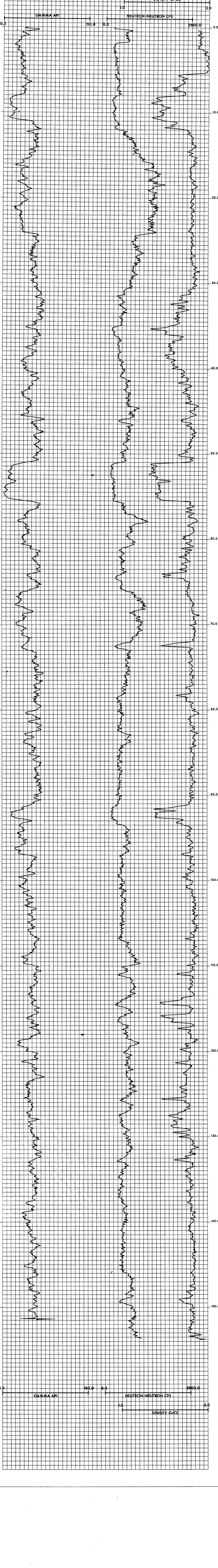
Datasource: **KPNLRDDH86029**  
 Log Date: 86-09-23  
 Company: CENTURY  
 Geologist: MACLEOD

Province: BC    Northing: 6343180.00    Lat: 571401  
 Zone: 9    Easting: 505752.00    Long: 1285417  
 Measuring Point:    Elevation: 1690.8

Scale: 1 to 100.0  
 Depth Range: 0.0 to 159.0  
 True Thickness: NO

Comments:  
 1. LOGGED THROUGH THE RODS  
 2.

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE

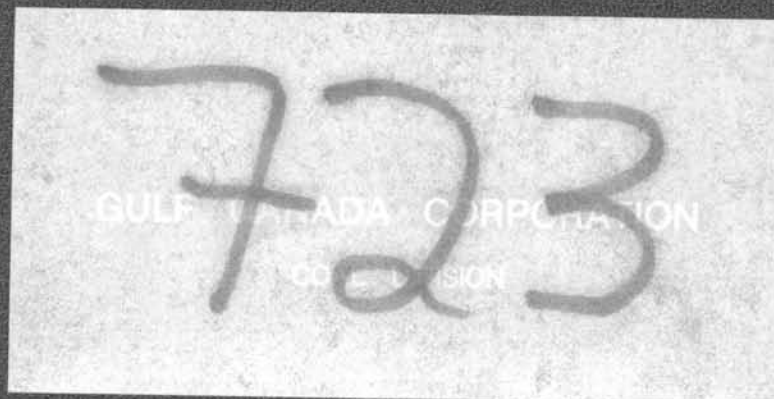


MOUNT KLAPPAN ANTHRACITE PROJECT  
LOST - FOX AREA  
GEOLOGICAL REPORT  
1986

APPENDIX IV

DIAMOND DRILL HOLE DATA  
VOLUME IV

KPNLRDDH 86030  
TO  
KPNLRDDH 86038



===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86030

DATE - 02/13/87

- HISTORY -

START DATE - 22/09/86

END DATE - 24/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - MACLEOD

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1531.20

LICENCE/LEASE NUMBER -

ZONE - 9

NORTHING - 6344803.00

EASTING - 507888.12

LATITUDE - 571453

LONGITUDE - 1285209

- ORIENTATION -

LENGTH - 157.58

CORE SIZE - 0.0

INCLINATION - 90.0

AZIMUTH - 0.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 3.66

AQUIFER DEPTHS (M) - 0.00

0.00

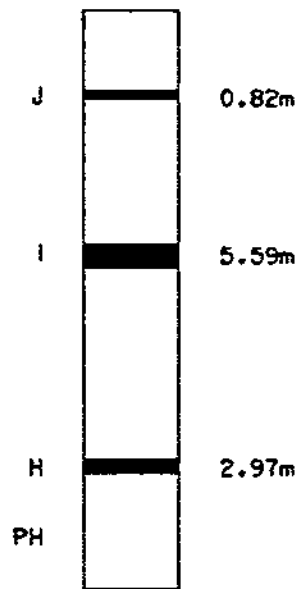
LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====

SEAM            TRUE SEAM THICKNESS  
                  (COAL & ROCK)



NOTE:

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE    1:2000

FIGURE

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86030

GULF CANADA CORPORATION  
11/03/87  
KLAP: [205057]870063030.LOG



PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	3.66	3.66	71			OVERBURDEN	CASING
1	3.66	4.39	0.73	71			SANDSTONE	FG.M.GY.MAS.BRKN UPPER HALF OF UNIT IS BROKEN WITH ABUNDANT FE STAINING ALONG FRACTURES.
1	4.39	4.84	0.45	71			SILTSTONE	SSY.M.GY.LAM.VBRKN INDISTINCT SS/SLTST CONTACT. APPEARS TO FINE TO BASE ALTHOUGH RUBBLY NATURE OF CORE DOES NOT ALLOW DETAILED LOGGING. ABUNDANT FE STAINING PARALLEL TO BDG AND ALONG FRACTURES.
2	4.84	4.92	0.08	71			SILTSTONE	SSY.M.GY.LAM.VBRKN HIGHLY FE STAINED RUBBLE.
2	4.92	5.66	0.74	*71			SILTSTONE	SSY.M.GY.LAM.BRKN UNEVENLY LAMINATED WITH INDISTINCT SLTS T/SS CONTACTS. GRADATIONAL BASAL CONTACT AS FINER GRAINED LAMINAE DECREASE IN NUMBER AND INCREASE IN SPACING. BROKEN PIECES ARE FE STAINED.
2	5.66	6.15	0.49	76			SANDSTONE	FG.M.GY.MAS.SLD FEATURELESS. GRADATIONAL UPPER AND BASAL CONTACT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
2	6.15	6.40	0.25	*79			SANDSTONE	VFG.M.GY.LAM.SLD SLIGHTLY FINER THAN ABOVE. UNIT IS FAINTLY AND INDISTINCTLY LAMINATED; GRADATIONAL BASAL CONTACT.
2	6.40	6.87	0.47	79			SANDSTONE	FG.M.GY.MAS.SLD FEATURELESS EXCEPT VERY FINE VERTICAL QTZ VEIN.
3	6.87	6.97	0.10	79			SANDSTONE	FG.LT.GY.MAS.SLD AS ABOVE. SHARP BASAL CONTACT.
3	6.97	6.99	0.02	79			MUDSTONE	DK.GY.LAM.SLD SHARP BASAL CONTACT.
3	6.99	7.01	0.02	79			MUDSTONE	M.GY.LAM.SLD SOFT, PLIABLE, UNCONSOL.
3	7.01	7.10	0.09	79			MUDSTONE	DK.GY.VBRKN BRECCIATION AND ABUNDANT FE STN OBSCURES FEATURES.
3	7.10	8.63	1.53	*79			SILTSTONE	CLYY.DK.GY.LAM.VBRKN SLIGHTLY WAVY TO PLANAR MUDST LAMINAE WITH RELATIVELY SHARP CONTACTS. BROKEN FRAGMENTS ARE HIGHLY FE STAINED. ABUNDANT RANDOMLY ORIENTED FRACTURES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	8.63	9.85	1.22	*87			SILTSTONE	CLYY, DK. GY. LAM. XBDG. VBRKN UNEVENLY LAMINATED. PLANAR LAMINATED TO X-LAMINATED. GRADATIONAL AND SHARP LAMINAE CONTACTS. PARTLY RUBBLE WITH ABUNDANT FE STAINING ALONG FRACTURES.
5	9.85	10.05	0.20	82			MUDSTONE	SLTY, DK. GY. LAM. BRKN AS ABOVE BUT SLIGHTLY FINER GRAINED.
5	10.05	11.62	1.57	*75			MUDSTONE	SLTY, DK. GY. LAM. VBRKN AS ABOVE. RUBBLY IN PART.
6	11.62	12.45	0.83	*80			MUDSTONE	SLTY, DK. GY. LAM. BRKN AS ABOVE. VERY RHYTHMICALLY LAMINATED WITH GRADATIONAL MUDST/SLTST CONTACTS. LOWER 25CM ARE V. BROKEN. COASTER LITHOLOGY.
6	12.45	13.65	1.20	80			MUDSTONE	SLTY, DK. GY. LAM. BRKN AS ABOVE. COASTER LITHOLOGY.
7	13.65	13.75	0.10	*80			MUDSTONE	SLTY, DK. GY. LAM. SLD AS ABOVE. COASTER LITHOLOGY.
7	13.75	15.25	1.50	81			ROCK LOSS	
8	15.25	16.99	1.74	*82			MUDSTONE	SLTY, DK. GY. LAM. SLD AS ABOVE. COASTER LITHOLOGY.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
9	16.99	17.84	0.85	*80			MUDSTONE	SLTY, DK. GY. LAM. BRKN AS ABOVE. COASTER LITHOLOGY.
9	17.84	18.66	0.82	80			MUDSTONE	SLTY, DK. GY. LAM. BRKN AS ABOVE. COASTER LITHOLOGY.
10	18.66	20.28	1.62	*80			MUDSTONE	SLTY, DK. GY. LAM. BRKN AS ABOVE. COASTER LITHOLOGY.
10	20.28	20.59	0.31	79			MUDSTONE	SLTY, DK. GY. LAM. VBRKN BROKEN AND FRACTURED. CARBONACEOUS NEAR BASE.
11	20.59	20.91	0.32	79			MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT.
11	20.91	21.27	0.36	78			MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT.
11	21.27	21.62	0.35	78			MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT.
11	21.62	21.77	0.15	78			COAL	C-6 SLD INTENSELY CLUSTERED STRINGERS OF COAL THROUGH MUDST.
11	21.77	21.92	0.15	78			MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
11	21.92	21.95	0.03	77		J	COAL	C-6.SLD
11	21.95	22.30	0.35	77		J	COAL LOSS	
11	22.30	22.43	0.13	77		J	ROCK LOSS	
11	22.43	22.61	0.18	77		J	COAL	C-2.BRKN
11	22.61	22.76	0.15	77		J	COAL	C-3.VBRKN
11	22.76	22.83	0.07	77			MUDSTONE	CARB.DK.GY.VBRKN
11	22.83	23.34	0.51	76			ROCK LOSS	
12	23.34	25.44	2.10	*75			MUDSTONE	SLTY.DK.GY.LAM.SLD LAM OBSCURE TO ABSENT IN UPPER 75 CM AND DISTINCT NEAR BASE. ABUNDANT PLANT FR AGS (PTEROPHYLLUM RECTANGULARE, EQUISET ITES LYELLI, NILSSONIA TENUICAILIS, PIT YOPHYLLUM NORDENSKIOLDII, CZEKANOWSKIA RIGIDA). DISTURBED BEDDING NEAR BASE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	25.44	27.59	2.15	*80			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.SLD 4CM SOFT PLIABLE UNCONSOLIDATED MED GY MUDST BAND AT BASE. DISTINCTLY LAMINATE D. (AS ABOVE) TO BIOTURBATED.
14	27.59	28.47	0.88	*78			MUDSTONE	SLTY.DK.GY.LAM.SLD AS ABOVE BUT LAMINAE ARE DISTINCT.
14	28.47	28.64	0.17	*85			SILTSTONE	CLYY.DK.GY.LAM.SLD COARSER THAN ABOVE UNIT AND LAMINAE ARE HAVIER AND MORE DISTURBED. MINOR LOAD C ASTING INDICATE TOPS UP. GRADATIONAL BA SAL CONTACT.
14	28.64	29.55	0.91	85			SANDSTONE	SLTY.DK.GY.LAM.SLD LAMINAE ARE MINOR AND INDISTINCT. LAST 3 UNITS HAVE REPRESENTED A FUS.
15	29.55	29.67	0.12	85			SANDSTONE	SLTY.DK.GY.SLD AS ABOVE. BEDDING VERY DISTURBED (BIOGE NICALLY OR SSD).
15	29.67	30.89	1.22	*85			SILTSTONE	SSY.DK.GY.LAM.SLD AS ABOVE EXCEPT AN INCREASE IN MUDST LA MINAE WITH SHARP TO GRADATIONAL CONTACT S. GRADATIONAL BASAL CONTACT.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	30.89	31.64	0.75	81			SANDSTONE	SLTY. VFG. DK. GY. LAM. SLD VERY RARE WAVY TO PLANAR MUDST LAMINAE. MINOR ORGANIC MATTER (?) IN MASSIVE BASE OF SECTION.
16	31.64	33.74	2.10	*75			MUDSTONE	SLTY. DK. GY. LAM. BIOTR. SLD SLTST/MUDST LAMINAE CONTACTS LARGELY OBSCURED BY BIOTURBATION WHICH IS MORE APPARENT NEAR TOP OF UNIT. ABUNDANT RANDOMLY ORIENTED QTZ VEINS IN BOTTOM HALF OF UNIT.
17	33.74	33.84	0.10	*80			SILTSTONE	CLYY. DK. GY. LAM. HRMBU. SLD SLIGHTLY COARSER THAN ABOVE UNIT WITH A GRADATIONAL UPPER CONTACT. AS ABOVE, MUDST LAMINATIONS ARE INDISTINCT AND FINE. SINGLE WORM BURROWS INDICATE TOPS UP.
17	33.84	35.05	1.21	80			SILTSTONE	CLYY. DK. GY. LAM. BIOTR. SLD AS ABOVE. LOCALLY BIOTURBATED.
18	35.05	36.70	1.65	80			MUDSTONE	SLTY. DK. GY. LAM. SLD UNEVENLY AND INDISTINCTLY LAMINATED. OCCASIONAL QTZ VEINS NEAR VERTICAL. GRADATIONAL BASAL CONTACT AS SLTST LAMINAE INCREASE. WORM BURROW (?) INDICATE TOPS UP. SHARP BASAL CONTACT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	36.70	36.90	0.20	*80			SILTSTONE	CLYY. DK. GY. LAM. SLD LAMINAE ARE MUCH MORE DISTINCTIVE THAN ABOVE AND CONTACTS ARE SHARP AND WAVY TO PLANAR.
18	36.90	36.99	0.09	79			SANDSTONE	FG. M. GY. MAS. SLD SHARP BASAL CONTACT.
18	36.99	37.18	0.19	78			SANDSTONE	SLTY. VFG. DK. GY. LAM. SLD WAVY TO PLANAR DARKER SLTST LAMINAE. VERTICAL QTZ VEIN.
19	37.18	37.24	0.06	*77			SANDSTONE	VFG. DK. GY. LAM. XBDG. SLD AS ABOVE. WISPY DK. GY. SLTST LAMINAE ARE RIPPLE CROSS LAMINATED. GRADATIONAL BASAL CONTACT.
19	37.24	39.24	2.00	*85			SANDSTONE	SLTY. VFG. DK. GY. LAM. SSD. SLD TOP AND MIDDLE OF UNIT HAS VERY MINOR WAVY & WISPY LAMINAE WHICH INCREASE SIGNIFICANTLY TOWARDS BASE OF UNIT. ABUNDANT LOAD CASTING INDICATES TOPS UP.
20	39.24	39.98	0.74	82			SANDSTONE	SLTY. VFG. DK. GY. LAM. SSD. SLD AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	39.98	40.99	1.01	80			SANDSTONE	VFG.DK.GY.MAS.SLD VERY OCCASIONAL WISPY DK GY SLTST LAMINAE NEAR BASE IN OTHERWISE MASSIVE AND FEATURELESS SS. GRADATIONAL BASAL CONTACT AND WISPY LAMINAE INCREASE.
20	40.99	41.39	0.40	*79			SANDSTONE	SLTY.VFG.DK.GY.LAM.SSD.SLD ABUNDANT WAVY AND DISTURBED LAMINAE WITH ABUNDANT LOAD CASTING INDICATING TOPS UP. LAMINAE PLANAR AND RELATIVELY UNDISTURBED IN BASAL 5CM OF UNIT. GRADATIONAL BASAL CONTACT.
21	41.39	43.05	1.66	*75			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE. ABUNDANT NORM BURROWS.LOCALIZED BIOTURBATION AND CROSS LAMINATIONS.
21	43.05	43.30	0.25	73			ROCK LOSS	
21	43.30	43.66	0.36	73			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN AS ABOVE.
22	43.66	45.86	2.20	*70			SILTSTONE	CLYY.DK.GY.LAM.SSD.SLD ABUNDANT NORM BURROWS AND LOAD CASTING INDICATE TOPS UP. LOCALLY X-LAMINATED. EVENLY INTERLAMINATED SLTST AND MUDST WITH PARTLY DISTURBED AND GRADATIONAL TO SHARP CONTACTS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
23	45.86	46.37	0.51	*79			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE. X-LAMINATED. NORM BURROWS INDICATE TOPS UP. SLTST/MUDST CONTACT INDICATE TOPS UP.
23	46.37	47.98	1.61	78			SILTSTONE	CLYY.DK.GY.LAM.BIOTR.SLD AS ABOVE. LOCALLY BIOTURBATED.
24	47.98	49.39	1.41	*76			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE. PLANT HASH PARALLEL TO BDG PLANES. LOCALLY BIOTURBATED.
24	49.39	50.07	0.68	*70			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE.
25	50.07	52.17	2.10	*78			SILTSTONE	CLYY.DK.GY.LAM.SLD AS ABOVE. GRADATIONAL LAMINAE CONTACT.
26	52.17	52.42	0.25	79			SILTSTONE	CLYY.DK.GY.LAM.SLD AS ABOVE.
26	52.42	54.22	1.80	*80			SILTSTONE	CLYY.DK.GY.LAM.SLD GRADATIONAL CONTACTS ON EVENLY LAMINATED UNIT AS ABOVE.
27	54.22	55.46	1.24	*80			SILTSTONE	CLYY.DK.GY.LAM.XBDG.SLD AS ABOVE. RARE RIPPLE LAMINATIONS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	55.46	56.31	0.85	72			SILTSTONE	CLYY.DK.GY.LAM.NRMBU.SLD AS ABOVE, SLIGHTLY MORE BIOTURBATED THAN ABOVE UNIT. WORM BURROWS INDICATE TOP S. UP.
28	56.31	58.41	2.10	*61			SILTSTONE	CLYY.DK.GY.LAM.SLD AS ABOVE, DECREASE IN MUDST LAMINAE NEAR BASE OF UNIT. 5CM BAND OF DIAGENETICALLY RECRYSTALLIZED CALCITE 75CM FROM BASE OF UNIT. 1CM QTZ VEIN PERPENDICULAR TO CORE AT BASE. GRADATIONAL BASAL CONTACT.
29	58.41	58.48	0.07	65			SILTSTONE	CLYY.DK.GY.LAM.BRKN FINELY PLANAR LAMINATED. QTZ VEINING PARALLEL TO BDG. LESS BIOTURBATED & DISTURBED THAN OVERLYING UNIT.
29	58.48	58.83	0.35	66			ROCK LOSS	
29	58.83	60.55	1.72	*70			SILTSTONE	CLYY.DK.GY.LAM.BRKN AS ABOVE, ABUNDANT QTZ VEINING RANDOMLY ORIENTED IS ABUNDANT, VERY BROKEN ALONG JOINT PLANES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	60.55	60.74	0.19	83			ROCK LOSS	
30	60.74	61.41	0.67	*89			SILTSTONE	CLYY.DK.GY.LAM.BRKN MUDST LAMINAE ARE PLANAR WITH SHARP CONTACTS, ABUNDANT FRACTURE PLANES, SOME QTZ FILLED, BASE IS GRADATIONAL OVER 2CM INTO BENTONITE.
30	61.41	61.61	0.20	73			BENTONITE	GY.LAM.SLD FINELY LAMINATED, BASAL 2CM IS SOFT AND UNCONSOL. SHARP BASAL CONTACT.
30	61.61	62.14	0.53	*59			MUDSTONE	CLYY.DK.GY.LAM.SSD.BRKN MUDST/SLTST CONTACTS ARE GRADATIONAL AND HIGHLY DISTURBED BY SSD (?).
30	62.14	62.56	0.42	59			ROCK LOSS	
30	62.56	63.01	0.45	59			MUDSTONE	CLYY.DK.GY.BIOTR.BRKN BIOTURBATION OBSCURES ALL BDG CONTACTS.
31	63.01	63.15	0.14	59	10090		MUDSTONE	SLTY.M-DK.GY.SLD
31	63.15	63.22	0.07	59	10091	I	COAL	C-3.PHRD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
31	63.22	63.48	0.26	59	10091	I	COAL LOSS	
31	63.48	63.52	0.04	59	10091	I	COAL	C-4. BRKN
31	63.52	63.74	0.22	59	10091	I	COAL	C-2. BRKN
31	63.74	63.94	0.20	59	10091	I	COAL	C-3. BRKN
31	63.94	64.12	0.18	59	10091	I	COAL	C-2. VBRKN
31	64.12	64.68	0.56	59	10091	I	COAL	C-2. BRKN C-3. BANDS WITHIN.
31	64.68	64.82	0.14	59	10091	I	COAL LOSS	
31	64.82	65.02	0.20	59	10092	I	ROCK LOSS	
31	65.02	65.04	0.02	59	10092	I	MUDSTONE	CARB. DK. GY. VBRKN FRAGMENTS OF PARTING.
31	65.04	65.13	0.09	59	10092	I	COAL	C-4. BRKN VITRAIN STRINGERS WITHIN.
32	65.13	65.25	0.12	59	10092	I	COAL	C-3. SLD C-2. BANDS THROUGHOUT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
32	65.25	65.61	0.36	59	10092	I	COAL LOSS	
32	65.61	67.12	1.51	59	10092	I	COAL	C-2. BRKN REMNANT PLANT STRUCTURE PARTIALLY PRESERVED. PARTIALLY SHEARED AND PRESERVED'S PORE STRUCTURES WITHIN.
32	67.12	67.14	0.02	60	10092	I	MUDSTONE	CARB. DK. GY. SLD QTZ THROUGHOUT.
32	67.14	67.20	0.06	60	10092	I	COAL	C-3. VBRKN SHEARED.
32	67.20	67.21	0.01	60	10092	I	MUDSTONE	CARB. DK. GY. SLD
32	67.21	67.23	0.02	60	10092	I	COAL	C-2. SHRD
32	67.23	67.26	0.03	60	10092	I	MUDSTONE	CARB. BLK. SLD POORLY CONSOLIDATED. COALY.
32	67.26	67.33	0.07	60	10092	I	COAL	C-2. BRKN
33	67.33	67.74	0.41	60	10093	I	COAL	C-1. BRKN

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
33	67.74	68.01	0.27	60	10093	I	COAL	C-1.SHRD
33	68.01	69.27	1.26	60	10093	I	COAL	C-1.VBRKN PARTIALLY POWDERED IN PLACES.
34	69.27	69.65	0.38	60	10093	I	COAL	C-1.BRKN
34	69.65	71.10	1.45	60	10094		MUDSTONE	CARB.DK.GY.SSD.SLD BECOMING SILTY TOWARDS BASE NILSSONIA T ENUCALIS WITHIN, AS WELL AS OTHER ABU NDANT PLANT MATTER. UPPER 25CM SAMPLED.
34	71.10	71.22	0.12	60			MUDSTONE	SLTY.DK.GY.SLD
35	71.22	71.95	0.73	60			MUDSTONE	SLTY.DK.GY.MAS.SLD FEATURELESS.
35	71.95	72.57	0.62	*60			MUDSTONE	SLTY.DK.GY.LAM.SLD LAMINAE CONTACTS ARE OBLICQUED (BIOTURBA TION?). SHARP BASAL CONTACT.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
35	72.57	73.29	0.72	62			SANDSTONE	FG.M.GY.LAM.VBRKN OCCASIONAL DK GY SLTST AND MUDST LAMINA E. MINOR GRAIN SIZE VARIATION FROM VFG TO MG WITH INDISTINCT BOUNDARIES. ABUND ANT JOINTS AT 30 DEGREES. GRADATIONAL B ASAL CONTACT.
35	73.29	73.37	0.08	63			ROCK LOSS	
36	73.37	74.29	0.92	64			SANDSTONE	PBLY.M.GY.MAS.BRKN OCCASIONAL LAMINAE IN OTHERWISE MASSIVE UNIT. ABUNDANT JOINT SURFACES.
36	74.29	74.74	0.45	65			SANDSTONE	PBLY.M.GY.MAS.BRKN ABUNDANT NEAR PLANAR CONCENTRATIONS OF ROUNDED POORLY SORTED CHERT PEBBLES UP TO 1CM. PEBBLE CONCENTRATIONS ARE 3-5CM WIDE AND 7-10CM APART.
36	74.74	75.01	0.27	66			SANDSTONE	M.GY.MAS.SLD AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	75.01	76.11	1.10	68		CONGLOMERATE	M. GY. MAS. SLD PEBBLES SLIGHTLY MORE SCATTERED THAN IN ABOVE UNIT. MATRIX SUPPORTED (M GY SS) - CHERT PEBBLES POORLY SORTED (1MM-2CM), WELL ROUNDED, ANGULAR ELONGATE RIPUP CLASTS UP TO 2CM IN BASAL 25CM.
37	76.11	77.23	1.12	70		SANDSTONE	MG. M. GY. MAS. SLD FEATURELESS MASSIVE SS WITH LOW ANGLE J DINTING (0-30 DEGREES).
38	77.23	77.95	0.72	73		SANDSTONE	MG. M. GY. MAS. BRKN AS ABOVE EXCEPT SINGLE MUDST BAND NEAR BASE 1CM WIDE. QTZ VEIN AT 20 DEGREES. SHARP BASAL CONTACT.
38	77.95	79.33	1.38	*75		SILTSTONE	CLYY. DK. GY. LAM. WRMBU. SLD WAVY TO PLANAR LAMINATED WITH ABUNDANT BURROWS INDICATING TOPS UP. SHARP MUDST /SLTST LAMINAE CONTACTS.
39	79.33	81.05	1.72	*75		MUDSTONE	SLTY. DK. GY. LAM. WRMBU. SLD UNIT SIMILAR TO LAST BUT LESS BURROWING AND SLIGHTLY FINER GRAINED THAN ABOVE.
39	81.05	81.28	0.23	77		MUDSTONE	SLTY. DK. GY. MAS. SLD FEATURELESS MASSIVE MUDST. LAST 4 UNITS REPRESENT A CUS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
40	81.28	82.68	1.40	79		MUDSTONE	DK. GY. MAS. SLD FEATURELESS AS ABOVE. GRADATIONAL CONTACT OVER 10CM INTO SLTST.
40	82.68	83.00	0.32	82		SILTSTONE	DK. GY. MAS. SLD UNLAMINATED FEATURELESS SLTST WITH SINGLE BIVALVE FRAGMENT. GRADATIONAL BASAL CONTACT.
40	83.00	83.75	0.75	*83		SILTSTONE	CLYY. DK. GY. LAM. BIOTR. SLD GRADATIONAL TO SHARP. PLANAR TO WAVY LAMINAE CONTACTS ARE LOCALLY DISRUPTED BY BIOTURBATION.
41	83.75	85.85	2.10	*89		SILTSTONE	CLYY. DK. GY. LAM. BIOTR. SLD AS ABOVE.
42	85.85	86.85	1.00	87		SILTSTONE	CLYY. DK. GY. BRKN HELMINTHOSIS PRESENT. DISTANCE BETWEEN MUDST LAMINAE INCREASES TOWARDS THE BASE. GRADATIONAL BASAL CONTACT.
42	86.85	86.91	0.06	*86		SANDSTONE	FG. DK. GY. LAM. SLD GRADATIONAL UPPER CONTACT AND SHARP BASAL CONTACT. UNIT COARSENS TO BASE. ANGULAR QTZ CLASTS INCREASE IN SIZE UP TO 1 MM TO BASE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	86.91	87.51	0.60	83		SANDSTONE	SLTY. VFG. DK. GY. LAM. WRMBU. SLD OCCASIONAL MUDST LAMINAE HAVE SHARP PLANAR CONTACTS WITH SS. SINGLE WORM BURROWS INDICATES TOPS UP.
42	87.51	87.93	0.42	*79		SANDSTONE	FG. DK. GY. MAS. WRMBU. SLD SINGLE LGE WORM BURROW 3CM LONG INDICATES TOPS UP. 1CM WIDE MUDST BAND AT BASE WITH SHARP PLANAR CONTACT WITH SURROUNDING SS.
43	87.93	88.03	0.10	80		SANDSTONE	FG. H. GY. MAS. SLD FEATURELESS. SHARP BASAL CONTACT. LOAD CASTING AT CONTACT WITH UNDERLYING UNIT
43	88.03	88.43	0.40	80		SANDSTONE	CLYY. FG. H. GY. LAM. WRMBU. SLD ABUNDANT LGE VERTICAL WORM BURROWS UP TO 0.7CM INDICATE TOPS UP. MUDST/SS CONTACT LARGELY OBSCURED BY BURROWING.
43	88.43	89.11	0.68	81		SANDSTONE	FG. H. GY. MAS. SLD FEATURELESS EXCEPT SINGLE MUDST BAND 2CM WIDE, 25CM FROM TOP OF UNIT.
43	89.11	89.18	0.07	*82		SANDSTONE	CLYY. VFG. DK. GY. LAM. SLD PLANAR MUDST LAMINAE WITH SHARP CONTACT S. INCREASE TO BASE. SHARP BASAL CONTACT

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
43	89.18	89.58	0.40	82		SANDSTONE	GRAN. DK. GY. YTHNB. SLD LGE RIPUP CLAST UP TO 3CM. MUDST BANDS UP TO 2.5CM.
43	89.58	89.66	0.08	83		MUDSTONE	DK. GY. LAM. SLD ABUNDANT PLANT WASH PARALLEL TO BDG PLANE (CZEKANOWSKIA CF. RIGIDA). SHARP BASAL CONTACT.
43	89.66	90.11	0.45	83		SANDSTONE	GRAN. H-DK. GY. MAS. SLD COARSENS TOWARDS TOP WHERE ANGULAR QTZ CLASTS ARE UP TO 1MM. LOAD CASTS INDICATE TOPS UP. OCCASIONAL MUDST RISPS.
44	90.11	90.45	0.34	84		SANDSTONE	GRAN. H-DK. GY. MAS. SLD AS ABOVE. FINES TOWARDS BASE.
44	90.45	91.23	0.78	*85		MUDSTONE	SLTY. H-DK. GY. LAM. WRMBU. BRKH DISTINCTLY BANDED WITH SHARP MUDST/SLTS CONTACT. WORM BURROWS INDICATE TOPS UP. SHARP BASAL CONTACT.
44	91.23	91.33	0.10	84		SANDSTONE	GRAN. H. GY. MAS. SLD "STORM UNIT". POORLY SORTED ANGULAR CLASTS. BASAL 2CM HAS MUDST BANDS INTERFINGERED WITH GRANULAR SS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
44	91.33	91.58	0.25		83		MUDSTONE	SILTY, DK. GY. LAM. WRMBU. SLD ABUNDANT WORM BURROWS AND LOAD CASTING OF OCCASIONAL STORM UNIT PODS INDICATE TOPS UP.
44	91.58	91.71	0.13		82		SANDSTONE	GRAN. PR. M. GY. MAS. SLD AS ABOVE STORM UNIT.
44	91.71	92.05	0.34		82		SANDSTONE	FG. PR. DK. GY. THKB. WRMBU. SLD 10CM MASSIVE SS BEDS INTERBEDDED WITH 3 CM OF LAMINATED MUDST. SINGLE ROUNDED MUDST RIPUP CLAST. VERTICAL WORM BURROW INDICATES TOPS UP.
45	92.05	93.35	1.30	*	79		SANDSTONE	FG. PR. DK. GY. THKB. WRMBU. SLD SILTY BANDED SANDSTONE WITH UNEVEN SPACING BETWEEN MUDST BANDS. BANDS ARE WAVY TO PLANAR WITH SHARP CONTACTS. OCCASIONAL WORM BURROWS INDICATE TOPS UP.
45	93.35	94.08	0.73		78		SANDSTONE	FG. PR. DK. GY. THKB. WRMBU. SLD AS ABOVE.
46	94.08	96.48	2.40	*	76		SANDSTONE	FG. PR. DK. GY. THKB. WRMBU. SLD AS ABOVE. SS BEDS BETWEEN MUDST BANDS UP TO 15CM. LOCALLY BIOTURBATED. WORM BURROWS INDICATE TOPS UP.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
47	96.48	96.59	0.11	*	76		SANDSTONE	FG. PR. M. GY. LAM. SLD OCCASIONAL MUDST LAMINAE UP TO 2MM. LOAD CAST INDICATES TOPS UP.
47	96.59	97.83	1.24		75		SANDSTONE	FG. PR. M. GY. LAM. WRMBU. BRKN SILTY BANDED SS WITH LOCALIZED BIOTURBATION WHICH OBSCURES MUDST/SS CONTACTS. ABUNDANT LOAD CASTS INDICATE TOPS UP.
47	97.83	98.57	0.74		74		MUDSTONE	BLK. MAS. BRKN OCCASIONAL VITRIN AND SLTST LAMINAE UP TO 2MM. SHARP UPPER CONTACT.
48	98.57	99.48	0.91		73		MUDSTONE	BLK. MAS. BRKN ABUNDANT COALIFIED PLANT FRAGMENTS (CZEKANOWSKIA CF. RIGIDA, PITYOPHYLLUM MORDENSKJOLDII, CLADOPHLEBIS VIRGINIENSIS, EUISETITES LYELLI, PTEROPHYLLUM RECTANGULARE).
48	99.48	100.68	1.20		72		MUDSTONE	BLK. MAS. BRKN AS ABOVE. ALL PLANTS ABOVE ARE ALSO PRESENT IN THIS INTERVAL BUT ARE LESS COALIFIED.
49	100.68	101.94	1.26	*	70		MUDSTONE	SILTY. BLK. LAM. BRKN SLIGHTLY COARSER GRAINED WITH OCCASIONAL BLACK SLTST LAMINAE. OCCASIONAL PLANT FRAGMENTS (CZEKANOWSKIA CF. RIGIDA).

\* DENOTES MEASURED BCA



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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
49	101.94	102.54	0.60	*85			MUDSTONE	SLTY. DK. GY. LAM. BRKN SLIGHTLY COARSER THAN ABOVE. UNIT COARS ENS TO BASE.
50	102.54	104.73	2.19	84			MUDSTONE	BLK. MAS. BRKN ABUNDANT PLANT FRAGMENTS (CZEKANOWSKIA CF. RIGIDA). QTZ VEINS AT 80 DEGREE ORI ENTATION. POLISHED LITRIC SLIP SURFACE S.
51	104.73	105.13	0.40	83			MUDSTONE	BLK. MAS. BRKN AS ABOVE. FEATURELESS.
51	105.13	106.73	1.60	82			MUDSTONE	BLK. MAS. VBRKN AS ABOVE. ABUNDANT LITRIC SHEAR SURFAC ES. PLANT FRAGMENTS PRESENT (SPHENOPTER IS BRULENSIS, CZEKANOWSKIA CF RIGIDA). UNIT BECOMES CARD TOWARD BASE. ABUNDANT LITRIC SHEAR SURFACES IN A HIGHLY SHE ARED 20CM INTERVAL 40CM FROM BASE.
51	106.73	106.78	0.05	81			ROCK LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
52	106.78	108.10	1.32	81			MUDSTONE	BLK. MAS. BRKN FEATURELESS EXCEPT ABUNDANT PLANT FRAGM ENTS (SPHENOPTERIS BRULENSIS, CZEKANOWS KIA. CF. RIGIDA). FISSILE.
52	108.10	108.80	0.70	80			MUDSTONE	BLK. MAS. BRKN AS ABOVE.
53	108.80	110.95	2.15	*79			MUDSTONE	SLTY. DK. GY. LAM. BRKN INCREASE IN WAVY TO PLANAR SLTST LAMINA E TO BASE. MINOR PLANT HASH BUT LESS TH AN ABOVE UNIT.
54	110.95	111.32	0.37	79			SANDSTONE	SLTY. FG. DK. GY. LAM. BRKN MUDST LAMINAE ARE PLANAR WITH SHARP CON TACTS. LOW ANGLE FRACTURES. LAST 3 BOXE S PART OF A FUS. LAM TO THKB.
54	111.32	112.98	1.66	*79			SANDSTONE	SLTY. FG. DK. GY. BRKN AS ABOVE. SILTY BANDED SANDSTONE WITH S HARP PLANAR CONTACTS. BEDDING IS LAMINAT ED TO THICK BEDDED.
55	112.98	114.35	1.37	85			SANDSTONE	SLTY. FG. DK. GY. BRKN AS ABOVE. BDC UNITS 1CM TO 15CM.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	114.35	115.08	0.73	*90			SANDSTONE	SLTY. FG. DK. GY. WRMBU. BRKN AS ABOVE. SS INTERVAL THICKER THAN LAST UNIT THEREFORE OVERALL COARSENING TREN D. OCCASIONAL WORM BURROWS AND LOAD CAS TS INDICATE TOPS UP.
56	115.08	117.21	2.13	*87			SANDSTONE	SLTY. FG. M. GY. THKB. WRMBU. BRKN AS ABOVE. WORM BURROWS INDICATE TOPS UP
57	117.21	117.49	0.28	81			SANDSTONE	CLYY. FG. PR. M. GY. THNB. SLD 6CM SS BEDS INTERBEDDED WITH 5-6CM MUDST BEDS. MINOR LOADING OF SS INTO MUDST INDICATES TOPS UP. MINOR MUDST RIPUPS I N SS. SHARP UPPER CONTACT.
57	117.49	119.23	1.74	*76			SANDSTONE	CLYY. FG. PR. M. GY. THNB. SLD AS ABOVE. BEDDING UNITS UP TO 20CM. MUD ST BEDS. AREV. THIN TO WISPY NEAR BASAL C ONTACT.
58	119.23	120.56	1.33	*82			MUDSTONE	SLTY. BLK. LAM. BRKN SLTST LAMINAE HAVE PLANAR TO WAVY CONTA CTS WITH MUDST. FISSILE. MINOR POLISHED SLIP SURFACES.
58	120.56	121.31	0.75	81			MUDSTONE	SLTY. BLK. LAM. BRKN AS ABOVE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
59	121.31	122.64	1.33	80	10095		MUDSTONE	SLTY. M-DK. GY. BRKN CARBONACEOUS LOWER 25CM WITH OCCASIONAL COALY STRINGERS. LOWER 25CM SAMPLED.
59	122.64	122.70	0.06	80	10096	H	COAL	C-4. SLD
59	122.70	122.97	0.27	80	10096	H	COAL	C-2. SLD
59	122.97	123.08	0.11	79	10096	H	MUDSTONE	CARB. DK. GY. VBRKN
59	123.08	123.14	0.06	79	10096	H	ROCK LOSS	
59	123.14	123.33	0.19	79	10096	H	COAL LOSS	
59	123.33	123.46	0.13	79	10096	H	COAL	C-3. SHRD
59	123.46	123.50	0.04	79	10096	H	COAL	C-6 BONE COAL.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
60	123.50	123.71	0.21	79	10096 H	COAL	C-2. YBRKN PARTIALLY SHEARED.
60	123.71	123.76	0.05	79	10096 H	COAL	C-4. YBRKN
60	123.76	125.07	1.31	78	10096 H	COAL	C-2. YBRKN OFTEN POWDERED & SHEARED THROUGHOUT.
60	125.07	125.20	0.13	78	10096 H	MUDSTONE	CARB. DK. GY. SLD.
61	125.20	125.68	0.48	77	10096 H	COAL	C-2. YBRKN MINOR BONE COAL BANDS WITHIN.
61	125.68	126.66	0.98	77	10097	MUDSTONE	CARB. M-DK. GY. YBRKN COALY STRINGERS AND THIN COALY BANDS TH ROUGHOUT. LISTRIC SURFACES. UPPER 25CM SAMPLED.
62	126.66	127.20	0.54	76		SILTSTONE	CLYY. DK. GY. LAM. BRKN HIGHLY FRACTURED. GRADATIONAL BASAL CON TACT.
62	127.20	128.12	0.92	76		SILTSTONE	SSY. DK. GY. LAM. SSD. BRKN CLYY SLTST BECOMES SSY TOWARDS BASE OF UNIT. PLANAR MUDST LAMINAE WITH SHARP C ONTACTS BECOME VERY DISRUPTED BY SSD AN D BIOTURBATION NEAR BASE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
62	128.12	128.58	0.46	*75		SANDSTONE	SLTY. FG. M. GY. THNB. BRKN UNEVENLY BEDDED WITH BDC UNITS BETWEEN 0.5CM TO 5CM. MUDST RIPUP CLAST AND THI CKER MUDST. BANDS CLOSER TO TOP OF UNIT WITH BASAL SECTION HAVING ONLY WISPS OF MUDST.
63	128.58	129.33	0.75	*55		SANDSTONE	MG. M. GY. THNB. BRKN GRAIN SIZE VARIATION FROM VFG TO M GY. W ITH NO DISTINCT CONTACTS. MUDST BANDS U P TO 2CM IN TOP OF UNIT AND THIN MUDST WISPS NEAR BASE. GRADATIONAL BASAL CONT ACT. RARE MUDST. RIPUP. CLASTS. UP. TO. 1CM.
63	129.33	129.48	0.15	55		SILTSTONE	CLYY. DK. GY. LAM. BRKN FEATURELESS LAMINATED SLTST WITH INDIST INCT LAMINAE. SHARP UPPER CONTACT.
63	129.48	130.65	1.17	*55		SANDSTONE	SLTY. FG. M. GY. THNB. BRKN FUS. IN WHICH MUDST BANDS DECREASE IN SI ZE FROM FEMCMS TO LESS THAN 1MM AND SPA CING INCREASES TO BASE OF UNIT. MUDST/SS CONTACTS ARE SHARP PLANAR TO GRADATION AL AND MAYV. MINOR POLISHING OF SLIP SU RFACES NEAR TOP WHERE MUDST LAM ARE MOR E PREVALENT.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
64	130.65	130.86	0.21	61			SANDSTONE	FG. M. GY. THNB. SLD AS ABOVE. DISTANCE BETWEEN WAVY TO PLANAR MUDST. 151-3CM. GRADATIONAL BASAL CONTACT AS MUDST. DECREASES.
64	130.86	132.55	1.69	*70			SANDSTONE	MG. M. GY. MAS. SLD MOSTLY MASSIVE WITH OCCASIONAL MUDST. LAMINAE IN BASAL 40CM. ROUNDED RIPUP CLASTS UP TO 3CM THROUGHOUT MASSIVE PART OF UNIT.
65	132.55	134.16	1.61	*74			SANDSTONE	MG. M. GY. THKB. SLD OCCASIONAL MUDST. BANDS UP TO 4CM. IN LOWER 45CM OF UNIT WITH SHARP PLANAR CONTACTS; RARE ROUNDED RIPUP CLASTS UP TO 3CM; GRAIN SIZE FG TO GRANULAR. SHARP BASAL CONTACT. MINOR RANDOMLY ORIENTED QTZ VEINS.
65	134.16	134.60	0.44	71			SILTSTONE	DK. GY. MAS. SLD FEATURELESS. BASAL 15CM HAS POLISHED LISTRIC SHEAR SURFACES.
66	134.60	135.55	0.95	69			SANDSTONE	VFG. DK. GY. THKB. BRKN THIN MUDST. LAMINAE BANDS UP TO 2CM ARE UP TO 10CM APART. ABUNDANT POLISHED SLIP SURFACES AND QTZ VEINING AT VARIOUS ORIENTATIONS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
66	135.55	136.52	0.97	*66			SANDSTONE	VFG. DK. GY. VTHNB. BRKN SHARP PLANAR CONTACTS BETWEEN SS AND SILT/MUDST. BANDS. UNIT BECOMES LAMINATED NEAR BASE.
67	136.52	138.40	1.88	66			MUDSTONE	SLTY. DK. GY. LAM. VBRKN SLTST. LAMINAE WITH WAVY TO PLANAR CONTACTS. ABUNDANT LISTRIC SHEAR SURFACES.
68	138.40	138.45	0.05	67			MUDSTONE	SLTY. DK. GY. LAM. SLD AS ABOVE BUT SHEARED.
68	138.45	140.43	1.98	67			MUDSTONE	BLK. MAS. SLD ABUNDANT BIVALVES (STAFFINELLA AND FERGANOCONCHA).
69	140.43	141.90	1.47	68			MUDSTONE	BLK. MAS. VBRKN AS ABOVE WITH RARE BIVALVE FRAGMENTS. MOSTLY RUBBLE. CORE TWIST OFF IN MIDDLE OF UNIT.
69	141.90	142.32	0.42	68			MUDSTONE	BLK. MAS. BRKN AS ABOVE. BIVALVES PRESENT.
70	142.32	142.55	0.23	68			MUDSTONE	CARB. DK. GY. BRKN PLANT FRAGS WITHIN.
70	142.55	143.23	0.68	68			MUDSTONE	CARB. DK. GY. VBRKN BIVALVES (FERGANOCONCHA).

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB603D

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
70	143.23	143.75	0.52	68			MUDSTONE	M-DK.GY.BRKN SILTY BANDS THROUGHOUT. LYSTRIC SURFACE S WITHIN.
70	143.75	143.87	0.12	68			COAL	C-3.BRKN
70	143.87	143.93	0.06	69			COAL LOSS	
70	143.93	144.02	0.09	69			MUDSTONE	CARB.DK.GY.VBRKN
70	144.02	144.07	0.05	69			COAL	C-3.SLD MINOR MUDDY BANDS WITHIN.
71	144.07	144.92	0.85	69	10098		MUDSTONE	CARB.DK.GY.BRKN ABUNDANT VITRAIN STRINGERS THROUGHOUT (AS MUCH AS 40 PERCENT VITRAIN). LOWER 1 6CM SAMPLED.
71	144.92	145.01	0.09	69	10098		MUDSTONE	CARB.DK.GY.BRKN ABUNDANT VITRAIN STRINGERS THROUGHOUT (AS MUCH AS 40 PERCENT VITRAIN).

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB603D

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
71	145.01	145.37	0.36	69	10099	PH	COAL	C-2.VBRKN
71	145.37	145.48	0.11	69	10099	PH	COAL	C-4.SLD
71	145.48	145.90	0.42	69	10100		MUDSTONE	CARB.DK.GY.BRKN ABUNDANT PLANT FRAGS WITHIN. SOME COALI FIED. UPPER25CM SAMPLED.
72	145.90	146.09	0.19	69			MUDSTONE	CARB.DK.GY.BRKN ABUNDANT PLANT FRAGS WITHIN, SOME COALI FIED.
72	146.09	146.13	0.04	69			COAL	C-4.SLD
72	146.13	146.15	0.02	69			MUDSTONE	CARB.DK.GY.SLD
72	146.15	146.26	0.11	69			COAL	C-4.BRKN

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
72	146.26	146.45	0.19	69			MUDSTONE	CARB. DK. GY. BRKN LISTRIC SURFACES.
72	146.45	146.66	0.21	69			COAL	C-3 YBRKN PARTIALLY SHEARED.
72	146.66	147.89	1.23	70			MUDSTONE	CARB. BRKN COALY BAND & COALIFIED PLANT FRAGS THROUGHOUT (NILSSONIA).
73	147.89	147.90	0.01	70			MUDSTONE	SLTY. BLK. LAM. SLD VERY FAINT, INDISTINCT LAMINAE. NILSSONIA PRESENT AS ABOVE.
73	147.90	149.13	1.23	*70			MUDSTONE	SLTY. BLK. MAS. WRMBU. SLD MASSIVE AT BASE AND SLTY LAMINATED AT TOP. PYRITE BLEBS 2CM WIDE AND ABUNDANT NILSSONIA CF. TENNICULIS PRESENT. GRADATIONAL BASAL CONTACT.
73	149.13	149.87	0.74	72			SILTSTONE	CLYY. DK. GY. BIOTR. SLD HIGHLY BURROHED OBSCURING ALL MUDST/SLT LAMINAE CONTACTS. ABUNDANT WORM BURROWS INDICATE TOPS UP.
74	149.87	150.82	0.95	*74			SILTSTONE	CLYY. DK. GY. LAM. WRMBU. SLD PLANAR MUDST LAMINAE CONTACTS LOCALLY OBTUSCURED BY WORM BURROWS WHICH INDICATE TOPS UP.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86030

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
74	150.82	151.77	0.95	68			SANDSTONE	CLYY. YFG. DK. GY. LAM. WRMBU. BRKN AS ABOVE. ABUNDANT FRACTURE PLANES WITH EUBHEDRAL CALCITE CRYSTALS. NORM BURROW S AND LOAD CASTING INDICATE TOPS UP.
75	151.77	153.75	1.98	*59			SANDSTONE	CLYY. YFG. DK. GY. THKB. SLD OCCASIONAL MUDST BANDS UP TO 1CM HAVE SHARP PLANAR CONTACTS. ABUNDANT LOW ANGLE FRACTURE PLANES. T.D. = 157.58 M. (DRILLER'S MARK).

\* DENOTES MEASURED BCA  
NEWPAGE











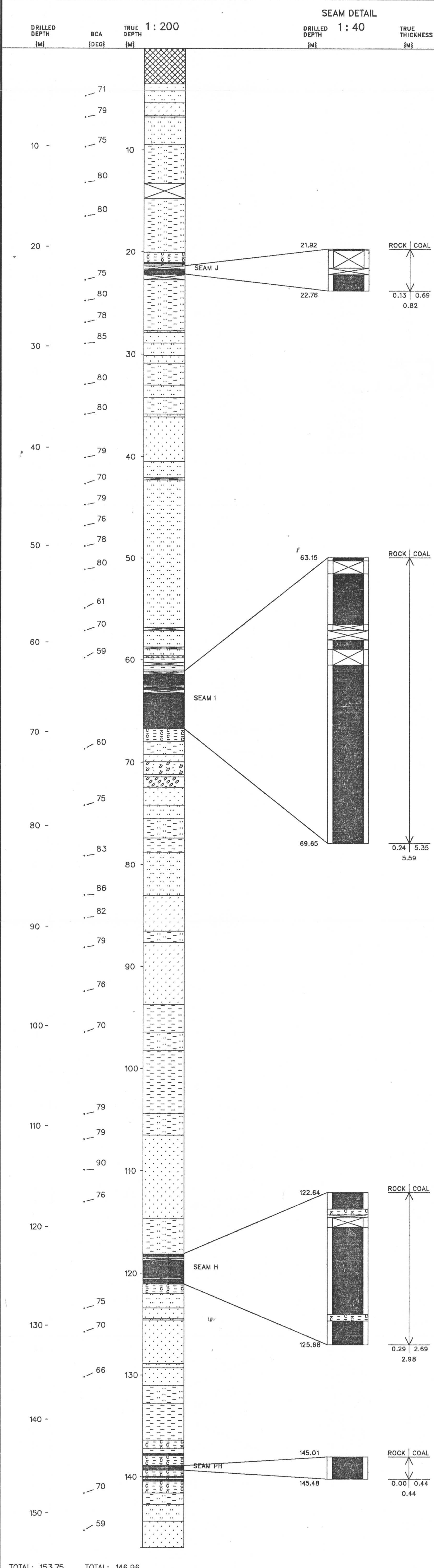
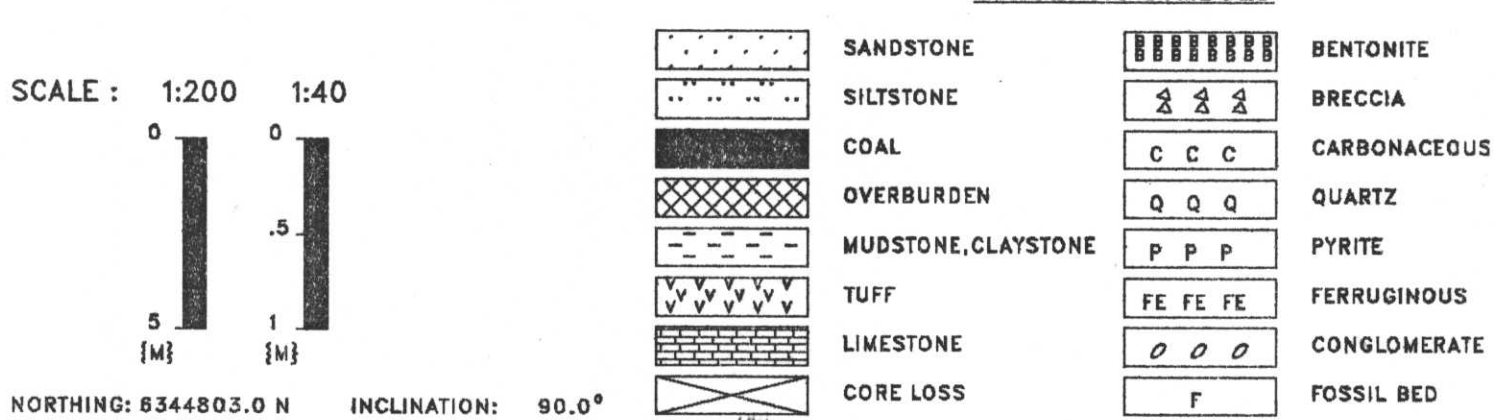
GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT  
 STRATIGRAPHIC LOG  
 KPN LR DDH86030

723

GEOLOGIST : MACLEOD

DATE : FEB 26/87

DRAWING NO. :



# Gulf Canada Corporation Coal Division

# 723

## Geophysical Log

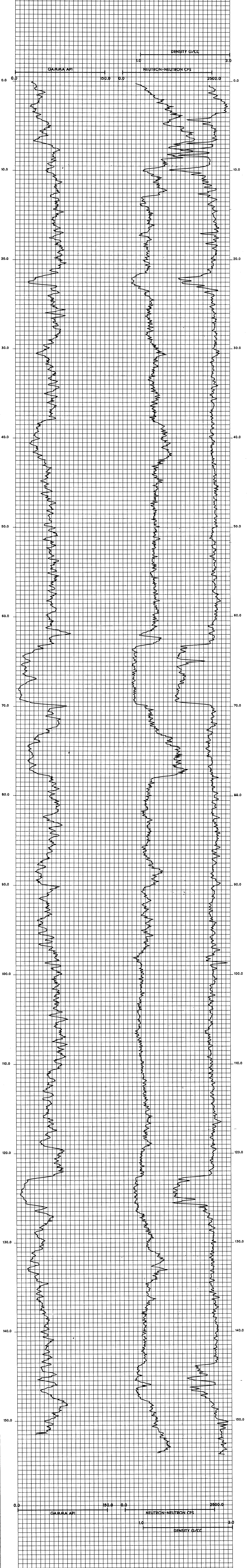
Datasource: **KPNLRDDH86030**  
 Log Date: 86-09-24  
 Company: CENTURY  
 Geologist: MACLEOD

Province: BC    Northlng: 6344800.00    Lat: 571453  
 Zone: 9    Easting: 507888.00    Long: 1285209  
 Measuring Point:    Elevation: 1531.2

Scale: 1 to 100.0  
 Depth Range: 0.0 to 159.0  
 True Thickness: NO

Comments:  
 1. LOGGED THROUGH THE RODS  
 2.

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	1 IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	1 IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	1 IN PIPE



KPNLRDDH86031

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPnlRDDH86031

DATE - 02/13/87

- HISTORY -

START DATE - 23/09/86

END DATE - 25/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - LOVE

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1699.75

LICENCE/LEASE NUMBER -

ZONE - 9

NORTHING - 6343071.00

EASTING - 505509.44

LATITUDE - 571357

LONGITUDE - 1285431

- ORIENTATION -

LENGTH - 150.57

CORE SIZE - 0.0

INCLINATION - 90.0

AZIMUTH - 0.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 3.05

AQUIFER DEPTHS (M) - 0.00

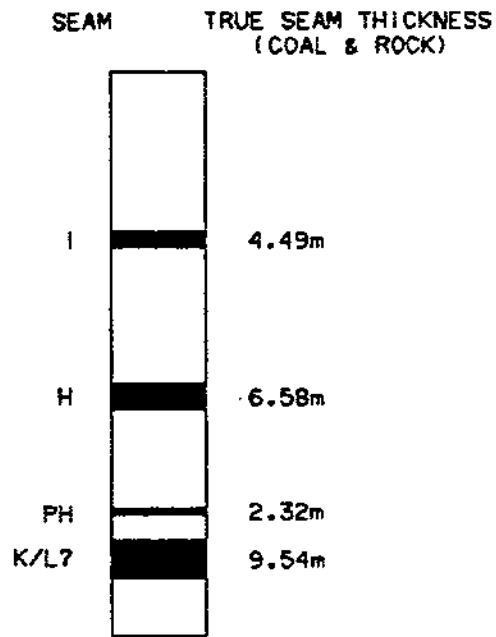
0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====



NOTE:

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86031

GULF CANADA CORPORATION  
11/03/B7  
KLAP: [205057]B70063031.L06



PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	3.05	3.05	75			OVERBURDEN	CASING
1	3.05	4.09	1.04	75			ROCK LOSS	
1	4.09	4.57	0.48	*75			MUDSTONE	SLTY. DK. GY. LAM. VBRKN FISSILE WITH 1CM SPACING. COASTER ZONE
1	4.57	5.27	0.70	75			ROCK LOSS	
1	5.27	6.41	1.14	75			MUDSTONE	SLTY. DK. GY. LAM. VBRKN SIMILAR TO ABOVE. FEW COALY LENSES. MANY PLANT FRAGMENTS. MANY LISTRIC SURFACES
1	6.41	7.03	0.62	76			ROCK LOSS	
2	7.03	7.44	0.41	76			MUDSTONE	DK. GY. LAM. BIOTR. BRKN NOT AS FISSILE AS ABOVE. SSD.
2	7.44	7.70	0.26	76			MUDSTONE	CARB. DK. GY. LAM. VBRKN COALY STRINGERS & THIN LAYERS. MANY PLANT FRAGMENTS. J SEAM. FISSILE.
2	7.70	8.63	0.93	76			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
2	8.63	9.23	0.60	76			MUDSTONE	DK. GY. MAS. BRKN HOMOGENEOUS. MANY PLANT FRAGMENTS.
2	9.23	9.55	0.32	76			ROCK LOSS	
2	9.55	10.02	0.47	77			MUDSTONE	DK. GY. MAS. BRKN SAME AS ABOVE.
3	10.02	10.63	0.61	77			MUDSTONE	DK. GY. MAS. BRKN SAME AS ABOVE.
3	10.63	11.94	1.31	*77			MUDSTONE	SLTY. M-DK. GY. LAM. SSD. SLD FAINTLY LAMINATED. RARE SSD. TOPS UP.
4	11.94	12.41	0.47	76			MUDSTONE	SLTY. DK. GY. LAM. BIOTR. SLD FAINTLY LAMINATED. SSD.
4	12.41	13.98	1.57	76			MUDSTONE	SSY. YFG. VPR. M-DK. GY. LAM. BIOTR. SLD TOPS UP. MOSTLY LAMINATED. SOME V. THIN S. ANDY BEDS. SSD.
5	13.98	15.26	1.28	*75			MUDSTONE	SSY. YFG. VPR. M-DK. GY. VTHNB. BIOTR. SLD SIMILAR TO ABOVE BUT VTHNB. SSD.
5	15.26	15.35	0.09	74			MUDSTONE	SSY. YFG. VPR. M-DK. GY. VTHNB. BIOTR. BRKN SAME ROCK TYPE AS ABOVE. SSD.

\* DENOTES MEASURED BCA



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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	15.95	15.94	0.59	72			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD
6	15.94	16.69	0.75	*72			SANDSTONE	SLTY. FG. PR. LT-M. GY. VTHNB. SLD VTHIN LAMINAE 1-5CM OF SLTST SEPARATED BY VTHIN TOTHTN BEDS OF SS.
6	16.69	17.40	0.71	72			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD
6	17.40	18.05	0.65	72			SILTSTONE	SSY. VFG. VPR. M. GY. LAM. SLD LAMINATED TO CLOSELY SPACED. MISPY.
7	18.05	20.10	2.05	72			SANDSTONE	FG. MOD. LT-M. GY. MAS. BRKN V BARE THIN. SILTY LAMINAE.
8	20.10	20.24	0.14	72			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD SAME ROCK TYPE AS ABOVE.
8	20.24	21.85	1.61	71			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD SAME AS ABOVE. RARE VERTICAL JOINTS.
8	21.85	22.02	0.17	71			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD SAME AS ABOVE. VERTICAL JOINTS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
9	22.02	23.45	1.43	71			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD TWO BEDS OF RIPUP CLASTS IN MASSIVE SS. CLASTS ARE 5CM TO 3CM, SUB ANGULAR TO SUB. ROUNDED MUDST. FE W DISCONTINUOUS. QTZ CARB - FILLED NEAR VERTICAL FRACTUR ES.
9	23.45	24.11	0.66	71			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD
10	24.11	26.15	2.04	*71			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD RARE WISPS TO VTHIN SLTST BED. MOSTLY M ASSIVE.
11	26.15	26.33	0.18	58			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD
11	26.33	27.75	1.42	49			SANDSTONE	FG. MOD. LT-M. GY. MAS. BRKN BOTTOM IS VBRKN.
11	27.75	27.87	0.12	41			SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	27.87	29.96	2.09	28		SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD. RARE SUB ROUNDED SMALL (1.5CM) RIPUP CLAST.
13	29.96	30.56	0.60	13		SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD. MANY SUB ANGULAR ELLIPSOIDAL MUDST RIPUP CLASTS. IN MIDDLE, UP TO 5CM DIAMETER.
13	30.56	31.20	0.64	06		SANDSTONE	FG. MOD. LT-M. GY. MAS. SLD. SUB ROUNDED RIPUP CLASTS. ESPECIALLY AT BASE, UP TO 3CM DIAMETER.
13	31.20	31.37	0.17	*01		SILTSTONE	M-DK. GY. THNB. BRKN.
13	31.37	31.72	0.35	34		ROCK LOSS	
13	31.72	32.05	0.33	*78		SILTSTONE	M-DK. GY. THNB. VBRKN
13	32.05	32.36	0.31	76		ROCK LOSS	
14	32.36	32.88	0.52	73		SILTSTONE	M. GY. LAM. BRKN. VERY THINLY LAMINATED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	32.88	33.38	0.50	*70		SILTSTONE	LT. GY. LAM. XBDG. BRKN. VERY THINLY LAMINATED. SILVERY. LOCALLY CROSS-BEDDED. TUFFITE.
14	33.38	33.41	0.03	70		BENTONITE	SLTY. LT. GY. SLD. SOFT.
14	33.41	33.50	0.09	70		SILTSTONE	LT. GY. LAM. SLD
14	33.50	33.52	0.02	70		SILTSTONE	LT. GY. LAM. SLD. V SOFT.
14	33.52	34.19	0.67	71		MUDSTONE	DK. GY. MAS. VBRKN. MASSIVE, HOMOGENEOUS, DARK MUDSTONE.
14	34.19	34.67	0.48	72		ROCK LOSS	
15	34.67	36.37	1.70	73		MUDSTONE	DK. GY. MAS. VBRKN. SAME AS ABOVE.
16	36.37	36.72	0.35	74		MUDSTONE	DK. GY. MAS. BIOTR. SLD. FEW BIVALVES.
16	36.72	37.63	0.91	*75		MUDSTONE	M-DK. GY. LAM. XBDG. SLD. LAMINATED AT TOP BECOMING THINLY BEDDED AND SILTIER AT BASE. V RARE COAL STRINGS. SSD.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	37.63	38.27	0.64	75			MUDSTONE	CARB. DK. GY. LAM. VBRKN MANY PLANT FRAGMENTS. VERY FAINTLY LAMINATED. COAL IN BOXES 17 & 18, 1 SEAM.
16	38.27	39.22	0.95	75			ROCK LOSS	
17	39.22	40.19	0.97	75			MUDSTONE	SLTY. M-DK. GY. BRKN MINOR PLANT FRAGS, SAME COALIFIED.
17	40.19	40.72	0.53	75	10151		MUDSTONE	SLTY. M-DK. GY. BRKN MINOR PLANT FRAGS, SOME COALIFIED. LOWER 25CM SAMPLED.
17	40.72	40.79	0.07	75	10152	I	COAL	C-2. BRKN
17	40.79	41.34	0.55	76	10152	I	COAL LOSS	
17	41.34	41.49	0.15	76	10152	I	ROCK LOSS	
17	41.49	41.54	0.05	76	10152	I	MUDSTONE	SLTY. M-DK. GY. SLD
17	41.54	41.59	0.05	76	10152	I	COAL	C-2. VBRKN

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	41.59	42.15	0.56	76	10152	I	COAL LOSS	
17	42.15	42.27	0.12	76	10152	I	MUDSTONE	CARB. DK. GY. VBRKN SLIGHTLY SHEARED.
17	42.27	42.32	0.05	76	10152	I	COAL	C-2. VBRKN
17	42.32	42.46	0.14	76	10152	I	MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS WITHIN.
18	42.46	42.53	0.07	76	10152	I	COAL	C-4. SLD
18	42.53	42.75	0.22	76	10152	I	COAL	C-2. VBRKN
18	42.75	43.40	0.65	76	10152	I	COAL LOSS	
18	43.40	43.44	0.04	76	10152	I	ROCK LOSS	
18	43.44	43.46	0.02	76	10152	I	MUDSTONE	CARB. DK. GY. SLD
18	43.46	43.55	0.09	76	10152	I	COAL	C-2. BRKN

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	43.55	43.57	0.02	76	10152	I	MUDSTONE	CARB. DK. GY. BRKN POORLY CONSOLIDATED.
18	43.57	44.20	0.63	76	10152	I	COAL	C-1.VBRKN
18	44.20	44.44	0.24	76	10152	I	COAL	C-1.VBRKN
18	44.44	45.36	0.92	76	10152	I	COAL LOSS	
18	45.36	45.49	0.13	76	10153		MUDSTONE	CARB. DK. GY. SLD COALY PLANT FRAGS. WITHIN.
19	45.49	46.56	1.07	76	10153		MUDSTONE	SLTY. DK. GY. LAM. SSD. BRKN SOFT SEDIMENT SLUMP/DROP FOLDING. TOPS UP. SILTIERTOWARDS BASE. UPPER 12CM SAM PLED.
19	46.56	46.90	0.34	76			SANDSTONE	SLTY. FG. M. GY. VTHNE. VBRKN BRECCIATED WITH ROCK POWDER MATRIX AT T OP. BEDS OF SLT. IN. SS.
19	46.90	47.34	0.44	76			ROCK LOSS	
19	47.34	47.64	0.30	76			SANDSTONE	FG. LT-M. GY. MAS. VBRKN

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	47.64	47.89	0.25	76			ROCK LOSS	
20	47.89	48.73	0.84	76			SANDSTONE	FG. LT-M. GY. MAS. VBRKN
20	48.73	49.23	0.50	77			SANDSTONE	FG. LT-M. GY. MAS. VBRKN
20	49.23	49.65	0.42	77			ROCK LOSS	
20	49.65	49.93	0.28	77			SANDSTONE	FG. LT-M. GY. MAS. VBRKN
21	49.93	50.44	0.51	77			SANDSTONE	FG. LT-M. GY. MAS. VBRKN FEW SMALL LONG THIN RIPUPS.
21	50.44	50.87	0.43	77			ROCK LOSS	
21	50.87	51.50	0.63	77			SANDSTONE	FG. LT-M. GY. MAS. VBRKN
21	51.50	51.96	0.46	77			MUDSTONE	DK. GY. BIOTR. VBRKN MOTTLED. VERY BIOTURBATED.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
22	51.96	53.37	1.41	*77			MUDSTONE	SLTY, DK. GY. LAM. WRMBU. SLD TOPS UP. HELMINTHOPHIS. BIOTRB.
22	53.37	53.86	0.49	75			MUDSTONE	SLTY, DK. GY. BRKN BRECCIATED WITH ROCK POWDER MATRIX.
23	53.86	53.98	0.12	74			MUDSTONE	SLTY, DK. GY. BRKN BRECCIATED WITH ROCK POWDER MATRIX.
23	53.98	55.43	1.45	72			SANDSTONE	FG, PR. M. GY. MAS. VBRKN TOP 33CM IS BRECCIATED.
23	55.43	55.81	0.38	70			ROCK LOSS	
24	55.81	56.42	0.61	69			SANDSTONE	FG, PR. M. GY. MAS. BRKN VBRKN AT. BOTOM.
24	56.42	56.83	0.41	68			SANDSTONE	SLTY, FG. VPR. M-DK. GY. LAM. BIOTR. BRKN CLAM BURROWS, WORM BURROWS ? TOPS UP. T HOROUGHLY BIOTURBATED. SSD.
24	56.83	57.63	0.80	67			SANDSTONE	SLTY, FG. VPR. M. GY. LAM. SSD. BRKN SLTST LAM BETWEEN VTHIN BEDS OF SS. FEW SMALL WORM BURROWS. TOPS UP. SOME SAND LENSES, NON PARALLEL BEDDING. FAIR CONT RAST, COULD BE SILTY BANDED SAND. WRMBUR

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
25	57.63	58.45	0.82	*65			SANDSTONE	SLTY, FG. PR. LT-M. GY. LAM. BRKN FEW SILTY LAM BETWEEN THIN TO VTHIN SS BEDS. NOT VERY SILTY.
25	58.45	58.56	0.11	65			ROCK LOSS	
25	58.56	59.19	0.63	65			SANDSTONE	SLTY, FG. PR. LT-M. GY. LAM. BRKN SAME AS ABOVE.
25	59.19	59.60	0.41	66			SANDSTONE	SLTY, FG. VPR. M. GY. LAM. BIOTR. SLD SILTIER THAN ABOVE. QUITE BIOTURBATED.
26	59.60	59.65	0.05	66			SANDSTONE	SLTY, FG. PR. LT-M. GY. LAM. VBRKN FEW SILTY LAM BETWEEN THIN TO VTHIN SS BEDS. NOT VERY SILTY.
26	59.65	60.08	0.43	66			ROCK LOSS	
26	60.08	60.51	0.43	66			SANDSTONE	SLTY, FG. VPR. M. GY. LAM. VBRKN SLTST LAM IN VTHNB SS.
26	60.51	60.71	0.20	66			ROCK LOSS	
26	60.71	61.35	0.64	66			SANDSTONE	SLTY, VFG. PR. M. GY. LAM. BIOTR. BRKN FAINTLY LAMINATED.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	61.35	62.30	0.95	67		SANDSTONE	SLTY. FG. VPR. LT-M. GY. LAM. BRKN FEW SILTY LAMINAE IN VTHNB SS.
27	62.30	63.14	0.84	*67		SILTSTONE	VPR. M-DK. GY. LAM. SSD. BRKN MUDDY SLTST.
28	63.14	64.39	1.25	*70		SILTSTONE	VPR. M-DK. GY. LAM. BIOTR. SLD MUDDY SLTST. LOCALLY BIOTURBATED. FEW S MALL WORM BURROWS. TOPS UP. WRMBUR. SSD
28	64.39	64.95	0.56	67		ROCK LOSS	
28	64.95	65.47	0.52	65		MUDSTONE	SLTY. DK. GY. LAM. YBRKN FAULT GOUGE AT 20 - 30CM.
29	65.47	67.57	2.10	*60		MUDSTONE	SLTY. DK. GY. LAM. BIOTR. SLD TOPS UP. FEW SMALL WORM BURROWS. LOCAL Y BIOTURBATED. WRMBUR. SSD.
30	67.57	68.26	0.69	63		MUDSTONE	SLTY. DK. GY. LAM. SSD ONLY SLIGHTLY SILTY. TOPS UP. WRMBUR.
30	68.26	69.51	1.25	65		MUDSTONE	SLTY. DK. GY. LAM ONLY SLIGHTLY SILTY. SEVERAL 1CM ZONES OF FAULT GOUGE AT VARIOUS ANGLES. LOCAL LY BRECCIATED WITH ROCK POWDER MATRIX.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
31	69.51	70.21	0.70	67		MUDSTONE	SSY. DK. GY. MAS. VBRKN PARTLY BRECCIATED WITH ROCK POWDER MATR IX.
31	70.21	70.71	0.50	68		ROCK LOSS	
31	70.71	70.78	0.07	69		MUDSTONE	SSY. DK. GY. MAS. VBRKN SAME AS ABOVE.
31	70.78	71.59	0.81	70		MUDSTONE	SLTY. DK. GY. LAM. SLD SLIGHTLY SILTY. FAINTLY LAMINATED AT TO P BECOMING MASSIVE TOWARDS BOTTOM. FEW PLANT FRAGS AND COALY LENSES.
32	71.59	71.75	0.16	71		MUDSTONE	DK. GY. MAS. SLD SAME AS BOTTOM OF UNIT ABOVE.
32	71.75	72.78	1.03	*72		MUDSTONE	SLTY. DK. GY. LAM. BRKN SEVERAL FRACTURES WITH < 1 CM OFFSETS.
32	72.78	73.33	0.55	74		MUDSTONE	DK. GY. MAS. BRKN
33	73.33	73.57	0.24	76		MUDSTONE	DK. GY. MAS. VBRKN
33	73.57	73.76	0.19	76		ROCK LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
33	73.76	74.26	0.50	77		MUDSTONE	DK.GY.MAS.BRKN
33	74.26	75.37	1.11	*80		MUDSTONE	SILTY DK.GY.LAM.BRKN SLIGHTLY SILTY. BRECCIATED WITH ROCK POWDER MATRIX.
34	75.37	75.71	0.34	80		MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME AS ABOVE.
34	75.71	77.35	1.64	79		MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME AS ABOVE. MUCH PLANT HASH.
35	77.35	79.23	1.88	78		MUDSTONE	SLTY.DK.GY.LAM.BRKN SIMILAR TO ABOVE.MINOR LOW ANGLE CROSS BEDDING. FRACTURED (SMALL <1CM OFFSETS). LOCALLY BRECCIATED WITH ROCK POWDER MATRIX. PLANT FRAGMENTS.
35	79.23	79.72	0.49	78		ROCK LOSS	
36	79.72	80.73	1.01	77		MUDSTONE	DK.GY.LAM.VBRKN FAINTLY LAMINATED.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
36	80.73	81.76	1.03	77		MUDSTONE	DK.GY.MAS.BRKN RARE SMALL SILTY LENSES.MINOR PLANT FRAGMENTS.
37	81.76	83.41	1.65	76 10154		MUDSTONE	DK.GY.MAS.BRKN PLANT FRAGMENTS, V MINOR PYRITE BLEBS. H SEAM COAL IN BOXES 38-40. LOWER 22 CM SAMPLED.
37	83.41	83.44	0.03	76 10154		MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS & PYRITE WITHIN.
37	83.44	83.72	0.28	76 10155 H		COAL	C-2.SHRD
38	83.72	83.78	0.06	76 10155 H		COAL	C-2.SHRD
38	83.78	83.88	0.10	76 10155 H		COAL LOSS	
38	83.88	84.04	0.16	76 10155 H		MUDSTONE	CLYY.DK.GY.SHRD MINOR QTZ WITHIN.
38	84.04	84.34	0.30	76 10155 H		COAL	C-3.SHRD
38	84.34	84.46	0.12	75 10155 H		COAL LOSS	

\* DENOTES MEASURED BCA

FORM  
40001

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	84.46	84.69	0.23	75 10155 H		MUDSTONE	CARB. DK. GY. SHRD LITRIC SURFACES.
38	84.69	85.30	0.61	75 10155 H		COAL	C-2. SHRD PARTIALLY SHEARED.
38	85.30	85.37	0.07	75 10155 H		COAL	C-3. BRKN BANDED WITH C-5.
38	85.37	85.69	0.32	75 10155 H		COAL	C-2. BRKN SLIGHTLY SHEARED.
39	85.69	85.79	0.10	75 10155 H		COAL	C-4. SLD MINOR QTZ WITHIN.
39	85.79	85.87	0.08	75 10155 H		COAL LOSS	
39	85.87	86.24	0.37	75 10155 H		MUDSTONE	SLTY. PR. M. GY. BRKN PARTIALLY SHEARED.
39	86.24	86.33	0.09	75 10155 H		COAL	C-3. SLD
39	86.33	86.37	0.04	75 10155 H		COAL	C-4. SLD
39	86.37	86.46	0.09	75 10155 H		COAL	C-2. VBRKN

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
39	86.46	86.53	0.07	74 10155 H		MUDSTONE	CLY. PR. M. GY. BRKN SILTY & CLAYEY.
39	86.53	86.65	0.12	74 10155 H		ROCK LOSS	
39	86.65	86.89	0.24	74 10155 H		COAL LOSS	
39	86.89	87.38	0.49	74 10155 H		COAL	C-3. BRKN BONE COAL BANDS WITHIN.
39	87.38	87.51	0.13	74 10155 H		MUDSTONE	CARB. DK. GY. SLD PLANT FRAGS WITHIN.
39	87.51	87.54	0.03	74 10155 H		COAL	C-2. SLD
39	87.54	87.61	0.07	74 10155 H		MUDSTONE	CARB. DK. GY. SHRD COALY STRINGERS WITHIN.
39	87.61	87.93	0.32	74 10156 H		COAL	C-2. VBRKN C-3 BANDS WITHIN.
40	87.93	88.06	0.13	74 10156 H		COAL	C-2. BRKN C-3 BANDS WITHIN.
40	88.06	88.12	0.06	74 10156 H		COAL	C-6. SLD

\* DENOTES MEASURED BCA



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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
40	88.12	88.81	0.69	74	10156	H	COAL	C-2.SHRD VERY BROKEN & POWDERED IN PLACES
40	88.81	88.88	0.07	73	10156	H	COAL	C-2.BRKN
40	88.88	89.72	0.84	73	10156	H	COAL LOSS	
40	89.72	89.81	0.09	73	10156	H	ROCK LOSS	
40	89.81	89.94	0.13	73	10156	H	MUDSTONE	SLTY.M-DK.GY.SLD MINOR PLANT FRAGS WITHIN.
40	89.94	89.98	0.04	73	10156	H	COAL	C-2.SLD
40	89.98	90.08	0.10	73	10156	H	COAL	C-2.SHRD VERY BROKEN, SHEARED, AND POWDERED.
40	90.08	90.10	0.02	73	10156	H	MUDSTONE	CARB.DK.GY.SLD POORLY CONSOLIDATED.
40	90.10	90.27	0.17	73	10156	H	COAL	C-2.BRKN
40	90.27	90.64	0.37	73	10157		MUDSTONE	CARB.DK.GY.SLD COALY PLANT FRAG & STRINGERS. PYRITE AN D QTZ BANDS WITHIN. UPPER 25CM SAMPLED.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	90.64	92.40	1.76	72			MUDSTONE	CARB.DK.GY.LAM.SLD MANY COAL LENSES AND STRINGERS. SILTY LA MINATED MUDSTONE. MINOR PYRITE BLEBS.
41	92.40	92.59	0.19	72			MUDSTONE	SLTY.DK.GY.LAM.SLD
42	92.59	94.29	1.70	71			MUDSTONE	DK.GY.MAS.SLD MASSIVE MONOTONOUS MUDSTONE.
42	94.29	94.66	0.37	71			MUDSTONE	SLTY.M-DK.GY.LAM.BIOTR.BRKN BIOTURBATED AT TOP. FEW HORN BURROWS TO PS UP.
43	94.66	95.40	0.74	70			SILTSTONE	SSY.VFG.M-DK.GY.LAM.BIOTR.BRKN BIOTURBATED AT TOP. SANDIER AT BASE.
43	95.40	96.47	1.07	*70			SILTSTONE	SSY.VFG.M-DK.GY.LAM.HRMBU.BRKN THINLY LAMINATED, LOCALLY FRACTURED AND SLIGHTLY OFFSET ALONG NEAR VERTICAL FR ACTURES. BECOMES LESS SANDY WITH DEPTH.
44	96.47	97.13	0.66	72			MUDSTONE	SLTY.DK.GY.LAM.SLD FEW SILTY LAMINAE IN MUDST. VBRKN AT BA SE. QUITE BRECCIATED WITH ROCK POWDER M ATRIX.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
44	97.13	97.62	0.49	*73			MUDSTONE	SLTY. DK. GY. LAM. WRMBU. SLD SAME AS ABOVE. TOPS UP.
44	97.62	98.23	0.61	73			SANDSTONE	SLTY. MG. M. GY. LAM. VBRKN FEW SLTST LAMINAE. MANY ELLIPTICAL RIPU P CLASTS, UP TO 3CM X 1CM.
44	98.23	98.65	0.42	72			ROCK LOSS	
44	98.65	98.75	0.10	72			SANDSTONE	SLTY. MG. M. GY. LAM. BRKN SAME AS ABOVE.
45	98.75	98.98	0.23	72			SANDSTONE	SLTY. MG. M. GY. LAM. VBRKN SAME AS ABOVE.
45	98.98	99.58	0.60	72			ROCK LOSS	
45	99.58	101.15	1.57	*71			SANDSTONE	SLTY. FG. M. GY. LAM. SSD. BRKN TOPS UP. THO LAYERS OF DIAGENETIC DENTR ITIC RECRYSTALLIZED CARBONATE. LOCALLY BRECCIATED WITH ROCK POWDER MATRIX. WRM BUR.
46	101.15	101.84	0.69	71			SILTSTONE	SSY. VFG. M-DK. GY. LAM. WRMBU. BRKN MOSTLY LAMINATED. FEW VTHIN BEDS OF BOT H VFG SS AND SLTST. SSD.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
46	101.84	102.20	0.36	71			MUDSTONE	SLTY. DK. GY. MAS. BRKN
46	102.20	102.47	0.27	71			MUDSTONE	SLTY. DK. GY. MAS. BRKN BRECCIATED WITH ROCK POWDER MATRIX.
46	102.47	103.17	0.70	71			MUDSTONE	SLTY. DK. GY. LAM. XBDG MINOR XBDG. FEW SILTY LENSES. BRECCIATED WITH ROCK POWDER MATRIX.
47	103.17	103.66	0.49	71			MUDSTONE	SLTY. DK. GY. LAM. SLD GRADATIONAL LOWER CONTACT.
47	103.66	104.93	1.27	71			SANDSTONE	VFG. VPR. M. GY. MAS. BRKN FRACTURED WITH SMALL OFFSETS. LOCALLY B RECCIATED.
48	104.93	105.29	0.36	71			SANDSTONE	VFG. VPR. M. GY. MAS. XBDG. BRKN FAINT LOW ANGLE XBDG. LOCALLY BRECCIATED
48	105.29	106.73	1.44	71			MUDSTONE	SLTY. DK. GY. MAS. BRKN RARE FAINT SLTY LAMINAE IN MOSTLY MASSI VE. MUDST. QUITE FRACTURED.
49	106.73	107.33	0.60	71			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
49	107.33	108.34	1.01	70			MUDSTONE	SLTY. DK. GY. MAS. VBRKN BRECCIATED.
49	108.34	108.69	0.35	70			ROCK LOSS	
49	108.69	109.41	0.72	70			MUDSTONE	SLTY. DK. GY. MAS. VBRKN BRECCIATED.
50	109.41	111.04	1.63	70			MUDSTONE	SLTY. DK. GY. MAS. VBRKN LOCALLY BRECCIATED.
50	111.04	111.74	0.70	70			ROCK LOSS	
50	111.74	111.79	0.05	70			MUDSTONE	SLTY. DK. GY. MAS. VBRKN VERY VERY BROKEN.
50	111.79	111.90	0.11	70			ROCK LOSS	
51	111.90	113.28	1.38	70			SANDSTONE	SLTY. VFG. VPR. M. GY. LAM. XBDG. VBRKN MINOR LOW ANGLE XBDG. QUITE FRACTURED WITH SMALL OFFSETS. COMMON, DISCOM. IRREGULAR, RANDOMLY ORIENTED. QTZ CARB VEINLETS. LOCALLY BRECCIATED. VEINLETS ARE ALSO BRECCIATED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
51	113.28	114.01	0.73	70			ROCK LOSS	
52	114.01	114.90	0.89	70			SANDSTONE	SLTY. VFG. VPR. M. GY. LAM. VBRKN FRACTURED. MINOR QTZ CARB VEINLETS. BRECCIATED SAME AS ABOVE.
52	114.90	115.47	0.57	*70			SANDSTONE	SLTY. VFG. VPR. M. GY. LAM. XBDG. BRKN BRKN AT TOP. MINOR LOW ANGLE XBDG. SAME ROCK TYPE AS ABOVE. SLIGHTLY FRACTURED - FEW QTZ CARB VEINLETS.
53	115.47	115.94	0.47	69			SANDSTONE	SLTY. VFG. VPR. M. GY. LAM. XBDG. BRKN SAME AS ABOVE. V FEW VEINLETS. NOT FRACTURED.
53	115.94	116.66	0.72	68			SILTSTONE	VPR. M-DK. GY. LAM. BRKN GRADATIONAL FROM ABOVE.
53	116.66	117.30	0.64	68			MUDSTONE	SLTY. VPR. M-DK. GY. LAM. BRKN FAINTLY LAMINATED. GRADATIONAL FROM ABOVE.
54	117.30	117.63	0.33	67			MUDSTONE	SLTY. VPR. DK. GY. LAM. BRKN SAME AS ABOVE TO 121.01 M. COAL IN BOXES 54 & 55.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
54	117.63	117.90	0.27	66	10158		MUDSTONE	CARB. DK. GY. ABUNDANT COALY STRINGERS AND BANDS THROUGHOUT. MINOR QTZ VEIN WITHIN.
54	117.90	117.96	0.06	66	10159	PH	COAL	C-2.SLD BONEY THIN BAND WITHIN.
54	117.96	118.03	0.07	66	10159	PH	MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS WITHIN.
54	118.03	118.07	0.04	66	10159	PH	COAL	C-2.SLD
54	118.07	118.12	0.05	66	10159	PH	MUDSTONE	CARB. DK. GY. BRKN SPOIL APPEARANCE.
54	118.12	118.20	0.08	66	10159	PH	COAL LOSS	
54	118.20	118.48	0.28	66	10159	PH	COAL	C-2. SHRD
54	118.48	118.62	0.14	65	10159	PH	COAL	C-2. BRKN MINOR QTZ WITHIN.
54	118.62	118.65	0.03	65	10159	PH	MUDSTONE	CARB. DK. GY. SLD
54	118.65	118.82	0.17	65	10159	PH	ROCK LOSS	

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
54	118.82	118.92	0.10	65	10159	PH	COAL LOSS	
54	118.92	119.64	0.72	64	10159	PH	COAL	C-2. SHRD SHEARED AND DIFFICULT TO DETERMINE GRADE.
55	119.64	119.89	0.25	64	10159	PH	COAL	C-2. SHRD
55	119.89	120.03	0.14	63	10159	PH	COAL	C-3. SHRD
55	120.03	120.20	0.17	63	10159	PH	MUDSTONE	CARB. DK. GY. SLD MIXTURE OF MUDST. & QTZ WITHIN.
55	120.20	120.35	0.15	63	10159	PH	COAL LOSS	
55	120.35	120.47	0.12	63	10159	PH	COAL	C-3. SHRD
55	120.47	120.62	0.15	63	10160		SILTSTONE	SSY. LT-M. GY. BRKN ABUNDANT QTZ AND COALY STRINGERS THROUGHOUT. (BRECCIA).
55	120.62	120.73	0.11	62			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	120.73	120.93	0.20	62	10160		MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS THROUGHOUT. UPPER 10CM SAMPLED.
55	120.93	121.20	0.27	62			SANDSTONE	FG. LT-M. GY. SLD QTZ BAND WITHIN.
55	121.20	121.64	0.44	61			MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT. SILTY BAN DS. AT BASE.
56	121.64	123.18	1.54	*60			SILTSTONE	M-DK. GY. LAM. WRMBU. SLD MUDDY SLTST. BANDED DK. GY. AND M. GY. A L OT OF SSD. LOAD STRUCTURES. TOPS UP. FEW WORM BURROWS. SSD.
56	123.18	123.55	0.37	61			MUDSTONE	SLTY. M-DK. GY. LAM. BRKN GRADATIONAL FROM ABOVE. COAL IN BOXES 5 7 - 62. G SEAM.
56	123.55	123.63	0.08	61			ROCK LOSS	
57	123.63	124.00	0.37	61	10161		MUDSTONE	SLTY. M. GY. BRKN CONTORTED QTZ AND COAL THROUGHOUT. LDWE R 25CM SAMPLED.
57	124.00	124.13	0.13	61	10162	K/L?	COAL LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
57	124.13	124.67	0.54	62	10162	K/L?	COAL	C-2 BRKN PARTIALLY SHEARED. MINOR QTZ STRINGERS AND THIN BANDS. C-3 BANDS WITHIN.
57	124.67	124.76	0.09	62	10162	K/L?	COAL	C-3 BRKN
57	124.76	125.07	0.31	62	10162	K/L?	COAL	C-2 BRKN C-3 BANDS WITHIN.
57	125.07	125.11	0.04	62	10162	K/L?	COAL	C-5 SLD
57	125.11	125.47	0.36	62	10162	K/L?	COAL	C-2 VBRKN
57	125.47	125.56	0.09	62	10162	K/L?	COAL LOSS	
57	125.56	125.66	0.10	62	10163	K/L?	MUDSTONE	CARB. DK. GY. SHRD COALY STRINGERS WITHIN. LISTRIC SURFACE S.
58	125.66	125.77	0.11	63	10163	K/L?	MUDSTONE	CARB. DK. GY. SHRD COALY STRINGERS WITHIN. LISTRIC SURFACE S.
58	125.77	126.37	0.60	63	10163	K/L?	COAL	C-3 SHRD HIGHLY SHEARED.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
58	126.37	126.42	0.05	63	10163	K/L?	MUDSTONE	CARB. DK. GY. BRKN
58	126.42	126.50	0.08	63	10163	K/L?	MUDSTONE	CARB. DK. GY. SLD COALY BANDS WITHIN.
58	126.50	126.83	0.33	63	10163	K/L?	COAL	C-3. SHRD INTENSELY SHEARED. DIFFICULT TO DETERMINE GRADE.
58	126.83	126.89	0.06	63	10163	K/L?	MUDSTONE	CARB. DK. GY. SHRD MIXED WITH SHEARED COAL.
58	126.89	127.07	0.18	64	10163	K/L?	COAL	C-3. SHRD HIGHLY SHEARED.
58	127.07	127.16	0.09	64	10163	K/L?	MUDSTONE	CARB. DK. GY. SLD SHEARED. MIXED WITH COAL & QTZ.
58	127.16	127.44	0.28	64	10164	K/L?	COAL	C-3. SHRD HIGHLY SHEARED.
59	127.44	127.74	0.30	64	10164	K/L?	COAL	C-5. SHRD HIGHLY SHEARED MUDDY COAL.
59	127.74	129.32	1.58	65	10164	K/L?	COAL	C-3. SHRD HIGHLY SHEARED BUT INTACT CORE. POSSIBLY INDISTINGUISHABLE QUALITY CHANGES.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
59	129.32	129.43	0.11	65	10164	K/L?	COAL	C-3. SHRD HIGHLY SHEARED BUT INTACT CORE. POSSIBLY INDISTINGUISHABLE QUALITY CHANGES.
60	129.43	130.17	0.74	66	10164	K/L?	COAL	C-3. SHRD HIGHLY SHEARED.
60	130.17	130.32	0.15	66	10164	K/L?	COAL	C-4. SHRD HIGHLY SHEARED.
60	130.32	130.44	0.12	66	10164	K/L?	COAL LOSS	
60	130.44	130.65	0.21	66	10164	K/L?	ROCK LOSS	
60	130.65	131.68	1.03	67	10165	K/L?	MUDSTONE	CARB. DK. GY. SHRD HIGHLY BRECCIATED IN QTZ AND MUDST THROUGHOUT. SHEARED LISTRIC SURFACES. MINOR SHEARED COAL THROUGHOUT.
61	131.68	131.86	0.18	67	10165	K/L?	MUDSTONE	CARB. DK. GY. SHRD HIGHLY BRECCIATED IN QTZ AND MUDST THROUGHOUT. SHEARED LISTRIC SURFACES. MINOR SHEARED COAL THROUGHOUT.
61	131.86	131.98	0.12	67	10165	K/L?	COAL	C-3. SHRD MUDDY SHEARED COAL.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
61	131.98	132.46	0.48	68	10165	K/L?	COAL	C-4. SHRD VERY SHEARED AND MIXED WITH DISSEMINATE D MUDST.
61	132.46	132.65	0.19	68	10165	K/L?	COAL LOSS	
61	132.65	132.79	0.14	68	10165	K/L?	MUDSTONE	CARB. M-DK. GY. SHRD LISTRIC SURFACES.
61	132.79	133.05	0.26	68	10165	K/L?	COAL	C-3. SHRD QTZ THROUGHOUT.
61	133.05	133.48	0.43	68	10165	K/L?	MUDSTONE	DK. GY. VBRKN SLIGHTLY SHEARED. ABUNDANT PLANT FRAGS, SOME COALIFIED.
61	133.48	133.69	0.21	69	10165	K/L?	COAL	C-2. BRKN
62	133.69	134.04	0.35	69	10165	K/L?	COAL	C-2. BRKN
62	134.04	134.32	0.28	69	10165	K/L?	MUDSTONE	CARB. DK. GY. BRKN ABUNDANT COALY STRINGERS AND THIN BANDS

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
62	134.32	134.51	0.19	69	10165	K/L?	COAL	C-3. SHRD
62	134.51	135.02	0.51	70	10166		MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS AND QTZ NEAR TOP. UPPER 25CM SAMPLED.
62	135.02	135.61	0.59	70			MUDSTONE	SLTY. M-DK. GY. BRKN QTZ THROUGHOUT IN VEINS OF ALL ORIENTAT ION.
63	135.61	137.59	1.98	*71			SILTSTONE	M-DK. GY. LAM. HRMBU. BRKN. MUDDY SLTST. BANDED DK GY AND M GY. A L OT OF SSD. LOAD STRUCTURES. TOPS UP. FEW NORM BURROWS.
64	137.59	138.55	0.96	*73			MUDSTONE	DK. GY. LAM. BRKN FAINTLY LAMINATED. MANY SMALL IRREGULAR SHORT QTZ CARB VEINLETS.
64	138.55	139.48	0.93	73			MUDSTONE	DK. GY. MAS. BRKN SIMILAR TO ROCK TYPE ABOVE. FEWER VEINL ETS. GRADATIONAL FROM FAINTLY LAMINATED TO MASSIVE.
65	139.48	141.06	1.58	74			MUDSTONE	SLTY. DK. GY. MAS. SLD MOSTLY MASSIVE HOMOGENEOUS SLTY MUDSTON E. V FEW LENSES OF SLTST AND MUDST.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86031

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP ID	SEAM ID	LITHOLOGY	DESCRIPTION
65	141.06	141.45	0.39	74			MUDSTONE	SLTY. DK. GY. MAS. SLD. SAME AS ABOVE.
66	141.45	143.49	2.04	75			MUDSTONE	SLTY. DK. GY. LAM. SLD. FAINTLY LAMINATED. FRACTURED WITH SMALL OFFSETS. MANY IRREGULAR, RANDOMLY ORIENTED, QTZ. CARB. VEINLETS.
67	143.49	143.85	0.36	75			MUDSTONE	CARB. DK. GY. LAM. SHRD. FEW COAL LAYERS 1-3CM. MANY LISTRIC SURFACES.
67	143.85	144.44	0.59	75			MUDSTONE	SLTY. M-DK. GY. S10TR. YBRKN. FINELY MOTTLED. QUITE BIOTURBATED.
67	144.44	145.04	0.60	76			SANDSTONE	SLTY. VEG. M. GY. LAM. XBDG. BRKN. MINOR LOW ANGLE XBDG.
68	145.04	145.72	0.68	*76			SANDSTONE	SLTY. VEG. M. GY. LAM. XBDG. BRKN. SAME AS ABOVE. END OF HOLE. TOTAL DEPTH = 150.57 M.

\* DENOTES MEASURED BCA  
NEWPAGE











# GULF CANADA CORPORATION

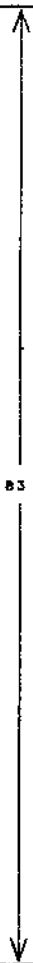
SEAM DETAIL

COAL DIVISION  
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86031 SEAM: K/L? INTERVAL(M): 124.00 - 130.65 ELEVATION(M): 1699.8  
 GEOLOGIST: LOVE SCALE: 1:40 DATE: MAR 05/87 DRAWING NO.:

SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES		% REC.	SAMPLE ID		COAL/ROCK TOTAL		COAL QUALITY A.D.B.								
			ROCK	COAL		SIMP	COMP	COMPOS	MINING SECTION	RES MOIST	ASH	VM	FC	TS	CAL VAL MJ/KG			
123456	124.00	↑		(0.11)														
				1.15	85.9	10182												
	125.56		0.19	(0.02)														
				0.53														
				0.12	100.0	10163												
				0.30														
	127.16			0.16														
				0.09														
				2.85	80.5	10184												
	130.65	↓		(0.19)	(0.11)													



83 5.34 / 0.63  
5.97

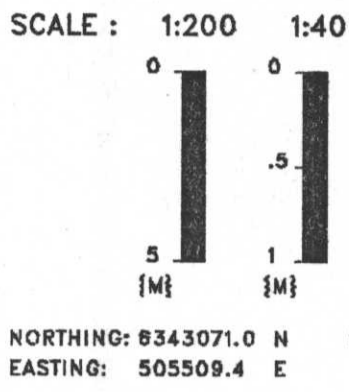
GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT  
 STRATIGRAPHIC LOG  
 KPN LR DDH86031

723

GEOLOGIST : LOVE

DATE : FEB 26/87

DRAWING NO. :

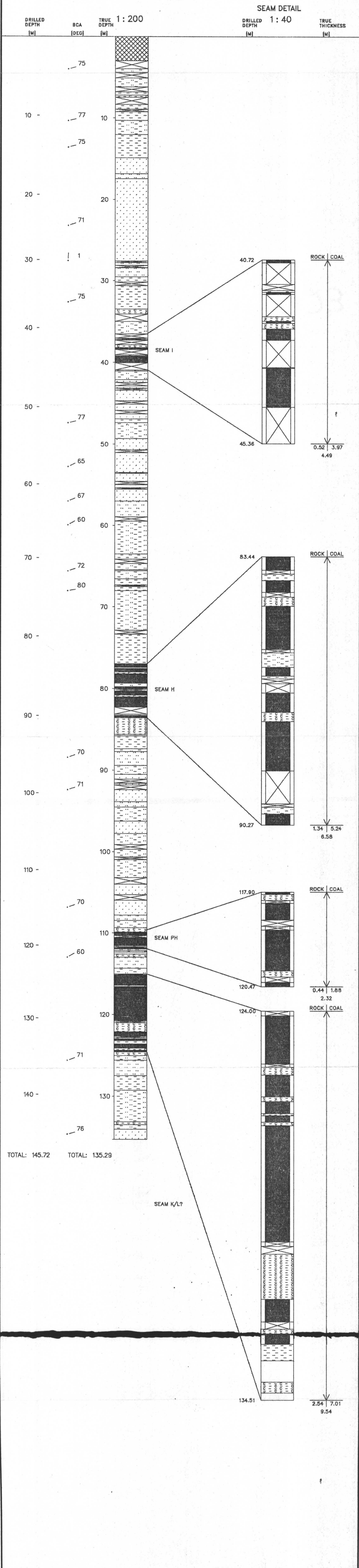


NORTHING: 8343071.0 N  
 EASTING: 505509.4 E

INCLINATION: 90.0°

LITHOLOGIC SYMBOLS

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

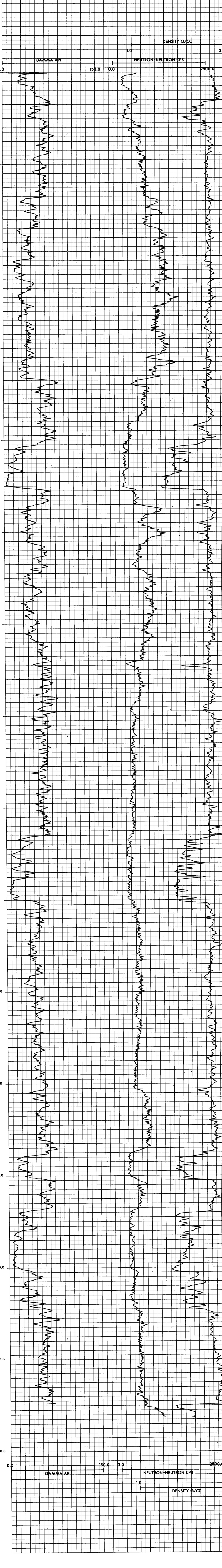


# Gulf Canada Corporation Coal Division

## 723

Geophysical Log

Datasource: <b>KPNLRDDH86031</b> Log Date: 86-09-25 Company: CENTURY Geologist: LOVE	Province: BC    Northing: 6343070.00 Zone: 9    Easting: 505509.00 Measuring Point:	Lat: 571357 Lang: 1285431 Elevation: 1699.7
Scale: 1 to 100.0 Depth Range: 0.0 to 151.0 True Thickness: NO		Comments: 1. LOGGED THROUGH THE RODS 2.
<b>Logs Plotted:</b>		
Description 1. GAMMA API 2. NEUTRON-NEUTRON CPS 3. DENSITY G/CC	Axis Range 0.0 to 150.0 0.0 to 2500.0 1.0 to 3.0	Axis Length 10.0 10.0 10.0
	Smoothing Points 31 9 15	Tool 9055A 9055A 9030A
		Comments IN PIPE IN PIPE IN PIPE



KPNLRDDH86032



===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86032

DATE - 02/13/87

- HISTORY -

START DATE - 24/09/86

END DATE - 25/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - SAVOIE

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC  
ELEVATION - 1519.34

ZONE - 9  
NORTHING - 6345039.00  
EASTING - 507804.44

LICENCE/LEASE NUMBER -

LATITUDE - 571501  
LONGITUDE - 1285214

- ORIENTATION -

LENGTH - 72.24

INCLINATION - 90.0  
AZIMUTH - 0.0

CORE SIZE - 0.0

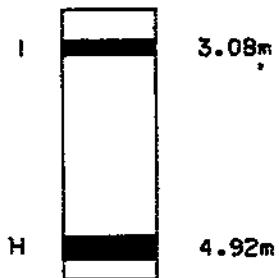
CEMENT - N  
PLUG - N  
PIEZ - N

CASING DEPTH (M) - 8.23  
AQUIFER DEPTHS (M) - 0.00  
0.00  
LOST CIRC. DEPTHS (M) - 0.00  
0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====

SEAM            TRUE SEAM THICKNESS  
                    (COAL & ROCK)



NOTE:

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE    1:2000

FIGURE

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86032

GULF CANADA CORPORATION  
11/03/87  
KLAP: (205057)870063032.L06



87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	8.15	8.15	83			OVERBURDEN	CASING
	8.15	8.23	0.08	83	10120	I	COAL LOSS	CASING (LOST COAL).
1	8.23	8.31	0.08	83	10120		COAL LOSS	
1	8.31	8.43	0.12	83	10120	I	COAL	C-2.VBRKN
1	8.43	8.50	0.07	83	10120	I	COAL	C-2.VBRKN
1	8.50	8.60	0.10	83	10120	I	ROCK LOSS	
1	8.60	8.64	0.04	83	10120	I	MUDSTONE	CARB.DK.GY.BRKN UNCONSOLIDATED.
1	8.64	8.94	0.30	83	10120	I	COAL	C-2.BRKN MINOR THIN MUDDY BANDS WITHIN.
1	8.94	8.98	0.04	83	10120	I	MUDSTONE	CARB.DK.GY.SLD
1	8.98	9.04	0.06	83	10120	I	COAL	C-3.SLD
1	9.04	9.07	0.03	83	10120	I	MUDSTONE	CARB.DK.GY.VBRKN

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
1	9.07	9.29	0.22	83	10120	I	COAL	C-3.BRKN
1	9.29	10.10	0.81	83	10121	I	COAL	C-2.BRKN APPROACHING C-1.
1	10.10	10.36	0.26	83	10121	I	COAL LOSS	
2	10.36	11.10	0.74	83	10121	I	COAL	C-1.BRKN
2	11.10	11.33	0.23	83	10121	I	COAL	C-2.VBRKN
2	11.33	12.37	1.04	83	10122		MUDSTONE	CARB.DK.GY.SLD ABUNDANT PLANT FRAGS SOME COALIFIED. UP PER 25CM SAMPLED.
3	12.37	12.58	0.21	83			MUDSTONE	SLTY.M.GY.MAS.SLD HOMOGENEOUS.
3	12.58	13.92	1.34	83			SILTSTONE	M.GY.LAM.BIOTR.SLD BDG OBSCURED BY BIOTR. GLOBULAR CHUNKS OF SLTST. 2 SMALL DEFORMED BANDS OF FG SS NEAR BASE.
3	13.92	13.95	0.03	83			SILTSTONE	M.GY.LAM.BIOTR.SLD OBSCURED BDG. FG SS BAND.

\* DENOTES MEASURED BCA

PROJECT: KPW BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	13.95	14.05	0.10	83		MUDSTONE	SLTY. M. GY. THNB. SLD HOMOGENEOUS.
3	14.05	14.12	0.07	83		SILTSTONE	M. GY. LAM. BIOTR. SLD BDG OBSCURED.
3	14.12	14.18	0.06	83		SANDSTONE	LT-M. GY. MAS. SLD QTZ AND TALC COVERED FRACTURE AT APPROX 20 DEGREES. ALSO HAS A GREEN MINERAL T MAT BY CONSENSUS WAS THOUGHT TO BE CHLO RITE.
4	14.18	14.34	0.16	83		SANDSTONE	LT-M. GY. SLD NUMEROUS SUB ANGULAR SLTST RIPUP CLASTS . QTZ VEIN AS ABOVE.
4	14.34	15.34	1.00	83		SANDSTONE	MG. PR. LT-M. GY. MAS. BRKN 3 SLTST BANDS (<3CM). SPARSE SLTST RIPU P CLASTS. QTZ VEINING. SUB PARALLEL TO CO RE.
4	15.34	15.84	0.50	83		CONGLOMERATE	PBLY. LT-M. GY. THKB. VBRKN OLIGOMICTIC PARACONGLOMERATE (MATRIX SU PPORTED). SUB ROUNDED CLASTS (LGST <2CM ) . CHERT "STORM UNIT".
4	15.84	16.62	0.78	83		ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPW BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	16.62	17.38	0.76	83		SANDSTONE	MG. VPR. LT-M. GY. MAS. VBRKN ABUNDANT FRACTURES PARALLEL TO CORE. SP ARSE CHERT CLASTS AS ABOVE.
5	17.38	17.48	0.10	83		CONGLOMERATE	PBLY. LT-M. GY. VTHNB. BRKN MATRIX SUPPORTED CHERT CLAST AS ABOVE. WHITE, OPAQUE, BLACK AND ESPECIALLY GRE Y IN COLOR.
5	17.48	17.99	0.51	83		ROCK LOSS	
5	17.99	18.79	0.80	83		SANDSTONE	MG. VPR. LT-M. GY. MAS. BRKN SPARSE SUBANGULAR CHERT CLASTS. FRACTUR E. RUNNING ALONG TOTAL LENGTH OF INTERVA L.
6	18.79	19.30	0.51	83		SANDSTONE	MG. PR. LT-M. GY. MAS. SLD MINOR DK GY CLASTS.
6	19.30	19.35	0.05	83		MUDSTONE	M-DK. GY. VTHNB. BRKN SOFT. SLIGHTLY SHEARED.
6	19.35	19.36	0.01	83		SANDSTONE	MG. PR. LT-M. GY. VTHNB. SLD BAND OF SAND.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	19.96	20.78	1.42	*83			SANDSTONE	SLTY. VFG. M. GY. LAM. HRMBU. SLD MINOR BURROWING. TOPS UP. INTERLAMINATE D SLTST AND MUDST. SLIGHTLY DISTORTED B DG. QTZ VEIN PARALLEL TO BDG NEAR BASE (.5CM WIDE).
7	20.78	20.92	0.14		82		SILTSTONE	M. GY. LAM. HRMBU. SLD INTERLAMINATED MUDST. SMALL BURRONS, TO PS UP.
7	20.92	21.76	0.84	*82			SILTSTONE	M. GY. LAM. HRMBU. SLD MINOR BURROWING AND SSD, 3CM QTZ VEIN. MUDDY TOWARD BASE.
7	21.76	22.66	0.90	81			MUDSTONE	SLTY. M-DK. GY. MAS. SLD FRACTURE AT 16 DEGREES.
8	22.66	23.81	1.15	81			MUDSTONE	DK. GY. MAS. SLD MONOTONOUS MUD. SILTY AT BASE.
8	23.81	24.06	0.25	80			SILTSTONE	SSY. M. GY. THNB. SLD SHARP BASAL CONTACT.
8	24.06	24.48	0.42	*80			SILTSTONE	M-DK. GY. LAM. XBDG. SLD SMALL SCALE XBDG. MINOR BURROWING.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
9	24.48	26.43	1.95	80			SILTSTONE	M-DK. GY. LAM. BIOTR. BRKN BDG APPEARS AS DISTURBED LAMINATIONS. T OPS UP. SMALL BURRONS. SOME FG SS LAMIN ATIONS.
9	26.43	26.98	0.55	79			ROCK LOSS	
10	26.98	27.35	0.37	79			SILTSTONE	M-DK. GY. LAM. BIOTR. SLD AS ABOVE.
10	27.35	27.45	0.10	79			SILTSTONE	M-DK. GY. LAM. BIOTR. SLD AS ABOVE.
10	27.45	28.03	0.58	79			SANDSTONE	SLTY. FG. M. GY. THNB. SLD BANDS OF PLANAR MUDST. ABUNDANT HELMINT HOPIS BURRONS IN BOTTOM 30CM.
10	28.03	28.07	0.04	79			SANDSTONE	PBLY. HG. M. GY. THNB. SLD SMALL UNIT OF COARSER MATERIAL. "STORM UNIT".
10	28.07	28.11	0.04	79			SANDSTONE	FG. M. GY. THNB. SLD
10	28.11	28.14	0.03	*79			MUDSTONE	M-DK. GY. THNB. SLD CORE TWIST OFF AT TOP OF INTERVAL.

\* DENOTES MEASURED BCA

1004 200 F

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
10	28.14	28.30	0.16	79			SANDSTONE	FG.M.GY.VTHNB.SLD INTERBEDDED MUDST BANDS.
10	28.30	28.98	0.68	79			SANDSTONE	FG.M.GY.MAS.BIOTR.SLD HEAVILY BIOTURBATED ZONE. ABUNDANT BURROWING. INTERMIXED MUD. SOME COALLY PLANT MATERIAL.
11	28.98	29.03	0.05	78			SANDSTONE	FG.M.GY.BIOTR.SLD AS ABOVE.
11	29.03	29.18	0.15	78			SANDSTONE	MG.LT-M.GY.THNB.SLD 2CM MUDST BAND. MINOR MUDST RIPUPS NEAR BASE.
11	29.18	29.26	0.08	78			MUDSTONE	M-DK.GY.THNB.SLD EROSIONAL UPPER CONTACT, SHARP LOWER CONTACT.
11	29.26	29.46	0.20	78			SANDSTONE	FG.M.GY.THNB.SLD TRACES OF MUDST.
11	29.46	29.90	0.44	78			SILTSTONE	SSY.M.GY.LAM.SLD INTERLAMINATED MUDST. SOME FG SS BANDS. FAULT PLANE AT 10 DEGREES.
11	29.90	30.14	0.24	78			MUDSTONE	SLTY.DK.GY.THNB.SLD ONE SLTY SS BAND (1.5CM), NILSSONIA CANADENSIS IMPRINT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
11	30.14	30.40	0.26	78			SANDSTONE	FG.LT-M.GY.THNB.SLD MUDST MIXED IN FOR BOTTOM 5CM THAT IS BIOTR.
11	30.40	30.87	0.47	77			SANDSTONE	MG.LT-M.GY.MAS.BIOTR.SLD DEFORMED WISPS AND BANDS OF MUDST CAUSED BY CRITTERS.
12	30.87	31.47	0.60	77			SANDSTONE	SLTY.FG.M-DK.GY.LAM.BIOTR.BRKN AS ABOVE. TOPS UP BURROWS. PARTIAL COAL STRINGER LINED WITH QTZ. LOW ANGLE FRACTURE (APPROX 20 DEGREES).
12	31.47	31.69	0.22	77			SANDSTONE	PBLY.CG.LT-M.GY.THNB.SLD CHERT CLASTS < 5CM. STORM UNIT.
12	31.69	32.47	0.78	76			SANDSTONE	MG.M.GY.LAM.BRKN INTERLAMINATED SLTY MUDST. FAULT GOUGE MATERIAL ALONG EDGE OF CORE.
12	32.47	32.60	0.13	76			MUDSTONE	DK.GY.THNB.SLD DISCONTINUOUS SLTY LAMINAE.
12	32.60	32.75	0.15	76			SANDSTONE	FG.M.GY.THNB.SLD A FEW MUDST BANDS.
13	32.75	33.35	0.60	76			SANDSTONE	FG.LT-M.GY.MAS.BRKN NUMEROUS SLTY MUDST BANDS. MINOR BIVALVE BURROWS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	33.35	33.82	0.47	75			SANDSTONE	FG.LT-M.GY.MAS.BRKN AS ABOVE.
13	33.82	34.02	0.20	*75			SANDSTONE	CG.LT-DK.GY.THNB.SLD NUMEROUS MUDST BANDS. MINOR BIOTRB. <1C M QTZ VEIN AT BASE. SHARP BASAL CONTACT
13	34.02	34.06	0.04	75			MUDSTONE	M.GY.THNB VERY SOFT. CONSISTENCY OF EXTRA SMOOTH PEANUT BUTTER.
13	34.06	34.14	0.08	75			SANDSTONE	CG.LT-M.GY.THNB.SLD TRACES OF MUDST LAMINAE.
13	34.14	34.66	0.52	75			SANDSTONE	FG.LT-M.GY.THNB.SLD CLAM BURROW, TOPS UP. MINOR BANDS OF MUDST.
13	34.66	34.72	0.06	75			SANDSTONE	CG.LT-M.GY.THNB.SLD SHARP BASAL CONTACT.
14	34.72	34.76	0.04	75			SANDSTONE	CG.LT-M.GY.THNB.SLD ONE MUDST LAMINAE.
14	34.76	34.84	0.08	75			SANDSTONE	SLTY.FG.M.GY.LAM.BRKN INTERLAMINATED SILT AND MUD.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	34.84	34.86	0.02	75			MUDSTONE	M.GY.THNB VERY SOFT (SMOOTH PEANUT BUTTER TEXTURE STRIKES AGAIN).
14	34.86	36.23	1.37	75			SANDSTONE	SLTY.MG.LT-DK.GY.MAS.SLD NUMEROUS MUDST BANDS AND LAMINAE. BIV. BURROWS IN TOP 30CM. SMALL DISPLACEMENT (<5CM) GROWTH FAULTS. COARSER GRAINED TOWARD BASE.
14	36.23	36.57	0.34	75			SANDSTONE	CG.LT.GY.MAS.SLD VERY SPARSE TRACES OF MUDST PARTINGS.
15	36.57	36.87	0.30	75			SANDSTONE	CG.LT.GY.MAS.SLD AS ABOVE. EROSIONAL BASE. TOPS UP, LOAD CAST.
15	36.87	36.95	0.08	75			SILTSTONE	M.GY.LAM.SLD INTERLAMINATED MUDST. MINOR CARBONATIZE D PLANT FRAGMENTS.
15	36.95	37.40	0.45	75			SANDSTONE	CG.LT.GY.MAS.SLD ONE BAND OF MUDST (<1CM). ONE LARGE (4C M) CIRCULAR SILTST RIPUP CLAST. EROSIONAL CONTACT AT BASE. BEGINNING OF COARSE SEDIMENT IN FLUX.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	37.40	37.85	0.45	76			SILTSTONE	M.GY.LAM.SLD CRUDELY LAMINATED WITH MUDST. MINOR SS BANDS ERDSIONAL UPPER CONTACT, GRADATIO NAL LOWER CONTACT.
15	37.85	38.50	0.65	76			MUDSTONE	CARB.DK.GY.MAS.SLD ABUNDANT COALIFIED PLANT FRAGMENTS. NUMEROUS COAL STRINGERS. 3CM ZONE OF PYRIT E. TWO 0.5CM QTZ VEINS.
16	38.50	39.15	0.65	76			MUDSTONE	DK.GY.MAS.BRKN
16	39.15	40.32	1.17	76			MUDSTONE	DK.GY.MAS.BRKN SPARSE HAZY SILTY LAMINAE. FRACTURE AT 15 DEGREES THAT IS FILLED WITH MUD.
16	40.32	40.54	0.22	76			ROCK LOSS	
17	40.54	41.80	1.26	76			MUDSTONE	SLTY.DK.GY.MAS.VBRKN QTZ VEIN PARALLEL TO BDG (<1CM).
17	41.80	41.85	0.05	76			MUDSTONE	M.GY VERY SOFT AND PLIABLE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	41.85	42.07	0.22	76			MUDSTONE	DK.GY.MAS.BRKN CARBONACEOUS PLANT IMPRINTS.
17	42.07	42.39	0.32	76			MUDSTONE	SLTY.DK.GY.LAM.BRKN INDISTINCT SLTY LAMINAE.
18	42.39	42.79	0.40	76			MUDSTONE	SLTY.M.GY.MAS.SLD
18	42.79	44.06	1.27	76			MUDSTONE	CARB.M-DK.GY.MAS.SHRD ABUNDANT LISTRIC SURFACES, PREDOMINANTLY WITH HORIZONTAL STRIATIONS. MINOR COALY STRINGERS.
18	44.06	44.28	0.22	77			ROCK LOSS	
19	44.28	44.95	0.67	77			SILTSTONE	CLYY.M.GY.MAS.VBRKN SOME OBLIQUE LISTRIC SURFACES.
19	44.95	45.75	0.80	77			SILTSTONE	CLYY.M.GY.MAS.SHRD ABUNDANT HORIZONTAL LISTRIC SURFACES. SILTIER AND LAMINATED TOWARD BASE.

\* DENOTES MEASURED BCA



87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 13

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	45.75	46.35	0.60	77		SILTSTONE	M.GY.LAM.SLD INDISTINCT MUDST LAMINATIONS. MINOR OBLIQUE LISTRIC SURFACES ON A PLANE THAT IS APPROX 25 DEGREES OFF OF THE CORE LENGTH.
20	46.35	46.39	0.04	77		SILTSTONE	M.GY.SLD ANGULAR SILTST FRAGMENTS ENCASED IN QTZ.
20	46.39	47.70	1.31	*77		SILTSTONE	M.GY.LAM.SLD OBLIQUE LISTRIC SURFACES OCCUR IN A 20CM SECTION.
21	47.70	48.19	0.49	74		SILTSTONE	M.GY.LAM.SSD.SLD INDISTINCT MUDST LAMINATIONS.
21	48.19	48.43	0.24	73		ROCK LOSS	
21	48.43	48.53	0.10	72		MUDSTONE	M-DK.GY.WRMBU.VBRKN FAIRLY SOFT MUDST THAT IS SLIGHTLY SHEARED. SMALL VERTICAL WRMBUR (3CM LONG, < 1CM WIDE).
21	48.53	49.91	1.38	*70		SILTSTONE	M.GY.LAM.SLD

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
22	49.91	50.86	0.95	*76		SILTSTONE	M.GY.LAM.WRMBU.SLD INTERLAMINATED MUDST. WRMBUR 10CM LONG, 1CM WIDE, VERTICAL. TOPS UP.
22	50.86	51.87	1.01	73		SILTSTONE	M.GY.LAM.SLD INTERLAMINATED MUDST. 2 BANDS OF SWIRLED CIRCULAR BANDS OF MUDST.
23	51.87	53.27	1.40	69		SILTSTONE	M.GY.LAM.BRKN INTERLAMINATED MUDST. ABUNDANT LISTRIC SURFACES IN BOTTOM 20CM COVERED IN TALC.
23	53.27	53.52	0.25	66		SANDSTONE	FG.PR.LT-M.GY.THNB.SLD TRACES OF MUDST LAMINAE. SHARP UPPER AND BASAL CONTACT.
23	53.52	53.83	0.31	*65		SILTSTONE	SSY.M.GY.SLD MINOR BURROWING. TOPS UP.
24	53.83	54.52	0.69	64		SANDSTONE	FG.VPR.LT-DK.GY.THNB.SLD BANDS OF INTERBEDDED MUDST. 1-2 CM DISPLACEMENT ON A TALC & CHLORITE COVERED MINOR FAULT PLANE IN A VERTICAL ORIENTATION. BIOTRB IN BOTTOM 20CM.
24	54.52	54.68	0.16	63		SANDSTONE	FG.PR.LT-M.GY.THNB.SLD TRACES OF MUDST LAMINAE.

\* DENOTES MEASURED BCA

FORM 4001

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	54.68	54.89	0.21		62		ROCK LOSS	
24	54.89	54.97	0.08		62		SANDSTONE	FG.VPR.LT-DK.GY.LAM.VBRKN INTERLAMINATED MUDST. LISTRIC SURFACES.
24	54.97	55.29	0.32		61		SANDSTONE	FG.PR.LT-M.GY.MAS.SLD
24	55.29	55.91	0.62	*60			SANDSTONE	FG.PR.LT-DK.GY.THNB.BRKN NUMEROUS BANDS OF MUDST. AND MUDST LAMINAE. TOPS UP (LOAD CAST).
25	55.91	56.94	1.03	*60			SANDSTONE	FG.VPR.LT-DK.GY.THNB.SLD AS ABOVE. MINOR BIOTRB.
25	56.94	57.46	0.52	*60			SANDSTONE	FG.VPR.LT-DK.GY.THNB.SLD AS ABOVE.
25	57.46	57.90	0.44		62		MUDSTONE	SLTY.M-DK.GY.THNB.SLD BANDS OF FG SS.
26	57.90	58.09	0.19		62		MUDSTONE	SLTY.M-DK.GY.THNB.SLD AS ABOVE.
26	58.09	58.22	0.13		63		SANDSTONE	FG.PR.M.GY.THNB.SLD TRACES OF MUDST LAMINAE.
26	58.22	58.30	0.08		63		MUDSTONE	DK.GY.THNB.SLD TRACES OF SS LAMINAE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	58.30	58.47	0.17		64		SANDSTONE	FG.PR.M.GY.THNB.SLD INDISTINCT TRACES OF MUDST LAMINAE AND C.1CM BLACK PELLETS THAT MAY BE FECAL PELLETS.
26	58.47	58.72	0.25		64		MUDSTONE	M-DK.GY.THNB.SLD MINOR FG SS BANDS. TOPS UP (LOAD CASTS).
26	58.72	58.78	0.06		65		SANDSTONE	FG.PR.M.GY.THNB.SLD
26	58.78	58.85	0.07		65		MUDSTONE	M-DK.GY.THNB.SLD ONE FG SS LAMINAE.
26	58.85	59.00	0.15		65		SANDSTONE	FG.PR.M.GY.THNB.SLD TRACES OF BROKEN UP MUDST LAMINAE.
26	59.00	59.14	0.14		66		MUDSTONE	M-DK.GY.THNB.SLD MINOR FG SS LAMINAE.
26	59.14	59.41	0.27		66		SANDSTONE	FG.PR.M.GY.THNB.SLD MINOR MUDST LAMINAE.
26	59.41	59.46	0.05	*67			MUDSTONE	M-DK.GY.LAM.SLD INTERLAMINATED FG SS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	59.46	59.81	0.35	66			SANDSTONE	FG. YPR. M. GY. THNB. SLD BROKEN TRACES OF MUDST LAMINAE. MUDST R IPUP CLAST (SPARSE). SCH BAND OF MUDST AT BASE.
27	59.81	60.06	0.25	66			SANDSTONE	MG. PR. M. GY. THNB. SLD TRACES OF MUDST LAMINAE.
27	60.06	60.27	0.21	*65			MUDSTONE	M-DK. GY. THNB. SLD NUMEROUS FG. SS. BANDS.
27	60.27	60.51	0.24	65			SANDSTONE	MG. PR. M. GY. THNB. SLD
27	60.51	60.60	0.09	65			MUDSTONE	M-DK. GY. THNB. SLD TRACES OF FG. SS. LAMINAE.
27	60.60	60.68	0.08	65			SANDSTONE	FG. YPR. M. GY. THNB. SLD
27	60.68	61.28	0.60	65			MUDSTONE	SLTY. M-DK. GY. LAM. SLD INTERLAMINATED WITH SLTY. FG. SS. MUDIER TOWARD BASE.
27	61.28	61.39	0.11	65			SANDSTONE	FG. LT-M. GY. THNB. SLD SHARP UPPER AND BASAL CONTACTS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	61.39	61.66	0.27	65			MUDSTONE	CARB. DK. GY. MAS. BRKN ABUNDANT COAL STRINGERS AND PLANT FRAGM ENTS. SUBVERTICAL LISTRIC SURFACES COAT ED WITH TALC AND CHLORITE. WITH HORIZONT AL STRIAE.
28	61.66	62.12	0.46	65	10123		MUDSTONE	CARB. BRKN PLANT FRAGS & LISTRIC SURFACES. LOWER 2 SCH SAMPLED.
28	62.12	62.47	0.35	65	10124	H	COAL	C-3. SHRD
28	62.47	62.64	0.17	65	10124	H	MUDSTONE	CLYY. M. GY. SLD
28	62.64	62.67	0.03	65	10124	H	COAL	C-4. SLD
28	62.67	62.74	0.07	65	10124	H	COAL	C-3. SHRD
28	62.74	62.79	0.05	65	10124	H	COAL	C-4. SLD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
28	62.79	62.90	0.11	65	10124	H	COAL	C-3.SHRD
28	62.90	63.11	0.21	65	10124	H	COAL LOSS	
28	63.11	63.16	0.05	65	10124	H	ROCK LOSS	
28	63.16	63.27	0.11	65	10124	H	MUDSTONE	CARB.DK.GY.BRKN
28	63.27	63.40	0.13	65	10124	H	COAL	C-3.SHRD
28	63.40	63.59	0.19	65	10124	H	COAL LOSS	
28	63.59	63.64	0.05	65	10124	H	ROCK LOSS	
29	63.64	63.69	0.05	65	10124	H	MUDSTONE	CARB.DK.GY.SLD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	63.69	64.11	0.42	65	10124	H	COAL	C-3.VBRKN SHEARED & POWDERED.
29	64.11	64.65	0.54	65	10124	H	COAL LOSS	
29	64.65	64.94	0.29	65	10125	H	MUDSTONE	CARB.DK.GY.BRKN PARTIALLY POORLY CONSOLIDATED.
29	64.94	65.01	0.07	65	10125	H	COAL	C-4.PHRD SHEARED.
29	65.01	65.19	0.18	65	10125	H	COAL LOSS	
29	65.19	65.25	0.06	65	10125	H	MUDSTONE	CARB.DK.GY.SLD
29	65.25	65.59	0.34	65	10125	H	COAL	C-3.BRKN BANDED WITH BONE COAL IN PLACES.
29	65.59	65.76	0.17	65	10125	H	COAL	C-2.BRKN
29	65.76	65.98	0.22	65	10125	H	COAL	C-3.SHRD
30	65.98	66.02	0.04	65	10125	H	COAL	C-2.VBRKN

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	66.02	66.07	0.05	65	10125	H	COAL	C-4, SLD C-2 BANDS WITHIN.
30	66.07	66.20	0.13	65	10125	H	COAL	C-3, BRKN
30	66.20	66.29	0.09	65	10125	H	MUDSTONE	CARB, DK, GY, SLD COALY PLANT FRAGS WITHIN.
30	66.29	66.81	0.52	65	10125	H	COAL	C-2, VBRKN
30	66.81	67.01	0.20	65	10125	H	MUDSTONE	CARB, DK, GY, VBRKN PARTIALLY SHEARED COALY STRINGERS WITHIN.
30	67.01	67.10	0.09	65	10125	H	COAL	C-3, SHRD
30	67.10	67.55	0.45	65	10125	H	COAL LOSS	
30	67.55	67.93	0.38	65	10126		MUDSTONE	CARB, DK, GY, BRKN COALY PLANT FRAGS THROUGHOUT, UPPER 25C M SAMPLED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86032

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	67.93	68.03	0.10	65			COAL	C-3, VBRKN
31	68.03	68.60	0.57	65			MUDSTONE	M-DK, GY, MAS, SLD ABUNDANT COALY PLANT FRAGMENTS.
31	68.60	69.92	1.32	65			MUDSTONE	M, GY, MAS, SLD MINOR PLANT FRAGS DECREASING DOWNWARD. SILTIER WITH DEPTH.
32	69.92	70.42	0.50	65			MUDSTONE	SLTY, LT-DK, GY, LAM, SLD CRUDELY INTERLAMINATED, FG, SS.
32	70.42	70.50	0.08	65			MUDSTONE	M, GY VERY SOFT.
32	70.50	71.13	0.63	65			SANDSTONE	FG, PR MINOR MUDST BANDS AND INDISTINCT SLTST LAMINATIONS. SMALL FUS. COARSER GRAIN'S S WITH DEPTH.
32	71.13	71.17	0.04	65			MUDSTONE	CARB, M-DK, GY, SLD SMALL ZONE OF COAL PLANT MATS THAT WERE DEPOSITED IN THE SAND, SHALLOW WATER.
32	71.17	71.61	0.44	*65			SANDSTONE	MG, VPR, LT-M, GY, MAS, SLD TRACES OF MUDST/SLTST LAMINAE. T.D. = 7 2.24 M.

\* DENOTES MEASURED BCA  
NEWPAGE



# GULF CANADA CORPORATION

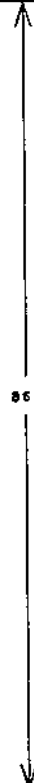
SEAM DETAIL

COAL DIVISION  
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86032 SEAM : H INTERVAL(M) : 62.12 - 67.55 ELEVATION(M) : 1519.3  
 GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 05/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES		% REC.	SAMPLE ID		COAL/ROCK TOTAL		COAL QUALITY A.D.B.							
			ROCK	COAL		SIMP	COMP	COMPOS	MINING SECTION	RES MOIST	ASH	VM	FC	TS	CAL. VAL MJ/KG		
	62.12	↑		0.32													
			0.19	0.24													
			(0.19)	0.10													
			0.12	0.38	58.8	10124											
			(0.17)	(0.49)													
	64.65		0.26														
			(0.16)	0.86													
			0.41	0.47	78.3	10125											
			0.28	0.18													
			(0.41)	0.38													
	67.55	↓															



86 3.96 / 0.97  
4.92

GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT  
 STRATIGRAPHIC LOG  
 KPN LR DDH86032

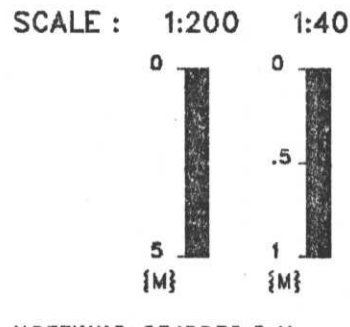
723

GEOLOGIST : SAVOIE

DATE : FEB 26/87

DRAWING NO. :

LITHOLOGIC SYMBOLS

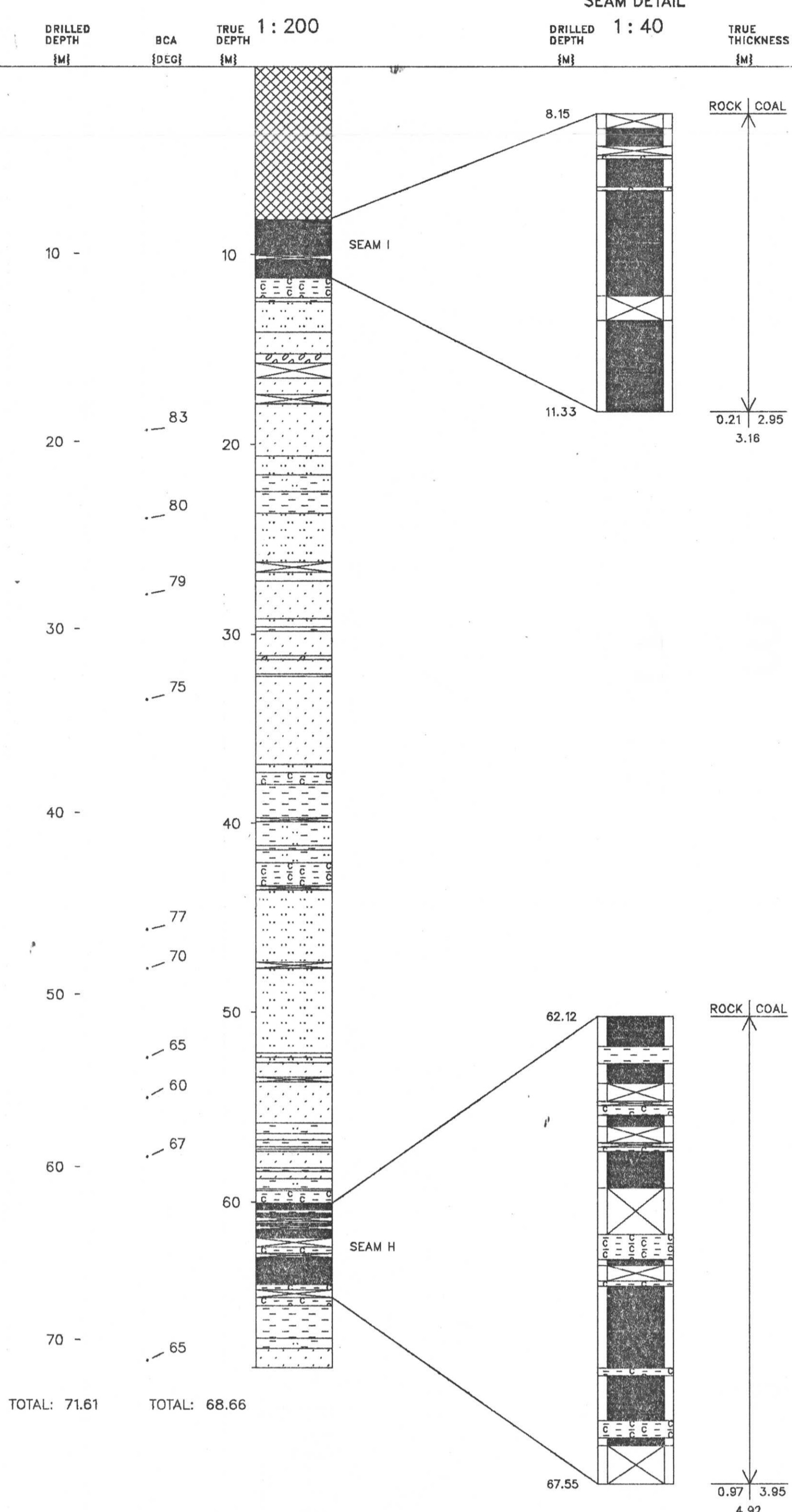


NORTHING: 6345039.0 N  
 EASTING: 507804.4 E

INCLINATION: 90.0°

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

SEAM DETAIL





# Gulf Canada Corporation Coal Division

# 723

Geophysical Log

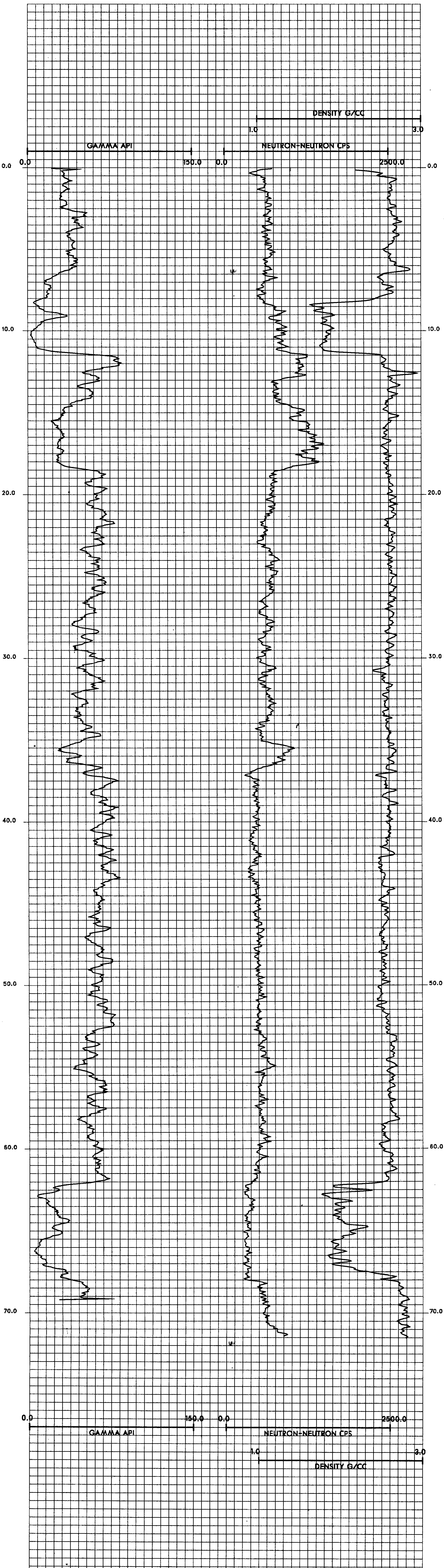
Datasource: **KPNLRDDH86032**  
 Log Date: 86-09-25  
 Company: CENTURY  
 Geologist: SAVOIE

Province: BC      Northing: 6345040.00      Lat: 571501  
 Zone: 9      Easting: 507805.00      Long: 1285214  
 Measuring Point:      Elevation: 1519.3

Scale: 1 to 100.0  
 Depth Range: 0.0 to 76.0  
 True Thickness: NO

Comments:  
 1. LOGGED THROUGH THE RODS  
 2.

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



**KPNLRDDH86033**

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86033

DATE - 02/13/87

- HISTORY -

START DATE - 27/09/86

END DATE - 29/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - BARKER

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1523.54

LICENCE/LEASE NUMBER -

ZONE - 9

NORTHING - 6344323.00

EASTING - 508088.81

LATITUDE - 571438

LONGITUDE - 1285158

- ORIENTATION -

LENGTH - 169.67

CORE SIZE - 0.0

INCLINATION - 90.0

AZIMUTH - 0.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 6.10

AQUIFER DEPTHS (M) - 0.00

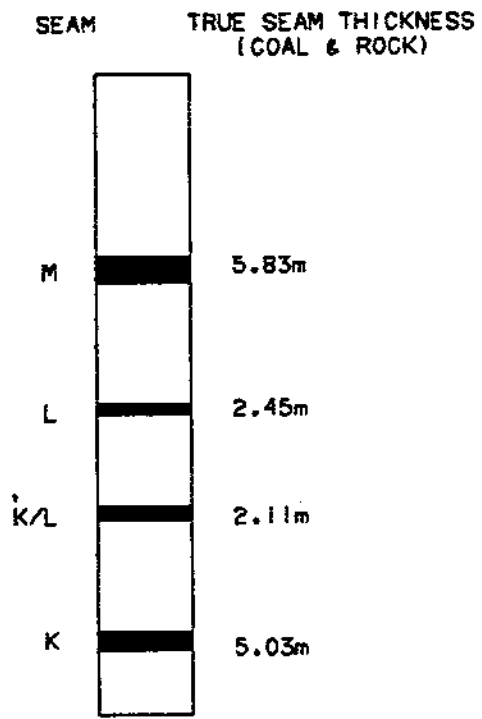
0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====




NOTE:  
 SCHEMATIC PROFILE,  
 NO THICKNESSES SHOWN  
 FOR SEAMS CONTAINING  
 LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

**FIGURE**  
**MOUNT KLAPPAN ANTHRACITE PROJECT**  
 1986 DIAMOND DRILL HOLES  
 DDH86033

GULF CANADA CORPORATION  
 11/03/E7  
 KLAP: I 205057 1870063033.LGG



87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	6.10	6.10	01			OVERBURDEN	CASING
1	6.10	7.93	1.83	01			ROCK LOSS	
1	7.93	8.23	0.30	01			SANDSTONE	MG. MOD. LT. GY. LAM. VBRKN RUBBLE. PREDOMINANTLY MASSIVE WITH OCC SILTY STRINGERS. LARGE SCALE CROSS BEDDING?
1	8.23	9.48	1.25	*01			SANDSTONE	MG. MOD. LT. GY. LAM. BRKN LITH AS ABOVE. POORLY CONSOLIDATED. CRUMBLES EASILY. FAINT LAMINAE VISIBLE. LARGE SCALE XBDG.
2	9.48	11.21	1.73	01			SANDSTONE	MG. MOD. LT. GY. MAS. BRKN LITH AS ABOVE.
2	11.21	11.28	0.07	01			SANDSTONE	MG. MOD. LT. GY. MAS. SLD LITH AS ABOVE. SOME VY POORLY CONSOLIDATED AREAS.
3	11.28	13.24	1.96	*01			SANDSTONE	MG. MOD. LT. GY. LAM. SLD LITH AS ABOVE. SLTY LAM AS ABOVE. BUT VERY FAINT. VERY POORLY CONSOLIDATED. CRUMBLES EASILY WHEN TOUCHED. THIST OFF AT TOP.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	13.24	15.14	1.90	*20			SANDSTONE	MG. MOD. LT. GY. MAS. BRKN LITH AS ABOVE. BUT NO SILTY LAMINAE. ONLY FAINT BEDDING VISIBLE IN THE SAND.
5	15.14	16.21	1.07	*12			SANDSTONE	MG. MOD. LT. GY. VTHNB. SLD LITH AS ABOVE. FAINT BEDDING. POORLY CONSOL. AS ABOVE.
5	16.21	17.07	0.86	12			SANDSTONE	MG. MOD. LT. GY. MAS. BRKN LITH AS ABOVE.
6	17.07	18.94	1.87	13			SANDSTONE	MG. MOD. LT. GY. MAS. BRKN LITH AS ABOVE.
7	18.94	19.13	0.19	13			SANDSTONE	MG. MOD. LT. GY. MAS. SLD LITH AS ABOVE.
7	19.13	20.96	1.83	*13			SANDSTONE	MG. MOD. LT. GY. MAS. SLD LITH AS ABOVE WITH OCC FAINT SILT WISPS. LARGE SCALE XBDG.
8	20.96	22.17	1.21	*12			SANDSTONE	MG. MOD. LT. GY. MAS. SLD LITH AS ABOVE.
8	22.17	22.99	0.82	13			SANDSTONE	MG. MOD. LT. GY. MAS. SLD LITH AS ABOVE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 3

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
9	22.99	24.72	1.73	14			SANDSTONE	MG. PR. LT. GY. LAM. SLD MANY MORE DISTINCT SILT LAMINAE THAN ABOVE. BCA'S RANGE FROM 20 DEGREES AT TOP TO 12 DEGREES AT BASE. XDDG?
9	24.72	25.01	0.29	15			SANDSTONE	PR. LT. GY. LAM. SLD AS ABOVE.
10	25.01	27.07	2.06	*16			SANDSTONE	PR. LT. GY. LAM. SLD LITH AS ABOVE. NUMEROUS FINE SLTY MISPS THROUGHOUT. VARIABLE BCA'S = 12-20 DEGREES.
11	27.07	27.17	0.10	*20			SANDSTONE	PR. LT. GY. LAM. SLD LITH AS ABOVE. SHARP LOWER CONTACT.
11	27.17	27.73	0.56	17			SILTSTONE	DK. GY. LAM. VBRKN LAM SILTST.
11	27.73	28.87	1.14	*10			SILTSTONE	PR. DK. GY. LAM. BRKN FINELY LAM SILTST. SLICKENSIDES.
12	28.87	30.37	1.50	07			SILTSTONE	PR. DK. GY. LAM. VBRKN FINELY LAM MUDDY SILTST.
12	30.37	30.78	0.41	04			ROCK LOSS	

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 4

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	30.78	32.63	1.85	*01			MUDSTONE	SLTY. VPR. DK. GY. VTHNB. VBRKN FINELY LAM. POSSIBLY MUCH BIODURATION. MUCH LESS SILT THAN ABOVE.
14	32.63	33.19	0.56	07			MUDSTONE	SLTY. VPR. DK. GY. LAM. VBRKN LITH AS ABOVE.
14	33.19	34.10	0.91	*10			MUDSTONE	SLTY. VPR. DK. GY. LAM. BRKN LITH AS ABOVE. RARE VITRINITE SPECKS IN MUSH. VSHRD. AREAS.
15	34.10	35.60	1.50	*08			MUDSTONE	SLTY. VPR. DK. GY. LAM. VBRKN LITH AS ABOVE. COAL RIPUP. CLASTS.
15	35.60	36.24	0.64	09			ROCK LOSS	
16	36.24	36.51	0.27	09			MUDSTONE	SLTY. VPR. DK. GY. LAM. VBRKN OCC V FAINT BEDDING VISIBLE. V POORLY CONSOLIDATED.
16	36.51	37.89	1.38	*10			MUDSTONE	SLTY. VPR. DK. GY. MAS. VBRKN MINOR FAINT BEDDING VISIBLE. SLICKENSIDES. ES. POORLY CONSOLIDATED.
16	37.89	38.40	0.51	08			ROCK LOSS	

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	38.40	39.63	1.23	*07		MUDSTONE	SLTY.VPR.DK.GY.LAM.VBRKN LITH AS ABOVE WITH OCC V HARD LAYERS. F AINT BEDDING.
17	39.63	39.96	0.33	08		MUDSTONE	SLTY.VPR.DK.GY.MAS.BRKN POORLY CONSOLIDATED.
18	39.96	41.79	1.83	09		MUDSTONE	SLTY.VPR.DK.GY.VTHNE.BRKN POORLY CONSOL OCC COALY STRINGERS 3MM W IDE. OCC HARD LIGHTER SILTY ZONES. NOT CALCAREOUS SILT.
18	41.79	42.09	0.30	10		ROCK LOSS	
19	42.09	42.65	0.56	10		MUDSTONE	SLTY.VPR.DK.GY.MAS.VBRKN LITH AS ABOVE, BUT NO COAL.
19	42.65	43.75	1.10	11		MUDSTONE	SLTY.VPR.DK.GY.MAS.BRKN LITH AS ABOVE WITH OCC COAL STRINGERS B ECOMING MORE COMMON DOWNWARD. OCC LIGHT ER GREY HARD SILTIER ZONES.
20	43.75	45.49	1.74	*12		MUDSTONE	VPR.DK.GY.LAM.VBRKN FINE LAMINAE. COALY STRINGERS THROUGHOU T. POORLY CONSOLIDATED. LESS SILT THAN ABOVE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	45.49	45.68	0.19	15		ROCK LOSS	
21	45.68	45.77	0.09	16		MUDSTONE	VPR.DK.GY.MAS.SLD LITH AS ABOVE.
21	45.77	47.38	1.61	18		MUDSTONE	CARB.VPR.DK.GY.LAM.BRKN COALY STRINGERS THROUGHOUT. SHEARED.
22	47.38	48.80	1.42	23 10215		MUDSTONE	CARB.DK.GY.BRKN SHALLOW ANGLE BCA'S. LOWER 25CM SAMPLED
22	48.80	50.01	1.21	27 10216 M		COAL LOSS	
22	50.01	50.43	0.42	*30 10216 M		COAL	C-3.BRKN HIGHLY CONTORTED WITH MINOR MUDST. BANDS
22	50.43	50.50	0.07	24 10216 M		MUDSTONE	CARB.DK.GY.BRKN
23	50.50	50.72	0.22	21 10216 M		MUDSTONE	CARB.DK.GY.BRKN

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
23	50.72	51.27	0.55	12	10216	M	COAL	C-2 PARALLELED BY MUDST DUE TO SHALLOW BCA'S.
23	51.27	51.60	0.33	*02	10216	M	MUDSTONE	CARB. DK. GY. BRKN PARALLELED BY C-2 & QTZ (LOW BCA'S).
23	51.60	52.01	0.41	06	10216	M	COAL	C-3. BRKN SHALLOW BCA.
23	52.01	52.22	0.21	10	10216	M	COAL LOSS	
23	52.22	52.54	0.32	13	10216	M	MUDSTONE	CARB. DK. GY. BRKN SHALLOW BCA.
24	52.54	52.77	0.23	17	10216	M	COAL	C-3. BRKN
24	52.77	53.03	0.26	20	10217	M	ROCK LOSS	
24	53.03	54.17	1.14	*28	10217	M	MUDSTONE	CARB. DK. GY. BRKN THIN HIGH ANGLE BANDS OF C-2 WITHIN.
24	54.17	54.60	0.43	28	10217	M	MUDSTONE	CARB. DK. GY. BRKN
25	54.60	55.11	0.51	27	10217	M	MUDSTONE	CARB. DK. GY. BRKN

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
25	55.11	55.15	0.04	27	10218	M	COAL	C-2. SLD
25	55.15	55.24	0.09	27	10218	M	MUDSTONE	CARB. DK. GY. BRKN
25	55.24	56.51	1.27	27	10218	M	COAL	C-2. BRKN
26	56.51	57.19	0.68	27	10219	M	MUDSTONE	CARB. DK. GY. BRKN LISTRIC SURFACES.
26	57.19	57.45	0.26	26	10219	M	ROCK LOSS	
26	57.45	57.91	0.46	26	10220	M	COAL LOSS	
26	57.91	59.18	1.27	26	10220	M	COAL	C-2. VBRKN PARTIALLY POWDERED & SHEARED.
26	59.18	59.23	0.05	26	10220	M	COAL	C-3. SHRD
27	59.23	59.55	0.32	26	10220	M	COAL	C-3. SHRD
27	59.55	59.80	0.25	25	10220	M	MUDSTONE	CARB. DK. GY. BRKN

\* DENOTES MEASURED BCA



PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	59.80	60.18	0.38	25	10220 M	COAL	C-3. PHRD SHEARED & POWDERED.
27	60.18	60.49	0.31	25	10220 M	MUDSTONE	CARB. DK. GY. BRKN SHEARED.
27	60.49	60.60	0.11	25	10220 M	COAL	C-4. VBRKN
27	60.60	60.68	0.08	25	10220 M	MUDSTONE	CARB. DK. GY. SLD
27	60.68	60.81	0.13	25	10220 M	COAL	C-4. SLD
28	60.81	60.94	0.13	*25	10220 M	MUDSTONE	CARB. DK. GY. BRKN PARTIALLY SHEARED.
28	60.94	61.25	0.31	29	10220 M	COAL	C-3. SHRD MIXTURE OF SHEARED COAL & MUD.
28	61.25	61.63	0.38	35	10220 M	COAL LOSS	
28	61.63	61.74	0.11	*40	10220 M	MUDSTONE	CARB. DK. GY. SLD
28	61.74	62.51	0.77	44	10220 M	COAL	C-3. SHRD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
28	62.51	63.07	0.56	50	10221	MUDSTONE	CARB. DK. GY. BRKN LISTRIC SURFACES. UPPER 25CM SAMPLED.
29	63.07	63.51	0.44	54		MUDSTONE	CARB. DK. GY. LAM. SHRD POORLY CONSOLIDATED. FAINT COALY STREAK S & VITRINITE SPECKS THROUGHOUT. OCC QTZ VEINING.
29	63.51	64.49	0.98	*60		MUDSTONE	CARB. DK. GY. LAM. SHRD LITH AS ABOVE. OCC VITRINITE SPECKS. OCC QTZ VEINING. POORLY CONSOLIDATED. SOME BRECCIATION.
30	64.49	64.94	0.45	*60		MUDSTONE	DK. GY. LAM. SHRD SLIGHTLY LESS CARB THAN ABOVE. POORLY CONSOLIDATED. FAINT LAMINAE. MINOR COALY STRINGERS.
30	64.94	66.38	1.44	60		MUDSTONE	DK. GY. MAS. SHRD V FAINT LAMINAE. LITH AS ABOVE.
30	66.38	67.00	0.62	60		ROCK LOSS	
31	67.00	67.99	0.99	60		MUDSTONE	SLTY. DK. GY. THNB. BIOTR. SHRD OCC BIOTURBATED/MOTTLED SILTY BANDS.
31	67.99	68.77	0.78	60		MUDSTONE	DK. GY. MAS. VBRKN OCC SMALL COALY/QTZ LENSES 1-2CM ACROSS. MOTTLED LAYER AT BOTTOM OF BOX.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDM86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
32	68.77	70.64	1.87	60			MUDSTONE	SLTY. DK. GY. THNB. SHRD MOTTLED (BIOTURBATED ? OR FEEDING TRAIL S?) SILTY LAYERS COMMON. FAIRLY SIMILAR TO "TYNDAL MOTTLES" BELOW L SEAM IN 86 004, BUT NOT EXACTLY THE SAME.
33	70.64	72.31	1.67	*60			SILTSTONE	SSY. VPR. M. GY. LAM. SSD. BRKN. BETTER DEFINED BEDDING IS NOW VISIBLE. LOAD CASTS AND MINOR SLUMPING SHOW TOPS UP. BCA'S MOSTLY 60 DEGREES. ON ONE SHEARED PIECE, BCA'S = 37 DEGREE. SLICKEN SIDES. FINELY LAM THROUGHOUT.
34	72.31	73.00	0.69	59			SILTSTONE	SSY. VPR. M. GY. VTHNB. BIOTR. BRKN. WIDER BANDING & SANDIER THAN ABOVE. 7CM OF "TYNDAL-LIKE MOTTLES" AT BASE OF INTERVAL.
34	73.00	74.25	1.25	58			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. SHRD. FINE SILTY WHIPS THROUGHOUT. VERY SHEARED BUT CONSOLIDATED. FRAC ZONE? ALMOST BRECCIA.
35	74.25	75.24	0.99	57			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. VBRKN. LITH AS ABOVE. BRECCIATED AT TOP. CLAY INFILL.
35	75.24	76.04	0.80	56			ROCK LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDM86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
35	76.04	76.82	0.79	*55			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. XBDG. BRKN. FINELY LAM. POOR XBDG. TOPS UP.
35	76.83	77.15	0.32	58			ROCK LOSS	
36	77.15	77.49	0.34	*60			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BRKN. PLANAR SILTY LAMINAE THROUGHOUT. SHARP CONTACT ON SILT LAMINAE.
36	77.49	79.12	1.63	*70			SANDSTONE	FG. VPR. M. GY. YTHNB. SLD. SLIGHTLY LESS SILT THAN ABOVE. SLICKENSIDES.
37	79.12	80.05	0.93	*60			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. SLD. V FINE PLANAR LAMINAE THROUGHOUT. NO APPARENT XBDG.
37	80.05	81.11	1.06	*65			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BRKN. V FINELY LAMINATED AS ABOVE. SHARP CONTACT ON LAMINAE. NO XBDG.
38	81.11	83.06	1.95	*65			SILTSTONE	SSY. VPR. M. GY. VTHNB. BRKN. MUCH MORE SILT THAN ABOVE. BEDDING IS LESS DISTINCT. NOT WELL CONSOLIDATED. WILL WEATHER EASILY.
38	83.06	83.81	0.75	68			ROCK LOSS	

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
39	83.81	85.58	1.77		72		SILTSTONE	SSY. YPR. M. GY. VTHNB. VSHRD. DISRUPTED BEDDING LIKELY FROM SLUMPING. VSHRD BUT CONSOLIDATED. WILL CRUMBLE EASILY.
40	85.58	86.52	0.94	*	75		SILTSTONE	SSY. M. GY. THNB. BRKN
40	86.52	87.42	0.90	*	10222		SILTSTONE	CLYY. M-DK. GY. BRKN BECOMES CARB AT BASE WITH LISTRIC SURFACES. LOWER 25CM. SAMPLED.
40	87.42	87.60	0.18		67 10223	L	COAL	C-2. SHRD
41	87.60	87.82	0.22		67 10223	L	COAL	C-2. SHRD
41	87.82	87.83	0.01		67 10223	L	MUDSTONE	CARB. DK. GY. SLD
41	87.83	87.87	0.04		67 10223	L	COAL	C-2. SLD

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	87.87	87.88	0.01		67 10223	L	MUDSTONE	CARB. DK. GY. SLD
41	87.88	88.17	0.29		68 10223	L	COAL	C-2. SHRD
41	88.17	88.20	0.03		68 10223	L	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
41	88.20	88.44	0.24		68 10223	L	COAL	C-3. BRKN
41	88.44	88.49	0.05		68 10223	L	COAL	C-2. SLD
41	88.49	88.52	0.03		68 10223	L	MUDSTONE	CARB. DK. GY. BRKN
41	88.52	88.65	0.13		68 10223	L	COAL	E-2. SLD
41	88.65	88.66	0.03		68 10223	L	MUDSTONE	CARB. DK. GY. SLD
41	88.68	88.83	0.15		68 10223	L	COAL	C-2. SLD C-3 BANDS WITHIN.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	88.83	88.86	0.03	68	10223	L	MUDSTONE	CARB. DK. GY. SLD
41	88.86	89.38	0.52	68	10223	L	COAL	C-3. BRKN
41	89.38	89.55	0.17	68	10223	L	COAL LOSS	
41	89.55	89.63	0.08	68	10223	L	ROCK LOSS	
41	89.63	89.73	0.10	68	10223	L	MUDSTONE	CARB. DK. GY. SLD PLANT FRAGS, SOME COALIFIED.
42	89.73	89.83	0.10	69	10223	L	MUDSTONE	CARB. DK. GY. BRKN PLANT FRAGS WITHIN.
42	89.83	89.91	0.08	69	10223	L	COAL	C-3. SLD BANDED WITH BONE COAL.
42	89.91	90.06	0.15	69	10223	L	COAL LOSS	
42	90.06	90.47	0.41	69	10224		MUDSTONE	CARB. DK. GY. BRKN THIN BAND & STRINGERS OF COALIFIED PLANT MATERIAL THROUGHOUT. UPPER 25CM SAMPL ED.
42	90.47	91.85	1.38	69			MUDSTONE	M-DK. GY. BRKN SILTIER TOWARDS BASE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	91.85	91.91	0.06	70			ROCK LOSS	
43	91.91	92.90	0.99	*70			SILTSTONE	VPR. M. GY. LAM. BIOTR. BRKN IRREGULAR MUD. LAMINAE, OCC MOTTLED (BIO TRB?) LAYERS. SLICKENSIDES.
43	92.90	93.84	0.94	71			SILTSTONE	VPR. M. GY. VTHNB. BIOTR. BRKN OCC MOTTLED LAYERS. COALIFIED PLANT HAS H.
43	93.84	94.18	0.34	72			ROCK LOSS	
44	94.18	96.02	1.84	73			SILTSTONE	VPR. M. GY. VTHNB. BIOTR. BRKN OCC MOTTLED LAYERS - SIMILAR TO BELOW S EAM L IN 86004, MANY POORLY CONSOLIDATE D LAYERS.
44	96.02	96.05	0.03	74			BENTONITE	M. SLD V SOFT. SHARP UPPER & LOWER CONTACTS. C LAY AS BELOW L SEAM IN 86004.
44	96.05	96.17	0.12	74			SILTSTONE	VPR. M. GY. VTHNB. SLD AS SILTST ABOVE.
45	96.17	98.23	2.06	*75			SILTSTONE	VPR. M. GY. VTHNB. BRKN LITH AS ABOVE. POORLY CONSOLIDATED. MIL L WEATHER & CRUMBLES EASILY. VARIABLE BC A'S; LARGE SCALE BDG?

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
46	98.23	99.21	0.98	66		SILTSTONE	SSY.VPR.M.GY.VTHNB.SLD SLIGHTLY MORE FG SS THAN ABOVE. POORLY CONSOLIDATED AS ABOVE.
46	99.21	100.23	1.02	*60		SILTSTONE	SSY.VPR.M.GY.VTHNB.SLD POORLY CONSOLIDATED SANDY SILTST AS ABOVE. ONE BAND OF QTZ BRECCIA 4CM WIDE.
47	100.23	102.08	1.85	*60		SILTSTONE	SSY.VPR.M.GY.LAM.BRKN MOD QTZ VEINING AND CLAY FRAC FILL. POORLY CONSOLIDATED. FINELY LAM. SLICKENSIDES WITH TALC FILL.
48	102.08	104.20	2.12	*67		SANDSTONE	FG-.PR.M.GY.LAM.SLD WISPY PLANAR SILT LAMINAE THROUGHOUT. FG-MG SS.
49	104.20	104.79	0.59	67		SANDSTONE	MG.MOD.M.GY.LAM.SLD SIGNIFICANTLY FEWER SILT STRINGERS.
49	104.79	106.09	1.30	68		SANDSTONE	MG.MOD.M.GY.LAM.SLD NO SILT LAMS BUT FAINT BEDDING SEEN WITH MIN SAND. VPOORLY CONSOLIDATED. WILL CRUMBLE FAIRLY EASILY. 8CM QTZ VEIN AT TOP.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
50	106.09	108.25	2.16	68		SANDSTONE	MG-.PR.M.GY.MAS.BRKN ANGULAR MUDST RIPUP CLASTS NEAR TOP. AMOUNT OF CG SAND MIXED INCREASES DOWNWARD. CORE TWIST OFF IN MIDDLE OF INTERVAL. 8CM QTZ VEIN AT TOP. CG-MG.
51	108.25	108.52	0.27	68		SANDSTONE	MG.VPR.M.GY.VTHNB.SLD CRUMBLES EASILY.
51	108.52	110.29	1.77	69		SANDSTONE	MG-.PR.M.GY.LAM.BRKN OCC BLACK ORGANIC-RICH LAMINAE. ORGANIC RIPUP CLASTS AT BASE. CG-MG.
52	110.29	110.45	0.16	69		SANDSTONE	CG-.PR.M.GY.MAS.BRKN MASSIVE WITH RIPPED UP MUDST LENSES. SHARP LOWER CONTACT. SLICKENSIDES. MG-CG.
52	110.45	110.81	0.36	69		SILTSTONE	SSY.DK.GY.LAM.SLD FINELY LAM. MUCH MORE SILT THAN ABOVE. FG SS LAYERS.
52	110.81	111.28	0.47	69		MUDSTONE	DK.GY.MAS.VSHRD GRADATIONAL FROM SILTST ABOVE.
52	111.28	111.49	0.21	69		ROCK LOSS	
52	111.49	112.42	0.93	69		SANDSTONE	MG-.M.GY.MAS.VBRKN M-CG SANDST. MUDST RIPUP CLASTS. VSHRD BUT CONSOLIDATED. MUCH QTZ VEINING.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
52	112.42	112.62	0.20	69			ROCK LOSS	
53	112.62	114.16	1.54	70			SANDSTONE	MG-M.GY.MAS.VBRKN OCC MUDST RIPUPS. POORLY CONSOLIDATED'S S. MODERATE QTZ VEINING. CG-MG.
53	114.16	114.19	0.03	70			SANDSTONE	CG-M.GY.MAS.SLD CONTINUED FROM ABOVE. SHARP LOWER CONTA CT. NG-CG.
53	114.19	114.51	0.32	70			MUDSTONE	DK.GY.MAS.VBRKN OCC COALY STRINGERS & YITRINITE SPECKS. MOD QTZ VEINING.
53	114.51	114.92	0.41	70			ROCK LOSS	
54	114.92	115.07	0.15	70	10225		MUDSTONE	CARB.DK.GY.BRKN
54	115.07	115.51	0.44	70	10226	K/L	COAL	C-3.SHRD SHEARED & POWDERED.
54	115.51	115.75	0.24	70	10226	K/L	COAL	C-3.BRKN

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
54	115.75	115.78	0.03	70	10226	K/L	COAL	C-6.SLD BONE COAL.
54	115.78	115.95	0.17	70	10226	K/L	COAL	C-3.BRKN
54	115.95	115.98	0.03	70	10226	K/L	COAL	C-3.SLD BONE COAL.
54	115.98	116.04	0.06	70	10226	K/L	COAL	C-3.SLD
54	116.04	116.16	0.12	70	10226	K/L	COAL LOSS	
54	116.16	116.30	0.14	70	10226	K/L	MUDSTONE	CARB.DK.GY.BRKN PLANT FRAGS WITHIN.
54	116.30	116.64	0.34	71	10226	K/L	COAL	C-3.PWRD
54	116.64	116.66	0.02	71	10226	K/L	COAL	C-6.BRKN
54	116.66	116.82	0.16	71	10226	K/L	COAL	C-3.BRKN
55	116.82	116.93	0.11	71	10226	K/L	COAL	C-4.SLD

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	116.93	117.11	0.18	71	10226 K/L	MUDSTONE	DK.GY.SLD PLANT FRAGS & STRINGERS THROUGHOUT.
55	117.11	117.31	0.20	71	10226 K/L	COAL	C-3.SLD
55	117.31	117.55	0.24	71	10227	MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.
55	117.55	117.68	0.13	71	10227	ROCK LOSS	
55	117.68	117.75	0.07	71	10227	COAL LOSS	
55	117.75	117.86	0.11	71	10227	COAL	C-3.BRKN
55	117.86	117.92	0.06	71	10227	COAL	C-5.SLD
55	117.92	119.06	1.14	71		MUDSTONE	CARB.DK.GY.BRKN PLANT FRAGS (COALY) AND THIN COAL BANDS THROUGHOUT.
56	119.06	119.64	0.58	71		MUDSTONE	CARB.DK.GY.MAS.SHRD FAIRLY POORLY CONSOL FROM MUCH SHEARING OCC COALY STRINGER UP TO 5MM WIDE. LISTRIC SURFACES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
56	119.64	120.79	1.15	72		MUDSTONE	DK.GY.MAS.VBRKN SLIGHTLY LESS CARBONACEOUS BUT WITH OCC VITRINITE SPECKS IN MUSHY LAYERS. COAL IFIED PLANT MASH. NUMEROUS LISTRIC SURF ACES.
56	120.79	121.17	0.38	72		ROCK LOSS	
57	121.17	122.97	1.80	*72		MUDSTONE	DK.GY.VTHNB.SLD INTERBEDDED POORLY CONSOLIDATED BANDS & MORE SOLIDBANDS. MINOR MOTTILING IN LIG HTER GREY HARDER BANDS. LISTRIC SURFACE S.
57	122.97	123.22	0.25	70		MUDSTONE	DK.GY.VTHNB.BRKN LITH AS ABOVE. BANDING AS ABOVE.
58	123.22	123.51	0.29	*70		MUDSTONE	DK.GY.VTHNB.SLD LITH & BANDING AS ABOVE.
58	123.51	125.30	1.79	*70		MUDSTONE	SLTY.DK.GY.LAM.WRMBU.BRKN OCC SILTY BANDS DOWNWARDS. MUCH MORE FINELY LAM THAN ABOVE. VERTICAL WORM BU RRROWS SHOW TOPS UP.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DOH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
59	125.30	125.88	0.58	68			MUDSTONE	SLTY. DK. GY. LAM. SSD. SLD DARK MUDST WITH NUMEROUS FINE SILTY LAM INAE THROUGHOUT. LOADING.
59	125.88	127.42	1.54	67			MUDSTONE	SLTY. DK. GY. LAM. SSD. SLD LITH AS ABOVE WITH SLIGHTLY FAINTER BED DING. FROM LESS SILT.
60	127.42	128.95	1.53	*65			MUDSTONE	DK. GY. VTHNB. SLD LESS SILT THAN ABOVE. WIDER BEDDING.
60	128.95	129.53	0.58	67			MUDSTONE	DK. GY. VTHNB. SLD LITH AS ABOVE. CORE THIST OFF AT BASE O F BOX.
61	129.53	129.85	0.32	68			MUDSTONE	DK. GY. MAS. VSHRD V POORLY CONSOLIDATED (SOFT, WAXY FEEL) UNIFORM MUDST. APPROACHING DARK CLAYST ONE.
61	129.85	130.70	0.85	70			ROCK LOSS	
61	130.70	132.00	1.30	*72			MUDSTONE	DK. GY. MAS. SLD HARD UNIFORM MUDST. RARE WISPY LT GY MU D WISPS IMMIDE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DOH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
61	132.00	132.36	0.36	72			MUDSTONE	DK. GY. LAM. SLD AS ABOVE WITH THIN LT GY MUDDY WISPS SL IGHTLY MORE COMMON.
62	132.36	134.51	2.15	71			CLAYSTONE	M. GY. LAM. BRKN EXTREMELY FINE GRAINED. NUMEROUS PLANAR LAMINAE THROUGHOUT. GRADATIONAL TO TUF FITE BELOW. PARTS ALONG BEDDING SIMILAR TO COASTERS. ALMOST RHYTHMIC.
63	134.51	135.02	0.51	*70			CLAYSTONE	LT. GY. LAM. BRKN EXTREMELY FINE GRAINED - TEXTURE OF POR CELAIN. HARD.
63	135.02	135.80	0.78	71			CLAYSTONE	LT. GY. LAM. SLD
63	135.80	136.44	0.64	71			CLAYSTONE	LT. GY. MAS. SLD MASSIVE. PORCELAIN-LIKE.
64	136.44	138.60	2.16	73			CLAYSTONE	LT. GY. MAS. SLD TUFFITE? MASSIVE. HARD. PORCELAIN-LIKE, AS ABOVE.
65	138.60	138.67	0.07	74			CLAYSTONE	LT. GY. MAS. SLD TUFFITE? AS ABOVE.

\* DENOTES MEASURED BCA



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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
65	138.67	138.71	0.04	74			BENTONITE	LT. GY. MAS. SLD SOFT, SHARP LOWER AND GRADATIONAL UPPER CONTACT.
65	138.71	138.87	0.16	74			SILTSTONE	DK. GY. LAM. BRKN INTERLAMINATED MUD AND FG SS. POORLY CONSOLIDATED-CRUMBLES EASILY.
65	138.87	140.66	1.79	*75			SILTSTONE	DK. GY. LAM. SSD. SLD AS ABOVE, LOAD CASTS SHOW TOPS UP, POORLY CONSOLIDATED-CRUMBLES EASILY.
66	140.66	142.86	2.20	71			SILTSTONE	DK. GY. VTHNB AS ABOVE BUT WIDER BANDING. WILL CRUMBLE EASILY.
67	142.86	143.41	0.55	*68			MUDSTONE	SILTY DK. GY. LAM. SSD. SLD NUMEROUS SILTY LAMINAE THROUGHOUT. MORE MUD AND LESS SANDY BANDS THAN ABOVE. LADING SHOWS TOPS UP.
67	143.41	143.57	0.16	70			MUDSTONE	DK. GY. MAS. BRKN SOFT, POORLY CONSOLIDATED. WAXY FEEL. CRUMBLES EASILY.
67	143.57	143.73	0.16	71			ROCK LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
67	143.73	144.97	1.24	*75			MUDSTONE	SILTY DK. GY. LAM. SSD. BRKN AS LAM MUDST ABOVE. OCC SOFT, POORLY CONSOLIDATED BANDS. SILT CONTENT DECREASES DOWNWARD.
68	144.97	147.13	2.16	74			MUDSTONE	DK. GY. MAS. SLD OCC LESS WELL CONSOLIDATED BANDS, PREDOMINANTLY MASSIVE. RARE COALIFIED PLANT MASS.
69	147.13	147.47	0.34	74	10228		MUDSTONE	CARB. DK. GY. BRKN PLANT FRAGS & COALY STRINGERS WITHIN. LOWER 25CM SAMPLED.
69	147.47	147.82	0.35	73	10229	K	COAL	C-2. SLD C-4. BANDS. WITHIN.
69	147.82	148.76	0.94	73	10229	K	COAL LOSS	
69	148.76	149.03	0.27	73	10229	K	ROCK LOSS	
69	149.03	149.09	0.06	73	10229	K	MUDSTONE	CARB. DK. GY. SLD
69	149.09	149.27	0.18	73	10229	K	COAL	C-2. SHRD
69	149.27	149.68	0.41	72	10229	K	COAL	C-2. BRKN

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPH BLOCK: LR DATA SOURCE: D0H86039

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCB ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	149.68	149.73	0.05	72	10229 K	MUDSTONE	CARB. DK. GY. BRKN
69	149.73	149.76	0.03	72	10229 K	COAL	C-2. BRKN
69	149.76	149.82	0.06	72	10229 K	COAL	C-3. BRKN
69	149.82	150.11	0.29	72	10229 K	COAL	C-4. BRKN
70	150.11	150.49	0.38	72	10229 K	COAL	C-2. BRKN
70	150.49	150.52	0.03	72	10229 K	MUDSTONE	CARB. DK. GY. SLD
70	150.52	150.89	0.37	72	10229 K	COAL	C-2. BRKN
70	150.89	150.96	0.07	72	10229 K	COAL	C-3. SLD
70	150.96	151.09	0.13	72	10229 K	COAL	C-2. BRKN
70	151.09	151.21	0.12	72	10229 K	COAL	C-3. BRKN GTZ VEINING WITHIN.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPH BLOCK: LR DATA SOURCE: D0H86039

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCB ID	SEAM ID	LITHOLOGY	DESCRIPTION
70	151.21	151.69	0.48	71	10230 K	MUDSTONE	CARB. DK. GY. BRKN ABUNDANT COALY PLANT FRAGS WITHIN.
70	151.69	151.74	0.05	71	10230 K	ROCK LOSS	
70	151.74	151.88	0.14	71	10230 K	COAL LOSS	
70	151.88	152.01	0.13	71	10230 K	COAL	C-2. BRKN
70	152.01	152.09	0.08	71	10230 K	COAL	C-2. BRKN
71	152.09	152.47	0.38	71	10230 K	COAL	C-3. SLD
71	152.47	152.52	0.05	71	10230 K	COAL	C-2. SLD
71	152.52	152.61	0.09	71	10230 K	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
71	152.61	152.76	0.15	71	10230 K	COAL	C-4. SLD
71	152.76	153.47	0.71	71	10231	MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS THROUGHOUT. PYRITE BAND S (10CM) NEAR TOP OF UNIT. UPPER 25CM S AMPLED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
71	153.47	153.49	0.02	70			SILTSTONE	M.GY.SLD
71	153.49	153.62	0.13	70			MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN.
71	153.62	153.84	0.22	70			SANDSTONE	FG.M.GY.SLD SHARP CONTACTS.
71	153.84	154.19	0.35	70			SILTSTONE	M-DK.GY.SLD SANDY NEAR BASE.
72	154.19	154.49	0.30	*70			SILTSTONE	VPR.DK.GY.MAS.SLD NO APPARENT BEDDING. SLUMPED? BCA TAKEN AT LOWER CONTACT.
72	154.49	155.84	1.35	*65			SANDSTONE	FG.PR.M.GY.LAM.SLD WISPY SILT LAMINAE AT TOP. MORE MASSIVE DOWNWARD. POSSIBLY LARGE SCALE XBDG.
72	155.84	156.29	0.45	*60			SILTSTONE	VPR.DK.GY.LAM.BRKN FINE PLANAR LAMINAE THROUGHOUT. VERY MU DDY SLTST.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
73	156.29	157.15	0.86	62			SILTSTONE	SSY.VPR.DK.GY.LAM.SSD.SLD SLUMPING APPARENT. SAND MIXED IN WITH L AM SLTST.G RADIALLY BECOMING MUCH MORE SANDY DOWNWARD.
73	157.15	158.38	1.23	*65			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.SSD.SLD INTERB SLUMPED SILT LAYERS AND VFG-FG.S AND LAYERS.LOADING SHOWS TOPS UP.
74	158.38	158.40	0.02	65			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.SSD.SLD AS ABOVE. SLUMPED. VERY MIXED UP LAYERS . SHARP LOWER CONTACT.
74	158.40	160.04	1.64	65			SANDSTONE	FG-.WEL.LT.GY.MAS.SLD F-MG. TYPICAL CLEAN SAND BELOW K SEAM.
74	160.04	160.24	0.20	65			SANDSTONE	FG-.WEL.LT.GY.MAS.SLD AS ABOVE. MG-FG.
75	160.24	160.44	0.20	65			SANDSTONE	FG-.WEL.LT.GY.MAS.BRKN AS ABOVE. MG-FG.
76	160.44	161.00	0.56	65			SANDSTONE	MG-.WEL.LT.GY.MAS.BRKN AS ABOVE. FG-MG.
76	161.00	162.46	1.46	65			SANDSTONE	MG-.WEL.LT.GY.MAS.BRKN AS ABOVE. FG-MG.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86033

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP ID	SEAM ID	LITHOLOGY	DESCRIPTION
77	162.46	163.54	1.08	65			SANDSTONE	FG-WEL.LT.GY.MAS.VBRKN VERY FRACTURED, QTZ FILL, NUMEROUS FRACTURES SUBPARALLEL TO CORE AXIS. MG-FG.
77	163.54	163.73	0.19	65			SANDSTONE	FG-WEL.LT.GY.MAS.VBRKN YUGGY QTZ BRECCIA WITH SS PIECES. MG-FG.
77	163.73	164.30	0.57	65			SANDSTONE	FG-WEL.LT.GY.MAS.VBRKN OCC MUDST RIPUP CLASTS 3-7MM IN DIA. V FRACTURED CORE WITH QTZ FRAC FILL AS ABOVE. MG-FG.
78	164.30	165.08	0.78	65			SANDSTONE	FG-WEL.LT.GY.MAS.VBRKN V FRACTURED CORE. LITH AS ABOVE.
78	165.08	165.71	0.63	65			SANDSTONE	FG-WEL.LT.GY.MAS.VBRKN AS ABOVE.
79	165.71	166.74	1.03	65			SANDSTONE	FG-WEL.LT.GY.MAS.VBRKN LITH AS ABOVE WITH NUMEROUS RIPUP CLAST S. 3-12 MM IN DIA. 169.81 M = T.D. END OF HOLE. DRILLER'S MARK.

\* DENOTES MEASURED BCA  
NEWPAGE















GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT  
 STRATIGRAPHIC LOG  
 KPN LR DDH86033

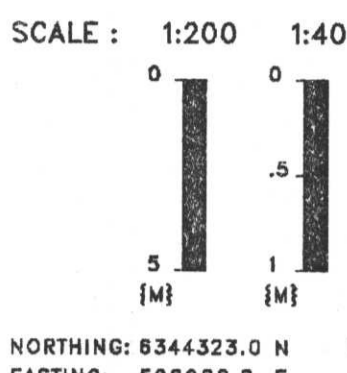
723

GEOLOGIST : BARKER

DATE : FEB 26/87

DRAWING NO. :

LITHOLOGIC SYMBOLS

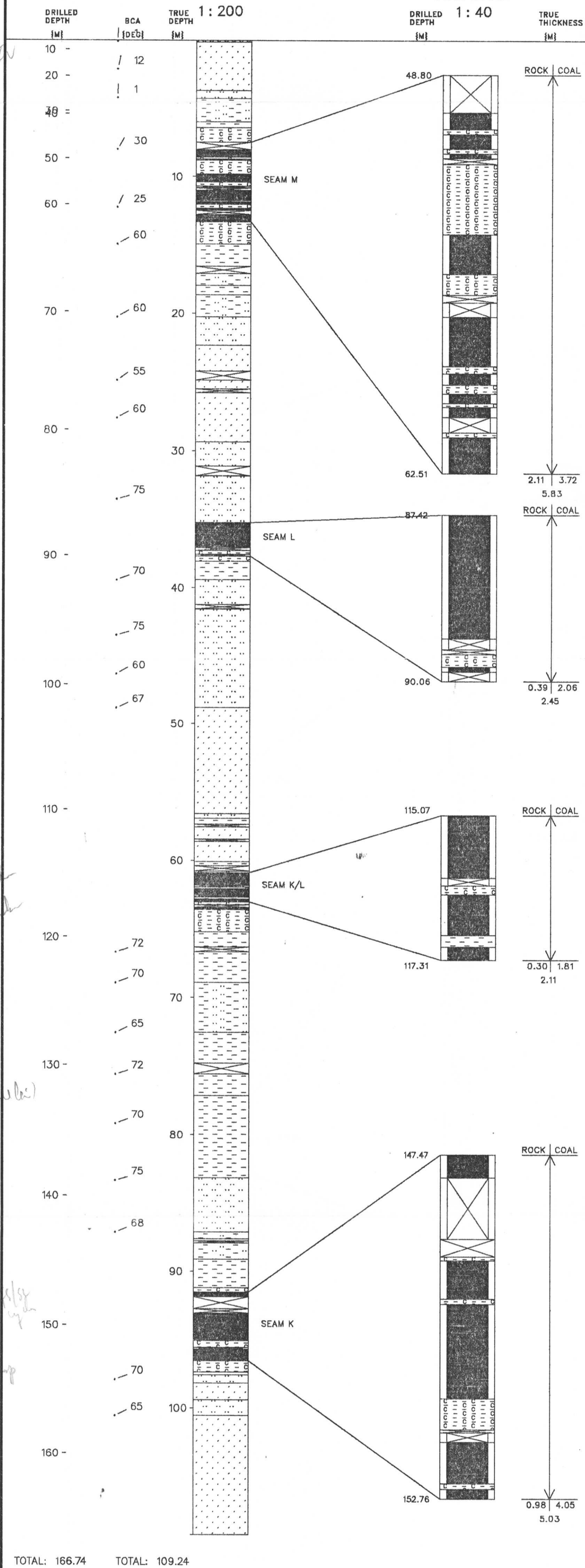


NORTHING: 6344323.0 N  
 EASTING: 508088.8 E

INCLINATION: 90.0°

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

SEAM DETAIL



# Gulf Canada Corporation Coal Division

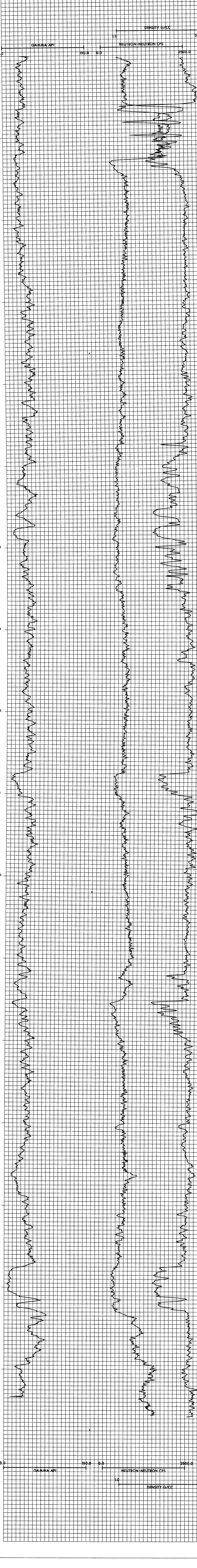
# 723

## Geophysical Log

Data source: KPNLRDDH86033	Province: BC	Northing: 6344320.00	Lat: 5714.38
Log Date: 86-09-27	Zone: 9	Easting: 508089.00	Long: 1285158
Company: CENTURY	Measuring Point:		Elevation: 1523.5
Geologist: BARKER			

Scale: 1 to 100.0	Comments: 1. LOGGED THROUGH THE RODS 2.
Depth Range: 0.0 to 171.0	
True Thickness: NO	

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



**KPNLRDDH86034**

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86034

DATE - 02/13/87

- HISTORY -

START DATE - 25/09/86

END DATE - 27/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - MACLEOD

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1503.64

LICENCE/LEASE NUMBER -

ZONE - 9

NORTHING - 6344599.00

EASTING - 508167.37

LATITUDE - 571447

LONGITUDE - 1285153

- ORIENTATION -

LENGTH - 158.49

CORE SIZE - 0.0

INCLINATION - 90.0

AZIMUTH - 0.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 13.72

AQUIFER DEPTHS (M) - 0.00

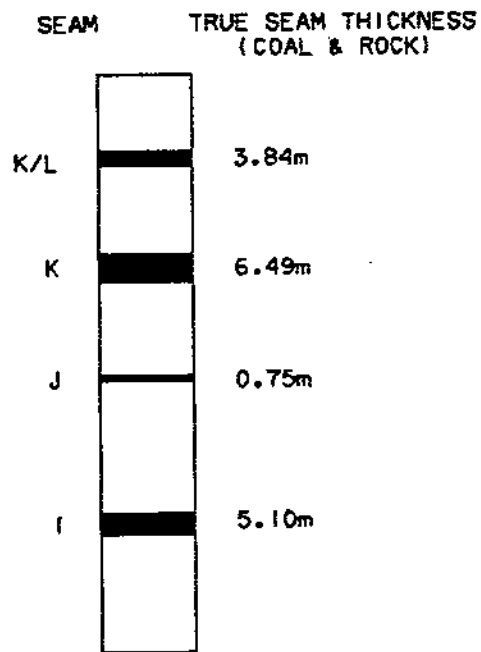
0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====



**NOTE:**

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

**FIGURE**

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86034

GULF CANADA CORPORATION  
11/03/87  
KLAP:[205057]870063034.LOG



87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	13.72	13.72	81			OVERBURDEN	CASING
1	13.72	13.81	0.09	81			ROCK LOSS	
1	13.81	13.85	0.04	81			SANDSTONE	MG. PR. LT. GY. MAS. SLD
1	13.85	14.69	0.84	*81			SANDSTONE	CLYY. FG. PR. LT. GY. LAM. BRKN CORE TWIST OFF IN MIDDLE OF UNIT. EVENLY INTERLAMINATED FG SS AND MUDST WITH WAVY TO PLANAR CONTACTS. UNIT POORLY CONSOL.
1	14.69	15.56	0.87	80			SANDSTONE	CLYY. FG. PR. LT. GY. LAM. BRKN AS ABOVE.
2	15.56	16.67	1.11	*78			SANDSTONE	CLYY. FG. PR. LT. GY. LAM. BRKN AS ABOVE. BASAL BCM IS RUBBLE. LAMINAE BECOME VERY IRREGULAR IN LOWER 20CM.
2	16.67	17.54	0.87	75			SANDSTONE	CLYY. VFG. PR. LT. GY. LAM. BRKN UNEVENLY LAMINATED WITH WAVY MUDST/SS CONTACTS. SLIGHTLY FINER THAN ABOVE UNIT
3	17.54	19.61	2.07	*70			MUDSTONE	SLTY. DK. GY. LAM. BRKN SLTY LAMINAE ARE INDISTINCT, PLANAR TO WAVY AND DECREASE IN NUMBER TO THE BASE

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	19.61	19.72	0.11	71			MUDSTONE	DK. GY. LAM. BRKN ABUNDANT PLANT FRAGMENTS (CZEKANOWSKIA RIGIDA, NILSSONIA CANADENSIS, NILSSONIA TENUICAULIS).
4	19.72	20.03	0.31	72	10167		MUDSTONE	DK. GY. LAM. BRKN
4	20.03	20.18	0.15	72	10168	K/L	COAL	C-3. BRKN
4	20.18	20.23	0.05	72	10168	K/L	COAL	C-4. BRKN
4	20.23	21.22	0.99	73	10168	K/L	COAL LOSS	
4	21.22	21.33	0.11	73	10168	K/L	ROCK LOSS	

\* DENOTES MEASURED BCA



87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 3

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	21.33	21.39	0.06	73	10168	K/L	MUDSTONE	CARB. DK. GY. SLD
4	21.39	21.61	0.22	74	10168	K/L	COAL	C-2. BRKN
4	21.61	21.80	0.19	74	10168	K/L	COAL LOSS	
4	21.80	21.86	0.06	74	10168	K/L	MUDSTONE	CARB. DK. GY. SLD
4	21.86	22.22	0.36	74	10168	K/L	COAL	C-2. BRKN
4	22.22	23.12	0.90	75	10168	K/L	COAL LOSS	
4	23.12	23.23	0.11	76	10168	K/L	ROCK LOSS	

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 4

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	23.23	23.29	0.06	76	10168	K/L	MUDSTONE	CARB. DK. GY. BRKN
4	23.29	23.46	0.17	76	10168	K/L	COAL	C-3. BRKN
4	23.46	23.56	0.10	76	10168	K/L	MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS WITHIN.
4	23.56	23.67	0.11	76	10168	K/L	ROCK LOSS	
5	23.67	23.86	0.19	77	10168	K/L	COAL LOSS	
5	23.86	24.02	0.16	77	10168	K/L	COAL	C-3. YBRKN BCM POWDERED.
5	24.02	24.52	0.50	77	10169		MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS. ABUNDANT VITRAIN LAM INAE. UPPER 25CM SAMPLED.
5	24.52	24.89	0.37	78			MUDSTONE	CARB. DK. GY. BRKN

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	24.89	25.47	0.58	78		MUDSTONE	CARB. DK. GY. BRKN VERY ABUNDANT COALY STRINGERS PACKED TH ROUGHOUT. MINOR THIN COALY BANDS WITHIN
6	25.47	25.68	0.21	79		MUDSTONE	CARB. BLK. LAM. SLD VITRAIN BANDS UP TO 1CM. BUT GENERALLY LESS THAN 1MM.
6	25.68	27.41	1.73	*80		MUDSTONE	CARB. BLK. LAM. BRKN LESS VITRAIN LAMINAE THAN ABOVE. ABUNDA NT PLANT FRAGMENTS (CLADOPHLEBIS VIRGIN IENSIS, NILSSONIA CANADENSIS, PITYOPHYL LUM NORDENSKIOLDII, CZEKANOWSKIA CF. RI GIDA); SOME PLANT FRAGMENTS COALIFIED.
7	27.41	29.33	1.92	72		MUDSTONE	DK. GY. LAM. BRKN LESS CARBONACEOUS THAN ABOVE UNIT WITH VERY RARE COAL LAMINAE NEAR TOP OF UNIT ONLY. SOME COAL PARTS RUBBLE OR BRECCIATED. PLANT WASH PRESENT. 21CM ZONE OF INTENS E QTZ VEINING AND BRECCIATION. 27CM FROM TOP OF UNIT.
8	29.33	30.23	0.90	65		MUDSTONE	DK. GY. LAM. BRKN AS ABOVE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	30.23	31.07	0.84	*61		MUDSTONE	DK. GY. LAM. BRKN AS ABOVE. PLANT FRAGMENTS PRESENT. OCCA SIONAL LAMINAE ARE DISTINCT.
9	31.07	32.91	1.84	*65		MUDSTONE	SLTY. DK. GY. LAM. BRKN PLANAR SLTST LAMINAE ARE DISRUPTED IN B ASAL 50CM (BY SSD?) AND INDISTINCT TO A BSENT IN REMAINDER OF UNIT. COARSER THA N ABOVE UNIT. GRADATIONAL BASAL CONTACT
10	32.91	34.91	2.00	*65		MUDSTONE	SLTY. DK. GY. LAM. SLD EVENLY SPACED SLTST LAMINAE WITH SHARP PLANAR CONTACT. LOCALLY DISTURBED (BY S SD OR BIOGENICALLY?); UNIFORM THROUGHOU T UNIT.
11	34.91	35.48	0.57	68		MUDSTONE	SLTY. DK. GY. LAM. SLD LITHOLOGICALLY AS ABOVE.
11	35.48	36.91	1.43	*70		MUDSTONE	SLTY. DK. GY. LAM. SLD AS ABOVE EXCEPT SLIGHTLY FEWER SLTST LA MINAE AND OVERALL FINER GRAINED.
12	36.91	38.05	1.14	*75		MUDSTONE	SLTY. DK. GY. LAM. BRKN AS ABOVE. MINOR QTZ VEIN PERPENDICULAR TO CORE 1CM WIDE. MINOR VERTICAL JOINT. FEATURELESS AND INDISTINCTLY LAMINATED

\* DENOTES MEASURED BCA

FORM 4001

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	38.05	38.71	0.66	75			MUDSTONE	SLTY. DK. GY. LAM. SLD AS ABOVE.
13	38.71	40.81	2.10	*75			MUDSTONE	SLTY. DK. GY. VTHNB. SLD AS ABOVE EXCEPT PLANAR SLTST LAMINAE UP TO 1CM. UNIFORM.
14	40.81	41.05	0.24	72			MUDSTONE	SLTY. DK. GY. VTHNB. VRKRN RUBBLE. CORE TOO BADLY BROKEN TO LOG IN DETAIL.
14	41.05	42.49	1.44	*70			MUDSTONE	SLTY. DK. GY. VTHNB INDISTINCT SLTST BANDS UP TO 1CM HAVE PLANAR CONTACTS WITH MUDST. OTHERWISE FEATURELESS.
15	42.49	43.79	1.30	*71			SILTSTONE	CLYY. DK. GY. LAM. BRKN EVENLY LAMINATED WITH SHARP PLANAR SLTST/MUDST CONTACTS. SLIGHTLY COARSER THAN ABOVE UNIT.
15	43.79	44.22	0.43	69			SILTSTONE	CLYY. DK. GY. LAM. SLD LITHOLOGICALLY AS ABOVE.
16	44.22	44.52	0.30	68			SILTSTONE	CLYY. DK. GY. LAM. SLD AS ABOVE. PARTLY UNCONSOL NEAR BASE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	44.52	46.03	1.51	*65			SILTSTONE	CLYY. DK. GY. LAM. BRKN AS ABOVE. 3CM BRECCIA ZONE 45CM FROM TOP. MINOR QTZ VEINING NEAR MIDDLE OF UNIT.
17	46.03	47.03	1.00	65			MUDSTONE	DK. GY. BIOTR. BRKN ANY LAMINATIONS. NEAR TOP, TOTALLY OBSCURED BY BIOT. ABUNDANT LISTRIC SHEAR SURFACES. VERY FAINT OCCASIONAL LAMINATIONS NEAR BASE.
17	47.03	47.09	0.06	64			MUDSTONE	DK. GY. BRKN TOTALLY UNCONSOL.
17	47.09	47.25	0.16	64			MUDSTONE	DK. GY. MAS. SLD HIGHLY QTZ VEINED THROUGHOUT UNIT. COAL LAMINAE ALONG FRACTURE SURFACES.
17	47.25	47.50	0.25	64			MUDSTONE	DK. GY. MAS. SLD AS ABOVE.
17	47.50	47.66	0.16	64			MUDSTONE	DK. GY. MAS. BRKN ABUNDANT LISTRIC SHEAR SURFACES. FRACTURING OBSCURES ANY LAMINATIONS. IF PRESENT. GRADATIONAL BASAL CONTACT.

\* DENOTES MEASURED BCA

FORM 2001

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	47.66	47.76	0.10	64		MUDSTONE	SLTY. M. GY. SLD
18	47.76	47.84	0.08	64		MUDSTONE	M-DK. GY. SLD POORLY CONSOLIDATED.
18	47.84	48.15	0.31	64		MUDSTONE	SLTY. M. GY. SLD
18	48.15	48.24	0.09	64		MUDSTONE	M-DK. GY. SLD POORLY CONSOLIDATED.
18	48.24	48.36	0.12	64		MUDSTONE	SLTY. M. GY. SLD
18	48.36	48.80	0.44	64	10170	MUDSTONE	CARB. DK. GY. BRKN ABUNDANT THIN COALY BANDS & STRINGERS. CONTORTED THROUGHOUT. LOWER 25CM SAMPLED
18	48.80	48.93	0.13	64	10171 K	COAL LOSS	
18	48.93	49.13	0.20	64	10171 K	ROCK LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	49.13	49.41	0.28	64	10171 K	COAL	C-3. BRKN
18	49.41	49.50	0.09	64	10171 K	COAL	C-2. SLD MUDDY BANDS THROUGHOUT.
18	49.50	49.62	0.12	64	10171 K	MUDSTONE	SLTY. M-DK. GY. SLD MINOR COALY STRINGERS WITHIN.
18	49.62	49.67	0.05	64	10171 K	ROCK LOSS	
18	49.67	49.92	0.25	64	10171 K	COAL LOSS	
18	49.92	50.08	0.16	64	10171 K	COAL	C-3. BRKN MINOR MUDDY BANDS.
18	50.08	50.21	0.13	64	10171 K	COAL	C-2. BRKN SHEARED PARTIALLY.
19	50.21	50.35	0.14	63	10171 K	COAL	C-2. BRKN
19	50.35	50.38	0.03	63	10171 K	MUDSTONE	CARB. DK. GY. SLD
19	50.38	50.44	0.06	63	10171 K	COAL	C-2. BRKN

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	50.44	50.81	0.37	63	10171	K	COAL	C-2.BRKN
19	50.81	50.90	0.09	63	10171	K	MUDSTONE	SLTY.M-DK.GY.BRKN
19	50.90	50.94	0.04	63	10171	K	MUDSTONE	CARB.DK.GY.SLD
19	50.94	51.00	0.06	63	10172	K	COAL LOSS	
19	51.00	51.23	0.23	63	10172	K	COAL	C-3.BRKN
19	51.23	51.95	0.72	63	10172	K	COAL	C-2.BRKN MINOR BONEY COAL BANDS THROUGHOUT. PARTIAL SHEARING & COOKED.
20	51.95	52.33	0.38	63	10172	K	COAL	C-2.VBRKN SHEARED & COOKED.
20	52.33	52.79	0.46	63	10172	K	COAL	C-3.VBRKN SHEARED & COOKED.
20	52.79	52.85	0.06	63	10172	K	COAL	C-3.BRKN SHEARED & COOKED.
20	52.85	52.90	0.05	63	10172	K	MUDSTONE	CARB.DK.GY.SLD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	52.90	52.97	0.07	63	10172	K	COAL	C-2.BRKN PARTIALLY SHEARED & COOKED.
20	52.97	53.22	0.25	63	10172	K	COAL	C-3.BRKN PARTIALLY SHEARED & COOKED.
20	53.22	53.26	0.04	63	10173	K	MUDSTONE	CARB.DK.GY.BRKN POORLY CONSOLIDATED. COALY.
20	53.26	53.34	0.08	63	10173	K	COAL	C-3.BRKN SHEARED & COOKED.
20	53.34	53.50	0.16	63	10173	K	MUDSTONE	CARB.DK.GY.BRKN COALY STRINGERS WITHIN.
20	53.50	53.83	0.33	62	10173	K	COAL LOSS	
21	53.83	53.95	0.12	62	10173	K	COAL	C-4.SHRD
21	53.95	54.16	0.21	62	10173	K	COAL	C-3.SHRD VERY BROKEN.
21	54.16	54.68	0.52	62	10173	K	MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS WITHIN. SHEARED PARTIALLY.
21	54.68	54.72	0.04	62	10173	K	COAL	C-3.SLD MINOR QTZ WITHIN.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOY	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	54.72	54.98	0.26	62	10173	K	MUDSTONE	CARB. DK. GY. SLD COALY PLANT FRAGS WITHIN.
21	54.98	55.02	0.04	62	10173	K	COAL	C-3. SLD
21	55.02	55.14	0.12	62	10173	K	MUDSTONE	CARB. DK. GY. SLD COALY PLANT FRAGS WITHIN.
21	55.14	55.26	0.12	62	10173	K	COAL	C-2. YBRKN
21	55.26	55.34	0.08	62	10173	K	MUDSTONE	CARB. DK. GY. BRKN PLANT FRAGS WITHIN, SOME COALY.
21	55.34	55.54	0.20	62	10173	K	COAL LOSS	
21	55.54	55.64	0.10	62	10173	K	COAL	C-2. BRKN
21	55.64	55.71	0.07	62	10173	K	COAL	C-3. SLD
21	55.71	55.85	0.14	62	10173	K	COAL	C-2. BRKN
22	55.85	55.87	0.02	62	10173	K	COAL	C-2. SLD

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOY	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
22	55.87	56.02	0.15	62	10173	K	COAL	C-3. BRKN
22	56.02	56.10	0.08	62	10173	K	COAL	C-4. YBRKN
22	56.10	56.45	0.35	62	10174		MUDSTONE	CARB. M-DK. GY. BRKN CONTAINS ABUNDANT PLANT MATERIAL, COALIFIED NEAR SEAM. UPPER 25CM SAMPLED.
22	56.45	56.98	0.53	62			MUDSTONE	CARB. M-DK. GY. BRKN ABUNDANT PLANT MATERIAL. SILTIER TOWARD S. BASE.
22	56.98	57.43	0.45	61			MUDSTONE	SLTY. M. GY. BRKN
23	57.43	59.27	1.84	*61			SANDSTONE	SLTY. YFG. DK. GY. MAS. BRKN VERY FAINT OCCASIONAL LAMINAE IN OTHERWISE FEATURELESS MUDST. LOW ANGLE JOINT PLANES.
24	59.27	59.40	0.13	63			MUDSTONE	SLTY. DK. GY. LAM. YBRKN RUBBLE. LAMINAE ARE DISTURBED (BIOGENIC ALLY).

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	59.40	60.50	1.10	*65			MUDSTONE	SLTY.DK.GY.LAM.SSD.VBRKN EVENLY PLANAR LAMINATED IN PART AND HIGHLY DISTURBED BY SSD AND BIOTURBATION IN PARTS. MOST OF UNIT IS V BROKEN EXCEPT BASAL 5CM. SHARP BASAL CONTACT.
24	60.50	60.61	0.11	63			SILTSTONE	CLYY.DK.GY.LAM.SLD FAINT OCCASIONAL MUDST LAMINAE. RARE PLANAR FRAGMENTS.
25	60.61	61.45	0.84	*61			SILTSTONE	CLYY.DK.GY.VTHHB.SSD.SLD OCCASIONAL THIN MUDST LAMINAE IN BANDS UP TO 1CM THICK ARE 5-10CM APART AND INCREASE IN NUMBER TOWARDS THE BASE. SOFT SEDIMENT DEFORMATION NEAR THE TOP CONTACT. GRADATIONAL BASAL CONTACT.
25	61.45	62.08	0.63	63			SANDSTONE	FG.M.GY.MAS.SLD FEATURELESS. LOW ANGLE JOINT PLANES. LAST 3 UNITS REPRESENT A FUS.
25	62.08	62.30	0.22	64			SANDSTONE	FG.M.GY.MAS.SLD AS ABOVE. MINOR ANGULAR MUDST RIPUP CLASTS UP TO 1CM. SHARP BASAL CONTACT.
25	62.30	63.10	0.80	*65			MUDSTONE	SLTY.DK.GY.LAM.SLD GRADATIONAL CONTACTS BETWEEN PLANAR MUDST AND SLTST CONTACTS. EVENLY LAMINATED

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	63.10	65.20	2.10	*45			SILTSTONE	CLYY.DK.GY.LAM.BIOTR.SLD EVENLY PLANAR LAMINATED WITH SHARP CONTACTS AT TOP. BIOTURBATION OBSCURES BOD CONTACTS IN MIDDLE OF UNIT. OCCASIONAL MUDST LAMINAE NEAR BASE. GRADATIONAL BASAL CONTACT INTO SLTST WITH VERY FEW MUDST LAMINAE.
27	65.20	65.79	0.59	*75			SILTSTONE	DK.GY.LAM.SLD OCCASIONAL MUDST WISPY LAMINAE IN MIDDLE OF UNIT ONLY. UNIT HAS GRADATIONAL BASAL CONTACT.
27	65.79	66.72	0.93	75			SANDSTONE	FG.M.GY.MAS.SLD OCCASIONAL LOW ANGLE FRACTURE PLANES WITH EUBEDRALOTZ CRYSTALS. SHARP BASAL CONTACT. LAST 3 UNIT REPRESENT A FUS.
27	66.72	67.29	0.57	*75			MUDSTONE	SLTY.DK.GY.LAM.SLD EVENLY PLANAR LAMINATED WITH GRADATIONAL CONTACTS BETWEEN MUDST/SLTST LAMINAE. GRADATIONAL BASAL CONTACT.
28	67.29	67.96	0.67	*70			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.BRKN TOP 50CM AS ABOVE UNIT. UNIT COARSENS TOWARD BASE AS MUDST LAMINAE SPACING INCREASES UP TO 5CM. BASAL 20CM IS RUBBLE. NORM BURROH AND LOAD CAST INDICATE TOP'S UP.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
28	67.96	68.11	0.15	69			SANDSTONE	FG.M.GY.MAS.BRKN FEATURELESS. SHARP BASAL CONTACT.
28	68.11	68.41	0.30	*69			SILTSTONE	CLYY.DK.GY.LAM.BRKN FAINTLY LAMINATED NEAR TOP AND BASE WITH H A MORE MASSIVE MID-UNIT SECTION. PLANAR LAMINAE HAVE GRADATIONAL CONTACTS.
28	68.41	68.58	0.17	69			SANDSTONE	FG.M.GY.MAS.BRKN FEATURELESS EXCEPT 3MM WIDE QTZ VEIN AT 24 DEGREE ORIENTATION.
28	68.58	68.73	0.15	69			SANDSTONE	FG.M.GY.MAS.BRKN AS ABOVE. QTZ VEIN 1CM THICK AT 20 DEGR EE ORIENTATION.
29	68.73	69.81	1.08	70			SANDSTONE	FG.M.GY.MAS.BRKN AS ABOVE. ABUNDANT LOW ANGLE JOINT PLANES. SHARP BASAL CONTACT. LAST 2 UNITS R EPRESENT A FUS.
29	69.81	70.49	0.68	*70			MUDSTONE	SLTY.DK.GY.LAM.BRKN EVENLY PLANAR LAMINATED WITH GRADATIONA L CONTACTS.
30	70.49	71.51	1.02	*69			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.BRKN AS ABOVE. SINGLE WORM BURROW INDICATES TOPS UP.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	71.51	72.51	1.00	69			MUDSTONE	SLTY.DK.GY.LAM.SLD AS ABOVE. GRADATIONAL BASAL CONTACT.
31	72.51	74.57	2.06	*70			MUDSTONE	SLTY.DK.GY.LAM.SLD EVENLY PLANAR LAMINATED WITH GRADATIONA L CONTACTS. SLIGHTLY SILTIER AT BASE. UN IT HAS SPLIT PARALLEL TO BDG. COASTER L ITHOLOGY.
32	74.57	76.22	1.65	*70			MUDSTONE	SLTY.DK.GY.LAM.BRKN AS ABOVE. COASTER LITHOLOGY.
33	76.22	77.66	1.44	70			MUDSTONE	SLTY.DK.GY.LAM.SLD AS ABOVE. COASTER LITHOLOGY.
33	77.66	78.23	0.57	*70			MUDSTONE	SLTY.DK.GY.LAM.SLD AS ABOVE. COASTER LITHOLOGY.
34	78.23	80.43	2.20	*70			MUDSTONE	SLTY.DK.GY.LAM.SLD AS ABOVE. COASTER LITHOLOGY.
35	80.43	80.71	0.28	*80			MUDSTONE	SLTY.DK.GY.LAM.SLD AS ABOVE. COASTER LITHOLOGY.
35	80.71	81.88	1.17	75 10175			MUDSTONE	SLTY.DK.GY.LAM.BRKN AS ABOVE. COASTER LITHOLOGY. LOWER 25CM SAMPLED.

\* DENOTES MEASURED BCA



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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
35	81.88	82.05	0.17	71	10176	J	COAL	C-4.VBRKN SHEARED.
35	82.05	82.13	0.08	70	10176	J	MUDSTONE	CARB.DK.GY.SLD
35	82.13	82.34	0.21	70	10176	J	COAL	C-2.VBRKN
36	82.34	82.57	0.23	68	10176	J	COAL	C-2.VBRKN
36	82.57	82.64	0.07	67	10176	J	MUDSTONE	CARB.DK.GY.SLD
36	82.64	82.68	0.04	67	10176	J	COAL	C-3.SLD
36	82.68	82.76	0.08	67	10177		MUDSTONE	CARB.DK.GY.SLD
36	82.76	82.82	0.06	66	10177		MUDSTONE	CARB.DK.GY.SLD ABUNDANT COALY STRINGERS THROUGHOUT (40 %).
36	82.82	83.11	0.29	*65	10177		MUDSTONE	SLTY CARB COALY STRINGERS NEAR TOP. UPPER 11 CM SAMPLED.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
36	83.11	83.67	0.56	66			MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.
36	83.67	84.15	0.48	67			SANDSTONE	SLTY.VFG.M.GY.SLD MUDDY LAMINAE WITHIN.
37	84.15	85.55	1.40	68			MUDSTONE	DK.GY.BIOTR.SLD UNIT SLTY AT BASE WHERE BIOTURBATION OBSCURES ANY LAMINATIONS WHICH MIGHT BE PRESENT. GRADES TOWARDS BASE INTO MASSIVE MUDST. GRADATIONAL BASAL CONTACT.
37	85.55	86.08	0.53	*70			MUDSTONE	SLTY.DK.GY.LAM.SLD FAINTLY LAMINATED WITH GRADATIONAL OBSCURE CONTACTS BETWEEN LAMINAE. MORE MASSIVE TOWARD BASE.
37	86.08	86.21	0.13	70			MUDSTONE	DK.GY.MAS.SLD FEATURELESS.
38	86.21	87.64	1.43	*70			MUDSTONE	SLTY.DK.GY.LAM.SLD EVENLY LAMINATED. EXCEPT WHERE DISTURBED BY BIOTURBATION. GRADATIONAL SLTST/MUDST LAMINAE CONTACTS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	87.64	88.29	0.65	*77		MUDSTONE	DK.GY.MAS.SLD FEATURELESS EXCEPT MINOR PLANT FRAGMENT S (CZEKANOWSKIA CF. RIGIDA, PITYOPHYLLUM NORDENSKIOLDII, MILSSNIA CF. TENNICALLIS).
39	88.29	88.89	0.60	*82		MUDSTONE	SLTY.DK.GY.LAM.SLD FAINTLY LAMINATED WITH GRADATIONAL SLTST/MUDST CONTACTS. LAMINAE DISRUPTED AT BASE WHERE UNIT COARSENS TO CLYY SLTST.
39	88.89	90.27	1.38	*70		SILTSTONE	CLYY.DK.GY.LAM.SLD UNEVENLY LAMINATED WITH GRADATIONAL WAY TO PLANAR MUDST/SLTST LAMINAE CONTACTS.
40	90.27	91.94	1.67	*71		SILTSTONE	CLYY.DK.GY.BIOTR.SLD UNIT LAMINATED IN TOP 14CM WITH GRADATIONAL PLANAR SLTST/MUDST CONTACTS, IN REMAINDER OF UNIT BIOTURBATION TOTALLY OBSCURES BDG CONTACTS.
40	91.94	92.25	0.31	*71		MUDSTONE	SLTY.DK.GY.BIOTR.SLD SLIGHTLY FINER THAN ABOVE UNIT. BIOTURBATION OBSCURES ANY BDG CONTACTS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	92.25	94.31	2.06	*71		SILTSTONE	CLYY.DK.GY.LAM.SLD GRADATIONAL PLANAR SLTST/MUDST CONTACTS IN BASAL ONE THIRD OF THE UNIT ARE TOTALLY OBSCURED BY BIOTURB. IN TOP TWO THIRDS OF UNIT.
42	94.31	95.04	0.73	*70		SILTSTONE	CLYY.DK.GY.LAM.SSD.SLD FINELY INTERLAMINATED SLTST/MUDST WITH GRADATIONAL NEAR-PLANAR CONTACTS. SOFT SEDIMENT DEFORMATION (SLUMP?) INTERRUPTS BEDDING CONTACTS NEAR BASE. GRADATIONAL BASAL CONTACT INTO MORE HIGHLY BURROWED UNIT.
42	95.04	95.69	0.65	*70		SILTSTONE	SSY.DK.GY.LAM.WRMBU.SLD HIGHLY BURROWED SLTST/MUDST LAMINAE. SLIGHTLY COARSER THAN ABOVE UNIT. LOAD CASTS AND WORN BURROWS INDICATE TOPS UP.
42	95.69	96.35	0.66	*70		MUDSTONE	SLTY.DK.GY.LAM.SLD GRADATIONAL NEAR-PLANAR LAMINAE DISRUPTED LOCALLY BY BURROWING. MINOR LOAD CASTING INDICATES TOPS UP. UNIT SLIGHTLY FINER THAN ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
43	96.35	97.25	0.90	*69			SILTSTONE	CLYY.DK.GY.LAM.BRKN UNIT PLANAR LAMINATED WITH GRADATIONAL CONTACTS EXCEPT NEAR MIDDLE OF UNIT WHERE THERE ARE OCCASIONAL MUDST. WISPS. LOW ANGLE JOINTING.
43	97.25	97.85	0.60	69			SILTSTONE	CLYY.DK.GY.LAM.VBRKN RUBBLE. LITHOLOGICALLY AS ABOVE.
44	97.85	99.40	1.55	*70			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.VBRKN MORE HIGHLY BURROWED THAN ABOVE UNIT. LAMINAE CONTACTS ARE PLANAR & GRADATIONAL. LOWER THIRD OF UNIT IS RUBBLE.
45	99.40	101.35	1.95	*71			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.VBRKN AS ABOVE. NORM BURROWS INDICATE TOPS UP.
46	101.35	103.45	2.10	*70			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE.
47	103.45	104.55	1.10	73			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE. GRADATIONAL PLANAR LAMINAE CONTACTS. LOCALIZED BIOTURBATION.
47	104.55	105.61	1.06	*75			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
48	105.61	107.18	1.57	*71			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.VBRKN SLIGHTLY FINER THAN ABOVE. ABUNDANT LOW ANGLE JOINT PLANES RESULTING IN V BROKEN CORE. LOCALIZED BIOT. IN BASAL 25 CM.
49	107.18	107.33	0.15	71			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.VBRKN AS ABOVE. RUBBLE.
49	107.33	109.02	1.69	*70			MUDSTONE	SLTY.DK.GY.LAM.BRKN GRADATIONAL PLANAR MUDST/SLTST. LAMINAE CONTACTS. LOW ANGLE JOINTING AS ABOVE.
50	109.02	109.32	0.30	70			MUDSTONE	SLTY.DK.GY.LAM.VBRKN RUBBLE. LITHOLOGICALLY AS ABOVE.
50	109.32	110.22	0.90	71			MUDSTONE	SLTY.DK.GY.LAM.VBRKN LARGELY RUBBLE. LITHOLOGICALLY AS ABOVE.
50	110.22	112.02	1.80	*71			MUDSTONE	SLTY.DK.GY.LAM.BRKN LITHOLOGICALLY AS ABOVE. GRADATIONAL BASAL CONTACT.
51	112.02	113.53	1.51	*61			SILTSTONE	CLYY.DK.GY.LAM.XBDG.VBRKN SLIGHTLY COARSER THAN ABOVE WITH GRADATIONAL PLANAR CONTACTS BETWEEN EVENLY SPACED CROSS LAMINAE. UNIT BECOMES COARSER TOWARDS THE BASE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
52	113.53	113.88	0.35	66			SILTSTONE	SSY.M.GY.LAM.VBRKN MOSTLY RUBBLE. OCCASIONAL PLANAR MUDST LAMINAE.
52	113.88	114.96	1.08	*70			SILTSTONE	SSY.DK.GY.LAM.BRKN AS ABOVE. GRADATIONAL PLANAR LAMINAE CONTACTS. ABUNDANT LOW ANGLE JOINTING IN MIDDLE OF UNIT.
52	114.96	115.08	0.12	68			SILTSTONE	SSY.DK.GY.LAM.BRKN AS ABOVE.
53	115.08	116.70	1.62	*65			SANDSTONE	SLTY.DK.GY.LAM.XBDG.BRKN SLIGHTLY COARSER THAN ABOVE WITH MED ANGLE SMALL SCALE X-LAMINATIONS.
54	116.70	117.44	0.74	*71			SILTSTONE	SSY.DK.GY.LAM.XBDG.SLD SLIGHTLY FINER THAN ABOVE. GRADATIONAL CONTACTS BETWEEN PLANAR LAMINAE. X-LAMINATIONS ALSO PRESENT NEAR TOP OF UNIT.
54	117.44	118.44	1.00	*70			SILTSTONE	CLYY.DK.GY.LAM.SLD FAINT GRADATIONAL LAMINAE CONTACTS. TUFFACEOUS.
54	118.44	118.49	0.05	68			BENTONITE	LT.GY.SLD SOFT. SHARP BASAL CONTACT AND GRADATION AL UPPER CONTACT.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
54	118.49	118.63	0.14	67			MUDSTONE	DK.GY.MAS.SLD FEATURELESS.
55	118.63	119.66	1.03	*65	10178		MUDSTONE	SLTY.M-DK.GY.BRKN PLANT FRAGS WITHIN, SOME COALIFIED. LOWER 25CM SAMPLED.
55	119.66	119.97	0.31	66	10179	I	COAL	C-2.VBRKN
55	119.97	120.01	0.04	66	10179	I	MUDSTONE	CARB.DK.GY.SLD COALY LENSES WITHIN.
55	120.01	120.06	0.05	66	10179	I	COAL	C-2.SLD
55	120.06	120.08	0.02	66	10179	I	MUDSTONE	CARB.DK.GY.SLD
55	120.08	120.22	0.14	66	10179	I	COAL	C-2.VBRKN
56	120.22	120.80	0.58	67	10179	I	COAL	C-2.BRKN
56	120.80	120.86	0.06	67	10179	I	COAL	C-3.SLD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
56	120.86	121.34	0.48		67	10179 I	COAL LOSS	
56	121.34	121.42	0.08		68	10180 I	ROCK LOSS	
56	121.42	121.49	0.07		68	10180 I	MUDSTONE	SLTY. M-DK. GY. SLD MINOR PLANT FRAGS.
56	121.49	121.56	0.07		68	10180 I	COAL	C-3. SLD
56	121.56	121.78	0.22		68	10180 I	COAL	C-2. BRKN
56	121.78	121.83	0.05		68	10180 I	MUDSTONE	CARB. DK. GY. SLD
56	121.83	121.87	0.04		68	10180 I	ROCK LOSS	
56	121.87	122.51	0.64		68	10180 I	COAL LOSS	
56	122.51	123.17	0.66		69	10180 I	COAL	C-2. BRKN
57	123.17	123.34	0.17		70	10180 I	COAL	C-3. SHRD
57	123.34	123.54	0.20		70	10181 I	COAL	C-1. YBRKN GOOD CLEAT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
57	123.54	124.88	1.34		71	10181 I	COAL	C-1. YBRKN GOOD CLEAT.
58	124.88	125.09	0.21		72	10181 I	COAL	C-1. SLD
58	125.09	125.13	0.04		72	10181 I	COAL	C-2. BRKN
58	125.13	126.53	1.40		73	10182	MUDSTONE	CARB. DK. GY. SLD CARB. PLANT FRAGS THROUGHOUT, COLAY LENS ES NEAR TOP. SILTY TOWARDS BASE. TOP 25 CM. SAMPLED.
58	126.53	126.70	0.17		73		MUDSTONE	SLTY. M-DK. GY. SLD
59	126.70	127.70	1.00		74		SILTSTONE	SSY. DK. GY. LAM. WRMBU. SLD GRADATIONAL WAVY LAMINAE CONTACTS LARGE LY OBSCURED BY BURROWING AND SOFT SEDIME NT DEFORMATION IN BASAL 30CM OF UNIT. G RADATIONAL BASAL CONTACT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
59	127.70	128.37	0.67	*75		SANDSTONE	SLTY. DK. GY. LAM. BRKN COARSER THAN ABOVE UNIT. ROUNDED TO ANGULAR MUDST CLASTS UP TO 1CM IN TOP 10CM OF UNIT. VERTICAL WORM BURROW INDICATE S TOPS UP. SSD (KINKING) 20 CM FROM BASE. LAMINAE ARE PLANAR AND INDISTINCT IN BASAL 10 CM. SHARP BASAL CONTACT.
59	128.37	128.71	0.34	75		SANDSTONE	FG. PR. LT. GY. MAS. VBRKN FEATURELESS. VERY BROKEN.
60	128.71	129.67	0.96	76		SANDSTONE	FG. PR. LT. GY. MAS. VBRKN AS ABOVE. FEATURELESS. MINOR VERTICAL Q. TZ VEINING.
60	129.67	130.44	0.77	77		SANDSTONE	FG. PR. LT. GY. MAS. BRKN AS ABOVE. NUMEROUS VERTICAL & LOW ANGLE JOINT PLANES.
61	130.44	132.18	1.74	78		SANDSTONE	FG. PR. LT. GY. MAS. BRKN AS ABOVE. FEATURELESS EXCEPT RARE MUDST RIPUP CLASTS UP TO 2CM.
61	132.18	132.39	0.21	79		SANDSTONE	FG. PR. LT. GY. MAS. SLD AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
62	132.39	132.73	0.34	79		SANDSTONE	FG. PR. M. GY. MAS. SLD FEATURELESS EXCEPT ROUNDED TO ANGULAR MUDST RIPUP CLASTS UP TO 1CM IN BASAL 10 CM. RELATIVELY SHARP BASAL CONTACT.
62	132.73	134.56	1.83	*80		SANDSTONE	CLYY. FG. PR. DK. GY. VTHNB. HRMBU. SLD BANDED SS WITH MUDST BANDS FROM 1MM TO 5CM WITH SHARP CONTACTS. LAMINAE MOSTLY PLANAR AND FREQUENTLY DISRUPTED BY VERTICAL WORM BURROWS AND LOAD CASTING WHICH INDICATE TOPS UP.
62	134.56	135.14	0.58	76		SILTSTONE	CLYY. DK. GY. LAM. HRMBU. SLD SLIGHTLY FINER THAN ABOVE UNIT. LAMINAE ARE MORE CLOSELY SPACED AND LAMINAE CONTACTS ARE MORE GRADATIONAL. PLANAR CONTACTS WITH MINOR LOAD CASTING INDICATING TOPS UP.
63	135.14	136.54	1.40	*72		MUDSTONE	SLTY. DK. GY. LAM. HRMBU. SLD FINER THAN ABOVE UNIT. LAST 3 UNITS REPRESENT A CUS. LAM LESS DISTINCT AND CONTACTS ARE COMPLETELY GRADATIONAL. MINOR VERTICAL WORM BURROWS INDICATE TOPS UP.

\* DENOTES MEASURED BCA

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## GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
64	136.54	137.82	1.28	76		MUDSTONE	SLTY. DK. GY. LAM. BRKN LITHOLOGICALLY AS ABOVE. ABUNDANT BRECCIATION WITH CLAY INFILL. SHARP BASAL CONTACT.
64	137.82	138.04	0.22	78		SILTSTONE	DK. GY. MAS. YBRKN RUBBLE, CORE TWIST OFF IN MIDDLE OF UNIT.
64	138.04	138.43	0.39	*79		SILTSTONE	CLYY. DK. GY. LAM. HRMBU. SLD MASSIVE AT BASE AND GRADES BASALLY INTO PLANAR LAMINATED UNIT WITH SHARP CONTACTS. ABUNDANT BURROWING. OBSCURES CONTACT LOCALLY.
65	138.43	140.06	1.63	*69		SILTSTONE	CLYY. DK. GY. LAM. HRMBU. YBRKN SOME PART OF UNIT RUBBLY. ABUNDANT LOW ANGLE JOINT PLANES. LITHOLOGICALLY AS ABOVE WITH ABUNDANT BURROWING.
66	140.06	141.18	1.12	71		SANDSTONE	SLTY. DK. GY. VTHNB. HRMBU. BRKN SILTY BANDED SS WITH BDG UNITS 1CM TO 5 CM WITH RELATIVELY SHARP PLANAR CONTACTS. ABUNDANT MORM BURROWS INDICATE TOPS UP. 4CM BAND OF SS WITH ANGULAR QTZ CLASTS (STORM UNIT) 25CM FROM BASE.

\* DENOTES MEASURED BCA

87/02/13

## GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 32

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
66	141.18	141.94	0.76	*72		SANDSTONE	SLTY. DK. GY. VTHNB. HRMBU. BRKN AS ABOVE. ABUNDANT MORM BURROWS AND LOAD CASTS INDICATE TOPS UP. BASAL 10CM IS SLIGHTLY COARSER GRAINED BUT GRADES BACK INTO SILTY BANDED SS AS ABOVE.
67	141.94	143.93	1.99	*70		SANDSTONE	SLTY. FG. DK. GY. THNB. HRMBU. SLD CONTAINS 15CM BEDS OF HIGHLY BURROWED CLYY SLT, MORE MAS FG SS WITH OCCASIONAL PLANAR MUDST BANDS UP TO TO 2CM WITH SHARP CONTACTS AND OCCASIONAL MAS GRANULAR SS. WHOLE SEQUENCE REPEATED FOR NEXT 5 M. LOAD CASTS AND HRMBURS. UP TO 7 CM LONG. TOPS UP.
68	143.93	144.06	0.13	70		SILTSTONE	CLYY. DK. GY. LAM. HRMBU. SLD SIMILAR TO THE HIGHLY BURROWED CLYY SLT OF ABOVE UNIT. CONTACTS ARE REL. SHARP AND PLANAR BUT DISRUPTED BY BURROWING.
68	144.06	145.96	1.90	*70		SANDSTONE	SLTY. FG. DK. GY. THNB. HRMBU. SLD AS UNIT ABOVE LAST. UNIT VARIES BETWEEN HIGHLY BURROWED CLYY SLT (AS DIRECTLY ABOVE) TO OCCASIONALLY LAM FG SS. ABUNDANT BURROWS AND LOAD CASTS INDICATE TOPS UP.

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDHB6034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	145.96	146.09	0.13	70			SANDSTONE	CLYY, FG, DK, GY, LAM, SLD 1MM TO 1CM MUDST BANDS HAVE SHARP PLANA R TO MAVY CONTACTS WITH FG SS.
69	146.09	147.96	1.87	*70			SANDSTONE	SLTY, FG, DK, GY, THNB, SLD UNIT VARIABLE AS ABOVE, HAS SS GRADES I NTO SS WITHMUDST BANDS UP TO 2CM WITH S HARP PLANAR CONTACTS. OCCASIONAL 9CM GR ANULAR SS BANDS WITHANGULAR QTZ CLASTS (STORM UNIT). NUMEROUS MUDST RIPUPS IN BASAL 30 CM, RARE RIPUPS IN REST OF UNI T.
70	147.96	148.83	0.87	69			SANDSTONE	SLTY, FG, DK, GY, THNB, WRMBU, BRKN HIGHLY BURROWED DISRUPTING BDG CONTACTS , UNIT LESSDISTINCTLY BANDED THAN UPPER UNIT. GRADATIONAL BASAL CONTACT.
70	148.83	149.03	0.20	69			SANDSTONE	FG, DK, GY, MAS, BRKN MASSIVE AND FEATURELESS EXCEPT LGE ROUN DED RIPUP CLASTS UP TO 4CM.
70	149.03	149.64	0.61	*69			SANDSTONE	FG, DK, GY, THNB, BRKN OCCASIONAL MUDST BANDS UP TO 1CM WITH S HARP PLANARCONTACTS. LOAD CAST INDICATE S TOPS UP.

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDHB6034

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
70	149.64	149.92	0.28	69			SANDSTONE	SLTY, FG, DK, GY, LAM, BIOTR, SLD HIGHLY BURROWED, TOTALLY OBSCURED BDG.
71	149.92	150.83	0.91	69			SILTSTONE	CLYY, DK, GY, LAM, BIOTR, SLD HIGHLY BIOTURBATED NEAR BASE. PYRITE BL EB 3CM WIDE. LAMINAE CONTACTS ARE PLANA R TO MAVY AND GRADATIONAL. MINOR NORM & URROWS INDICATE TOPS UP.
71	150.83	151.01	0.18	69			MUDSTONE	CARB, BLK, MAS, SLD FEATURELESS. 1CM PYRITE AT BASE.
71	151.01	151.04	0.03	69			COAL	C-5, BLK, LAM, SLD QTZ VEINS THROUGHOUT.
71	151.04	151.08	0.04	69			COAL	C-3, BLK, LAM, SLD VITRAIN LAMINAE AND QTZ VEINING.
71	151.08	151.33	0.25	69			MUDSTONE	CARB, BLK, LAM, SLD ABUNDANT VITRAIN LAMINAE AND SINGLE PYR ITE BAND 1CM WIDE. GRADATIONAL BASAL CO NTACT.
71	151.33	152.03	0.70	69			MUDSTONE	CARB, BLK, MAS, SLD FEATURELESS EXCEPT ABUNDANT PLANT FRAG MENTS (NILSSONIA SP, PITYOPHYLLUM NORDEN SKIOLDII).

\* DENOTES MEASURED BCA



PROJECT: KPH BLOCK: LR DATA SOURCE: ODH86034

BOY	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
72	152.03	154.13	2.10	69			MUDSTONE	BLK.MAS.SLD FEATURELESS MASSIVE MUDST. SINGLE PYRIT E BLEB.
73	154.13	154.47	0.34	69			MUDSTONE	BLK.MAS.BRKN ABUNDANT LISTRIC SHEAR SURFACES. THIN Q TZ VEIN 1CMWIDE PERPENDICULAR TO CORE. PLANT HASH (PITYOPHYLLUM NORDENSKIOLDI ).
73	154.47	156.03	1.56	69			MUDSTONE	BLK.MAS.BRKN ABUNDANT LISTRIC SHEAR SURFACES IN OTHE R NISE. FEATURELESS MUDSI. RARE VITRAIN LAMINAE.
74	156.03	157.75	1.72	69			MUDSTONE	BLK.MAS.BRKN SOFT, FEATURELESS MUDST. POORLY CONSOL. MINOR PLANT HASH. T.O. = 158.50 M. DR ILLER'S MARK.

\* DENOTES MEASURED BCA  
NEWPAGE













# Gulf Canada Corporation Coal Division

Geophysical Log

# 723

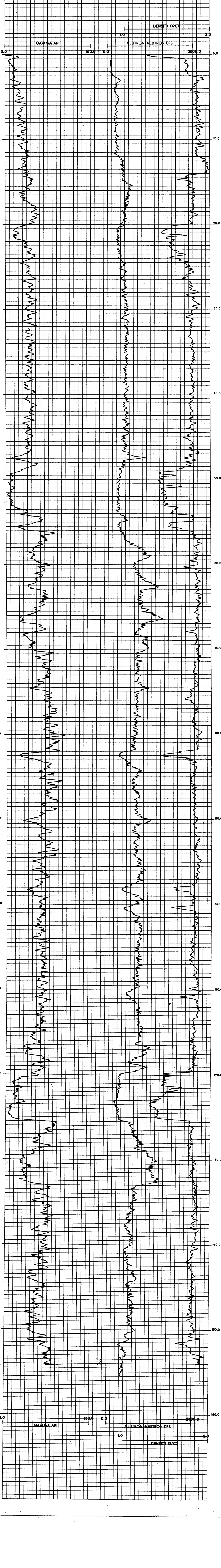
**Data source:** KPNLRDDH86034  
**Log Date:** 86-09-27  
**Company:** CENTURY  
**Geologist:** MACLEOD

**Province:** BC    **Northing:** 6344600.00    **Lat:** 571447  
**Zone:** 9    **Easting:** 508167.00    **Long:** 1285153  
**Measuring Point:**    **Elevation:** 1503.6

**Scale:** 1 to 100.0  
**Depth Range:** 0.0 to 160.0  
**True Thickness:** NC

**Comments:**  
 1. LOGGED THROUGH THE RODS  
 2.

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9055A	1 IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	1 IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	75	9030A	1 IN PIPE





KPNLRDDH86035

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86035

DATE - 02/13/87

- HISTORY -

START DATE - 27/09/86

END DATE - 30/09/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - SAVOIE

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE. CASING TO 20.42  
M WITH MINOR RECOVERY BETWEEN 7.67 M AND 20.42 M.

- LOCATION -

PROVINCE - BC

ELEVATION - 1502.46

ZONE - 9

NORTHING - 6344512.00

EASTING - 508451.56

LICENCE/LEASE NUMBER -

LATITUDE - 571444

LONGITUDE - 1285136

- ORIENTATION -

LENGTH - 212.45

INCLINATION - 90.0

AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 20.42

AQUIFER DEPTHS (M) - 0.00

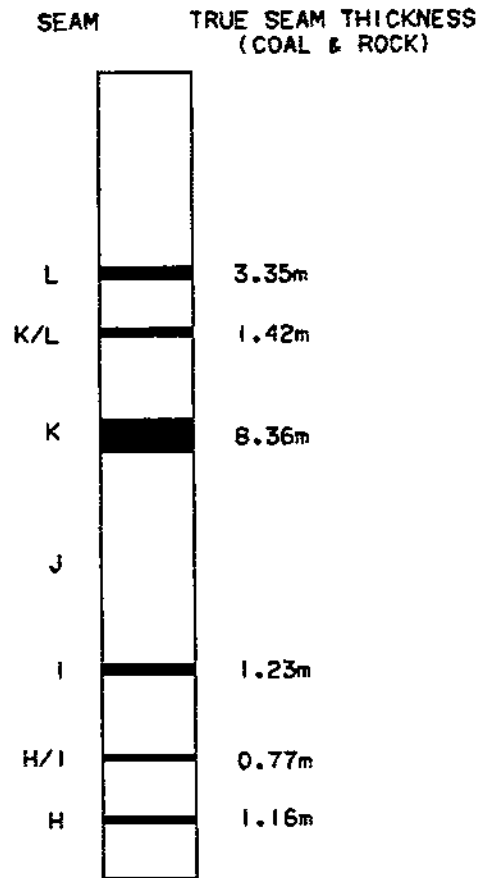
0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====



**NOTE:**

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

**FIGURE**

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86035

GULF CANADA CORPORATION  
11/03/87  
KLAP: [205057]870063035.L06



87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	7.67	7.67	60		OVERBURDEN	CASING TO 20.42 M BUT MINIMAL CORE RECD. VERY BETWEEN 7.67 M AND 20.42 M.
1	7.67	8.23	0.56	60		SANDSTONE	FG.M.GY.MAS.SLD
1	8.23	8.75	0.52	60		SANDSTONE	FG.M.GY.MAS.BRKN CAVE MATERIAL WITHIN.
1	8.75	11.28	2.53	60		ROCK LOSS	
1	11.28	11.49	0.21	60		SANDSTONE	FG.M.GY.MAS.BRKN CAVE MATERIAL WITHIN.
1	11.49	11.85	0.36	60		COAL	C-3.PHRD MUDDY, SHEARED & POWDERED.
1	11.85	15.16	3.31	60		ROCK LOSS	
2	15.16	15.38	0.22	60		COAL	C-4.PHRD MUDDY, SHEARED & POWDERED.
2	15.38	15.58	0.20	60		MUDSTONE	SLTY.M-DK.GY.VBRKN POSSIBLY CAVE.
2	15.58	15.63	0.05	60		COAL	C-3.PHRD

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
2	15.63	15.70	0.07	60		SILTSTONE	CLYY.M-DK.GY.SLD
2	15.70	15.94	0.24	60		COAL	C-3.PHRD
2	15.94	16.49	0.55	60		MUDSTONE	CARB.DK.GY.VBRKN COALY STRINGERS THROUGHOUT.
2	16.49	19.49	3.00	60		ROCK LOSS	
2	19.49	19.66	0.17	60		SANDSTONE	FG.M.GY.BRKN HEATHERED.
2	19.66	19.78	0.12	60		MUDSTONE	CARB.M-DK.GY.BRKN
3	19.78	20.18	0.40	60		MUDSTONE	DK.GY.VBRKN DEFINITE CORE LOSS POSSIBILITY. CAVE IN SS CHUNKS FROM CAVE IN.
3	20.18	20.69	0.51	60		ROCK LOSS	
3	20.69	21.58	0.89	60		MUDSTONE	M-DK.GY.LAM.BRKN SPARSE SLTST LAMINATIONS. CARBONATIZED PLANT FRAGMENTS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	21.58	21.71	0.13	60			SILTSTONE	M.GY.LAM.SLD INTERLAMINATED MUDST LAMINAE.
4	21.71	22.63	0.92	*60			SILTSTONE	CLY. M.GY. BRKN INDISTINCT INTERLAMINATED MUDST LAMINAE. MINOR LISTRIC SURFACES AT APPROX 45 DEGREES WITH A VERTICAL SENSE OF MOVEMENT.
4	22.63	23.74	1.11	61			ROCK LOSS	
4	23.74	24.09	0.35	61			MUDSTONE	SLTY. M-DK. GY. VBRKN RUBBLE. PROBABLE CORE LOSS. CAVED IN MATERIAL (SOME SS).
4	24.09	25.26	1.17	62			ROCK LOSS	
4	25.26	25.41	0.15	*62			SILTSTONE	SSY. M.GY. LAM. SLD TRACES OF MUDST LAMINAE.
5	25.41	26.40	0.99	*60			SILTSTONE	SSY. M.GY. LAM. BIOTR. BRKN AS ABOVE. MINOR BANDS OF MUDST. VERTICAL STRIATIONS ON A PLANER SURFACE AT 45 DEGREES TO CORE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	26.40	26.79	0.39	53			ROCK LOSS	
5	26.79	27.18	0.39	49			SILTSTONE	M.GY. BIOTR. SLD BDG OBSCURED BY BIOTRB. ONE QTZ VEIN.
5	27.18	27.56	0.38	*45			SANDSTONE	FG. VPR. LT-M.GY. THNB. XBDG. SLD TRACES OF MUDST.
5	27.56	27.82	0.26	38			SILTSTONE	M.GY. LAM. SLD SPARSE FG SS LAMINATIONS. TRACES OF MUDST LAMINATIONS.
6	27.82	28.64	0.82	*26			SANDSTONE	FG. VPR. LT-M.GY. LAM. SLD TRACES OF MUDST LAMINAE. FAULT AT BASE OF SECTION. ORIENTATION-26 DEGREES. AMOUNT OF DISPLACEMENT IS >15CM. DIRECTION UNKNOWN.
6	28.64	29.02	0.38	33			SANDSTONE	FG. VPR. M.GY. LAM. SLD ABUNDANT DISTINCT MUDST LAMINAE.
6	29.02	29.47	0.45	38			SANDSTONE	FG. PR. LT-M.GY. THNB. SLD VERY SPARSE TRACES OF MUDST LAMINAE.
6	29.47	29.54	0.07	41			SANDSTONE	FG. VPR. M.GY. LAM. SLD ABUNDANT DISTINCT MUDST LAMINAE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	29.54	29.76	0.22	42			SANDSTONE	FG. PR. LT-M. GY. THNB. SLD VERY SPARSE TRACES OF MUDST LAMINAE.
7	29.76	30.15	0.39	46			SANDSTONE	FG. PR. LT-M. GY. THNB. SLD AS ABOVE.
7	30.15	30.45	0.30	50			ROCK LOSS	
7	30.45	30.54	0.09	*52			SANDSTONE	FG. VPR. M. GY. LAM. BRKN ABUNDANT MUDST/SLTST. LAMINAE.
7	30.54	30.68	0.14	52			SANDSTONE	FG. PR. LT-M. GY. THNB MINOR TRACES OF MUDST. BRKN. UP.
7	30.68	31.39	0.71	53			SANDSTONE	FG. PR. LT-M. GY. THNB. BRKN MUDST/SLTST RIPUP CLASTS (LGST 4CM). MI NOR MUDST TRACES. QTZ FILLED FRACTURE AT 26 DEGREES.
7	31.39	31.44	0.05	54			MUDSTONE	SLTY. M-DK. GY. THNB. SLD SCOURED EROSIONAL TOP. TOPS UP.
7	31.44	31.83	0.39	54			SANDSTONE	FG. VPR. M. GY. THNB. SLD
8	31.83	32.48	0.65	55			SANDSTONE	FG. PR. LT-M. GY. MAS. VBRKN ABUNDANT DARK SLTST CLASTS IN THE BOTTO M. 20CM. SUBANGULAR. <2CM. QTZ FILLED FR ACTURES AT 25 DEGREES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	32.48	32.89	0.41	56			ROCK LOSS	
8	32.89	33.99	1.10	57			SANDSTONE	FG. PR. M. GY. MAS. BRKN NUMEROUS MUDST/SLTST RIPUP CLASTS AS AB OVE. 20CM. ZONE OF INTERSECTING QTZ VEIN S. LARGE 2CM QTZ VEIN 15CM FROM BASE OF INTERVAL.
9	33.99	35.64	1.65	*60			SANDSTONE	MG. PR. LT-M. GY. MAS. BRKN MINOR PLANAR MUDST TRACES. FEW MUDST RI PUP CLASTS.
9	35.64	35.80	0.16	57			SANDSTONE	MG. PR. LT-M. GY. MAS. BRKN
10	35.80	35.90	0.10	57			SANDSTONE	MG. PR. S-P. GY. MAS. BRKN MINOR FAULT AT BASE OF INTERVAL AT 35 D EGREES TO CORE LENGTH.
10	35.90	37.18	1.23	54			SANDSTONE	MG. PR. S-P. GY. MAS. BRKN FEW MUDST TRACES. NUMEROUS QTZ VEINS < 5CM. TALC COATED SURFACES IN TOP 30CM.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
10	37.13	37.52	0.39	52			SANDSTONE	PBLY. MG. VPR. LT-M. GY. MAS. SLD A FEW CHERT PEBBLES, SUBROUNDED, <2CM. MINOR QTZ VEINING.
11	37.52	38.35	0.83	50			SANDSTONE	PBLY. MG. VPR. LT-M. GY. MAS. SLD AS ABOVE.
11	38.35	38.43	0.08	48			MUDSTONE	M. GY. VBRKN VERY SOFT AND CRUMBLY (DRY). <.4CM FRAG MENTS OF SS AND COALY FLECKS. ENCASED IN MUD.
11	38.43	38.87	0.44	47			ROCK LOSS	
11	38.87	39.68	0.81	*45			SANDSTONE	CG. VPR. LT-M. GY. MAS. BRKN BLACK CHERT PEBBLES <.5CM SPARSELY SPRE AD OUT THROUGH INTERVAL. MINOR QTZ VEIN ING.
12	39.68	40.98	1.30	45			SANDSTONE	CG. VPR. LT-M. GY. MAS. BRKN SPARSE LARGE SLTST RIPUP CLASTS, ANGULA R. QTZ VEINING (<.5CM) IN THE TOP 30CM.
12	40.98	41.07	0.09	45			SANDSTONE	MG. VPR. M. GY. THNB. SLD APPEARS TO CONTAIN VERY SMALL COAL FLEC KS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	41.07	41.10	0.03	*45			SILTSTONE	M. GY. YTHNB. SLD
12	41.10	41.21	0.11	46			SANDSTONE	MG. VPR. M. GY. YTHNB. SLD APPARENT SMALL FLECKS.
12	41.21	41.50	0.29	48			SILTSTONE	M. GY. MAS. SLD ABRUPT CHANGE IN LITHOLOGY FOR NO APPAR ENT REASON. CORE LOSS?
13	41.50	42.98	1.48	56			MUDSTONE	SLTY. M. GY. MAS. SLD ONE LISTRIC SURFACE WITH HORIZONTAL MOV EMENT ON A PLANE PERPENDICULAR TO CORE.
13	42.98	43.03	0.05	63			MUDSTONE	M. GY. VERY SOFT. SMALL WHITE QTZ FRAGMENTS BE DDED IN MUD.
13	43.03	43.37	0.34	*65			MUDSTONE	SLTY. M. GY. LAM. BRKN VERY THINLY INTERLAMINATED SLTST, ALMOS T. RYTHMIC. BDC PLANE CLVG.
13	43.37	43.68	0.31	63			ROCK LOSS	
14	43.68	43.77	0.09	62			MUDSTONE	SLTY. M. GY. LAM. BRKN AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	43.77	43.80	0.03	62			MUDSTONE	SLTY. M. GY SOFT, PASTE LIKE MATERIAL.
14	43.80	43.85	0.05	62			MUDSTONE	DK. GY. VBRKN ABUNDANT QTZ VEINING.
14	43.85	44.14	0.29	61			ROCK LOSS	
14	44.14	44.59	0.45	*59			MUDSTONE	SLTY. M-DK. GY. LAM. SLD INTERLAMINATED INDISTINCT SLTST.
14	44.59	45.57	0.98	60			MUDSTONE	SLTY. M-DK. GY. LAM. SLD AS ABOVE.
15	45.57	46.80	1.23	*62			SILTSTONE	M. GY. LAM. SLD INTERLAMINATED, WELL DEFINED MUDST. LAMI NAE. SANDIER TOWARD BASE.
15	46.80	47.45	0.65	70			SANDSTONE	SLTY. FG. PR. M. GY. THNB. WRMBU. SLD BANDS OF MUDST. ALONG WITH MUDST. LAMINAE NEAR BOTTOM OF INTERVAL. MINOR BURROHI NG. (<1CH) TOPS UP.
16	47.45	48.50	1.05	*77			MUDSTONE	SLTY. M-DK. GY. LAM. VBRKN MINOR SLTY. LAMINATIONS, ABUNDANT HORIZO NTALLY STRIATED LISTRIC SURFACES.
16	48.50	48.97	0.47	75			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	48.97	49.45	0.48	74			MUDSTONE	M-DK. GY. MAS. VBRKN PLANT FRAGMENTS (HILSSONIA CANADENSIS?)
16	49.45	49.57	0.12	74			ROCK LOSS	
17	49.57	50.75	1.18	73			MUDSTONE	CARB. DK. GY. MAS. VBRKN ABUNDANT PLANT FRAGMENTS AND COALLY STR INGERS.
18	50.75	50.78	0.03	71			MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
18	50.78	50.86	0.08	71	10183	L	COAL LOSS	
18	50.86	51.21	0.35	71	10183	L	COAL	C-2. PWRD
18	51.21	51.27	0.06	70	10183	L	MUDSTONE	CARB. DK. GY. SLD COALY.
18	51.27	51.40	0.13	70	10183	L	ROCK LOSS	
18	51.40	51.59	0.19	70	10183	L	COAL LOSS	
18	51.59	51.80	0.21	69	10183	L	COAL	C-3. VBRKN PARTIALLY POWDERED & BANDED WITH C-4.

\* DENOTES MEASURED BCA



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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	51.80	52.19	0.39	69	10183	L	MUDSTONE	CARB. DK. GY. BRKN PARTIALLY SHEARED. COALY STRINGERS WITH IN.
18	52.19	53.25	1.06	67	10183	L	COAL LOSS	
18	53.25	53.47	0.22	66	10183	L	COAL	C-4. PHRD SHEARED, POWDERED & MUDDY.
18	53.47	53.55	0.08	66	10183	L	MUDSTONE	CARB. DK. GY. SLD
18	53.55	53.62	0.07	66	10183	L	ROCK LOSS	
18	53.62	53.85	0.23	65	10183	L	COAL LOSS	
18	53.85	54.00	0.15	65	10183	L	ROCK LOSS	
18	54.00	54.30	0.30	64	10183	L	COAL LOSS	
18	54.30	54.40	0.10	64	10183	L	COAL	C-4. SHRD SHEARED & MUDDY.
18	54.40	54.66	0.26	64	10184		MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS WITHIN LITRIC SURFACES.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	54.66	54.78	0.12	63			MUDSTONE	CARB. DK. GY. SLD SOFT, MANY COAL FLECKS.
19	54.78	54.96	0.18	63			SILTSTONE	M-DK. GY. THNB. SLD SMALL CARBONATIZED PLANT FRAGMENTS.
19	54.96	55.26	0.30	63			SILTSTONE	SSY. M. GY. SSD. SLD TRACES OF MUDST LAMINATION. TOPS POSSIBLY DOWN?
19	55.26	55.46	0.20	*62			SILTSTONE	SSY. M. GY. LAM. SLD INTERLAMINATED MUDST. NUMEROUS TALC COATED SURFACES.
19	55.46	56.29	0.83	63			SILTSTONE	CLYY. M. GY. MAS. SHRD ABUNDANT TALC COATED SURFACES.
20	56.29	56.49	0.20	63			SILTSTONE	M. GY. MAS. SLD MUDIER TOWARD BASE.
20	56.49	56.89	0.40	64			MUDSTONE	M. GY. MAS COAL FLECKS IN VERY SOFT MUD NEAR BASE.
20	56.89	57.18	0.29	64			SILTSTONE	M. GY. MAS. BRKN VERTICAL STRIATIONS ON QTZ.
20	57.18	58.00	0.82	65			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	58.00	58.33	0.33	66			SILTSTONE	M. GY. MAS. VBRKN MINOR BANDS OF FG SS.
20	58.33	58.84	0.51	67			ROCK LOSS	
20	58.84	58.86	0.02	67			MUDSTONE	M. GY. SHRD SOFT, ABUNDANT QTZ VEINING PARALLEL TO BDG.
20	58.86	59.17	0.31	67			SANDSTONE	SLTY. FG. M. GY. MAS. VBRKN MINOR QTZ VEINING.
20	59.17	59.81	0.64	68			ROCK LOSS	
21	59.81	60.09	0.28	69			SANDSTONE	SLTY. FG. M. GY. LAM. VBRKN MUDST. LAMINATIONS.
21	60.09	60.50	0.41	69			SANDSTONE	FG. PR. LT-M. GY. MAS. BRKN VERTICAL STRIATIONS ON FRACTURE.
21	60.50	60.53	0.03	69			MUDSTONE	SLTY. M. GY. VTHHB. SLD LOAD CASTS, TOPS UP.
21	60.53	60.95	0.42	70			SANDSTONE	FG. PR. LT-M. GY. MAS. BRKN SPARSE SLTST RIPUP CLASTS IN A 5CM ZONE . MINOR QTZ VEINING.
21	60.95	61.46	0.51	70			SANDSTONE	FG. PR. LT-M. GY. MAS SPARSE, VERY INDISTINCT MUDST LAMINAE.

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	61.46	61.69	0.23	71			ROCK LOSS	
22	61.69	63.39	1.70	72			SANDSTONE	FG. PR. LT-M. GY. MAS. BRKN MINOR QTZ VEINING, HORIZONTALLY STRIATE D FRACTURE SURFACES, VERY BROKEN TOWARD BASE.
23	63.39	64.95	1.56	75			SANDSTONE	FG. PR. LT-M. GY. MAS. VBRKN FRACTURES ALONG THE LENGTH OF CORE, MIN OR QTZ VEINING, MUDST LAMINAE TOWARD SA SE.
23	64.95	65.56	0.61	76			ROCK LOSS	
23	65.56	65.79	0.23	77			MUDSTONE	SLTY. M. GY. MAS. VBRKN SLIGHTLY SHEARED.
24	65.79	65.83	0.04	77			MUDSTONE	SLTY. M. GY. SLD
24	65.83	67.43	1.60	*78			SILTSTONE	SSY. PR. M. GY. THNB. VBRKN THIN SANDY & MUDDY BANDS WITHIN.
24	67.43	67.87	0.44	78			ROCK LOSS	
24	67.87	67.95	0.08	78			MUDSTONE	CARB. DK. GY PYRITE ABUNDANT WITHIN.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	67.95	68.10	0.15	78		K/L	COAL	C-3.YBRKN
25	68.10	68.23	0.13	78		K/L	COAL	C-3.YBRKN
25	68.23	68.34	0.11	78		K/L	COAL	C-4.BRKN
25	68.34	68.44	0.10	78		K/L	COAL LOSS	
25	68.44	68.59	0.15	78		K/L	ROCK LOSS	
25	68.59	69.40	0.81	78		K/L	COAL LOSS	
25	69.40	70.62	1.22	78			MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT.
25	70.62	70.95	0.33	78			MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT.
25	70.95	71.55	0.60	78			ROCK LOSS	
26	71.55	72.70	1.15	78			MUDSTONE	M-DK. GY. MAS. BRKN SILTY IN SOME PLACES. ABUNDANT CARBONAT IZED PLANT FRAGMENTS.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	72.70	73.17	0.47	78			MUDSTONE	SLTY. M. GY. MAS. SLD BAND OF SLTST. DECREASING PLANT FRAGMEN TS.
27	73.17	73.92	0.75	78			MUDSTONE	SLTY. DK. GY. LAM. SLD SLTST LAMINATIONS THROUGHOUT. TOPS UP (LOAD CAST). VERTICAL STRIATIONS ON A QTZ COVERED FRACTURE AT 45 DEGREES.
27	73.92	75.18	1.26	*78			MUDSTONE	SLTY. M. GY. MAS. WRMBU. SLD SLTST LAMINATIONS IN THE FIRST 30CM WHI CH DISAPPEAR TOWARD THE BASE OF THE INT ERVAL. MINDR. WRMBUR. (TOPS UP).
28	75.18	76.88	1.70	79			MUDSTONE	SLTY. M-DK. GY. MAS. SLD VERY INDISTINCT SLTY. BANDS.
28	76.88	77.08	0.20	80			ROCK LOSS	
28	77.08	77.28	0.20	81			MUDSTONE	SLTY. M-DK. GY. MAS. SLD
29	77.28	79.36	2.08	82			MUDSTONE	SLTY. M-DK. GY. MAS. SLD
30	79.36	79.64	0.28	*83			MUDSTONE	SLTY. M-DK. GY. MAS. SLD LISTRIC SURFACES. MINDR SLTST LAMINAE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	79.64	79.83	0.19	84			MUDSTONE	M-DK. GY. MAS. SHRD VERY SOFT.
30	79.83	80.28	0.45	84			ROCK LOSS	
30	80.28	80.46	0.18	85			MUDSTONE	SLTY. M-DK. GY. MAS. SLD SPARSE INDISTINCT SLTY. LAMINAE.
30	80.46	81.78	1.32	87			MUDSTONE	SLTY. M-DK. GY. MAS. SLD MONOTONOUS MUD.
31	81.78	83.53	1.75	*90			MUDSTONE	M-DK. GY. LAM. SLD VERY SMALL INTERLAMINATED SLTST. LAMINAE ( $< 1$ CM).
31	83.53	83.91	0.38	89			MUDSTONE	SLTY. M-DK. GY. LAM. SLD AS ABOVE. MONOTONOUS MUD.
32	83.91	85.94	2.03	87			MUDSTONE	SLTY. M-DK. GY. MAS. SLD AS ABOVE.
33	85.94	86.26	0.32	86			MUDSTONE	SLTY. M-DK. GY. MAS. SLD MONOTONOUS MUD.
33	86.26	88.01	1.75	85			MUDSTONE	SLTY. M-DK. GY. MAS. SLD AS ABOVE.
34	88.01	89.22	1.21	83			MUDSTONE	SLTY. M-DK. GY. MAS. BRKN AS ABOVE. LESS SLTY TOWARD BASE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
34	89.22	89.49	0.27	82			ROCK LOSS	
34	89.49	90.05	0.56	81			MUDSTONE	M-DK. GY. MAS. BRKN MINOR QTZ. VEINING AT BASE.
35	90.05	90.73	0.68	81	10201		MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS. THROUGHOUT. LOWER 25C M SAMPLED.
35	90.73	91.20	0.47	80	10202 K		COAL	C-5. BRKN ABUNDANT VITRAIN STRINGERS & THIN BANDS THROUGHOUT.
35	91.20	91.45	0.25	80	10202 K		COAL	C-2. BRKN
35	91.45	91.53	0.08	79	10202 K		COAL	C-5. BRKN C-2. BANDS WITHIN.
35	91.53	91.71	0.18	79	10202 K		COAL	C-3. VBRKN
35	91.71	91.83	0.12	79	10202 K		COAL	C-3. VBRKN
35	91.83	91.96	0.13	79	10202 K		COAL	C-3. VBRKN

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
36	91.96	92.61	0.65	78	10202	K	COAL LOSS	
36	92.61	92.99	0.38	78	10202	K	ROCK LOSS	
36	92.99	93.11	0.12	77	10202	K	COAL LOSS	
36	93.11	93.81	0.70	77	10202	K	COAL	C-2.BRKN C-1 IN PLACES.
36	93.81	93.96	0.15	76	10202	K	ROCK LOSS	
36	93.96	94.48	0.52	76	10203	K	COAL	C-2.BRKN C-1 IN PLACES.
36	94.48	94.53	0.05	76	10203	K	COAL	C-3.SLD
36	94.53	94.77	0.24	76	10203	K	COAL	C-2.VBRKN
36	94.77	94.88	0.11	75	10203	K	COAL	C-3.BRKN C-2 BANDS WITHIN.
36	94.88	95.05	0.17	75	10203	K	COAL	C-2.BRKN
37	95.05	95.30	0.25	75	10203	K	COAL	C-2.BRKN POWDERED AT END OF INTERVAL.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	95.30	95.48	0.18	75	10203	K	MUDSTONE	CARB.BRKN COALY PLANT FRAGS AND THIN BANDS WITHIN
37	95.48	96.50	1.02	74	10203	K	COAL LOSS	
37	96.50	97.29	0.79	73	10203	K	COAL	C-3.SHRD VERY SHEARED & POWDERED.
37	97.29	97.44	0.15	72	10204	K	MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.
37	97.44	97.80	0.36	72	10204	K	MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.
38	97.80	97.95	0.15	72	10204	K	MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.
38	97.95	98.07	0.12	71	10204	K	ROCK LOSS	
38	98.07	98.55	0.48	71	10204	K	COAL	C-3.BRKN SHEARED IN PLACES QTZ BAND AT BASE.
38	98.55	98.58	0.03	71	10204	K	MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN.
38	98.58	98.65	0.10	71	10204	K	ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	98.68	98.82	0.14	71	10204	K	COAL LOSS	
38	98.82	98.89	0.07	70	10204	K	COAL	C-3.BRKN
38	98.89	98.97	0.08	70	10204	K	MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN.
38	98.97	99.02	0.05	70	10204	K	ROCK LOSS	
38	99.02	99.15	0.13	70	10204	K	COAL LOSS	
38	99.15	99.39	0.24	70	10204	K	COAL	C-4.BRKN C-2 BANDS WITHIN.
38	99.39	99.56	0.17	70	10205		MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.
38	99.56	100.22	0.66	69	10205		MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT. UPPER 8CM SAMPLED.
39	100.22	101.11	0.89	68			MUDSTONE	BLK.MAS.SLD PLANT FRAGMENTS AND MINOR PYRITE AT TOP DECREASING TOWARD BASE. GRADATIONALLY SILTIER TOWARD BASE. FUS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
39	101.11	101.31	0.20	68			SILTSTONE	M.GY.MAS.VBRKN GRADATIONAL UPPER CONTACT, SLIGHTLY HAZ Y BASAL CONTACT.
39	101.31	102.06	0.75	67			SANDSTONE	FG.LT-M.GY.MAS.VBRKN SPARSE INDISTINCT SLTY/MUDST LAMINAE.
39	102.06	102.61	0.55	66			ROCK LOSS	
40	102.61	102.74	0.13	66			SANDSTONE	FG.LT-M.GY.MAS.VBRKN
40	102.74	102.97	0.23	66			ROCK LOSS	
40	102.97	103.56	0.59	65			SILTSTONE	SSY.M.GY.MAS.BRKN
40	103.56	104.79	1.23	*64			SANDSTONE	FG.LT-M.GY.TMNB.SLD NUMEROUS MUDST BANDS AND LAMINAE, MINOR BIOTRIB IN A 15CM ZONE. TOPS UP (LOAD C AST). VERY SPARSE QTZ VEINING (<.3CM).
41	104.79	105.45	0.66	*63			SILTSTONE	M.GY.TMNB.SLD INTERBEDDED FG SS, FEW MUDST LAMINAE. V ERY SPARSE PLANT FRAGMENTS.
41	105.45	105.66	0.21	63			SANDSTONE	FG.LT-M.GY.TMNB.SLD

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	105.66	105.91	0.25		62		SANDSTONE	FG. VPR. LT-DK. GY. THNB. SLD ONE 2CM MUDST BAND AND NUMEROUS MUDST LAMINAE. MINOR QTZ VEIN.
41	105.91	106.35	0.44		*62		SILTSTONE	M. GY. LAM. SSD. BRKN INTERLAMINATED MUDST. GRADATIONAL CONTACT.
41	106.35	106.50	0.15		62		SANDSTONE	FG. LT-M. GY. SLD THIN QTZ VEINS (<.2CM).
41	106.50	106.55	0.05		62		SILTSTONE	M. GY. LAM. SLD INTERLAMINATED MUDST.
42	106.55	107.15	0.60		62		SANDSTONE	FG. M. GY. THNB. VBRKN LISTRIC SURFACES. INTERLAMINATED SLTST. AND MUDST BANDS. ABUNDANT QTZ VEINING.
42	107.15	107.57	0.42		62		ROCK LOSS	
42	107.57	108.39	0.82		62		SANDSTONE	SLTY. VFG. LT-M. GY. MAS. BRKN VERY HARD. SOME EXTENSIONAL FRACTURES FILLED WITH QTZ (15CM ZONE). MINOR MUDST LAMINAE.
43	108.39	109.68	1.29		63		SANDSTONE	MG. LT-M. GY. MAS. SLD 2CM ZONE OF GRADATIONAL SLTST. MINOR HORIZONTAL QTZ VEINING.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
43	109.68	110.15	0.47		*63		SILTSTONE	M. GY. VTHNB. SLD INTERBEDDED FG SS.
43	110.15	110.93	0.78		62		SILTSTONE	M. GY. LAM. SLD CRUDELY INTERLAMINATED FG SS AND TO A LESSER EXTENT MUDST.
44	110.93	110.70	0.37		61		SANDSTONE	SLTY. VFG. MOD. M. GY. MAS. BRKN VERY HARD, WELL CEMENTED.
44	110.70	111.26	0.56		*60		SILTSTONE	SSY. M. GY. LAM. SLD INTERLAMINATED FG SS AND MUDST.
44	111.26	111.56	0.30		60		SILTSTONE	SSY. M. GY. LAM. SLD AS ABOVE.
44	111.56	111.82	0.26		61		SANDSTONE	FG. PR. LT-M. GY. MAS. VBRKN QTZ VEINING.
44	111.82	112.11	0.29		61		ROCK LOSS	
44	112.11	112.45	0.34		61		SILTSTONE	SSY. M. GY. LAM. BRKN INTERLAMINATED MUDST.
45	112.45	114.16	1.71		*62		SANDSTONE	FG. LT-M. GY. MAS. SLD 3 BANDS OF SLTST IN A 10CM ZONE. INDISTINCT MUDST LAMINAE. VERY MINOR QTZ VEINING.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
45	114.16	114.31	0.15	63			SILTSTONE	M.GY.MAS.SLD
45	114.31	114.51	0.20	63			SILTSTONE	M.GY.MAS.SLD
45	114.51	114.65	0.14	64			SANDSTONE	FG.LT-M.GY.THNB.SLD INDISTINCT MUDST STRINGERS.
46	114.65	116.62	1.97	*65			SILTSTONE	M.GY.LAM.SLD INTERLAMINATED MUDST. ALMOST RYTHMIC. 1 CM ZONE OF XBDG.
47	116.62	117.41	0.79	68			SILTSTONE	M.GY.LAM.BRKN INTERLAMINATED MUDST. DISTINCT BDG PLAN E CLVG.
47	117.41	118.60	1.19	*70			SILTSTONE	M.GY.LAM.BRKN AS ABOVE. MUD FILLED CRACK DISECTING LO WER SEDIMENTS, TOPS UP. RYTHMITES "COAS TER ZONE". PLANAR VEIN OF CHLORITE AND CARBONATE.
48	118.60	120.38	1.78	*70			SILTSTONE	M.GY.LAM.BRKN RYTHMITES, "COASTER ZONE".

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
48	120.38	120.59	0.21	69			SILTSTONE	M.GY.LAM.BRKN AS ABOVE. ONE .3CM PLANAR CARBONATE AND CHLORITE VEIN ALONG BDG PLANE.
49	120.59	122.40	1.81	*68			MUDSTONE	SLTY COASTERS, MINOR QTZ THROUGHOUT.
49	122.40	122.44	0.04	67			MUDSTONE	CARB.DK.GY.SLD LISTRIC SURFACES.
49	122.44	122.53	0.09	67		J	COAL	C-3.SHRD
50	122.53	122.71	0.18	67		J	COAL	C-2.SHRD
50	122.71	122.85	0.14	67		J	COAL LOSS	
50	122.85	123.29	0.44	66			MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.
50	123.29	123.38	0.09	66			COAL	C-3.PHRD
50	123.38	124.39	1.01	65			MUDSTONE	SLTY.M-DK.GY.BRKN LISTRIC SURFACES COALY PLANT FRAGS WITH IN.

\* DENOTES MEASURED BCA



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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
51	124.39	124.68	0.29	65		MUDSTONE	SLTY. M. GY. BIOTR. SLD HOMOGENOUS. POLISHED SURFACE AT 45 DEGR EES. VERTICAL STRIATIONS.
51	124.68	124.76	0.08	64		SANDSTONE	FG. LT-M. GY. THNB. SLD EROSIONAL SCURED BASE, NO NOTICEABLE C ONNECTION TO OVERLYING MUDST.
51	124.76	125.46	0.70	64		SILTSTONE	M. GY. MAS. VBRKN ABUNDANT LISTRIC SURFACES, GRADATIONAL BASAL CONTACT.
51	125.46	125.86	0.40	63		ROCK LOSS	
51	125.86	126.54	0.68	63		MUDSTONE	SLTY. M. GY. MAS. SLD HOMOGENOUS, FAIRLY HARD.
52	126.54	127.04	0.50	62		MUDSTONE	M. GY. MAS. BRKN
52	127.04	127.52	0.48	62		MUDSTONE	M. GY. MAS. SLD GRADATIONALLY SILTIER TOWARD BASE. VERTI CALLY STRIATED LISTRIC SURFACE.
52	127.52	127.62	0.10	61		SILTSTONE	M. GY. MAS. SLD SANDIER TOWARD BASE. GRADATIONAL Contac TS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
52	127.62	128.33	0.71	61		SANDSTONE	FG. LT-M. GY. MAS. SLD MINOR QTZ VEINING.
53	128.33	128.86	0.53	60		SANDSTONE	FG. LT-M. GY. MAS. SLD SPARSE MUDST TRACES.
53	128.86	129.48	0.62	59		ROCK LOSS	
53	129.48	130.50	1.02	58		SILTSTONE	M. GY. LAM. BRKN ONE QTZ VEIN (.4CM THICK) WITH VERTICAL STRIATIONS AT A 25 DEGREE ANGLE TO COR E. NUMEROUS MUDST LAMINAE.
53	130.50	130.77	0.27	58		SILTSTONE	LT-M. GY. SLD VERY HARD, RECRYSTALLIZED CEMENT.
54	130.77	132.48	1.71	57		MUDSTONE	SLTY. M. GY. MAS. BRKN
54	132.48	132.72	0.24	56		ROCK LOSS	
55	132.72	133.51	0.79	*55		MUDSTONE	M. GY. LAM. BRKN INTERLAMINATED MUDST.
55	133.51	134.46	0.95	56		MUDSTONE	M. GY. MAS. SLD MINOR SLTY LAMINAE. 4CM QTZ VEIN WITH M UDST LAMINATIONS AND SMALL ANGULAR FRAG MENTS.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
56	134.46	135.71	1.25	57			MUDSTONE	M.GY.MAS.SLD SPARSE SLTY BANDS.
56	135.71	136.46	0.75	*58			MUDSTONE	M.GY.MAS.SLD AS ABOVE. VERTICAL STRIATIONS ON POLISHED FRACTURE SURFACE AT 45 DEGREES TO CORE ANGLE. MINOR BURROW (VERTICAL). TOPS UP.
57	136.46	137.10	0.64	59			SILTSTONE	M.GY.LAM.BRKN TOPS UP, BURROW. CRUDELY INTERLAMINATED MUDST.
57	137.10	137.52	0.42	60			SILTSTONE	SSV.M.GY.VBRKN ABUNDANT TALC COATED SLIPPAGE SURFACES. GRADATIONAL CONTACTS.
57	137.52	137.84	0.32	60			ROCK LOSS	
57	137.84	138.14	0.30	61			SANDSTONE	FG.MOD.LT-M.GY.VBRKN SPARSE MUDSI LAMINAE.
57	138.14	138.39	0.25	61			ROCK LOSS	
57	138.39	138.50	0.11	62			SANDSTONE	FG.MOD.LT-M.GY.SLD AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
58	138.50	140.40	1.90	*63			SANDSTONE	FG.MOD.LT-M.GY.MAS.BIOTR.BRKN OBSCURED BDG. SOME VISIBLE VERTICAL BURROWING. INDISTINCT WISPS OF MUDST. TOPS UP.
59	140.40	140.76	0.36	62			SANDSTONE	FG.MOD.LT-M.GY.THNB.SSD.SLD MINOR BANDS OF MUDST. NEAR BASE. LOAD CAST TOPS UP.
59	140.76	140.89	0.12	62			SANDSTONE	SLTY.FG.PR.LT-M.GY.LAM.SSD.BRKN INTERLAMINATED MUDST.
59	140.89	142.31	1.42	*62			SANDSTONE	FG.PR.LT-M.GY.MAS.SLD SPARSE WISPS OF MUDST.
60	142.31	143.03	0.72	55			SANDSTONE	SLTY.FG.VPR.M.GY.MAS.SLD WISPS OF CARBONACEOUS MUDST. TWO 2.2CM QTZ VEINS.
60	143.03	143.10	0.07	52			SILTSTONE	M-DK.GY.LAM.SLD INTERLAMINATED MUDST WITH STRINGY FRAGMENTS OF MUD INCORPORATED IN THE SILTST. MINOR QTZ VEIN, PERPENDICULAR TO BDG.
60	143.10	143.80	0.70	*50			SANDSTONE	SLTY.FG.M.GY.MAS.BRKN THREE 5CM ZONES OF CARBONACEOUS PLANT MATERIAL. DISCONTINUOUS INTERLAMINATED MUDST/SLTST.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
60	143.80	144.16	0.36	52			SANDSTONE	FG.M.GY.LAM.BIOTR.SLD INTERLAMINATED MUDST.
61	144.16	144.56	0.40	53			SANDSTONE	SLTY.FG.M.GY.LAM.BIOTR.SLD QTZ FILLED FRACTURE AT 15 DEGREES. AS ABOVE.
61	144.56	144.96	0.40	55			ROCK LOSS	
61	144.96	145.16	0.20	56			SILTSTONE	M.GY.LAM.VBRKN
61	145.16	146.52	1.36	58			SILTSTONE	M.GY.LAM.BIOTR.SLD INTERLAMINATED MUDST. BDG OBSCURED BY A BUNDANT BURROWING, TOPS UP.
62	146.52	147.92	1.40	*63			SILTSTONE	M.GY.LAM.BIOTR.SLD AS ABOVE.
62	147.92	148.45	0.53	61			SILTSTONE	M.GY.LAM.BIOTR.SLD AS ABOVE. MINOR VERTICALLY STRIATED LISTRIC SURFACES AT 60 DEGREES.
62	148.45	149.06	0.61	60			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
63	149.06	150.41	1.35	58			SILTSTONE	M.GY.LAM.BIOTR.VBRKN SHEARED. ABUNDANT LISTRIC SURFACES. INC REASE IN QTZ VEINING TOWARD BASE. BDG M QRE OBSCURED TOWARD BASE. CORE LOSS?
63	150.41	150.66	0.25	56			SILTSTONE	LT-M.GY.SLD INTENSE SPORADIC QTZ VEINING. SMALL BRECCIA ZONE.
63	150.66	151.22	0.56	55			ROCK LOSS	
64	151.22	151.45	0.23	54			SILTSTONE	M.GY.VBRKN CORE TWIST OFF. SANDY ZONE WITH QTZ VEINING. POSSIBLE MINOR CORE LOSS.
64	151.45	151.89	0.44	53			ROCK LOSS	
64	151.89	153.06	1.17	52			SILTSTONE	M.GY.LAM.BIOTR.BRKN INDISTINCT MUDST LAMINAE. BDG OBSCURED.
64	153.06	153.45	0.39	50			ROCK LOSS	
64	153.45	153.60	0.15	49			SILTSTONE	M.GY.VBRKN POSSIBLE CORE LOSS.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
65	153.60	153.72	0.12	49		SILTSTONE	LT-M.GY.MAS.BRKN PORTION ON LONGITUDINAL EDGE OF CORE RESEMBLES A LARGE COALY PLANT FRAGMENT.
65	153.72	153.92	0.20	49		MUDSTONE	SLTY.M.GY.LAM.VBRKN SILTY LAMINAE. ONE 5CM FRAGMENT HAS ABUNDANT QTZ. CORE LOSS?
65	153.92	154.06	0.14	48		ROCK LOSS	
65	154.06	155.12	1.06	*47		SILTSTONE	M.GY.LAM.BIOTR.SLD INTERLAMINATED MUDST. TALC ENCRUSTED FRACTURE SURFACES (BDG PLANE).
65	155.12	155.49	0.37	55		SILTSTONE	M.GY.LAM.VBRKN APPEARS TO BE A BAND OF FAULT GOUGE MATERIAL. AS ABOVE.
66	155.49	156.89	1.40	*65		SILTSTONE	CLYV.M.GY.SLD MUDST LAMINAE WITHIN.
66	156.89	157.51	0.62	68 10206		SILTSTONE	CLYV.M.GY.SLD MUDST LAMINAE WITHIN. LOWER 25CM SAMPLE D.
66	157.51	157.60	0.09	68 10207 I		COAL	C-2.BIOTR.SHRD POWDERED.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
67	157.60	158.00	0.40	69 10207 I		COAL	C-2.SHRD VERY SHEARED.
67	158.00	158.06	0.06	70 10207 I		COAL LOSS	
67	158.06	158.28	0.22	70 10207 I		COAL	C-3.SHRD VERY SHEARED.
67	158.28	158.82	0.54	71 10207 I		COAL	C-3.SHRD VERY SHEARED.
67	158.82	159.15	0.33	72 10208		MUDSTONE	CARB.DK.GY.BRKN MINOR PLANT FRAGS WITHIN. LISTRIC SURFACES, SILTY AT BASE. UPPER 25CM SAMPLED.
67	159.15	159.21	0.06	73		MUDSTONE	SLTY.M.GY.SLD LISTRIC SURFACES.
67	159.21	159.29	0.08	73		SILTSTONE	M.GY.SLD LISTRIC SURFACES.
67	159.29	159.52	0.23	73		SANDSTONE	FG.PR.LT-M.GY.BRKN MINOR MUDDY LAMINAE WITHIN (LISTRIC SURFACES).
68	159.52	159.82	0.30	74		MUDSTONE	SILTY.M.GY.SHRD POSSIBLE FAULT ZONE. VERY SHEARED MUDST MIXED WITH FG SS. VERY BROKEN. 3CM QTZ VEIN AT TOP OF INTERVAL.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 35

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
68	159.82	160.50	0.68	75			SILTSTONE	M.GY.VTHNB.BRKN BANDS OF MUDST. GRADATIONALLY SANDIER T OWARD BASE. 30CM BAND OF ABUNDANT HELMI NTHOPSIS BURROWING.
68	160.50	160.73	0.23	76			SANDSTONE	FG.MOD.LT-M.GY.THNB.SLD GRADATIONAL CONTACTS, VERTICAL LISTRIC SURFACES WITH VERTICAL STRIATIONS.
68	160.73	160.80	0.07	77			SILTSTONE	M.GY.SHRD
68	160.80	161.35	0.55	78			SANDSTONE	FG.VPR.M.GY.MAS.BRKN LISTRIC SURFACES WITH VERTICAL STRIATIO NS PARALLEL TO LENGTH OF CORE. MINOR MU DST BANDS AND QTZ VEINING. SMALL SCALE DISPLACEMENT ALONG FAULT PLANE (SUB-VER TICAL).
69	161.35	161.94	0.59	79			SANDSTONE	FG.VPR.M.GY.MAS.BRKN SMALL SCALE DISPLACEMENT (<2CM) ALONG S UB-VERTICAL PLANE.
69	161.94	162.14	0.20	*80			SILTSTONE	M.GY.LAM.BRKN SLIGHTLY DEFORMED MUDST BANDS. BDG PLAN E STRIATED HORIZONTALLY, POLISHED SURFA CES.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 36

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	162.14	162.40	0.26	80			SANDSTONE	FG.LT-M.GY.SHRD BANDS OF BIOTRB MUDST. SUB-VERTICAL LIS TRIC SURFACES. VERTICAL DISPLACEMENT OF STRATA.
69	162.40	162.52	0.12	80			ROCK LOSS	
69	162.52	162.63	0.11	80			SANDSTONE	CG.LT.GY.THNB.BIOTR.SLD SMALL STORM UNIT. ONE BAND OF MUDST THA T HAS BEEN HEAVILY BURROWED THROUGH. TO PS UP.
69	162.63	162.90	0.27	80			SANDSTONE	CG.LT.GY.THNB.BIOTR.VBRKN ERRATIC MUDST STRINGS AND ONE BAND (2CM ). AS ABOVE. VERTICALLY STRIATED LISTRI C SURFACES.
69	162.90	163.14	0.24	*80			MUDSTONE	M.GY.LAM.SHRD EVERY BEDDING PLANE SURFACE IS POLISHED , HORIZONTAL MOVEMENT. COAL STRINGER NE AR TOP OF INTERVAL. INTERLAMINATED SILT Y SS.
69	163.14	163.23	0.09	80			SANDSTONE	MG.VPR.LT-M.GY.THNB.SHRD SLTST RIPUP CLASTS (SUB ROUNDED 1-2CM). APPEARS SLD BUT HAS HORIZONTAL SHEAR P LANES.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 37

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	163.23	163.22	0.09	80			SILTSTONE	M.GY.LAM.SHRD INTERLAMINATED MUDST. EROSIONAL UPPER CONTACT. HORIZONTAL POLISHED SURFACES.
70	163.32	163.48	0.16	80			SILTSTONE	M.GY.LAM.SHRD INTERLAMINATED MUD.
70	163.48	165.04	1.56	*80			SANDSTONE	CG.VPR.LT-M.GY.MAS.BRKN NUMEROUS BANDS OF MUDST THAT ALWAYS HAVE HORIZONTAL (BDG PLANE) POLISHED SURFACES. MINOR BIOTRB, TOPS UP. SOME MUDST R IPUP CLASTS.
70	165.04	165.25	0.21	78			MUDSTONE	M-DK.GY.LAM.SLD INTERLAMINATED FG SS AND SLTST. GRADATIONAL CONTACTS.
70	165.25	165.38	0.13	78			SILTSTONE	LT-M.GY.LAM.BRKN MINOR MUDST LAMINAE. HORIZONTAL LISTRIC SURFACES PERSIST.
70	165.38	165.68	0.30	78			ROCK LOSS	
71	165.68	166.08	0.40	77			SILTSTONE	SSY.M.GY.VSHRD TRACES OF MUDST. MINOR MUDST BANDS THAT ARE EXTREMELY SHEARED AND SOFT.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 38

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
71	166.08	166.30	0.22	76			BRECCIA	M.GY.VSHRD QTZ, MUD AND SLTST IN A VERY SHEARED POSSIBLE FAULT ZONE.
71	166.30	167.00	0.70	75			MUDSTONE	M.GY.VSHRD EXTREMELY SHRD. SOME QTZ FRAGMENTS CAN BE FOUND MIXED IN WITH MUD. SPARSE SILTY LAMINAE. SOFT.
71	167.00	167.30	0.30	74			SILTSTONE	M.GY.LAM.SHRD INTERLAMINATED MUDST.
72	167.30	168.03	0.73	73			SILTSTONE	M.GY.LAM.BIOTR.SHRD AS ABOVE. BDG OBSCURED IN PLACES. ABUNDANT LISTRIC SURFACES.
72	168.03	168.72	0.69	72			ROCK LOSS	
72	168.72	169.22	0.50	71			SILTSTONE	M.GY.LAM.BIOTR.VBRKN AS ABOVE. 3CM BAND OF QTZ VEINING AND MUDST STRINGERS.
72	169.22	169.72	0.50	*70			SANDSTONE	FG.M.GY.MAS.BRKN TALC COVERED VERTICAL FRACTURE. ONE SILTY BAND, INDISTINCT BOUNDARIES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
73	169.72	170.02	0.30	70			BRECCIA	M. GY. VSHRD FG SS AT TOP WHICH QUICKLY PROCEEDS TO ASSEMBLAGE OF VSHRD MUD AND SLTST WITH QTZ.
73	170.02	170.49	0.47	69			ROCK LOSS	
73	170.49	171.77	1.28	69			MUDSTONE	M-DK. GY. MAS. BRKN TOP 30CM HAS HORIZ LISTRIC SURFACES.
73	171.77	172.19	0.42	68			MUDSTONE	DK. GY. MAS. SLD FRACTURE AT 30 DEGREES.
74	172.19	173.25	1.06	67			MUDSTONE	DK. GY. MAS. SLD AS ABOVE. SPARSE SILTY BANDS THAT SHOWS HELMINTHOPSIS BURROWS. GRADATIONAL BASAL CONTACT. PYRITE BLEB.
74	173.25	174.19	0.94	67			SANDSTONE	PBLY. VCG. VPR. S-P. GY. MAS. BRKN GRADES QUICKLY INTO A VCG. SS. QTZ VEINING.
75	174.19	174.72	0.53	66			SANDSTONE	PBLY. VCG. VPR. S-P. GY. MAS. BRKN QTZ VEINING.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
75	174.72	175.37	0.65	66			SANDSTONE	MG. VPR. M. GY. MAS. BRKN NUMEROUS HORIZONTALLY SHEARED SILTY MUDST BANDS. SPARSE QTZ VEINING.
75	175.37	175.87	0.50	65			SANDSTONE	CG. VPR. M. GY. MAS. BRKN ABUNDANT VERY LARGE QTZ VEINING (UP TO 6CM THICK). 4CM BAND OF VSHRD MUDST. NEAR BASE. CORE LOSS.
75	175.87	176.40	0.53	65			ROCK LOSS	
76	176.40	176.90	0.50	64			SANDSTONE	PBLY. VCG. VPR. S-P. GY. MAS. VBRKN ABUNDANT LARGE QTZ VEINS. ONE SLTST LAMINAE. CORE LOSS.
76	176.90	178.05	1.15	64			SANDSTONE	PBLY. VCG. VPR. S-P. GY. MAS. VBRKN AS ABOVE. 2 MUDST BANDS.
77	178.05	179.15	1.10	63			SANDSTONE	PBLY. VCG. VPR. S-P. GY. MAS. BRKN AS ABOVE.
77	179.15	179.50	0.35	62			ROCK LOSS	

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
77	179.50	180.25	0.75	62		SANDSTONE	VCG. VPR. S-P. GY. MAS. VBRKN AS ABOVE. TWO 5CM ZONES OF INTERLAMINATED SLTST AND MUDST. FRACTURE AT 40 DEGR EES. SLTST ZONES HAVE POLISHED BDG PLAN ES.
78	180.25	180.33	0.08	62	10209	SANDSTONE	PBLY. VCG. LT-M. GY. BRKN
78	180.33	180.61	0.28	61	10210 H/I	COAL	C-3. SHRD
78	180.61	181.00	0.39	61	10210 H/I	COAL LOSS	
78	181.00	181.13	0.13	61	10210 H/I	MUDSTONE	CARB. DK. GY. SHRD

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
78	181.13	181.21	0.08	61	10210 H/I	COAL	C-4. SLD
78	181.21	181.93	0.72	61	10211	MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS & THIN BANDS WITHIN.
78	181.93	182.12	0.19	60		ROCK LOSS	
78	182.12	182.27	0.15	60		SILTSTONE	M. GY. BRKN MINOR MUDST. BANDS THROUGHOUT.
78	182.27	182.54	0.27	*60		SILTSTONE	M. GY. BRKN MINOR MUDST. BANDS THROUGHOUT.
79	182.54	184.49	1.95	*67		SANDSTONE	FG. PR. M. GY. MAS. SLD FREQUENT WISPS AND LAMINAE OF MUDST. LISTRIC SURFACES. TALC COATED FRACTURES SUBPARALLEL TO CORE.
79	184.49	184.65	0.16	64		SANDSTONE	FG. PR. M. GY. MAS. SLD WISPS OF MUDST.

\* DENOTES MEASURED BCA

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87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPW BLOCK: LR DATA SOURCE: DDM86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
80	184.65	186.62	1.97	*60			SANDSTONE	FG. PR. M. GY. MAS. BRKN SPARSE MUDST TRACES. MINOR MUDST RIPUP CLASTS. FRACTURE AT 25 DEGREES. DISCONT INOUS QZ VEIN AT TOP OF INTERVAL (KIC M).
81	186.62	187.31	0.69	61			SANDSTONE	FG. PR. M. GY. MAS. SLD TRACES OF MUDST BANDING IN BASAL 15CM.
81	187.31	187.66	0.35	62			SANDSTONE	FG. PR. M. GY. MAS. SLD TRACES OF MUDST LAMINAE.
81	187.66	187.77	0.11	62			SANDSTONE	YFG. PR. M-DK. GY. MAS. SLD ABUNDANT CARBONACEOUS PLANT FRAGMENTS A ND COALY MATS.
81	187.77	188.37	0.60	63			SANDSTONE	FG. PR. M. GY. MAS. SLD TRACES OF MUDST BANDS, SOME WITH COALY PLANT MATERIAL. ONE LARGE MUDST RIPUP C LASTS (5CM).
81	188.37	188.52	0.15	63			SANDSTONE	FG. PR. M. GY. THNB. SLD SUBANGULAR MUDST RIPUP CLAST CONTAINING HELMINTHOPSIS BURROWS (LGST = 5CM) TOP S UP.
81	188.52	188.67	0.15	63			MUDSTONE	DK. GY. THNB. SLD HELMINTHOPSIS BURROWS. EROSIONAL TOP. S OURCE OF RIPUP CLASTS.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPW BLOCK: LR DATA SOURCE: DDM86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
81	188.67	188.72	0.05	63			SANDSTONE	SLTY. VFG. M. GY. MAS. BRKN
81	188.72	188.92	0.20	63			ROCK LOSS	
82	188.92	190.13	1.21	64			SILTSTONE	SSY. M. GY. MAS. BRKN SLIGHTLY X-BEDDED WISP OF MUDST. SPARSE QZ VEINING. 3CM DISPLACEMENT ALONG VE RTICAL FRACTURE. TOPS UP LOAD STRUCTURE
82	190.13	190.87	0.74	*65			SANDSTONE	FG. M. GY. MAS. BRKN MINOR WISPS OF MUDST.
83	190.87	192.77	1.90	64			SANDSTONE	FG. M. GY. MAS. BRKN AS ABOVE. TOPS UP ON 2 SMALL LOAD STRUC TURES. SUBVERTICAL AS WELL AS HORIZONTAL L (BDG PLANE) POLISHED SURFACES.
84	192.77	193.09	0.32	63			SANDSTONE	FG. M. GY. MAS. BRKN SPARSE X-BEDDED WISPS OF MUDST. MINOR 2 ONE OF INTERMIXED BIOTRB MUD.
84	193.09	193.29	0.20	62			ROCK LOSS	

\* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPM BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
84	193.29	195.01	1.72	61			SANDSTONE	FG. MOD. M. GY. MAS. BRKN FREQUENT WISPS AND TRACKS OF MUDST.
85	195.01	196.29	1.28	*60			SANDSTONE	FG. MOD. M. GY. MAS. SLD ONE HORIZONTAL STRIATED, POLISHED BDC PLANE. AS ABOVE.
85	196.29	196.33	0.04	60			SANDSTONE	FG. MOD. M. GY. MAS. SLD EROSIONAL BASE. TOPS UP.
85	196.33	196.45	0.12	61			SILTSTONE	M-DK. GY. LAM. SLD INTERLAMINATED MUDST. GRADATIONAL BASAL CONTACT.
85	196.45	197.09	0.64	61			SANDSTONE	FG. MOD. M. GY. MAS. SLD SOME SLIGHTLY X-BEDDED WISPS OF MUDST. TRUNCATION INDICATES TOPS UP. SOME MUDS T BANDS NEAR BASE THAT HAVE COALY MATS. SILTIER TOWARD BASE.
86	197.09	197.14	0.05	61	10212		SANDSTONE	SLTY. YFG. M. GY. SLD PYRITE & MUDDY BANDS WITHIN.
86	197.14	197.19	0.05	61	10212		MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS WITHIN.
86	197.19	197.71	0.52	61	10213 H		COAL	C-3. SHRD SHEARED & PARTIALLY POWDERED.

\* DENOTES MEASURED BCA

PROJECT: KPM BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
86	197.71	197.74	0.03	62	10213 H		MUDSTONE	CARB. DK. GY. SLD
86	197.74	197.91	0.17	62	10213 H		ROCK LOSS	
86	197.91	198.22	0.31	62	10213 H		COAL	C-3. VBRKN SHEARED & POWDERED.
86	198.22	198.31	0.09	62	10213 H		COAL	C-5. BRKN C-2. BANDS WITHIN.
86	198.31	198.51	0.20	62	10213 H		COAL LOSS	
86	198.51	198.73	0.22	62	10214		MUDSTONE	CARB. BRKN COALY PLANT FRAGS WITHIN.
86	198.73	199.03	0.30	62			MUDSTONE	SLTY COALY CARB PLANT FRAGS & LENSES THROUGH OUT. UPPER 3CM SAMPLED.
87	199.03	199.99	0.96	63			SILTSTONE	CLYY. M. GY. MAS. SLD VERTICAL STRIATIONS ALONG POLISHED SURF ACE AT 45 DEGREES. THIN QTZ VEINING ALONG VERTICAL FRACTURE.
87	199.99	200.05	0.06	63			MUDSTONE	LT. GY. THNB. SLD CARBONATE RECRYSTALIZED MUDST.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
87	200.05	200.95	0.90	64		SILTSTONE	CLYY. M. GY. MAS. SLD INDISTINCT DISTORTED MUDST LAMINAE. MIN OR SSD.
87	200.95	201.10	0.15	*64		SILTSTONE	SSY. M. GY. THNB. SLD 2CM BAND OF SS.
88	201.10	202.05	0.95	66		SILTSTONE	SSY. M. GY. MAS. SLD GRADATIONAL CONTACTS.
88	202.05	203.15	1.10	*70		SANDSTONE	SLTY. FG. PR. M. GY. MAS. SLD INTERLAMINATED MUDST SPARSELY SCATTERED THROUGHOUT. MINDR BURROWS (VERTICAL). QTZ VEINING NEAR BASE.
89	203.15	205.02	1.87	*68		SANDSTONE	SLTY. FG. PR. M. GY. THNB. BRKN INTERBEDDED BANDS AND WISPS OF MUDST HO RIZONTALLY DISPLACED (<2CM). QTZ FILLED VERTICAL FRACTURE. APPEARS BOUDINAGE.
89	205.02	205.14	0.12	55		SANDSTONE	FG. PR. M. GY. MAS. SLD NUMEROUS WISPS. OF MUDST.
90	205.14	207.15	2.01	*62		SANDSTONE	FG. PR. M. GY. MAS. SLD MINOR WISPS OF MUDST. VERY THIN VERTICA L QTZ VEINING.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86035

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
91	207.15	208.00	0.85	59		SANDSTONE	FG. PR. LT-M. GY. MAS. SLD WISPS OF MUDST. LAST 15CM YS X-BEDDED M UDST WISPS. QTZ VEIN ALONG BDG PLANE. M ITH SECONDARY VEINS RUNNING PARALLEL TO CORE.
91	208.00	209.00	1.00	*57		SANDSTONE	FG. PR. LT-M. GY. MAS. SLD AS ABOVE.
91	209.00	209.03	0.03	57		SILTSTONE	M. GY. THNB. SLD
92	209.03	209.08	0.05	57		SILTSTONE	M. GY. THNB. SLD SHARP BASAL CONTACT.
92	209.08	210.25	1.17	57		SANDSTONE	HG. MOD. LT-M. GY. MAS. SLD VERTICAL QTZ VEIN (<1CM).
92	210.25	210.43	0.18	57		SILTSTONE	SSY. M. GY. THNB. SLD
92	210.43	210.81	0.38	57		SANDSTONE	FG. LT-M. GY. VBRKN VERTICAL QTZ VEINING. T.D. = 212.45 M. DRILLER'S MARK.

\* DENOTES MEASURED BCA  
NEWPAGE









# GULF CANADA CORPORATION

## COAL DIVISION MOUNT KLAPPAN PROJECT

SEAM DETAIL

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86035 SEAM: J INTERVAL(M): 122.44 - 122.85 ELEVATION(M): 1502.5  
 GEOLOGIST: SAVOIE SCALE: 1:40 DATE: MAR 05/87 DRAWING NO.:

SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES		% REC.	SAMPLE ID		COAL/ROCK TOTAL		COAL QUALITY A.D.B.						
			ROCK	COAL		SIMP	COMP	COMPOS	MINING SECTION	RES MOIST	ASH	VM	FC	TS	CAL. VAL MJ/KG	
1 2 3 4 5 6		↑		0.25	86.0	99999	99999	0.36 / 0.00	—	—	—	—	—	—	—	
	122.44	↓		( 0.18 )				0.58								









GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT

STRATIGRAPHIC LOG

KPN LR DDH86035

723

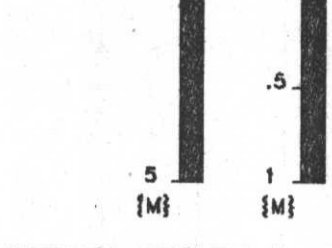
GEOLOGIST : SAVOIE

DATE : FEB 26/87

DRAWING NO. :

LITHOLOGIC SYMBOLS

SCALE : 1:200 1:40

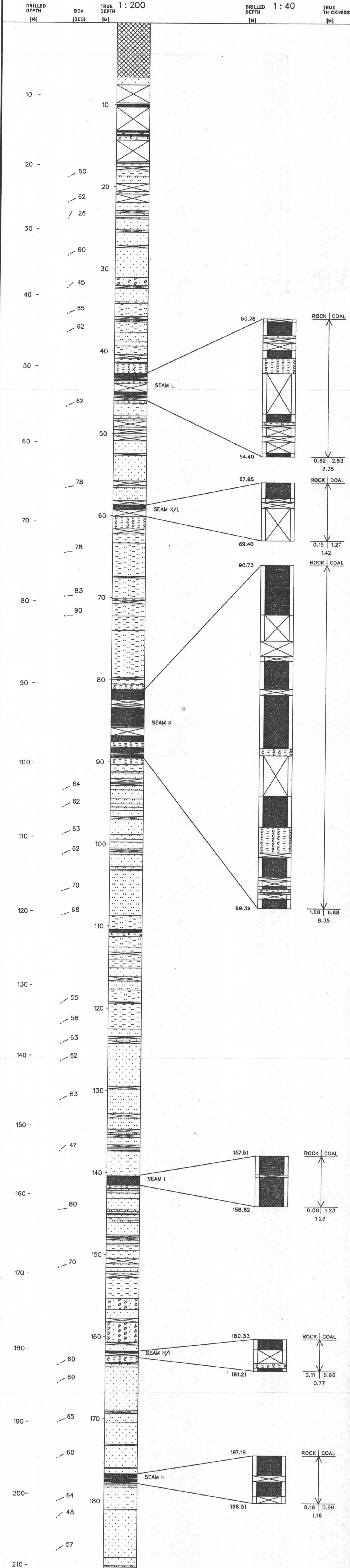


NORTHING: 834452.0 N  
 EASTING: 508451.5 E

INCLINATION: 90.0°

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

SEAM DETAIL

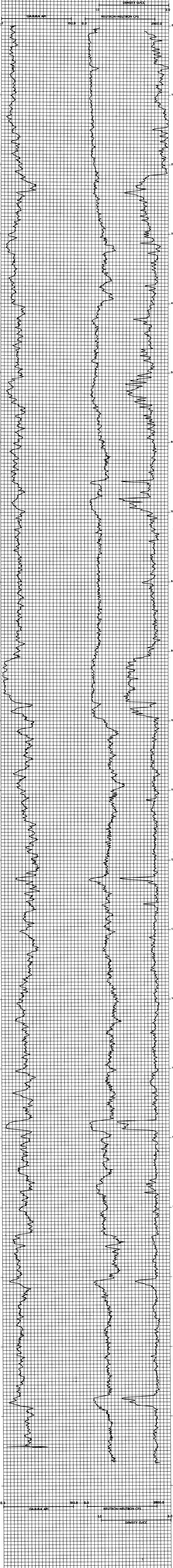


# Gulf Canada Corporation Coal Division

# 723

## Geophysical Log

Datasource: <b>KPNLRDDH86035</b> Log Date: 86-09-30 Company: CENTURY Geologist: SAVOIE	Province: BC Zone: 9 Measuring Point:	Northlng: 6344510.00 Easting: 508452.00 Lat: 571444 Long: 1285136 Elevation: 1502.4
Scale: 1 to 100.0 Depth Range: 0.0 to 212.0 True Thickness: NO	Comments: 1. LOGGED THROUGH THE RODS 2.	
<b>Logs Plotted:</b> 1. GAMMA API 2. NEUTRON-NEUTRON CPS 3. DENSITY G/CC	Axis Range 0.0 to 150.0 0.0 to 2500.0 1.0 to 3.0	Axis Length 10.0 10.0 10.0
	Smoothing Points 31 9 15	Tool 9030A 9055A 9030A
	Comments IN PIPE IN PIPE IN PIPE	



KPNLRDDH86036

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86036

DATE - 02/13/87

- HISTORY -

START DATE - 29/09/86

END DATE - 01/10/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - BARKER

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1507.54

ZONE - 9

NORTHING - 6344851.00

EASTING - 508346.87

LICENCE/LEASE NUMBER -

LATITUDE - 571455

LONGITUDE - 1285142

- ORIENTATION -

LENGTH - 148.43

INCLINATION - 90.0

AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 7.62

AQUIFER DEPTHS (M) - 0.00

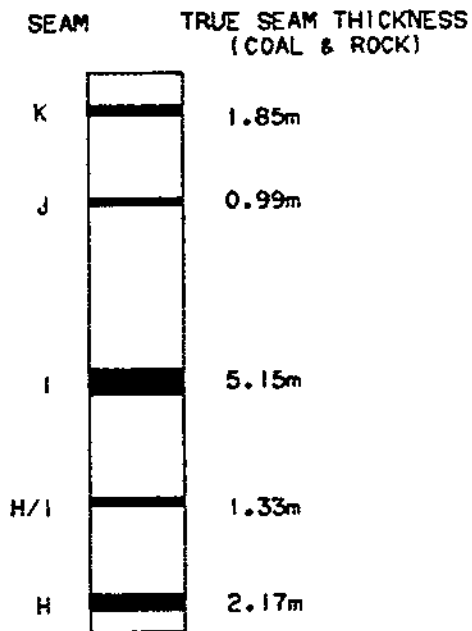
0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====



**NOTE:**

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

**FIGURE**

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86036

GULF CANADA CORPORATION  
11/03/87  
KLAP:[205057]1870063036.LOG





87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	7.62	7.62	75		OVERBURDEN	CASING
1	7.62	7.90	0.28	75		MUDSTONE	DK.GY.MAS.BRKN VERY SOFT, LIKE PLASTICENE, LIKELY SLUM P FROM ABOVE MIXED IN.
1	7.90	8.29	0.39	75		MUDSTONE	DK.GY.MAS.VBRKN MORE CONSOLIDATED THAN ABOVE. OCC MUSHY AREAS.
1	8.29	8.38	0.09	75	K	COAL	C-3.BLK.MAS.VBRKN
1	8.38	8.68	0.30	75	K	COAL LOSS	
1	8.68	8.89	0.21	75	K	ROCK LOSS	
1	8.89	9.37	0.48	75	K	COAL LOSS	
1	9.37	9.44	0.07	75	K	MUDSTONE	DK.GY.MAS.VBRKN
1	9.44	9.66	0.22	75	K	ROCK LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
1	9.66	9.68	0.02	75	K	COAL	C-2.BLK.MAS.BRKN
1	9.68	10.21	0.53	75	K	COAL LOSS	
1	10.21	10.25	0.04	75		MUDSTONE	CARB.BLK.MAS.VBRKN FROTHY MUSH. VITRINITE SPECKS THROUGHOUT.
1	10.25	10.59	0.34	75		MUDSTONE	DK.GY.MAS.VBRKN UNIFORM MUDST. HARD. OCC. COALY STREAKS.
2	10.59	11.02	0.43	75		SILTSTONE	DK.GY.MAS.SSD.SLD SLUMPED.
2	11.02	11.62	0.60	75		SILTSTONE	GY.MAS.SSD.BRKN SHIRLED BEDDING FROM SLUMPING. ONE 9CM WIDE BAND OF LIGHTER GREY SLTST.
2	11.62	12.05	0.43	*75		SANDSTONE	FG.M.GY.LAM.BRKN OCC FINE PLANAR SILT WISPS THROUGHOUT.
2	12.05	12.56	0.51	*70		SILTSTONE	M.GY.LAM.SLD FINELY LAMINATED - APPROACHING RHYTHM ITES.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 3

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	12.56	13.62	1.06	71			SILTSTONE	VPR. DK. GY. LAM. BIOTR. SLD V FINE PLANAR LAMINAE THROUGHOUT. APPROACHING RHYTHMITES. OCC LT GY SILT BANDS & LENSES WHICH ARE BIODURBATED.
3	13.62	14.01	0.39	72			SANDSTONE	FG. MOD. LT. GY. MAS. YBRKN MOSTLY MASSIVE WITH ONE DISRUPTED SILT BAND. GRADATIONAL FROM SLTST ABOVE.
3	14.01	14.16	0.15	72			ROCK LOSS	
3	14.16	14.60	0.44	73			SANDSTONE	FG. MEL. LT. GY. MAS. YBRKN NUMEROUS FRACTURES SUBPARALLEL TO CORE AXIS. CLEAN SAND AS IS TYPICALLY BELOW K SEAM.
4	14.60	14.82	0.22	73			SANDSTONE	FG. MEL. LT. GY. MAS. SLD SHARP LOWER CONTACT.
4	14.82	15.84	1.02	74			SANDSTONE	FG. MEL. LT. GY. THKB. YBRKN ONE LAYER OF FG SAND WITH SHARP LOWER CONTACT, FINING UP TO 5CM BAND OF SILT AT TOP. SHARP CONTACT WITH SAND IN INTERVAL ABOVE.
4	15.84	16.10	0.26	75			SILTSTONE	DK. GY. LAM. YBRKN V FINE LAMINAE. APPROACHING RHYTHMITES.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 4

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	16.10	16.25	0.15	75			ROCK LOSS	
4	16.25	16.43	0.18	75			SILTSTONE	DK. GY. LAM. YBRKN AS ABOVE.
5	16.43	17.46	1.03	*76			SILTSTONE	DK. GY. LAM. BRKN INTERLAM'D FG SS AND SLTST. GRADATIONAL CONTACT INTO SS BELOW.
5	17.46	18.52	1.06	75			SANDSTONE	FG. MEL. LT. GY. MAS. BRKN MASSIVE SS.
6	18.52	19.13	0.61	73			SANDSTONE	FG. MEL. LT. GY. MAS. BRKN NUMEROUS QTZ FILLED FRACTURES SUBPARALLEL TO CORE AXIS.
6	19.13	20.09	0.96	72			SILTSTONE	SSY. VPR. M. GY. VTHNB. BRKN FINELY LAMINATED LAYERS. FINE UPWARDS FROM FG SS TO DARK MUD.
6	20.09	20.32	0.23	72			SANDSTONE	FG. LT. GY. LAM. SLD OCC FAINT SILTY WISPS.
7	20.32	22.43	2.11	*70			SANDSTONE	FG. LT. GY. MAS. SLD RARE SILT WISPS - LIKELY LARGE SCALE XBDG. BCA'S 65-70 DEGREES.

\* DENOTES MEASURED BCA

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87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	22.43	23.05	0.62	70			SANDSTONE	SLTY. M. GY. THNB. VBRKN FG SS FINING DOWNWARD TO SLTST. DARK OR GANIC-RICH MISPS IN MORE MASSIVE SAND L AYERS.
8	23.05	23.11	0.06	70			ROCK LOSS	
8	23.11	23.63	0.52	*70			SILTSTONE	M. GY. VTHNB. BRKN OCC FG SS LAYERS. OVERALL, FINING DOWN TO RHYTHMITES BELOW.
8	23.63	24.31	0.68	70			SILTSTONE	DK. GY. LAM. BRKN V FINE PLANAR LAMINAE. RHYTHMITES NOT F ISSILE, YET.
9	24.31	26.15	1.84	71			SILTSTONE	DK. GY. LAM. XBDG. BRKN SANDY MISPS NEAR TOP, GRADING DOWN TO C DASTERS AT BASE OF BOX. OCC XBDG IN THE SE SANDY LAYERS.
10	26.15	28.18	2.03	73			SILTSTONE	DK. GY. LAM. BRKN RHYTHMITES - COASTERS ZONE.
11	28.18	29.05	0.87	74			SILTSTONE	DK. GY. LAM. SLD COASTER ZONE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
11	29.05	30.24	1.19	75			SILTSTONE	DK. GY. LAM. SLD COASTER ZONE.
12	30.24	32.05	1.81	76			SILTSTONE	DK. GY. LAM. VBRKN COASTER ZONE. ONE 8MM WIDE GREEN TALC C DASTERS.
12	32.05	32.10	0.05	77			ROCK LOSS	
13	32.10	32.84	0.74	*77	10127		SILTSTONE	DK. GY. LAM. BRKN COASTERS. LOWER 25CM SAMPLED.
13	32.84	32.91	0.07	75	10128	J	COAL	C-2. BRKN
13	32.91	32.93	0.02	75	10128	J	MUDSTONE	CARB. DK. GY. SLD
13	32.93	33.41	0.48	74	10128	J	COAL	C-2. BRKN
13	33.41	33.69	0.28	73	10128	J	COAL LOSS	
13	33.69	33.73	0.04	72	10128	J	COAL	C-4. BRKN
13	33.73	33.87	0.14	72	10128	J	COAL	C-2. BRKN

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	33.87	34.31	0.44	70	10129		MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT. UPPER 25CM SAMPLED.
14	34.31	34.51	0.20	69			MUDSTONE	CARB. BLK. MAS. SLD COALY STRINGERS THROUGHOUT. PLANT HASH.
14	34.51	34.55	0.04	69			COAL	C-6. BLK. MAS. SLD
14	34.55	34.58	0.03	69			COAL	C-3. BLK. MAS. SLD
14	34.58	34.73	0.15	68			MUDSTONE	CARB. BLK. MAS. BRKN SHARP LOWER CONTACT.
14	34.73	34.82	0.09	68			SANDSTONE	FG. MOD. LT. GY. MAS. SLD FINES UPWARD. SHARP UPPER & LOWER CONTACTS.
14	34.82	35.18	0.36	67			SILTSTONE	SSY. VPR. M. GY. LAM. BIOTR. SLD BIOTURBATED OR SLUMPED. DISRUPTED BEDDING THROUGHOUT.
14	35.18	36.33	1.15	64			SILTSTONE	SSY. VPR. M. GY. LAM. BIOTR. SLD AS ABOVE. BIOTURBATION? OR SLUMPING? BEDDING COMPLETELY DISRUPTED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	36.33	37.01	0.68	*60			SILTSTONE	VPR. M. GY. LAM. BIOTR. SLD LESS SAND THAN ABOVE. DISRUPTED BEDDING FROM BIOTR'B'N OR SLUMPING.
15	37.01	38.18	1.17	64			MUDSTONE	CARB. DK. GY. MAS. SLD OCC COALY STRINGERS 2MM WIDE. ONE C-2 B AND 15MM WIDE. COALIFIED PLANT HASH.
15	38.18	38.34	0.16	67			MUDSTONE	CARB. DK. GY. MAS. SSD. SLD ONE WHIRLED (SLUMP?) LIGHTER GREY MUD LAYER. 4CM WIDE. COALIFIED PLANT HASH.
16	38.34	40.16	1.82	*72			MUDSTONE	DK. GY. VTHNB. BIOTR. SLD FEWER COALY STRINGERS THAN ABOVE. OCC LIGHT GY MUD LAYERS. ONE PYRITE LENS 4CM WIDE LENS WITH 4-5MM WIDE QTZ FILLED SPHERES. BIOTR'B'N AT LOWER CONTACT.
16	40.16	40.40	0.24	71			SILTSTONE	SSY. DK. GY. VTHNB. SLD GRADATIONAL UPPER CONTACT.
17	40.40	41.24	0.84	71			SANDSTONE	VFG. M. GY. THNB. SLD VFG-FG MOSTLY COARSENING UPWARDS LAYERS. OCC SILTYWISP.
17	41.24	42.44	1.20	*70			SANDSTONE	SLTY. FG. M. GY. VTHNB. SLD INTERBEDDED FG SAND AND VFG SS/SILT BANDS. LAYERS COARSEN UPWARDS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	42.44	44.23	1.79	70		SANDSTONE	SLTY. FG. M. GY. VTHNB. SLD LITH AS ABOVE.
18	44.23	44.39	0.16	70		SANDSTONE	SLTY. FG. LT. GY. MAS. SLD MASSIVE FG SS.
19	44.39	45.08	0.69	70		SANDSTONE	SLTY. FG. M. GY. LAM. XBDG. BRKN WISPY XBDED LAMINAE THROUGHOUT LAYERS THAT ARE 30CM WIDE WHICH COARSEN UPWARDS
19	45.08	46.46	1.38	69		SILTSTONE	M. GY. MAS. SLD NO BEDDING VISIBLE. BIOTURBATED THROUGH OUT.
20	46.46	47.14	0.68	69		SILTSTONE	M. GY. VTHNB. SLD LAYERS COARSENS SLIGHTLY UPWARDS.
20	47.14	48.30	1.16	69		SILTSTONE	M. GY. LAM. SLD FINELY LAM'D THROUGHOUT WITH MUCH BIOTU RBATION.
21	48.30	50.05	1.75	*69		SILTSTONE	SSY. VPR. M. GY. LAM. XBDG. BRKN FINELY INTERLAMINATED FG SS AND SILT. M UMEROUS SILTY XBDG. SAND CONTENT DECREA SES DOWNWARDS.
21	50.05	50.16	0.11	69		SILTSTONE	DK. GY. MAS. SLD NO SANDY LAYERS. NO XBDG.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
22	50.16	52.29	2.13	*69		SILTSTONE	M. GY. VTHNB. WRMBU. SLD FAINT BEDDING. OCC VERT BURROWS SHOW TO PS UP. SOME LAYERS VERY BIOTURBATED. FA IRLY CONSTANT GRAIN SIZE THROUGHOUT.
23	52.29	54.25	1.96	*70		SILTSTONE	SSY. M. GY. LAM. XBDG. SLD FINE SILTY LAMINAE THROUGHOUT. FINING U PHARD CYCLES ABOUT 40CM THICK WHICH GRA DE FROM FG SS UP TO MUDDY SLTST.
24	54.25	55.99	1.74	71		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. XBDG. SLD FINE SILTY LAMINAE THROUGHOUT UNIFORM F G SS. MINOR XBDG.
24	55.99	56.32	0.33	71		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. XBDG. SLD LITH AS ABOVE. MINOR XBDG.
25	56.32	58.42	2.10	*72		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. WRMBU. SLD SAME LITHOLOGY AS ABOVE EXCEPT THIS ZON E SHOWS MUCH BIOGENIC ACTIVITY. INTENSE VERT & HORIZ BURROWING. SOME LAYERS CO MPLATELY BIOTURBATED.
26	58.42	59.10	0.68	*67		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BIOTR. SLD SLIGHTLY MORE SILT THAN ABOVE MUCH BIOT URBATION & WRM BURROWS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	59.10	60.34	1.24		67		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BIOTR. BRKN LITH AS ABOVE. MUCH BIOGENIC ACTIVITY.
27	60.34	62.09	1.75	*68			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BIOTR. BRKN LITH AS ABOVE. MUCH BIOGENIC ACTIVITY.
27	62.09	62.34	0.25		70		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BIOTR. BRKN LITH AS ABOVE. MUCH BIOGENIC ACTIVITY.
27	62.34	62.59	0.25		71		ROCK LOSS	
28	62.59	64.60	2.01		74		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BIOTR. VBRKN LITH AS ABOVE. MUCH BIOGENIC ACTIVITY. NUMEROUS VERTICAL JOINTS.
29	64.60	65.37	0.77		77		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BIOTR. BRKN LITH AS ABOVE. MUCH BIOGENIC ACTIVITY VERTICAL JOINTING.
29	65.37	66.56	1.19		79		SILTSTONE	SSY. M. GY. VTHNB. BIOTR. SLD LESS SAND THAN ABOVE, BUT STILL MUCH BI OGENIC ACTIVITY.
30	66.56	68.15	1.59		83		SILTSTONE	VPR. DK. GY. LAM. WRMBU. SLD HORIZ WRMBURS & VERT WRMBURS NUMEROUS, SOME BIOTR BUT NOT AS INTENSE AS ABOVE , FAIRLY UNIFORM GRAIN SIZE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	68.15	68.53	0.38	*85			SILTSTONE	VPR. DK. GY. LAM. WRMBU. SLD AS ABOVE.
31	68.53	70.47	1.94	*75			SILTSTONE	VPR. DK. GY. VTHNB. BIOTR. BRKN MUCH FAINTER & MORE GRADATIONAL LAYERIN G THAN ABOVE. OCC BIOTURBATED LAYERS.
32	70.47	71.15	0.68		72		SILTSTONE	VPR. DK. GY. VTHNB. BIOTR. SLD FINE DARK LAMINAE THROUGHOUT. OCC LIGHT ER GREY BIOTURBATED BANDS. TINY BLACK S PECS (WRMBR OR PLANT MASH) IN THESE BAN DS.
32	71.15	72.49	1.34		69		SILTSTONE	VPR. DK. GY. VTHNB. BIOTR. SLD AS ABOVE.
33	72.49	74.16	1.67	*65			SILTSTONE	VPR. M. GY. LAM. XBDG. BRKN NO BIOGENIC ACTIVITY. FAINT LT GY PLANA R LAMINAE. UNIFORM GRAINSIZE.
33	74.16	74.37	0.21		70		SILTSTONE	VPR. M. GY. LAM. SLD AS ABOVE.
34	74.37	75.91	1.54	*75			SILTSTONE	SSY. VPR. LT. GY. VTHNB. XBDG. VBRKN FG SAND MIXED IN. OCC DARK SILTY MISP. GRADATIONAL INTO TUFFITE. BELOW MINDR XBDG. MANY FRACTURED SUBPARALLEL TO COR E AXIS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
34	75.91	76.22	0.31	72			ROCK LOSS	
35	76.22	76.71	0.49	71			SILTSTONE	LT.GY.LAM.VBRKN TUFFITE - BRECCIATED.
35	76.71	77.03	0.32	*70			SILTSTONE	LT.GY.LAM.VBRKN TUFFITE - BRECCIATED. GRADATIONAL CONTA CT WITH BENTONITE BELOW.
35	77.03	77.38	0.35	70			ROCK LOSS	
35	77.38	77.55	0.17	70			BENTONITE	WH.VBRKN SOFT. SHARP LOWER CONTACT. TYPICAL BENT ONITE MARKER ABOVE I SEAM.
35	77.55	78.30	0.75	70			MUDSTONE	DK.GY.LAM.VBRKN HARD. FAINT SILTY LAMINAE. V FRACTURED. LOWER 18CM SAMPLED.
35	78.30	78.49	0.19	70			ROCK LOSS	
36	78.49	78.56	0.07	70	10130		MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS & QTZ WITHIN.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
36	78.56	78.74	0.18	70	10131	I	COAL	C-2.BRKN
36	78.74	78.77	0.03	70	10131	I	MUDSTONE	CARB.DK.GY.SLD
36	78.77	78.80	0.03	70	10131	I	COAL	C-4.SLD
36	78.80	79.31	0.51	70	10131	I	COAL	C-2.SHRD
36	79.31	79.35	0.04	70	10131	I	COAL	C-3.SLD
36	79.35	79.59	0.24	70	10131	I	COAL	C-2.SHRD
36	79.59	79.64	0.05	70	10131	I	MUDSTONE	CARB.SLD QTZ THROUGHOUT.
36	79.64	79.91	0.27	70	10131	I	COAL	C-2.BRKN SLIGHTLY SHEARED.
36	79.91	80.21	0.30	70	10131	I	COAL	C-2.BRKN SLIGHTLY SHEARED.
37	80.21	80.80	0.59	70	10131	I	COAL	C-2.BRKN C-3 BANDS WITHIN SHEARED.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	80.80	80.85	0.05	70	10131	I	COAL	C-3.BRKN
37	80.85	80.94	0.09	70	10132	I	MUDSTONE	SLTY.M-DK.GY.VBRKN
37	80.94	81.06	0.12	70	10132	I	COAL	C-3.SHRD
37	81.06	81.15	0.09	70	10132	I	MUDSTONE	CARB.DK.GY.SHRD
37	81.15	82.03	0.88	70	10132	I	COAL	C-2.SHRD VERY SHEARED.
38	82.03	82.64	1.61	70	10133	I	COAL	C-1.BRKN
38	82.64	82.81	0.17	70	10133	I	COAL	C-1.BRKN
39	83.81	83.94	0.13	70	10133	I	COAL	C-1.PHRD
39	83.94	84.00	0.06	70	10133	I	COAL	C-4.SLD QTZ THROUGHOUT.
39	84.00	84.06	0.06	70	10133	I	COAL LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
39	84.06	85.91	1.85	69	10134		MUDSTONE	CARB.DK.GY.SLD ABUNDANT PLANT FRAGS; MANY COALIFIED 15 CM QTZ VEINS RUNNING ALONG CORE. UPPER 25CM SAMPLED.
39	85.91	85.93	0.02	69			SILTSTONE	M.GY.SLD
40	85.93	86.96	1.03	69			SANDSTONE	FG.VPR.M.GY.LAM.BIOTR.BRKN V.DISTURBED BEDDING. MUDDY SILT LAMINAE THROUGHOUT.
40	86.96	87.90	0.94	69			SANDSTONE	MG.VPR.M.GY.LAM.BIOTR.BRKN AS ABOVE.
41	87.90	89.70	1.80	69			SANDSTONE	MG.MOD.M.GY.MAS.BRKN F-MG. PREDOMINANTLY MASSIVE. RARE FAINT SILTY WISPS. MANY FRACS SUB PARALLEL TO CORE AXIS.
42	89.70	89.83	0.13	69			SANDSTONE	MG.MOD.M.GY.MAS.SLD AS ABOVE.

\* DENOTES MEASURED BCA



PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	89.83	90.95	1.12	69		SANDSTONE	FG. MOD. M. GY. MAS. BRKN THIS INTERVAL GRADES FROM FG SS AT TOP DOWN TO MG SS WITH A SHARP CONTACT AT B ASE. IRREGULARLY SHAPED MUDST. RIPUPS 1- 3CM ACROSS.
42	90.95	91.61	0.66	69		SANDSTONE	FG. VPR. M. GY. VTHNB. SLD INTERBEDDED SS AND MUD BANDS. SHARP CON TACTS. "SILTY BANDED SANDSTONE" MARKER. BETWEEN SEAMS. H AND I.
43	91.61	92.14	0.53	69		MUDSTONE	SLTY. DK. GY. LAM. WRMBU. BRKN NUMEROUS FINE SILTY LAMINAE THROUGHOUT FINE DARK MUDST. HORIZ WRMBURS. SLICKEN SIDES.
43	92.14	93.49	1.35	*69		MUDSTONE	SLTY. DK. GY. LAM. WRMBU. SLD AS ABOVE.
44	93.49	95.22	1.73	70		MUDSTONE	DK. GY. LAM. SLD LITH AS ABOVE BUT WITH SLIGHTLY FEWER & THINNER SILTY LAMINAE. MINOR HELMINTHO PSIS.
44	95.22	95.55	0.33	70		MUDSTONE	DK. GY. MAS. SLD AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
45	95.55	97.00	1.45	71		MUDSTONE	DK. GY. MAS. SLD GRADUALLY BECOMES SILTIER DOWNWARD. FUS
45	97.00	97.54	0.54	71		MUDSTONE	SLTY. M. GY. LAM. WRMBU. BRKN FINE SILT LAMINAE THROUGHOUT. HORIZONTAL L. WRMBURS. & MINOR HELMINTHOSIS.
46	97.54	98.16	0.62	71		SILTSTONE	M. GY. LAM. SSD. BRKN FINELY INTERLAMINATED. MUD & SILT. SLUMP ING & LOADING.
46	98.16	99.57	1.41	72		SANDSTONE	MG. VPR. M. GY. BIOTR. SLD BIOTURBATED AREA (COMPLETELY DISRUPTED BEDDING) WITH 2CM WIDE QTZ-REPLACED BIV ALVES. MUDST RIPUPS 1-2CM LONG. OCC. BLA CK SPECKS-NORM PELLETS.
47	99.57	101.25	1.68	73		SANDSTONE	MG. VPR. M. GY. VTHNB. WRMBU. SLD MUD LAYERS WITH SHARP CONTACTS (SILTY B ANDED SAND), NUMEROUS HORIZ & VERT WRMB URS.
47	101.25	101.63	0.38	73		SANDSTONE	MG. VPR. M. GY. VTHNB. WRMBU. SLD LITH AS ABOVE BUT WITH MUCH MORE BIOGEN IC ACTIVITY.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
48	101.63	103.71	2.08	74			SANDSTONE	MG. VPR. M. GY. YTHNB. WRMBU. SLD INTERBEDDED MUD AND SAND AS ABOVE WITH THE SAND LAYERS RANGING FROM FINE TO COARSE GRAINED. MUCH BIOGENIC ACTIVITY: VERT & HORIZ WRMBURS.
49	103.71	104.37	0.66	74			SANDSTONE	MG. VPR. M. GY. YTHNB. WRMBU. SLD AS ABOVE.
49	104.37	104.74	0.37	75			SANDSTONE	GRAN. M. GY. MAS. SLD GRANULAR SAND (STORMY BAND) LAYER. SHARP LOWER CONTACT WITH A VERT WRMBUR.
49	104.74	105.70	0.96	*75			SILTSTONE	SSY. VPR. M. GY. LAM. SSD. BRKN FINE PLANAR LAMINAE THROUGHOUT. INTER LAMINATED MUD AND SILTY FG SAND. MINOR LADING VISIBLE. SILTY BANDED SAND.
50	105.70	107.35	1.65	75			SANDSTONE	FG. M. GY. YTHNB. WRMBU. SLD INTERBEDDED F-MG SS AND MUD. SHARP CONTACT. "SILTY BANDED SAND" - LARGE BIVALV F. BURROWS. OCC HORIZ BURROWS.
50	107.35	107.72	0.37	75			SANDSTONE	FG. M. GY. YTHNB. WRMBU. SLD AS ABOVE.
51	107.72	109.82	2.10	75			SANDSTONE	MG. M. GY. YTHNB. WRMBU. SLD "SILTY BANDED SS" AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
52	109.82	110.09	0.27	75			SANDSTONE	MG. M. GY. LAM. WRMBU. SLD "SILTY BANDED SS" AS ABOVE. EXCEPT BEDDING IS FINER. PYRITE BANDS AT BASE.
52	110.09	110.12	0.03	75			COAL	C-2. BLK. BRKN
52	110.12	110.28	0.16	75			MUDSTONE	CARB. DK. GY. SLD FINE COALY STRINGERS THROUGHOUT.
52	110.28	110.46	0.18	75			MUDSTONE	DK. GY. MAS. BRKN FEATURELESS UNIFORM MUDST. PLANT HASH.
52	110.46	111.73	1.27	75			MUDSTONE	DK. GY. MAS. BRKN PLANT HASH WEATHERS/CRUMBLES EASILY.
53	111.73	112.07	0.34	75			MUDSTONE	CARB. DK. GY. BRKN COALY PLANT FRAGS THROUGHOUT.
53	112.07	112.65	0.58	75			MUDSTONE	CARB. DK. GY. BRKN ABUNDANT COALY PLANT FRAGS (40%).
53	112.65	112.72	0.07	75			COAL	C-3. SLD QTZ. STRINGERS CONTORTED THROUGHOUT.
53	112.72	113.10	0.38	75			MUDSTONE	CARB. DK. GY. SHRD COALY STRINGERS & LENSES THROUGHOUT.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
530	113.10	113.22	0.12	75			ROCK LOSS	
53	113.22	114.12	0.90	75	H/I		COAL	C-3 QTZ STRINGERS CONTORTED THROUGHOUT.
53	114.12	114.52	0.40	75	H/I		MUDSTONE	CARB. DK. GY. BRKN COALY LENSES & PLANT FRAGS. WITHIN.
530	114.52	114.60	0.08	75	H/I		ROCK LOSS	
54	114.60	116.39	1.79	75			MUDSTONE	DK. GY. MAS. BIOTR. VBRKN WIDE ZONES OF WELL CONSOLIDATED BIOTURBATED MUDST.; OTHERWISE POORLY CONSOLIDATED FLAKEY MASSIVE MUDST. NO TRUE BEDDING VISIBLE. PLANT HASH.
54	116.39	116.60	0.21	74			ROCK LOSS	
55	116.60	117.32	0.72	74			MUDSTONE	DK. GY. MAS. VBRKN POORLY CONSOLIDATED MASSIVE MUDST - WEATHERS/CRUMBLES EASILY. PLANT HASH.
55	117.32	117.72	0.40	74			ROCK LOSS	

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	117.72	118.45	0.73	74			MUDSTONE	DK. GY. MAS. VBRKN MUDST (POORLY CONSOLIDATED) AS ABOVE. PLANT HASH, SOME COALIFIED.
55	118.45	118.85	0.40	74			ROCK LOSS	
56	118.85	120.62	1.77	74			MUDSTONE	DK. GY. MAS. VBRKN POORLY CONSOLIDATED MUDST AS ABOVE COALY STRINGERS 3-10CM WIDE AND PLANT HASH. ONE HARD LIGHTER GREY BIOTURBATED ZONE 7CM WIDE.
57	120.62	120.68	0.06	74			MUDSTONE	DK. GY. MAS. VBRKN POORLY CONSOLIDATED MUDST AS ABOVE. NO COALY STREAKS.
57	120.68	120.98	0.30	74			ROCK LOSS	
57	120.98	122.70	1.72	74			MUDSTONE	DK. GY. MAS. VBRKN MUDST AS ABOVE. POORLY CONSOLIDATED MUDST WITH PLANT HASH.
58	122.70	123.87	1.17	74			MUDSTONE	DK. GY. MAS. BRKN POORLY CONSOLIDATED MUDST AS ABOVE. LESS PLANT HASH THAN ABOVE.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
58	123.87	124.54	0.67	74		MUDSTONE	DK. GY. MAS. BRKN AS ABOVE.
59	124.54	125.23	0.69	74		SILTSTONE	DK. GY. VTHNB. BRKN VERY POORLY CONSOLIDATED-LAYERS CRUMBLE EASILY. PLANAR LAMINAE.
59	125.23	126.51	1.28	*74		SANDSTONE	SLTY. FG. PR. M. GY. LAM. SSD. SLD FINE SILTY LAMINAE THROUGHOUT. V POORLY CONSOLIDATED-CRUMBLES EASILY. SOME LOAD CASTS SHOW TOPS UP.
60	126.51	126.82	0.31	74		SANDSTONE	SLTY. FG. PR. M. GY. LAM. SSD. VBRKN INTERLAMINATED SS AND MUDST. SIMILAR TO SS BUT THINNER BEDS AND NO BIOTURBATIO N. POORLY CONSOLIDATED.
60	126.82	126.92	0.10	74		ROCK LOSS	
60	126.92	128.56	1.64	75		SANDSTONE	SLTY. FG. PR. M. GY. LAM. SSD. BRKN AS ABOVE.
61	128.56	129.97	1.41	*75		SANDSTONE	SLTY. FG. PR. M. GY. LAM. BRKN OCC MUDST RIPUP IN SAND LAYERS. SLIGHTLY BETTER CONSOLIDATION.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 24

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
61	129.97	130.61	0.64	*75		SANDSTONE	SLTY. FG. PR. M. GY. LAM. BRKN AS ABOVE.
62	130.61	132.75	2.14	*70		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. SLD PLANAR SILTY LAMINAE THROUGHOUT. SLIGHTLY BETTER CONSOLIDATION THAN ABOVE.
63	132.75	133.03	0.28	73		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. SLD AS ABOVE.
63	133.03	134.69	1.66	*75		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. SLD AS ABOVE.
64	134.69	136.05	1.36	72		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. SLD AS ABOVE.
64	136.05	136.76	0.71	70		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. SLD AS ABOVE.
65	136.76	138.80	2.04	*67		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. SLD AS ABOVE. BCA'S 60-75 DEGREES.
66	138.80	138.98	0.18	*70		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BRKN QTZ WITHIN SILTY LAMINAE THROUGHOUT.
66	138.98	139.56	0.58	70 10135		SANDSTONE	SLTY. FG. VPR. M. GY. LAM. BRKN QTZ WITHIN SILTY LAMINAE THROUGHOUT. L OWER 25CM SAMPLED.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 25

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
66	139.56	139.60	0.04	71	10136	H	COAL	C-3.SLD
66	139.60	139.61	0.01	71	10136	H	MUDSTONE	CARB.DK.GY.SLD
66	139.61	139.74	0.13	71	10136	H	COAL	C-3.BRKN C-3. & QIZ BANDS WITHIN.
66	139.74	139.87	0.13	71	10136	H	COAL	C-2.PHRD SHEARED.
66	139.87	140.01	0.14	71	10136	H	MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS & THIN BANDS WITHIN.
66	140.01	140.09	0.08	71	10136	H	COAL	C-3.BRKN SHEARED.
66	140.09	140.19	0.10	71	10136	H	COAL LOSS	
66	140.19	140.62	0.43	71	10136	H	MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.
67	140.62	140.67	0.05	71	10136	H	MUDSTONE	CARB.DK.GY.BRKN COALY PLANT FRAGS THROUGHOUT.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
67	140.67	140.95	0.28	71	10137	H	COAL	C-3.SHRD LISTRIC SURFACES.
67	140.95	141.51	0.56	72	10137	H	COAL	C-2.SHRD LISTRIC SURFACES.
67	141.51	141.55	0.04	72	10137	H	MUDSTONE	CARB.DK.GY.SHRD LISTRIC SURFACES.
67	141.55	141.85	0.30	72	10137	H	COAL	C-2.SHRD LISTRIC SURFACES.
67	141.85	142.08	0.23	72	10138		MUDSTONE	CARB.DK.GY.SHRD PLANT FRAGS THROUGHOUT, SOME COALIFIED.
68	142.08	142.25	0.17	73			SANDSTONE	FG.VPR.M.GY.LAM.VSHRD FINE DARK PLANAR SILTY LAMINAE. DISRUPTED BEDDING FROM SHEARING?
68	142.25	143.41	1.16	73			SANDSTONE	MG.MOD.M.GY.MAS.VBRKN IRREGULARLY SHAPED MUDST RIPUP CLASTS 5 -25MM LONG. LISTRIC SURFACES.
68	143.41	143.89	0.48	74			SANDSTONE	MG.MOD.M.GY.LAM.SLD NUMEROUS MUD LAMINAE 2-10MM WIDE WITH 5 HARP CONTACTS.
69	143.89	144.83	0.94	74			SANDSTONE	MG.MOD.M.GY.LAM.VBRKN LITH AS ABOVE. SLICKENSIDES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86036

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	144.83	145.83	1.00	*75		SANDSTONE	MG. MOD. M. GY. LAM. SLD LITH AS ABOVE, BUT WITH SLIGHTLY FEWER MUD LAMINAE. 8CM WIDE BAND CONSISTING O F ROUNDED MUDST. RIPUP CLASTS. AT BOTTOM OF BOX.
70	145.83	147.75	1.92	*70		SILTSTONE	SSY. VPR. DK. GY. LAM. BIOTR. BRKN DARK SANDY SILTSTONE. HELMINTHOPSIS. ON E 26CM ZONE OF INTENSE BIOTURBATION. T. D. = 148.44 M. END OF HOLE. DRILLER'S M. ARKER.

\* DENOTES MEASURED BCA  
NEWPAGE













GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT  
 STRATIGRAPHIC LOG  
 KPN LR DDH86036

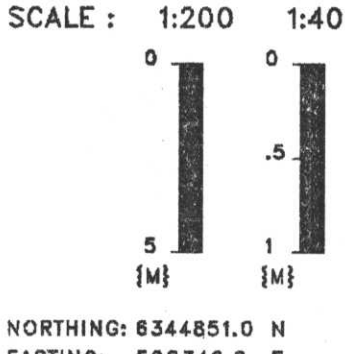
723

GEOLOGIST : BARKER

DATE : FEB 26/87

DRAWING NO. :

LITHOLOGIC SYMBOLS

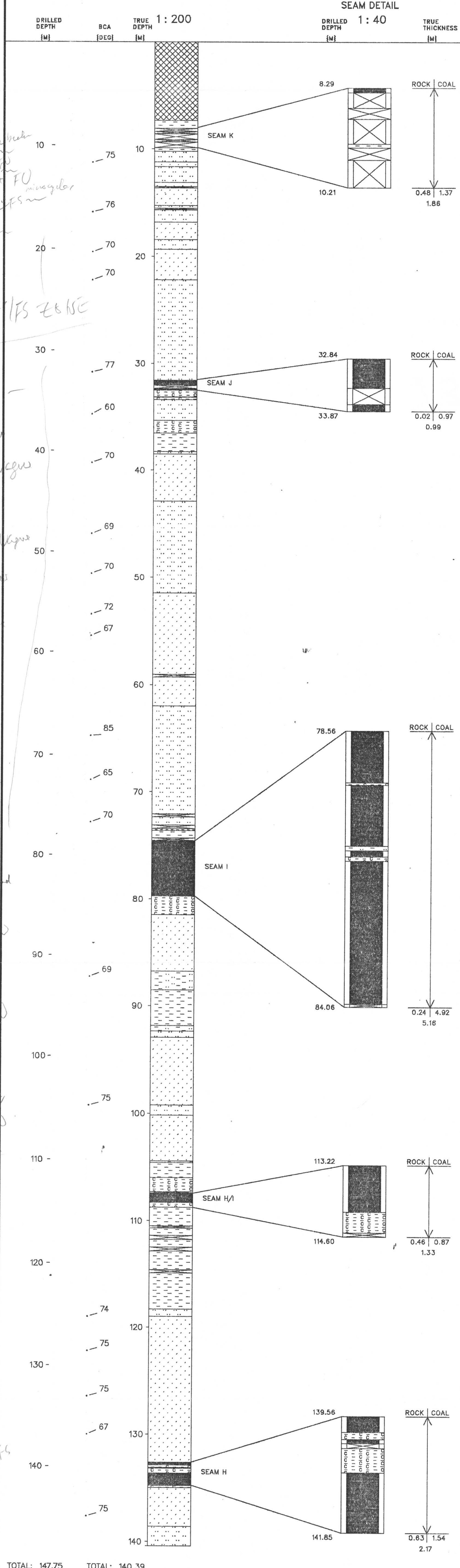


NORTHING: 6344851.0 N  
 EASTING: 508346.8 E

INCLINATION: 90.0°

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

*Handwritten notes on the left margin:*  
 10 - 75  
 20 - 70  
 30 - 77  
 40 - 70  
 50 - 69, 70, 72  
 60 - 67  
 70 - 85, 65, 70  
 80 - 80  
 90 - 69  
 100 - 75  
 110 - 74, 75  
 120 - 74, 75  
 130 - 75  
 140 - 67, 75



TOTAL: 147.75      TOTAL: 140.39

# Gulf Canada Corporation Coal Division

# 723

Geophysical Log

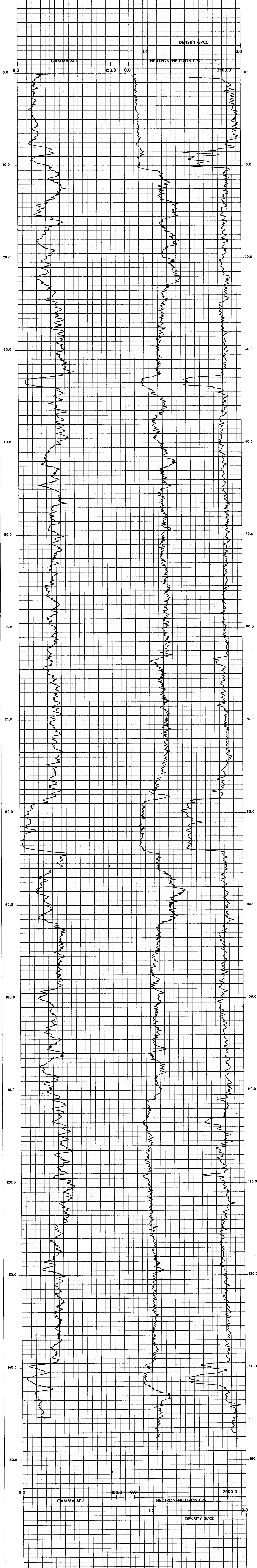
Datasource: **KPNLRDDH86036**  
 Log Date: 86-09-29  
 Company: CENTURY  
 Geologist: BARKER

Province: BC    Northing: 6344850.00    Lat: 571455  
 Zone: 9    Easting: 508347.00    Long: 1285142  
 Measuring Point:    Elevation: 1507.5

Scale: 1 to 100.0  
 Depth Range: 0.0 to 153.0  
 True Thickness: NO

Comments:  
 1. LOGGED THROUGH THE RODS  
 2.

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



KPNLRDDH86037

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86037

DATE - 02/13/87

- HISTORY -

START DATE - 30/09/86

END DATE - 01/10/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - MACLEOD

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1641.62

LICENCE/LEASE NUMBER -

ZONE - 9

NORTHING - 6342290.00

EASTING - 506750.37

LATITUDE - 571332

LONGITUDE - 1285318

- ORIENTATION -

LENGTH - 160.63

CORE SIZE - 0.0

INCLINATION - 90.0

AZIMUTH - 0.0

CEMENT - N

PLUG - N

PIEZ - N

CASING DEPTH (M) - 7.62

AQUIFER DEPTHS (M) - 0.00

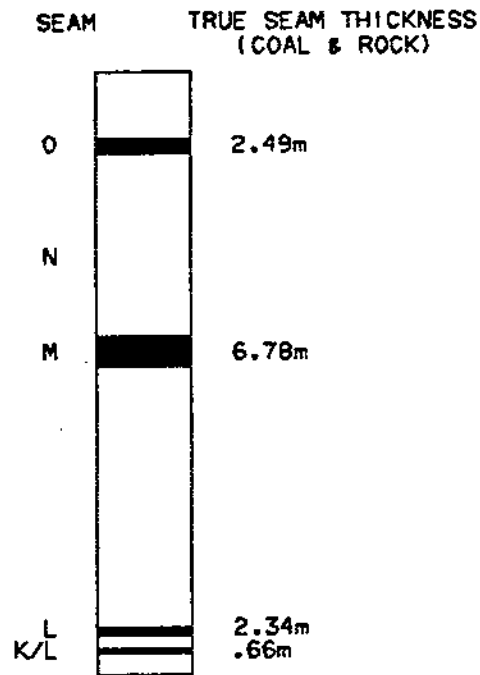
0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====



NOTE:

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE  
**MOUNT KLAPPAN ANTHRACITE PROJECT**  
1986 DIAMOND DRILL HOLES  
DDH86037

GULF CANADA CORPORATION  
11/03/87  
KLAP: [205057]870063037.L06





87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	7.62	7.62	89		OVERBURDEN	CASING
1	7.62	9.41	1.79	*89		MUDSTONE	DK.GY.MAS.VBRKN RARE SLTST BANDS UP TO 1CM. BROKEN NATU RE OF CORE DOES NOT ALLOW MORE DETAILED LOGGING.
2	9.41	10.59	1.18	88		MUDSTONE	DK.GY.MAS.VBRKN AS ABOVE. RUBBLY IN PART.
2	10.59	11.11	0.52	88		MUDSTONE	CARB.BLK.LAM.BRKN VITRAIN BAND 1CM WIDE 10CM FROM BASE AN D NUMEROUS VITRAIN LAMINAE LESS THAN 1M H THROUGHOUT UNIT.
3	11.11	13.27	2.16	*87		MUDSTONE	BLK.MAS.BRKN OCCASIONAL VITRAIN LAMINAE UP TO 1MM WI DE. TOP HALF OF UNIT IS CARBONACEOUS. P LANT HASH ABUNDANT THROUGHOUT AND IS CO ALIFIED IN TOP HALF OF UNIT (CZEKANOWSK IA CF. RIGIDA?).
4	13.27	13.66	0.39	86		MUDSTONE	BLK.MAS.BRKN AS ABOVE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	13.66	15.32	1.66	*86		MUDSTONE	SLTY.DK.GY.LAM.BRKN VERY FAINT OCCASIONAL SLTST LAMINAE WIT H INDISTINCT, GRADATIONAL CONTACTS. BAS E OF UNIT IS MORE MASSIVE. PLANT FOSSIL S ARE ABUNDANT (CZEKANOWSKIA CF. RIGIDA PITYOPHYLLUM NORDENSKIOLDII) AND SOME TIMESCOALIFIED.
5	15.32	16.78	1.46	83		MUDSTONE	DK.GY.MAS.SLD FEATURELESS EXCEPT ABUNDANT PLANT FRAGM ENTS (CZEKANOWSKIA CF. RIGIDA, PITYOPHYL LUM NORDENSKIOLDII, BAIERA FURCATA), SO ME FRAGMENTS COALIFIED.
5	16.78	17.48	0.70	81 10139		MUDSTONE	BLK.MAS.BRKN CARBONACEOUS NEAR TOP WITH SINGLE COAL BAND 1.8CM WIDE (C-5) 5CM FROM UPPER CO NTACT. OCCASIONAL VITRAIN LAMINAE THROU GHOUT. ABUNDANT WELL PRESERVED PLANT FO SSILS (PTEROPHYLLUM RECTANGULARE ABUNDA NT). LOWER 25CM SAMPLED.
6	17.48	17.52	0.04	81 10140 0		COAL	C-5.BRKN

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	17.52	17.60	0.08	81	10140	0	COAL	C-4.BRKN
6	17.60	17.84	0.24	80	10140	0	COAL LOSS	
6	17.84	17.95	0.11	80	10140	0	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS THROUGHOUT. 5MM PYRITE LENS WITHIN.
6	17.95	18.00	0.05	80	10140	0	COAL	C-2.BRKN
6	18.00	18.31	0.31	80	10140	0	MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS THROUGHOUT. PYRITE NODULE OCCURANCE.
6	18.31	18.44	0.13	79	10140	0	COAL	C-3.BRKN C-2 BANDS WITHIN.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	18.44	18.48	0.04	79	10140	0	MUDSTONE	CARB. M-DK. GY. SLD
6	18.48	18.50	0.02	79	10140	0	COAL	C-2.BRKN
6	18.50	18.52	0.02	79	10140	0	MUDSTONE	CARB. DK. GY. BRKN
6	18.52	18.64	0.12	79	10140	0	COAL	C-3.BRKN
6	18.64	18.66	0.02	79	10140	0	MUDSTONE	CARB. DK. GY. SLD
6	18.66	18.78	0.12	79	10140	0	COAL	C-3.VBRKN
6	18.78	18.82	0.04	78	10140	0	MUDSTONE	CARB. DK. GY. BRKN
6	18.82	19.36	0.54	78	10140	0	COAL	C-3.VBRKN
6	19.36	19.40	0.04	77	10140	0	COAL	C-4. SLD
6	19.40	19.47	0.07	77	10140	0	COAL	C-2.BRKN

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
7	19.47	19.54	0.07	77	10140	0	COAL	C-1.VBRKN ABUNDANT CONCHOIDAL FRAC SURFACES.
7	19.54	19.71	0.17	77	10140	0	COAL LOSS	
7	19.71	19.83	0.12	77	10140	0	MUDSTONE	BLK.MAS.SLD FEATURELESS. MINOR COALIFIED PLANT FRAGMENTS.
7	19.83	19.93	0.10	77	10140	0	MUDSTONE	BLK.MAS.SLD AS ABOVE.
7	19.93	19.97	0.04	76	10140	0	COAL	C-3.SLD THIN QIZ BAND 1MM WIDE.
7	19.97	20.03	0.06	76	10140	0	COAL	C-2.SLD
7	20.03	20.33	0.30	76	10141		MUDSTONE	BLK.MAS.SLD FEATURELESS EXCEPT ABUNDANT PLANT FOSSILS (PITYOPHYLLUM NORDENSKIOLDII, CZEKANOWSKIA CF. RIGIDA AND V SMALL GINKGO PL. URIPARTITA (?)).
7	20.33	20.48	0.15	76			MUDSTONE	BLK.MAS.BRKN ABUNDANT QIZ VEINS SURROUNDING VITRAIN BANDS UP TO 1CM. LISTRIC SHEAR SURFACES.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
7	20.48	21.39	0.91	75			MUDSTONE	BLK.MAS.VBRKN OCCASIONAL VITRAIN LAMINAE 40CM FROM TO P OF UNIT IN OTHERWISE MASSIVE UNIT.
7	21.39	21.60	0.21	74			ROCK LOSS	
8	21.60	22.69	1.09	73			MUDSTONE	BLK.MAS.BRKN TOP 13CM OF UNIT IS BIOTURBATED. 50CM FROM TOP IS 1CM UNCONSOLIDATED SOFT CLAY BAND. BASAL 18CM IS RUBBLE.
8	22.69	23.49	0.80	*71			MUDSTONE	BLK.MAS.BRKN FEATURELESS AND MASSIVE EXCEPT SINGLE LIGHT GY MUDST BAND 2CM WIDE 25CM FROM BASE OF UNIT WITH AN INDISTINCT, NON PLANAR CONTACT WITH SURROUNDING MUDST. MINOR LISTRIC SHEAR SURFACES.
9	23.49	25.45	1.96	74			MUDSTONE	DK.GY.MAS.BRKN FEATURELESS. DEEP GROOVES FROM CORE BAR REL. OBSCURE ANY FEATURES IN MOST OF UNIT. MINOR LISTRIC SHEAR SURFACES.
10	25.45	25.70	0.25	77			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
10	25.70	26.94	1.24	79			MUDSTONE	DK.GY.MAS.YBRKN SOFT, POORLY CONSOL, FEATURELESS MUDST AS ABOVE. LOCALLY RUBBLY.
10	26.94	27.09	0.15	80			ROCK LOSS	
11	27.09	28.24	1.15	*82			MUDSTONE	DK.GY.MAS.BRKN SOFT, DEEP GROOVES FROM CORE BARREL OBS CURES ANY FEATURES. 1CM WIDE SOFT, PLIA BLE MUD BAND 10CM FROMTOP OF UNIT. UPPE R 8CM IS RUBBLE.
11	28.24	28.36	0.12	81			BENTONITE	LT.GY.MAS.SLD SHARP BASAL CONTACT.
11	28.36	28.71	0.35	80			MUDSTONE	DK.GY.MAS.BRKN MASSIVE AND FEATURELESS.
11	28.71	29.11	0.40	80			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE.
12	29.11	30.51	1.40	*78			MUDSTONE	SLTY.DK.GY.LAM.BRKN FINELY LAMINATED WITH PLANAR CONTACTS. UNIT IS POORLY CONSOL AS ABOVE. BASAL 2 8CM IS RUBBLE WITH ABUNDANT QTZ VEINS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	30.51	31.58	1.07	*80			SANDSTONE	VFG.PR.M.GY.LAM.SLD MASSIVE TOP BECOMES FINELY LAMINATED IN BASAL 74CM OF UNIT. 1CM VITRAIN AND QTZ LAMINAE 60CM FROM BASE. LOCALIZED BRECC CIATION. GRADATIONAL BASAL CONTACT.
13	31.58	32.03	0.45	72			SANDSTONE	FG.PR.M.GY.MAS.BRKN FEATURELESS.
13	32.03	33.54	1.51	*62			SANDSTONE	FG.PR.M.GY.LAM.SLD OCCASIONAL BANDS OF MUDST LAMINAE WITH SHARP PLANAR CONTACTS. OTHERWISE FEATUR ELESS.
14	33.54	35.08	1.54	*70			SANDSTONE	FG.PR.M.GY.LAM.BRKN MUDST BEDS UP TO 1CM IN TOP 5CM, VARIOU S BANDS OF ROUNDED TO ANGULAR MUDST RIP UP CLASTS 0.5CM TO 6CM AND A FEW COAL RI PUP CLASTS SURROUNDED BY QTZ. BASAL 30C M IS FAINTLY X-LAM. SCOURING INDICATES TOPS UP. GRADATIONAL BASAL CONTACT.
14	35.08	35.43	0.35	75			SANDSTONE	MG.PR.M.GY.MAS.SLD FEATURELESS. COARSER THAN ABOVE UNIT.
14	35.43	35.51	0.08	76			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	35.51	36.86	1.35	*80		SANDSTONE	MG. PR. M. GY. LAM. VBRKN VERY FAINT AND OCCASIONAL MUDST OR VITR AIN LAMINAE. LARGELY RUBBLE IN BASAL HA LF OF UNIT. GRADATIONAL BASAL CONTACT.
15	36.86	37.11	0.25	78		SANDSTONE	CG. PR. M. GY. MAS. SLD MASSIVE. POLYMICITIC. FEATURELESS. GRADATI ONAL BASAL CONTACT.
15	37.11	37.35	0.24	78		SANDSTONE	MG. PR. M. GY. MAS. SLD SLIGHTLY FINER THAN ABOVE.
16	37.35	37.60	0.25	77		SANDSTONE	MG. PR. M. GY. MAS. YBRKN RUBBLE. LITHOLOGICALLY AS ABOVE.
16	37.60	37.70	0.10	77		ROCK LOSS	
16	37.70	39.22	1.52	75		SANDSTONE	MG. PR. M. GY. THKB. BRKN MASSIVE SS INTERBEDDED WITH OCCASIONAL 1-3CM BANDS OF FG SS WITH ABUNDANT COAL LAMINAE. COALY BANDS ARE SOFTER AND MOR E EASILY WEATHERED.
17	39.22	40.81	1.59	72		SANDSTONE	MG. PR. M. GY. MAS. SLD LOCALLY CG WITH GRADATIONAL BOUNDARIES BETWEEN THE FINER AND COARSER UNITS.
17	40.81	40.82	0.01	70		MUDSTONE	DK. GY. MAS. SLD HIGHLY POLISHED SLIP SURFACES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	40.82	41.16	0.34	*70		SANDSTONE	MG. PR. M. GY. LAM. SLD OCCASIONAL PLANAR MUDST LAMINAE IN OTHE RWISE MASSIVE UNIT.
18	41.16	42.86	1.70	68		SANDSTONE	MG. PR. M. GY. MAS. SLD 15CM BED OF CG SS IN MIDDLE OF UNIT WIT H GRADATIONAL CONTACTS WITH SURROUNDING MG SS. SHARP BASAL CONTACT.
18	42.86	42.90	0.04	66		MUDSTONE	DK. GY. LAM. SLD NUMEROUS QTZ LAMINAE THROUGHOUT PARALLE L TO BDG. SHARP BASAL CONTACT.
18	42.90	43.22	0.32	66		SANDSTONE	MG. PR. M. GY. MAS. SLD FEATURELESS MASSIVE SS.
19	43.22	43.64	0.42	65		SANDSTONE	MG. PR. M. GY. MAS. SLD AS ABOVE BUT WITH OCCASIONAL ANGULAR TO ROUNDED CHERT PEBBLES UP TO 0.5CM. SHA RP PLANAR BASAL CONTACT.
19	43.64	43.84	0.20	64		CONGLOMERATE	PR. M. GY. MAS. SLD CLAST SUPPORTED WITH ROUNDED CHERT PEBB LES IN MG SS MATRIX. GRADES BASALLY INT O MATRIX SUPPORTED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	43.84	45.25	1.41	63			SANDSTONE	MG. PR. M. GY. MAS. SLD OCCASIONAL V THIN AND DISCONT MUDST W/IS PS AND LOW ANGLE OTZ VEINS < 0.5CM WIDE POLISHED SLIP SURFACES.
20	45.25	46.68	1.43	*60			SANDSTONE	MG. PR. M. GY. VTHNB. SLD PLANAR MUDST LAMINAE UP TO .75CM UNEVEN LY SPACED THROUGHOUT UNIT. BDG UNITS FR OM 1 CM- 10 CM. SHARP BASAL CONTACT.
20	46.68	46.89	0.21	61			CONGLOMERATE	PR. M. GY. MAS. SLD CLAST SUPPORTED. LITHOLOGICALLY LIKE CG L ABOVE. CLASTS INCREASE TOWARDS BASE. CLAST SUPPORTED.
20	46.89	46.99	0.10	*61			MUDSTONE	DK. GY. LAM. SLD BECOMES MORE CARB TOWARDS BASE.
20	46.99	47.21	0.22	61			MUDSTONE	CARB. DK. GY. LAM. BRKN ABUNDANT COALIFIED PLANT FRAGS PARALLEL TO BDG PLANES.
21	47.21	48.16	0.95	61			MUDSTONE	CARB. BLK. MAS. SLD ABUNDANT VITRAIN LAMINAE AND COALIFIED PLANT FRAGMENTS.
21	48.16	49.12	0.96	*61			MUDSTONE	BLK. LAM. BIOTR. SLD MAYY TO PLANAR LAMINAE ARE INDISTINCT. BASAL 20CM IS HIGHLY BIOTURBATED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	49.12	49.16	0.04	64		N	COAL	C-3. VBRKN HIGHLY SHEARED.
21	49.16	49.28	0.12	65		N	COAL LOSS	
22	49.28	49.67	0.39	66		N	MUDSTONE	CARB. BLK. VSHRD HIGHLY SHEARED RUBBLE CONSISTING OF CON CAVE SLIP SURFACES. VITRAIN LAMINAE ARE MINOR.
22	49.67	49.79	0.12	68		N	COAL LOSS	
22	49.79	49.82	0.03	68		N	COAL	C-3. SHRD SHEARED AND CRUMBLY.
22	49.82	50.62	0.80	71			MUDSTONE	CARB. BLK. LAM. BRKN ABUNDANT VITRAIN LAMINAE AND COALIFIED PLANT FRAGS. LISTRIC SHEAR SURFACES LES S CARBONACEOUS TOWARDS BASE.
22	50.62	51.14	0.52	*75			MUDSTONE	SLTY. DK. GY. LAM. BRKN UNEVENLY SPACED MUDST LAMINAE WITH SHAR P. MAYY TO PLANAR CONATCTS.

\* DENOTES MEASURED BCA

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GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
23	51.14	52.43	1.29	*69			MUDSTONE	SLTY.DK.GY.SLD PLANAR MUDST LAMINAE WITH SHARP CONTACT S. VTHNB TOLAMINATED. MINOR VITRAIN LAM INAE.
23	52.43	53.08	0.65	70			MUDSTONE	CARB.BLK.LAM.SLD VITRAIN BANDS UP TO 1CM BUT GENERALLY L ESS THAN 1MM. LITRISTIC SHEAR SURFACES.
24	53.08	55.18	2.10	73			MUDSTONE	DK.BLK.LAM.BRKN MINOR QTZ VEINS. LITHOLOGICALLY AS BASA L PORTION OF ABOVE.
25	55.18	56.34	1.16	*75			MUDSTONE	DK.GY.LAM.BRKN VERY FAINT, OCCASIONAL LAMINAE AND WISP S. PYRITE BLEBS UP TO 1CM. BASAL 30CM L ARGELY RUBBLE.
25	56.34	56.37	0.03	77			ROCK LOSS	
25	56.37	56.98	0.61	79			MUDSTONE	DK.GY.MAS.BIOTR.VBRKN NO PLANAR LAMINAE OBVIOUS. BASAL 10CM B IOTURBATED.ABUNDANT LITRISTIC SHEAR. SUREA CES. TOP 30CM RUBBLY.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	56.98	58.79	1.81	84			MUDSTONE	DK.GY.MAS.BIOTR.BRKN LOCALLY BIOTURBATED. ABUNDANT NEAR VERT ICAL VERY FINE QTZ VEINS.
27	58.79	59.45	0.66	*89			MUDSTONE	DK.GY.LAM.WRMBU.SLD FINELY INTERLAMINATED SLTY MUDST AND MU DST WITH GRADATIONAL PLANAR CONTACT. BA SAL 20CM HAS WORM BURROWING WHICH OBSCU RES BDG CONTACTS.
27	59.45	60.19	0.74	89			MUDSTONE	DK.GY.LAM.SLD FINELY PLANAR INTERLAMINATED MUDST AS A BOVE. NO BURROWING. GRADATIONAL BASAL C ONTACT.
27	60.19	60.88	0.69	*90			MUDSTONE	SLTY.DK.GY.LAM.SLD SLIGHTLY COARSER THAN ABOVE. LAMINAE AR E INDISTINCT AND SLIGHTLY MORE WAVY THA N ABOVE.
28	60.88	62.57	1.69	*90			SILTSTONE	CLYY.DK.GY.LAM.BRKN SLTST LAMINAE HAVE REL SHARP PLANAR CON TACTS WITH MUDST. NUMEROUS LOAD CASTS I NDICATE TOPS UP. QTZ VEIN 1CM THICK PAR ALLEL TO BDG. MINOR LITRISTIC SHEARSURFAC ES. GRADATIONAL BASAL CONTACT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	62.57	64.69	2.12	*89			MUDSTONE	SLTY.DK.GY.LAM.SLD TOP 5CM IS FINER THAN ABOVE UNIT. UNIT COARSENS SLIGHTLY TO BASE AND EVEN GRADATIONAL PLANAR LAMINAE CONTACTS BECOMES LESS DISTINCT. PLANT HASH PARALLEL TO BDG PLANES (PITYOPHYLLUM NORDENSKIOLDII)
30	64.69	65.69	1.00	83			SILTSTONE	CLYY.DK.GY.LAM.XBDG.SLD LOW ANGLE CROSS LAMINATIONS INDICATE TO PS UP. CONTACTS ARE GRADATIONAL AND NEAR PLANAR.
30	65.69	66.74	1.05	*79			SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD AS ABOVE. MINOR VERTICAL WORM BURROWS INDICATE TOPS UP.
31	66.74	68.65	1.91	*86			SILTSTONE	CLYY.DK.GY.LAM.VBRKN AS ABOVE. MUDST RIPUP CLAST WITH PYRITE IS 3CM LONG. UNIT IS POORLY CONSOLIDATED AND WILL WEATHER EASILY.
32	68.65	68.96	0.31	*90			SILTSTONE	CLYY.DK.GY.LAM.XBDG.SLD AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
32	68.96	70.46	1.50	86			SILTSTONE	CLYY.DK.GY.LAM.VBRKN AS ABOVE. MINOR MUDST RIPUP CLASTS WITH PYRITE BLEBS UP TO 0.5CM. ABUNDANT LISTRIC SHEAR SURFACES. GRADATIONAL BASAL CONTACT.
33	70.46	70.98	0.52	82	10142		MUDSTONE	CARB.DK.GY.SHRD COALY STRINGERS THROUGHOUT. LISTRIC SURFACES. LOWER 25CM SAMPLED.
33	70.98	71.32	0.34	81	10143 M		COAL	C-3.SHRD
33	71.32	71.40	0.08	80	10143 M		ROCK LOSS	
33	71.40	71.64	0.24	79	10143 M		COAL LOSS	
33	71.64	71.69	0.05	79	10143 M		MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS THROUGHOUT.
33	71.69	71.74	0.05	79	10143 M		COAL	C-3.SLD
33	71.74	71.79	0.05	78	10143 M		MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS THROUGHOUT.

\* DENOTES MEASURED BCA



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## GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
33	71.79	71.88	0.09	78	10143 M	COAL	C-3. SHRD
33	71.88	72.41	0.53	77	10143 M	MUDSTONE	CARB. DK. GY. BRKN PLANT FRAGMENTS. SOME COALIFIED (BAIERA FURCATA, PITYOPHYLLUM NORDENSKIOLDII, CZEKANOWSKIA CF. RIGIDA, SPHENOPTERIS B. RULENSIS).
34	72.41	72.82	0.41	75	10143 M	MUDSTONE	SLTY. M. GY. BRKN MINOR PLANT FRAGS THROUGHOUT.
34	72.82	73.12	0.30	74	10143 M	MUDSTONE	CARB. DK. GY. BRKN COALY STRINGERS & THIN BANDS THROUGHOUT
34	73.12	73.48	0.36	72	10144 M	COAL	C-2. BRKN C-3 BANDS.
34	73.48	73.56	0.08	71	10144 M	COAL	C-4. SLD
34	73.56	73.87	0.31	71	10144 M	COAL	C-2. BRKN
34	73.87	74.01	0.14	70	10144 M	MUDSTONE	SLTY. M-DK. GY. SLD

\* DENOTES MEASURED BCA

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## GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
34	74.01	74.17	0.16	69	10144 M	MUDSTONE	SSY. PR. BM. SLD
35	74.17	74.21	0.04	69	10144 M	COAL	C-3. SLD
35	74.21	74.57	0.36	68	10144 M	COAL	C-2. BRKN
35	74.57	74.65	0.08	67	10144 M	COAL	C-4. BRKN
35	74.65	74.72	0.07	67	10144 M	COAL	C-3. BRKN
35	74.72	74.80	0.08	67	10144 M	MUDSTONE	CARB. DK. GY. BRKN COAL BANDS WITHIN.
35	74.80	74.87	0.07	66	10144 M	COAL	C-2. SHRD POWDERED.
35	74.87	74.90	0.03	66	10144 M	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS THROUGHOUT.
35	74.90	75.17	0.27	66	10144 M	COAL LOSS	
35	75.17	75.27	0.10	65	10144 M	COAL	C-3. SHRD

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
35	75.27	75.31	0.04	65	10144 M	MUDSTONE	CARB. DK. GY. SLD SPOIL APPEARANCE.
35	75.31	75.39	0.08	64	10144 M	MUDSTONE	CARB. DK. GY. SHRD COALY STRINGERS WITHIN.
35	75.39	75.57	0.18	64	10144 M	COAL	C-2. BRKN
35	75.57	75.80	0.23	63	10145 M	MUDSTONE	CARB. DK. GY. SLD COALY STRINGERS THROUGHOUT.
35	75.80	75.90	0.10	62	10145 M	COAL	C-3. SHRD
35	75.90	76.15	0.25	62	10145 M	MUDSTONE	CARB. DK. GY. SLD COALY PLANT FRAGS THROUGHOUT.
35	76.15	76.18	0.03	61	10145 M	COAL LOSS	
36	76.18	76.49	0.31	60	10145 M	COAL	C-2. BRKN
36	76.49	77.27	0.78	58	10145 M	MUDSTONE	CARB. DK. GY. BRKN ABUNDANT PLANT FRAGS, COALY STRINGERS & THIN BANDS THROUGHOUT. PARTIALLY SHEARED.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
36	77.27	77.81	0.54	56	10145 M	COAL	C-3. SHRD VERY SHEARED. SIGNS OF PARASITIC FOLDING WITHIN.
36	77.81	77.85	0.04	55	10145 M	COAL	C-3. SHRD
36	77.85	78.03	0.18	54	10145 M	MUDSTONE	CARB. DK. GY. SHRD COALY STRINGERS WITHIN.
37	78.03	78.31	0.28	53	10145 M	COAL	C-3. SHRD
37	78.31	78.44	0.13	52	10145 M	COAL LOSS	
37	78.44	80.04	1.60	49	10146	MUDSTONE	SLTY. M-DK. GY. BRKN CONTAINS COALY STRINGERS NEAR TOP. LISTRIC SURFACES ESPECIALLY IN UPPER HALF. UPPER 25CM SAMPLED.
38	80.04	81.03	0.99	44		MUDSTONE	SLTY. DK. GY. LAM. VBRKN GRADATIONAL SLTST LAMINAE CONTACTS. UNIT V BRKN AND HIGHLY SHEARED WITH LISTRIC SHEAR SURFACES. THICK QTZ VEINS UP TO 3CM WITH EUBEDRAL QTZ CRYSTALS PARALLEL TO BDG AND THIN VEINS AT RANDOM ORIENTATION. UNIT POORLY CEMENTED.

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	81.03	81.13	0.10	*42			ROCK LOSS	
38	81.13	81.92	0.79	*40			MUDSTONE	SLTY. DK. GY. LAM. BRKN MOST OF UNIT IS INDISTINCTLY LAMINATED EXCEPT NEAR BASE WHERE SLTST BANDS ARE U P TO 3CM. QTZ VEINS P ARALLEL TO BDG.
39	81.92	82.45	0.53	*58			MUDSTONE	SLTY. DK. GY. LAM. BRKN AS ABOVE. UNIT HAS INDISTINCT LAMINAE, PARTICULARLY NEAR BASAL CONTACT. POORLY CEMENTED. GRADATIONAL BASAL CONTACT.
39	82.45	83.97	1.52	*25			MUDSTONE	SLTY. DK. GY. LAM. WRMBU. VBRKN LITHOLOGICALLY AS ABOVE. RARE NORM BURR OWS INDICATE TOPS UP. LOCALLY BRECCIATE D NEAR BASE NEARER FAULTED FOLD AXIS. Q TZ VEINS UP TO 1CM.
39	83.97	84.07	0.10	15			ROCK LOSS	

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
40	84.07	84.67	0.60	*10			MUDSTONE	SLTY. DK. GY. LAM. BRKN LITHOLOGICALLY AS ABOVE. FOLD AXIS. LIS TRIC SHEAR SURFACES. PARTLY BRECCIATED OBSCURING FEATURES.
40	84.67	86.03	1.36	*39			SILTSTONE	CLYY. DK. GY. LAM. XBDG. BRKN EVENLY LAMINATED WITH LDH ANGLE CROSS L AMINATIONS. UNIT COARSENS TOWARDS GRADAT IONAL BASAL CONTACT. LISTRIC SHEAR SURF ACES.
41	86.03	87.08	1.05	*60			SANDSTONE	SLTY. FG. DK. GY. LAM. SLD EVENLY PLANAR LAMINATED WITH OCCASIONAL MUDST BANDS UP TO 1CM WITH SHARP CONTA CTS WITH SS. LISTRIC SHEAR SURFACES.
41	87.08	87.96	0.88	*60			SANDSTONE	SLTY. FG. DK. GY. LAM. SLD LITHOLOGICALLY AS ABOVE.
42	87.96	90.10	2.14	*65			SANDSTONE	SLTY. FG. DK. GY. LAM. WRMBU. SLD LITHOLOGICALLY AS ABOVE. OCCASIONAL SLI GHTLY WAVY MUDST LAMINAE IN OTHER WISE EVENLY PLANAR LAMINATED UNIT. SINGLE MO RM BURROW INDICATES UNIT IS NON-OVERTUR NED.
43	90.10	90.24	0.14	65			SANDSTONE	SLTY. FG. DK. GY. LAM. SLD AS ABOVE.

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDM86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
43	90.24	92.07	1.83	*65		SANDSTONE	SLTY. FG. DK. GY. LAM. BIOTR. SLD AS ABOVE. LOCALIZED BAND OF BIOTURBATIO N IN MIDDLE OF UNIT. QTZ VEIN 3.5CM WIDE PERPENDICULAR TO CORE. BDG UNIT VARIAB LE BETWEEN IMM LAMINAE AND UP TO 3 CM'S S BANDS.
44	92.07	93.15	1.08	*75		SANDSTONE	SLTY. FG. DK. GY. SLD SAME SILTY BANDED/LAMINATED SS AS ABOVE
44	93.15	94.08	0.93	*68		SANDSTONE	SLTY. FG. DK. GY. WRMBU. SLD AS ABOVE. OCCASIONAL WORM BURROWS INDIC ATE BEDS OVERTURNED.
45	94.08	96.25	2.17	*75		SANDSTONE	SLTY. FG. DK. GY. LAM. XBDG. SLD SILTY BANDED/LAMINATED SS AS ABOVE. OCC ASIONAL WORM BURROWS INDICATE OVERTURNE D BEDS. LOW ANGLE CROSS LAMINATIONS.
46	96.25	98.35	2.10	*64		SANDSTONE	SLTY. FG. DK. GY. LAM. BIOTR. SLD AS ABOVE. SILTY BANDED/LAMINATED SS. LO CALIZED BAND OF BIOTURBATION NEAR TOP O F UNIT. VERTICAL WORM BURROWS INDICATE BEDS OVERTURNED. LAMINAE PLANAR TO WAVY

\* DENOTES MEASURED BCA

PROJECT: KPH BLOCK: LR DATA SOURCE: DDM86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
47	98.35	99.58	1.23	*75		MUDSTONE	SLTY. FG. DK. GY. LAM. BIOTR. SLD LITHOLOGICALLY AS ABOVE. 10CM BAND OF B IOTURBATION NEAR BASE OF UNIT.
47	99.58	100.38	0.80	73		MUDSTONE	SLTY. FG. DK. GY. LAM. SLD MINOR PLANT HASH PRESENT (PITYOPHYLLUM NORDENSKIOLDII). SLIGHTLY FINER GRAINED THAN ABOVE.
48	100.38	102.35	1.97	*70		MUDSTONE	DK. GY. LAM. SLD CARBONACEOUS NEAR TOP AND GRADES INTO S LTY MUDST IN BASAL HALF OF UNIT. QTZ VE INS UP TO 1CM ARE PERPENDICULAR TO CORE BDG UNITS GRADATIONALLY INCREASE UP T O 2CM IN COARSER BOTTOM HALF. MINOR PLA NT FRAGS. PRESENT.
49	102.35	104.38	2.03	*85		MUDSTONE	SLTY. DK. GY. LAM. SLD LITH AS BASAL HALF OF ABOVE. LOAD CASTS INDICATE BEDS OVERTURNED. PLANT FRAG P RESENT AND PARTLY COALIFIED (PODOZAMITE S CF. LANCEOLATUS, CZEKANOWSKIA CF. RIG IDA). UNIT FINES GRADATIONALLY TO BASE AS SLST LAM DECREASE IN NUMBER AND WIDT HS.
50	104.38	105.18	0.80	*65		MUDSTONE	SLTY. DK. GY. LAM. SLD INDISTINCT GRADATIONAL LAMINAE CONTACTS

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
50	105.18	105.56	0.38	65		SILTSTONE	CLYY.DK.GY.LAM.WRMBU.SLD SLIGHTLY COARSER THAN ABOVE AND SLTST LAMINAE MORE DISTINCT. LAMINAE CONTACTS ARE SHARPER THAN ABOVE AND PLAMAR. UNIT FINES TO SLTY MUOST OVER BASAL 45CM.
51	105.56	107.36	1.80	65		MUDSTONE	DK.GY.SLD FINER THAN ABOVE. NO DISTINCT BEDDING OVER MOST OF UNIT. MINOR MOTTLING.
52	107.36	109.44	2.08	*66		MUDSTONE	DK.GY.BIOTR.SLD BDG CONTACTS LARGELY OBSCURED BY BIOTURBATION IN OTHERWISE UNIFORM FEATURELESS UNIT.
53	109.44	109.55	0.11	65		MUDSTONE	DK.GY.BIOTR.SLD AS ABOVE.
53	109.55	111.35	1.80	65		MUDSTONE	DK.GY.BIOTR.SLD AS ABOVE. LISTRIC SHEAR SURFACE ON 4CM FRACTURE ZONE 73CM FROM TOP OF UNIT. CORE THIST OFF. 12CM FROM BASE.
54	111.35	113.50	2.15	64		MUDSTONE	DK.GY.BIOTR.SLD AS ABOVE. 2CM WIDE QTZ VEIN, 20CM FROM TOP OF UNIT IS PERPENDICULAR TO CORE. BEDDING CONTACTS COMPLETELY OBSCURED BY BIOT. MINOR PLANT HASH IN BASAL 2CM (PI TYOPHYLLUM NORDENSKIOLDII).

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	113.50	114.60	1.10	63		MUDSTONE	DK.GY.MAS.SLD UNIT POORLY CONSOL WITH RESPECT TO ABOVE UNIT. ABUNDANT COALIFIED PLANT FRAGMENTS THROUGHOUT IN OTHERWISE FEATURELESS MUDST. GRADATIONAL BASAL CONTACT.
55	114.60	115.12	0.52	63		BRECCIA	DK.GY.MAS.SLD BRECCIATED MUOST CLASTS VARY IN SIZE FROM 1MM TO 4CM WITH QTZ MATRIX.
55	115.12	115.26	0.14	62		MUDSTONE	DK.GY.MAS.BRKN SOFT. POORLY CEMENTED. FEATURELESS.
56	115.26	116.39	1.13	*62		MUDSTONE	SLTY.DK.GY.LAM.BRKN FAINTLY LAMINATED. SLIGHTLY COARSER THAN ABOVE UNIT. 4CM BRECCIA BAND (AS ABOVE) 20CM FROM BASE.
56	116.39	117.38	0.99	58		MUDSTONE	SLTY.DK.GY.LAM.WRMBU.SLD LAMINAE CONTACTS ALMOST TOTALLY OBSCURED BY BURROWING.
57	117.38	118.08	0.70	*55		MUDSTONE	SLTY.DK.GY.LAM.WRMBU.SLD AS ABOVE. LISTRIC SHEAR SURFACES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
57	118.08	118.55	0.47	64			MUDSTONE	SLTY. DK. GY. LAM. SLD MORE COMPETENT THAN ABOVE. ABUNDANT HIGHLY POLISHED LISTRIC SHEAR SURFACES. QTZ VEINS UP TO 0.5CM PARALLEL TO BDG. GRADATIONAL INTO FG SS OVER 10CM.
57	118.55	118.93	0.38	*70			SANDSTONE	SLTY. DK. GY. VTHNB. SLD NEAR-PLANAR MUDST BANDS UP TO 1.5CM INTERBEDDED WITH SS BEDS UP TO 6CM.
57	118.93	119.34	0.41	67			MUDSTONE	SLTY. DK. GY. BIOTR. BRKN BIOTURBATED IN TOP HALF OF UNIT. THIN COAL LAMINAE AND ABUNDANT V FINE QTZ VEIN S IN BASAL 10CM. LISTRIC SHEAR SURFACES AT BASE.
58	119.34	119.89	0.55	63			MUDSTONE	DK. GY. LAM. BRKN FAINT INDISTINCT LAMINAE WITH V FINE QTZ VEINING NEAR BASE. ABUNDANT LISTRIC SHEAR SURFACES AT BASE.
58	119.89	120.37	0.48	59			MUDSTONE	DK. GY. LAM. BRKN ABUNDANT VITRIN LAMINAE. MINOR PYRITE BLEBS. ELEVEN CM FRACTURED AND QTZ VEIN ED ZONE 20 CM FROM BASE. FAINTLY AND INDISTINCTLY LAMINATED. COARSENS TO BASE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
58	120.37	121.04	0.67	*55			MUDSTONE	DK. GY. LAM. BRKN FAINTLY AND INDISTINCTLY LAMINATED. UNIT COARSENS TO BASE.
59	121.04	122.14	1.10	55			SILTSTONE	CLY. DK. GY. VTHNB. BIOTR. BRKN VERY THIN BEDS ALMOST TOTALLY OBSCURED BY BIOT. BASAL 10CM VBRKN. 2CM BRECCIA ZONE (SMALL SCALE) 3CM FROM BASE.
59	122.14	122.79	0.65	*55			SILTSTONE	CLY. DK. GY. LAM. XBDG. SLD VERY FAINTLY LAMINATED NEAR TOP WITH ABUNDANT COALLAMINAE AND WISPS. MIDDLE AND BASE OF UNIT RIPPLE CROSS LAMINATED. UNIT COARSENS TO BASE.
60	122.79	123.44	0.65	*70			SANDSTONE	SLTY. VFG. DK. GY. LAM. BRKN FAINTLY PLANAR LAMINATED WITH GRADATIONAL CONTACTS BETWEEN VFG SS AND SLTST/MUDST LAMINAE. GRADATIONAL BASAL CONTACT. LOW ANGLE JOINT PLANES.
60	123.44	124.09	0.65	57			SILTSTONE	DK. GY. LAM. BIOTR. BRKN VERY MOTTLED BDG. SLIGHTLY FINER THAN ABOVE. ABUNDANT POLISHING ALONG SLIP SURFACES. SHARP BASAL CONTACT.
60	124.09	124.13	0.04	*50			SANDSTONE	FG. PR. M. GY. MAS. SLD SINGLE SS BAND WITH SHARP TOP AND BASAL CONTACT.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
60	124.13	124.39	0.26	51			SILTSTONE	CLYY.DK.GY.VBRKN RUBBLE. PARTLY BRECCIATED.
60	124.39	124.49	0.10	51			ROCK LOSS	
61	124.49	125.12	0.63	52			SILTSTONE	CLYY.DK.GY.VBRKN RUBBLE AT TOP. INDISTINCT MUDST LAMINAE AND WISPS.
61	125.12	126.58	1.46	*56			SILTSTONE	SSY.DK.GY.SLD INDISTINCTLY LAMINATED TO V-F BEDDED WITH GRADATIONAL CONTACTS. UNIT MORE MASSIVE TO BASE AND SLIGHTLY COARSER.
62	126.58	126.96	0.38	56			MUDSTONE	SELY.DK.GY.MAS.SLD FEATURELESS. SHARP BASAL CONTACT.
62	126.96	128.22	1.26	57			MUDSTONE	CARB.BLK.VBRKN ABUNDANT LISTRIC SHEAR SURFACES. COAL LAMINAE THROUGHOUT AND 1.75 CM C-1 COAL BAND 50CM FROM TOP OF UNIT. BASAL 17CM BRECCIATED WITH QTZ INFILL. MOST OF UNIT IS RUBBLY.
62	128.22	128.30	0.08	57			MUDSTONE	CARB.BLK.MAS.BRKN ABUNDANT QTZ VEINS AND VITRAIN LAMINAE. LGE PYRITEBLEB.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
63	128.30	129.97	1.67	57			MUDSTONE	DK.GY.MAS.VBRKN RUBBLY AND SHEARED NATURE OF CORE MAKES DETAILED LOGGING IMPOSSIBLE. ABUNDANT LISTRIC SHEAR SURFACES. VITRAIN LAMINAE UP TO 1CM. QTZ VEIN 5CM WIDE 10CM FROM BASE.
63	129.97	130.07	0.10	58			ROCK LOSS	
64	130.07	130.72	0.65	58			MUDSTONE	DK.GY.MAS.VBRKN AS ABOVE. FEATURELESS.
64	130.72	131.98	1.26	*58			MUDSTONE	DK.GY.MAS.BRKN OCCASIONAL INDISTINCT LAMINAE WITH GRADATIONAL CONTACTS. ABUNDANT LISTRIC SHEAR SURFACES. LOW ANGLE QTZ VEIN.
65	131.98	133.11	1.13	59			SILTSTONE	CLYY.DK.GY.MAS.VBRKN LARGELY RUBBLE. SLIGHTLY COARSER THAN ABOVE. NO DISTINCT BDG UNITS. SHARP BASAL CONTACT.
65	133.11	133.31	0.20	*60			SILTSTONE	SSY.VFG.DK.GY.THKB.BRKN SINGLE MUDST BAND 1CM WIDE 7CM FROM TOP OF UNIT INOTHERWISE MASSIVE SS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
65	133.31	133.62	0.31	*60			SILTSTONE	SSY, VFG, DK, GY, THKB, SLD AS ABOVE. GRADATIONAL BASAL CONTACT INTO DARKER FINER GRAINED UNIT.
65	133.62	133.91	0.29	60			SILTSTONE	CLYY, DK, GY, MAS, SLD LISTRIC SHEAR SURFACES IN OTHERWISE FEATURELESS MUDST.
66	133.91	134.46	0.55	61			MUDSTONE	DK, GY, MAS, VBRKN POORLY CONSOL. RARE PLANT FRAGS.
66	134.46	135.72	1.26	62			MUDSTONE	SLTY, DK, GY, MAS, BRKN POORLY CONSOL. LISTRIC SHEAR SURFACES. CORE WILL WEATHER EASILY.
66	135.72	135.82	0.10	62			ROCK LOSS	
67	135.82	137.95	2.13	64			MUDSTONE	SLTY, DK, GY, MAS, VBRKN POORLY CONSOL AS ABOVE. LISTRIC SHEAR SURFACES. RUBBLY IN PLACES. MINOR QTZ VEINING.
68	137.95	140.05	2.10	66			MUDSTONE	SLTY, DK, GY, MAS, BRKN AS ABOVE. PARTS OF UNIT POORLY CONSOLIDATED EASILY WEATHERED. ABUNDANT LISTRIC SHEAR SURFACES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	140.05	141.45	1.40	68			MUDSTONE	SLTY, DK, GY, MAS, VBRKN AS ABOVE. BRECCIATED ZONE 37CM FROM BASE.
69	141.45	142.10	0.65	69			MUDSTONE	SLTY, DK, GY, MAS, VBRKN RUBBLE. SINGLE PYRITE BLEBS. FINE QTZ VEINS RANDOMLY ORIENTED THROUGHOUT ARE ABUNDANT IN BASAL 5CM. ABUNDANT LISTRIC SHEAR SURFACES.
69	142.10	142.21	0.11	69			ROCK LOSS	
70	142.21	143.31	1.10	70			MUDSTONE	SLTY, DK, GY, MAS, VBRKN AS ABOVE.
70	143.31	144.18	0.87	*71			MUDSTONE	SLTY, DK, GY, LAM, BRKN UNIT MORE COMPETENT THAN ABOVE WITH GRADATIONAL, PLANAR CONTACTS BETWEEN LAMINAE. UNIT BROKEN PREDOMINANTLY ALONG BEDDING PLANES.

\* DENOTES MEASURED BCA



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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
71	146.18	146.08	1.90	*65		SILTSTONE	CLYY.DK.GY.LAM.BRKN SLIGHTLY COARSER THAN ABOVE. EVENLY PLANNAR LAMINATED WITH GRADATIONAL CONTACTS. MINOR QTZ VEINING. CORE BROKEN ALONG BDG PLANES. ABUNDANT LISTRIC SHEAR SURFACES IN BASAL 30CM.
72	146.08	147.78	1.70	*70		SILTSTONE	CLYY.DK.GY.LAM.BRKN LITHOLOGICALLY AS ABOVE ALTHOUGH MORE POORLY CONSOLIDATED. MINOR QTZ VEINING AND ABUNDANT LISTRIC SHEAR SURFACES. 5CM BRECCIA ZONE 95CM FROM TOP OF UNIT. SINGLE PYRITE BLEB NEAR BASE.
72	147.78	148.02	0.24	71 10147		MUDSTONE	CARB.BLK.BRKN HIGHLY SHEARED, ABUNDANT VITRAIN LAMINAE INCREASE IN SIZE TO BASE.
72	148.02	148.08	0.06	71 10148 L		COAL	C-3.BLK.BRKN
73	148.08	148.20	0.12	71 10148 L		COAL	C-2.BRKN
73	148.20	148.24	0.04	71 10148 L		MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
73	148.24	148.42	0.18	71 10148 L		COAL LOSS	
73	148.42	148.52	0.10	71 10148 L		COAL	C-3.BRKN PYRITE WITHIN.
73	148.52	148.56	0.04	72 10148 L		MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN.
73	148.56	148.61	0.05	72 10148 L		COAL	C-2.SLD
73	148.61	148.65	0.04	72 10148 L		MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN.
73	148.65	148.86	0.21	72 10148 L		COAL	C-3.BRKN
73	148.86	149.12	0.26	72 10148 L		MUDSTONE	CARB.DK.GY.BRKN
73	149.12	149.17	0.05	72 10148 L		COAL	C-3.SLD
73	149.17	149.55	0.38	72 10148 L		COAL	C-2.VSHRD VERY SHEARED, MUDDY, DIFFICULT TO DETERMINE GRADE.
73	149.55	149.85	0.30	73 10148 L		MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
73	149.85	149.92	0.07	73 10148	L	COAL	C-2.SHRD
73	149.92	150.01	0.09	73 10148	L	MUDSTONE	CARB.DK.GY.SHRD LISTRIC SURFACES.
73	150.01	150.15	0.14	73 10148	L	COAL LOSS	
73	150.15	150.23	0.08	73 10148	L	COAL	C-2.SHRD
74	150.23	150.40	0.17	73 10148	L	COAL	C-2.SHRD
74	150.40	150.48	0.08	73 10148	L	COAL	C-3.SHRD
74	150.48	151.96	1.48	74 10149		MUDSTONE	SLTY.M.GY.BRKN MINOR LISTRIC SURFACES. ABUNDANT PLANT FRAGS IN LESS SILTY BANDS. UPPER 25CM S AMPLED.
75	151.96	153.27	1.31	75		MUDSTONE	SLTY.M.GY.BRKN ABUNDANT PLANT FRAGS, SOME COALIFIED.
75	153.27	153.95	0.68	76 10150	K/L	COAL	C-3.SHRD VERY SHEARED, POWDERED MUDDY MIXTURE.

\* DENOTES MEASURED BCA

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PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
76	153.95	155.29	1.34	77		MUDSTONE	BLK.MAS.VBRKN POORLY CONSOL. HIGHLY SHEARED WITH ABUN DANT LISTRIC SHEAR SURFACES. SLIGHTLY C ARBONACEOUS AT TOP AND COARSENS SLIGHTLY TO SILTY MUDST NEAR GRADATIONAL BASAL CONTACT.
76	155.29	155.96	0.67	78		MUDSTONE	SLTY.BLK.MAS.BRKN OCCASIONAL WISPY LAMINAE OF MUDST IN SL TY MUDST UNIT. POORLY CONSOL. GRADATION AL BASAL CONTACT.
77	155.96	156.81	0.85	*79		SANDSTONE	SLTY.FG.DK.GY.VYHNB.SSD.BRKN VERY POORLY CONSOL. PLANAR SHARP BEDDIN G CONTACTS. BDG UNITS VARY FROM 1CM TO 8 CM BETWEEN MUDST BANDS AND INCREASE TO B ASE. SLUMPING AND LGE MUDST RIPUPCLAST 5CM LONG AT BASE.
77	156.81	157.70	0.89	78		SANDSTONE	SLTY.VFG.DK.GY.VYHNB.SSD.BRKN AS ABOVE. VERY POORLY CEMENTED AND CRUM BLY. LARGERSPACING BETWEEN MUDST LAMINA E THAN ABOVE. MUDST LAMINAE BECOME WAVY & IRREGULAR NEAR BASE.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6037

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA	SEAM ID	LITHOLOGY	DESCRIPTION
78	157.70	159.88	2.18	*75		SILTSTONE	DK.GY.VTHNB.SSD.BRKN SANDY AT TOP AND BECOMES GRADATIONALLY MORE MUDDY TOWARDS BASE. SSD (KINKING) 40CM FROM TOP OF UNIT VERY POORLY CONSO L AS ABOVE. CORE BROKEN ALONG BD G PLAN ES. MORE FINELY BEDDED TO BASE. T.D.=16 0.63 M. DRILLER'S MARKER.

\* DENOTES MEASURED BCA  
NEWPAGE

















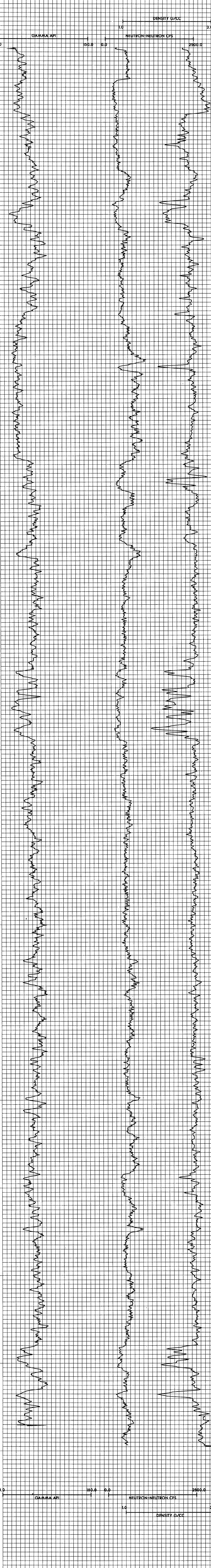
# Gulf Canada Corporation Coal Division

# 723

## Geophysical Log

Datasource: <b>KPNLRDDH86037</b> Log Date: 86-10-01 Company: CENTURY Geologist: MACLEOD	Province: BC    Northing: 6342290.00    Lat: 571332 Zone: 9    Easting: 506750.00    Long: 1285318 Measuring Point: Elevation: 1641.6	
Scale: 1 to 100.0 Depth Range: 0.0 to 164.0 True Thickness: NO	Comments: 1. LOGGED THROUGH THE RODS 2.	

Logs Plotted:	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	1N PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	1N PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	1N PIPE



**KPNLRDDH86038**

===== GULF CANADA CORPORATION =====

- DATA SOURCE SUMMARY -

DATA SOURCE - KPNLRDDH86038

DATE - 02/13/87

- HISTORY -

START DATE - 30/09/86

END DATE - 02/10/86

CONTRACTOR - J.T. THOMAS

GEOLOGIST - BARKER

OPERATOR - G.C.C.

SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- LOCATION -

PROVINCE - BC

ELEVATION - 1388.95

LICENCE/LEASE NUMBER -

ZONE - 9

NORTHING - 6346177.00

EASTING - 505424.75

LATITUDE - 571538

LONGITUDE - 1285436

- ORIENTATION -

LENGTH - 122.53

CORE SIZE - 0.0

CEMENT - N

PLUG - N

PIEZ - N

INCLINATION - 90.0

AZIMUTH - 0.0

CASING DEPTH (M) - 24.99

AQUIFER DEPTHS (M) - 0.00

0.00

LOST CIRC. DEPTHS (M) - 0.00

0.00

\*\*\* NOTE \*\*\* 0 INDICATES NO VALUE

=====

SEAM

TRUE SEAM THICKNESS  
(COAL & ROCK)

A



NOTE:

SCHEMATIC PROFILE.  
NO THICKNESSES SHOWN  
FOR SEAMS CONTAINING  
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

**MOUNT KLAPPAN ANTHRACITE PROJECT**

1986 DIAMOND DRILL HOLES  
DDH86038

GULF CANADA CORPORATION  
11/03/87  
KLAP:[205057]870063038.LOG



87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	24.99	24.99	60		OVERBURDEN	CASING
1	24.99	25.17	0.18	60		SANDSTONE	PBLY. FG. MOD. LT. GY. MAS. VBRKN RUBBLE. ONE PIECE OF PBLY. SS AT BASE OF INTERVAL.
1	25.17	26.86	1.69	60		ROCK LOSS	
1	26.86	27.13	0.27	60		MUDSTONE	DK. GY. MAS. VBRKN PYRITE BLEBS & LENSES 2-4CM LONG 3-20MM WIDE.
1	27.13	27.89	0.76	60		MUDSTONE	DK. GY. MAS. VBRKN VFG UNIFORM MUDST WITH PYRITE BLEBS AS ABOVE. NO PLANTS.
1	27.89	28.04	0.15	60		ROCK LOSS	
1	28.04	28.24	0.20	60		MUDSTONE	DK. GY. MAS. VBRKN LITH AS ABOVE.
2	28.24	29.61	1.37	*60		MUDSTONE	DK. GY. MAS. VBRKN LITH AS ABOVE WITH PYRITE LENSES 7MM X 40MM LONG.
2	29.61	29.83	0.22	60		MUDSTONE	DK. GY. MAS. VBRKN LITH AS ABOVE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	29.83	30.04	0.21	60		MUDSTONE	DK. GY. MAS. VBRKN LITH AS ABOVE.
3	30.04	30.52	0.48	60		ROCK LOSS	
3	30.52	31.62	1.10	61		MUDSTONE	DK. GY. MAS. VBRKN LITH AS ABOVE. BELEMNITE SLICE 1CM IN D. IA CALCITE REPLACED WITH A 2 1/2MM HOLE IN CENTRE - LIKELY IN VICINITY OF SEAM A-1 OR A-2.
4	31.62	33.06	1.44	61		MUDSTONE	DK. GY. MAS. VBRKN LITH AS ABOVE. POSSIBLY LARGE FINE QTZ - REPLACED OYSTER SHELLS 5-7CM WIDE.
4	33.06	33.87	0.81	61		ROCK LOSS	
4	33.87	34.06	0.19	62		MUDSTONE	DK. GY. MAS. BRKN LITH AS ABOVE.
5	34.06	35.72	1.66	62		MUDSTONE	DK. GY. MAS. BRKN LITH AS ABOVE. OCC PYRITE BLEBS.
5	35.72	35.88	0.16	62		MUDSTONE	DK. GY. MAS. SLD LITH AS ABOVE.
6	35.88	37.90	2.02	62		MUDSTONE	DK. GY. MAS. BRKN LITH AS ABOVE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 3

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
7	37.90	38.61	0.71	63			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE.
7	38.61	39.64	1.03	63			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE. RARE BIVALVES 2CM WIDE.
8	39.64	41.08	1.44	64			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE.
8	41.08	41.44	0.36	64			MUDSTONE	DK.GY.MAS.SLD LITH AS ABOVE WITH BIVALVES 2CM WIDE.
9	41.44	43.09	1.65	64			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE. RARE 2CM WIDE BIVALVES. ONE QTZ/ANKERITE VEIN MIXED WITH MUDST 3CM WIDE.
10	43.09	44.90	1.81	65			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE. ONE FRACTURE WITH LIGHTE R GREY FRACTURE FILL.
11	44.90	45.59	0.69	65			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE.
11	45.59	46.46	0.87	65			ROCK LOSS	
11	46.46	47.50	1.04	66			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 4

PROJECT: KPN BLOCK: LR DATA SOURCE: D0H86038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	47.50	47.98	0.48	66			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE.
12	47.98	48.38	0.40	66			ROCK LOSS	
12	48.38	49.36	0.98	66			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE. ONE WHITE ROUND CALCAREO US SPOT 5MM IN DIA. POSSIBLE BELEMNITE?
13	49.36	49.52	0.16	66			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE.
13	49.52	49.89	0.37	66			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE.
13	49.89	50.12	0.23	67			ROCK LOSS	
13	50.12	50.75	0.63	67			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE WITH POORLY CONSOLIDATED CLAY FRACTURE FILL AT BASE.
13	50.75	50.91	0.16	67		A	MUDSTONE	CARB.DK.GY.MAS.VBRKN COAL STRINGERS 3-10MM WIDE. OCC FINE AN KERITE VEINLETS. FIRST APPEARANCE OF PLA NT MATERIAL IN THIS HOLE.
14	50.91	52.30	1.39	67		A	MUDSTONE	CARB.DK.GY.MAS.BRKN CARB MUDST WITH COAL BANDS 5-30MM WIDE.

\* DENOTES MEASURED BCA

FORM  
4001



PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	52.30	53.20	0.90	67	A	ROCK LOSS	
14	53.20	53.66	0.46	68		MUDSTONE	DK.GY.MAS.SLD LESS CARB THAN ABOVE, BUT CONTAINS PLANT T HASH.
15	53.66	55.62	1.96	*68		MUDSTONE	DK.GY.MAS.BRKN UNIFORM MUDST AS ABOVE WITH OCC COAL ST RINGER & QTZ 3-20MM WIDE, DISEMINATED P YRITE & RARE PYRITE BANDS, PLANT HASH, V FAINT BEDDING VISIBLE.
16	55.62	56.02	0.40	71		MUDSTONE	DK.GY.YTHNB.SLD V FAINT BEDDING VISIBLE, COALIFIED PLANT T FOSSILS, UNIDENTIFIABLE.
16	56.02	57.03	1.01	73		SILTSTONE	DK.GY.LAM.WRMBU.SLD V FINELY LAN'D MUDDY SLTST. TRANSITIONA L BETWEEN ABOVE MUDST AND SANDST BELOW, OCC VERT & HORIZ WRMBURS. PYRITE BLEBS 1CM IN DIA.
16	57.03	57.70	0.67	*75		SANDSTONE	SLTY FG.VPR.M.GY.LAM.WRMBU.SLD FINELY LAN'D. NUMEROUS LOAD CASTS AND H ORIZ WRMBURS. TOPS UP, MUCH SILT MIXED IN. SSD. START OF EAGLESNEST SANDSTONE UNIT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	57.70	59.31	1.61	*70		SANDSTONE	MG.WEL.LT.GY.MAS.VBRKN FG SS AT TOP GRADING TO MG SS AT BASE O F INTERVAL. TWO SILT BANDS. NUMEROUS MU DST RIPUPS. 1-10MM WIDE. EAGLESNEST SAND STONE UNIT.
17	59.31	59.45	0.14	72		SANDSTONE	MG.WEL.LT.GY.MAS.SLD LITH AS ABOVE. EAGLESNEST SANDSTONE UNI T.
18	59.45	61.29	1.84	*75		SANDSTONE	MG.MOD.LT.GY.MAS.BRKN LITH AS ABOVE WITH NUMEROUS ALIGNED MUD ST CLASTS NEAR BASE OF INTERVAL. NUMERO US QTZ VEINS SUB PARALLEL TO CORE AXIS. EAGLESNEST SANDSTONE UNIT.
19	61.29	61.68	0.39	74		SANDSTONE	MG.MOD.LT.GY.MAS.SLD UNIFORM SANDST WITH VERY RARE ROUNDED C HERT & MUDST CLASTS 5-10MM IN DIA. EAGL ESNEST SANDSTONE UNIT.
19	61.68	63.35	1.67	73		SANDSTONE	MG.MOD.LT.GY.MAS.SLD LITH AS ABOVE BUT NO CHERT CLASTS. RARE MUDST RIPUPS. EAGLESNEST SANDSTONE UNI T.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	63.35	64.66	1.31	72			SANDSTONE	FG. MOD. LT. GY. MAS. SLD PREDOMINANTLY FINE GRAINED VERY UNIFORM AND MASSIVE. EAGLESNEST SANDSTONE UNIT
20	64.66	65.38	0.72	71			SANDSTONE	FG. MOD. LT. GY. MAS. SLD LITH AS ABOVE WITH OCC MUDST RIPUPS <5C M WIDE. EAGLESNEST SANDSTONE UNIT.
21	65.38	67.25	1.87	*70			SANDSTONE	FG. MEL. LT. GY. MAS. SLD V FAIN BEDDING VISIBLE. RARE MUDST RIP UPS 1-2CM IN DIA. EAGLESNEST SANDSTONE UNIT.
21	67.25	67.40	0.15	70			SANDSTONE	FG. MEL. LT. GY. MAS. SLD LITH AS ABOVE. EAGLESNEST SANDSTONE UNI T.
22	67.40	69.51	2.11	71			SANDSTONE	MG. MEL. LT. GY. MAS. SLD NUMEROUS MUDST RIPUPS OF VARIOUS SIZES 3MM -3CM IN DIA. SS AS ABOVE. EAGLESNES T. SANDSTONE UNIT.
23	69.51	70.21	0.70	71			SANDSTONE	FG. MEL. LT. GY. MAS. SLD AS ABOVE.
23	70.21	71.55	1.34	71			SANDSTONE	MG. MEL. LT. GY. MAS. BRKN AS ABOVE WITH MANY VERTICAL FRACTURES.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	71.55	72.99	1.44	72			SANDSTONE	FG. MEL. LT. GY. MAS. SLD LITH AS ABOVE. RIPUPS ARE RARE.
24	72.99	73.66	0.67	72			SANDSTONE	MG. MEL. LT. GY. MAS. SLD LITH AS ABOVE. RARE RIPUPS.
25	73.66	74.67	1.01	*72			SANDSTONE	FG. MEL. LT. GY. YTHNB. SLD OCC SILT LAMINAE. SHARP LOWER CONTACT.
25	74.67	75.76	1.09	70			SILTSTONE	SSY. VPR. M. GY. LAM. BIOTR. SLD VERTICAL WRMBURS. OCC ZONES OF INTENSE BIOTURBATION. MUCH VFG-FG SS MIXED IN. WRMBURS.
26	75.76	76.17	0.41	*68			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. WRMBU. SLD DARK FINE SILTY LAMINAE THROUGHOUT. ONE LARGE BIVALVE BURROW. EAGLESNEST SANDS TONE UNIT.
26	76.17	77.81	1.64	*69			SANDSTONE	SLTY. FG. VPR. M. GY. LAM. WRMBU. SLD LITH AS ABOVE. OCC VERT WRMBUR AND LOAD ING. VISIBLE.
27	77.81	78.99	1.18	*78			SANDSTONE	SLTY. FG. VPR. M. GY. THNB. WRMBU. BRKN LITH AS ABOVE BUT WITH WIDER BEDS. OCC WIDER ZONES OF MASSIVE FG SS. LOADING. HORIZ & VERT WRMBURS.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
28	78.99	80.37	1.38	*70			SANDSTONE	MG. MOD. LT. GY. MAS. SLD PREDOMINANTLY MASSIVE WITH MINOR BANDS OF MUDST & MUDST RIPUP CLASTS. SAND FIN ES UPWARD FROM MG SS TO FG SS AND THAN THESE MUD BANDS. EAGLESNEST SANDSTONE U NIT.
28	80.37	81.11	0.74	71			SANDSTONE	FG. MOD. LT. GY. MAS. SLD AS ABOVE.
29	81.11	83.02	1.91	73			SANDSTONE	MG. MEL. LT. GY. MAS. SLD LITH AS ABOVE. MINOR MUDST RIPUP CLASTS
30	83.02	84.03	1.01	*75			SANDSTONE	FG. PR. LT. GY. LAM. SLD FINE WISPY SILTY LAMINAE THROUGHOUT. NI DER LAMINAE FINE UPWARDS. EAGLESNEST SA NDSTONE UNIT.
30	84.03	84.99	0.96	74			SANDSTONE	FG. PR. LT. GY. LAM. SLD AS ABOVE.
31	84.99	86.92	1.93	73			SANDSTONE	FG. MOD. LT. GY. MAS. BRKN PREDOMINANTLY MASSIVE. FEWER SILT LAMIN AE THAN ABOVE.
32	86.92	89.04	2.12	*72			SANDSTONE	FG. M. GY. LAM. BRKN FINE DARK SILTY LAMINAE THROUGHOUT. BAS E OF EAGLESNEST SANDSTONE UNIT.

\* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6038

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA ID	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
35	89.04	89.94	0.90	*70			SILTSTONE	SSY. VPR. M. GY. VTHNB. SLD NUMEROUS THIN PLANAR BEDS FINING UP FRO M FG SAND TO DARK MUD.
33	89.94	91.00	1.06	70			SILTSTONE	SSY. VPR. M. GY. VTHNB. SLD AS ABOVE.
34	91.00	92.25	1.25	70			SILTSTONE	SSY. VPR. M. GY. LAM. WRMBU. SLD FINER LAMINAE THAN ABOVE. MINOR LOADING VISIBLE SLIGHT BIOTURBATION & OCC VERT WRMBURS. MINOR HELMINTHOPSIS.
34	92.25	93.07	0.82	70			SILTSTONE	SSY. VPR. M. GY. LAM. WRMBU. SLD AS ABOVE WITH SAME SED STRUCTURES.
35	93.07	95.09	2.02	*70			SILTSTONE	SSY. VPR. M. GY. LAM. SSD. BRKN LARGE ZONE OF SLUMPING AT BASE OF INTER VAL. LITH OTHERWISE AS ABOVE.
36	95.09	95.33	0.24	72			SILTSTONE	SSY. VPR. M. GY. LAM. VBRKN LITH AS ABOVE.
36	95.33	97.03	1.70	73			MUDSTONE	SILTY. DK. GY. LAM. SSD. BRKN OCC LIGHTER GREY SILTY LAMINAE THROUGH UT UNIFORM DARK MUDST. OCC LOADING & HO RIZ WRMBURS. PYRITE BLEBS UP TO 2CM IN DIA.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 11

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH8603B

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	97.03	98.37	1.34	*75		MUDSTONE	DK.GY.VTHNB.WRMBU.BRKN FEWER AND FAINTER LAMINAE THAN ABOVE. P YRITE BLEBS OCC HELMINTHOPSIS. ONE VERT WRMBUR CONTAINING BLACK SPECKS (HORN P ELLETS?).
37	98.37	98.91	0.54	75		MUDSTONE	DK.GY.VTHNB.WRMBU.BRKN LITH AS ABOVE WITH SAME SED STRUCTURES.
38	98.91	100.97	2.06	75		MUDSTONE	DK.GY.VTHNB.WRMBU.SLD LITH AS ABOVE WITH SLIGHTLY FEWER LAMIN AE THAN ABOVE, PYRITE BLEBS.
39	100.97	102.99	2.02	75		MUDSTONE	DK.GY.MAS.SLD ONLY FAINT BEDDING VISIBLE. NUMEROUS IR REGULARLY SHAPED PYRITE BLEBS & LENSES. MINOR HELMINTHOPSIS.
40	102.99	103.95	0.96	75		MUDSTONE	DK.GY.THNB.BRKN PYRITE BLEBS & HELMINTHOPSIS. MINOR VER T WRMBURS VISIBLE.
40	103.95	105.00	1.05	*75		MUDSTONE	DK.GY.THNB.BRKN LITH & SED STRUCTURES AS ABOVE.
41	105.00	106.87	1.87	75		MUDSTONE	DK.GY.THNB.SSD.BRKN FINE MUDST WITH FAINT BEDDING AS ABOVE. PYRITE BLEBS. SOME SLUMPING VISIBLE.

\* DENOTES MEASURED BCA

87/02/13

GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG

PAGE 12

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH8603B

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	SAMP. BCA ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	106.87	108.98	2.11	74		MUDSTONE	DK.GY.VTHNB.SLD LITH AS ABOVE WITH PYRITE BLEBS & OCC H ELMINTHOPSIS.
43	108.98	110.98	2.00	73		MUDSTONE	DK.GY.VTHNB.SLD LITH AS ABOVE. PYRITE BLEBS. QTZ VEIN 1 CM WIDE.
44	110.98	112.70	1.72	73		MUDSTONE	DK.GY.VTHNB.SLD LITH AS ABOVE. NO PYRITE.
44	112.70	113.01	0.31	72		MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE BUT PREDOMINANTLY MASSIVE
45	113.01	115.11	2.10	*72		MUDSTONE	DK.GY.VTHNB.SLD OCC SMALL VERT BURROWS. PYRITE BLEBS.
46	115.11	117.10	1.99	71		MUDSTONE	DK.GY.LAM.SLD MUDST AS ABOVE WITH MINOR LIGHTER GREY LAMINAE. PYRITE BLEBS. TWO 1CM WIDE QTZ VEINS.
47	117.10	118.09	0.99	*70		MUDSTONE	DK.GY.LAM.SLD MUDST WITH MINOR LIGHTER GREY LAMINAE A S ABOVE PYRITE BLEBS. T.D. = 122.53 M. DRILLER'S MARKER. END OF HOLE. END OF P ROGRAM !!

FORM  
4001

GULF CANADA CORPORATION  
 COAL DIVISION  
 KLAPPAN PROJECT  
 STRATIGRAPHIC LOG  
 KPN LR DDH86038

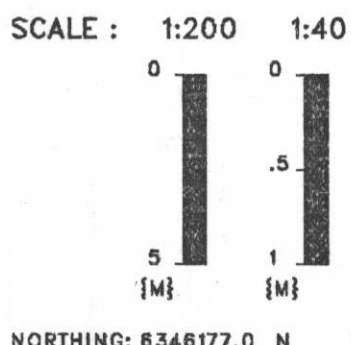
723

GEOLOGIST : BARKER

DATE : MAR 11/87

DRAWING NO. :

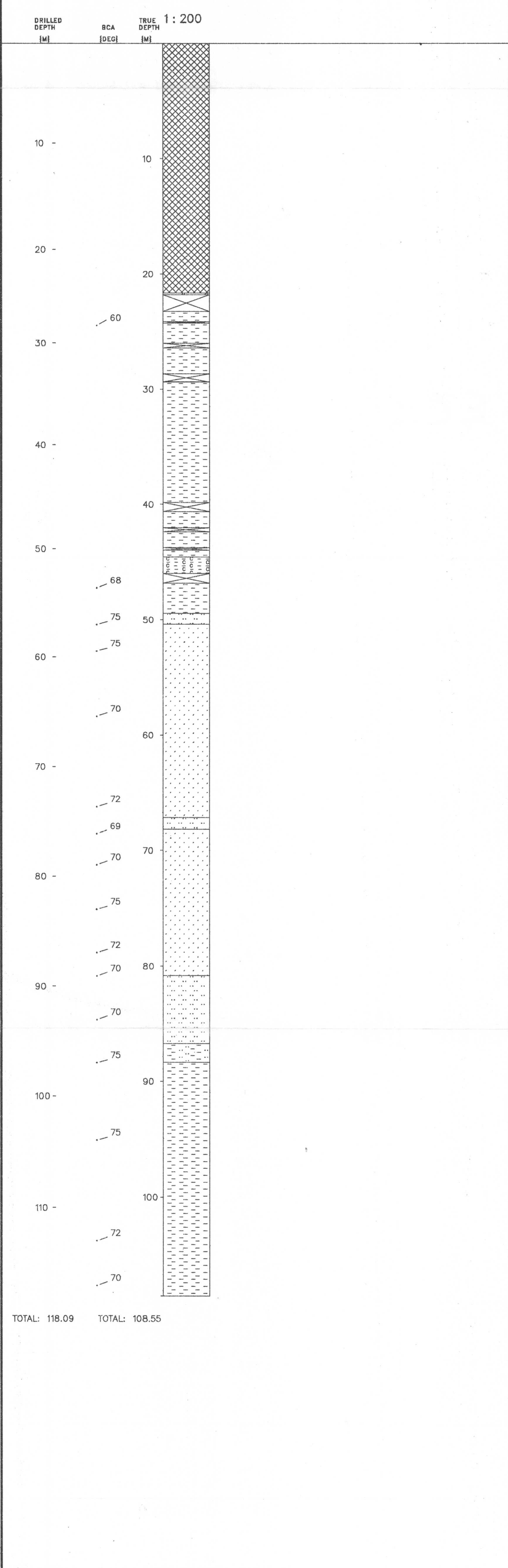
LITHOLOGIC SYMBOLS



NORTHING: 6346177.0 N  
 EASTING: 505424.7 E

INCLINATION: 90.0°

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



# Gulf Canada Corporation Coal Division

Geophysical Log

# 723

Datasource: **KPNLRDDH86038**

Province: BC

Northing: 6346180.00

Lat: 571538

Log Date: 86-10-02

Zone: 9

Easting: 505425.00

Long: 1285436

Company: CENTURY

Measuring Point:

Elevation: 1388.9

Geologist: BARKER

Scale: 1 to 100.0

Depth Range: 0.0 to 126.0

True Thickness: NO

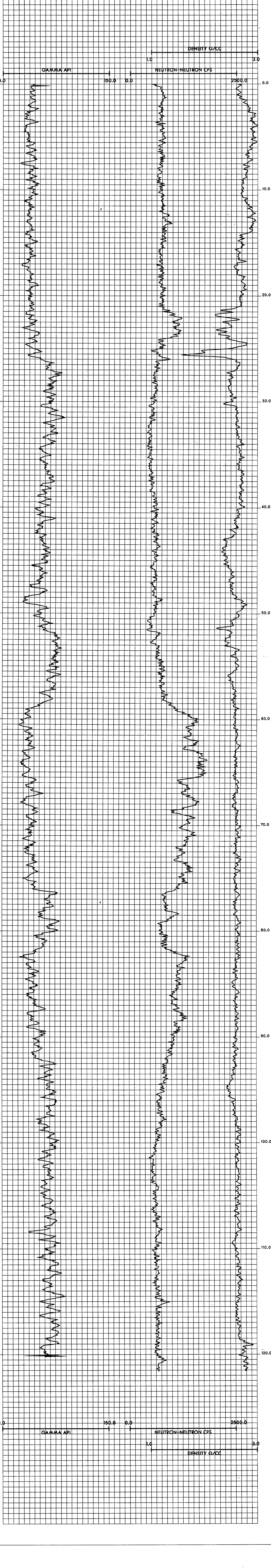
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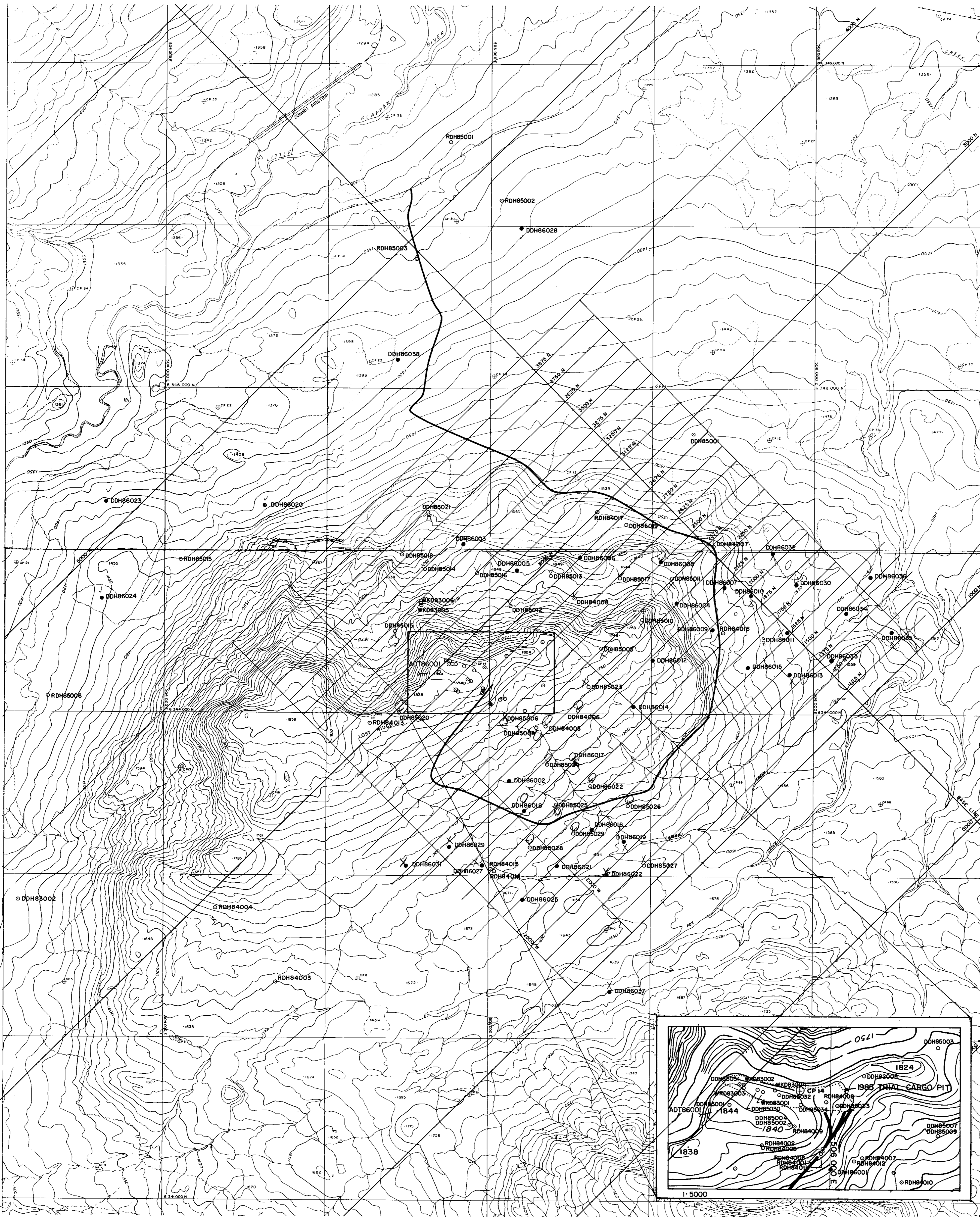
1. LOGGED THROUGH THE RODS

2.

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9055A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE





LEGEND

BUILDING	---	□
ROAD, HARD SURFACE	---	▬
LOOSE SURFACE	---	▬
CART TRACK	---	▬
TRAIL	---	▬
RAILROAD BED	---	▬
STREAM, DEFINITE	---	▬
APPROXIMATE	---	▬
SPLIT	---	▬
LAKE	---	▬
WATER LEVEL	---	▬
SWAMP	---	▬
BEAVER DAM	---	▬
TREE LINE	---	▬
CUT LINE	---	▬
CONTOURS, INDEX	---	▬
INTERMEDIATE	---	▬
DEPRESSION	---	▬
APPROXIMATE	---	▬
SPOT ELEVATION	---	▬
FIELD CONTROL POINT	---	▬
COAL LICENCE	---	▬
DIAMOND DRILL HOLE	---	DDH
ROTARY DRILL HOLE	---	RDH
WINNIE DRILL HOLE	---	WDH
ROAD	---	▬
PERIMETER OF 1985 TRIAL CARGO PIT	---	▬

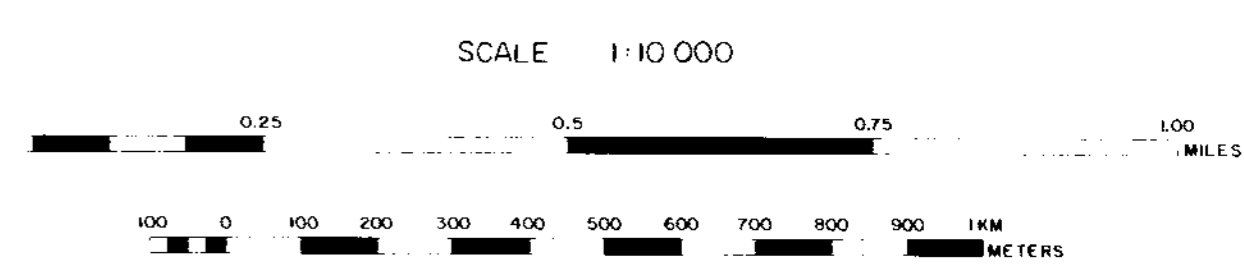
NOTES

CONTOUR INTERVAL 10 METERS

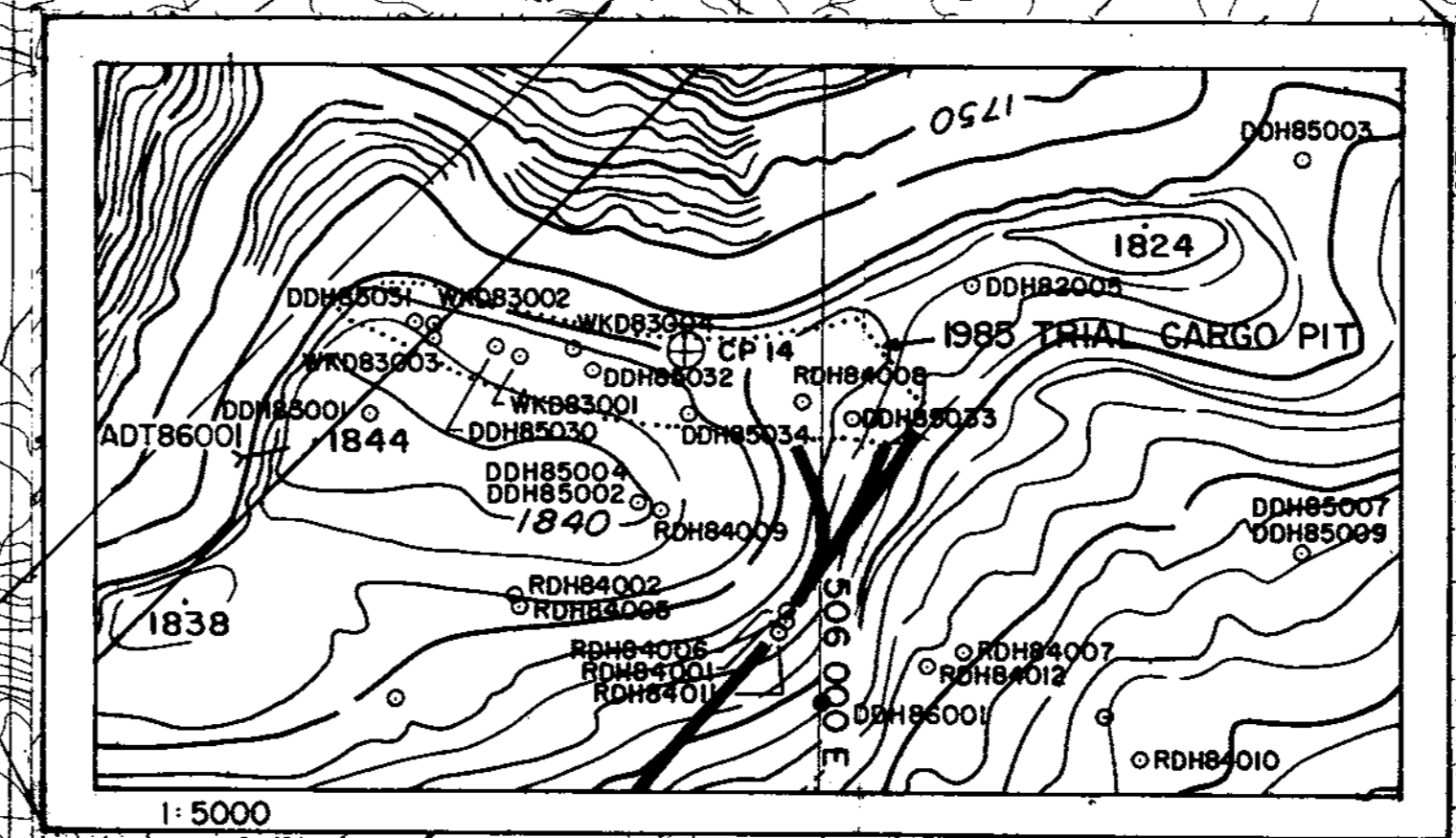
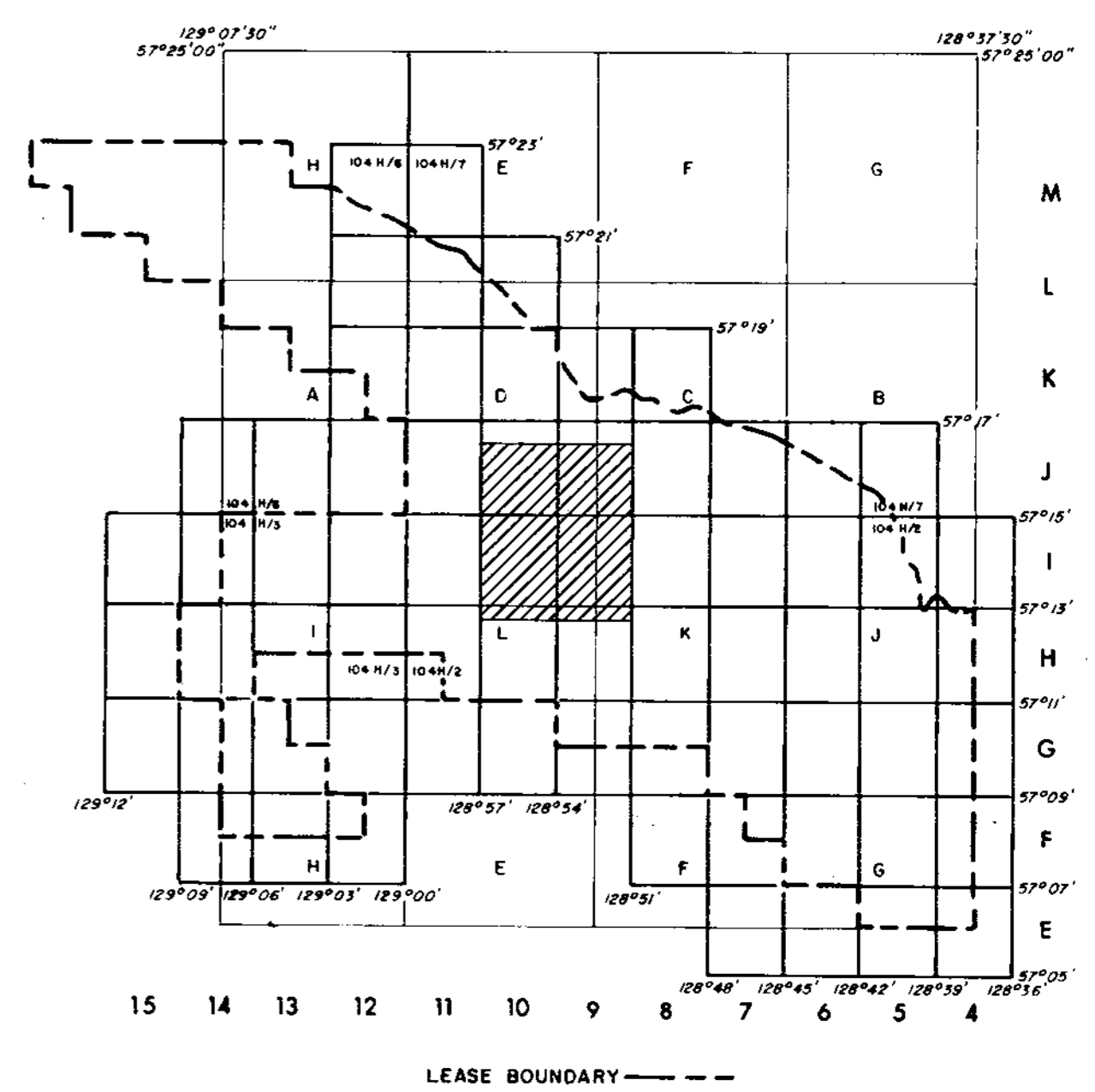
SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON DATA SUPPLIED BY B.C. RAIL

COMPILED BY WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60,000 (APPROXIMATE)



MT. KLAPPAN AREA  
INDEX MAP



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<b>GULF CANADA RESOURCES INC.</b>		
CALGARY	Coal Division	
MOUNT KLAPPAN COAL PROPERTY 1986 LOST-FOX AREA DRILL HOLE LOCATION MAP		
PREPARED BY: A.P.	DATE: MAR. 1987	DRAWING No. KPN86001
APPROVED BY: E.S.		