MOUNT KLAPPAN ANTHRACITE PROJECT

GEOLOGICAL REPORT

1988

APPENDIX V

DIAMOND DRILL HOLE COAL QUALITY
VOLUME I

KPNLRDDH 88001
TO
KPNLRDDH 88014

GULF CANADA RESOURCES LIMITED
COAL DIVISION

MOUNT KLAPPAN ANTHRACITE PROJECT

1988

APPENDIX V

DIAMOND DRILL HOLE
COAL QUALITY DATA

VOLUME I

748

LOST-FOX AREA

1988

Coal Quality Legend

Composite Sample I.D.	1 - 161 Raw Coal
	201 - 284 35.0 x 6.0 mm Size Fraction
	300 - 379 6.0 mm x 0.5 mm Size Fraction
Sample Product #	SP-1 Raw Coal
	SP-2 8.0% Ash Coal Product
	SP-3 7.5% Ash Coal Product
	SP-4 10.0% Ash (Primary Wash) Coal Product
	SP-5 11.0% Ash (Middlings) Coal Product (produced from 8.0% ash product reject)
Ash Minerals Analysis	
(Raw and Product Coal)	AM-1 Head
	AM-3 0.5 x 0.15 mm Size Fraction
	AM-4 0.15 x 0 mm Size Fraction
Ash Fusion Quality	
(Raw and Product Coal)	AF-1 Head
	AF-3 0.5 x 0.15 mm Size Fraction
	AF-4 0.15 x 0 mm Size Fraction

Extent to which analysis was completed, as per flow chart, was dependent on coal core recovery percentage.

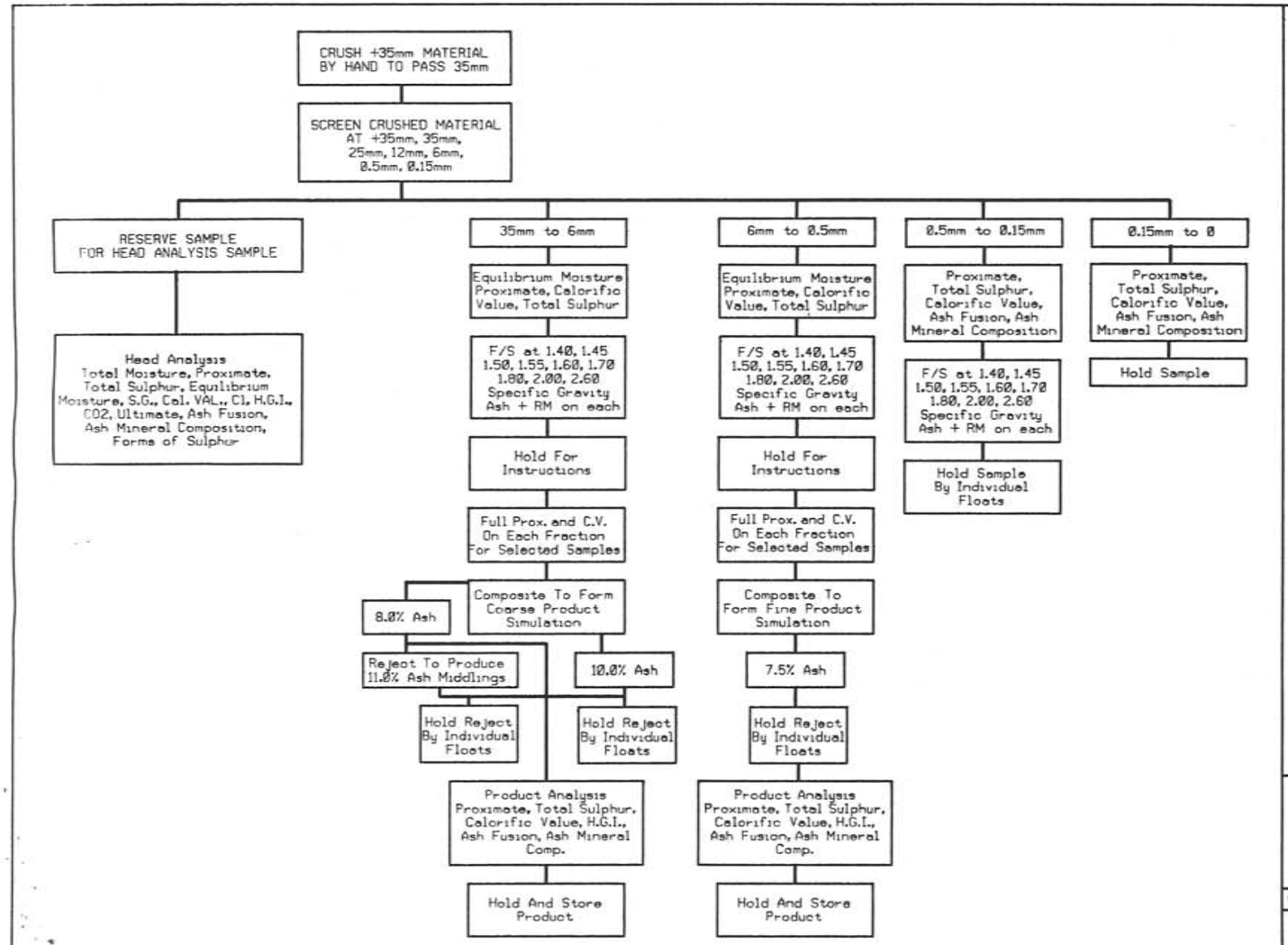


FIGURE 8-1

MOUNT KLAPPAN ANTHRACITE PROJECT

DIAMOND DRILL HOLE COAL CORE ANALYSIS FLOW SHEET

GULF CANADA RESOURCES LTD.

GULF CANADA RESOURCES LTD.
88/03/17
KLAP:I205057I860591001.CHT

KPNLRDDH88001

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88001 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/11/88
END DATE - 06/12/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MURRAY
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SITE 1:INTERSECTED SEAMS J, I AND H RESPECTIVELY D
RILLED NEAR EASTERN HOGBACK.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1622.37
ZONE - 9
NORTHING - 6344958.73
EASTING - 506938.98

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571458
LONGITUDE - 1285306

- O R I E N T A T I O N -

LENGTH - 126.67
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

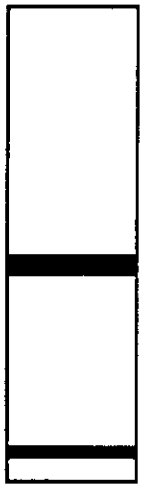
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-001

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
I	5.15 m
H	2.81 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88001										
		4367	24.63	24.65	100.00		0.018			0.000- 0.018
		4368	64.70	64.76	100.00		0.053			0.000- 0.053
	H ROOF	10404	116.15	116.85	100.00		0.621			0.000- 0.621
	H	10405	116.85	120.01	80.38	1.993	0.267	0.462	0.089	2.455- 0.356
	H FLOOR	10406	120.01	120.31	100.00		0.267			0.000- 0.267
	I	10411	66.57	70.81	87.26	3.081	0.272	0.489		3.570- 0.272
	I	10412	70.81	72.26	100.00	1.259	0.054			1.259- 0.054
	I FLOOR	10413	72.26	72.93	100.00		0.607			0.000- 0.607
	I ROOF	10442	65.93	66.57	100.00		0.580			0.000- 0.580
	J	99999	23.71	24.02	54.84	0.154		0.127		0.281- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88001												
	I	1	10411	10411	66.57	70.81	87.26	3.40	0.30	0.54	0.00	3.94- 0.30
	I	2	10412	10412	70.81	72.26	100.00	1.39	0.06	0.00	0.00	1.39- 0.06
	H	3	10405	10405	116.85	120.01	80.37	2.24	0.30	0.52	0.10	2.76- 0.40
	I	201	10411	10411	66.57	70.81	87.26	3.40	0.30	0.54	0.00	3.94- 0.30
	I	202	10412	10412	70.81	72.26	100.00	1.39	0.06	0.00	0.00	1.39- 0.06
	H	203	10405	10405	116.85	120.01	80.37	2.24	0.30	0.52	0.10	2.76- 0.40
	I	300	10411	10412	66.57	72.26	90.50	4.79	0.36	0.54	0.00	5.33- 0.36
	H	301	10405	10405	116.85	120.01	80.37	2.24	0.30	0.52	0.10	2.76- 0.40

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

COAL DIVISION

MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88001 SEAM : J INTERVAL(M) : 23.71 – 24.02 ELEVATION(M) : 1622.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	23.71			0.15	54.8	99999		0.28/ 0.00		—	—	—	—	—	—
	24.02			(0.13)				0.28							

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — TRUE THICKNESS

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88001 SEAM : 1 INTERVAL(M) : 66.57 – 72.26 ELEVATION(M) : 1622.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 19/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	66.57			0.24												
				0.35												
				(0.49)												
				0.45												
			0.10													
				2.04	87.3	10411	1	3.57 / 0.27 3.84	4.83 / 0.33 5.15	1.80	24.89	5.31	68.00	0.37	24.84	—
	70.81		0.13													
				1.19	100.0	10412	2	1.26 / 0.05 1.31		1.56	16.56	4.46	77.42	0.42	28.05	—
	72.26		0.07													

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

October 24, 1988.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88001
Coal zone:	I		
Field sample no.:	10411	Composite sample no.:	1
Lab sample no.:	31481		
True sample thickness:	3.842 meters	Drill core recovery (%):	87.26 %
Coal/Rock:	3.570 / 0.272 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	31.11	20.24	14.50	25.08	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	5.54	3.53			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.80	
Ash (%):	24.89	25.35
Volatile matter (%):	5.31	5.41
Fixed carbon (%):	68.00	69.24
Total sulphur (%):	0.37	0.38
Combustible sulphur (%):	0.12	
Net calorific value (cal/g):	5937.00	6045.00
Gross calorific value (cal/g):	5937.00	6045.00
Volatile matter (dmmf%):	4.50	
Hardgrove index:	56.00	
Specific gravity:	1.50	
Carbon dioxide (%):	0.54	
Phosphorous in coal (%):	0.040	
Chlorine in coal (ppm):	736.00	
Forms of Sulphur (%):	PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.34	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	66.46	67.68
Hydrogen (%):	2.00	2.04
Nitrogen (%):	0.86	0.88
Oxygen (%):	3.62	3.67

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1285.00	1219.00
Softening temperature (°C):	1306.00	1274.00
Hemispherical temperature (°C):	1327.00	1282.00
Final temperature (°C):	1401.00	1382.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	52.20	TiO2 (%):	0.89
Al2O3 (%):	21.17	Na2O (%):	1.73
Fe2O3 (%):	8.27	K2O (%):	0.99
CaO (%):	3.33	SO3 (%):	2.55
MgO (%):	4.12	P2O5 (%):	0.37

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

October 24, 1988.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88001
Coal zone:	I		
Field sample no.:	10412	Composite sample no.:	2
True sample thickness:	1.313 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	1.259 / 0.054 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	31.13	21.22	15.77	24.80
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.80	3.28		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.56	
Ash (%):	16.56	16.82
Volatile matter (%):	4.46	4.53
Fixed carbon (%):	77.42	78.65
Total sulphur (%):	0.42	0.43
Combustible sulphur (%):	0.08	
Net calorific value (cal/g):	6704.00	6810.00
Gross calorific value (cal/g):	6704.00	6810.00
Volatile matter (dmmf%):	3.70	
Hardgrove index:	64.00	
Specific gravity:	1.44	
Carbon dioxide (%):	0.29	
Phosphorous in coal (%):	0.160	
Chlorine in coal (ppm):	904.00	

Forms of Sulphur (%): PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.39

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	75.44	76.63
Hydrogen (%):	1.85	1.88
Nitrogen (%):	0.89	0.90
Oxygen (%):	3.28	3.34

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1187.00	1185.00
Softening temperature (°C):	1256.00	1195.00
Hemispherical temperature (°C):	1261.00	1206.00
Final temperature (°C):	1322.00	1317.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	43.94	TiO2 (%):	1.29
Al2O3 (%):	17.39	Na2O (%):	2.05
Fe2O3 (%):	9.44	K2O (%):	0.72
CaO (%):	8.40	SO3 (%):	5.19
MgO (%):	4.68	P2O5 (%):	2.21

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88001

sample id 00001
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1156.0	initial temp.(C)	1154.0
softening temp.(C)	1472.0	softening temp.(C)	1472.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1472.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88001

sample id 00001
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	51.00
aluminium oxide %	(al2o3)	28.35
ferric oxide %	(fe2o3)	5.32
titanium dioxide %	(tio2)	1.12
phosphorous pentoxide %	(p2o5)	0.39
calcium oxide %	(cao)	2.41
magnesium oxide %	(mgo)	2.87
sulphur trioxide %	(so3)	1.77
sodium oxide %	(na2o)	1.61
potassium oxide %	(k2o)	1.14

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88001

sample id 00001
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1148.0	initial temp.(C)	1053.0
softening temp.(C)	1472.0	softening temp.(C)	1472.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1472.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88001

sample id 00001
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	53.14
aluminium oxide %	(al2o3)	29.11
ferric oxide %	(fe2o3)	4.13
titanium dioxide %	(tio2)	0.93
phosphorous pentoxide %	(p2o5)	0.35
calcium oxide %	(cao)	2.07
magnesium oxide %	(mgo)	2.41
sulphur trioxide %	(so3)	1.32
sodium oxide %	(na2o)	1.64
potassium oxide %	(k2o)	1.02

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88001

sample id 00002
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1230.0	initial temp.(C)	1106.0
softening temp.(C)	1248.0	softening temp.(C)	1206.0
hemispherical temp.(C)	1253.0	hemispherical temp.(C)	1211.0
fluid temp.(C)	1317.0	fluid temp.(C)	1306.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88001

sample id 00002
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	37.68
aluminium oxide %	(al2o3)	17.63
ferric oxide %	(fe2o3)	9.21
titanium dioxide %	(tio2)	1.23
phosphorous pentoxide %	(p2o5)	2.93
calcium oxide %	(cao)	13.49
magnesium oxide %	(mgo)	6.57
sulphur trioxide %	(so3)	4.77
sodium oxide %	(na2o)	1.58
potassium oxide %	(k2o)	0.64

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88001

sample id 00002
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1085.0	initial temp.(C)	1016.0
softening temp.(C)	1282.0	softening temp.(C)	1256.0
hemispherical temp.(C)	1288.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1311.0	fluid temp.(C)	1310.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88001

sample id 00002
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	42.98
aluminium oxide %	(al2o3)	21.93
ferric oxide %	(fe2o3)	6.09
titanium dioxide %	(tio2)	0.93
phosphorous pentoxide %	(p2o5)	3.84
calcium oxide %	(cao)	9.39
magnesium oxide %	(mgo)	3.97
sulphur trioxide %	(so3)	3.56
sodium oxide %	(na2o)	1.61
potassium oxide %	(k2o)	0.78

90.0 <= total <= 100.0

GULF CANADA CORPORATION

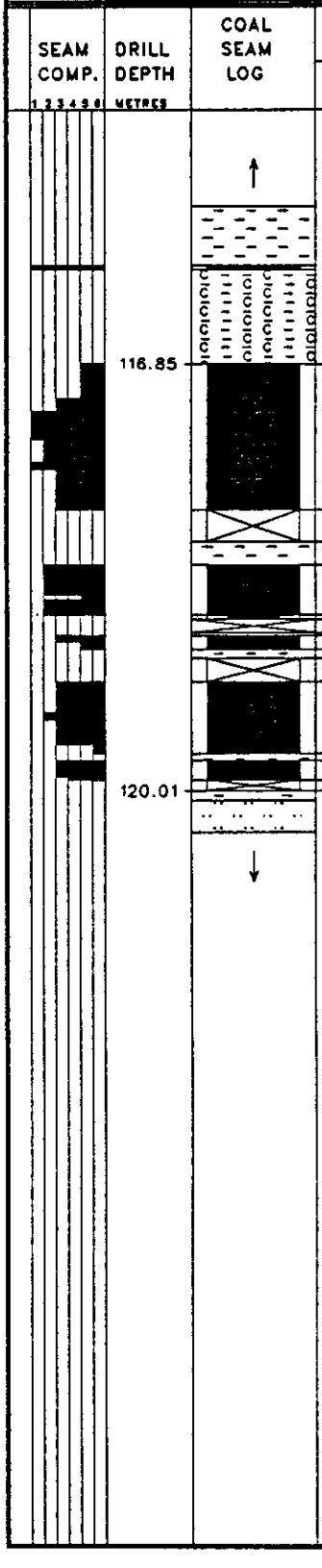
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88001 SEAM : H INTERVAL(M) : 116.85 – 120.01 ELEVATION(M) : 1622.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 19/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	116.85			0.97											
				(0.21)											
			0.16												
				0.33	80.4	10405	3	2.45 / 0.36 2.81	2.45 / 0.38 2.81	1.42	35.40	4.55	58.63	0.42	21.14
				(0.83)											
			0.08												
				0.08											
				(0.18)											
				0.47											
				0.13											
				(0.97)											
	120.01														

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

October 24, 1988.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88001
Coal zone:	H		
Field sample no.:	10405	Composite sample no.:	3
True sample thickness:	2.811 meters	Drill core recovery (%):	80.37 %
Coal/Rock:	2.455 / 0.356 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	27.02	17.61	12.88	32.25
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	5.90	4.34		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.42	
Ash (%):	35.40	35.91
Volatile matter (%):	4.55	4.62
Fixed carbon (%):	58.63	59.47
Total sulphur (%):	0.42	0.43
Combustible sulphur (%):	0.05	
Net calorific value (cal/g):	5052.00	5125.00
Gross calorific value (cal/g):	5052.00	5125.00
Volatile matter (dmmf%):	2.60	
Hardgrove index:	63.00	
Specific gravity:	1.58	
Carbon dioxide (%):	0.80	
Phosphorous in coal (%):	0.125	
Chlorine in coal (ppm):	944.00	

Forms of Sulphur (%): PYRITE 00.11 SULPHATE 00.00 ORGANIC 00.31

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	56.78	57.60
Hydrogen (%):	1.59	1.61
Nitrogen (%):	0.68	0.69
Oxygen (%):	3.71	3.76

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1219.00	1206.00
Softening temperature (°C):	1259.00	1232.00
Hemispherical temperature (°C):	1269.00	1238.00
Final temperature (°C):	1348.00	1344.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	56.94	TiO2 (%):	1.12
Al2O3 (%):	16.75	Na2O (%):	1.81
Fe2O3 (%):	6.03	K2O (%):	0.66
CaO (%):	5.43	SO3 (%):	2.64
MgO (%):	3.22	P2O5 (%):	0.81

gcri coal division ash fusion proj KPN BLK LR DS DDH88001

sample id 00003
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1261.0	initial temp.(C)	1145.0
softening temp.(C)	1285.0	softening temp.(C)	1261.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1282.0
fluid temp.(C)	1395.0	fluid temp.(C)	1392.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88001

sample id 00003
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.24
aluminium oxide %	(al2o3)	20.66
ferric oxide %	(fe2o3)	5.18
titanium dioxide %	(tio2)	1.32
phosphorous pentoxide %	(p2o5)	1.06
calcium oxide %	(cao)	4.15
magnesium oxide %	(mgo)	2.70
sulphur trioxide %	(so3)	2.44
sodium oxide %	(na2o)	1.83
potassium oxide %	(k2o)	0.60

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88001

sample id 00003
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1182.0	initial temp.(C)	1132.0
softening temp.(C)	1353.0	softening temp.(C)	1282.0
hemispherical temp.(C)	1374.0	hemispherical temp.(C)	1327.0
fluid temp.(C)	1432.0	fluid temp.(C)	1428.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88001

sample id 00003
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.42
aluminium oxide %	(al2o3)	18.14
ferric oxide %	(fe2o3)	5.09
titanium dioxide %	(tio2)	1.29
phosphorous pentoxide %	(p2o5)	1.14
calcium oxide %	(cao)	3.69
magnesium oxide %	(mgo)	8.40
sulphur trioxide %	(so3)	1.86
sodium oxide %	(na2o)	1.99
potassium oxide %	(k2o)	0.57

90.0 <= total <= 100.0

KPNLRDDH88002

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88002 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/11/88
END DATE - 06/13/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - LEE
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - "I" SEAM INTERSECTED. OVERTURN AND START OF SEQUEN CE REPEAT AT BOTTOM OF HOLE. SITE C.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1689.11
ZONE - 9
NORTHING - 6342603.02
EASTING - 504523.89

LICENCE/LEASE NUMBER - 7149

LATITUDE - 571342
LONGITUDE - 1285530

- O R I E N T A T I O N -

LENGTH - 111.04
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-002

SEAM		TRUE SEAM THICKNESS (Coal + Rock)
1		4.25 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE		SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88002											
	I	ROOF	10401	10.79	11.44	100.00		0.591			0.000- 0.591
	I		10402	11.44	16.05	50.98	1.976	0.183	2.042	0.046	4.018- 0.229
	I	FLOOR	10403	16.05	16.08	100.00		0.028			0.000- 0.028

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88002												
	I	4	10402	10402	11.44	16.05	50.97	2.15	0.20	2.21	0.05	4.36- 0.25

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

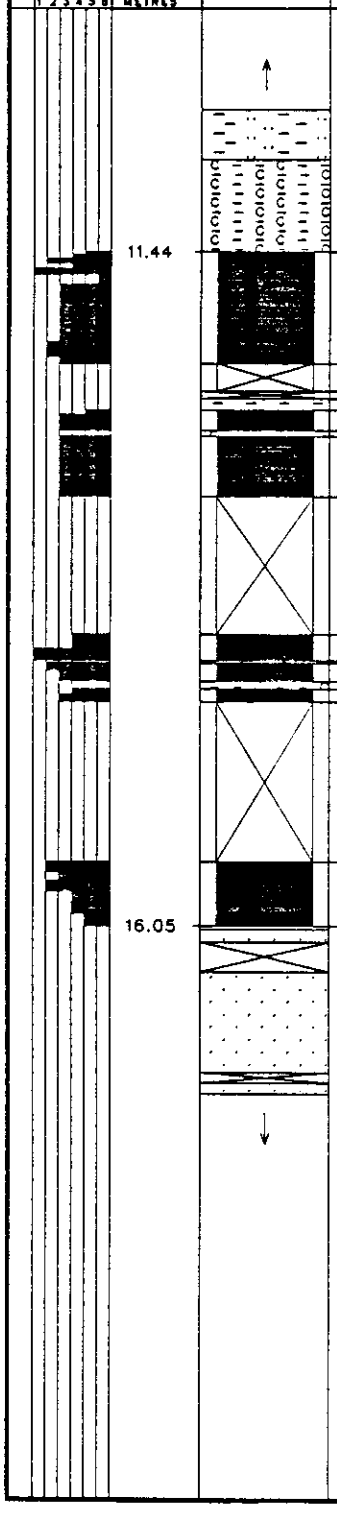
GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88002 SEAM : 1 INTERVAL(M) : 11.44 – 16.05 ELEVATION(M) : 1689.1

GEOLOGIST : LEE SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	11.44			0.71												
				(0.17)												
			0.07	0.13												
			0.04													
				0.39												
				(0.87)	50.8	10402	4	4.02 / 0.23 4.25	4.02 / 0.23 4.25	0.78	32.34	8.68	60.22	—	22.19	—
			0.02	0.17												
			0.11													
			0.08													
				(1.00)												
				0.40												
	16.05															

KPNLRDDH88003

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88003 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/12/88
END DATE - 06/14/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - KRAUS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED 5 SEAMS: J,K,K/L,L?,M?. AQUIFER =164.
14M.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1672.11
ZONE - 9
NORTHING - 6342751.59
EASTING - 505627.23

LICENCE/LEASE NUMBER - 7148

LATITUDE - 571347
LONGITUDE - 1285424

- O R I E N T A T I O N -

LENGTH - 170.00
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-003

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
M ?	4.57 m
L ?	2.36 m
K/L	6.11 m
K	3.10 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88003										
	M? ROOF	10407	40.41	41.11	100.00		0.665			0.000- 0.665
	M?	10408	41.11	46.01	63.27	2.497	0.381	1.521	0.167	4.018- 0.548
	M?	10409	46.01	48.78	76.17	1.272	0.632	0.321	0.270	1.593- 0.902
	M? FLOOR	10410	48.78	49.00	100.00		0.193			0.000- 0.193
	L? ROOF	10414	53.81	54.54	100.00		0.632			0.000- 0.632
	L?	10415	54.54	57.17	77.95	1.467	0.376	0.516		1.983- 0.376
	L? FLOOR	10416	57.17	57.72	100.00		0.508			0.000- 0.508
	K/L ROOF	10417	94.15	94.54	100.00		0.369			0.000- 0.369
	K/L	10418	94.54	98.56	87.56	2.874	0.411	0.468		3.342- 0.411
	K/L	10419	98.56	101.15	75.29	1.374	0.401	0.432	0.155	1.806- 0.556
	K/L FLOOR	10420	101.15	101.53	100.00		0.343			0.000- 0.343
	K ROOF	10421	115.29	115.69	100.00		0.374			0.000- 0.374
	K	10422	115.69	117.42	100.00	1.441	0.168			1.441- 0.168
	K	10423	117.42	119.01	100.00	1.490				1.490- 0.000
	K FLOOR	10424	119.01	119.31	100.00		0.281			0.000- 0.281
	J	99999	157.23	157.53	96.67	0.267		0.009		0.276- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88003												
	M ?	5	10408	10408	41.11	46.01	63.26	2.69	0.41	1.62	0.18	4.31- 0.59
	M ?	6	10409	10409	46.01	48.78	76.17	1.41	0.70	0.36	0.30	1.77- 1.00
	L ?	7	10415	10415	54.54	57.17	77.94	1.63	0.42	0.58	0.00	2.21- 0.42
	K/L	8	10418	10418	94.54	98.56	87.56	3.08	0.44	0.50	0.00	3.58- 0.44
	K/L	9	10419	10419	98.56	101.15	75.28	1.51	0.44	0.47	0.17	1.98- 0.61
	K	10	10422	10422	115.69	117.42	100.00	1.55	0.18	0.00	0.00	1.55- 0.18
	K	11	10423	10423	117.42	119.01	100.00	1.59	0.00	0.00	0.00	1.59- 0.00
	M ?	204	10408	10408	41.11	46.01	63.26	2.69	0.41	1.62	0.18	4.31- 0.59
	L ?	205	10415	10415	54.54	57.17	77.94	1.63	0.42	0.58	0.00	2.21- 0.42
	K/L	206	10418	10419	94.54	101.15	82.75	4.59	0.88	0.97	0.17	5.56- 1.05
	K	207	10422	10423	115.69	119.01	100.00	3.14	0.18	0.00	0.00	3.14- 0.18
	M ?	302	10408	10409	41.11	48.78	67.92	4.10	1.11	1.98	0.48	6.08- 1.59
	L ?	303	10415	10415	54.54	57.17	77.94	1.63	0.42	0.58	0.00	2.21- 0.42
	K/L	304	10418	10419	94.54	101.15	82.75	4.59	0.88	0.97	0.17	5.56- 1.05
	K	305	10422	10423	115.69	119.01	100.00	3.14	0.18	0.00	0.00	3.14- 0.18

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

PAGE : 1 / 2

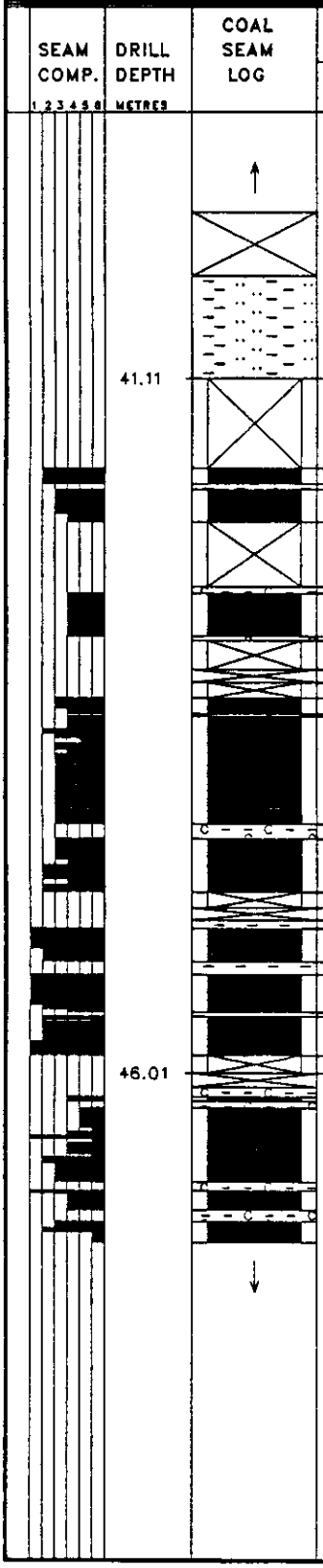
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88003 SEAM : M? TOTAL INTERVAL(M) : 41.11 – 48.78
INTERVAL(M) : 41.11 – 46.01
ELEVATION(M) : 1672.1

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 30/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	41.11			(0.59)											
			0.04	0.10											
				0.22											
				(0.42)											
				0.28											
			0.03	(0.19)											
			(0.08)	(0.10)											
			0.02	0.10											
				0.71	63.0	10408	S	4.02 / 0.55 4.57		1.54	32.79	5.01	60.66	0.60	22.17
			0.09												
				0.35											
			(0.08)	(0.10)											
			0.04	0.22											
			0.08												
				0.25											
			0.03	0.26											
	46.01			(0.12)											

GULF CANADA CORPORATION

PAGE : 2 / 2

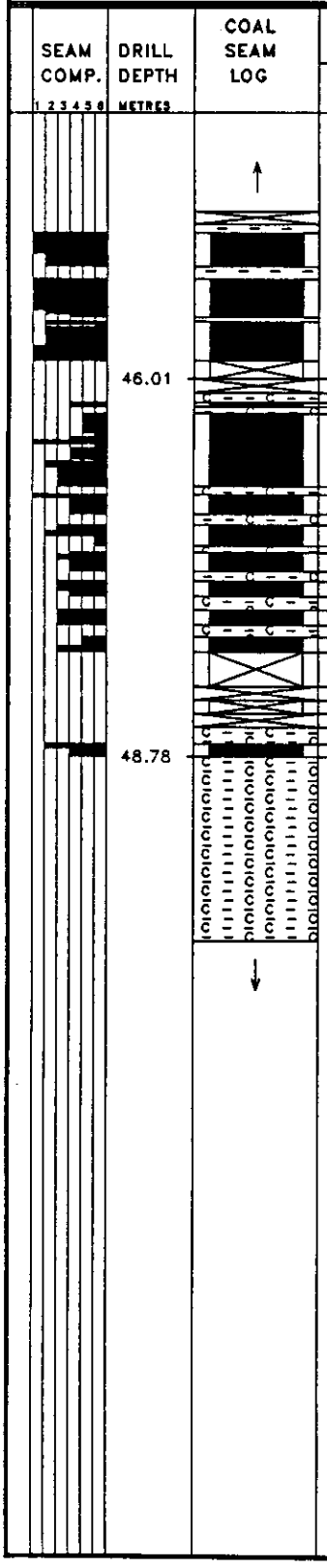
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88003 SEAM : M? TOTAL INTERVAL(M) : 41.11 – 48.78
INTERVAL(M) : 46.01 – 48.78
ELEVATION(M) : 1672.1

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 30/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	46.01		(0.09)						~~4.02 / 0.55~~ 4.57						
			0.38	0.03											
			0.05												
				0.48											
			0.05												
			0.07	0.13											
			0.05	0.14											
				0.13	76.3	10409	6	1.59 / 0.90		1.54	53.13	7.05	38.28	0.37	13.44
			0.04	0.10				2.50							
			0.09	0.10											
			0.08	0.10											
				(0.23)											
			(0.09)												
			(0.09)	(0.09)											
			0.12												
	48.78			0.08											

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88003
Coal zone:	M?		
Field sample no.:	10408	Composite sample no.:	5
True sample thickness:	4.566 meters	Drill core recovery (%):	63.26 %
Coal/Rock:	4.018 / 0.548 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	6.82	16.73	19.08	41.22	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	10.32	5.83			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.54	
Ash (%):	32.79	33.30
Volatile matter (%):	5.01	5.09
Fixed carbon (%):	60.66	61.61
Total sulphur (%):	0.60	0.61
Combustible sulphur (%):	0.20	
Net calorific value (cal/g):	5299.00	5381.00
Gross calorific value (cal/g):	5299.00	5381.00
Volatile matter (dmmf%):	3.50	
Specific gravity:	1.53	
Carbon dioxide (%):	0.58	
Phosphorous in coal (%):	0.153	
Chlorine in coal (ppm):	1264.00	

Forms of Sulphur (%): PYRITE 00.17 SULPHATE 00.00 ORGANIC 00.43

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	58.81	59.73
Hydrogen (%):	1.19	1.21
Nitrogen (%):	0.78	0.79
Oxygen (%):	4.29	4.36

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1248.00	1077.00
Softening temperature (°C):	1261.00	1214.00
Hemispherical temperature (°C):	1269.00	1230.00
Final temperature (°C):	1358.00	1355.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	51.14	TiO2 (%):	1.32
Al2O3 (%):	21.68	Na2O (%):	2.05
Fe2O3 (%):	7.12	K2O (%):	0.82
CaO (%):	4.65	SO3 (%):	3.03
MgO (%):	3.36	P2O5 (%):	1.07

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88003
Coal zone:	M?		
Field sample no.:	10409	Composite sample no.:	6
True sample thickness:	2.495 meters	Drill core recovery (%):	76.17 %
Coal/Rock:	1.593 / 0.902 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	25.93	27.67	19.02	21.43
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.86	2.09		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.54	
Ash (%):	53.13	53.96
Volatile matter (%):	7.05	7.16
Fixed carbon (%):	38.28	38.88
Total sulphur (%):	0.37	0.38
Combustible sulphur (%):	0.05	
Net calorific value (cal/g):	3212.00	3262.00
Gross calorific value (cal/g):	3212.00	3262.00
Volatile matter (dmmf%):	6.50	
Hardgrove index:	59.00	
Specific gravity:	1.70	
Carbon dioxide (%):	0.73	
Phosphorous in coal (%):	0.053	
Chlorine in coal (ppm):	2144.00	

Forms of Sulphur (%): PYRITE 00.09 SULPHATE 00.00 ORGANIC 00.28

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	39.98	40.60
Hydrogen (%):	2.06	2.09
Nitrogen (%):	0.64	0.65
Oxygen (%):	2.28	2.32

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1153.00	1147.00
Softening temperature (°C):	1277.00	1209.00
Hemispherical temperature (°C):	1288.00	1245.00
Final temperature (°C):	1327.00	1290.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	53.88	TiO2 (%):	1.23
Al2O3 (%):	18.82	Na2O (%):	1.49
Fe2O3 (%):	9.35	K2O (%):	1.52
CaO (%):	3.05	SO3 (%):	1.52
MgO (%):	4.19	P2O5 (%):	0.23

gcri coal division ash fusion proj KPN BLK LR DS DDH88003

sample id 00005
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1264.0	initial temp.(C)	1111.0
softening temp.(C)	1274.0	softening temp.(C)	1238.0
hemispherical temp.(C)	1288.0	hemispherical temp.(C)	1245.0
fluid temp.(C)	1369.0	fluid temp.(C)	1340.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88003

sample id 00005
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	51.92
aluminium oxide %	(al2o3)	20.06
ferric oxide %	(fe2o3)	6.06
titanium dioxide %	(tio2)	1.54
phosphorous pentoxide %	(p2o5)	1.27
calcium oxide %	(cao)	5.23
magnesium oxide %	(mgo)	3.22
sulphur trioxide %	(so3)	3.51
sodium oxide %	(na2o)	1.77
potassium oxide %	(k2o)	0.72

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88003

sample id 00005
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1148.0	initial temp.(C)	1116.0
softening temp.(C)	1285.0	softening temp.(C)	1243.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1256.0
fluid temp.(C)	1385.0	fluid temp.(C)	1311.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88003

sample id 00005
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	52.96
aluminium oxide %	(al2o3)	20.79
ferric oxide %	(fe2o3)	5.55
titanium dioxide %	(tio2)	1.23
phosphorous pentoxide %	(p2o5)	1.13
calcium oxide %	(cao)	5.12
magnesium oxide %	(mgo)	3.27
sulphur trioxide %	(so3)	3.17
sodium oxide %	(na2o)	1.59
potassium oxide %	(k2o)	0.65

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88003

sample id 00006
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1317.0	initial temp.(C)	1277.0
softening temp.(C)	1385.0	softening temp.(C)	1361.0
hemispherical temp.(C)	1419.0	hemispherical temp.(C)	1364.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88003

sample id 00006
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide	%	(sio2)	56.83
aluminium oxide	%	(al2o3)	23.44
ferric oxide	%	(fe2o3)	4.98
titanium dioxide	%	(tio2)	1.73
phosphorous pentoxide	%	(p2o5)	0.45
calcium oxide	%	(cao)	2.32
magnesium oxide	%	(mgo)	2.50
sulphur trioxide	%	(so3)	1.22
sodium oxide	%	(na2o)	1.82
potassium oxide	%	(k2o)	1.42

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88003

sample id 00006
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1401.0	initial temp.(C)	1285.0
softening temp.(C)	1435.0	softening temp.(C)	1364.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1395.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88003

sample id 00006
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.32
aluminium oxide %	(al2o3)	24.19
ferric oxide %	(fe2o3)	4.38
titanium dioxide %	(tio2)	1.54
phosphorous pentoxide %	(p2o5)	0.41
calcium oxide %	(cao)	2.18
magnesium oxide %	(mgo)	2.44
sulphur trioxide %	(so3)	1.34
sodium oxide %	(na2o)	1.91
potassium oxide %	(k2o)	1.37

90.0 <= total <= 100.0

GULF CANADA CORPORATION

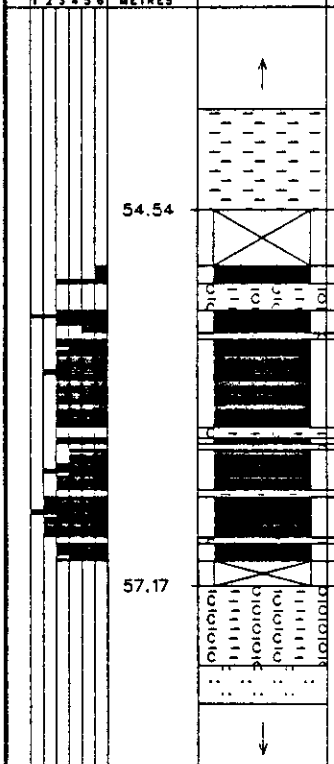
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88003 SEAM : L? INTERVAL(M) : 54.54 – 57.17 ELEVATION(M) : 1672.1

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	54.54			(0.35)												
				0.11												
			0.17													
				0.14												
			0.04													
				0.56	78.5	10415	7	1.98 / 0.38	1.98 / 0.38	1.10	39.80	8.23	50.87	0.49	18.87	—
			0.04					2.36	2.36							
			0.04													
				0.25												
			0.05													
				0.26												
			0.04													
				0.11												
	57.17			(0.16)												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88003
Coal zone:	L?		
Field sample no.:	10415	Composite sample no.:	7
True sample thickness:	2.359 meters	Drill core recovery (%):	77.94 %
Coal/Rock:	1.983 / 0.376 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	31.17	25.32	15.78	22.62	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	3.30	1.81			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.10	
Ash (%):	39.80	40.24
Volatile matter (%):	8.23	8.32
Fixed carbon (%):	50.87	51.44
Total sulphur (%):	0.49	0.50
Combustible sulphur (%):	0.03	
Net calorific value (cal/g):	4509.00	4559.00
Gross calorific value (cal/g):	4510.00	4560.00
Volatile matter (dmmf%):	8.80	
Hardgrove index:	59.00	
Specific gravity:	1.58	
Carbon dioxide (%):	0.87	
Phosphorous in coal (%):	0.195	
Chlorine in coal (ppm):	1784.00	
Forms of Sulphur (%):	PYRITE 00.40 SULPHATE 00.00 ORGANIC 00.09	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	51.64	52.21
Hydrogen (%):	2.44	2.47
Nitrogen (%):	0.56	0.57
Oxygen (%):	3.97	4.01

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1195.00	1137.00
Softening temperature (°C):	1230.00	1182.00
Hemispherical temperature (°C):	1238.00	1190.00
Final temperature (°C):	1385.00	1374.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	52.64	TiO2 (%):	1.29
Al2O3 (%):	14.61	Na2O (%):	1.65
Fe2O3 (%):	7.89	K2O (%):	0.65
CaO (%):	8.23	SO3 (%):	2.87
MgO (%):	4.56	P2O5 (%):	1.12

gcri coal division ash fusion proj KPN BLK LR DS DDH88003

sample id 00007
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1214.0	initial temp.(C)	1058.0
softening temp.(C)	1288.0	softening temp.(C)	1248.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1332.0	fluid temp.(C)	1328.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88003

sample id 00007
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	57.28
aluminium oxide %	(al2o3)	17.97
ferric oxide %	(fe2o3)	4.05
titanium dioxide %	(tio2)	1.29
phosphorous pentoxide %	(p2o5)	1.56
calcium oxide %	(cao)	5.29
magnesium oxide %	(mgo)	2.74
sulphur trioxide %	(so3)	2.52
sodium oxide %	(na2o)	1.64
potassium oxide %	(k2o)	0.81

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88003

sample id 00007
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1245.0	1164.0
softening temp.(C)	1322.0	1285.0
hemispherical temp.(C)	1332.0	1295.0
fluid temp.(C)	1427.0	1411.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88003

sample id 00007
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.98
aluminium oxide %	(al2o3)	21.47
ferric oxide %	(fe2o3)	3.83
titanium dioxide %	(tio2)	1.23
phosphorous pentoxide %	(p2o5)	1.29
calcium oxide %	(cao)	4.51
magnesium oxide %	(mgo)	2.55
sulphur trioxide %	(so3)	1.62
sodium oxide %	(na2o)	1.67
potassium oxide %	(k2o)	0.91

90.0 <= total <= 100.0

GULF CANADA CORPORATION

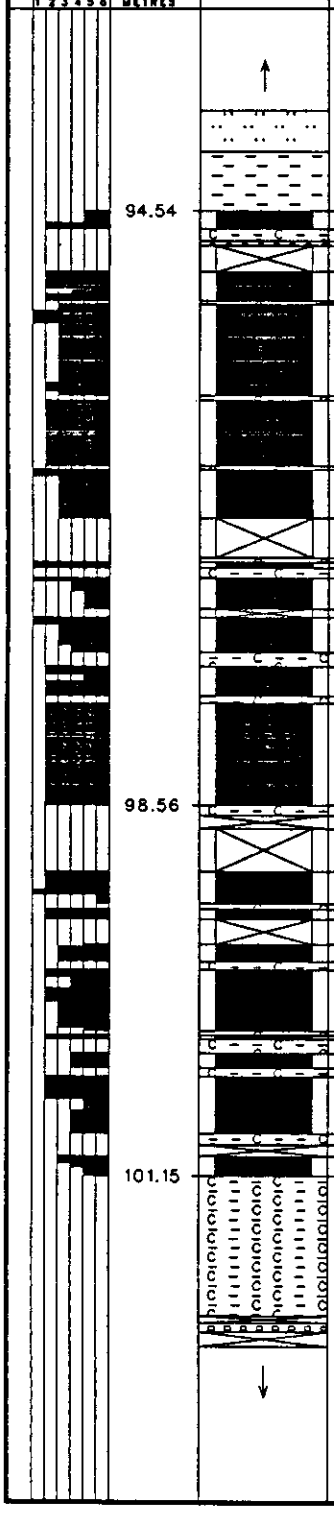
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88003 SEAM : K/L INTERVAL(M) : 94.54 – 101.15 ELEVATION(M) : 1672.1

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	94.54			0.11												
			0.03	(0.16)												
				0.18												
			0.03	0.57												
			0.03	0.41												
			0.03	0.31	87.5	10418	8	3.34 / 0.41 3.75		0.97	32.16	5.85	61.00	0.76	22.19	—
			0.03	(0.25)												
			0.07	0.20												
			0.09	0.22												
				0.19					5.15 / 0.97 6.11							
				0.65												
	98.56		0.06 (0.09)													
				(0.28)												
			0.04	0.20												
			0.08	(0.16)												
			0.08	0.11												
				0.39	75.1	10419	9	1.81 / 0.56 2.36		0.99	40.57	6.59	51.85	0.38	19.13	—
			0.03													
			0.09	0.09												
			0.06	0.36												
			0.07 (0.07)													
	101.15			0.13												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88003
Coal zone:	K/L		
Field sample no.:	10418	Composite sample no.:	8
True sample thickness:	3.753 meters	Drill core recovery (%):	87.56 %
Coal/Rock:	3.342 / 0.411 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	33.65	22.39	15.82	22.62
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.86	1.66		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.97	
Ash (%):	32.18	32.50
Volatile matter (%):	5.85	5.91
Fixed carbon (%):	61.00	61.59
Total sulphur (%):	0.76	0.77
Combustible sulphur (%):	0.33	
Net calorific value (cal/g):	5303.00	5355.00
Gross calorific value (cal/g):	5303.00	5355.00
Volatile matter (dmmf%):	4.70	
Hardgrove index:	54.00	
Specific gravity:	1.55	
Carbon dioxide (%):	0.77	
Phosphorous in coal (%):	0.094	
Chlorine in coal (ppm):	1504.00	
Forms of Sulphur (%):	PYRITE 00.28 SULPHATE 00.00 ORGANIC 00.48	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	57.77	58.34
Hydrogen (%):	2.13	2.15
Nitrogen (%):	0.76	0.77
Oxygen (%):	5.43	5.47

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1177.00	1166.00
Softening temperature (°C):	1280.00	1185.00
Hemispherical temperature (°C):	1285.00	1190.00
Final temperature (°C):	1338.00	1285.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	50.82	TiO2 (%):	1.12
Al2O3 (%):	14.99	Na2O (%):	1.30
Fe2O3 (%):	12.73	K2O (%):	0.86
CaO (%):	5.15	SO3 (%):	3.35
MgO (%):	4.17	P2O5 (%):	0.67

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88003
Coal zone:	K/L		
Field sample no.:	10419	Composite sample no.:	9
True sample thickness:	2.362 meters	Drill core recovery (%):	75.28 %
Coal/Rock:	1.806 / 0.556 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	33.69	24.69	15.95	21.20
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	2.90	1.57		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.99	
Ash (%):	40.57	40.98
Volatile matter (%):	6.59	6.66
Fixed carbon (%):	51.85	52.36
Total sulphur (%):	0.38	0.38
Combustible sulphur (%):	0.03	
Net calorific value (cal/g):	4572.00	4618.00
Gross calorific value (cal/g):	4572.00	4618.00
Volatile matter (dmmf%):	5.90	
Hardgrove index:	57.00	
Specific gravity:	1.58	
Carbon dioxide (%):	0.25	
Phosphorous in coal (%):	0.076	
Chlorine in coal (ppm):	1424.00	

Forms of Sulphur (%): PYRITE 00.05 SULPHATE 00.00 ORGANIC 00.33

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	51.33	51.84
Hydrogen (%):	1.85	1.87
Nitrogen (%):	0.63	0.64
Oxygen (%):	4.25	4.29

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1251.00	1195.00
Softening temperature (°C):	1269.00	1214.00
Hemispherical temperature (°C):	1280.00	1232.00
Final temperature (°C):	1319.00	1285.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	55.90	TiO2 (%):	0.98
Al2O3 (%):	18.15	Na2O (%):	2.35
Fe2O3 (%):	6.03	K2O (%):	0.99
CaO (%):	4.20	SO3 (%):	2.17
MgO (%):	3.40	P2O5 (%):	0.43

gcri coal division ash fusion proj KPN BLK LR DS DDH88003

sample id 00008
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1185.0	initial temp.(C)	1161.0
softening temp.(C)	1330.0	softening temp.(C)	1274.0
hemispherical temp.(C)	1358.0	hemispherical temp.(C)	1295.0
fluid temp.(C)	1427.0	fluid temp.(C)	1411.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88003

sample id 00008
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.54
aluminium oxide %	(al2o3)	20.41
ferric oxide %	(fe2o3)	5.66
titanium dioxide %	(tio2)	0.89
phosphorous pentoxide %	(p2o5)	0.90
calcium oxide %	(cao)	4.06
magnesium oxide %	(mgo)	2.44
sulphur trioxide %	(so3)	2.37
sodium oxide %	(na2o)	1.71
potassium oxide %	(k2o)	0.87

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88003

sample id 00008
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1269.0	initial temp.(C)	1259.0
softening temp.(C)	1348.0	softening temp.(C)	1306.0
hemispherical temp.(C)	1364.0	hemispherical temp.(C)	1327.0
fluid temp.(C)	1435.0	fluid temp.(C)	1432.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88003

sample id 00008
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.93
aluminium oxide %	(al2o3)	21.34
ferric oxide %	(fe2o3)	4.79
titanium dioxide %	(tio2)	0.76
phosphorous pentoxide %	(p2o5)	0.45
calcium oxide %	(cao)	4.06
magnesium oxide %	(mgo)	2.42
sulphur trioxide %	(so3)	2.18
sodium oxide %	(na2o)	1.97
potassium oxide %	(k2o)	1.04

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88003

sample id 00009
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1222.0	initial temp.(C)	1174.0
softening temp.(C)	1282.0	softening temp.(C)	1248.0
hemispherical temp.(C)	1288.0	hemispherical temp.(C)	1259.0
fluid temp.(C)	1324.0	fluid temp.(C)	1288.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88003

sample id 00009
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	53.88
aluminium oxide %	(al2o3)	19.66
ferric oxide %	(fe2o3)	5.23
titanium dioxide %	(tio2)	0.98
phosphorous pentoxide %	(p2o5)	1.03
calcium oxide %	(cao)	4.70
magnesium oxide %	(mgo)	3.16
sulphur trioxide %	(so3)	2.59
sodium oxide %	(na2o)	1.89
potassium oxide %	(k2o)	0.84

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88003

sample id 00009
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1243.0	initial temp.(C)	1227.0
softening temp.(C)	1290.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1269.0
fluid temp.(C)	1343.0	fluid temp.(C)	1324.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88003

sample id 00009
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.42
aluminium oxide %	(al2o3)	21.55
ferric oxide %	(fe2o3)	4.86
titanium dioxide %	(tio2)	0.98
phosphorous pentoxide %	(p2o5)	0.93
calcium oxide %	(cao)	4.25
magnesium oxide %	(mgo)	2.86
sulphur trioxide %	(so3)	2.20
sodium oxide %	(na2o)	2.13
potassium oxide %	(k2o)	0.93

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88003 SEAM : K INTERVAL(M) : 115.69 – 119.01 ELEVATION(M) : 1672.1

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	115.69			0.52												
			0.09													
				0.70	100.0	10422	10	1.44 / 0.17 1.61		0.95	37.18	7.39	54.48	1.19	19.78	—
			0.18						2.93 / 0.17 3.10							
	117.42		0.03													
				1.54	100.0	10423	11	1.49 / 0.00 1.49		0.81	26.66	7.19	65.34	0.57	24.40	—
	119.01															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88003
Coal zone:	K		
Field sample no.:	10422	Composite sample no.:	10
True sample thickness:	1.609 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	1.441 / 0.168 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	37.89	20.95	13.13	22.12
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.96	1.95		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.95	
Ash (%):	37.18	37.54
Volatile matter (%):	7.39	7.46
Fixed carbon (%):	54.48	55.00
Total sulphur (%):	1.19	1.20
Combustible sulphur (%):	0.15	
Net calorific value (cal/g):	4727.00	4773.00
Gross calorific value (cal/g):	4727.00	4773.00
Volatile matter (dmmf%):	6.80	
Hardgrove index:	62.00	
Specific gravity:	1.58	
Carbon dioxide (%):	0.37	
Phosphorous in coal (%):	0.135	
Chlorine in coal (ppm):	1704.00	

Forms of Sulphur (%): PYRITE 00.56 SULPHATE 00.00 ORGANIC 00.63

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	54.55	55.07
Hydrogen (%):	1.75	1.77
Nitrogen (%):	0.62	0.63
Oxygen (%):	3.76	3.79

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1206.00	1166.00
Softening temperature (°C):	1227.00	1177.00
Hemispherical temperature (°C):	1232.00	1182.00
Final temperature (°C):	1245.00	1200.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	43.46	TiO2 (%):	0.95
Al2O3 (%):	14.23	Na2O (%):	1.99
Fe2O3 (%):	12.16	K2O (%):	0.61
CaO (%):	10.58	SO3 (%):	6.96
MgO (%):	3.48	P2O5 (%):	0.83

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88003
Coal zone:	K		
Field sample no.:	10423	Composite sample no.:	11
True sample thickness:	1.490 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	1.490 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	38.25	21.79	13.90	21.74
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	2.92	1.40		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.81	
Ash (%):	26.66	26.88
Volatile matter (%):	7.19	7.25
Fixed carbon (%):	65.34	65.87
Total sulphur (%):	0.57	0.57
Combustible sulphur (%):	0.06	
Net calorific value (cal/g):	5831.00	5878.00
Gross calorific value (cal/g):	5832.00	5879.00
Volatile matter (dmmf%):	6.90	
Hardgrove index:	50.00	
Specific gravity:	1.50	
Carbon dioxide (%):	0.46	
Phosphorous in coal (%):	0.064	
Chlorine in coal (ppm):	1104.00	
Forms of Sulphur (%):	PYRITE 00.11 SULPHATE 00.00 ORGANIC 00.46	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	66.35	66.89
Hydrogen (%):	2.77	2.79
Nitrogen (%):	0.79	0.80
Oxygen (%):	2.05	2.07

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1137.00	1116.00
Softening temperature (°C):	1251.00	1209.00
Hemispherical temperature (°C):	1259.00	1214.00
Final temperature (°C):	1301.00	1261.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	46.62	TiO2 (%):	0.98
Al2O3 (%):	16.26	Na2O (%):	1.52
Fe2O3 (%):	9.52	K2O (%):	1.22
CaO (%):	7.39	SO3 (%):	4.80
MgO (%):	6.76	P2O5 (%):	0.55

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88003

sample id 00010
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1185.0	initial temp.(C)	1085.0
softening temp.(C)	1280.0	softening temp.(C)	1214.0
hemispherical temp.(C)	1288.0	hemispherical temp.(C)	1232.0
fluid temp.(C)	1324.0	fluid temp.(C)	1274.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88003

sample id 00010
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide	%	(sio2)	53.22
aluminium oxide	%	(al2o3)	18.52
ferric oxide	%	(fe2o3)	7.12
titanium dioxide	%	(tio2)	1.01
phosphorous pentoxide	%	(p2o5)	1.13
calcium oxide	%	(cao)	4.95
magnesium oxide	%	(mgo)	3.58
sulphur trioxide	%	(so3)	3.27
sodium oxide	%	(na2o)	1.76
potassium oxide	%	(k2o)	0.73

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88003

sample id 00010
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1232.0	initial temp.(C)	1182.0
softening temp.(C)	1301.0	softening temp.(C)	1256.0
hemispherical temp.(C)	1311.0	hemispherical temp.(C)	1266.0
fluid temp.(C)	1358.0	fluid temp.(C)	1317.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88003

sample id 00010
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	53.34
aluminium oxide %	(al2o3)	20.41
ferric oxide %	(fe2o3)	6.06
titanium dioxide %	(tio2)	0.98
phosphorous pentoxide %	(p2o5)	1.33
calcium oxide %	(cao)	4.56
magnesium oxide %	(mgo)	3.22
sulphur trioxide %	(so3)	2.63
sodium oxide %	(na2o)	1.80
potassium oxide %	(k2o)	0.70

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88003

sample id 00011
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1290.0	1187.0
softening temp.(C)	1303.0	1274.0
hemispherical temp.(C)	1317.0	1332.0
fluid temp.(C)	1361.0	1332.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88003

sample id 00011
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	52.46
aluminium oxide %	(al2o3)	19.66
ferric oxide %	(fe2o3)	5.69
titanium dioxide %	(tio2)	0.88
phosphorous pentoxide %	(p2o5)	0.82
calcium oxide %	(cao)	5.01
magnesium oxide %	(mgo)	4.79
sulphur trioxide %	(so3)	3.37
sodium oxide %	(na2o)	1.46
potassium oxide %	(k2o)	0.90

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88003

sample id 00011
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1259.0	initial temp.(C)	1164.0
softening temp.(C)	1314.0	softening temp.(C)	1290.0
hemispherical temp.(C)	1327.0	hemispherical temp.(C)	1303.0
fluid temp.(C)	1369.0	fluid temp.(C)	1356.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88003

sample id 00011
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	52.84
aluminium oxide %	(al2o3)	21.93
ferric oxide %	(fe2o3)	5.41
titanium dioxide %	(tio2)	0.98
phosphorous pentoxide %	(p2o5)	0.76
calcium oxide %	(cao)	4.87
magnesium oxide %	(mgo)	4.49
sulphur trioxide %	(so3)	2.53
sodium oxide %	(na2o)	1.62
potassium oxide %	(k2o)	0.92

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88003 SEAM : J INTERVAL(M) : 157.23 – 157.53 ELEVATION(M) : 1672.1

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	157.23			0.28	100.0	99999		0.28/ 0.00		—	—	—	—	—	—	—
	157.53							0.28								

KPNLRDDH88004

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88004 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/13/88
END DATE - 06/15/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - HEARN
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SEAMS J,J2,?,?,I,H INTERSECTED.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1650.45
ZONE - 9
NORTHING - 6342222.27
EASTING - 504450.18

LICENCE/LEASE NUMBER - 7149

LATITUDE - 571330
LONGITUDE - 1285535

- O R I E N T A T I O N -

LENGTH - 148.54
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

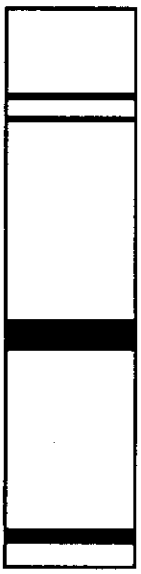
CASING DEPTH (M) - 3.05
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-004

SEAM		TRUE SEAM THICKNESS (Coal + Rock)
J/J_2		0.94 m/0.69 m
I		7.95 m
H		3.32 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88004										
	J2 ROOF	10425	28.22	28.80	100.00		0.525			0.000- 0.525
	J2	10426	28.80	29.55	54.67	0.375		0.312		0.687- 0.000
	J2 FLOOR	10427	29.55	31.13	100.00	0.009	1.423			0.009- 1.423
	I ROOF	10428	82.48	82.76	100.00		0.276			0.000- 0.276
	I	10429	82.76	86.06	62.42	1.816	0.195	1.211		3.027- 0.195
	I	10430	86.06	87.00	100.00	0.446	0.465			0.446- 0.465
	I	10431	87.00	90.34	85.03	2.690	0.038	0.477		3.167- 0.038
	I	10432	90.34	91.95	95.03	1.447		0.076		1.523- 0.000
	I FLOOR	10433	91.95	92.54	100.00		0.555			0.000- 0.555
	H ROOF	10434	137.72	138.00	100.00		0.225			0.000- 0.225
	H	10435	138.00	140.10	100.00	1.627	0.154			1.627- 0.154
	H	10436	140.10	141.27	82.05	0.567	0.270		0.185	0.567- 0.455
	H	10437	141.27	143.07	100.00	1.493	0.042			1.493- 0.042
	H FLOOR	10438	143.07	143.63	100.00		0.467			0.000- 0.467
	? ROOF	10439	55.91	56.25	100.00		0.308			0.000- 0.308
	?	10440	56.25	56.70	100.00	0.362	0.045			0.362- 0.045
	? FLOOR	10441	56.70	57.32	100.00		0.565			0.000- 0.565
	J	99998	22.29	23.45	27.59	0.217	0.041	0.633	0.049	0.850- 0.090
	?.	99999	39.55	39.98	88.37	0.213		0.028		0.241- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88004												
	J2	12	10426	10426	28.80	29.55	54.66	0.41	0.00	0.34	0.00	0.75- 0.00
	?	13	10440	10440	56.25	56.70	100.00	0.40	0.05	0.00	0.00	0.40- 0.05
	I	14	10429	10429	82.76	86.06	62.42	1.86	0.20	1.24	0.00	3.10- 0.20
	I	15	10430	10430	86.06	87.00	100.00	0.46	0.48	0.00	0.00	0.46- 0.48
	I	16	10431	10432	87.00	91.95	88.28	4.33	0.04	0.58	0.00	4.91- 0.04
	H	17	10435	10435	138.00	140.10	100.00	1.92	0.18	0.00	0.00	1.92- 0.18
	H	18	10436	10436	140.10	141.27	82.05	0.65	0.31	0.00	0.21	0.65- 0.52
	H	19	10437	10437	141.27	143.07	100.00	1.75	0.05	0.00	0.00	1.75- 0.05
	I	208	10429	10430	82.76	87.00	70.75	2.32	0.68	1.24	0.00	3.56- 0.68
	I	209	10431	10432	87.00	91.95	88.28	4.33	0.04	0.58	0.00	4.91- 0.04
	H	210	10435	10435	138.00	140.10	100.00	1.92	0.18	0.00	0.00	1.92- 0.18
	H	211	10437	10437	141.27	143.07	100.00	1.75	0.05	0.00	0.00	1.75- 0.05
	I	306	10429	10432	82.76	91.95	80.19	6.65	0.72	1.82	0.00	8.47- 0.72
	H	307	10435	10437	138.00	143.07	94.89	3.67	0.23	0.00	0.21	3.67- 0.44

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : J INTERVAL(M) : 22.29 – 23.45 ELEVATION(M) : 1650.5

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	22.29			(0.34)											
				0.09											
					27.4	99998			0.85/ 0.09	—	—	—	—	—	—
				(0.23)					0.94						
				0.13											
	23.45			(0.05)											

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : J2 INTERVAL(M) : 28.80 – 29.55 ELEVATION(M) : 1650.5

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	28.80			(0.23)												
				0.28	54.6	10428	12	0.69/ 0.00	0.69/ 0.00	0.81	32.13	5.55	61.51	—	21.61	—
				(0.08)				0.69	0.69							
	29.55			0.19												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : ?. INTERVAL(M) : 39.55 – 39.98 ELEVATION(M) : 1650.5

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	39.55			0.13 (0.03) 0.09	88.4	99999		0.24 / 0.00		—	—	—	—	—	—
	39.98							0.24							

GULF CANADA CORPORATION

COAL DIVISION

MOUNT KLAPPAN PROJECT

SEAM DETAIL

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : ? INTERVAL(M) : 56.25 – 56.70 ELEVATION(M) : 1650.5

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	56.25		0.03	0.06												
			0.02	0.20	100.0	10440	13	0.36/ 0.05		1.09	39.08	5.25	54.58	—	19.70	—
	56.70			0.11				0.41								

GULF CANADA CORPORATION

COAL DIVISION

MOUNT KLAPPAN PROJECT

SEAM DETAIL

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : 1 TOTAL INTERVAL(M) : 82.76 – 91.95 ELEVATION(M) : 1650.5

INTERVAL(M) : 82.76 – 86.06

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	82.76			(0.14)												
				0.94												
				(1.07)	62.4	10429	14	3.03/ 0.20 3.22		0.61	39.19	5.89	54.31	0.31	19.15	—
			0.15	0.08												
				0.80												
	86.06															

GULF CANADA CORPORATION

COAL DIVISION

MOUNT KLAPPAN PROJECT

SEAM DETAIL

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : 1 TOTAL INTERVAL(M) : 82.76 – 91.95 ELEVATION(M) : 1650.5

GEOLOGIST : HEARN SCALE: 1:40 INTERVAL(M) : 86.06 – 87.00 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
									3.03/ 0.20 3.22							
	86.06		0.10	0.04												
			0.05	0.05												
			0.10													
				0.15												
			0.04	0.04	100.0	10430	15	0.45/ 0.47 0.91		1.45	64.48	6.17	27.90	0.18	9.86	—
			0.08	0.08												
			0.07	0.10												
	87.00		0.04													

GULF CANADA CORPORATION

COAL DIVISION

MOUNT KLAPPAN PROJECT

SEAM DETAIL

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : 1 TOTAL INTERVAL(M) : 82.76 – 91.95 ELEVATION(M) : 1650.5

INTERVAL(M) : 87.00 – 90.34

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	87.00			1.93	85.1	10431	16								
			0.04	0.42											
				(0.48)											
	90.34			0.34											

GULF CANADA CORPORATION

PAGE : 4 / 4

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : 1 TOTAL INTERVAL(M) : 82.76 - 91.95 ELEVATION(M) : 1650.5
INTERVAL(M) : 90.34 - 91.95

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	90.34			0.09 (0.98)					4.69 / 0.04 4.73							
				1.36	95.0	10432	16	4.69 / 0.04 4.73		1.09	16.10	4.44	78.37	0.45	28.58	—
	91.95															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88004
Coal zone:	I		
Field sample no.:	10429	Composite sample no.:	14
True sample thickness:	3.222 meters	Drill core recovery (%):	62.42 %
Coal/Rock:	3.027 / 0.195 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	27.55	20.48	15.27	30.10	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	4.44	2.16			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.61	
Ash (%):	39.19	39.43
Volatile matter (%):	5.89	5.93
Fixed carbon (%):	54.31	54.64
Total sulphur (%):	0.31	0.31
Combustible sulphur (%):	0.01	
Net calorific value (cal/g):	4577.00	4605.00
Gross calorific value (cal/g):	4577.00	4605.00
Volatile matter (dmmf%):	4.70	
Hardgrove index:	63.00	
Specific gravity:	1.59	
Carbon dioxide (%):	0.92	
Phosphorous in coal (%):	0.039	
Chlorine in coal (ppm):	944.00	
Forms of Sulphur (%):	PYRITE 00.01 SULPHATE 00.00 ORGANIC 00.30	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	54.74	55.07
Hydrogen (%):	2.13	2.14
Nitrogen (%):	0.58	0.58
Oxygen (%):	2.44	2.47

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1230.00	1203.00
Softening temperature (°C):	1264.00	1216.00
Hemispherical temperature (°C):	1274.00	1232.00
Final temperature (°C):	1332.00	1295.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	62.17	TiO2 (%):	0.73
Al2O3 (%):	14.37	Na2O (%):	1.58
Fe2O3 (%):	5.46	K2O (%):	1.55
CaO (%):	4.14	SO3 (%):	2.03
MgO (%):	4.02	P2O5 (%):	0.23

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88004
Coal zone:	I		
Field sample no.:	10430	Composite sample no.:	15
True sample thickness:	0.911 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	0.446 / 0.465 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	23.13	27.10	19.30	24.97	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	3.75	1.75			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.45	
Ash (%):	64.48	65.43
Volatile matter (%):	6.17	6.26
Fixed carbon (%):	27.90	28.31
Total sulphur (%):	0.18	0.18
Combustible sulphur (%):	0.05	
Net calorific value (cal/g):	2357.00	2391.00
Gross calorific value (cal/g):	2357.00	2391.00
Volatile matter (dmmf%):	3.30	
Hardgrove index:	80.00	
Specific gravity:	1.75	
Carbon dioxide (%):	0.78	
Phosphorous in coal (%):	0.031	
Chlorine in coal (ppm):	1184.00	
Forms of Sulphur (%):	PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.15	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	28.13	28.54
Hydrogen (%):	1.14	1.16
Nitrogen (%):	0.36	0.37
Oxygen (%):	4.26	4.32

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1269.00	1227.00
Softening temperature (°C):	1322.00	1272.00
Hemispherical temperature (°C):	1372.00	1314.00
Final temperature (°C):	1432.00	1430.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	56.82	TiO2 (%):	0.98
Al2O3 (%):	22.30	Na2O (%):	3.61
Fe2O3 (%):	4.89	K2O (%):	1.11
CaO (%):	1.20	SO3 (%):	0.50
MgO (%):	3.51	P2O5 (%):	0.11

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88004
Coal zone:	I		
Field sample no.:	10431 - 10432	Composite sample no.:	16
True sample thickness:	4.728 meters	Drill core recovery (%):	88.28 %
Coal/Rock:	4.690 / 0.038 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	21.79	13.69	14.59	36.13
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	9.76	4.04		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.09	
Ash (%):	16.10	16.28
Volatile matter (%):	4.44	4.49
Fixed carbon (%):	78.37	79.23
Total sulphur (%):	0.45	0.45
Combustible sulphur (%):	0.30	
Net calorific value (cal/g):	6831.00	6906.00
Gross calorific value (cal/g):	6831.00	6906.00
Volatile matter (dmmf%):	3.70	
Hardgrove index:	53.00	
Specific gravity:	1.48	
Carbon dioxide (%):	0.54	
Phosphorous in coal (%):	0.174	
Chlorine in coal (ppm):	1064.00	

Forms of Sulphur (%): PYRITE 00.01 SULPHATE 00.00 ORGANIC 00.44

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	76.25	77.09
Hydrogen (%):	2.29	2.32
Nitrogen (%):	0.81	0.82
Oxygen (%):	3.01	3.04

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1182.00	1114.00
Softening temperature (°C):	1259.00	1200.00
Hemispherical temperature (°C):	1269.00	1224.00
Final temperature (°C):	1348.00	1343.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	48.52	TiO2 (%):	1.20
Al2O3 (%):	21.93	Na2O (%):	2.13
Fe2O3 (%):	6.72	K2O (%):	1.31
CaO (%):	4.95	SO3 (%):	2.37
MgO (%):	4.33	P2O5 (%):	2.47

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88004

sample id 00014
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1222.0	initial temp.(C)	1198.0
softening temp.(C)	1259.0	softening temp.(C)	1211.0
hemispherical temp.(C)	1269.0	hemispherical temp.(C)	1216.0
fluid temp.(C)	1338.0	fluid temp.(C)	1332.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

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sample id 00014
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.56
aluminium oxide %	(al2o3)	14.74
ferric oxide %	(fe2o3)	8.44
titanium dioxide %	(tio2)	0.98
phosphorous pentoxide %	(p2o5)	0.29
calcium oxide %	(cao)	4.65
magnesium oxide %	(mgo)	5.11
sulphur trioxide %	(so3)	3.60
sodium oxide %	(na2o)	1.21
potassium oxide %	(k2o)	1.18

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88004

sample id 00014
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1137.0	initial temp.(C)	1095.0
softening temp.(C)	1269.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1280.0	hemispherical temp.(C)	1240.0
fluid temp.(C)	1306.0	fluid temp.(C)	1280.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

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sample id 00014
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	56.80
aluminium oxide %	(al2o3)	16.26
ferric oxide %	(fe2o3)	6.89
titanium dioxide %	(tio2)	0.95
phosphorous pentoxide %	(p2o5)	0.31
calcium oxide %	(cao)	4.25
magnesium oxide %	(mgo)	4.77
sulphur trioxide %	(so3)	2.54
sodium oxide %	(na2o)	1.28
potassium oxide %	(k2o)	1.25

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88004

sample id 00015
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1306.0	initial temp.(C)	1266.0
softening temp.(C)	1424.0	softening temp.(C)	1374.0
hemispherical temp.(C)	1448.0	hemispherical temp.(C)	1411.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88004

sample id 00015
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.46
aluminium oxide %	(al2o3)	25.71
ferric oxide %	(fe2o3)	5.41
titanium dioxide %	(tio2)	1.01
phosphorous pentoxide %	(p2o5)	0.21
calcium oxide %	(cao)	1.48
magnesium oxide %	(mgo)	4.10
sulphur trioxide %	(so3)	0.77
sodium oxide %	(na2o)	2.75
potassium oxide %	(k2o)	1.20

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88004

sample id 00015
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1164.0	initial temp.(C)	1116.0
softening temp.(C)	1472.0	softening temp.(C)	1422.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1438.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88004

sample id 00015
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.68
aluminium oxide %	(al2o3)	26.46
ferric oxide %	(fe2o3)	5.21
titanium dioxide %	(tio2)	1.20
phosphorous pentoxide %	(p2o5)	0.15
calcium oxide %	(cao)	1.40
magnesium oxide %	(mgo)	4.03
sulphur trioxide %	(so3)	0.61
sodium oxide %	(na2o)	2.59
potassium oxide %	(k2o)	1.17

90.0 <= total <= 100.0

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sample id 00016
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1151.0	initial temp.(C)	1116.0
softening temp.(C)	1280.0	softening temp.(C)	1243.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1251.0
fluid temp.(C)	1330.0	fluid temp.(C)	1285.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88004

sample id 00016
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	52.58
aluminium oxide %	(al2o3)	20.41
ferric oxide %	(fe2o3)	6.26
titanium dioxide %	(tio2)	1.01
phosphorous pentoxide %	(p2o5)	1.86
calcium oxide %	(cao)	5.37
magnesium oxide %	(mgo)	4.89
sulphur trioxide %	(so3)	2.77
sodium oxide %	(na2o)	1.51
potassium oxide %	(k2o)	1.07

90.0 <= total <= 100.0

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sample id 00016
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1269.0	initial temp.(C)	1203.0
softening temp.(C)	1311.0	softening temp.(C)	1280.0
hemispherical temp.(C)	1335.0	hemispherical temp.(C)	1285.0
fluid temp.(C)	1374.0	fluid temp.(C)	1332.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88004

sample id 00016
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	53.92
aluminium oxide %	(al2o3)	21.93
ferric oxide %	(fe2o3)	5.75
titanium dioxide %	(tio2)	0.98
phosphorous pentoxide %	(p2o5)	1.48
calcium oxide %	(cao)	4.59
magnesium oxide %	(mgo)	4.67
sulphur trioxide %	(so3)	2.42
sodium oxide %	(na2o)	1.38
potassium oxide %	(k2o)	1.08

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88004 SEAM : H INTERVAL(M) : 138.00 – 143.07 ELEVATION(M) : 1650.5

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	138.00														
				1.08	100.0	10435	17	1.63 / 0.15 1.78	1.63 / 0.15 1.78	0.69	34.46	5.38	59.47	0.54	21.41
			0.14												
				0.53											
	140.10		(0.19)												
			0.11												
				0.48	81.9	10436	18	0.57 / 0.46 1.02		0.74	57.88	6.04	35.36	—	11.88
			0.09												
				0.05											
	141.27		0.07												
				1.12	100.0	10437	19	1.49 / 0.04 1.54	1.49 / 0.04 1.54	1.05	25.76	4.51	68.68	0.37	24.56
				0.37											
	143.07														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88004
Coal zone:	H		
Field sample no.:	10435	Composite sample no.:	17
True sample thickness:	1.781 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	1.627 / 0.154 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	31.87	24.53	16.06	23.57
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	2.68	1.29		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.69	
Ash (%):	34.46	34.70
Volatile matter (%):	5.38	5.42
Fixed carbon (%):	59.47	59.88
Total sulphur (%):	0.54	0.54
Combustible sulphur (%):	0.01	
Net calorific value (cal/g):	5117.00	5152.00
Gross calorific value (cal/g):	5117.00	5152.00
Volatile matter (dmmf%):	3.90	
Hardgrove index:	50.00	
Specific gravity:	1.54	
Carbon dioxide (%):	0.71	
Phosphorous in coal (%):	0.083	
Chlorine in coal (ppm):	1544.00	

Forms of Sulphur (%): PYRITE 00.33 SULPHATE 00.00 ORGANIC 00.21

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	58.97	59.38
Hydrogen (%):	2.03	2.04
Nitrogen (%):	0.63	0.63
Oxygen (%):	2.68	2.71

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1216.00	1169.00
Softening temperature (°C):	1285.00	1216.00
Hemispherical temperature (°C):	1306.00	1232.00
Final temperature (°C):	1330.00	1282.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	54.84	TiO2 (%):	0.98
Al2O3 (%):	14.74	Na2O (%):	1.68
Fe2O3 (%):	6.46	K2O (%):	0.76
CaO (%):	6.49	SO3 (%):	3.86
MgO (%):	4.87	P2O5 (%):	0.55

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88004
Coal zone:	H		
Field sample no.:	10437	Composite sample no.:	19
True sample thickness:	1.535 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	1.493 / 0.042 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	22.39	17.71	16.11	34.67	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	6.04	3.08			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.05	
Ash (%):	25.76	26.03
Volatile matter (%):	4.51	4.56
Fixed carbon (%):	68.68	69.41
Total sulphur (%):	0.37	0.37
Combustible sulphur (%):	0.01	
Net calorific value (cal/g):	5870.00	5932.00
Gross calorific value (cal/g):	5870.00	5932.00
Volatile matter (dmmf%):	3.30	
Hardgrove index:	58.00	
Specific gravity:	1.51	
Carbon dioxide (%):	0.59	
Phosphorous in coal (%):	0.171	
Chlorine in coal (ppm):	632.00	
Forms of Sulphur (%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.35	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	67.08	67.79
Hydrogen (%):	2.04	2.06
Nitrogen (%):	1.02	1.03
Oxygen (%):	2.68	2.72

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1180.00	1137.00
Softening temperature (°C):	1248.00	1200.00
Hemispherical temperature (°C):	1256.00	1222.00
Final temperature (°C):	1293.00	1269.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	51.18	TiO2 (%):	1.43
Al2O3 (%):	17.39	Na2O (%):	2.12
Fe2O3 (%):	4.58	K2O (%):	1.02
CaO (%):	7.89	SO3 (%):	3.48
MgO (%):	4.42	P2O5 (%):	1.52

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88004

sample id 00017
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AF3 | date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1259.0	initial temp.(C)	1240.0
softening temp.(C)	1285.0	softening temp.(C)	1264.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1269.0
fluid temp.(C)	1338.0	fluid temp.(C)	1303.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88004

sample id 00017
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AM3 | date analysed 31/07/88

silicon dioxide %	(sio2)	52.96
aluminium oxide %	(al2o3)	18.90
ferric oxide %	(fe2o3)	5.66
titanium dioxide %	(tio2)	0.82
phosphorous pentoxide %	(p2o5)	0.78
calcium oxide %	(cao)	5.37
magnesium oxide %	(mgo)	5.03
sulphur trioxide %	(so3)	3.03
sodium oxide %	(na2o)	1.68
potassium oxide %	(k2o)	1.03

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88004

sample id 00017
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1272.0	initial temp.(C)	1251.0
softening temp.(C)	1295.0	softening temp.(C)	1274.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1290.0
fluid temp.(C)	1348.0	fluid temp.(C)	1343.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88004

sample id 00017
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	53.06
aluminium oxide %	(al2o3)	20.41
ferric oxide %	(fe2o3)	5.49
titanium dioxide %	(tio2)	0.66
phosphorous pentoxide %	(p2o5)	0.74
calcium oxide %	(cao)	4.70
magnesium oxide %	(mgo)	4.66
sulphur trioxide %	(so3)	2.35
sodium oxide %	(na2o)	1.77
potassium oxide %	(k2o)	1.21

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88004

sample id 00019
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1222.0	initial temp.(C)	1216.0
softening temp.(C)	1285.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1293.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1338.0	fluid temp.(C)	1306.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88004

sample id 00019
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	51.96
aluminium oxide %	(al2o3)	17.77
ferric oxide %	(fe2o3)	5.63
titanium dioxide %	(tio2)	1.41
phosphorous pentoxide %	(p2o5)	2.48
calcium oxide %	(cao)	6.55
magnesium oxide %	(mgo)	3.87
sulphur trioxide %	(so3)	3.29
sodium oxide %	(na2o)	1.64
potassium oxide %	(k2o)	0.65

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88004

sample id 00019
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1238.0	initial temp.(C)	1235.0
softening temp.(C)	1298.0	softening temp.(C)	1261.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1272.0
fluid temp.(C)	1345.0	fluid temp.(C)	1322.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88004

sample id 00019
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	51.64
aluminium oxide %	(al2o3)	20.41
ferric oxide %	(fe2o3)	5.35
titanium dioxide %	(tio2)	1.80
phosphorous pentoxide %	(p2o5)	2.37
calcium oxide %	(cao)	5.40
magnesium oxide %	(mgo)	3.61
sulphur trioxide %	(so3)	2.25
sodium oxide %	(na2o)	1.56
potassium oxide %	(k2o)	0.72

90.0 <= total <= 100.0

KPNLRDDH88005

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88005 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/16/88
END DATE - 06/19/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - ETMANSKI
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - AQUIFER = 135.62. INTERSECTED SEAMS ; K/L,K,J,I.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1682.69
ZONE - 9
NORTHING - 6342794.52
EASTING - 505390.09

LICENCE/LEASE NUMBER - 7148

LATITUDE - 571348
LONGITUDE - 1285439

- O R I E N T A T I O N -

LENGTH - 141.00
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH(M) - 15.24
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

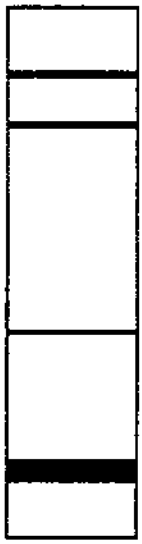
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-005

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
K/L	0.97 m
K	1.03 m
J	0.75 m
I	5.65 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88005										
		4367	36.19	36.32	100.00		0.115			0.000- 0.115
	K/L ROOF	4370	16.57	16.82	100.00		0.168			0.000- 0.168
	K/L	4371	16.82	18.17	60.00	0.450	0.134	0.383		0.833- 0.134
	K/L FLOOR	4372	18.17	18.57	100.00		0.307			0.000- 0.307
	K ROOF	4373	29.98	30.58	100.00		0.500			0.000- 0.500
	K	4374	30.58	31.80	86.89	0.892		0.134		1.026- 0.000
	K PARTING	4375	31.80	32.18	100.00		0.330			0.000- 0.330
	J ROOF	4376	85.14	85.46	100.00		0.289			0.000- 0.289
	J	4377	85.46	86.30	55.95	0.422		0.332		0.754- 0.000
	J FLOOR	4378	86.30	86.46	100.00		0.143			0.000- 0.143
	I ROOF	4379	119.27	119.62	100.00		0.325			0.000- 0.325
	I	4380	119.62	120.20	70.69	0.380		0.157		0.537- 0.000
	I	4381	120.20	121.07	100.00	0.120	0.683			0.120- 0.683
	I	4382	121.07	122.05	79.59	0.718		0.184		0.902- 0.000
	I	4383	122.05	124.11	100.00	1.575	0.311			1.575- 0.311
	I	4384	124.11	126.66	99.61	2.309		0.009		2.318- 0.000
	I FLOOR	4385	126.66	127.41	100.00		0.678			0.000- 0.678

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88005												
	K/L	20	4371	4371	16.82	18.17	60.00	0.62	0.19	0.54	0.00	1.16- 0.19
	K	21	4374	4374	30.58	31.80	86.88	1.06	0.00	0.16	0.00	1.22- 0.00
	J	22	4377	4377	85.46	86.30	55.95	0.47	0.00	0.37	0.00	0.84- 0.00
	I	23	4380	4380	119.62	120.20	70.68	0.41	0.00	0.17	0.00	0.58- 0.00
	I	24	4381	4381	120.20	121.07	100.00	0.13	0.74	0.00	0.00	0.13- 0.74
	I	25	4382	4383	121.07	124.11	93.42	2.50	0.34	0.20	0.00	2.70- 0.34
	I	26	4384	4384	124.11	126.66	99.60	2.54	0.00	0.01	0.00	2.55- 0.00
	K/L	212	4371	4371	16.82	18.17	60.00	0.62	0.19	0.54	0.00	1.16- 0.19
	K	213	4374	4374	30.58	31.80	86.88	1.06	0.00	0.16	0.00	1.22- 0.00
	J	214	4377	4377	85.46	86.30	55.95	0.47	0.00	0.37	0.00	0.84- 0.00
	I	215	4380	4383	119.62	124.11	89.77	2.91	0.34	0.37	0.00	3.28- 0.34
	I	216	4384	4384	124.11	126.66	99.60	2.54	0.00	0.01	0.00	2.55- 0.00
	K/L	308	4371	4371	16.82	18.17	60.00	0.62	0.19	0.54	0.00	1.16- 0.19
	K	309	4374	4374	30.58	31.80	86.88	1.06	0.00	0.16	0.00	1.22- 0.00
	J	310	4377	4377	85.46	86.30	55.95	0.47	0.00	0.37	0.00	0.84- 0.00
	I	311	4380	4384	119.62	126.66	93.84	5.45	0.34	0.38	0.00	5.83- 0.34

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88005 SEAM : K/L INTERVAL(M) : 16.82 – 18.17 ELEVATION(M) : 1682.7

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	16.82			0.08												
				(0.24)												
			0.87													
				(0.09)												
				0.37	60.4	4371	20	0.83/ 0.13		0.84	55.30	5.49	38.37	0.61	12.87	—
								0.97								
	18.17			(0.08)												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88005
Coal zone:	K/L		
Field sample no.:	04371	Composite sample no.:	20
True sample thickness:	0.967 meters	Drill core recovery (%):	60.00 %
Coal/Rock:	0.833 / 0.134 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	26.90	24.05	17.11	24.80	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	4.67	2.47			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.84	
Ash (%):	55.30	55.77
Volatile matter (%):	5.49	5.54
Fixed carbon (%):	38.37	38.69
Total sulphur (%):	0.61	0.62
Combustible sulphur (%):	0.34	
Net calorific value (cal/g):	3076.00	3102.00
Gross calorific value (cal/g):	3076.00	3102.00
Volatile matter (dmmf%):	2.20	
Hardgrove index:	63.00	
Specific gravity:	1.68	
Carbon dioxide (%):	0.43	
Phosphorous in coal (%):	0.268	
Chlorine in coal (ppm):	1544.00	
Forms of Sulphur (%):	PYRITE 00.43 SULPHATE 00.00 ORGANIC 00.18	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	36.94	37.25
Hydrogen (%):	1.77	1.79
Nitrogen (%):	0.62	0.63
Oxygen (%):	3.92	3.94

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1180.00	1159.00
Softening temperature (°C):	1311.00	1216.00
Hemispherical temperature (°C):	1327.00	1232.00
Final temperature (°C):	1372.00	1285.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	59.94	TiO2 (%):	1.05
Al2O3 (%):	17.01	Na2O (%):	1.14
Fe2O3 (%):	7.55	K2O (%):	1.35
CaO (%):	2.18	SO3 (%):	1.21
MgO (%):	2.58	P2O5 (%):	1.11

qcri coal division ash fusion proj KPN BLK LR DS DDH88005

sample id 00020
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1116.0	initial temp.(C)	1101.0
softening temp.(C)	1317.0	softening temp.(C)	1224.0
hemispherical temp.(C)	1338.0	hemispherical temp.(C)	1243.0
fluid temp.(C)	1369.0	fluid temp.(C)	1338.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88005

sample id 00020
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	50.66
aluminium oxide %	(al2o3)	21.17
ferric oxide %	(fe2o3)	9.27
titanium dioxide %	(tio2)	1.73
phosphorous pentoxide %	(p2o5)	1.72
calcium oxide %	(cao)	3.50
magnesium oxide %	(mgo)	3.37
sulphur trioxide %	(so3)	1.02
sodium oxide %	(na2o)	1.45
potassium oxide %	(k2o)	1.16

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88005

sample id 00020
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1227.0	initial temp.(C)	1177.0
softening temp.(C)	1295.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1314.0	hemispherical temp.(C)	1240.0
fluid temp.(C)	1356.0	fluid temp.(C)	1314.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88005

sample id 00020
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	49.06
aluminium oxide %	(al2o3)	20.04
ferric oxide %	(fe2o3)	9.61
titanium dioxide %	(tio2)	1.45
phosphorous pentoxide %	(p2o5)	2.07
calcium oxide %	(cao)	4.37
magnesium oxide %	(mgo)	3.55
sulphur trioxide %	(so3)	2.36
sodium oxide %	(na2o)	1.52
potassium oxide %	(k2o)	0.99

90.0 <= total <= 100.0

GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88005 SEAM : K INTERVAL(M) : 30.58 – 32.18 ELEVATION(M) : 1682.7

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	30.58			(0.13)											
				0.89	86.9	4374	21	1.03/0.00 1.03	1.03/0.00 1.03	0.92	24.34	5.60	69.14	0.81	26.01
	31.80		0.28		100.0	4375									
	32.18														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88005
Coal zone:	K		
Field sample no.:	04374	Composite sample no.:	21
True sample thickness:	1.026 meters	Drill core recovery (%):	86.88 %
Coal/Rock:	1.026 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	13.49	21.44	18.51	34.25
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	8.12	4.19		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.92	
Ash (%):	24.34	24.57
Volatile matter (%):	5.60	5.65
Fixed carbon (%):	69.14	69.78
Total sulphur (%):	0.61	0.62
Combustible sulphur (%):	0.38	
Net calorific value (cal/g):	6215.00	6273.00
Gross calorific value (cal/g):	6216.00	6274.00
Volatile matter (dmmf%):	4.80	
Hardgrove index:	59.00	
Specific gravity:	1.49	
Carbon dioxide (%):	0.41	
Phosphorous in coal (%):	0.369	
Chlorine in coal (ppm):	1104.00	

Forms of Sulphur (%): PYRITE 00.33 SULPHATE 00.00 ORGANIC 00.28

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	67.65	68.28
Hydrogen (%):	2.48	2.50
Nitrogen (%):	0.66	0.67
Oxygen (%):	3.34	3.36

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1211.00	1130.00
Softening temperature (°C):	1269.00	1195.00
Hemispherical temperature (°C):	1280.00	1206.00
Final temperature (°C):	1317.00	1264.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	44.16	TiO2 (%):	1.25
Al2O3 (%):	20.76	Na2O (%):	1.95
Fe2O3 (%):	10.27	K2O (%):	1.11
CaO (%):	6.58	SO3 (%):	2.38
MgO (%):	3.16	P2O5 (%):	3.47

gcri coal division ash fusion proj KPN BLK LR DS DDH88005

,ample id 00021
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1153.0	initial temp.(C)	1116.0
softening temp.(C)	1306.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1327.0	hemispherical temp.(C)	1259.0
fluid temp.(C)	1385.0	fluid temp.(C)	1381.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88005

sample id 00021
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	53.12
aluminium oxide %	(al2o3)	21.17
ferric oxide %	(fe2o3)	7.12
titanium dioxide %	(tio2)	1.52
phosphorous pentoxide %	(p2o5)	1.88
calcium oxide %	(cao)	3.83
magnesium oxide %	(mgo)	2.98
sulphur trioxide %	(so3)	1.43
sodium oxide %	(na2o)	1.83
potassium oxide %	(k2o)	0.96

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88005

sample id 00021
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1111.0	initial temp.(C)	1098.0
softening temp.(C)	1390.0	softening temp.(C)	1314.0
hemispherical temp.(C)	1419.0	hemispherical temp.(C)	1358.0
fluid temp.(C)	1446.0	fluid temp.(C)	1444.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88005

sample id 00021
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	50.90
aluminium oxide %	(al2o3)	24.57
ferric oxide %	(fe2o3)	7.81
titanium dioxide %	(tio2)	1.52
phosphorous pentoxide %	(p2o5)	1.56
calcium oxide %	(cao)	3.44
magnesium oxide %	(mgo)	3.18
sulphur trioxide %	(so3)	1.15
sodium oxide %	(na2o)	1.79
potassium oxide %	(k2o)	0.80

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR 00H88005 SEAM : J INTERVAL(M) : 85.46 – 86.30 ELEVATION(M) : 1682.7

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	85.46			(0.19)											
				0.42	56.0	4377	22	0.75 / 0.00 0.75	0.75 / 0.00 0.75	1.01	22.63	5.37	70.99	—	25.12
	86.30			(0.14)											

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88005 SEAM : 1 INTERVAL(M) : 119.62 – 126.66 ELEVATION(M) : 1682.7

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 30/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	119.62			(0.07)												
				0.38	70.8	4380	23	0.54 / 0.00	0.54 / 0.00	0.77	20.05	7.72	71.46	—	26.37	—
	120.20			(0.09)				0.54	0.54							
			0.55		100.0	4381	24	0.12 / 0.68		0.87	89.41	6.36	3.36	—	0.89	—
			0.08					0.80								
	121.07			0.72												
				(0.10)	78.6	4382										
				0.12												
	122.05			(0.06)												
			0.15													
				1.58	100.0	4383	25	2.48 / 0.31		1.56	25.22	5.61	67.61	0.41	24.66	—
								2.79								
			0.16						4.79 / 0.31							
	124.11								5.11							
				2.32	100.0	4384	26	2.32 / 0.00		1.15	11.89	4.30	82.66	0.48	30.45	—
								2.32								
	126.66															

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88005
Coal zone:	I		
Field sample no.:	04382 - 04383	Composite sample no.:	25
True sample thickness:	2.788 meters	Drill core recovery (%):	93.42 %
Coal/Rock:	2.477 / 0.311 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	11.53	16.04	16.55	43.68
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	7.46	4.74		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.56	
Ash (%):	25.22	25.62
Volatile matter (%):	5.61	5.70
Fixed carbon (%):	67.61	68.68
Total sulphur (%):	0.41	0.42
Combustible sulphur (%):	0.11	
Net calorific value (cal/g):	5894.00	5987.00
Gross calorific value (cal/g):	5894.00	5987.00
Volatile matter (dmmf%):	4.90	
Hardgrove index:	60.00	
Specific gravity:	1.51	
Carbon dioxide (%):	0.61	
Phosphorous in coal (%):	0.098	
Chlorine in coal (ppm):	2544.00	

Forms of Sulphur (%): PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.38

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	66.31	67.36
Hydrogen (%):	2.08	2.11
Nitrogen (%):	0.89	0.90
Oxygen (%):	3.33	3.59

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1227.00	1159.00
Softening temperature (°C):	1274.00	1216.00
Hemispherical temperature (°C):	1285.00	1232.00
Final temperature (°C):	1340.00	1288.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	52.34	TiO2 (%):	1.13
Al2O3 (%):	17.77	Na2O (%):	1.60
Fe2O3 (%):	8.35	K2O (%):	0.82
CaO (%):	4.59	SO3 (%):	2.93
MgO (%):	4.86	P2O5 (%):	0.89

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88005
Coal zone:	I		
Field sample no.:	04384	Composite sample no.:	26
True sample thickness:	2.318 meters	Drill core recovery(%):	99.60 %
Coal/Rock:	2.318 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight(%):	3.44	6.25	20.79	57.73	
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight(%):	7.51	4.28			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.15	
Ash(%):	11.89	12.03
Volatile matter(%):	4.30	4.35
Fixed carbon(%):	82.66	83.62
Total sulphur(%):	0.48	0.49
Combustible sulphur(%):	0.31	
Net calorific value(cal/g):	7277.00	7361.00
Gross calorific value(cal/g):	7278.00	7362.00
Volatile matter(dmmf%):	3.70	
Hardgrove index:	50.00	
Specific gravity:	1.43	
Carbon dioxide(%):	0.47	
Phosphorous in coal(%):	0.259	
Chlorine in coal(ppm):	2064.00	
Forms of Sulphur(%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.46	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	81.13	82.07
Hydrogen(%):	2.35	2.38
Nitrogen(%):	0.74	0.75
Oxygen(%):	2.26	2.28

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1195.00	1174.00
Softening temperature(°C):	1253.00	1206.00
Hemispherical temperature(°C):	1259.00	1224.00
Final temperature(°C):	1277.00	1248.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	45.44	TiO2(%):	1.21
Al2O3(%):	19.28	Na2O(%):	1.54
Fe2O3(%):	5.89	K2O(%):	0.87
CaO(%):	8.26	SO3(%):	3.56
MgO(%):	4.18	P2O5(%):	4.99

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88005

sample id 00025
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AF3 | date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1211.0	1111.0
softening temp.(C)	1309.0	1274.0
hemispherical temp.(C)	1330.0	1311.0
fluid temp.(C)	1409.0	1372.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88005

sample id 00025
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AM3 | date analysed 31/07/88

silicon dioxide %	(sio2)	56.98
aluminium oxide %	(al2o3)	21.93
ferric oxide %	(fe2o3)	4.89
titanium dioxide %	(tio2)	0.80
phosphorous pentoxide %	(p2o5)	1.72
calcium oxide %	(cao)	4.25
magnesium oxide %	(mgo)	3.33
sulphur trioxide %	(so3)	1.85
sodium oxide %	(na2o)	1.68
potassium oxide %	(k2o)	0.70

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88005

sample id 00025
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1238.0	initial temp.(C)	1212.0
softening temp.(C)	1338.0	softening temp.(C)	1261.0
hemispherical temp.(C)	1364.0	hemispherical temp.(C)	1288.0
fluid temp.(C)	1440.0	fluid temp.(C)	1374.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88005

sample id 00025
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	53.46
aluminium oxide %	(al2o3)	23.82
ferric oxide %	(fe2o3)	4.78
titanium dioxide %	(tio2)	1.13
phosphorous pentoxide %	(p2o5)	1.66
calcium oxide %	(cao)	3.53
magnesium oxide %	(mgo)	3.18
sulphur trioxide %	(so3)	1.43
sodium oxide %	(na2o)	1.52
potassium oxide %	(k2o)	0.64

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88005

sample id 00026
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1165.0	initial temp.(C)	1153.0
softening temp.(C)	1274.0	softening temp.(C)	1238.0
hemispherical temp.(C)	1277.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1290.0	fluid temp.(C)	1282.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88005

sample id 00026
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	38.50
aluminium oxide %	(al2o3)	19.66
ferric oxide %	(fe2o3)	4.92
titanium dioxide %	(tio2)	1.14
phosphorous pentoxide %	(p2o5)	7.33
calcium oxide %	(cao)	12.48
magnesium oxide %	(mgo)	4.61
sulphur trioxide %	(so3)	4.55
sodium oxide %	(na2o)	1.39
potassium oxide %	(k2o)	0.79

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88005

sample id 00026
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1256.0	initial temp.(C)	1248.0
softening temp.(C)	1285.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1261.0
fluid temp.(C)	1301.0	fluid temp.(C)	1274.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88005

sample id 00026
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	38.82
aluminium oxide %	(al2o3)	20.04
ferric oxide %	(fe2o3)	5.35
titanium dioxide %	(tio2)	1.13
phosphorous pentoxide %	(p2o5)	7.13
calcium oxide %	(cao)	12.09
magnesium oxide %	(mgo)	4.64
sulphur trioxide %	(so3)	4.01
sodium oxide %	(na2o)	1.31
potassium oxide %	(k2o)	0.76

90.0 <= total <= 100.0

KPNLRDDH88006

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88006 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/16/88
END DATE - 06/18/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MATTHEWS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED SEAMS; K(OVT), ?(OVT), K/L(OVT).

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1697.40
ZONE - 9
NORTHING - 6343788.69
EASTING - 506730.92

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571421
LONGITUDE - 1285319

- O R I E N T A T I O N -

LENGTH - 254.61
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

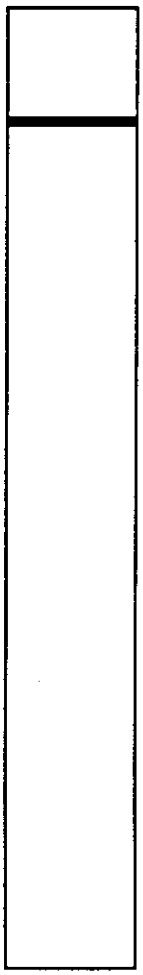
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-006

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
K ovt.	2.11 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88006										
		4398	53.23	53.30	100.00		0.015			0.000- 0.015
		4399	72.45	72.47	100.00		0.004			0.000- 0.004
	K OVT ROOF	8101	28.59	28.85	100.00		0.047			0.000- 0.047
	K OVT	8102	28.85	33.18	38.11	0.393	0.013	0.592	0.024	0.985- 0.037
	K OVT	8103	33.18	33.56	100.00		0.111			0.000- 0.111
	K OVT	8104	33.56	36.52	52.36	0.502		0.477		0.979- 0.000
	K OVT FLOOR	8105	36.52	36.82	100.00		0.110			0.000- 0.110
	K/L? OVT RF	8106	217.50	219.00	100.00		0.330			0.000- 0.330
	K/L? OVT	8107	219.00	221.02	83.66	0.398	0.018	0.077		0.475- 0.018
	K/L? OVT FL	8108	221.02	221.38	100.00		0.093			0.000- 0.093
	? OVT	99999	126.75	128.00	40.80	0.230		0.335		0.565- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88006												
	K OVT	27	8102	8102	28.85	33.18	38.10	1.59	0.06	2.57	0.11	4.16- 0.17
	K OVT	28	8103	8103	33.18	33.56	100.00	0.00	0.38	0.00	0.00	0.00- 0.38
	K OVT	29	8104	8104	33.56	36.52	52.36	1.55	0.00	1.41	0.00	2.96- 0.00
	K/L? OVT	30	8107	8107	219.00	221.02	83.66	1.62	0.07	0.33	0.00	1.95- 0.07
	K/L? OVT	312	8107	8107	219.00	221.02	83.66	1.62	0.07	0.33	0.00	1.95- 0.07

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — TRUE THICKNESS

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88006 SEAM : K OVT INTERVAL(M) : 28.85 – 36.52 ELEVATION(M) : 1697.4

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	28.85			(0.15)												
				(0.31)	39.7	8102	27	0.99/ 0.04		1.15	40.80	7.79	50.26	—	18.51	—
				0.30				1.02								
	33.18			(0.14)												
	33.56				100.0	8103	28	0.00/ 0.11	1.96 / 0.15	1.01	78.71	11.78	8.50	—	4.06	—
				0.27				0.11	2.11							
				(0.31)	51.3	8104	29	0.98/ 0.00		1.00	39.02	10.81	49.17	—	18.61	—
				0.23				0.98								
	36.52			(0.17)												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88006 SEAM : ? OVT INTERVAL(M) : 126.75 – 128.00 ELEVATION(M) : 1697.4

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	126.75			0.16												
				(0.34)	40.7	99999		0.57 / 0.00		—	—	—	—	—	—	—
	128.00			0.13				0.57								

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88006 SEAM : K/L? OVT INTERVAL(M) : 219.00 – 221.02 ELEVATION(M) : 1697.4

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	219.00			(0.09)												
				0.33	82.8	8107	30	0.48/0.02		1.02	47.72	6.90	44.36	3.75	16.66	—
	221.02		0.03					0.49								

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88006
Coal zone:	K/L? OVT		
Field sample no.:	08107	Composite sample no.:	30
True sample thickness:	0.493 meters	Drill core recovery (%):	83.66 %
Coal/Rock:	0.475 / 0.018 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	23.92	20.16	17.28	30.43	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	6.29	1.92			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.02	
Ash (%):	47.72	48.21
Volatile matter (%):	6.90	6.97
Fixed carbon (%):	44.36	44.82
Total sulphur (%):	3.75	3.79
Combustible sulphur (%):	3.08	
Net calorific value (cal/g):	3982.00	4023.00
Gross calorific value (cal/g):	3982.00	4023.00
Volatile matter (dmmf%):	3.50	
Hardgrove index:	73.00	
Specific gravity:	1.65	
Carbon dioxide (%):	0.24	
Phosphorous in coal (%):	0.038	
Chlorine in coal (ppm):	208.00	
Forms of Sulphur (%):	PYRITE 03.43 SULPHATE 00.06 ORGANIC 00.26	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	43.48	43.93
Hydrogen (%):	1.59	1.61
Nitrogen (%):	0.43	0.43
Oxygen (%):	2.01	2.03

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1166.00	1066.00
Softening temperature (°C):	1285.00	1151.00
Hemispherical temperature (°C):	1293.00	1169.00
Final temperature (°C):	1343.00	1256.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	55.56	TiO2 (%):	0.83
Al2O3 (%):	17.10	Na2O (%):	1.13
Fe2O3 (%):	13.70	K2O (%):	1.86
CaO (%):	3.48	SO3 (%):	3.51
MgO (%):	2.32	P2O5 (%):	0.18

gcri coal division ash fusion proj KPN BLK LR DS DDH88006

sample id 00030
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1195.0	initial temp.(C)	1090.0
softening temp.(C)	1440.0	softening temp.(C)	1338.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1374.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88006

sample id 00030
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	54.77
aluminium oxide %	(al2o3)	25.12
ferric oxide %	(fe2o3)	10.30
titanium dioxide %	(tio2)	1.14
phosphorous pentoxide %	(p2o5)	0.17
calcium oxide %	(cao)	1.32
magnesium oxide %	(mgo)	1.63
sulphur trioxide %	(so3)	1.08
sodium oxide %	(na2o)	1.27
potassium oxide %	(k2o)	1.76

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88006

sample id 00030
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1274.0	initial temp.(C)	1140.0
softening temp.(C)	1472.0	softening temp.(C)	1411.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1432.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88006

sample id 00030
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.29
aluminium oxide %	(al2o3)	26.72
ferric oxide %	(fe2o3)	8.41
titanium dioxide %	(tio2)	0.99
phosphorous pentoxide %	(p2o5)	0.17
calcium oxide %	(cao)	1.44
magnesium oxide %	(mgo)	2.04
sulphur trioxide %	(so3)	1.20
sodium oxide %	(na2o)	1.08
potassium oxide %	(k2o)	1.69

90.0 <= total <= 100.0

KPNLRDDH88007

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88007 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/16/88
END DATE - 06/20/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - WALLACE
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - HOLE WAS TD'ED BECAUSE AN ARTESION AQUIFER WAS INT
ERSECTED. SEAMS INTERSECTED: I?(OVT), H?, ?, PH?,
G?.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1689.54
ZONE - 9
NORTHING - 6342733.98
EASTING - 505143.30

LICENCE/LEASE NUMBER - 7148

LATITUDE - 571347
LONGITUDE - 1285453

- O R I E N T A T I O N -

LENGTH - 188.45
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

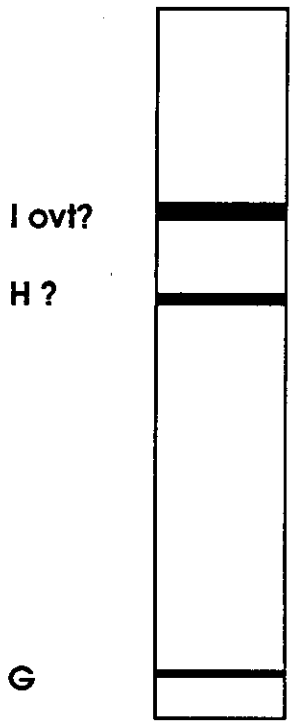
CASING DEPTH(M) - 4.57
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-007



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88007										
	I? OVT FLOOR	4389	50.90	51.16	100.00		0.089			0.000- 0.089
	I? OVT	4390	51.16	53.36	100.00	0.717	0.149			0.717- 0.149
	I? OVT	4391	53.36	54.71	100.00		0.698			0.000- 0.698
	I? OVT	4392	54.71	59.19	92.41	2.655	0.201	0.263		2.918- 0.201
	I? OVT ROOF	4393	59.19	59.45	100.00		0.214			0.000- 0.214
	G? ROOF	4394	175.28	175.55	100.00		0.261			0.000- 0.261
	G?	4395	175.55	176.97	92.25	1.263		0.106		1.369- 0.000
	G? FLOOR	4396	176.97	178.24	100.00		1.216			0.000- 1.216
	PH?	99998	75.72	147.87	71.74	0.515	1.525	0.225	0.582	0.740- 2.107
	?	99999	85.79	86.12	60.61	0.181		0.119		0.300- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88007												
	I? OVT	31	4390	4390	51.16	53.36	100.00	1.80	0.40	0.00	0.00	1.80- 0.40
	I? OVT	32	4391	4391	53.36	54.71	100.00	0.00	1.35	0.00	0.00	0.00- 1.35
	I? OVT	33	4392	4392	54.71	59.19	92.41	3.87	0.27	0.34	0.00	4.21- 0.27
	G?	34	4395	4395	175.55	176.97	92.25	1.31	0.00	0.11	0.00	1.42- 0.00
	I? OVT	217	4392	4392	54.71	59.19	92.41	3.87	0.27	0.34	0.00	4.21- 0.27
	G?	218	4395	4395	175.55	176.97	92.25	1.31	0.00	0.11	0.00	1.42- 0.00
	I? OVT	313	4390	4392	51.16	59.19	94.91	5.67	0.67	0.34	0.00	6.01- 0.67
	G?	314	4395	4395	175.55	176.97	92.25	1.31	0.00	0.11	0.00	1.42- 0.00

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88007 SEAM : I ? OVT INTERVAL(M) : 51.16 - 59.19 ELEVATION(M) : 1689.5

GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	51.16			0.14												
			0.08													
				0.18												
			0.07		100.0	4390	31	0.72 / 0.15	0.72 / 0.15	1.35	44.50	6.26	47.89	1.13	17.68	—
				0.39				0.87	0.87							
	53.36		0.54		100.0	4391	32	0.00/ 0.70		0.76	90.56	5.41	3.27	0.28	1.31	—
			0.15					0.70								
	54.71			0.66												
				1.58	91.6	4392	33	2.92 / 0.20	2.92 / 0.20	1.88	31.89	7.00	59.23	0.68	22.13	—
								3.12	3.12							
				(0.26)												
			0.16													
				0.42												
	59.19															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88007
Coal zone:	I? OVT		
Field sample no.:	04390	Composite sample no.:	31
True sample thickness:	0.866 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	0.717 / 0.149 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	8.98	13.16	15.98	44.17
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	12.54	5.17		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.35	
Ash (%):	44.50	45.11
Volatile matter (%):	6.26	6.35
Fixed carbon (%):	47.89	48.54
Total sulphur (%):	1.13	1.15
Combustible sulphur (%):	0.72	
Net calorific value (cal/g):	4228.00	4286.00
Gross calorific value (cal/g):	4228.00	4286.00
Volatile matter (dmmf%):	4.50	
Hardgrove index:	76.00	
Specific gravity:	1.62	
Carbon dioxide (%):	0.29	
Phosphorous in coal (%):	0.567	
Chlorine in coal (ppm):	200.00	

Forms of Sulphur (%): PYRITE 00.83 SULPHATE 00.00 ORGANIC 00.30

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	47.36	48.01
Hydrogen (%):	1.80	1.82
Nitrogen (%):	0.68	0.69
Oxygen (%):	3.18	3.22

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1182.00	1151.00
Softening temperature (°C):	1259.00	1164.00
Hemispherical temperature (°C):	1269.00	1169.00
Final temperature (°C):	1322.00	1232.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	53.43	TiO2 (%):	0.94
Al2O3 (%):	16.75	Na2O (%):	1.04
Fe2O3 (%):	9.00	K2O (%):	1.93
CaO (%):	6.85	SO3 (%):	2.28
MgO (%):	3.63	P2O5 (%):	2.92

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88007
Coal zone:	I? OVT		
Field sample no.:	04391	Composite sample no.:	32
True sample thickness:	0.698 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	0.000 / 0.698 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	39.22	20.95	17.59	18.59
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	2.63	1.02		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.76	
Ash (%):	90.56	91.26
Volatile matter (%):	5.41	5.45
Fixed carbon (%):	3.27	3.29
Total sulphur (%):	0.28	0.28
Combustible sulphur (%):	0.16	
Net calorific value (cal/g):	313.00	316.00
Gross calorific value (cal/g):	313.00	316.00
Volatile matter (dmmf%):	151.90	
Hardgrove index:	61.00	
Specific gravity:	2.01	
Carbon dioxide (%):	0.17	
Phosphorous in coal (%):	0.087	
Chlorine in coal (ppm):	944.00	

Forms of Sulphur (%): PYRITE 00.12 SULPHATE 00.00 ORGANIC 00.16

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	5.23	5.27
Hydrogen (%):	0.41	0.41
Nitrogen (%):	0.22	0.22
Oxygen (%):	2.54	2.56

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1248.00	1106.00
Softening temperature (°C):	1332.00	1293.00
Hemispherical temperature (°C):	1364.00	1311.00
Final temperature (°C):	1409.00	1407.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	70.98	TiO2 (%):	0.86
Al2O3 (%):	15.81	Na2O (%):	1.57
Fe2O3 (%):	4.29	K2O (%):	2.40
CaO (%):	0.64	SO3 (%):	0.34
MgO (%):	2.40	P2O5 (%):	0.22

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88007
Coal zone:	1? OVT		
Field sample no.:	04392	Composite sample no.:	33
True sample thickness:	3.119 meters	Drill core recovery (%):	92.41 %
Coal/Rock:	2.918 / 0.201 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	0.55	5.61	11.14	53.02
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	22.49	7.19		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.88	
Ash (%):	31.89	32.50
Volatile matter (%):	7.00	7.13
Fixed carbon (%):	59.23	60.37
Total sulphur (%):	0.68	0.69
Combustible sulphur (%):	0.19	
Net calorific value (cal/g):	5289.00	5391.00
Gross calorific value (cal/g):	5289.00	5391.00
Volatile matter (dmmf%):	6.60	
Hardgrove index:	97.00	
Specific gravity:	1.53	
Carbon dioxide (%):	0.33	
Phosphorous in coal (%):	0.312	
Chlorine in coal (ppm):	528.00	
Forms of Sulphur (%):	PYRITE 00.33 SULPHATE 00.01 ORGANIC 00.34	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	60.45	61.61
Hydrogen (%):	1.98	2.02
Nitrogen (%):	0.87	0.89
Oxygen (%):	2.25	2.29

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1222.00	1172.00
Softening temperature (°C):	1277.00	1180.00
Hemispherical temperature (°C):	1290.00	1190.00
Final temperature (°C):	1338.00	1248.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	52.76	TiO2 (%):	0.87
Al2O3 (%):	15.74	Na2O (%):	0.88
Fe2O3 (%):	9.02	K2O (%):	1.27
CaO (%):	8.16	SO3 (%):	3.86
MgO (%):	4.42	P2O5 (%):	2.24

gcri coal division ash fusion proj KPN BLK LR DS DDH88007

sample id 00031
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1259.0	1190.0
softening temp.(C)	1274.0	1216.0
hemispherical temp.(C)	1280.0	1222.0
fluid temp.(C)	1301.0	1259.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88007

sample id 00031
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	49.98
aluminium oxide %	(al2o3)	21.83
ferric oxide %	(fe2o3)	7.94
titanium dioxide %	(tio2)	1.30
phosphorous pentoxide %	(p2o5)	3.50
calcium oxide %	(cao)	6.29
magnesium oxide %	(mgo)	3.88
sulphur trioxide %	(so3)	1.10
sodium oxide %	(na2o)	0.95
potassium oxide %	(k2o)	1.74

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88007

sample id 00031
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1132.0	initial temp.(C)	1101.0
softening temp.(C)	1295.0	softening temp.(C)	1243.0
hemispherical temp.(C)	1301.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1358.0	fluid temp.(C)	1280.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88007

sample id 00031
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	50.32
aluminium oxide %	(al2o3)	23.44
ferric oxide %	(fe2o3)	8.26
titanium dioxide %	(tio2)	1.22
phosphorous pentoxide %	(p2o5)	2.98
calcium oxide %	(cao)	5.66
magnesium oxide %	(mgo)	4.06
sulphur trioxide %	(so3)	1.19
sodium oxide %	(na2o)	0.88
potassium oxide %	(k2o)	1.39

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88007

sample id 00032
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1251.0	initial temp.(C)	1137.0
softening temp.(C)	1338.0	softening temp.(C)	1256.0
hemispherical temp.(C)	1356.0	hemispherical temp.(C)	1288.0
fluid temp.(C)	1395.0	fluid temp.(C)	1369.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88007

sample id 00032
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	65.60
aluminium oxide %	(al2o3)	17.26
ferric oxide %	(fe2o3)	6.09
titanium dioxide %	(tio2)	1.23
phosphorous pentoxide %	(p2o5)	0.42
calcium oxide %	(cao)	1.08
magnesium oxide %	(mgo)	2.81
sulphur trioxide %	(so3)	0.54
sodium oxide %	(na2o)	1.27
potassium oxide %	(k2o)	2.17

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88007

sample id 00032
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1256.0	1148.0
softening temp.(C)	1340.0	1264.0
hemispherical temp.(C)	1359.0	1285.0
fluid temp.(C)	1388.0	1348.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88007

sample id 00032
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	63.88
aluminium oxide %	(al2o3)	18.78
ferric oxide %	(fe2o3)	6.87
titanium dioxide %	(tio2)	1.38
phosphorous pentoxide %	(p2o5)	0.37
calcium oxide %	(cao)	1.24
magnesium oxide %	(mgo)	3.09
sulphur trioxide %	(so3)	0.73
sodium oxide %	(na2o)	1.25
potassium oxide %	(k2o)	2.02

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88007

sample id 00033
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1080.0
softening temp.(C)	1301.0	softening temp.(C)	1238.0
hemispherical temp.(C)	1309.0	hemispherical temp.(C)	1259.0
fluid temp.(C)	1348.0	fluid temp.(C)	1288.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88007

sample id 00033
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	51.80
aluminium oxide %	(al2o3)	22.55
ferric oxide %	(fe2o3)	7.27
titanium dioxide %	(tio2)	1.24
phosphorous pentoxide %	(p2o5)	2.51
calcium oxide %	(cao)	5.40
magnesium oxide %	(mgo)	3.58
sulphur trioxide %	(so3)	1.43
sodium oxide %	(na2o)	1.11
potassium oxide %	(k2o)	1.64

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88007

sample id 00033
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1174.0	initial temp.(C)	1132.0
softening temp.(C)	1269.0	softening temp.(C)	1243.0
hemispherical temp.(C)	1282.0	hemispherical temp.(C)	1253.0
fluid temp.(C)	1327.0	fluid temp.(C)	1285.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88007

sample id 00033
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	50.56
aluminium oxide %	(al2o3)	23.79
ferric oxide %	(fe2o3)	7.92
titanium dioxide %	(tio2)	1.17
phosphorous pentoxide %	(p2o5)	2.36
calcium oxide %	(cao)	5.25
magnesium oxide %	(mgo)	3.97
sulphur trioxide %	(so3)	1.59
sodium oxide %	(na2o)	1.05
potassium oxide %	(k2o)	1.26

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88007 SEAM : H? INTERVAL(M) : 75.72 – 78.66 ELEVATION(M) : 1689.5

GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	75.72			0.14 (0.03)												
			0.89													
			0.12													
			(0.37)													
			0.36													
			0.55		69.0	99998		0.50/2.11 2.60		—	—	—	—	—	—	—
			0.37													
			(0.17)													
				0.13												
	78.66			(0.20)												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88007 SEAM : ? INTERVAL(M) : 85.79 – 86.12 ELEVATION(M) : 1689.5

GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	85.79			0.18	60.3	99999		0.30/ 0.00		—	—	—	—	—	—
	86.12			(0.12)				0.30							

GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88007 SEAM : PH? INTERVAL(M) : 147.59 – 147.87 ELEVATION(M) : 1689.5

GEOLOGIST : WALLACE SCALE: 1:40 DATE : FEB 02/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	147.59			0.25	100.0	99998		0.25/ 0.00		—	—	—	—	—	—
	147.87							0.25							

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88007 SEAM : G? INTERVAL(M) : 175.55 – 176.97 ELEVATION(M) : 1689.5

GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	175.55														
				1.26	92.3	4395	34	1.37 / 0.00	1.37 / 0.00	1.92	29.56	5.78	62.74	1.72	23.05
								1.37	1.37						
	176.97			(0.11)											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88007
Coal zone:	G?		
Field sample no.:	04395	Composite sample no.:	34
True sample thickness:	1.369 meters	Drill core recovery (%):	92.25 %
Coal/Rock:	1.369 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	5.76	8.02	12.46	49.04
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	16.25	8.47		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.92	
Ash (%):	29.56	30.14
Volatile matter (%):	5.78	5.89
Fixed carbon (%):	62.74	63.97
Total sulphur (%):	1.72	1.75
Combustible sulphur (%):	1.20	
Net calorific value (cal/g):	5509.00	5617.00
Gross calorific value (cal/g):	5509.00	5617.00
Volatile matter (dmmf%):	4.20	
Hardgrove index:	90.00	
Specific gravity:	1.54	
Carbon dioxide (%):	0.22	
Phosphorous in coal (%):	0.350	
Chlorine in coal (ppm):	800.00	
Forms of Sulphur (%):	PYRITE 01.07 SULPHATE 00.03 ORGANIC 00.62	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	61.09	62.29
Hydrogen (%):	2.01	2.05
Nitrogen (%):	0.62	0.63
Oxygen (%):	3.08	3.14

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1172.00	1127.00
Softening temperature (°C):	1253.00	1164.00
Hemispherical temperature (°C):	1261.00	1169.00
Final temperature (°C):	1285.00	1211.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	48.51	TiO2 (%):	0.83
Al2O3 (%):	16.43	Na2O (%):	1.00
Fe2O3 (%):	12.65	K2O (%):	1.39
CaO (%):	8.26	SO3 (%):	4.43
MgO (%):	3.71	P2O5 (%):	2.71

gcri coal division ash fusion proj KPN BLK LR DS DDH88007

sample id 00034
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1211.0	initial temp.(C)	1190.0
softening temp.(C)	1274.0	softening temp.(C)	1219.0
hemispherical temp.(C)	1280.0	hemispherical temp.(C)	1227.0
fluid temp.(C)	1295.0	fluid temp.(C)	1253.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88007

sample id 00034
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	45.36
aluminium oxide %	(al2o3)	21.33
ferric oxide %	(fe2o3)	7.89
titanium dioxide %	(tio2)	1.11
phosphorous pentoxide %	(p2o5)	3.62
calcium oxide %	(cao)	9.26
magnesium oxide %	(mgo)	4.01
sulphur trioxide %	(so3)	4.12
sodium oxide %	(na2o)	1.03
potassium oxide %	(k2o)	1.54

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88007

sample id 00034
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1235.0	initial temp.(C)	1232.0
softening temp.(C)	1282.0	softening temp.(C)	1248.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1253.0
fluid temp.(C)	1306.0	fluid temp.(C)	1269.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88007

sample id 00034
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	46.44
aluminium oxide %	(al2o3)	23.84
ferric oxide %	(fe2o3)	6.61
titanium dioxide %	(tio2)	0.94
phosphorous pentoxide %	(p2o5)	3.62
calcium oxide %	(cao)	8.25
magnesium oxide %	(mgo)	3.63
sulphur trioxide %	(so3)	2.80
sodium oxide %	(na2o)	1.08
potassium oxide %	(k2o)	1.45

90.0 <= total <= 100.0

KPNLRDDH88008

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88008 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/19/88
END DATE - 06/21/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MURRAY
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SECTION OVERTURNS AT APPROX 20.25M. J SEAM INTERSE
CTED AT 117.68 M.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1671.87
ZONE - 9
NORTHING - 6343610.52
EASTING - 506854.35

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571415
LONGITUDE - 1285311

- O R I E N T A T I O N -

LENGTH - 157.44
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

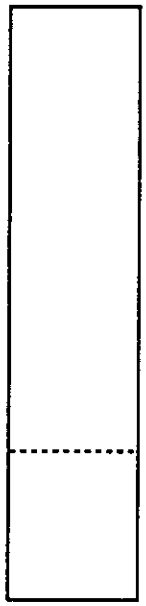
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-008

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
J ovt.	0.06 m



SCALE

1:2000

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88008										
		4386	17.84	18.06	100.00		0.195			0.000- 0.195
		4387	120.71	120.74	100.00		0.010			0.000- 0.010
		4388	23.87	23.94	100.00		0.034			0.000- 0.034
	J OVT	99999	117.68	117.86	100.00		0.062			0.000- 0.062

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88008												

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

COAL DIVISION

MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88008 SEAM : J OVT INTERVAL(M) : 117.68 – 117.86 ELEVATION(M) : 1671.9

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	117.68			0.06	100.0	99995		0.00/ 0.06							
	117.86							0.06							

KPNLRDDH88009

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88009 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/20/88
END DATE - 06/22/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - KRAUS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED SEAMS H,I,J,K,K/L,L,&M?. CASING ADDED DUE TO LOSS CIRC.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1637.90
ZONE - 9
NORTHING - 6342937.76
EASTING - 506557.40

LICENCE/LEASE NUMBER - 7147

LATITUDE - 571353
LONGITUDE - 1285329

- O R I E N T A T I O N -

LENGTH - 204.18
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 7.93
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

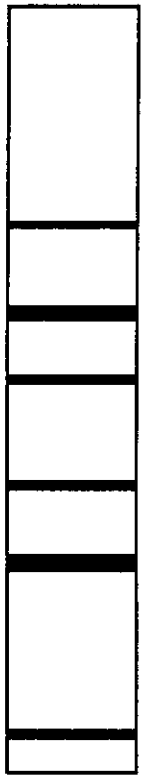
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-009

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
L	0.86 m
K/L	3.98 m
K	1.57 m
J	1.66 m
I	4.40 m
H	2.11 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88009										
	L ROOF	8109	56.73	57.02	100.00		0.264			0.000- 0.264
	L	8110	57.02	57.97	55.79	0.479		0.206	0.171	0.685- 0.171
	L FLOOR	8111	57.97	58.61	100.00		0.569			0.000- 0.569
	K/L ROOF	8112	79.00	79.80	100.00		0.777			0.000- 0.777
	K/L	8113	79.80	84.09	68.76	2.381	0.353	1.244		3.625- 0.353
	K/L FLOOR	8114	84.09	84.43	100.00	0.017	0.279			0.017- 0.279
	K ROOF	8115	96.98	97.42	100.00		0.390			0.000- 0.390
	K	8116	97.42	99.19	74.58	0.992	0.177	0.284	0.115	1.276- 0.292
	K FLOOR	8117	99.19	99.97	100.00		0.691			0.000- 0.691
	I ROOF	8118	146.26	146.53	100.00		0.254			0.000- 0.254
	I	8119	146.53	147.84	80.15	0.991		0.104	0.141	1.095- 0.141
	I	8120	147.84	148.14	100.00	0.113	0.170			0.113- 0.170
	I	8121	148.14	151.18	100.00	2.800	0.085			2.800- 0.085
	I FLOOR	8122	151.18	151.40	100.00		0.209			0.000- 0.209
	H ROOF	8123	191.80	192.32	100.00		0.454			0.000- 0.454
	H	8124	192.32	194.87	66.67	1.219	0.209	0.513	0.173	1.732- 0.382
	H FLOOR	8125	194.87	195.05	100.00		0.142			0.000- 0.142
	M?	99998	18.65	19.05	87.50	0.302		0.043		0.345- 0.000
	J	99999	125.95	127.88	91.19		1.510		0.145	0.000- 1.655

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88009												
	L	35	8110	8110	57.02	57.97	55.78	0.53	0.00	0.23	0.19	0.76- 0.19
	K/L	36	8113	8113	79.80	84.09	68.76	2.57	0.38	1.34	0.00	3.91- 0.38
	K	37	8116	8116	97.42	99.19	74.57	1.12	0.20	0.32	0.13	1.44- 0.33
	I	38	8119	8120	146.53	148.14	83.85	1.17	0.18	0.11	0.15	1.28- 0.33
	I	39	8121	8121	148.14	151.18	100.00	2.95	0.09	0.00	0.00	2.95- 0.09
	H	40	8124	8124	192.32	194.87	66.66	1.45	0.25	0.64	0.21	2.09- 0.46
	K/L	219	8113	8113	79.80	84.09	68.76	2.57	0.38	1.34	0.00	3.91- 0.38
	K	220	8116	8116	97.42	99.19	74.57	1.12	0.20	0.32	0.13	1.44- 0.33
	I	221	8119	8120	146.53	148.14	83.85	1.17	0.18	0.11	0.15	1.28- 0.33
	I	222	8121	8121	148.14	151.18	100.00	2.95	0.09	0.00	0.00	2.95- 0.09
	H	223	8124	8124	192.32	194.87	66.66	1.45	0.25	0.64	0.21	2.09- 0.46
	K/L	315	8113	8113	79.80	84.09	68.76	2.57	0.38	1.34	0.00	3.91- 0.38
	K	316	8116	8116	97.42	99.19	74.57	1.12	0.20	0.32	0.13	1.44- 0.33
	I	317	8119	8121	146.53	151.18	94.40	4.12	0.27	0.11	0.15	4.23- 0.42
	H	318	8124	8124	192.32	194.87	66.66	1.45	0.25	0.64	0.21	2.09- 0.46

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88009 SEAM : M? INTERVAL(M) : 18.65 – 19.05 ELEVATION(M) : 1637.9

GEOLOGIST : KRAUS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	18.65			0.30	87.5	99998		0.35/ 0.00		—	—	—	—	—	—	—
	19.05							0.35								

GULF CANADA CORPORATION

COAL DIVISION

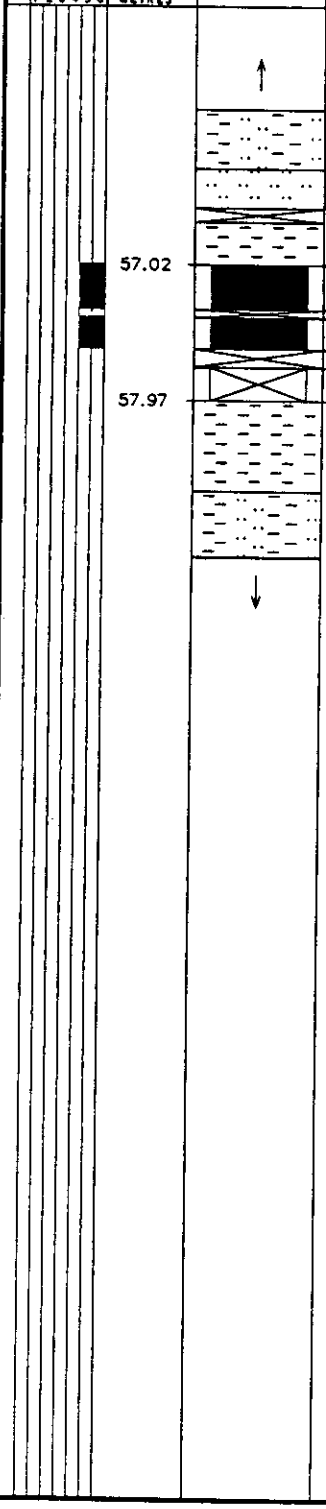
MOUNT KLAPPAN PROJECT

SEAM DETAIL

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88009 SEAM : L INTERVAL(M) : 57.02 – 57.97 ELEVATION(M) : 1637.9

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	57.02			0.28												
			(0.08)	0.20	56.0	8110	35	0.68/ 0.17		0.80	68.77	8.92	21.51	—	7.06	—
			(0.12)					0.86								
	57.97			(0.21)												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88009 SEAM : K/L INTERVAL(M) : 79.80 – 84.09 ELEVATION(M) : 1637.9

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	79.80			(0.49)											
				0.50											
			0.11												
				0.45											
			0.08	0.15											
			0.04	(0.31)	68.7	8113	36	3.62/ 0.35 3.98	3.62/ 0.35 3.98	1.81	37.96	6.28	53.95	0.44	19.88
				0.24											
			0.03	0.35											
				(0.17)											
				0.16											
			0.09												
				0.48											
			0.02												
			0.08	(0.27)											
	84.09														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88009
Coal zone:	K/L		
Field sample no.:	08113	Composite sample no.:	36
True sample thickness:	3.978 meters	Drill core recovery (%):	68.76 %
Coal/Rock:	3.625 / 0.353 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	15.86	19.46	17.32	35.64	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	8.75	2.97			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.81	
Ash (%):	37.96	38.66
Volatile matter (%):	6.28	6.40
Fixed carbon (%):	53.95	54.94
Total sulphur (%):	0.44	0.45
Combustible sulphur (%):	0.08	
Net calorific value (cal/g):	4747.00	4834.00
Gross calorific value (cal/g):	4747.00	4834.00
Volatile matter (dmmf%):	5.40	
Hardgrove index:	60.00	
Specific gravity:	1.59	
Carbon dioxide (%):	0.61	
Phosphorous in coal (%):	0.149	
Chlorine in coal (ppm):	200.00	
Forms of Sulphur (%):	PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.41	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	55.11	56.12
Hydrogen (%):	1.80	1.83
Nitrogen (%):	0.71	0.72
Oxygen (%):	2.17	2.22

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1238.00	1140.00
Softening temperature (°C):	1274.00	1243.00
Hemispherical temperature (°C):	1288.00	1256.00
Final temperature (°C):	1322.00	1314.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	56.12	TiO2 (%):	1.08
Al2O3 (%):	21.13	Na2O (%):	1.92
Fe2O3 (%):	5.66	K2O (%):	1.77
CaO (%):	5.14	SO3 (%):	2.35
MgO (%):	2.68	P2O5 (%):	0.90

gcri coal division ash fusion proj KPN BLK LR DS DDH88009

sample id 00036
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1264.0	initial temp.(C)	1248.0
softening temp.(C)	1332.0	softening temp.(C)	1288.0
hemispherical temp.(C)	1340.0	hemispherical temp.(C)	1317.0
fluid temp.(C)	1398.0	fluid temp.(C)	1395.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88009

sample id 00036
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	59.20
aluminium oxide %	(al2o3)	23.04
ferric oxide %	(fe2o3)	3.91
titanium dioxide %	(tio2)	1.15
phosphorous pentoxide %	(p2o5)	1.23
calcium oxide %	(cao)	3.89
magnesium oxide %	(mgo)	1.88
sulphur trioxide %	(so3)	2.06
sodium oxide %	(na2o)	1.98
potassium oxide %	(k2o)	1.54

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88009 SEAM : K INTERVAL(M) : 97.42 – 99.19 ELEVATION(M) : 1637.9

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	97.42			(0.23)											
			(0.12)												
				0.11											
				0.32	74.6	8116	37	1.28 / 0.29	1.28 / 0.29	1.64	42.17	5.87	50.32	0.35	18.21
			0.13					1.57	1.57						
				0.57											
	99.19														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88009
Coal zone:	K		
Field sample no.:	08116	Composite sample no.:	37
True sample thickness:	1.568 meters	Drill core recovery (%):	74.57 %
Coal/Rock:	1.276 / 0.292 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	11.47	12.59	15.89	46.82

Fraction size (mm):	0.50 X 0.15	0.15 X 0.00
Relative weight (%):	9.78	3.45

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.64	
Ash (%):	42.17	42.87
Volatile matter (%):	5.87	5.97
Fixed carbon (%):	50.32	51.16
Total sulphur (%):	0.35	0.36
Combustible sulphur (%):	0.05	
Net calorific value (cal/g):	4352.00	4425.00
Gross calorific value (cal/g):	4352.00	4425.00
Volatile matter (dmmf%):	4.50	
Hardgrove index:	61.00	
Specific gravity:	1.61	
Carbon dioxide (%):	0.45	
Phosphorous in coal (%):	0.131	
Chlorine in coal (ppm):	120.00	

Forms of Sulphur (%): PYRITE 00.05 SULPHATE 00.00 ORGANIC 00.30

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	50.40	51.24
Hydrogen (%):	1.63	1.66
Nitrogen (%):	0.65	0.66
Oxygen (%):	3.16	3.21

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1200.00	1195.00
Softening temperature (°C):	1266.00	1235.00
Hemispherical temperature (°C):	1280.00	1243.00
Final temperature (°C):	1327.00	1324.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	62.16	TiO2 (%):	0.93
Al2O3 (%):	18.45	Na2O (%):	1.91
Fe2O3 (%):	5.14	K2O (%):	1.95
CaO (%):	3.98	SO3 (%):	1.78
MgO (%):	2.89	P2O5 (%):	0.71

qcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88009

sample id 00037
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1214.0	initial temp.(C)	1206.0
softening temp.(C)	1298.0	softening temp.(C)	1256.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1269.0
fluid temp.(C)	1358.0	fluid temp.(C)	1354.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88009

sample id 00037
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	64.50
aluminium oxide %	(al2o3)	18.07
ferric oxide %	(fe2o3)	4.55
titanium dioxide %	(tio2)	0.91
phosphorous pentoxide %	(p2o5)	0.61
calcium oxide %	(cao)	3.11
magnesium oxide %	(mgo)	2.70
sulphur trioxide %	(so3)	1.93
sodium oxide %	(na2o)	1.58
potassium oxide %	(k2o)	1.85

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88009

sample id 00037
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1209.0	initial temp.(C)	1130.0
softening temp.(C)	1348.0	softening temp.(C)	1301.0
hemispherical temp.(C)	1374.0	hemispherical temp.(C)	1327.0
fluid temp.(C)	1435.0	fluid temp.(C)	1433.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88009

sample id 00037
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	62.90
aluminium oxide %	(al2o3)	21.61
ferric oxide %	(fe2o3)	4.55
titanium dioxide %	(tio2)	0.77
phosphorous pentoxide %	(p2o5)	0.67
calcium oxide %	(cao)	2.25
magnesium oxide %	(mgo)	2.53
sulphur trioxide %	(so3)	1.25
sodium oxide %	(na2o)	1.64
potassium oxide %	(k2o)	1.59

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88009 SEAM : J INTERVAL(M) : 125.95 – 127.88 ELEVATION(M) : 1637.9

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	125.95															
				1.07	91.2	99999		0.00/ 1.66		—	—	—	—	—	—	—
				(0.15)				1.66								
				0.44												
	127.88															

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88009 SEAM : I INTERVAL(M) : 146.53 – 151.18 ELEVATION(M) : 1637.9

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 30/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	146.53			(0.10)												
				0.51												
			(0.14)		80.2	8119	38	1.21 / 0.31		1.49	38.15	6.17	54.19	0.30	19.32	—
				0.48				1.52								
	147.84		0.09													
				0.11	100.0	8120										
	148.14		0.46													
				0.64												
			0.08						4.01 / 0.40							
				0.48					4.40							
			0.04													
					100.0	8121	39	2.80 / 0.09		1.70	11.34	4.62	82.34	0.33	29.98	—
				1.67				2.88								
	151.18															

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88009
Coal zone:	I		
Field sample no.:	08119 - 08120	Composite sample no.:	38
True sample thickness:	1.519 meters	Drill core recovery (%):	83.85 %
Coal/Rock:	1.208 / 0.311 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	24.19	23.90	17.09	27.78
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	5.58	1.46		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.49	
Ash (%):	38.15	38.73
Volatile matter (%):	6.17	6.26
Fixed carbon (%):	54.19	55.01
Total sulphur (%):	0.30	0.30
Combustible sulphur (%):	0.09	
Net calorific value (cal/g):	4617.00	4687.00
Gross calorific value (cal/g):	4617.00	4687.00
Volatile matter (dmmf%):	5.30	
Hardgrove index:	68.00	
Specific gravity:	1.60	
Carbon dioxide (%):	0.91	
Phosphorous in coal (%):	0.047	
Chlorine in coal (ppm):	480.00	

Forms of Sulphur (%): PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.27

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	52.20	52.99
Hydrogen (%):	1.64	1.66
Nitrogen (%):	0.59	0.60
Oxygen (%):	5.63	5.72

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1190.00	1111.00
Softening temperature (°C):	1274.00	1180.00
Hemispherical temperature (°C):	1282.00	1206.00
Final temperature (°C):	1343.00	1288.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	56.82	TiO2 (%):	0.97
Al2O3 (%):	19.20	Na2O (%):	3.07
Fe2O3 (%):	9.57	K2O (%):	1.24
CaO (%):	2.11	SO3 (%):	1.37
MgO (%):	4.73	P2O5 (%):	0.28

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88009
Coal zone:	I		
Field sample no.:	08121	Composite sample no.:	39
True sample thickness:	2.885 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	2.800 / 0.085 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	33.37	24.00	16.21	21.74	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	3.57	1.11			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.70	
Ash (%):	11.34	11.54
Volatile matter (%):	4.62	4.70
Fixed carbon (%):	82.34	83.76
Total sulphur (%):	0.33	0.34
Combustible sulphur (%):	0.13	
Net calorific value (cal/g):	7164.00	7288.00
Gross calorific value (cal/g):	7165.00	7289.00
Volatile matter (dmmf%):	4.20	
Hardgrove index:	48.00	
Specific gravity:	1.42	
Carbon dioxide (%):	0.20	
Phosphorous in coal (%):	0.147	
Chlorine in coal (ppm):	140.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.31

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	80.69	82.09
Hydrogen (%):	2.37	2.41
Nitrogen (%):	0.87	0.89
Oxygen (%):	2.70	2.73

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1203.00	1122.00
Softening temperature (°C):	1290.00	1238.00
Hemispherical temperature (°C):	1295.00	1245.00
Final temperature (°C):	1319.00	1315.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	43.68	TiO2 (%):	1.36
Al2O3 (%):	24.07	Na2O (%):	1.65
Fe2O3 (%):	8.48	K2O (%):	1.48
CaO (%):	6.52	SO3 (%):	4.47
MgO (%):	4.43	P2O5 (%):	2.97

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88009

sample id 00038
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1177.0	initial temp.(C)	1127.0
softening temp.(C)	1285.0	softening temp.(C)	1238.0
hemispherical temp.(C)	1293.0	hemispherical temp.(C)	1245.0
fluid temp.(C)	1338.0	fluid temp.(C)	1322.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88009

sample id 00038
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.90
aluminium oxide %	(al2o3)	20.84
ferric oxide %	(fe2o3)	6.83
titanium dioxide %	(tio2)	0.83
phosphorous pentoxide %	(p2o5)	0.33
calcium oxide %	(cao)	4.48
magnesium oxide %	(mgo)	3.87
sulphur trioxide %	(so3)	2.30
sodium oxide %	(na2o)	1.96
potassium oxide %	(k2o)	1.35

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88009

sample id 00038
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1222.0	initial temp.(C)	1156.0
softening temp.(C)	1314.0	softening temp.(C)	1264.0
hemispherical temp.(C)	1327.0	hemispherical temp.(C)	1280.0
fluid temp.(C)	1369.0	fluid temp.(C)	1348.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88009

sample id 00038
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	57.02
aluminium oxide %	(al2o3)	21.15
ferric oxide %	(fe2o3)	5.50
titanium dioxide %	(tio2)	0.75
phosphorous pentoxide %	(p2o5)	0.35
calcium oxide %	(cao)	5.65
magnesium oxide %	(mgo)	2.85
sulphur trioxide %	(so3)	1.84
sodium oxide %	(na2o)	2.06
potassium oxide %	(k2o)	1.48

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88009

sample id 00039
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1180.0	initial temp.(C)	1156.0
softening temp.(C)	1274.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1280.0	hemispherical temp.(C)	1238.0
fluid temp.(C)	1295.0	fluid temp.(C)	1251.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88009

sample id 00039
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	43.82
aluminium oxide %	(al2o3)	22.01
ferric oxide %	(fe2o3)	8.95
titanium dioxide %	(tio2)	0.91
phosphorous pentoxide %	(p2o5)	3.19
calcium oxide %	(cao)	8.86
magnesium oxide %	(mgo)	5.43
sulphur trioxide %	(so3)	4.10
sodium oxide %	(na2o)	1.23
potassium oxide %	(k2o)	1.32

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88009

sample id 00039
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1274.0	initial temp.(C)	1180.0
softening temp.(C)	1285.0	softening temp.(C)	1248.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1266.0
fluid temp.(C)	1311.0	fluid temp.(C)	1309.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88009

sample id 00039
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	47.78
aluminium oxide %	(al2o3)	23.15
ferric oxide %	(fe2o3)	7.01
titanium dioxide %	(tio2)	0.83
phosphorous pentoxide %	(p2o5)	2.45
calcium oxide %	(cao)	7.92
magnesium oxide %	(mgo)	4.28
sulphur trioxide %	(so3)	2.37
sodium oxide %	(na2o)	1.46
potassium oxide %	(k2o)	1.49

90.0 <= total <= 100.0

GULF CANADA CORPORATION

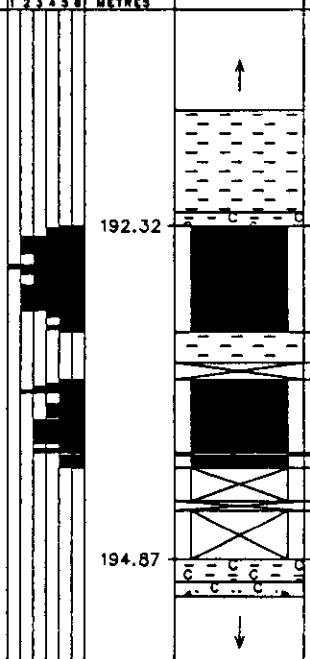
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88009 SEAM : H INTERVAL(M) : 192.32 – 194.87 ELEVATION(M) : 1637.9

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 30/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	192.32			0.88											
			0.19												
			(0.11)												
				0.46	67.5	8124	40	1.73 / 0.38	1.73 / 0.38	1.50	37.30	5.78	55.42	0.64	20.18
								2.11	2.11						
			0.02	0.06											
				(0.21)											
			(0.04)												
				(0.30)											
	194.87														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88009
Coal zone:	H		
Field sample no.:	08124	Composite sample no.:	40
True sample thickness:	2.114 meters	Drill core recovery (%):	66.66 %
Coal/Rock:	1.732 / 0.382 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	31.69	23.26	15.66	24.37
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.89	1.13		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.50	
Ash (%):	37.30	37.87
Volatile matter (%):	5.78	5.87
Fixed carbon (%):	55.42	56.26
Total sulphur (%):	0.64	0.65
Combustible sulphur (%):	0.22	
Net calorific value (cal/g):	4823.00	4896.00
Gross calorific value (cal/g):	4823.00	4896.00
Volatile matter (dmmf%):	4.40	
Hardgrove index:	58.00	
Specific gravity:	1.56	
Carbon dioxide (%):	0.16	
Phosphorous in coal (%):	0.055	
Chlorine in coal (ppm):	360.00	

Forms of Sulphur (%): PYRITE 00.40 SULPHATE 00.00 ORGANIC 00.24

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	56.05	56.90
Hydrogen (%):	1.64	1.66
Nitrogen (%):	0.58	0.59
Oxygen (%):	2.29	2.33

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1230.00	1216.00
Softening temperature (°C):	1266.00	1245.00
Hemispherical temperature (°C):	1272.00	1253.00
Final temperature (°C):	1319.00	1295.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	59.48	TiO2 (%):	0.83
Al2O3 (%):	18.03	Na2O (%):	1.86
Fe2O3 (%):	5.01	K2O (%):	1.15
CaO (%):	5.81	SO3 (%):	2.79
MgO (%):	4.30	P2O5 (%):	0.34

gcri coal division ash fusion proj KPN BLK LR DS DDH88009

sample id 00040
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1253.0	initial temp.(C)	1238.0
softening temp.(C)	1277.0	softening temp.(C)	1253.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1269.0
fluid temp.(C)	1338.0	fluid temp.(C)	1306.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88009

sample id 00040
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	59.65
aluminium oxide %	(al2o3)	20.10
ferric oxide %	(fe2o3)	5.06
titanium dioxide %	(tio2)	0.79
phosphorous pentoxide %	(p2o5)	0.44
calcium oxide %	(cao)	4.55
magnesium oxide %	(mgo)	4.08
sulphur trioxide %	(so3)	2.51
sodium oxide %	(na2o)	1.63
potassium oxide %	(k2o)	1.18

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88009

sample id 00040
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1264.0	initial temp.(C)	1253.0
softening temp.(C)	1290.0	softening temp.(C)	1269.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1280.0
fluid temp.(C)	1358.0	fluid temp.(C)	1319.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88009

sample id 00040
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	57.28
aluminium oxide %	(al2o3)	22.23
ferric oxide %	(fe2o3)	4.66
titanium dioxide %	(tio2)	0.75
phosphorous pentoxide %	(p2o5)	0.47
calcium oxide %	(cao)	4.54
magnesium oxide %	(mgo)	4.02
sulphur trioxide %	(so3)	2.07
sodium oxide %	(na2o)	1.66
potassium oxide %	(k2o)	1.30

90.0 <= total <= 100.0

KPNLRDDH88010

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88010 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/22/88
END DATE - 06/25/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - HEARN
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SEAMS INTERSECTED: M, L, K/L, K, J, I, H.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1614.80
ZONE - 9
NORTHING - 6343278.35
EASTING - 507071.62

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571404
LONGITUDE - 1285258

- O R I E N T A T I O N -

LENGTH - 203.96
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 4.57
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

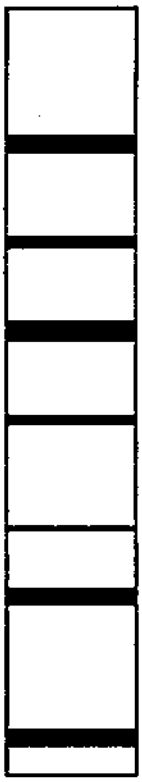
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DH88-010

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
M	4.12 m
L	2.85 m
K/L	4.80 m
K	2.13 m
J	0.50 m
I	4.12 m
H	4.24 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88010										
	H ROOR	8126	190.55	191.60	100.00		1.013			0.000- 1.013
	H	8127	191.60	196.14	78.19	2.943	0.375	0.924		3.867- 0.375
	H FLOOR	8128	196.14	196.44	100.00		0.271			0.000- 0.271
	M ROOF	8129	35.02	35.41	100.00		0.326			0.000- 0.326
	M	8130	35.41	40.07	49.36	1.545	0.457	2.119		3.664- 0.457
	M	8131	40.07	42.31	48.66	0.303	0.722	0.896	0.180	1.199- 0.902
	M FLOOR	8132	42.31	42.80	100.00		0.468			0.000- 0.468
	L ROOF	8133	59.73	60.81	100.00		1.074			0.000- 1.074
	L	8134	60.81	63.69	47.57	0.789	0.562	1.496		2.285- 0.562
	L FLOOR	8135	63.69	64.25	100.00		0.549			0.000- 0.549
	K/L ROOF	8136	81.49	83.42	100.00		1.887			0.000- 1.887
	K/L	8137	83.42	88.39	63.58	2.554	0.501	1.208	0.540	3.762- 1.041
	K/L FLOOR	8138	88.39	90.19	97.22	0.067	1.602		0.048	0.067- 1.650
	K ROOF	8139	108.37	108.72	100.00		0.326			0.000- 0.326
	K	8140	108.72	111.00	72.37	1.409	0.130	0.178	0.411	1.587- 0.541
	K FLOOR	8141	111.00	111.36	100.00		0.338			0.000- 0.338
	I ROOF	8142	154.37	154.64	100.00		0.254			0.000- 0.254
	I	8143	154.64	155.78	36.84	0.289	0.103	0.671		0.960- 0.103
	I	8144	155.78	156.19	85.37	0.028	0.296		0.056	0.028- 0.352
	I	8145	156.19	159.12	76.79	2.060		0.615		2.675- 0.000
	I FLOOR	8146	159.12	159.19	100.00		0.063			0.000- 0.063
		10388	153.19	153.40	100.00		0.199			0.000- 0.199
	J	99999	138.57	139.19	72.58		0.366		0.138	0.000- 0.504

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88010												
	M	41	8130	8130	35.41	40.07	49.35	1.77	0.53	2.36	0.00	4.13- 0.53
	M	42	8131	8131	40.07	42.31	48.66	0.32	0.77	0.96	0.19	1.28- 0.96
	L	43	8134	8134	60.81	63.69	47.56	0.80	0.57	1.51	0.00	2.31- 0.57
	K/L	44	8137	8137	83.42	88.39	63.58	2.64	0.52	1.25	0.56	3.89- 1.08
	K	45	8140	8140	108.72	111.00	72.36	1.51	0.14	0.19	0.44	1.70- 0.58
	I	46	8143	8144	154.64	156.19	49.67	0.34	0.43	0.72	0.06	1.06- 0.49
	I	47	8145	8145	156.19	159.12	76.79	2.25	0.00	0.68	0.00	2.93- 0.00
	H	48	8127	8127	191.60	196.14	78.19	3.15	0.40	0.99	0.00	4.14- 0.40
	M	224	8130	8130	35.41	40.07	49.35	1.77	0.53	2.36	0.00	4.13- 0.53
	K/L	225	8137	8137	83.42	88.39	63.58	2.64	0.52	1.25	0.56	3.89- 1.08
	K	226	8140	8140	108.72	111.00	72.36	1.51	0.14	0.19	0.44	1.70- 0.58
	I	227	8143	8144	154.64	156.19	49.67	0.34	0.43	0.72	0.06	1.06- 0.49
	I	228	8145	8145	156.19	159.12	76.79	2.25	0.00	0.68	0.00	2.93- 0.00
	H	229	8127	8127	191.60	196.14	78.19	3.15	0.40	0.99	0.00	4.14- 0.40
	M	319	8130	8130	35.41	40.07	49.35	1.77	0.53	2.36	0.00	4.13- 0.53
	L	320	8134	8134	60.81	63.69	47.56	0.80	0.57	1.51	0.00	2.31- 0.57
	K/L	321	8137	8137	83.42	88.39	63.58	2.64	0.52	1.25	0.56	3.89- 1.08
	K	322	8140	8140	108.72	111.00	72.36	1.51	0.14	0.19	0.44	1.70- 0.58
	I	323	8143	8145	154.64	159.12	67.41	2.59	0.43	1.40	0.06	3.99- 0.49
	H	324	8127	8127	191.60	196.14	78.19	3.15	0.40	0.99	0.00	4.14- 0.40

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88010 SEAM : M INTERVAL(M) : 35.41 – 42.31 ELEVATION(M) : 1614.8

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	35.41			0.18												
				0.13												
				0.64												
				(0.53)												
				0.20												
				0.42												
				0.27	48.6	8130	41	3.66/0.46 4.12	3.66/0.46 4.12	1.05	42.84	10.66	45.45	—	17.06	—
				(1.59)												
	40.07															
				(0.72)												
				(0.18)	48.6	8131	42	1.20/0.90 2.10		0.88	73.81	13.91	11.40	—	2.49	—
	42.31															

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88010 SEAM : L INTERVAL(M) : 60.81 – 63.69 ELEVATION(M) : 1614.8

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	60.81			(1.15)											
				0.12											
			0.23		47.5	8134	43	2.28 / 0.56	2.28 / 0.56	1.44	61.61	7.50	29.45	0.20	10.89
								2.85	2.85						
				(0.35)											
				0.24											
			0.13												
				0.21											
			0.18												
				0.17											
	63.69		0.24												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88010
Coal zone:	L		
Field sample no.:	08134	Composite sample no.:	43
True sample thickness:	2.847 meters	Drill core recovery (%):	47.56 %
Coal/Rock:	2.285 / 0.562 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	12.44	17.77	18.23	36.57
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	9.92	5.07		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.44	
Ash (%):	61.61	62.51
Volatile matter (%):	7.50	7.61
Fixed carbon (%):	29.45	29.88
Total sulphur (%):	0.20	0.20
Combustible sulphur (%):	0.03	
Net calorific value (cal/g):	2603.00	2641.00
Gross calorific value (cal/g):	2603.00	2641.00
Volatile matter (dmmf%):	7.90	
Hardgrove index:	85.00	
Specific gravity:	1.71	
Carbon dioxide (%):	0.22	
Phosphorous in coal (%):	0.067	
Chlorine in coal (ppm):	840.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.18

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	30.32	30.76
Hydrogen (%):	1.33	1.35
Nitrogen (%):	0.45	0.46
Oxygen (%):	4.65	4.72

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1132.00	1101.00
Softening temperature (°C):	1358.00	1285.00
Hemispherical temperature (°C):	1395.00	1317.00
Final temperature (°C):	1448.00	1443.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	60.50	TiO2 (%):	1.46
Al2O3 (%):	23.55	Na2O (%):	2.98
Fe2O3 (%):	3.19	K2O (%):	1.70
CaO (%):	2.65	SO3 (%):	0.94
MgO (%):	2.28	P2O5 (%):	0.25

gcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00043
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1140.0	initial temp.(C)	1108.0
softening temp.(C)	1398.0	softening temp.(C)	1374.0
hemispherical temp.(C)	1448.0	hemispherical temp.(C)	1406.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00043
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	60.68
aluminium oxide %	(al2o3)	23.44
ferric oxide %	(fe2o3)	3.64
titanium dioxide %	(tio2)	1.66
phosphorous pentoxide %	(p2o5)	0.18
calcium oxide %	(cao)	1.66
magnesium oxide %	(mgo)	2.03
sulphur trioxide %	(so3)	1.15
sodium oxide %	(na2o)	2.61
potassium oxide %	(k2o)	1.72

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00043
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1259.0	initial temp.(C)	1116.0
softening temp.(C)	1411.0	softening temp.(C)	1361.0
hemispherical temp.(C)	1438.0	hemispherical temp.(C)	1395.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00043
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	60.00
aluminium oxide %	(al2o3)	23.55
ferric oxide %	(fe2o3)	4.11
titanium dioxide %	(tio2)	1.46
phosphorous pentoxide %	(p2o5)	0.20
calcium oxide %	(cao)	2.27
magnesium oxide %	(mgo)	2.19
sulphur trioxide %	(so3)	1.37
sodium oxide %	(na2o)	2.39
potassium oxide %	(k2o)	1.53

90.0 <= total <= 100.0

GULF CANADA CORPORATION

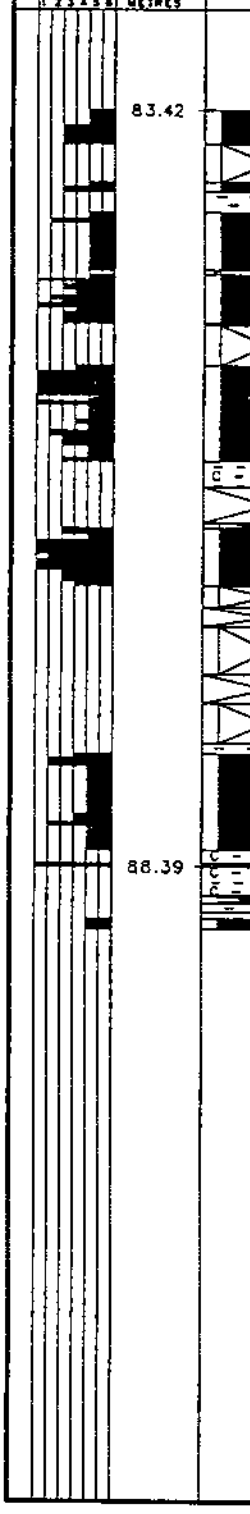
SEAM DETAIL

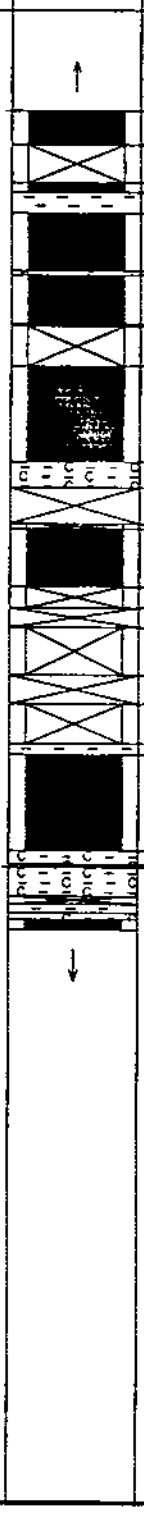
COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88010 SEAM : K/L INTERVAL(M) : 83.42 – 88.39 ELEVATION(M) : 1614.8

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :





INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION
	0.21					
	(0.24)					
0.14						
	0.37					
0.03						
	0.31					
0.02						
	(0.25)					
	0.61					
0.16		63.6	8737	44	3.76 / 1.04	3.76 / 1.04
	(0.23)				4.80	4.80
(0.03)						
	0.37					
	(0.14)					
(0.13)						
	(0.30)					
(0.18)						
	(0.25)					
0.07						
	0.61					
0.09						
0.03						

COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
1.80	49.21	8.19	40.70	0.46	15.11

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88010
Coal zone:	K/L		
Field sample no.:	08137	Composite sample no.:	44
True sample thickness:	4.803 meters	Drill core recovery (%):	63.58 %
Coal/Rock:	3.762 / 1.041 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	23.55	24.37	17.28	26.53
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	5.17	3.10		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.90	
Ash (%):	49.21	50.16
Volatile matter (%):	8.19	8.35
Fixed carbon (%):	40.70	41.49
Total sulphur (%):	0.46	0.47
Combustible sulphur (%):	0.12	
Net calorific value (cal/g):	3611.00	3681.00
Gross calorific value (cal/g):	3611.00	3681.00
Volatile matter (dmmf%):	9.20	
Hardgrove index:	63.00	
Specific gravity:	1.65	
Carbon dioxide (%):	0.27	
Phosphorous in coal (%):	0.084	
Chlorine in coal (ppm):	200.00	

Forms of Sulphur (%): PYRITE 00.07 SULPHATE 00.00 ORGANIC 00.39

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	43.57	44.42
Hydrogen (%):	1.46	1.49
Nitrogen (%):	0.56	0.57
Oxygen (%):	2.84	2.89

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1190.00	1166.00
Softening temperature (°C):	1282.00	1195.00
Hemispherical temperature (°C):	1298.00	1211.00
Final temperature (°C):	1332.00	1288.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	58.12	TiO2 (%):	0.95
Al2O3 (%):	19.01	Na2O (%):	1.86
Fe2O3 (%):	8.17	K2O (%):	1.64
CaO (%):	4.47	SO3 (%):	1.74
MgO (%):	3.36	P2O5 (%):	0.39

qcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00044
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1266.0	initial temp.(C)	1172.0
softening temp.(C)	1395.0	softening temp.(C)	1327.0
hemispherical temp.(C)	1448.0	hemispherical temp.(C)	1361.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00044
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	60.30
aluminium oxide %	(al2o3)	23.13
ferric oxide %	(fe2o3)	5.20
titanium dioxide %	(tio2)	1.07
phosphorous pentoxide %	(p2o5)	0.44
calcium oxide %	(cao)	2.09
magnesium oxide %	(mgo)	2.35
sulphur trioxide %	(so3)	1.13
sodium oxide %	(na2o)	1.97
potassium oxide %	(k2o)	1.56

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00044
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1274.0	initial temp.(C)	1227.0
softening temp.(C)	1448.0	softening temp.(C)	1351.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1380.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00044
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	58.56
aluminium oxide %	(al2o3)	24.85
ferric oxide %	(fe2o3)	5.39
titanium dioxide %	(tio2)	1.04
phosphorous pentoxide %	(p2o5)	0.48
calcium oxide %	(cao)	1.97
magnesium oxide %	(mgo)	2.39
sulphur trioxide %	(so3)	1.28
sodium oxide %	(na2o)	2.03
potassium oxide %	(k2o)	1.56

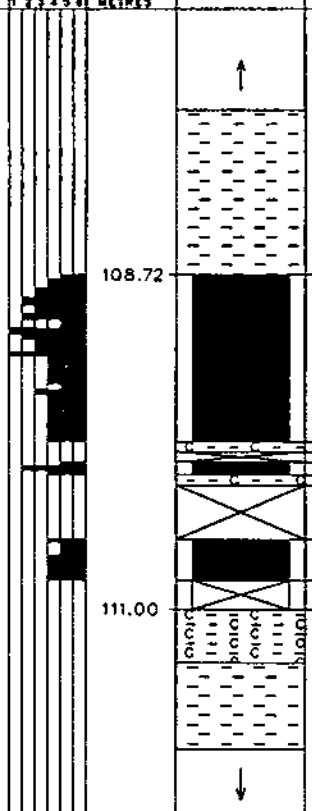
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88010 SEAM : K INTERVAL(M) : 108.72 – 111.00 ELEVATION(M) : 1614.8

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
1 2 3 4 5 6	108.72			1.06											
			0.07												
			0.07												
				0.08											
			0.07												
			(0.35)												
				0.26											
	111.00			(0.18)											
					72.3	8140	45	1.59 / 0.54 2.13	1.59 / 0.54 2.13	1.82	34.72	9.22	54.24	0.35	20.65

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88010
Coal zone:	K		
Field sample no.:	08140	Composite sample no.:	45
True sample thickness:	2.128 meters	Drill core recovery(%):	72.36 %
Coal/Rock:	1.587 / 0.541 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	16.66	20.63	15.90	35.15
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	8.00	3.66		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.82	
Ash(%):	34.72	35.36
Volatile matter(%):	9.22	9.39
Fixed carbon(%):	54.24	55.25
Total sulphur(%):	0.35	0.36
Combustible sulphur(%):	0.01	
Net calorific value(cal/g):	4935.00	5027.00
Gross calorific value(cal/g):	4935.00	5027.00
Volatile matter(dmmf%):	10.50	
Hardgrove index:	62.00	
Specific gravity:	1.56	
Carbon dioxide(%):	0.26	
Phosphorous in coal(%):	0.146	
Chlorine in coal(ppm):	60.00	

Forms of Sulphur(%): PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.32

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	57.06	58.12
Hydrogen(%):	1.79	1.82
Nitrogen(%):	0.64	0.65
Oxygen(%):	3.62	3.69

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1143.00	1116.00
Softening temperature(°C):	1264.00	1185.00
Hemispherical temperature(°C):	1269.00	1190.00
Final temperature(°C):	1290.00	1243.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	48.56	TiO2(%):	1.02
Al2O3(%):	19.51	Na2O(%):	1.99
Fe2O3(%):	12.40	K2O(%):	1.68
CaO(%):	5.29	SO3(%):	2.59
MgO(%):	4.44	P2O5(%):	0.96

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88010

sample id 00045
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1148.0	initial temp.(C)	1127.0
softening temp.(C)	1285.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1243.0
fluid temp.(C)	1311.0	fluid temp.(C)	1307.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88010

sample id 00045
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	52.90
aluminium oxide %	(al2o3)	22.66
ferric oxide %	(fe2o3)	8.75
titanium dioxide %	(tio2)	1.13
phosphorous pentoxide %	(p2o5)	2.02
calcium oxide %	(cao)	4.69
magnesium oxide %	(mgo)	3.27
sulphur trioxide %	(so3)	1.69
sodium oxide %	(na2o)	1.78
potassium oxide %	(k2o)	1.68

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88010

sample id 00045
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1156.0	1130.0
softening temp.(C)	1330.0	1248.0
hemispherical temp.(C)	1369.0	1266.0
fluid temp.(C)	1406.0	1404.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88010

sample id 00045
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	52.34
aluminium oxide %	(al2o3)	25.65
ferric oxide %	(fe2o3)	6.28
titanium dioxide %	(tio2)	0.97
phosphorous pentoxide %	(p2o5)	1.84
calcium oxide %	(cao)	3.66
magnesium oxide %	(mgo)	3.01
sulphur trioxide %	(so3)	1.02
sodium oxide %	(na2o)	1.87
potassium oxide %	(k2o)	1.72

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88010 SEAM : J INTERVAL(M) : 138.57 – 139.19 ELEVATION(M) : 1614.8

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	138.57			0.12												
				0.09												
				(0.14)		72.6	99999	0.00/ 0.50		—	—	—	—	—	—	—
	139.19			0.16				0.50								

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88010 SEAM : 1 INTERVAL(M) : 154.64 – 159.12 ELEVATION(M) : 1614.8

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	154.64			(0.24)											
			0.03	0.03											
			0.03	0.07											
				0.20	38.9	8143									
				(0.43)			48	0.99/0.46 1.44		1.78	42.98	6.09	49.15	0.31	18.49
	155.78		(0.04)												
			0.14												
				0.03	85.3	8144									
			0.10												
	156.19		0.08												
				1.93					3.68/0.46 4.12						
					77.0	8145	47	2.68/0.00 2.68		1.10	24.09	5.75	69.06	0.39	25.34
				(0.52)											
				0.14											
	159.12			(0.10)											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88010
Coal zone:	I		
Field sample no.:	08143 - 08144	Composite sample no.:	46
True sample thickness:	1.443 meters	Drill core recovery (%):	49.67 %
Coal/Rock:	0.988 / 0.455 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	6.81	14.13	16.91	44.35	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	13.12	4.68			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.78	
Ash (%):	42.98	43.76
Volatile matter (%):	6.09	6.20
Fixed carbon (%):	49.15	50.04
Total sulphur (%):	0.31	0.32
Combustible sulphur (%):	0.13	
Net calorific value (cal/g):	4419.00	4499.00
Gross calorific value (cal/g):	4419.00	4499.00
Volatile matter (dmmf%):	4.90	
Hardgrove index:	88.00	
Specific gravity:	1.59	
Carbon dioxide (%):	0.15	
Phosphorous in coal (%):	0.045	
Chlorine in coal (ppm):	600.00	
Forms of Sulphur (%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.29	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	50.35	51.26
Hydrogen (%):	1.64	1.67
Nitrogen (%):	0.65	0.66
Oxygen (%):	2.29	2.33

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1195.00	1137.00
Softening temperature (°C):	1401.00	1301.00
Hemispherical temperature (°C):	1432.00	1369.00
Final temperature (°C):	1472.00	1472.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	59.34	TiO2 (%):	1.01
Al2O3 (%):	24.03	Na2O (%):	2.83
Fe2O3 (%):	4.16	K2O (%):	1.88
CaO (%):	1.48	SO3 (%):	1.07
MgO (%):	3.05	P2O5 (%):	0.24

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88010
Coal zone:	I		
Field sample no.:	08145	Composite sample no.:	47
True sample thickness:	2.675 meters	Drill core recovery(%):	76.79 %
Coal/Rock:	2.675 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	8.58	14.48	11.87	37.37
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	20.40	7.30		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.10	
Ash(%):	24.09	24.36
Volatile matter(%):	5.75	5.81
Fixed carbon(%):	69.06	69.83
Total sulphur(%):	0.39	0.39
Combustible sulphur(%):	0.20	
Net calorific value(cal/g):	6056.00	6123.00
Gross calorific value(cal/g):	6056.00	6123.00
Volatile matter(dmmf%):	5.10	
Hardgrove index:	93.00	
Specific gravity:	1.50	
Carbon dioxide(%):	0.17	
Phosphorous in coal(%):	0.059	
Chlorine in coal(ppm):	116.00	

Forms of Sulphur(%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.37

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	69.53	70.30
Hydrogen(%):	1.88	1.90
Nitrogen(%):	0.77	0.78
Oxygen(%):	2.24	2.27

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1140.00	1127.00
Softening temperature(°C):	1295.00	1235.00
Hemispherical temperature(°C):	1317.00	1269.00
Final temperature(°C):	1377.00	1358.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	55.55	TiO2(%):	1.01
Al2O3(%):	21.38	Na2O(%):	1.95
Fe2O3(%):	8.42	K2O(%):	1.85
CaO(%):	2.68	SO3(%):	2.02
MgO(%):	4.07	P2O5(%):	0.56

gcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00046
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1211.0	initial temp.(C)	1143.0
softening temp.(C)	1290.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1374.0	fluid temp.(C)	1353.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00046
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	60.46
aluminium oxide %	(al2o3)	20.05
ferric oxide %	(fe2o3)	5.81
titanium dioxide %	(tio2)	0.93
phosphorous pentoxide %	(p2o5)	0.45
calcium oxide %	(cao)	2.43
magnesium oxide %	(mgo)	3.44
sulphur trioxide %	(so3)	1.88
sodium oxide %	(na2o)	2.13
potassium oxide %	(k2o)	1.44

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88010

sample id 00046
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AF4 | date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1216.0	initial temp.(C)	1153.0
softening temp.(C)	1324.0	softening temp.(C)	1245.0
hemispherical temp.(C)	1353.0	hemispherical temp.(C)	1290.0
fluid temp.(C)	1395.0	fluid temp.(C)	1393.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88010

sample id 00046
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AM4 | date analysed 31/07/88

silicon dioxide	%	(sio2)	59.72
aluminium oxide	%	(al2o3)	22.15
ferric oxide	%	(fe2o3)	5.62
titanium dioxide	%	(tio2)	1.00
phosphorous pentoxide	%	(p2o5)	0.55
calcium oxide	%	(cao)	2.36
magnesium oxide	%	(mgo)	3.35
sulphur trioxide	%	(so3)	1.36
sodium oxide	%	(na2o)	2.01
potassium oxide	%	(k2o)	1.41

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00047
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1161.0	initial temp.(C)	1108.0
softening temp.(C)	1280.0	softening temp.(C)	1211.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1238.0
fluid temp.(C)	1364.0	fluid temp.(C)	1332.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00047
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	53.96
aluminium oxide %	(al2o3)	24.45
ferric oxide %	(fe2o3)	6.83
titanium dioxide %	(tio2)	1.08
phosphorous pentoxide %	(p2o5)	1.36
calcium oxide %	(cao)	2.59
magnesium oxide %	(mgo)	3.70
sulphur trioxide %	(so3)	1.33
sodium oxide %	(na2o)	1.71
potassium oxide %	(k2o)	1.52

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00047
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1130.0	initial temp.(C)	1111.0
softening temp.(C)	1214.0	softening temp.(C)	1164.0
hemispherical temp.(C)	1353.0	hemispherical temp.(C)	1253.0
fluid temp.(C)	1385.0	fluid temp.(C)	1369.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00047
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	53.92
aluminium oxide %	(al2o3)	24.10
ferric oxide %	(fe2o3)	6.83
titanium dioxide %	(tio2)	1.08
phosphorous pentoxide %	(p2o5)	1.36
calcium oxide %	(cao)	2.59
magnesium oxide %	(mgo)	3.70
sulphur trioxide %	(so3)	1.12
sodium oxide %	(na2o)	1.71
potassium oxide %	(k2o)	1.52

90.0 <= total <= 100.0

GULF CANADA CORPORATION

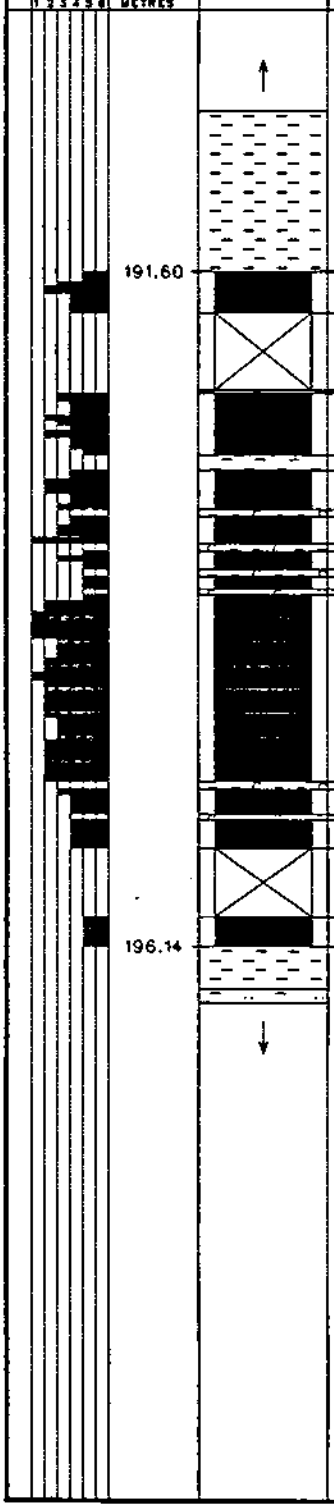
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88010 SEAM : H INTERVAL(M) : 191.60 – 196.14 ELEVATION(M) : 1614.8

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	191.60			0.28											
				(0.49)											
			0.02												
				0.39											
			0.10												
				0.25											
			0.06												
				0.17											
			0.03												
				0.11											
			0.04	0.08											
				1.16	78.2	8127	48	3.87/0.38 4.24	3.87/0.38 4.24	1.71	38.38	6.51	55.40	0.61	20.54
			0.18												
			0.04	0.18											
				(0.44)											
				0.18											
	196.14														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88010
Coal zone:	H		
Field sample no.:	08127	Composite sample no.:	48
True sample thickness:	4.242 meters	Drill core recovery (%):	78.19 %
Coal/Rock:	3.867 / 0.375 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	26.30	19.02	16.24	29.83
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	7.09	1.52		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.71	
Ash (%):	36.38	37.01
Volatile matter (%):	6.51	6.62
Fixed carbon (%):	55.40	56.37
Total sulphur (%):	0.61	0.62
Combustible sulphur (%):	0.16	
Net calorific value (cal/g):	4909.00	4994.00
Gross calorific value (cal/g):	4909.00	4994.00
Volatile matter (dmmf%):	5.80	
Hardgrove index:	57.00	
Specific gravity:	1.56	
Carbon dioxide (%):	0.29	
Phosphorous in coal (%):	0.070	
Chlorine in coal (ppm):	40.00	

Forms of Sulphur (%): PYRITE 00.52 SULPHATE 00.00 ORGANIC 00.09

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	57.24	58.24
Hydrogen (%):	1.68	1.71
Nitrogen (%):	0.59	0.60
Oxygen (%):	1.79	1.82

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1185.00	1135.00
Softening temperature (°C):	1238.00	1193.00
Hemispherical temperature (°C):	1251.00	1198.00
Final temperature (°C):	1290.00	1256.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	56.75	TiO2 (%):	0.91
Al2O3 (%):	16.50	Na2O (%):	1.60
Fe2O3 (%):	6.63	K2O (%):	1.29
CaO (%):	7.77	SO3 (%):	3.08
MgO (%):	4.64	P2O5 (%):	0.44

gcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00048
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1137.0
softening temp.(C)	1277.0	softening temp.(C)	1224.0
hemispherical temp.(C)	1293.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1343.0	fluid temp.(C)	1309.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00048
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.28
aluminium oxide %	(al2o3)	21.24
ferric oxide %	(fe2o3)	6.35
titanium dioxide %	(tio2)	1.02
phosphorous pentoxide %	(p2o5)	0.69
calcium oxide %	(cao)	4.72
magnesium oxide %	(mgo)	3.82
sulphur trioxide %	(so3)	2.25
sodium oxide %	(na2o)	1.77
potassium oxide %	(k2o)	1.43

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88010

sample id 00048
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1187.0	initial temp.(C)	1143.0
softening temp.(C)	1295.0	softening temp.(C)	1253.0
hemispherical temp.(C)	1311.0	hemispherical temp.(C)	1274.0
fluid temp.(C)	1385.0	fluid temp.(C)	1367.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88010

sample id 00048
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.23
aluminium oxide %	(al2o3)	23.11
ferric oxide %	(fe2o3)	6.28
titanium dioxide %	(tio2)	0.90
phosphorous pentoxide %	(p2o5)	0.80
calcium oxide %	(cao)	3.92
magnesium oxide %	(mgo)	3.45
sulphur trioxide %	(so3)	2.52
sodium oxide %	(na2o)	1.77
potassium oxide %	(k2o)	1.59

90.0 <= total <= 100.0

KPNLR00H88011

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88011 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/22/88
END DATE - 06/25/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - ETMANSKI
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - EIGHT SEAMS INTERSECTED: H,I,J,K,K/L,?,?,L.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1519.94
ZONE - 9
NORTHING - 6344372.61
EASTING - 507948.54

LICENCE/LEASE NUMBER - 7145

LATITUDE - 571439
LONGITUDE - 1285206

- O R I E N T A T I O N -

LENGTH - 243.68
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 12.19
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-011

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
L	0.79 m
?	2.94 m
?	6.62 m
K/L	1.72 m
K	6.52 m
J	0.66 m
I	4.89 m
H	3.94 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88011										
	L ROOF	8167	30.10	31.45	100.00		0.755			0.000- 0.755
	L	8168	31.45	32.72	86.61	0.605	0.072	0.109		0.714- 0.072
	L FLOOR	8169	32.72	33.00	100.00		0.182			0.000- 0.182
	K/L ROOF	8170	76.80	77.75	100.00		0.860			0.000- 0.860
	K/L	8171	77.75	79.71	76.02	1.170	0.142	0.411		1.581- 0.142
	K/L	8172	79.71	82.79	39.94	0.373	0.652	0.843	0.679	1.216- 1.331
	K/L FLOOR	8173	82.79	83.45	100.00		0.517			0.000- 0.517
	K ROOF	8174	111.83	113.41	100.00		1.443			0.000- 1.443
	K	8175	113.41	119.93	39.88	2.218	0.127	3.501		5.719- 0.127
	K	8176	119.93	120.32	100.00		0.344			0.000- 0.344
	K	8177	120.32	120.70	44.74	0.141	0.009	0.185		0.326- 0.009
	K FLOOR	8178	120.70	121.02	100.00		0.281			0.000- 0.281
	I ROOF	8179	178.27	179.08	100.00		0.740			0.000- 0.740
	I	8180	179.08	180.81	79.77	1.047	0.234	0.323		1.370- 0.234
	I	8181	180.81	182.36	48.39	0.707		0.756		1.463- 0.000
	I	8182	182.36	184.26	100.00	1.821				1.821- 0.000
	I FLOOR	8183	184.26	185.67	100.00		1.368			0.000- 1.368
	H ROOF	8184	234.60	234.94	100.00		0.324			0.000- 0.324
	H	8185	234.94	236.90	60.20	0.950	0.171	0.541	0.199	1.491- 0.370
	H	8186	236.90	239.12	75.68	1.464	0.112	0.508		1.972- 0.112
	H FLOOR	8187	239.12	240.26	100.00		1.059			0.000- 1.059
	? ROOF	8347	64.88	65.00	83.33		0.079		0.016	0.000- 0.095
	?	8348	65.00	66.60	71.25	0.326	0.577	0.363		0.689- 0.577
	?	8349	66.60	73.32	54.61	1.771	1.156	2.422		4.193- 1.156
	? FLOOR	8350	73.32	73.89	100.00		0.455			0.000- 0.455
	? ROOF	8351	51.58	51.69	100.00		0.066			0.000- 0.066
	?	8352	51.69	53.40	68.42	0.595	0.108	0.326		0.921- 0.108
	?	8353	53.40	54.98	100.00	0.182	0.780			0.182- 0.780

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	?	8354	54.98	56.53	100.00	0.785	0.164			0.785- 0.164
	? FLOOR	8355	56.53	56.80	100.00		0.167			0.000- 0.167
		10444	88.44	88.52	100.00		0.074			0.000- 0.074
		10445	90.35	90.46	100.00		0.104			0.000- 0.104
		10446	95.30	95.39	100.00		0.085			0.000- 0.085
		10448	177.61	177.70	100.00		0.082			0.000- 0.082
	J	99999	137.83	138.56	69.86	0.108	0.351	0.198		0.306- 0.351

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88011												
	?	49	8352	8352	51.69	53.40	68.42	0.99	0.18	0.54	0.00	1.53- 0.18
	?	50	8353	8353	53.40	54.98	100.00	0.30	1.28	0.00	0.00	0.30- 1.28
	?	51	8354	8354	54.98	56.53	100.00	1.28	0.27	0.00	0.00	1.28- 0.27
	?	52	8348	8348	65.00	66.60	71.25	0.41	0.73	0.46	0.00	0.87- 0.73
	?	53	8349	8349	66.60	73.32	54.61	2.22	1.45	3.05	0.00	5.27- 1.45
	K/L	54	8171	8171	77.75	79.71	76.02	1.33	0.16	0.47	0.00	1.80- 0.16
	k/l	55	8172	8172	79.71	82.79	39.93	0.45	0.78	1.03	0.82	1.48- 1.60
	K	56	8175	8177	113.41	120.70	43.34	2.62	0.54	4.13	0.00	6.75- 0.54
	I	57	8180	8180	179.08	180.81	79.76	1.13	0.25	0.35	0.00	1.48- 0.25
	I	58	8181	8182	180.81	184.26	76.81	2.65	0.00	0.80	0.00	3.45- 0.00
	H	59	8185	8185	234.94	236.90	60.20	1.00	0.18	0.57	0.21	1.57- 0.39
	H	60	8186	8186	236.90	239.12	75.67	1.56	0.12	0.54	0.00	2.10- 0.12
	L	61	8168	8168	31.45	32.72	86.61	0.98	0.12	0.17	0.00	1.15- 0.12
	?	230	8348	8349	65.00	73.32	57.81	2.63	2.18	3.51	0.00	6.14- 2.18
	K/L	231	8171	8172	77.75	82.79	53.96	1.78	0.94	1.50	0.82	3.28- 1.76
	I	232	8180	8180	179.08	180.81	79.76	1.13	0.25	0.35	0.00	1.48- 0.25
	I	233	8181	8182	180.81	184.26	76.81	2.65	0.00	0.80	0.00	3.45- 0.00
	H	234	8186	8186	236.90	239.12	75.67	1.56	0.12	0.54	0.00	2.10- 0.12
	?	325	8352	8354	51.69	56.53	88.84	2.57	1.73	0.54	0.00	3.11- 1.73
	?	326	8348	8349	65.00	73.32	57.81	2.63	2.18	3.51	0.00	6.14- 2.18
	K/L	327	8171	8172	77.75	82.79	53.96	1.78	0.94	1.50	0.82	3.28- 1.76
	K	328	8175	8177	113.41	120.70	43.34	2.62	0.54	4.13	0.00	6.75- 0.54
	I	329	8180	8182	179.08	184.26	77.79	3.78	0.25	1.15	0.00	4.93- 0.25
	H	330	8186	8186	236.90	239.12	75.67	1.56	0.12	0.54	0.00	2.10- 0.12

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL

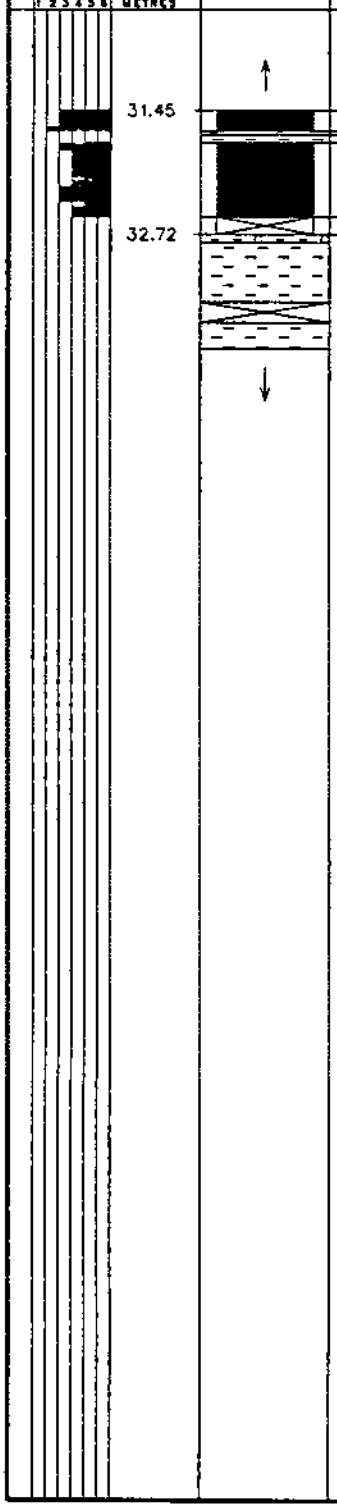
COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88011 SEAM : L INTERVAL(M) : 31.45 – 32.72 ELEVATION(M) : 1519.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	31.45		0.01	0.13												
				0.47	86.1	8168	81	0.71 / 0.07 0.79	0.71 / 0.07 0.79	1.18	37.70	8.27	54.85	0.45	20.78	
	32.72			(0.11)												



GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	L		
Field sample no.:	08168	Composite sample no.:	61
True sample thickness:	0.786 meters	Drill core recovery (%):	86.61 %
Coal/Rock:	0.714 / 0.072 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	18.82	24.62	16.87	28.42
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	8.15	3.12		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.18	
Ash (%):	37.70	38.15
Volatile matter (%):	6.27	6.34
Fixed carbon (%):	54.85	55.51
Total sulphur (%):	0.45	0.46
Combustible sulphur (%):	0.13	
Net calorific value (cal/g):	4966.00	5026.00
Gross calorific value (cal/g):	4966.00	5026.00
Volatile matter (dmmf%):	5.40	
Hardgrove index:	81.00	
Specific gravity:	1.59	
Carbon dioxide (%):	0.25	
Phosphorous in coal (%):	0.189	
Chlorine in coal (ppm):	108.00	

Forms of Sulphur (%): PYRITE 00.20 SULPHATE 00.00 ORGANIC 00.25

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	53.75	54.39
Hydrogen (%):	1.93	1.95
Nitrogen (%):	0.70	0.71
Oxygen (%):	4.29	4.34

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1122.00	1117.00
Softening temperature (°C):	1345.00	1338.00
Hemispherical temperature (°C):	1374.00	1368.00
Final temperature (°C):	1432.00	1430.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	71.02	TiO2 (%):	0.56
Al2O3 (%):	12.99	Na2O (%):	1.25
Fe2O3 (%):	3.33	K2O (%):	0.86
CaO (%):	4.23	SO3 (%):	2.14
MgO (%):	1.84	P2O5 (%):	1.15

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00061
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1200.0	initial temp.(C)	1180.0
softening temp.(C)	1319.0	softening temp.(C)	1303.0
hemispherical temp.(C)	1348.0	hemispherical temp.(C)	1327.0
fluid temp.(C)	1417.0	fluid temp.(C)	1413.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00061
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	66.78
aluminium oxide %	(al2o3)	18.55
ferric oxide %	(fe2o3)	2.66
titanium dioxide %	(tio2)	0.84
phosphorous pentoxide %	(p2o5)	1.59
calcium oxide %	(cao)	3.99
magnesium oxide %	(mgo)	1.73
sulphur trioxide %	(so3)	1.13
sodium oxide %	(na2o)	1.28
potassium oxide %	(k2o)	0.90

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00061
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1214.0	initial temp.(C)	1169.0
softening temp.(C)	1380.0	softening temp.(C)	1332.0
hemispherical temp.(C)	1411.0	hemispherical temp.(C)	1380.0
fluid temp.(C)	1451.0	fluid temp.(C)	1449.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00061
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	63.66
aluminium oxide %	(al2o3)	22.13
ferric oxide %	(fe2o3)	3.10
titanium dioxide %	(tio2)	0.77
phosphorous pentoxide %	(p2o5)	1.41
calcium oxide %	(cao)	3.36
magnesium oxide %	(mgo)	1.89
sulphur trioxide %	(so3)	1.04
sodium oxide %	(na2o)	1.24
potassium oxide %	(k2o)	0.90

90.0 <= total <= 100.0

GULF CANADA CORPORATION

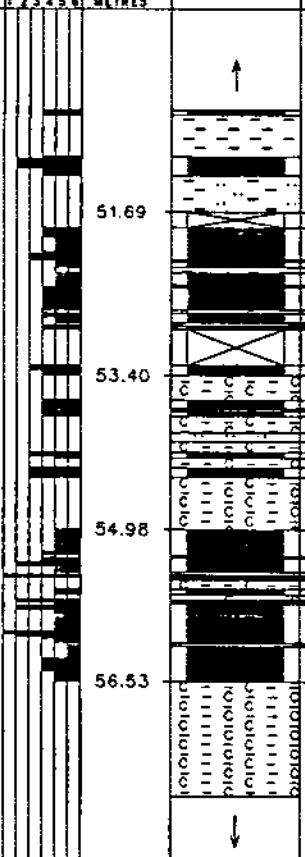
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88011 SEAM : ? INTERVAL(M) : 51.69 - 56.53 ELEVATION(M) : 1519.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
1 2 3 4 5 6																
	51.69			(0.10) 0.20 0.14 (0.22)	68.3	8352	49	0.92/0.11 1.03		1.57	63.37	6.57	28.49	0.22	9.97	—
	53.40		0.15 0.10 0.32	0.04	100.0	8353	50	0.18/0.78 0.96		1.55	70.91	7.61	19.93	0.41	7.13	—
	54.98			0.17 0.25 0.22	100.0	8354	51	0.78/0.16 0.95		1.57	63.29	6.25	28.89	0.24	9.75	—
	56.53															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	?		
Field sample no.:	08352	Composite sample no.:	49
True sample thickness:	1.029 meters	Drill core recovery(%):	68.42 %
Coal/Rock:	0.921 / 0.108 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM			
Size analysis:	SZ1			
Fraction size(mm):	35.00 X 6.00	6.00 X 0.50	0.50 X 0.15	0.15 X 0.00
Relative weight(%):	62.51	29.54	4.45	3.50

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.57	
Ash(%):	63.37	64.38
Volatile matter(%):	6.57	6.68
Fixed carbon(%):	28.49	28.94
Total sulphur(%):	0.22	0.22
Combustible sulphur(%):	0.08	
Net calorific value(cal/g):	2383.00	2421.00
Gross calorific value(cal/g):	2383.00	2421.00
Volatile matter(dmmf%):	4.80	
Hardgrove index:	86.00	
Specific gravity:	1.76	
Carbon dioxide(%):	0.35	
Phosphorous in coal(%):	0.028	
Chlorine in coal(ppm):	272.00	
Forms of Sulphur(%):	PYRITE 00.05 SULPHATE 00.00 ORGANIC 00.17	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	28.94	29.40
Hydrogen(%):	1.19	1.21
Nitrogen(%):	0.44	0.45
Oxygen(%):	4.27	4.34

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1343.00	1306.00
Softening temperature(°C):	1424.00	1372.00
Hemispherical temperature(°C):	1472.00	1401.00
Final temperature(°C):	1472.00	1471.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	69.12	TiO2(%):	1.01
Al2O3(%):	19.65	Na2O(%):	1.21
Fe2O3(%):	3.09	K2O(%):	1.57
CaO(%):	1.33	SO3(%):	0.56
MgO(%):	1.62	P2O5(%):	0.10

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	?		
Field sample no.:	08353	Composite sample no.:	50
True sample thickness:	0.962 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	0.182 / 0.780 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 6.00	6.00 X 0.50	0.50 X 0.15	0.15 X 0.00
Relative weight (%):	81.28	14.69	2.60	1.43

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.55	
Ash (%):	70.91	72.02
Volatile matter (%):	7.61	7.73
Fixed carbon (%):	19.93	20.25
Total sulphur (%):	0.41	0.42
Combustible sulphur (%):	0.20	
Net calorific value (cal/g):	1704.00	1731.00
Gross calorific value (cal/g):	1704.00	1731.00
Volatile matter (dmmf%):	8.20	
Hardgrove index:	70.00	
Specific gravity:	1.78	
Carbon dioxide (%):	0.25	
Phosphorous in coal (%):	0.062	
Chlorine in coal (ppm):	840.00	
Forms of Sulphur (%):	PYRITE 00.10 SULPHATE 00.00 ORGANIC 00.31	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	21.38	21.72
Hydrogen (%):	1.07	1.09
Nitrogen (%):	0.40	0.41
Oxygen (%):	4.28	4.34

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1206.00	1148.00
Softening temperature (°C):	1311.00	1232.00
Hemispherical temperature (°C):	1327.00	1275.00
Final temperature (°C):	1401.00	1377.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	63.84	TiO2 (%):	1.02
Al2O3 (%):	18.95	Na2O (%):	1.22
Fe2O3 (%):	7.01	K2O (%):	1.82
CaO (%):	2.12	SO3 (%):	0.75
MgO (%):	2.54	P2O5 (%):	0.20

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	?		
Field sample no.:	08354	Composite sample no.:	51
True sample thickness:	0.949 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	0.785 / 0.164 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 6.00	6.00 X 0.50	0.50 X 0.15	0.15 X 0.00
Relative weight (%):	87.26	9.56	2.14	1.04

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.57	
Ash (%):	63.29	64.30
Volatile matter (%):	6.25	6.35
Fixed carbon (%):	28.89	29.35
Total sulphur (%):	0.24	0.24
Combustible sulphur (%):	0.14	
Net calorific value (cal/g):	2330.00	2368.00
Gross calorific value (cal/g):	2330.00	2368.00
Volatile matter (dmmf%):	3.70	
Hardgrove index:	66.00	
Specific gravity:	1.74	
Carbon dioxide (%):	0.08	
Phosphorous in coal (%):	0.047	
Chlorine in coal (ppm):	680.00	

Forms of Sulphur (%): PYRITE 00.04 SULPHATE 00.00 ORGANIC 00.20

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	30.89	31.38
Hydrogen (%):	1.49	1.51
Nitrogen (%):	0.55	0.56
Oxygen (%):	1.97	2.01

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1253.00	1232.00
Softening temperature (°C):	1438.00	1332.00
Hemispherical temperature (°C):	1472.00	1359.00
Final temperature (°C):	1472.00	1471.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	65.80	TiO2 (%):	1.11
Al2O3 (%):	20.57	Na2O (%):	0.98
Fe2O3 (%):	4.40	K2O (%):	2.47
CaO (%):	0.66	SO3 (%):	0.38
MgO (%):	1.99	P2O5 (%):	0.17

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00049
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1472.0	initial temp.(C)	1448.0
softening temp.(C)	1472.0	softening temp.(C)	1471.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1471.0
fluid temp.(C)	1472.0	fluid temp.(C)	1471.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00049
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 01/10/88

silicon dioxide %	(sio2)	58.14
aluminium oxide %	(al2o3)	27.07
ferric oxide %	(fe2o3)	5.24
titanium dioxide %	(tio2)	1.70
phosphorous pentoxide %	(p2o5)	0.16
calcium oxide %	(cao)	1.11
magnesium oxide %	(mgo)	2.27
sulphur trioxide %	(so3)	0.91
sodium oxide %	(na2o)	1.31
potassium oxide %	(k2o)	1.62

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00049
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1472.0	initial temp.(C)	1446.0
softening temp.(C)	1472.0	softening temp.(C)	1471.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1471.0
fluid temp.(C)	1472.0	fluid temp.(C)	1471.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00049
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 01/10/88

silicon dioxide %	(sio2)	54.66
aluminium oxide %	(al2o3)	29.47
ferric oxide %	(fe2o3)	5.73
titanium dioxide %	(tio2)	1.74
phosphorous pentoxide %	(p2o5)	0.16
calcium oxide %	(cao)	1.58
magnesium oxide %	(mgo)	2.38
sulphur trioxide %	(so3)	0.78
sodium oxide %	(na2o)	1.31
potassium oxide %	(k2o)	1.29

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00050
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1151.0	initial temp.(C)	1101.0
softening temp.(C)	1411.0	softening temp.(C)	1301.0
hemispherical temp.(C)	1443.0	hemispherical temp.(C)	1338.0
fluid temp.(C)	1472.0	fluid temp.(C)	1471.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00050
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 01/10/88

silicon dioxide %	(sio2)	59.32
aluminium oxide %	(al2o3)	23.97
ferric oxide %	(fe2o3)	6.74
titanium dioxide %	(tio2)	1.71
phosphorous pentoxide %	(p2o5)	0.22
calcium oxide %	(cao)	1.31
magnesium oxide %	(mgo)	2.47
sulphur trioxide %	(so3)	0.68
sodium oxide %	(na2o)	1.45
potassium oxide %	(k2o)	1.64

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00050
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1411.0	initial temp.(C)	1306.0
softening temp.(C)	1472.0	softening temp.(C)	1359.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1385.0
fluid temp.(C)	1472.0	fluid temp.(C)	1471.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00050
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 01/10/88

silicon dioxide %	(sio2)	58.02
aluminium oxide %	(al2o3)	25.17
ferric oxide %	(fe2o3)	6.19
titanium dioxide %	(tio2)	1.37
phosphorous pentoxide %	(p2o5)	0.17
calcium oxide %	(cao)	1.25
magnesium oxide %	(mgo)	2.35
sulphur trioxide %	(so3)	0.54
sodium oxide %	(na2o)	1.55
potassium oxide %	(k2o)	1.65

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00051
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1224.0	initial temp.(C)	1195.0
softening temp.(C)	1374.0	softening temp.(C)	1295.0
hemispherical temp.(C)	1419.0	hemispherical temp.(C)	1327.0
fluid temp.(C)	1448.0	fluid temp.(C)	1442.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00051
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 01/10/88

silicon dioxide %	(sio2)	62.84
aluminium oxide %	(al2o3)	21.56
ferric oxide %	(fe2o3)	5.22
titanium dioxide %	(tio2)	1.37
phosphorous pentoxide %	(p2o5)	0.19
calcium oxide %	(cao)	1.18
magnesium oxide %	(mgo)	2.32
sulphur trioxide %	(so3)	0.80
sodium oxide %	(na2o)	1.03
potassium oxide %	(k2o)	2.42

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00051
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1248.0	initial temp.(C)	1206.0
softening temp.(C)	1432.0	softening temp.(C)	1359.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1382.0
fluid temp.(C)	1472.0	fluid temp.(C)	1471.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00051
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 01/10/88

silicon dioxide %	(sio2)	58.02
aluminium oxide %	(al2o3)	25.45
ferric oxide %	(fe2o3)	6.69
titanium dioxide %	(tio2)	1.17
phosphorous pentoxide %	(p2o5)	0.18
calcium oxide %	(cao)	0.72
magnesium oxide %	(mgo)	2.64
sulphur trioxide %	(so3)	0.34
sodium oxide %	(na2o)	1.22
potassium oxide %	(k2o)	2.03

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88011 SEAM : ? TOTAL INTERVAL(M) : 65.00 – 73.32
INTERVAL(M) : 65.00 – 66.60
ELEVATION(M) : 1519.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89
DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	65.00			(0.18)												
			0.09	0.11												
			0.37	0.17	71.3	8348	52	0.69/ 0.58 1.27		1.58	79.80	5.22	13.42	0.33	5.05	—
				(0.14)												
	66.60		0.12													

GULF CANADA CORPORATION

PAGE : 2 / 2

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88011 SEAM : ? TOTAL INTERVAL(M) : 65.00 – 73.32 ELEVATION(M) : 1519.9
INTERVAL(M) : 66.60 – 73.32
GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. (1 2 3 4 5 6)	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	66.60			0.22											
				0.10											
				0.26											
				(0.25)											
				0.22											
				(1.64)	54.7	8349	53	4.19 / 1.16 5.35		1.60	72.86	8.71	17.03	0.31	5.79
				0.14											
				0.10											
				0.21											
				(0.15)											
				(0.10)											
				0.17											
				(0.15)											
				0.23											
	73.32														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	?		
Field sample no.:	08348	Composite sample no.:	52
True sample thickness:	1.266 meters	Drill core recovery (%):	71.25 %
Coal/Rock:	0.689 / 0.577 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 6.00	6.00 X 0.50	0.50 X 0.15	0.15 X 0.00
Relative weight (%):	75.86	17.86	3.76	2.52

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.56	
Ash (%):	79.80	81.06
Volatile matter (%):	5.22	5.30
Fixed carbon (%):	13.42	13.64
Total sulphur (%):	0.33	0.34
Combustible sulphur (%):	0.24	
Net calorific value (cal/g):	1207.00	1226.00
Gross calorific value (cal/g):	1207.00	1226.00
Volatile matter (dmmf%):	10.70	
Hardgrove index:	66.00	
Specific gravity:	1.81	
Carbon dioxide (%):	0.10	
Phosphorous in coal (%):	0.108	
Chlorine in coal (ppm):	448.00	

Forms of Sulphur (%): PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.30

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	14.67	14.90
Hydrogen (%):	0.95	0.97
Nitrogen (%):	0.37	0.38
Oxygen (%):	2.32	2.35

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1285.00	1172.00
Softening temperature (°C):	1451.00	1338.00
Hemispherical temperature (°C):	1472.00	1372.00
Final temperature (°C):	1472.00	1471.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	68.12	TiO2 (%):	1.04
Al2O3 (%):	20.55	Na2O (%):	0.94
Fe2O3 (%):	2.97	K2O (%):	2.69
CaO (%):	0.88	SO3 (%):	0.29
MgO (%):	1.58	P2O5 (%):	0.31

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	?		
Field sample no.:	08349	Composite sample no.:	53
True sample thickness:	5.349 meters	Drill core recovery (%):	54.61 %
Coal/Rock:	4.193 / 1.156 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 6.00	6.00 X 0.50	0.50 X 0.15	0.15 X 0.00
Relative weight (%):	79.80	14.13	3.46	2.61

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.60	
Ash (%):	72.66	73.84
Volatile matter (%):	8.71	8.85
Fixed carbon (%):	17.03	17.31
Total sulphur (%):	0.31	0.32
Combustible sulphur (%):	0.06	
Net calorific value (cal/g):	1623.00	1649.00
Gross calorific value (cal/g):	1623.00	1649.00
Volatile matter (dmmf%):	14.10	
Hardgrove index:	73.00	
Specific gravity:	1.78	
Carbon dioxide (%):	0.26	
Phosphorous in coal (%):	0.108	
Chlorine in coal (ppm):	472.00	

Forms of Sulphur (%): PYRITE 00.20 SULPHATE 00.00 ORGANIC 00.11

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	19.13	19.44
Hydrogen (%):	0.88	0.89
Nitrogen (%):	0.39	0.40
Oxygen (%):	5.03	5.11

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1148.00	1098.00
Softening temperature (°C):	1274.00	1185.00
Hemispherical temperature (°C):	1301.00	1206.00
Final temperature (°C):	1327.00	1290.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	59.16	TiO2 (%):	0.93
Al2O3 (%):	18.38	Na2O (%):	1.00
Fe2O3 (%):	9.31	K2O (%):	2.09
CaO (%):	3.64	SO3 (%):	0.85
MgO (%):	3.10	P2O5 (%):	0.34

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00052
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1301.0	initial temp.(C)	1159.0
softening temp.(C)	1438.0	softening temp.(C)	1338.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1385.0
fluid temp.(C)	1472.0	fluid temp.(C)	1471.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00052
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 01/10/88

silicon dioxide %	(sio2)	62.66
aluminium oxide %	(al2o3)	22.64
ferric oxide %	(fe2o3)	5.43
titanium dioxide %	(tio2)	1.69
phosphorous pentoxide %	(p2o5)	0.26
calcium oxide %	(cao)	1.00
magnesium oxide %	(mgo)	2.15
sulphur trioxide %	(so3)	0.45
sodium oxide %	(na2o)	0.96
potassium oxide %	(k2o)	2.30

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00052
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1338.0	initial temp.(C)	1174.0
softening temp.(C)	1472.0	softening temp.(C)	1374.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1403.0
fluid temp.(C)	1472.0	fluid temp.(C)	1471.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00052
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 01/10/88

silicon dioxide %	(sio2)	59.62
aluminium oxide %	(al2o3)	24.33
ferric oxide %	(fe2o3)	5.76
titanium dioxide %	(tio2)	1.64
phosphorous pentoxide %	(p2o5)	0.25
calcium oxide %	(cao)	1.67
magnesium oxide %	(mgo)	2.21
sulphur trioxide %	(so3)	0.73
sodium oxide %	(na2o)	1.13
potassium oxide %	(k2o)	1.98

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00053
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1159.0	initial temp.(C)	1095.0
softening temp.(C)	1380.0	softening temp.(C)	1243.0
hemispherical temp.(C)	1406.0	hemispherical temp.(C)	1319.0
fluid temp.(C)	1427.0	fluid temp.(C)	1401.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00053
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 01/10/88

silicon dioxide %	(sio2)	54.54
aluminium oxide %	(al2o3)	24.75
ferric oxide %	(fe2o3)	8.02
titanium dioxide %	(tio2)	2.12
phosphorous pentoxide %	(p2o5)	0.56
calcium oxide %	(cao)	2.29
magnesium oxide %	(mgo)	3.06
sulphur trioxide %	(so3)	1.22
sodium oxide %	(na2o)	1.17
potassium oxide %	(k2o)	1.92

90.0 <= total <= 100.0

qcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88011

sample id 00053
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AF4 | date analysed 01/10/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1187.0	initial temp.(C)	1174.0
softening temp.(C)	1432.0	softening temp.(C)	1359.0
hemispherical temp.(C)	1453.0	hemispherical temp.(C)	1388.0
fluid temp.(C)	1472.0	fluid temp.(C)	1450.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88011

sample id 00053
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AM4 | date analysed 01/10/88

silicon dioxide %	(sio2)	53.54
aluminium oxide %	(al2o3)	26.73
ferric oxide %	(fe2o3)	7.44
titanium dioxide %	(tio2)	1.91
phosphorous pentoxide %	(p2o5)	0.47
calcium oxide %	(cao)	2.04
magnesium oxide %	(mgo)	2.83
sulphur trioxide %	(so3)	1.63
sodium oxide %	(na2o)	1.18
potassium oxide %	(k2o)	1.73

90.0 <= total <= 100.0

GULF CANADA CORPORATION

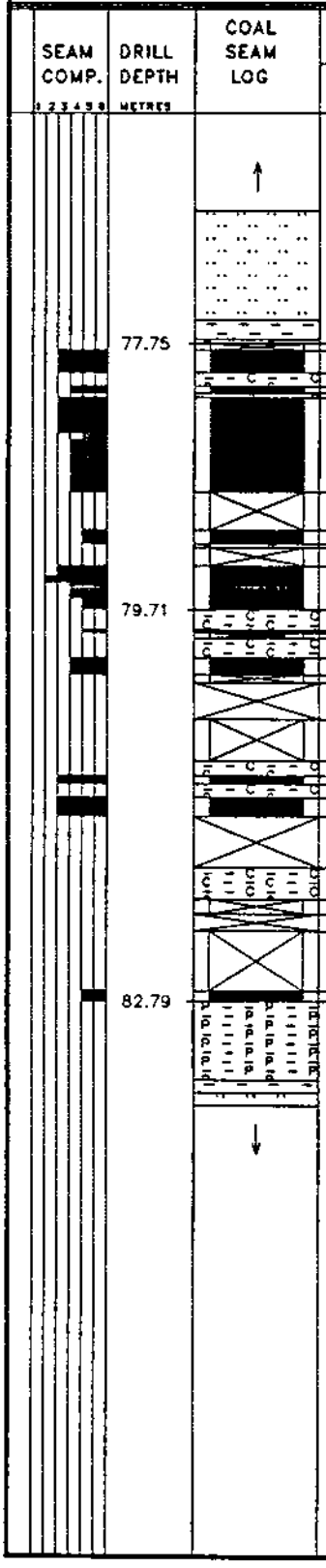
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88011 SEAM : K/L INTERVAL(M) : 77.75 – 82.79 ELEVATION(M) : 1519.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	77.75			0.14												
			0.09	0.03												
				0.61	76.1	8171	54	1.58 / 0.14	1.58 / 0.14	1.36	49.25	7.44	41.95	0.49	15.37	—
								1.72	1.72							
				(0.25)												
			0.03	0.09												
				(0.12)												
				0.29												
	79.71		0.13													
				(0.33)												
			0.13													
				0.11												
				(0.26)												
			(0.24)													
				(0.27)												
			0.10													
			0.09	0.03												
				0.12	40.2	8172	55	1.22 / 1.33		1.13	70.34	4.80	23.73	—	6.03	—
			(0.33)					2.55								
			0.20													
				(0.10)												
			(0.11)													
				(0.39)												
	82.79			0.07												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	K/L		
Field sample no.:	08171	Composite sample no.:	54
True sample thickness:	1.723 meters	Drill core recovery (%):	76.02 %
Coal/Rock:	1.581 / 0.142 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	16.81	28.99	19.10	25.52
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	5.69	3.89		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.36	
Ash (%):	49.25	49.93
Volatile matter (%):	7.44	7.54
Fixed carbon (%):	41.95	42.53
Total sulphur (%):	0.49	0.50
Combustible sulphur (%):	0.08	
Net calorific value (cal/g):	3673.00	3724.00
Gross calorific value (cal/g):	3673.00	3724.00
Volatile matter (dmmf%):	7.40	
Hardgrove index:	76.00	
Specific gravity:	1.65	
Carbon dioxide (%):	0.19	
Phosphorous in coal (%):	0.065	
Chlorine in coal (ppm):	1040.00	

Forms of Sulphur (%): PYRITE 00.14 SULPHATE 00.00 ORGANIC 00.35

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	43.21	43.81
Hydrogen (%):	1.67	1.69
Nitrogen (%):	0.68	0.69
Oxygen (%):	3.34	3.38

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1106.00	1102.00
Softening temperature (°C):	1364.00	1245.00
Hemispherical temperature (°C):	1390.00	1285.00
Final temperature (°C):	1451.00	1440.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	58.64	TiO2 (%):	1.05
Al2O3 (%):	20.79	Na2O (%):	1.38
Fe2O3 (%):	7.46	K2O (%):	1.37
CaO (%):	2.97	SO3 (%):	2.06
MgO (%):	2.91	P2O5 (%):	0.30

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00054
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1282.0	initial temp.(C)	1245.0
softening temp.(C)	1472.0	softening temp.(C)	1411.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1438.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00054
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.44
aluminium oxide %	(al2o3)	27.22
ferric oxide %	(fe2o3)	5.89
titanium dioxide %	(tio2)	1.68
phosphorous pentoxide %	(p2o5)	0.28
calcium oxide %	(cao)	1.51
magnesium oxide %	(mgo)	2.24
sulphur trioxide %	(so3)	1.02
sodium oxide %	(na2o)	1.67
potassium oxide %	(k2o)	1.20

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00054
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1348.0	initial temp.(C)	1264.0
softening temp.(C)	1472.0	softening temp.(C)	1472.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1472.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00054
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.52
aluminium oxide %	(al2o3)	29.49
ferric oxide %	(fe2o3)	5.55
titanium dioxide %	(tio2)	1.33
phosphorous pentoxide %	(p2o5)	0.30
calcium oxide %	(cao)	1.48
magnesium oxide %	(mgo)	2.16
sulphur trioxide %	(so3)	0.95
sodium oxide %	(na2o)	1.81
potassium oxide %	(k2o)	0.99

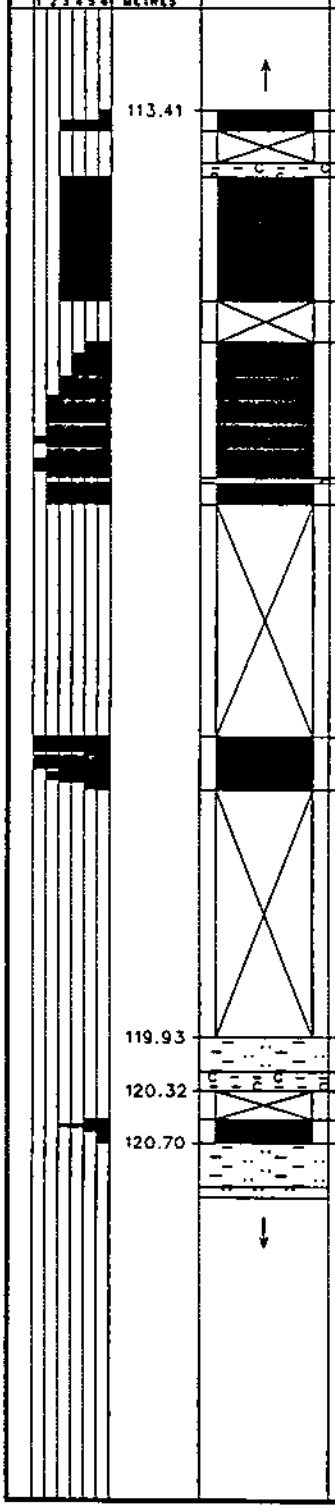
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR 00H88011 SEAM : K INTERVAL(M) : 113.41 – 120.70 ELEVATION(M) : 1519.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	113.41			0.13											
				(0.20)											
			0.09												
				0.78											
				(0.25)											
				0.84											
			0.04												
				0.14											
				(1.47)	40.1	8175	58	6.04/0.48 6.52	6.04/0.48 6.52	1.64	37.86	8.04	52.46	0.38	19.68
				0.34											
				(1.58)											
	119.93		0.22		100.0	8176									
	120.32		0.12												
				(0.19)	44.8	8177									
	120.70			0.19											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	K		
Field sample no.:	08175 - 08177	Composite sample no.:	56
True sample thickness:	6.525 meters	Drill core recovery (%):	43.34 %
Coal/Rock:	6.045 / 0.480 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	23.27	18.00	15.06	29.46
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	11.15	3.06		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.64	
Ash (%):	37.86	38.49
Volatile matter (%):	8.04	8.17
Fixed carbon (%):	52.46	53.34
Total sulphur (%):	0.38	0.39
Combustible sulphur (%):	0.07	
Net calorific value (cal/g):	4704.00	4782.00
Gross calorific value (cal/g):	4704.00	4782.00
Volatile matter (dmmf%):	8.50	
Hardgrove index:	70.00	
Specific gravity:	1.59	
Carbon dioxide (%):	0.37	
Phosphorous in coal (%):	0.086	
Chlorine in coal (ppm):	84.00	
Forms of Sulphur (%):	PYRITE 00.05 SULPHATE 00.00 ORGANIC 00.33	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	53.14	54.03
Hydrogen (%):	1.86	1.89
Nitrogen (%):	0.70	0.71
Oxygen (%):	4.42	4.49

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1116.00	1074.00
Softening temperature (°C):	1269.00	1182.00
Hemispherical temperature (°C):	1288.00	1211.00
Final temperature (°C):	1332.00	1314.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	55.80	TiO2 (%):	1.11
Al2O3 (%):	18.99	Na2O (%):	1.50
Fe2O3 (%):	10.40	K2O (%):	1.82
CaO (%):	3.15	SO3 (%):	2.08
MgO (%):	3.85	P2O5 (%):	0.52

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00056
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1127.0	initial temp.(C)	1090.0
softening temp.(C)	1309.0	softening temp.(C)	1269.0
hemispherical temp.(C)	1395.0	hemispherical temp.(C)	1317.0
fluid temp.(C)	1432.0	fluid temp.(C)	1427.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00056
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	53.92
aluminium oxide %	(al2o3)	23.37
ferric oxide %	(fe2o3)	5.97
titanium dioxide %	(tio2)	1.51
phosphorous pentoxide %	(p2o5)	1.11
calcium oxide %	(cao)	3.63
magnesium oxide %	(mgo)	2.97
sulphur trioxide %	(so3)	2.13
sodium oxide %	(na2o)	1.46
potassium oxide %	(k2o)	1.53

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00056
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1209.0	initial temp.(C)	1080.0
softening temp.(C)	1385.0	softening temp.(C)	1301.0
hemispherical temp.(C)	1446.0	hemispherical temp.(C)	1395.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00056
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.48
aluminium oxide %	(al2o3)	25.89
ferric oxide %	(fe2o3)	4.92
titanium dioxide %	(tio2)	1.36
phosphorous pentoxide %	(p2o5)	0.91
calcium oxide %	(cao)	2.98
magnesium oxide %	(mgo)	2.60
sulphur trioxide %	(so3)	1.61
sodium oxide %	(na2o)	1.43
potassium oxide %	(k2o)	1.25

90.0 <= total <= 100.0

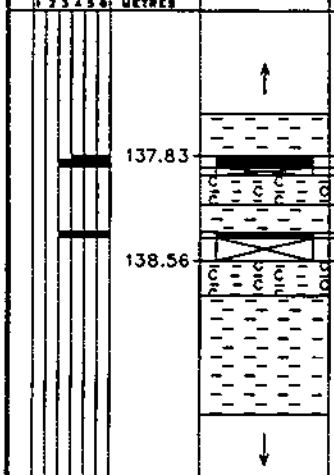
GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION, MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88011 SEAM : J INTERVAL(M) : 137.83 – 138.56 ELEVATION(M) : 1519.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	137.83			0.03 (0.03)											
			0.18												
			0.17		69.9	99999		0.31/0.35		—	—	—	—	—	—
				0.04 (0.14)				0.66							
	138.56														



GULF CANADA CORPORATION

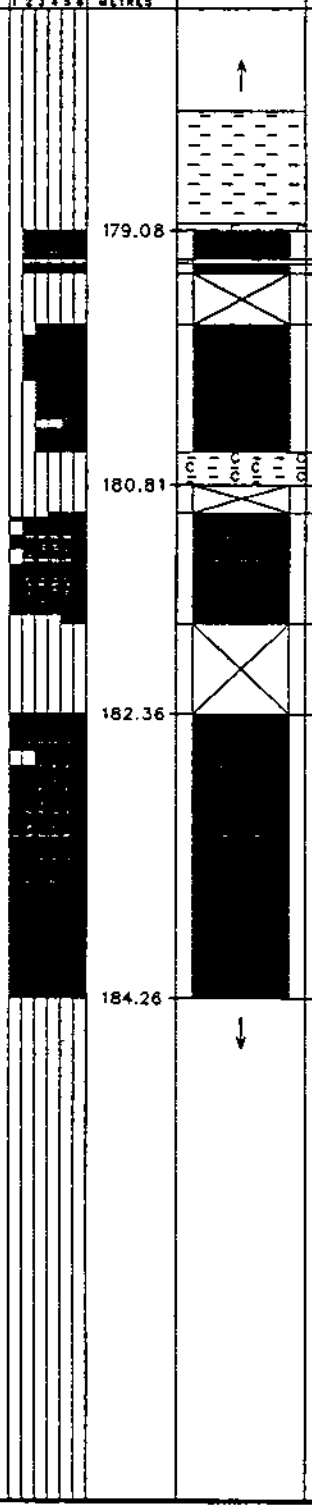
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR 0DH88011 SEAM : 1 INTERVAL(M) : 179.08 – 184.26 ELEVATION(M) : 1519.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	179.08			0.18												
			0.03	0.04												
				(0.32)												
				0.61	79.8	8160	57	1.37 / 0.23 1.60		1.44	39.17	8.92	52.47	0.33	20.76	—
			0.21													
	180.81			(0.18)												
				0.71	48.3	8161			4.65 / 0.23 4.89							
				(0.58)												
	182.36						58	3.28 / 0.00 3.28		1.44	14.98	6.93	76.64	0.43	29.29	—
				1.82	100.0	8162										
	184.26															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	I		
Field sample no.:	08180	Composite sample no.:	57
True sample thickness:	1.604 meters	Drill core recovery (%):	79.76 %
Coal/Rock:	1.370 / 0.234 meters		

RAW HEAD ANALYSIS (HDI)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	23.16	17.58	15.46	31.65	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	8.09	4.06			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.44	
Ash (%):	39.17	39.74
Volatile matter (%):	6.92	7.02
Fixed carbon (%):	52.47	53.24
Total sulphur (%):	0.33	0.33
Combustible sulphur (%):	0.01	
Net calorific value (cal/g):	4962.00	5034.00
Gross calorific value (cal/g):	4962.00	5034.00
Volatile matter (dmmf%):	6.60	
Hardgrove index:	63.00	
Specific gravity:	1.56	
Carbon dioxide (%):	0.20	
Phosphorous in coal (%):	0.022	
Chlorine in coal (ppm):	84.00	
Forms of Sulphur (%):	PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.30	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	54.74	55.54
Hydrogen (%):	2.09	2.12
Nitrogen (%):	0.73	0.74
Oxygen (%):	1.50	1.53

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1272.00	1174.00
Softening temperature (°C):	1332.00	1274.00
Hemispherical temperature (°C):	1348.00	1303.00
Final temperature (°C):	1432.00	1414.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	57.74	TiO2 (%):	0.94
Al2O3 (%):	20.79	Na2O (%):	2.16
Fe2O3 (%):	6.36	K2O (%):	1.66
CaO (%):	2.57	SO3 (%):	2.02
MgO (%):	3.55	P2O5 (%):	0.13

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	I		
Field sample no.:	08181 - 08182	Composite sample no.:	58
True sample thickness:	3.284 meters	Drill core recovery (%):	76.81 %
Coal/Rock:	3.284 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	18.55	22.12	21.09	30.07
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	5.89	2.28		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.44	
Ash (%):	14.99	15.21
Volatile matter (%):	6.93	7.03
Fixed carbon (%):	76.64	77.76
Total sulphur (%):	0.43	0.44
Combustible sulphur (%):	0.18	
Net calorific value (cal/g):	6999.00	7102.00
Gross calorific value (cal/g):	7000.00	7103.00
Volatile matter (dmmf%):	6.80	
Hardgrove index:	48.00	
Specific gravity:	1.44	
Carbon dioxide (%):	0.15	
Phosphorous in coal (%):	0.192	
Chlorine in coal (ppm):	320.00	

Forms of Sulphur (%): PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.40

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	77.42	78.55
Hydrogen (%):	2.49	2.53
Nitrogen (%):	0.94	0.95
Oxygen (%):	2.29	2.32

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1193.00	1119.00
Softening temperature (°C):	1261.00	1177.00
Hemispherical temperature (°C):	1274.00	1198.00
Final temperature (°C):	1306.00	1301.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	43.90	TiO2 (%):	1.35
Al2O3 (%):	21.38	Na2O (%):	1.77
Fe2O3 (%):	10.50	K2O (%):	1.25
CaO (%):	6.63	SO3 (%):	4.16
MgO (%):	3.83	P2O5 (%):	2.94

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00057
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1227.0	initial temp.(C)	1119.0
softening temp.(C)	1472.0	softening temp.(C)	1332.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1414.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00057
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide	%	(sio2)	56.50
aluminium oxide	%	(al2o3)	26.01
ferric oxide	%	(fe2o3)	5.35
titanium dioxide	%	(tio2)	1.03
phosphorous pentoxide	%	(p2o5)	0.21
calcium oxide	%	(cao)	1.77
magnesium oxide	%	(mgo)	3.26
sulphur trioxide	%	(so3)	1.50
sodium oxide	%	(na2o)	2.29
potassium oxide	%	(k2o)	1.75

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00057
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1285.0	initial temp.(C)	1122.0
softening temp.(C)	1446.0	softening temp.(C)	1377.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1417.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00057
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	57.36
aluminium oxide %	(al2o3)	26.10
ferric oxide %	(fe2o3)	4.04
titanium dioxide %	(tio2)	0.96
phosphorous pentoxide %	(p2o5)	0.25
calcium oxide %	(cao)	2.20
magnesium oxide %	(mgo)	2.47
sulphur trioxide %	(so3)	1.43
sodium oxide %	(na2o)	1.97
potassium oxide %	(k2o)	1.59

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00058
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1259.0	initial temp.(C)	1148.0
softening temp.(C)	1301.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1309.0	hemispherical temp.(C)	1274.0
fluid temp.(C)	1335.0	fluid temp.(C)	1327.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00058
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide	%	(sio2)	42.76
aluminium oxide	%	(al2o3)	20.90
ferric oxide	%	(fe2o3)	5.18
titanium dioxide	%	(tio2)	0.79
phosphorous pentoxide	%	(p2o5)	2.24
calcium oxide	%	(cao)	7.66
magnesium oxide	%	(mgo)	3.48
sulphur trioxide	%	(so3)	5.08
sodium oxide	%	(na2o)	1.48
potassium oxide	%	(k2o)	1.15

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00058
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1269.0	initial temp.(C)	1130.0
softening temp.(C)	1311.0	softening temp.(C)	1290.0
hemispherical temp.(C)	1317.0	hemispherical temp.(C)	1306.0
fluid temp.(C)	1356.0	fluid temp.(C)	1345.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00058
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	50.54
aluminium oxide %	(al2o3)	24.33
ferric oxide %	(fe2o3)	4.48
titanium dioxide %	(tio2)	0.78
phosphorous pentoxide %	(p2o5)	2.62
calcium oxide %	(cao)	7.34
magnesium oxide %	(mgo)	2.94
sulphur trioxide %	(so3)	2.87
sodium oxide %	(na2o)	1.63
potassium oxide %	(k2o)	1.43

90.0 <= total <= 100.0

GULF CANADA CORPORATION

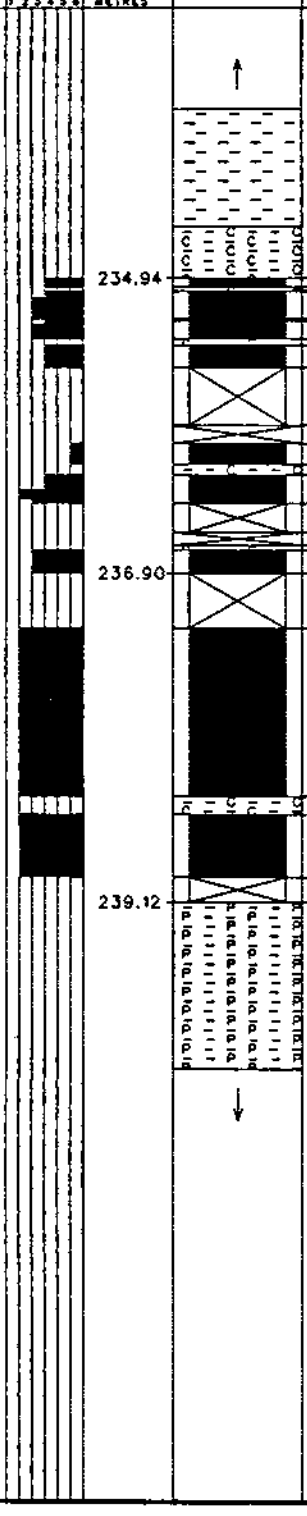
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN ER DDH88011 SEAM : H INTERVAL(M) : 234.94 – 239.12 ELEVATION(M) : 1519.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP.	DRILL DEPTH METRES	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	234.94		0.17												
			0.11												
			0.14												
			(0.36)												
				60.2	8185	59	1.49 / 0.37 1.86		1.81	43.34	7.30	47.35	0.28	17.98	—
			0.13												
			0.18												
			(0.18)												
			0.13												
	236.90		(0.35)					3.48 / 0.48 3.94							
			1.06	75.8	8186	60	1.97 / 0.11 2.08		1.88	26.48	—	64.90	0.37	24.75	—
			0.40												
	239.12		(0.14)												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	H		
Field sample no.:	08185	Composite sample no.:	59
True sample thickness:	1.861 meters	Drill core recovery (%):	60.20 %
Coal/Rock:	1.491 / 0.370 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	9.70	17.37	16.30	37.73	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	11.30	7.60			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.81	
Ash (%):	43.34	44.14
Volatile matter (%):	7.50	7.64
Fixed carbon (%):	47.35	48.22
Total sulphur (%):	0.28	0.29
Combustible sulphur (%):	0.28	
Net calorific value (cal/g):	4297.00	4376.00
Gross calorific value (cal/g):	4297.00	4376.00
Volatile matter (dmmf%):	7.70	
Hardgrove index:	90.00	
Specific gravity:	1.61	
Carbon dioxide (%):	0.35	
Phosphorous in coal (%):	0.148	
Chlorine in coal (ppm):	136.00	
Forms of Sulphur (%):	PYRITE 00.04 SULPHATE 00.00 ORGANIC 00.24	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	48.06	48.94
Hydrogen (%):	1.84	1.87
Nitrogen (%):	0.57	0.58
Oxygen (%):	4.10	4.18

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1248.00	1172.00
Softening temperature (°C):	1259.00	1185.00
Hemispherical temperature (°C):	1269.00	1200.00
Final temperature (°C):	1306.00	1303.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	57.08	TiO2 (%):	1.20
Al2O3 (%):	18.15	Na2O (%):	1.53
Fe2O3 (%):	6.55	K2O (%):	0.96
CaO (%):	4.48	SO3 (%):	3.25
MgO (%):	3.32	P2O5 (%):	0.78

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88011
Coal zone:	H		
Field sample no.:	08186	Composite sample no.:	60
True sample thickness:	2.084 meters	Drill core recovery (%):	75.67 %
Coal/Rock:	1.972 / 0.112 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	12.00	12.38	14.42	42.24
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	10.51	8.45		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.88	
Ash (%):	26.49	27.00
Fixed carbon (%):	64.90	73.00
Total sulphur (%):	0.37	0.38
Combustible sulphur (%):	0.10	
Net calorific value (cal/g):	5915.00	6029.00
Gross calorific value (cal/g):	5915.00	6029.00
Volatile matter (dmmf%):	6.50	
Hardgrove index:	63.00	
Carbon dioxide (%):	0.75	
Phosphorous in coal (%):	0.217	
Chlorine in coal (ppm):	152.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.35

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	66.04	67.31
Hydrogen (%):	2.08	2.12
Nitrogen (%):	0.75	0.76
Oxygen (%):	2.39	2.43

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1243.00	1206.00
Softening temperature (°C):	1290.00	1224.00
Hemispherical temperature (°C):	1301.00	1240.00
Final temperature (°C):	1327.00	1325.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	50.50	TiO2 (%):	1.38
Al2O3 (%):	20.79	Na2O (%):	2.66
Fe2O3 (%):	6.72	K2O (%):	0.60
CaO (%):	7.25	SO3 (%):	2.55
MgO (%):	3.56	P2O5 (%):	1.88

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00059
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1240.0	initial temp.(C)	1185.0
softening temp.(C)	1401.0	softening temp.(C)	1290.0
hemispherical temp.(C)	1443.0	hemispherical temp.(C)	1338.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00059
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	59.60
aluminium oxide %	(al2o3)	21.55
ferric oxide %	(fe2o3)	4.75
titanium dioxide %	(tio2)	1.36
phosphorous pentoxide %	(p2o5)	0.53
calcium oxide %	(cao)	2.60
magnesium oxide %	(mgo)	2.47
sulphur trioxide %	(so3)	1.80
sodium oxide %	(na2o)	1.73
potassium oxide %	(k2o)	0.93

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00059
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1290.0	initial temp.(C)	1259.0
softening temp.(C)	1472.0	softening temp.(C)	1395.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1472.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00059
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	58.88
aluminium oxide %	(al2o3)	23.44
ferric oxide %	(fe2o3)	3.86
titanium dioxide %	(tio2)	1.52
phosphorous pentoxide %	(p2o5)	0.52
calcium oxide %	(cao)	1.71
magnesium oxide %	(mgo)	1.98
sulphur trioxide %	(so3)	2.64
sodium oxide %	(na2o)	1.56
potassium oxide %	(k2o)	0.61

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00060
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1301.0	initial temp.(C)	1232.0
softening temp.(C)	1327.0	softening temp.(C)	1256.0
hemispherical temp.(C)	1367.0	hemispherical temp.(C)	1295.0
fluid temp.(C)	1427.0	fluid temp.(C)	1424.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00060
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	51.84
aluminium oxide %	(al2o3)	23.06
ferric oxide %	(fe2o3)	5.32
titanium dioxide %	(tio2)	1.65
phosphorous pentoxide %	(p2o5)	1.49
calcium oxide %	(cao)	4.70
magnesium oxide %	(mgo)	3.08
sulphur trioxide %	(so3)	3.57
sodium oxide %	(na2o)	2.20
potassium oxide %	(k2o)	0.55

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88011

sample id 00060
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1301.0	initial temp.(C)	1285.0
softening temp.(C)	1411.0	softening temp.(C)	1343.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1401.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88011

sample id 00060
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide	%	(sio2)	52.62
aluminium oxide	%	(al2o3)	24.95
ferric oxide	%	(fe2o3)	4.43
titanium dioxide	%	(tio2)	1.23
phosphorous pentoxide	%	(p2o5)	1.34
calcium oxide	%	(cao)	3.22
magnesium oxide	%	(mgo)	2.54
sulphur trioxide	%	(so3)	3.43
sodium oxide	%	(na2o)	1.87
potassium oxide	%	(k2o)	0.44

90.0 <= total <= 100.0

KPNLRDDH88012

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88012 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/23/88
END DATE - 06/25/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MATTHEWS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SEAMS INTERSECTED: I, K/L?, K, J, I, I(OVT).

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1654.96
ZONE - 9
NORTHING - 6343219.55
EASTING - 506484.41

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571402
LONGITUDE - 1285333

- O R I E N T A T I O N -

LENGTH - 175.04
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-012

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
I	4.92 m
K/L ?/K	2.12 m/2.75 m
J	0.57 m
I	3.60 m
I ovt.	5.40 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88012										
	I ROOF	8147	4.51	4.62	100.00		0.098			0.000- 0.098
	I	8148	4.62	10.26	29.79	1.135	0.332	3.321	0.129	4.456- 0.461
	I FLOOR	8149	10.26	10.64	100.00		0.325			0.000- 0.325
	K/L ? ROOF	8151	22.63	22.91	100.00		0.233			0.000- 0.233
	K/L ?	8152	22.91	27.71	21.46	0.757	0.119	2.466	0.715	3.223- 0.834
	K ROOF	8153	27.71	30.10	92.47		1.912		0.157	0.000- 2.069
	K	8154	30.10	31.79	66.86	0.963	0.045	0.382	0.128	1.345- 0.173
	K	8155	31.79	32.12	100.00		0.303			0.000- 0.303
	K	8156	32.12	33.12	9.00	0.083		0.847		0.930- 0.000
	K FLOOR	8157	33.12	33.91	100.00		0.732			0.000- 0.732
	I ROOF	8158	95.32	95.70	68.42		0.241		0.111	0.000- 0.352
	I	8159	95.70	99.58	46.39	1.559	0.130	1.910		3.469- 0.130
	I FLOOR	8160	99.58	100.49	100.00		0.844			0.000- 0.844
	I OVT FLOOR	8161	160.97	161.73	100.00		0.552			0.000- 0.552
	I OVT	8162	161.73	164.18	39.59	0.719		1.081		1.800- 0.000
	I OVT	8163	164.18	166.09	100.00	1.395	0.053			1.395- 0.053
	I OVT	8164	166.09	166.59	100.00		0.387			0.000- 0.387
	I OVT	8165	166.59	168.80	61.09	1.022	0.048	0.691		1.713- 0.048
	I OVT ROOF	8166	168.80	169.36	100.00		0.454			0.000- 0.454
	J	99999	62.30	62.93	0.00			0.566		0.566- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL	TOTAL ROCK
DDH88012													
	I	62	8148	8148	4.62	10.26	29.78	1.30	0.38	3.81	0.15	5.11	0.53
	K/L ?	63	8152	8152	22.91	27.71	21.45	0.89	0.14	2.92	0.85	3.81	0.99
	K	64	8154	8154	30.10	31.79	66.86	1.08	0.05	0.42	0.14	1.50	0.19
	K	65	8155	8155	31.79	32.12	100.00	0.00	0.33	0.00	0.00	0.00	0.33
	K	66	8156	8156	32.12	33.12	9.00	0.09	0.00	0.91	0.00	1.00	0.00
	I	67	8159	8159	95.70	99.58	46.39	1.66	0.14	2.08	0.00	3.74	0.14
	I OVT	68	8162	8163	161.73	166.09	66.05	2.81	0.07	1.48	0.00	4.29	0.07
	I OVT	69	8164	8164	166.09	166.59	100.00	0.00	0.50	0.00	0.00	0.00	0.50
	I OVT	70	8165	8165	166.59	168.80	61.08	1.29	0.06	0.86	0.00	2.15	0.06
	I	235	8148	8148	4.62	10.26	29.78	1.30	0.38	3.81	0.15	5.11	0.53
	K	236	8154	8154	30.10	31.79	66.86	1.08	0.05	0.42	0.14	1.50	0.19
	I ovt	237	8162	8163	161.73	166.09	66.05	2.81	0.07	1.48	0.00	4.29	0.07
	I ovt	238	8165	8165	166.59	168.80	61.08	1.29	0.06	0.86	0.00	2.15	0.06
	I	331	8148	8148	4.62	10.26	29.78	1.30	0.38	3.81	0.15	5.11	0.53
	K	332	8154	8154	30.10	31.79	66.86	1.08	0.05	0.42	0.14	1.50	0.19
	I ovt	333	8162	8165	161.73	168.80	64.38	4.10	0.13	2.34	0.00	6.44	0.13

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

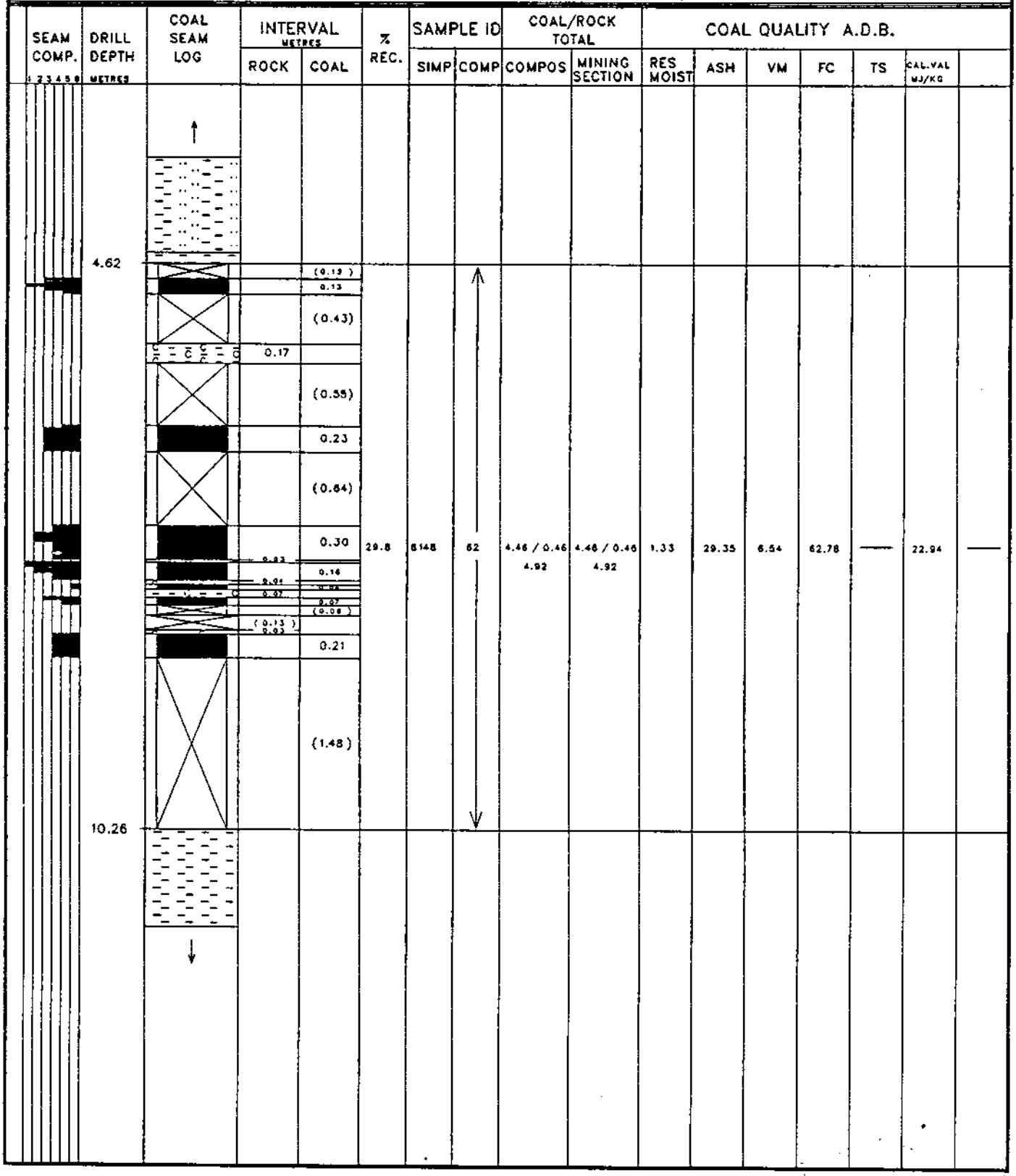
GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88012 SEAM : 1 INTERVAL(M) : 4.62 – 10.26 ELEVATION(M) : 1655.0

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	4.62			(0.13)												
				0.13												
				(0.43)												
			0.17													
				(0.55)												
				0.23												
				(0.64)												
				0.30	29.8	6148	62	4.46 / 0.46 4.92	4.46 / 0.46 4.92	1.33	29.35	6.54	62.78	—	22.94	—
			0.03													
				0.16												
			0.01													
			0.07													
				0.07												
				(0.08)												
			(0.13) 0.03													
				0.21												
				(1.48)												
	10.26															

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88012 SEAM : K/L ? INTERVAL(M) : 22.91 – 27.71 ELEVATION(M) : 1655.0

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	22.91			(0.62)	21.6	8152	83	3.22 / 0.83 4.06	1.89 / 0.24 2.12	1.00	33.65	11.67	53.48	—	20.22
			(0.13)												
				(0.41)											
			(0.38)												
				(0.31)											
			(0.09)												
				(0.15)											
			0.02	0.14											
				0.37											
			0.10												
				0.25											
				(0.55)											
			(0.13)												
	27.71			(0.43)											

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88012 SEAM : K INTERVAL(M) : 30.10 – 33.12 ELEVATION(M) : 1655.0

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	30.10			0.38												
			0.03													
				0.22												
			0.03	(0.04)												
				0.23	66.4	8154	64	1.35 / 0.17		1.28	31.52	7.84	59.36	—	19.58	—
				(0.15)				1.52								
				0.14												
				(0.20)					2.27 / 0.48							
	31.79		(0.13)						2.75							
			0.30		100.0	8155	65	0.00/ 0.30		1.42	90.67	6.53	1.38	—	0.73	—
	32.12			0.09				0.30								
				(0.85)	8.9	8156	66	0.93/ 0.00		—	—	—	—	—	—	—
								0.93								
	33.12			0.03												

GULF CANADA CORPORATION

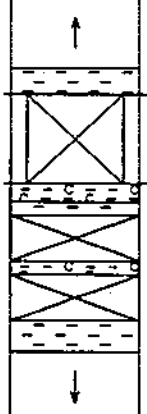
COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88012 SEAM : J INTERVAL(M) : 62.30 – 62.93 ELEVATION(M) : 1655.0

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	62.30			(0.57)	0.0	99999		0.57 / 0.00 0.57		—	—	—	—	—	—	—
	62.93															



GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR 00H88012 SEAM : 1 INTERVAL(M) : 95.70 – 99.58 ELEVATION(M) : 1655.0

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	95.70			(0.12)												
				0.20												
				(0.42)												
				0.26												
			0.11													
			0.03	0.17												
				0.32												
				(1.39)	46.4	8159	87	3.47 / 0.13 3.60	3.47 / 0.13 3.60	1.13	30.88	5.37	82.82	—	21.24	—
				0.59												
	99.58															

GULF CANADA CORPORATION

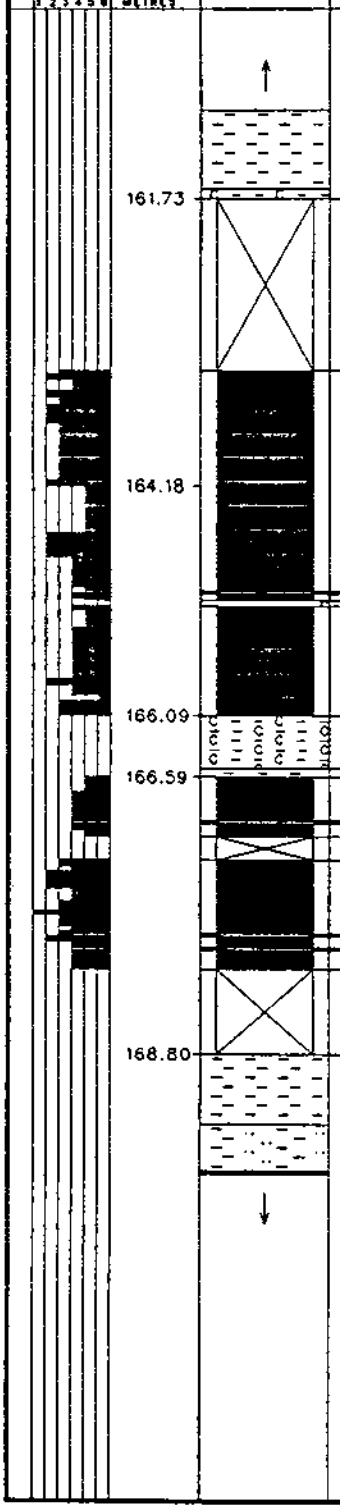
COAL DIVISION

MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88012 SEAM : 1 OVT INTERVAL(M) : 161.73 – 168.80 ELEVATION(M) : 1655.0

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	161.73			(1.08)	39.9	8162	68	3.19 / 0.05 3.25		1.07	15.26	5.55	78.10	0.46	28.91
	164.18			1.38											
			0.02 0.93	0.05	100.0	8163			4.91 / 0.49 5.40						
				0.69											
	166.09		0.33		100.0	8164	69	0.00 / 0.39 0.38		1.54	67.02	7.21	24.23	—	8.60
	166.59			0.27	60.8	8165	70	1.71 / 0.05 1.76		1.29	24.10	5.30	69.31	0.40	25.44
			0.02	0.05											
				(0.15)											
				0.47											
			0.03 0.02	0.07 0.12											
				(0.54)											
	168.80														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88012
Coal zone:	I OVT		
Field sample no.:	08162 - 08163	Composite sample no.:	68
True sample thickness:	3.248 meters	Drill core recovery (%):	66.05 %
Coal/Rock:	3.195 / 0.053 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	10.25	11.40	19.47	46.22
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	9.52	3.14		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.07	
Ash (%):	15.28	15.45
Volatile matter (%):	5.55	5.61
Fixed carbon (%):	78.10	78.94
Total sulphur (%):	0.46	0.46
Combustible sulphur (%):	0.09	
Net calorific value (cal/g):	6909.00	6984.00
Gross calorific value (cal/g):	6909.00	6984.00
Volatile matter (dmmf%):	5.10	
Hardgrove index:	54.00	
Specific gravity:	1.45	
Carbon dioxide (%):	0.20	
Phosphorous in coal (%):	0.108	
Chlorine in coal (ppm):	465.00	
Forms of Sulphur (%):	PYRITE 00.01 SULPHATE 00.00 ORGANIC 00.45	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	76.96	77.79
Hydrogen (%):	2.30	2.32
Nitrogen (%):	0.84	0.85
Oxygen (%):	3.09	3.13

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1095.00	1066.00
Softening temperature (°C):	1264.00	1232.00
Hemispherical temperature (°C):	1274.00	1238.00
Final temperature (°C):	1282.00	1253.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	48.24	TiO2 (%):	1.01
Al2O3 (%):	20.45	Na2O (%):	1.59
Fe2O3 (%):	6.61	K2O (%):	1.64
CaO (%):	7.02	SO3 (%):	6.13
MgO (%):	4.47	P2O5 (%):	1.62

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88012
Coal zone:	I OVT		
Field sample no.:	08165	Composite sample no.:	70
True sample thickness:	1.761 meters	Drill core recovery(%):	61.08 %
Coal/Rock:	1.713 / 0.048 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight(%):	25.40	17.52	14.76	32.37	
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight(%):	7.00	2.95			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.29	
Ash(%):	24.10	24.42
Volatile matter(%):	5.30	5.37
Fixed carbon(%):	69.31	70.21
Total sulphur(%):	0.40	0.41
Combustible sulphur(%):	0.10	
Net calorific value(cal/g):	6080.00	6160.00
Gross calorific value(cal/g):	6080.00	6160.00
Volatile matter(dmmf%):	4.50	
Hardgrove index:	54.00	
Specific gravity:	1.51	
Carbon dioxide(%):	0.31	
Phosphorous in coal(%):	0.026	
Chlorine in coal(ppm):	560.00	
Forms of Sulphur(%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.38	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	67.39	68.27
Hydrogen(%):	1.99	2.02
Nitrogen(%):	0.76	0.77
Oxygen(%):	4.07	4.11

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1227.00	1143.00
Softening temperature(°C):	1282.00	1238.00
Hemispherical temperature(°C):	1298.00	1243.00
Final temperature(°C):	1348.00	1317.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	59.54	TiO2(%):	0.85
Al2O3(%):	20.17	Na2O(%):	1.50
Fe2O3(%):	5.57	K2O(%):	1.77
CaO(%):	3.72	SO3(%):	3.07
MgO(%):	3.53	P2O5(%):	0.25

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88012

sample id 00068
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1145.0	initial temp.(C)	1111.0
softening temp.(C)	1269.0	softening temp.(C)	1235.0
hemispherical temp.(C)	1277.0	hemispherical temp.(C)	1238.0
fluid temp.(C)	1288.0	fluid temp.(C)	1261.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88012

sample id 00068
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide	%	(sio2)	46.19
aluminium oxide	%	(al2o3)	21.08
ferric oxide	%	(fe2o3)	7.25
titanium dioxide	%	(tio2)	0.81
phosphorous pentoxide	%	(p2o5)	2.72
calcium oxide	%	(cao)	8.92
magnesium oxide	%	(mgo)	4.87
sulphur trioxide	%	(so3)	4.97
sodium oxide	%	(na2o)	0.91
potassium oxide	%	(k2o)	1.49

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88012

sample id 00068
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AF4 | date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1127.0	initial temp.(C)	1118.0
softening temp.(C)	1290.0	softening temp.(C)	1266.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1274.0
fluid temp.(C)	1301.0	fluid temp.(C)	1295.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88012

sample id 00068
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AM4 | date analysed 31/07/88

silicon dioxide %	(sio2)	47.88
aluminium oxide %	(al2o3)	24.57
ferric oxide %	(fe2o3)	5.77
titanium dioxide %	(tio2)	0.73
phosphorous pentoxide %	(p2o5)	2.85
calcium oxide %	(cao)	6.61
magnesium oxide %	(mgo)	3.80
sulphur trioxide %	(so3)	3.02
sodium oxide %	(na2o)	1.26
potassium oxide %	(k2o)	1.75

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88012

sample id 00070
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1201.0	initial temp.(C)	1156.0
softening temp.(C)	1280.0	softening temp.(C)	1240.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1253.0
fluid temp.(C)	1332.0	fluid temp.(C)	1319.0

normal ranges all temps.
1000.0)= values <= 1500.0
oxidation temps)= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88012

sample id 00070
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	59.38
aluminium oxide %	(al2o3)	20.01
ferric oxide %	(fe2o3)	6.57
titanium dioxide %	(tio2)	0.77
phosphorous pentoxide %	(p2o5)	0.30
calcium oxide %	(cao)	3.65
magnesium oxide %	(mgo)	3.59
sulphur trioxide %	(so3)	2.81
sodium oxide %	(na2o)	1.20
potassium oxide %	(k2o)	1.43

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88012

sample id 00070
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1203.0	initial temp.(C)	1201.0
softening temp.(C)	1301.0	softening temp.(C)	1274.0
hemispherical temp.(C)	1348.0	hemispherical temp.(C)	1285.0
fluid temp.(C)	1393.0	fluid temp.(C)	1353.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88012

sample id 00070
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	60.08
aluminium oxide %	(al2o3)	21.27
ferric oxide %	(fe2o3)	5.08
titanium dioxide %	(tio2)	0.67
phosphorous pentoxide %	(p2o5)	0.32
calcium oxide %	(cao)	3.40
magnesium oxide %	(mgo)	3.06
sulphur trioxide %	(so3)	2.61
sodium oxide %	(na2o)	1.24
potassium oxide %	(k2o)	1.49

90.0 <= total <= 100.0

KPNLRDDH88013

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88013 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/24/88
END DATE - 06/27/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MURRAY
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTS L, K/L, K, J, I, AND H. BCA AVERAGE 80 DEGREES THROUGHOUT.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1557.42
ZONE - 9
NORTHING - 6344116.66
EASTING - 507700.10

LICENCE/LEASE NUMBER - 7145

LATITUDE - 571431
LONGITUDE - 1285221

- O R I E N T A T I O N -

LENGTH - 223.50
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-013

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
L	2.60 m
K/L	1.04 m
K	4.25 m
J	0.50 m
I	4.33 m
H	4.86 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88013										
	L ROOF	8188	18.35	18.80	100.00		0.435			0.000- 0.435
	L	8189	18.80	21.45	72.45	1.750	0.137	0.710		2.460- 0.137
	L FLOOR	8190	21.45	22.57	89.29		0.996		0.119	0.000- 1.115
	K/L ROOF	8191	37.22	37.62	100.00		0.394			0.000- 0.394
	K/L	8192	37.62	38.68	82.08	0.806	0.049	0.187		0.993- 0.049
	K ROOF	8193	38.68	95.62	100.00		2.144			0.000- 2.144
	K	8194	95.62	99.16	76.84	2.410	0.191	0.651	0.134	3.061- 0.325
	K	8195	99.16	100.09	100.00	0.009	0.873			0.009- 0.873
	K	8196	100.09	101.00	87.91	0.669	0.085	0.103		0.772- 0.085
	K FLOOR	8197	101.00	101.52	100.00		0.489			0.000- 0.489
	J ROOF	8198	126.08	126.77	100.00		0.683			0.000- 0.683
	J	8199	126.77	127.28	100.00	0.503				0.503- 0.000
	J FLOOR	8200	127.28	127.66	100.00		0.373			0.000- 0.373
	I ROOF	8201	160.86	161.29	100.00		0.416			0.000- 0.416
	I	8202	161.29	164.47	83.96	2.491	0.107	0.500		2.991- 0.107
	I	8203	164.47	165.73	100.00	1.236				1.236- 0.000
	I FLOOR	8204	165.73	165.87	100.00		0.138			0.000- 0.138
	H ROOF	8205	207.38	208.40	100.00		1.016			0.000- 1.016
	H	8206	208.40	209.93	90.85	1.240	0.150	0.140		1.380- 0.150
	H	8207	209.93	211.48	100.00	1.137	0.376			1.137- 0.376
	H	8208	211.48	213.37	70.37	1.189	0.095	0.536		1.725- 0.095
	H FLOOR	8209	213.37	213.69	100.00		0.301			0.000- 0.301
		10352	159.35	159.45	100.00		0.099			0.000- 0.099
		10353	190.22	190.25	100.00		0.030			0.000- 0.030

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88013												
	L	71	8189	8189	18.80	21.45	72.45	1.78	0.14	0.73	0.00	2.51- 0.14
	K/L	72	8192	8192	37.62	38.68	82.07	0.82	0.05	0.19	0.00	1.01- 0.05
	K	73	8194	8194	95.62	99.16	76.83	2.52	0.20	0.68	0.14	3.20- 0.34
	K	74	8195	8195	99.16	100.09	100.00	0.01	0.92	0.00	0.00	0.01- 0.92
	K	75	8196	8196	100.09	101.00	87.91	0.71	0.09	0.11	0.00	0.82- 0.09
	J	76	8199	8199	126.77	127.28	100.00	0.51	0.00	0.00	0.00	0.51- 0.00
	I	77	8202	8202	161.29	164.47	83.96	2.56	0.11	0.51	0.00	3.07- 0.11
	I	78	8203	8203	164.47	165.73	100.00	1.26	0.00	0.00	0.00	1.26- 0.00
	H	79	8206	8207	208.40	211.48	95.45	2.41	0.53	0.14	0.00	2.55- 0.53
	H	80	8208	8208	211.48	213.37	70.37	1.23	0.10	0.56	0.00	1.79- 0.10
	L	239	8189	8189	18.80	21.45	72.45	1.78	0.14	0.73	0.00	2.51- 0.14
	K/L	240	8192	8192	37.62	38.68	82.07	0.82	0.05	0.19	0.00	1.01- 0.05
	K	241	8194	8194	95.62	99.16	76.83	2.52	0.20	0.68	0.14	3.20- 0.34
	K	242	8196	8196	100.09	101.00	87.91	0.71	0.09	0.11	0.00	0.82- 0.09
	J	243	8199	8199	126.77	127.28	100.00	0.51	0.00	0.00	0.00	0.51- 0.00
	I	244	8202	8202	161.29	164.47	83.96	2.56	0.11	0.51	0.00	3.07- 0.11
	I	245	8203	8203	164.47	165.73	100.00	1.26	0.00	0.00	0.00	1.26- 0.00
	H	246	8206	8207	208.40	211.48	95.45	2.41	0.53	0.14	0.00	2.55- 0.53
	H	247	8208	8208	211.48	213.37	70.37	1.23	0.10	0.56	0.00	1.79- 0.10
	L	334	8189	8189	18.80	21.45	72.45	1.78	0.14	0.73	0.00	2.51- 0.14
	K/L	335	8192	8192	37.62	38.68	82.07	0.82	0.05	0.19	0.00	1.01- 0.05
	K	336	8194	8196	95.62	101.00	79.10	3.23	0.29	0.79	0.14	4.02- 0.43
	J	337	8199	8199	126.77	127.28	100.00	0.51	0.00	0.00	0.00	0.51- 0.00
	I	338	8202	8203	161.29	165.73	88.51	3.82	0.11	0.51	0.00	4.33- 0.11
	H	339	8206	8208	208.40	213.37	85.91	3.64	0.63	0.70	0.00	4.34- 0.63

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

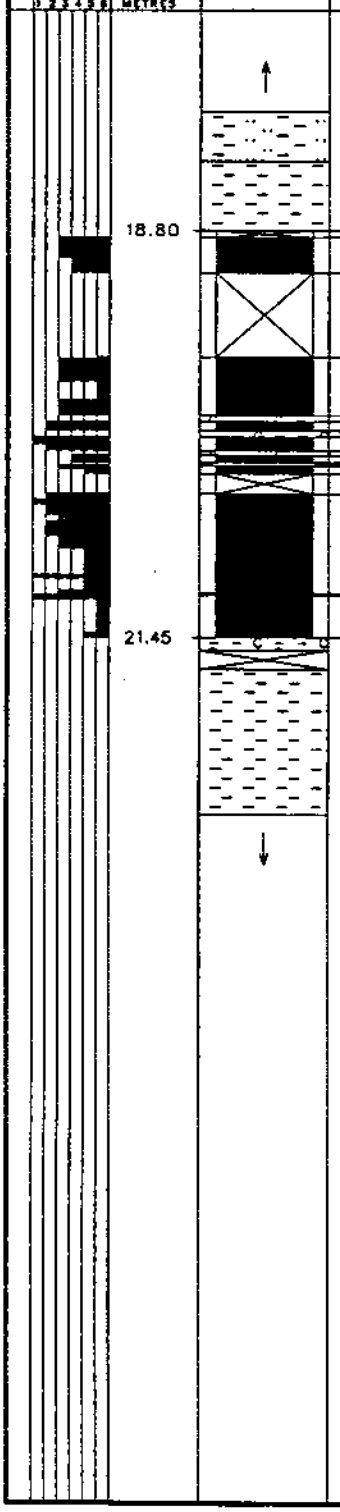
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88013 SEAM : L INTERVAL(M) : 18.80 – 21.45 ELEVATION(M) : 1557.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
1 2 3 4 5 6	18.80			0.22											
				(0.53)											
				0.37											
			0.04	0.04	72.7	8189	71	2.48 / 0.14	2.48 / 0.14	1.31	41.51	9.84	47.34	0.35	17.90
			0.04	0.04				2.60	2.60						
			0.09	0.09											
			0.03	[illegible]											
			0.03	[illegible]											
				(0.13)											
				0.64											
			0.01												
				0.27											
	21.45														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	L		
Field sample no.:	08189	Composite sample no.:	71
True sample thickness:	2.597 meters	Drill core recovery (%):	72.45 %
Coal/Rock:	2.460 / 0.137 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	32.35	27.10	16.39	19.37
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.01	1.78		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.31	
Ash (%):	41.51	42.06
Volatile matter (%):	9.84	9.97
Fixed carbon (%):	47.34	47.97
Total sulphur (%):	0.35	0.35
Combustible sulphur (%):	0.03	
Net calorific value (cal/g):	4278.00	4335.00
Gross calorific value (cal/g):	4278.00	4335.00
Volatile matter (dmmf%):	11.90	
Hardgrove index:	58.00	
Specific gravity:	1.61	
Carbon dioxide (%):	0.36	
Phosphorous in coal (%):	0.134	
Chlorine in coal (ppm):	176.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.33

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	49.04	49.69
Hydrogen (%):	1.54	1.56
Nitrogen (%):	0.62	0.63
Oxygen (%):	5.63	5.71

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1195.00	1077.00
Softening temperature (°C):	1235.00	1182.00
Hemispherical temperature (°C):	1240.00	1195.00
Final temperature (°C):	1301.00	1243.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	52.56	TiO2 (%):	0.85
Al2O3 (%):	15.91	Na2O (%):	1.53
Fe2O3 (%):	10.00	K2O (%):	1.03
CaO (%):	9.26	SO3 (%):	1.90
MgO (%):	5.46	P2O5 (%):	0.74

qcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88013

sample id 00071
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1130.0	initial temp.(C)	1085.0
softening temp.(C)	1293.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1301.0	hemispherical temp.(C)	1240.0
fluid temp.(C)	1353.0	fluid temp.(C)	1309.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88013

sample id 00071
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	53.20
aluminium oxide %	(al2o3)	22.06
ferric oxide %	(fe2o3)	7.73
titanium dioxide %	(tio2)	1.19
phosphorous pentoxide %	(p2o5)	0.82
calcium oxide %	(cao)	5.37
magnesium oxide %	(mgo)	3.43
sulphur trioxide %	(so3)	3.05
sodium oxide %	(na2o)	2.02
potassium oxide %	(k2o)	1.08

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00071
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1185.0	initial temp.(C)	1119.0
softening temp.(C)	1314.0	softening temp.(C)	1274.0
hemispherical temp.(C)	1330.0	hemispherical temp.(C)	1288.0
fluid temp.(C)	1380.0	fluid temp.(C)	1348.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00071
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	56.02
aluminium oxide %	(al2o3)	22.55
ferric oxide %	(fe2o3)	5.54
titanium dioxide %	(tio2)	0.94
phosphorous pentoxide %	(p2o5)	0.80
calcium oxide %	(cao)	5.40
magnesium oxide %	(mgo)	2.65
sulphur trioxide %	(so3)	1.93
sodium oxide %	(na2o)	2.19
potassium oxide %	(k2o)	1.21

90.0 <= total <= 100.0

GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88013 SEAM : K/L INTERVAL(M) : 37.62 - 38.68 ELEVATION(M) : 1557.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	37.62			0.44											
				(0.19)	82.1	8192	72	0.99/ 0.05	0.99/ 0.05	1.50	51.03	6.92	40.55	0.43	15.35
			0.83					1.04	1.04						
				0.36											
	38.68														

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	K/L		
Field sample no.:	08192	Composite sample no.:	72
True sample thickness:	1.042 meters	Drill core recovery (%):	82.07 %
Coal/Rock:	0.993 / 0.049 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	36.66	31.24	13.96	14.66
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	2.31	1.17		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.50	
Ash (%):	51.03	51.81
Volatile matter (%):	6.92	7.03
Fixed carbon (%):	40.55	41.16
Total sulphur (%):	0.43	0.44
Combustible sulphur (%):	0.09	
Net calorific value (cal/g):	3669.00	3724.00
Gross calorific value (cal/g):	3669.00	3724.00
Volatile matter (dmmf%):	6.20	
Hardgrove index:	58.00	
Specific gravity:	1.66	
Carbon dioxide (%):	0.18	
Phosphorous in coal (%):	0.149	
Chlorine in coal (ppm):	128.00	

Forms of Sulphur (%): PYRITE 00.31 SULPHATE 00.00 ORGANIC 00.12

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	42.20	42.84
Hydrogen (%):	1.51	1.53
Nitrogen (%):	0.58	0.59
Oxygen (%):	2.75	2.79

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1295.00	1227.00
Softening temperature (°C):	1311.00	1245.00
Hemispherical temperature (°C):	1332.00	1274.00
Final temperature (°C):	1424.00	1361.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	59.28	TiO2 (%):	1.12
Al2O3 (%):	20.75	Na2O (%):	1.86
Fe2O3 (%):	5.19	K2O (%):	2.18
CaO (%):	3.72	SO3 (%):	1.65
MgO (%):	2.46	P2O5 (%):	0.67

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00072
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1251.0	initial temp.(C)	1238.0
softening temp.(C)	1380.0	softening temp.(C)	1301.0
hemispherical temp.(C)	1422.0	hemispherical temp.(C)	1351.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00072
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.66
aluminium oxide %	(al2o3)	25.54
ferric oxide %	(fe2o3)	4.47
titanium dioxide %	(tio2)	1.35
phosphorous pentoxide %	(p2o5)	0.79
calcium oxide %	(cao)	3.09
magnesium oxide %	(mgo)	2.52
sulphur trioxide %	(so3)	1.30
sodium oxide %	(na2o)	1.95
potassium oxide %	(k2o)	2.40

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00072
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1232.0	initial temp.(C)	1228.0
softening temp.(C)	1414.0	softening temp.(C)	1309.0
hemispherical temp.(C)	1427.0	hemispherical temp.(C)	1374.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00072
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.16
aluminium oxide %	(al2o3)	26.03
ferric oxide %	(fe2o3)	4.04
titanium dioxide %	(tio2)	1.15
phosphorous pentoxide %	(p2o5)	0.84
calcium oxide %	(cao)	2.97
magnesium oxide %	(mgo)	2.00
sulphur trioxide %	(so3)	1.16
sodium oxide %	(na2o)	2.21
potassium oxide %	(k2o)	2.45

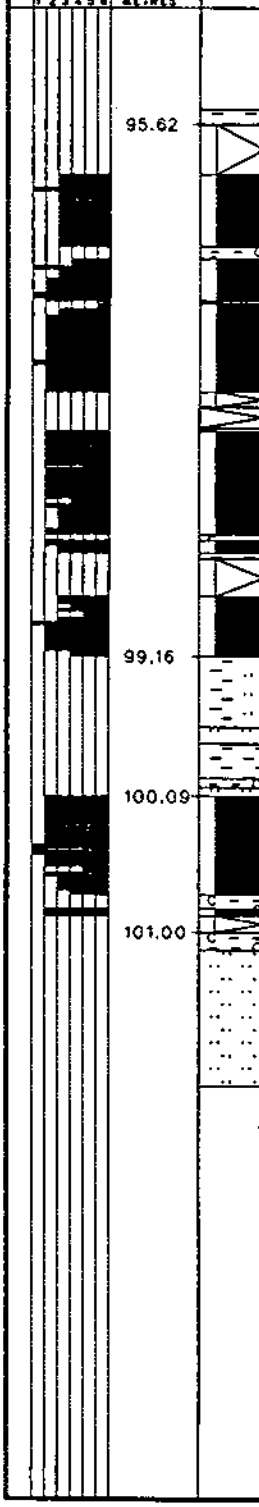
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88013 SEAM : K INTERVAL(M) : 95.62 – 101.00 ELEVATION(M) : 1557.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	95.62			(0.32)												
				0.46												
			0.08													
				0.27												
			0.02													
				0.57												
				(0.10)	76.8	8194	73	3.06/ 0.33	3.06/ 0.33	0.93	32.94	7.40	58.73	0.39	22.17	—
			(0.13)					3.39	3.39							
			0.02													
				0.66												
			0.04													
			0.04	0.08												
				(0.24)												
				0.38												
	99.16		0.45													
			0.10		100.0	8195	74	0.00/ 0.87		1.19	84.63	13.12	1.06	—	0.49	—
			0.22					0.88								
			0.04													
	100.09		0.04													
				0.62												
			0.08		88.0	8196	75	0.77/ 0.09	0.77/ 0.09	1.38	38.85	5.50	56.27	0.61	21.03	—
	101.00			(0.10)				0.86	0.86							

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	K		
Field sample no.:	08194	Composite sample no.:	73
True sample thickness:	3.386 meters	Drill core recovery (%):	76.83 %
Coal/Rock:	3.061 / 0.325 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	40.37	25.58	12.86	16.91	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	2.76	1.52			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.93	
Ash (%):	32.94	33.25
Volatile matter (%):	7.40	7.47
Fixed carbon (%):	58.73	59.28
Total sulphur (%):	0.39	0.39
Combustible sulphur (%):	0.06	
Net calorific value (cal/g):	5299.00	5348.00
Gross calorific value (cal/g):	5299.00	5348.00
Volatile matter (dmmf%):	7.30	
Hardgrove index:	54.00	
Specific gravity:	1.56	
Carbon dioxide (%):	0.20	
Phosphorous in coal (%):	0.509	
Chlorine in coal (ppm):	384.00	

Forms of Sulphur (%): PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.36

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	58.32	58.87
Hydrogen (%):	1.91	1.93
Nitrogen (%):	0.81	0.82
Oxygen (%):	4.70	4.74

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1169.00	1108.00
Softening temperature (°C):	1282.00	1248.00
Hemispherical temperature (°C):	1290.00	1259.00
Final temperature (°C):	1306.00	1295.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	49.32	TiO2 (%):	0.98
Al2O3 (%):	22.20	Na2O (%):	1.35
Fe2O3 (%):	6.36	K2O (%):	1.34
CaO (%):	8.04	SO3 (%):	2.53
MgO (%):	3.64	P2O5 (%):	3.54

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	K		
Field sample no.:	08196	Composite sample no.:	75
True sample thickness:	0.857 meters	Drill core recovery (%):	87.91 %
Coal/Rock:	0.772 / 0.085 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	23.01	21.50	16.81	31.68
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	4.71	2.29		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.38	
Ash (%):	36.85	37.37
Volatile matter (%):	5.50	5.58
Fixed carbon (%):	56.27	57.05
Total sulphur (%):	0.81	0.82
Combustible sulphur (%):	0.65	
Net calorific value (cal/g):	5026.00	5097.00
Gross calorific value (cal/g):	5026.00	5097.00
Volatile matter (dmmf%):	3.90	
Hardgrove index:	62.00	
Specific gravity:	1.57	
Carbon dioxide (%):	0.45	
Phosphorous in coal (%):	0.024	
Chlorine in coal (ppm):	80.00	
Forms of Sulphur (%):	PYRITE 00.33 SULPHATE 00.01 ORGANIC 00.47	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	56.87	57.67
Hydrogen (%):	1.76	1.78
Nitrogen (%):	0.79	0.80
Oxygen (%):	1.54	1.56

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1245.00	1090.00
Softening temperature (°C):	1472.00	1348.00
Hemispherical temperature (°C):	1472.00	1385.00
Final temperature (°C):	1472.00	1472.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	58.58	TiO2 (%):	1.34
Al2O3 (%):	24.95	Na2O (%):	1.70
Fe2O3 (%):	4.47	K2O (%):	2.56
CaO (%):	1.18	SO3 (%):	1.08
MgO (%):	2.19	P2O5 (%):	0.15

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00073
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1274.0	initial temp.(C)	1132.0
softening temp.(C)	1288.0	softening temp.(C)	1245.0
hemispherical temp.(C)	1301.0	hemispherical temp.(C)	1261.0
fluid temp.(C)	1332.0	fluid temp.(C)	1328.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00073
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	51.02
aluminium oxide %	(al2o3)	24.25
ferric oxide %	(fe2o3)	5.87
titanium dioxide %	(tio2)	0.86
phosphorous pentoxide %	(p2o5)	2.34
calcium oxide %	(cao)	6.00
magnesium oxide %	(mgo)	2.94
sulphur trioxide %	(so3)	1.84
sodium oxide %	(na2o)	1.67
potassium oxide %	(k2o)	1.52

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00075
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1140.0	initial temp.(C)	1103.0
softening temp.(C)	1472.0	softening temp.(C)	1453.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1472.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00075
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	53.66
aluminium oxide %	(al2o3)	30.13
ferric oxide %	(fe2o3)	5.05
titanium dioxide %	(tio2)	1.51
phosphorous pentoxide %	(p2o5)	0.18
calcium oxide %	(cao)	0.86
magnesium oxide %	(mgo)	3.26
sulphur trioxide %	(so3)	0.60
sodium oxide %	(na2o)	1.32
potassium oxide %	(k2o)	2.18

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00075
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1130.0	initial temp.(C)	1108.0
softening temp.(C)	1472.0	softening temp.(C)	1453.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1472.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00075
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	52.22
aluminium oxide %	(al2o3)	30.95
ferric oxide %	(fe2o3)	4.95
titanium dioxide %	(tio2)	1.19
phosphorous pentoxide %	(p2o5)	0.16
calcium oxide %	(cao)	0.99
magnesium oxide %	(mgo)	2.93
sulphur trioxide %	(so3)	0.68
sodium oxide %	(na2o)	1.55
potassium oxide %	(k2o)	2.26

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88013 SEAM : J INTERVAL(M) : 126.77 – 127.28 ELEVATION(M) : 1557.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	126.77			0.50	100.0	8199	78	0.50/ 0.00 0.50	0.50/ 0.00 0.50	0.64	46.68	8.18	46.50	0.54	16.75	—
	127.28															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	J		
Field sample no.:	08199	Composite sample no.:	76
True sample thickness:	0.503 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	0.503 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	49.41	19.95	12.24	15.10
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	2.28	1.02		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.64	
Ash (%):	46.68	46.98
Volatile matter (%):	6.18	6.22
Fixed carbon (%):	46.50	46.80
Total sulphur (%):	0.54	0.54
Combustible sulphur (%):	0.28	
Net calorific value (cal/g):	4003.00	4029.00
Gross calorific value (cal/g):	4003.00	4029.00
Volatile matter (dmmf%):	4.60	
Hardgrove index:	56.00	
Specific gravity:	1.63	
Carbon dioxide (%):	0.35	
Phosphorous in coal (%):	0.108	
Chlorine in coal (ppm):	840.00	

Forms of Sulphur (%): PYRITE 00.19 SULPHATE 00.00 ORGANIC 00.35

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	47.82	48.13
Hydrogen (%):	1.77	1.78
Nitrogen (%):	0.62	0.62
Oxygen (%):	1.93	1.95

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1248.00	1127.00
Softening temperature (°C):	1351.00	1259.00
Hemispherical temperature (°C):	1364.00	1285.00
Final temperature (°C):	1443.00	1419.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	67.46	TiO2 (%):	0.83
Al2O3 (%):	16.30	Na2O (%):	1.37
Fe2O3 (%):	3.84	K2O (%):	2.54
CaO (%):	2.24	SO3 (%):	1.41
MgO (%):	2.13	P2O5 (%):	0.53

qcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00076
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1259.0	initial temp.(C)	1119.0
softening temp.(C)	1290.0	softening temp.(C)	1224.0
hemispherical temp.(C)	1301.0	hemispherical temp.(C)	1243.0
fluid temp.(C)	1353.0	fluid temp.(C)	1311.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00076
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.08
aluminium oxide %	(al2o3)	17.14
ferric oxide %	(fe2o3)	6.25
titanium dioxide %	(tio2)	0.89
phosphorous pentoxide %	(p2o5)	1.80
calcium oxide %	(cao)	7.13
magnesium oxide %	(mgo)	4.16
sulphur trioxide %	(so3)	3.33
sodium oxide %	(na2o)	0.91
potassium oxide %	(k2o)	2.04

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00076
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1206.0	initial temp.(C)	1161.0
softening temp.(C)	1266.0	softening temp.(C)	1227.0
hemispherical temp.(C)	1274.0	hemispherical temp.(C)	1238.0
fluid temp.(C)	1369.0	fluid temp.(C)	1298.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00076
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	56.34
aluminium oxide %	(al2o3)	19.25
ferric oxide %	(fe2o3)	5.67
titanium dioxide %	(tio2)	0.79
phosphorous pentoxide %	(p2o5)	1.59
calcium oxide %	(cao)	6.41
magnesium oxide %	(mgo)	3.60
sulphur trioxide %	(so3)	2.12
sodium oxide %	(na2o)	1.16
potassium oxide %	(k2o)	2.30

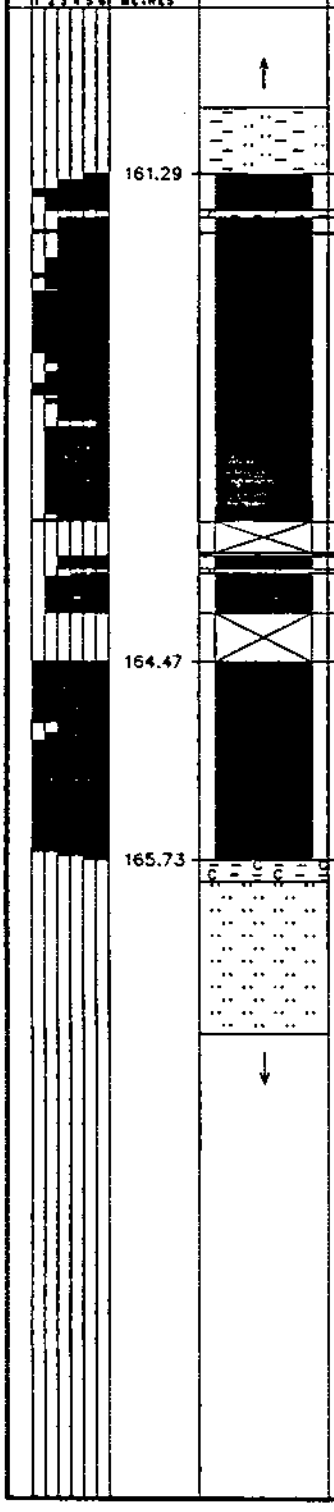
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR 00H88013 SEAM : 1 INTERVAL(M) : 161.29 – 165.73 ELEVATION(M) : 1557.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP.	DRILL DEPTH METRES	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	161.29		0.23											
			0.10											
			1.83	83.8	8202	77	2.98 / 0.11 3.10		0.52	18.44	6.81	74.23	0.40	28.13
			(0.20)					4.23 / 0.11 4.33						
			0.26											
			(0.30)											
	164.47		1.24	100.0	8203	78	1.24 / 0.00 1.24		0.42	11.99	6.88	80.71	0.53	30.50
	165.73													

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	I		
Field sample no.:	08202	Composite sample no.:	77
True sample thickness:	3.098 meters	Drill core recovery (%):	83.96 %
Coal/Rock:	2.991 / 0.107 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	26.22	22.81	15.49	28.24
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	5.05	2.19		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.52	
Ash (%):	18.44	18.54
Volatile matter (%):	6.81	6.85
Fixed carbon (%):	74.23	74.61
Total sulphur (%):	0.40	0.40
Combustible sulphur (%):	0.16	
Net calorific value (cal/g):	6722.00	6757.00
Gross calorific value (cal/g):	6723.00	6758.00
Volatile matter (dmmf%):	6.60	
Hardgrove index:	54.00	
Specific gravity:	1.46	
Carbon dioxide (%):	0.22	
Phosphorous in coal (%):	0.019	
Chlorine in coal (ppm):	56.00	
Forms of Sulphur (%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.38	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	75.14	75.53
Hydrogen (%):	2.51	2.52
Nitrogen (%):	0.89	0.89
Oxygen (%):	2.10	2.12

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1153.00	1148.00
Softening temperature (°C):	1264.00	1224.00
Hemispherical temperature (°C):	1272.00	1232.00
Final temperature (°C):	1351.00	1295.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	56.66	TiO2 (%):	1.12
Al2O3 (%):	20.17	Na2O (%):	1.90
Fe2O3 (%):	6.53	K2O (%):	1.51
CaO (%):	4.44	SO3 (%):	3.29
MgO (%):	3.73	P2O5 (%):	0.23

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	I		
Field sample no.:	08203	Composite sample no.:	78
True sample thickness:	1.236 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	1.236 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	30.65	21.81	15.35	25.67	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	4.26	2.26			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.42	
Ash (%):	11.99	12.04
Volatile matter (%):	6.88	6.91
Fixed carbon (%):	80.71	81.05
Total sulphur (%):	0.53	0.53
Combustible sulphur (%):	0.39	
Net calorific value (cal/g):	7289.00	7319.00
Gross calorific value (cal/g):	7290.00	7320.00
Volatile matter (dmmf%):	6.70	
Hardgrove index:	43.00	
Specific gravity:	1.43	
Carbon dioxide (%):	0.12	
Phosphorous in coal (%):	0.227	
Chlorine in coal (ppm):	72.00	
Forms of Sulphur (%):	PYRITE 00.10 SULPHATE 00.00 ORGANIC 00.43	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	79.96	80.30
Hydrogen (%):	2.64	2.65
Nitrogen (%):	0.89	0.89
Oxygen (%):	3.57	3.59

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1201.00	1095.00
Softening temperature (°C):	1242.00	1148.00
Hemispherical temperature (°C):	1251.00	1156.00
Final temperature (°C):	1269.00	1211.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	38.70	TiO2 (%):	1.31
Al2O3 (%):	20.45	Na2O (%):	1.49
Fe2O3 (%):	14.69	K2O (%):	1.34
CaO (%):	7.39	SO3 (%):	2.98
MgO (%):	4.57	P2O5 (%):	4.34

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00077
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 01/08/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1172.0	initial temp.(C)	1159.0
softening temp.(C)	1317.0	softening temp.(C)	1269.0
hemispherical temp.(C)	1364.0	hemispherical temp.(C)	1285.0
fluid temp.(C)	1411.0	fluid temp.(C)	1356.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

trans-code 3

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00077
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 01/08/88

silicon dioxide %	(sio2)	54.32
aluminium oxide %	(al2o3)	23.75
ferric oxide %	(fe2o3)	7.31
titanium dioxide %	(tio2)	0.78
phosphorous pentoxide %	(p2o5)	0.29
calcium oxide %	(cao)	3.31
magnesium oxide %	(mgo)	3.57
sulphur trioxide %	(so3)	2.19
sodium oxide %	(na2o)	1.44
potassium oxide %	(k2o)	1.44

90.0 <= total <= 100.0

trans-code 3

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00077
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1227.0	initial temp.(C)	1164.0
softening temp.(C)	1330.0	softening temp.(C)	1274.0
hemispherical temp.(C)	1390.0	hemispherical temp.(C)	1295.0
fluid temp.(C)	1422.0	fluid temp.(C)	1374.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00077
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.26
aluminium oxide %	(al2o3)	25.01
ferric oxide %	(fe2o3)	7.15
titanium dioxide %	(tio2)	0.70
phosphorous pentoxide %	(p2o5)	0.27
calcium oxide %	(cao)	2.99
magnesium oxide %	(mgo)	3.39
sulphur trioxide %	(so3)	2.01
sodium oxide %	(na2o)	1.39
potassium oxide %	(k2o)	1.46

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00078
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1206.0	initial temp.(C)	1116.0
softening temp.(C)	1264.0	softening temp.(C)	1240.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1319.0	fluid temp.(C)	1290.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00078
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	35.68
aluminium oxide %	(al2o3)	24.55
ferric oxide %	(fe2o3)	8.61
titanium dioxide %	(tio2)	1.43
phosphorous pentoxide %	(p2o5)	4.91
calcium oxide %	(cao)	9.75
magnesium oxide %	(mgo)	4.32
sulphur trioxide %	(so3)	3.38
sodium oxide %	(na2o)	1.38
potassium oxide %	(k2o)	1.24

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00078
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1211.0	initial temp.(C)	1127.0
softening temp.(C)	1288.0	softening temp.(C)	1219.0
hemispherical temp.(C)	1298.0	hemispherical temp.(C)	1253.0
fluid temp.(C)	1322.0	fluid temp.(C)	1285.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00078
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	40.88
aluminium oxide %	(al2o3)	24.95
ferric oxide %	(fe2o3)	7.77
titanium dioxide %	(tio2)	1.04
phosphorous pentoxide %	(p2o5)	4.31
calcium oxide %	(cao)	8.55
magnesium oxide %	(mgo)	3.36
sulphur trioxide %	(so3)	2.37
sodium oxide %	(na2o)	1.49
potassium oxide %	(k2o)	1.31

90.0 <= total <= 100.0

GULF CANADA CORPORATION

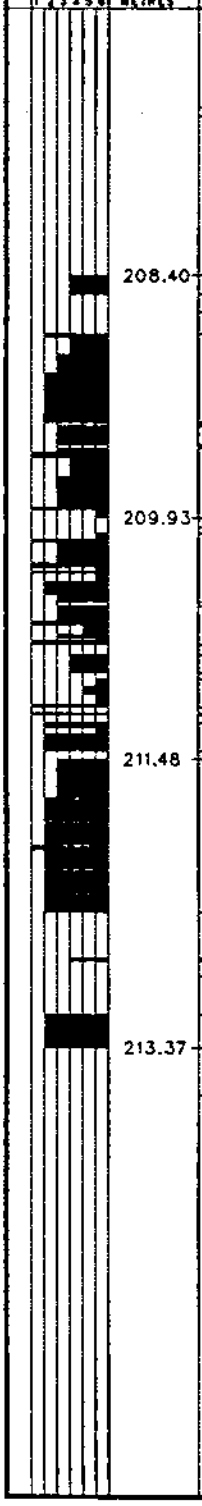
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88013 SEAM : H INTERVAL(M) : 208.40 – 213.37 ELEVATION(M) : 1557.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	208.40			0.12												
			0.11	(0.14)												
				0.56	90.8	8208										
			0.02	0.12												
			0.02	0.44												
	209.93		0.48				79	2.52 / 0.53		1.44	42.75	6.89	48.92	0.57	17.86	—
				0.42				3.04								
			0.43	0.24	108.0	8207										
			0.07	0.14					4.24 / 0.62							
			0.04	0.18					4.86							
			0.01	0.18												
	211.48		0.08													
				0.96												
				(0.29)	70.5	8208	80	1.73 / 0.10		1.37	28.10	8.01	64.52	0.37	24.68	—
			0.02					1.82								
			0.10	(0.25)												
				0.21												
	213.37															

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	H		
Field sample no.:	08206 - 08207	Composite sample no.:	79
True sample thickness:	3.043 meters	Drill core recovery (%):	95.45 %
Coal/Rock:	2.517 / 0.526 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	36.00	29.22	14.05	16.78
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	2.59	1.36		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.44	
Ash (%):	42.75	43.37
Volatile matter (%):	6.89	6.99
Fixed carbon (%):	48.92	49.64
Total sulphur (%):	0.57	0.58
Combustible sulphur (%):	0.31	
Net calorific value (cal/g):	4221.00	4282.00
Gross calorific value (cal/g):	4221.00	4282.00
Volatile matter (dmmf%):	6.30	
Hardgrove index:	61.00	
Specific gravity:	1.63	
Carbon dioxide (%):	0.35	
Phosphorous in coal (%):	0.075	
Chlorine in coal (ppm):	128.00	
Forms of Sulphur (%):	PYRITE 00.10 SULPHATE 00.00 ORGANIC 00.47	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	48.71	49.42
Hydrogen (%):	1.76	1.79
Nitrogen (%):	0.56	0.57
Oxygen (%):	4.21	4.27

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1174.00	1103.00
Softening temperature (°C):	1301.00	1248.00
Hemispherical temperature (°C):	1330.00	1269.00
Final temperature (°C):	1406.00	1353.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	63.18	TiO2 (%):	0.97
Al2O3 (%):	19.85	Na2O (%):	2.11
Fe2O3 (%):	4.32	K2O (%):	1.24
CaO (%):	3.20	SO3 (%):	1.50
MgO (%):	2.64	P2O5 (%):	0.40

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88013
Coal zone:	H		
Field sample no.:	08208	Composite sample no.:	80
True sample thickness:	1.820 meters	Drill core recovery (%):	70.37 %
Coal/Rock:	1.725 / 0.095 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.15
Relative weight (%):	24.29	16.39	17.37	33.49
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	5.27	3.19		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.37	
Ash (%):	26.10	26.46
Volatile matter (%):	8.01	8.12
Fixed carbon (%):	64.52	65.42
Total sulphur (%):	0.37	0.38
Combustible sulphur (%):	0.13	
Net calorific value (cal/g):	5899.00	5981.00
Gross calorific value (cal/g):	5899.00	5981.00
Volatile matter (dmmf%):	8.30	
Hardgrove index:	50.00	
Specific gravity:	1.52	
Carbon dioxide (%):	0.32	
Phosphorous in coal (%):	0.179	
Chlorine in coal (ppm):	136.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.35

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	63.90	64.79
Hydrogen (%):	2.19	2.22
Nitrogen (%):	0.70	0.71
Oxygen (%):	5.37	5.44

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1232.00	1159.00
Softening temperature (°C):	1261.00	1211.00
Hemispherical temperature (°C):	1266.00	1224.00
Final temperature (°C):	1306.00	1301.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	46.12	TiO2 (%):	1.30
Al2O3 (%):	21.90	Na2O (%):	2.28
Fe2O3 (%):	6.83	K2O (%):	0.92
CaO (%):	9.58	SO3 (%):	2.29
MgO (%):	4.28	P2O5 (%):	1.57

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00079
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1180.0	initial temp.(C)	1153.0
softening temp.(C)	1343.0	softening temp.(C)	1293.0
hemispherical temp.(C)	1395.0	hemispherical temp.(C)	1330.0
fluid temp.(C)	1472.0	fluid temp.(C)	1453.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00079
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.28
aluminium oxide %	(al2o3)	25.03
ferric oxide %	(fe2o3)	4.96
titanium dioxide %	(tio2)	1.12
phosphorous pentoxide %	(p2o5)	0.46
calcium oxide %	(cao)	3.17
magnesium oxide %	(mgo)	2.96
sulphur trioxide %	(so3)	1.87
sodium oxide %	(na2o)	1.99
potassium oxide %	(k2o)	1.40

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00079
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1211.0	initial temp.(C)	1106.0
softening temp.(C)	1422.0	softening temp.(C)	1348.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1380.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00079
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	56.04
aluminium oxide %	(al2o3)	26.16
ferric oxide %	(fe2o3)	4.92
titanium dioxide %	(tio2)	0.97
phosphorous pentoxide %	(p2o5)	0.48
calcium oxide %	(cao)	2.98
magnesium oxide %	(mgo)	2.84
sulphur trioxide %	(so3)	1.26
sodium oxide %	(na2o)	1.88
potassium oxide %	(k2o)	1.36

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88013

sample id 00080
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1238.0	initial temp.(C)	1214.0
softening temp.(C)	1277.0	softening temp.(C)	1238.0
hemispherical temp.(C)	1285.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1324.0	fluid temp.(C)	1318.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88013

sample id 00080
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	49.15
aluminium oxide %	(al2o3)	22.22
ferric oxide %	(fe2o3)	6.14
titanium dioxide %	(tio2)	1.13
phosphorous pentoxide %	(p2o5)	1.71
calcium oxide %	(cao)	7.03
magnesium oxide %	(mgo)	3.83
sulphur trioxide %	(so3)	4.96
sodium oxide %	(na2o)	1.85
potassium oxide %	(k2o)	0.81

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88013

sample id 00080
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1277.0	initial temp.(C)	1224.0
softening temp.(C)	1285.0	softening temp.(C)	1245.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1364.0	fluid temp.(C)	1360.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88013

sample id 00080
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	52.09
aluminium oxide %	(al2o3)	24.70
ferric oxide %	(fe2o3)	5.88
titanium dioxide %	(tio2)	0.87
phosphorous pentoxide %	(p2o5)	1.87
calcium oxide %	(cao)	5.69
magnesium oxide %	(mgo)	3.24
sulphur trioxide %	(so3)	1.17
sodium oxide %	(na2o)	1.67
potassium oxide %	(k2o)	0.76

90.0 <= total <= 100.0

KPNLRDDH88014

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88014 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/26/88
END DATE - 06/27/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - KRAUS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED SEAMS: K, J, I, H.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1670.31
ZONE - 9
NORTHING - 6343257.67
EASTING - 506380.31

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571403
LONGITUDE - 1285340

- O R I E N T A T I O N -

LENGTH - 130.60
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-014

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
K	2.25 m
I	3.17 m
H	1.78 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88014										
	I ROOF	8210	77.88	78.51	100.00		0.556			0.000- 0.556
	I	8211	78.51	80.04	80.39	1.167		0.284		1.451- 0.000
	I	8212	80.04	80.22	100.00		0.177			0.000- 0.177
	I	8213	80.22	81.82	84.37	1.307	0.020	0.245		1.552- 0.020
	I FLOOR	8214	81.82	81.93	100.00		0.108			0.000- 0.108
	H ROOF	8215	118.35	118.67	100.00		0.304			0.000- 0.304
	H	8216	118.67	119.07	85.00	0.085	0.237	0.057		0.142- 0.237
	H	8217	119.07	120.95	74.47	1.186	0.131	0.451		1.637- 0.131
	H FLOOR	8218	120.95	122.78	100.00		1.697			0.000- 1.697
		10351	70.17	70.25	100.00		0.074			0.000- 0.074
	J	99998	48.04	48.62	12.07	0.057		0.380	0.041	0.437- 0.041
	K?	99999	29.47	31.85	7.98	0.141	0.038	1.995	0.076	2.136- 0.114

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88014												
	I	81	8211	8212	78.51	80.22	82.45	1.23	0.18	0.30	0.00	1.53- 0.18
	I	82	8213	8213	80.22	81.82	84.37	1.33	0.02	0.25	0.00	1.58- 0.02
	H	83	8216	8216	118.67	119.07	85.00	0.09	0.25	0.06	0.00	0.15- 0.25
	H	84	8217	8217	119.07	120.95	74.46	1.26	0.14	0.48	0.00	1.74- 0.14
	I	248	8211	8212	78.51	80.22	82.45	1.23	0.18	0.30	0.00	1.53- 0.18
	I	249	8213	8213	80.22	81.82	84.37	1.33	0.02	0.25	0.00	1.58- 0.02
	H	250	8217	8217	119.07	120.95	74.46	1.26	0.14	0.48	0.00	1.74- 0.14
	I	340	8211	8213	78.51	81.82	83.38	2.56	0.20	0.55	0.00	3.11- 0.20
	H	341	8217	8217	119.07	120.95	74.46	1.26	0.14	0.48	0.00	1.74- 0.14

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

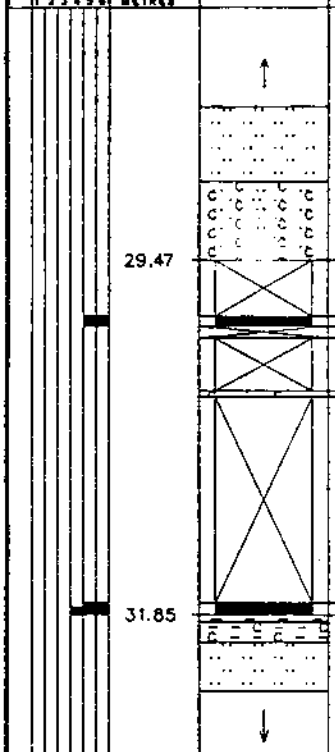
GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88014 SEAM : K INTERVAL(M) : 29.47 – 31.85 ELEVATION(M) : 1670.3

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	29.47			(0.36)												
				0.07												
			0.04													
				(0.33)												
			0.04													
					8.0	99999			2.14 / 0.11 2.25	—	—	—	—	—	—	—
				(1.11)												
	31.85			0.08												

GULF CANADA CORPORATION

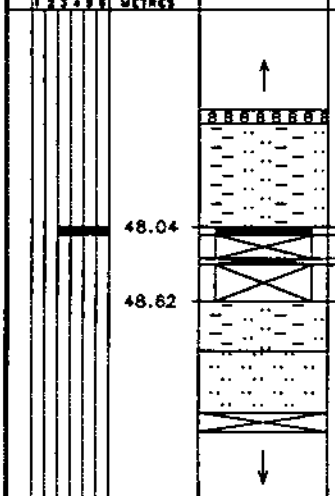
COAL DIVISION

MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88014 | SEAM : J | INTERVAL(M) : 48.04 – 48.62 | ELEVATION(M) : 1670.3

GEOLOGIST : KRAUS | SCALE: 1:40 | DATE : FEB 07/89 | DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	48.04			(0.15)	11.9	99998		0.44 / 0.04		—	—	—	—	—	—	—
	48.62			(0.23)				0.48								

GULF CANADA CORPORATION

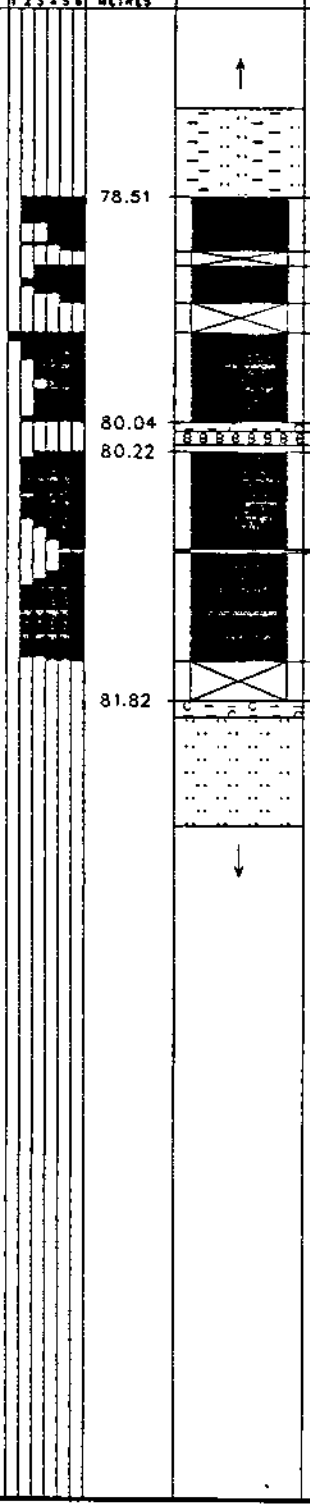
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88014 SEAM : 1 INTERVAL(M) : 78.51 - 81.82 ELEVATION(M) : 1670.3

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	78.51		0.35											
			(0.09)											
			0.23											
			(0.19)	80.3	8211	81	1.43 / 0.18		1.33	33.14	6.93	58.60	0.38	21.80
							1.61							
			0.57											
	80.04	0.05												
	80.22	0.02		100.0	8212			2.97 / 0.20						
								3.17						
			0.62											
		0.02												
			0.68	84.5	8213	82	1.54 / 0.02		1.47	21.82	5.84	71.07	0.41	28.39
							1.56							
			(0.24)											
	81.82													

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88014
Coal zone:	1		
Field sample no.:	08211 - 08212	Composite sample no.:	81
True sample thickness:	1.628 meters	Drill core recovery (%):	82.45 %
Coal/Rock:	1.451 / 0.177 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	20.33	18.21	14.35	34.89	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	7.86	4.36			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.33	
Ash (%):	33.14	33.59
Volatile matter (%):	6.93	7.02
Fixed carbon (%):	58.60	59.39
Total sulphur (%):	0.38	0.39
Combustible sulphur (%):	0.19	
Net calorific value (cal/g):	5210.00	5281.00
Gross calorific value (cal/g):	5210.00	5281.00
Volatile matter (dmmf%):	6.60	
Hardgrove index:	61.00	
Specific gravity:	1.55	
Carbon dioxide (%):	0.17	
Phosphorous in coal (%):	0.030	
Chlorine in coal (ppm):	120.00	
Forms of Sulphur (%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.36	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	58.97	59.77
Hydrogen (%):	1.85	1.87
Nitrogen (%):	0.66	0.67
Oxygen (%):	3.67	3.71

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1148.00	1085.00
Softening temperature (°C):	1259.00	1185.00
Hemispherical temperature (°C):	1277.00	1211.00
Final temperature (°C):	1353.00	1274.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	59.22	TiO2 (%):	0.83
Al2O3 (%):	19.01	Na2O (%):	2.46
Fe2O3 (%):	6.15	K2O (%):	1.29
CaO (%):	3.70	SO3 (%):	1.41
MgO (%):	3.89	P2O5 (%):	0.21

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88014
Coal zone:	1		
Field sample no.:	08213	Composite sample no.:	82
True sample thickness:	1.572 meters	Drill core recovery (%):	84.37 %
Coal/Rock:	1.552 / 0.020 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM			
Size analysis:	SZ1			
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	4.59	9.38	15.86	53.20
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	9.99	6.98		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.47	
Ash (%):	21.62	21.94
Volatile matter (%):	5.84	5.93
Fixed carbon (%):	71.07	72.13
Total sulphur (%):	0.41	0.42
Combustible sulphur (%):	0.16	
Net calorific value (cal/g):	6307.00	6401.00
Gross calorific value (cal/g):	6307.00	6401.00
Volatile matter (dmmf%):	5.30	
Hardgrove index:	66.00	
Specific gravity:	1.48	
Carbon dioxide (%):	0.12	
Phosphorous in coal (%):	0.067	
Chlorine in coal (ppm):	88.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.39

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	71.67	72.74
Hydrogen (%):	2.17	2.20
Nitrogen (%):	0.80	0.81
Oxygen (%):	1.86	1.89

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1132.00	1090.00
Softening temperature (°C):	1348.00	1243.00
Hemispherical temperature (°C):	1401.00	1311.00
Final temperature (°C):	1448.00	1427.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	55.64	TiO2 (%):	1.12
Al2O3 (%):	24.25	Na2O (%):	1.90
Fe2O3 (%):	5.13	K2O (%):	1.69
CaO (%):	2.62	SO3 (%):	2.88
MgO (%):	2.75	P2O5 (%):	0.71

gcri coal division ash fusion proj KPN BLK LR DS DDH88014

sample id 00081
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1156.0	initial temp.(C)	1108.0
softening temp.(C)	1280.0	softening temp.(C)	1238.0
hemispherical temp.(C)	1288.0	hemispherical temp.(C)	1253.0
fluid temp.(C)	1361.0	fluid temp.(C)	1314.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88014

sample id 00081
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	60.04
aluminium oxide %	(al2o3)	19.13
ferric oxide %	(fe2o3)	6.04
titanium dioxide %	(tio2)	0.78
phosphorous pentoxide %	(p2o5)	0.23
calcium oxide %	(cao)	3.01
magnesium oxide %	(mgo)	3.68
sulphur trioxide %	(so3)	2.08
sodium oxide %	(na2o)	1.61
potassium oxide %	(k2o)	1.22

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88014

sample id 00081
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1169.0	initial temp.(C)	1132.0
softening temp.(C)	1311.0	softening temp.(C)	1274.0
hemispherical temp.(C)	1343.0	hemispherical temp.(C)	1301.0
fluid temp.(C)	1401.0	fluid temp.(C)	1374.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88014

sample id 00081
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide	%	(sio2)	59.98
aluminium oxide	%	(al2o3)	21.27
ferric oxide	%	(fe2o3)	5.34
titanium dioxide	%	(tio2)	0.72
phosphorous pentoxide	%	(p2o5)	0.23
calcium oxide	%	(cao)	2.35
magnesium oxide	%	(mgo)	3.33
sulphur trioxide	%	(so3)	3.42
sodium oxide	%	(na2o)	1.62
potassium oxide	%	(k2o)	1.23

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88014

sample id 00082
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1187.0	initial temp.(C)	1101.0
softening temp.(C)	1285.0	softening temp.(C)	1238.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1359.0	fluid temp.(C)	1301.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88014

sample id 00082
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	51.92
aluminium oxide %	(al2o3)	21.20
ferric oxide %	(fe2o3)	5.82
titanium dioxide %	(tio2)	1.03
phosphorous pentoxide %	(p2o5)	1.31
calcium oxide %	(cao)	5.47
magnesium oxide %	(mgo)	3.86
sulphur trioxide %	(so3)	2.13
sodium oxide %	(na2o)	1.35
potassium oxide %	(k2o)	1.35

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88014

sample id 00082
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1285.0	initial temp.(C)	1201.0
softening temp.(C)	1306.0	softening temp.(C)	1274.0
hemispherical temp.(C)	1332.0	hemispherical temp.(C)	1301.0
fluid temp.(C)	1411.0	fluid temp.(C)	1348.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88014

sample id 00082
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	58.08
aluminium oxide %	(al2o3)	21.15
ferric oxide %	(fe2o3)	4.97
titanium dioxide %	(tio2)	0.85
phosphorous pentoxide %	(p2o5)	0.87
calcium oxide %	(cao)	3.91
magnesium oxide %	(mgo)	3.63
sulphur trioxide %	(so3)	3.35
sodium oxide %	(na2o)	1.40
potassium oxide %	(k2o)	1.27

90.0 <= total <= 100.0

SAMPLE 249

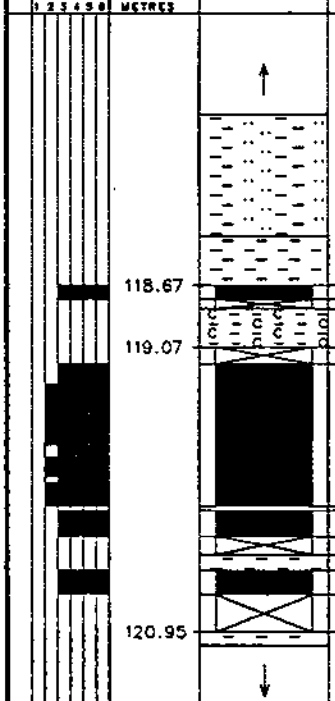
INSUFFICIENT COAL FOR ANALYSIS

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88014 SEAM : H INTERVAL(M) : 118.67 – 120.95 ELEVATION(M) : 1670.3

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 23/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	118.67			0.09 (0.04)												
			0.24		85.0	8216	83	0.15 / 0.24 0.39		1.30	77.98	6.86	13.86	—	5.07	—
	119.07			(0.11)												
				0.89												
			0.93		74.6	8217	84	1.65 / 0.13 1.78	1.65 / 0.13 1.78	1.63	29.32	6.18	62.87	0.49	23.32	—
				0.16												
				(0.11)												
			0.10													
				0.15												
	120.95			(0.23)												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88014
Coal zone:	H		
Field sample no.:	08217	Composite sample no.:	84
True sample thickness:	1.768 meters	Drill core recovery (%):	74.46 %
Coal/Rock:	1.637 / 0.131 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	21.39	16.00	13.85	38.02	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	6.97	3.77			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.63	
Ash (%):	29.32	29.81
Volatile matter (%):	6.18	6.28
Fixed carbon (%):	62.87	63.91
Total sulphur (%):	0.49	0.50
Combustible sulphur (%):	0.23	
Net calorific value (cal/g):	5573.00	5666.00
Gross calorific value (cal/g):	5573.00	5666.00
Volatile matter (dmmf%):	5.50	
Hardgrove index:	57.00	
Specific gravity:	1.54	
Carbon dioxide (%):	0.20	
Phosphorous in coal (%):	0.077	
Chlorine in coal (ppm):	544.00	
Forms of Sulphur (%):	PYRITE 00.14 SULPHATE 00.00 ORGANIC 00.35	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	63.19	64.24
Hydrogen (%):	1.89	1.92
Nitrogen (%):	0.64	0.65
Oxygen (%):	2.84	2.88

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1232.00	1153.00
Softening temperature (°C):	1253.00	1206.00
Hemispherical temperature (°C):	1285.00	1224.00
Final temperature (°C):	1351.00	1288.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	57.60	TiO2 (%):	0.80
Al2O3 (%):	15.99	Na2O (%):	1.46
Fe2O3 (%):	5.14	K2O (%):	1.24
CaO (%):	8.27	SO3 (%):	2.24
MgO (%):	4.83	P2O5 (%):	0.60

gcri coal division ash fusion proj KPN BLK LR DS DDH88014

sample id 00084
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1103.0	initial temp.(C)	1066.0
softening temp.(C)	1269.0	softening temp.(C)	1240.0
hemispherical temp.(C)	1274.0	hemispherical temp.(C)	1253.0
fluid temp.(C)	1356.0	fluid temp.(C)	1309.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88014

sample id 00084
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	60.04
aluminium oxide %	(al2o3)	18.45
ferric oxide %	(fe2o3)	4.65
titanium dioxide %	(tio2)	0.89
phosphorous pentoxide %	(p2o5)	0.65
calcium oxide %	(cao)	4.98
magnesium oxide %	(mgo)	3.68
sulphur trioxide %	(so3)	1.82
sodium oxide %	(na2o)	1.24
potassium oxide %	(k2o)	1.22

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88014

sample id 00084
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1148.0	initial temp.(C)	1145.0
softening temp.(C)	1288.0	softening temp.(C)	1272.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1295.0
fluid temp.(C)	1374.0	fluid temp.(C)	1332.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88014

sample id 00084
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	59.56
aluminium oxide %	(al2o3)	20.29
ferric oxide %	(fe2o3)	4.54
titanium dioxide %	(tio2)	0.71
phosphorous pentoxide %	(p2o5)	0.64
calcium oxide %	(cao)	3.73
magnesium oxide %	(mgo)	3.52
sulphur trioxide %	(so3)	3.70
sodium oxide %	(na2o)	1.22
potassium oxide %	(k2o)	1.27

90.0 <= total <= 100.0

MOUNT KLAPPAN ANTHRACITE PROJECT

GEOLOGICAL REPORT

1988

APPENDIX V

DIAMOND DRILL HOLE COAL QUALITY
VOLUME II

KPNLRDDH 88015

TO

KPNLRDDH 88029

GULF CANADA RESOURCES LIMITED

COAL DIVISION

MOUNT KLAPPAN ANTHRACITE PROJECT

1988

APPENDIX V

DIAMOND DRILL HOLE
COAL QUALITY DATA

VOLUME II

748

LOST-FOX AREA

1988

Coal Quality Legend

Composite Sample I.D.	1 - 161 Raw Coal
	201 - 284 35.0 x 6.0 mm Size Fraction
	300 - 379 6.0 mm x 0.5 mm Size Fraction
Sample Product #	SP-1 Raw Coal
	SP-2 8.0% Ash Coal Product
	SP-3 7.5% Ash Coal Product
	SP-4 10.0% Ash (Primary Wash) Coal Product
	SP-5 11.0% Ash (Middlings) Coal Product (produced from 8.0% ash product reject)
Ash Minerals Analysis	
(Raw and Product Coal)	AM-1 Head
	AM-3 0.5 x 0.15 mm Size Fraction
	AM-4 0.15 x 0 mm Size Fraction
Ash Fusion Quality	
(Raw and Product Coal)	AF-1 Head
	AF-3 0.5 x 0.15 mm Size Fraction
	AF-4 0.15 x 0 mm Size Fraction

Extent to which analysis was completed, as per flow chart, was dependent on coal core recovery percentage.

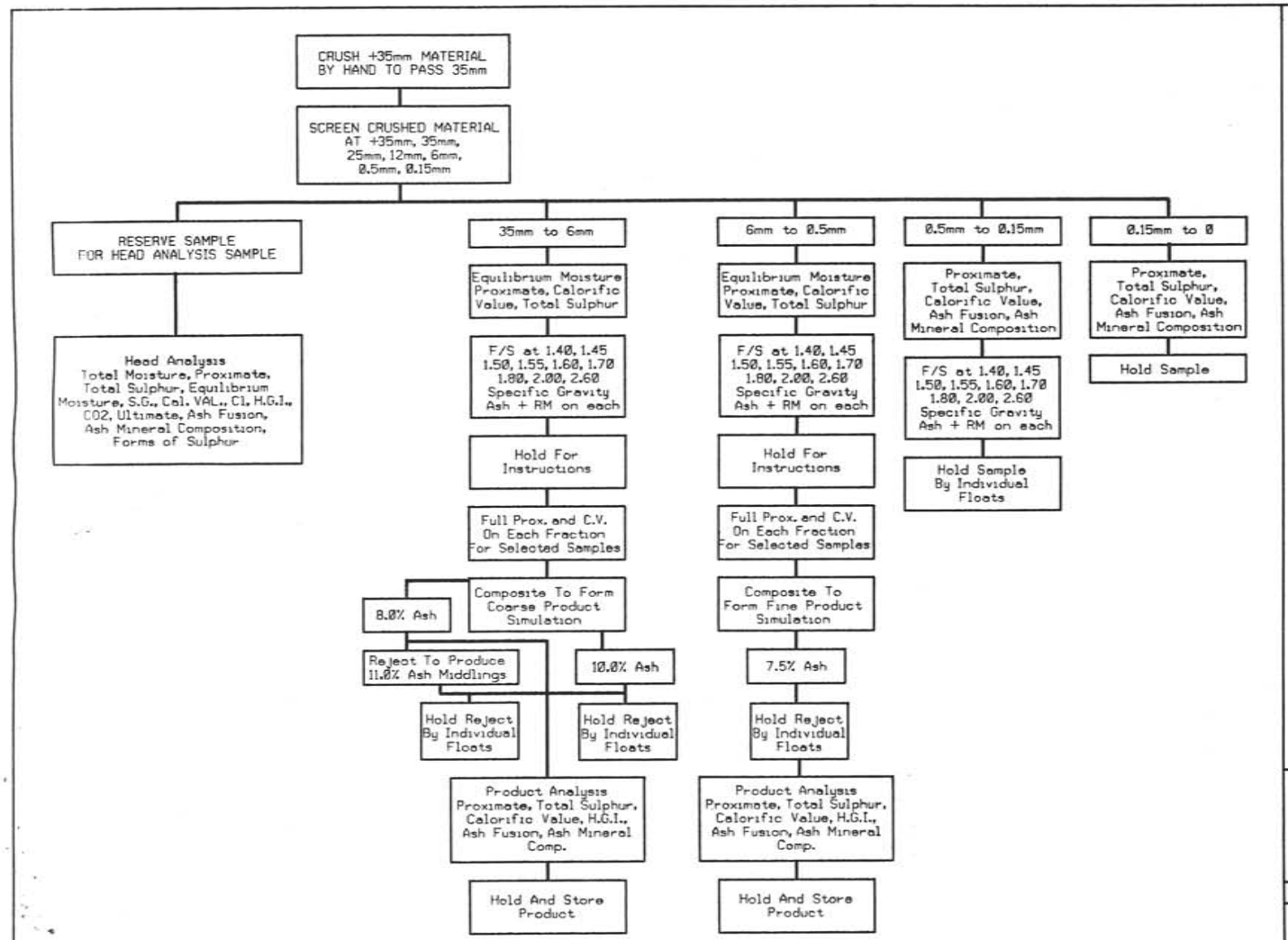


FIGURE 8-1

MOUNT KLAPPAN ANTHRACITE PROJECT

DIAMOND DRILL HOLE COAL CORE ANALYSIS FLOW SHEET

GULF CANADA RESOURCES LTD.

GULF CANADA RESOURCES LTD.
88/03/17
KLAP:[20505718605910O1.CHT

KPNLRDDH88015

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88015 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/27/88
END DATE - 06/29/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - ETMANSKI
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SEAMS L? & K/L? CORED BUT NOT ON LOG. EXTRA CSG ADDED DUE TO LOSS OF CIRC AT APPROX 30-35M. SEAMS INTERSECTED: L?,K/L?,K,J,I,H/I,&H.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1558.93
ZONE - 9
NORTHING - 6344416.52
EASTING - 507651.83

LICENCE/LEASE NUMBER - 7145

LATITUDE - 571441
LONGITUDE - 1285224

- O R I E N T A T I O N -

LENGTH - 222.74
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 35.66
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

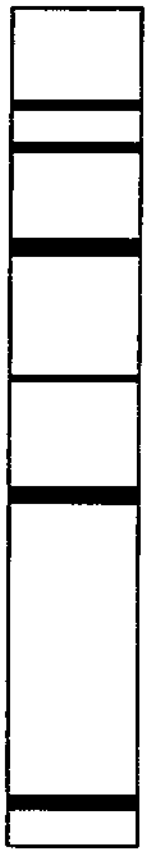
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-015

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
L ?	2.25 m
K/L ?	2.11 m
K	4.01 m
J	1.06 m
I	4.33 m
H	3.62 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88015										
	K ROOF	8219	60.57	61.08	100.00		0.446			0.000- 0.446
	K	8220	61.08	62.87	75.98	1.163	0.026	0.376		1.539- 0.026
	K	8221	62.87	64.80	86.53	1.434	0.026	0.227		1.661- 0.026
	K	8222	64.80	65.67	49.43	0.253	0.122	0.385		0.638- 0.122
	K FLOOR	8223	65.67	65.87	100.00		0.175			0.000- 0.175
	J ROOF	8224	97.23	97.52	100.00		0.285			0.000- 0.285
	J	8225	97.52	98.61	85.32	0.829	0.078	0.157		0.986- 0.078
	J	8226	98.61	99.26	69.23	0.134	0.298	0.192		0.326- 0.298
	J FLOOR	8227	99.26	100.08	100.00	0.019	0.753			0.019- 0.753
	I ROOF	8228	125.68	126.73	100.00		0.907			0.000- 0.907
	I	8229	126.73	130.04	76.13	1.665	0.209	0.379	0.170	2.044- 0.379
	I	8230	130.04	133.96	70.41	1.195	0.076	0.477		1.672- 0.076
	I	8231	133.96	134.65	100.00	0.161				0.161- 0.000
	I FLOOR	8232	134.65	134.89	100.00		0.045			0.000- 0.045
	H/I ROOF	8233	203.49	203.59	100.00		0.080			0.000- 0.080
	H/I	8234	203.59	204.11	67.31	0.288		0.138		0.426- 0.000
	H/I FLOOR	8235	204.11	204.58	100.00		0.396			0.000- 0.396
	H ROOF	8236	209.41	209.60	100.00		0.171			0.000- 0.171
	H	8237	209.60	210.62	69.61	0.597	0.045	0.281		0.878- 0.045
	H	8238	210.62	212.11	71.81	0.594	0.384	0.387		0.981- 0.384
	H	8239	212.11	213.55	83.33	1.065	0.047	0.223		1.288- 0.047
	H FLOOR	8240	213.55	214.05	100.00		0.467			0.000- 0.467
	L?	8325	24.37	26.65	25.00	0.455	0.109	1.688		2.143- 0.109
	L? ROOF	8326	23.47	24.37	11.11		0.098		0.790	0.000- 0.888
	L? FLOOR	8327	26.65	26.93	100.00		0.277			0.000- 0.277
		10354	97.21	97.23	100.00		0.020			0.000- 0.020
		10369	125.63	125.68	100.00		0.041			0.000- 0.041
	K/L?	99998	35.57	37.88	59.31	0.212	1.039		0.862	0.212- 1.901

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88015												
	L ?	85	8325	8325	24.37	26.65	25.00	0.46	0.11	1.71	0.00	2.17- 0.11
	K	86	8220	8221	61.08	64.80	81.45	2.97	0.06	0.69	0.00	3.66- 0.06
	K	87	8222	8222	64.80	65.67	49.42	0.29	0.14	0.44	0.00	0.73- 0.14
	J	88	8225	8225	97.52	98.61	85.32	0.85	0.08	0.16	0.00	1.01- 0.08
	J	89	8226	8226	98.61	99.26	69.23	0.14	0.31	0.20	0.00	0.34- 0.31
	I	90	8229	8229	126.73	130.04	76.13	2.22	0.30	0.54	0.25	2.76- 0.55
	I	91	8230	8230	130.04	133.96	70.40	2.59	0.17	1.16	0.00	3.75- 0.17
	I	92	8231	8231	133.96	134.65	100.00	0.69	0.00	0.00	0.00	0.69- 0.00
	H/I	93	8234	8234	203.59	204.11	67.30	0.35	0.00	0.17	0.00	0.52- 0.00
	H	94	8237	8238	209.60	212.11	70.91	1.31	0.47	0.73	0.00	2.04- 0.47
	H	95	8239	8239	212.11	213.55	83.33	1.15	0.05	0.24	0.00	1.39- 0.05
	L ?	251	8325	8325	24.37	26.65	25.00	0.46	0.11	1.71	0.00	2.17- 0.11
	K	252	8220	8222	61.08	65.67	75.38	3.26	0.20	1.13	0.00	4.39- 0.20
	I	253	8229	8229	126.73	130.04	76.13	2.22	0.30	0.54	0.25	2.76- 0.55
	I	254	8230	8231	130.04	134.65	74.83	3.28	0.17	1.16	0.00	4.44- 0.17
	H	255	8239	8239	212.11	213.55	83.33	1.15	0.05	0.24	0.00	1.39- 0.05
	L ?	342	8325	8325	24.37	26.65	25.00	0.46	0.11	1.71	0.00	2.17- 0.11
	K	343	8220	8222	61.08	65.67	75.38	3.26	0.20	1.13	0.00	4.39- 0.20
	J	344	8225	8226	97.52	99.26	79.31	0.99	0.39	0.36	0.00	1.35- 0.39
	I	345	8229	8231	126.73	134.65	75.37	5.50	0.47	1.70	0.25	7.20- 0.72
	H/I	346	8234	8234	203.59	204.11	67.30	0.35	0.00	0.17	0.00	0.52- 0.00
	H	347	8237	8239	209.60	213.55	75.44	2.46	0.52	0.97	0.00	3.43- 0.52

COAL SEAM DATA SHEETS

AND

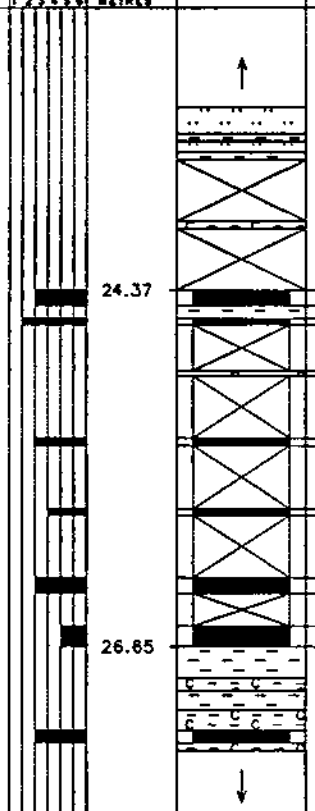
COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88015 SEAM : L? INTERVAL(M) : 24.37 – 26.65 ELEVATION(M) : 1558.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : FEB 02/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	24.37			0.10											
			0.08												
				(0.30)											
			0.03												
				(0.40)											
				(0.40)	25.0	8325	85	2.14 / 0.11 2.25		1.34	40.85	7.75	50.06	—	18.82
				(0.40)											
				0.10											
				(0.21)											
	26.65			0.13											

SAMPLE 342

INSUFFICIENT COAL FOR ANALYSIS

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88015 SEAM : K/L? INTERVAL(M) : 35.57 – 37.88 ELEVATION(M) : 1558.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : FEB 02/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	35.57		0.14												
			0.45												
			(0.46)												
				0.15	58.2	99998		0.21 / 1.80		—	—	—	—	—	—
			0.18					2.11							
			0.11												
			(0.41)												
	37.88		0.12												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88015 SEAM : K INTERVAL(M) : 61.08 – 65.67 ELEVATION(M) : 1558.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	61.08			(0.21)											
				0.82	76.0	8220									
				(0.17)											
	62.87			0.60			86	3.20/0.05		1.05	22.99	8.40	67.56	0.45	25.70
			0.93					3.25							
				0.73	86.5	8221			3.84/0.17						
				(0.23)					4.01						
				0.39											
	64.80			(0.15)											
			0.97												
				(0.17)	49.3	8222	87	0.64/0.12		1.40	38.19	7.61	52.80	0.41	19.92
				0.17				0.76							
	65.67		0.93	(0.97)											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88015
Coal zone:	K		
Field sample no.:	08220 - 08221	Composite sample no.:	86
True sample thickness:	3.252 meters	Drill core recovery(%):	81.45 %
Coal/Rock:	3.200 / 0.052 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	5.76	10.22	16.55	46.47
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	11.71	9.29		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.05	
Ash(%):	22.99	23.23
Volatile matter(%):	8.40	8.49
Fixed carbon(%):	67.56	68.28
Total sulphur(%):	0.45	0.45
Combustible sulphur(%):	0.22	
Net calorific value(cal/g):	6141.00	6206.00
Gross calorific value(cal/g):	6142.00	6207.00
Volatile matter(dmmf%):	8.70	
Hardgrove index:	81.00	
Specific gravity:	1.50	
Carbon dioxide(%):	0.16	
Phosphorous in coal(%):	0.222	
Chlorine in coal(ppm):	1520.00	

Forms of Sulphur(%): PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.42

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	69.26	69.99
Hydrogen(%):	2.41	2.44
Nitrogen(%):	0.86	0.87
Oxygen(%):	2.98	3.02

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1098.00	1058.00
Softening temperature(°C):	1253.00	1182.00
Hemispherical temperature(°C):	1259.00	1190.00
Final temperature(°C):	1272.00	1222.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	43.72	TiO2(%):	1.02
Al2O3(%):	18.93	Na2O(%):	1.21
Fe2O3(%):	11.70	K2O(%):	1.12
CaO(%):	9.04	SO3(%):	2.52
MgO(%):	4.62	P2O5(%):	2.21

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88015
Coal zone:	K		
Field sample no.:	08222	Composite sample no.:	87
True sample thickness:	0.760 meters	Drill core recovery(%):	49.42 %
Coal/Rock:	0.638 / 0.122 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	14.09	19.40	11.54	36.16
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	11.18	7.63		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.40	
Ash(%):	38.19	38.73
Volatile matter(%):	7.61	7.72
Fixed carbon(%):	52.80	53.55
Total sulphur(%):	0.41	0.42
Combustible sulphur(%):	0.06	
Net calorific value(cal/g):	4761.00	4828.00
Gross calorific value(cal/g):	4761.00	4828.00
Volatile matter(dmmf%):	7.70	
Hardgrove index:	92.00	
Specific gravity:	1.58	
Carbon dioxide(%):	0.16	
Phosphorous in coal(%):	0.038	
Chlorine in coal(ppm):	1009.00	

Forms of Sulphur(%): PYRITE 00.06 SULPHATE 00.00 ORGANIC 00.35

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	53.64	54.40
Hydrogen(%):	1.89	1.92
Nitrogen(%):	0.69	0.70
Oxygen(%):	3.78	3.83

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1206.00	1108.00
Softening temperature(°C):	1264.00	1200.00
Hemispherical temperature(°C):	1274.00	1222.00
Final temperature(°C):	1340.00	1306.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	58.20	TiO2(%):	1.00
Al2O3(%):	17.77	Na2O(%):	1.29
Fe2O3(%):	6.58	K2O(%):	1.21
CaO(%):	4.81	SO3(%):	2.32
MgO(%):	3.99	P2O5(%):	0.23

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00086
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1172.0	initial temp.(C)	1061.0
softening temp.(C)	1285.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1330.0	fluid temp.(C)	1311.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00086
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	43.60
aluminium oxide %	(al2o3)	23.91
ferric oxide %	(fe2o3)	6.18
titanium dioxide %	(tio2)	1.53
phosphorous pentoxide %	(p2o5)	2.86
calcium oxide %	(cao)	5.73
magnesium oxide %	(mgo)	2.17
sulphur trioxide %	(so3)	3.31
sodium oxide %	(na2o)	1.33
potassium oxide %	(k2o)	1.12

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00086
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1116.0	initial temp.(C)	1064.0
softening temp.(C)	1406.0	softening temp.(C)	1332.0
hemispherical temp.(C)	1438.0	hemispherical temp.(C)	1364.0
fluid temp.(C)	1472.0	fluid temp.(C)	1432.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00086
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	48.78
aluminium oxide %	(al2o3)	28.55
ferric oxide %	(fe2o3)	6.33
titanium dioxide %	(tio2)	1.40
phosphorous pentoxide %	(p2o5)	2.39
calcium oxide %	(cao)	4.82
magnesium oxide %	(mgo)	2.10
sulphur trioxide %	(so3)	1.57
sodium oxide %	(na2o)	1.43
potassium oxide %	(k2o)	1.07

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88015

sample id 00087
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1169.0	initial temp.(C)	1143.0
softening temp.(C)	1395.0	softening temp.(C)	1295.0
hemispherical temp.(C)	1432.0	hemispherical temp.(C)	1327.0
fluid temp.(C)	1451.0	fluid temp.(C)	1438.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88015

sample id 00087
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	54.42
aluminium oxide %	(al2o3)	23.44
ferric oxide %	(fe2o3)	7.24
titanium dioxide %	(tio2)	1.47
phosphorous pentoxide %	(p2o5)	0.36
calcium oxide %	(cao)	2.60
magnesium oxide %	(mgo)	3.56
sulphur trioxide %	(so3)	1.69
sodium oxide %	(na2o)	1.40
potassium oxide %	(k2o)	1.44

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00087
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1132.0	initial temp.(C)	1080.0
softening temp.(C)	1453.0	softening temp.(C)	1380.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1424.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00087
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide	%	(sio2)	55.78
aluminium oxide	%	(al2o3)	24.95
ferric oxide	%	(fe2o3)	7.15
titanium dioxide	%	(tio2)	1.47
phosphorous pentoxide	%	(p2o5)	0.27
calcium oxide	%	(cao)	2.10
magnesium oxide	%	(mgo)	3.55
sulphur trioxide	%	(so3)	1.17
sodium oxide	%	(na2o)	1.20
potassium oxide	%	(k2o)	1.13

90.0 <= total <= 100.0

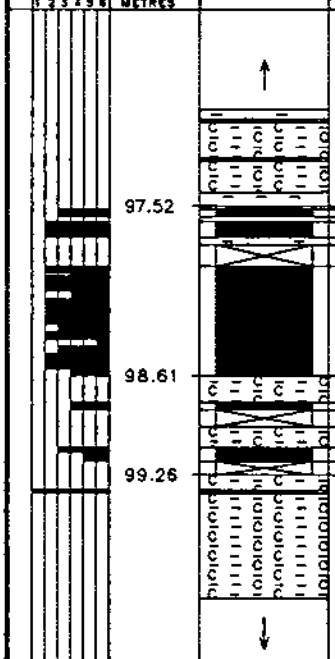
GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DOH88015 SEAM : J INTERVAL(M) : 97.52 – 99.26 ELEVATION(M) : 1558.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	97.52		0.03	(0.03)												
				0.19												
			0.08	(0.16)												
				0.68	85.2	8225	88	0.99/ 0.08 1.06	0.99/ 0.08 1.06	1.31	38.77	7.61	52.31	0.56	19.66	—
	98.61		0.15													
				0.03												
				(0.11)												
			0.13		69.2	8226	89	0.33/ 0.30 0.62		0.88	75.02	9.36	14.74	—	5.40	—
				0.08												
	99.26			(0.09)												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88015
Coal zone:	J		
Field sample no.:	08225	Composite sample no.:	88
True sample thickness:	1.064 meters	Drill core recovery(%):	85.32 %
Coal/Rock:	0.986 / 0.078 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	18.62	20.72	14.55	33.53
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	7.95	4.63		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.31	
Ash(%):	38.77	39.29
Volatile matter(%):	7.61	7.71
Fixed carbon(%):	52.31	53.00
Total sulphur(%):	0.56	0.57
Combustible sulphur(%):	0.17	
Net calorific value(cal/g):	4699.00	4761.00
Gross calorific value(cal/g):	4699.00	4761.00
Volatile matter(dmmf%):	7.60	
Hardgrove index:	68.00	
Specific gravity:	1.59	
Carbon dioxide(%):	0.15	
Phosphorous in coal(%):	0.212	
Chlorine in coal(ppm):	1080.00	
Forms of Sulphur(%):	PYRITE 00.16 SULPHATE 00.01 ORGANIC 00.39	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	53.24	53.95
Hydrogen(%):	1.77	1.79
Nitrogen(%):	0.56	0.57
Oxygen(%):	3.79	3.83

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1230.00	1182.00
Softening temperature(°C):	1274.00	1243.00
Hemispherical temperature(°C):	1285.00	1261.00
Final temperature(°C):	1367.00	1343.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	59.80	TiO2(%):	0.69
Al2O3(%):	14.37	Na2O(%):	0.96
Fe2O3(%):	5.29	K2O(%):	1.05
CaO(%):	7.16	SO3(%):	2.52
MgO(%):	4.84	P2O5(%):	1.25

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00088
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1185.0	initial temp.(C)	1137.0
softening temp.(C)	1256.0	softening temp.(C)	1219.0
hemispherical temp.(C)	1269.0	hemispherical temp.(C)	1235.0
fluid temp.(C)	1301.0	fluid temp.(C)	1295.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00088
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	51.12
aluminium oxide %	(al2o3)	15.12
ferric oxide %	(fe2o3)	7.55
titanium dioxide %	(tio2)	0.78
phosphorous pentoxide %	(p2o5)	1.66
calcium oxide %	(cao)	10.19
magnesium oxide %	(mgo)	3.76
sulphur trioxide %	(so3)	6.10
sodium oxide %	(na2o)	0.88
potassium oxide %	(k2o)	0.71

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88015

sample id 00088
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1206.0	initial temp.(C)	1106.0
softening temp.(C)	1232.0	softening temp.(C)	1216.0
hemispherical temp.(C)	1240.0	hemispherical temp.(C)	1222.0
fluid temp.(C)	1264.0	fluid temp.(C)	1253.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88015

sample id 00088
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	51.06
aluminium oxide %	(al2o3)	16.26
ferric oxide %	(fe2o3)	7.89
titanium dioxide %	(tio2)	0.72
phosphorous pentoxide %	(p2o5)	1.58
calcium oxide %	(cao)	9.40
magnesium oxide %	(mgo)	3.70
sulphur trioxide %	(so3)	5.82
sodium oxide %	(na2o)	0.92
potassium oxide %	(k2o)	0.78

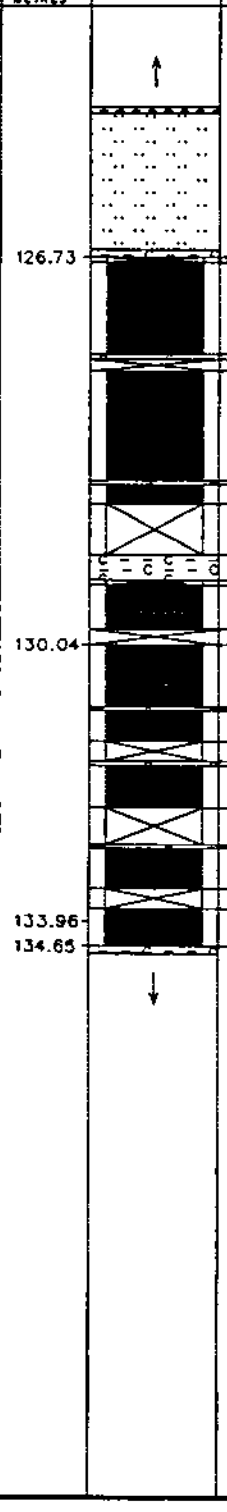
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88015 SEAM : 1 INTERVAL(M) : 126.73 – 134.65 ELEVATION(M) : 1558.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	126.73			(0.03)												
				0.58												
			0.03	(0.07)												
				0.69	77.3	8229	90	2.04 / 0.38		1.15	31.79	8.74	60.32	0.33	22.76	—
			0.02	0.12				2.42								
				(0.31)												
			0.18	(0.83)												
				0.28					3.88 / 0.46							
	130.04		(0.10)						4.33							
				0.39												
			0.02	0.20												
				(0.12)												
			0.03	0.26	72.2	8230	91	1.67 / 0.08		1.43	28.45	7.32	62.80	0.32	23.79	—
				(0.24)				1.75								
			0.01	0.26												
				(0.13)												
	133.96			0.25	100.0	8231	92	0.16 / 0.00		1.53	12.70	6.38	79.39	0.44	29.92	—
	134.65							0.16								

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88015
Coal zone:	I		
Field sample no.:	08229	Composite sample no.:	90
True sample thickness:	2.423 meters	Drill core recovery (%):	76.13 %
Coal/Rock:	2.044 / 0.379 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	10.44	13.16	17.25	42.30	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	9.58	7.27			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.15	
Ash (%):	31.79	32.16
Volatile matter (%):	6.74	6.82
Fixed carbon (%):	60.32	61.02
Total sulphur (%):	0.33	0.33
Combustible sulphur (%):	0.04	
Net calorific value (cal/g):	5440.00	5503.00
Gross calorific value (cal/g):	5440.00	5503.00
Volatile matter (dmmf%):	6.40	
Hardgrove index:	74.00	
Specific gravity:	1.55	
Carbon dioxide (%):	0.13	
Phosphorous in coal (%):	0.019	
Chlorine in coal (ppm):	640.00	
Forms of Sulphur (%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.31	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	60.20	60.90
Hydrogen (%):	2.10	2.12
Nitrogen (%):	0.75	0.76
Oxygen (%):	3.68	3.73

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1106.00	1072.00
Softening temperature (°C):	1256.00	1206.00
Hemispherical temperature (°C):	1285.00	1232.00
Final temperature (°C):	1311.00	1309.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	61.36	TiO2 (%):	0.72
Al2O3 (%):	15.88	Na2O (%):	1.52
Fe2O3 (%):	8.47	K2O (%):	1.19
CaO (%):	3.36	SO3 (%):	2.25
MgO (%):	3.54	P2O5 (%):	0.14

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88015
Coal zone:	I		
Field sample no.:	08230	Composite sample no.:	91
True sample thickness:	1.748 meters	Drill core recovery (%):	70.40 %
Coal/Rock:	1.672 / 0.076 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	7.80	14.60	16.26	43.03
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	11.23	7.08		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.43	
Ash (%):	28.45	28.86
Volatile matter (%):	7.32	7.43
Fixed carbon (%):	62.80	63.71
Total sulphur (%):	0.32	0.32
Combustible sulphur (%):	0.12	
Net calorific value (cal/g):	5686.00	5768.00
Gross calorific value (cal/g):	5686.00	5768.00
Volatile matter (dmmf%):	7.30	
Hardgrove index:	81.00	
Specific gravity:	1.56	
Carbon dioxide (%):	0.12	
Phosphorous in coal (%):	0.039	
Chlorine in coal (ppm):	1680.00	
Forms of Sulphur (%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.30	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	62.34	63.24
Hydrogen (%):	2.03	2.06
Nitrogen (%):	0.80	0.81
Oxygen (%):	4.63	4.71

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1206.00	1159.00
Softening temperature (°C):	1288.00	1216.00
Hemispherical temperature (°C):	1309.00	1261.00
Final temperature (°C):	1395.00	1369.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	53.00	TiO2 (%):	1.20
Al2O3 (%):	22.30	Na2O (%):	2.29
Fe2O3 (%):	9.15	K2O (%):	1.38
CaO (%):	2.99	SO3 (%):	1.72
MgO (%):	3.72	P2O5 (%):	0.31

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88015
Coal zone:	I		
Field sample no.:	08231	Composite sample no.:	92
True sample thickness:	0.161 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	0.161 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	2.46	10.99	11.19	47.85
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	17.05	10.46		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.53	
Ash (%):	12.70	12.90
Volatile matter (%):	6.38	6.48
Fixed carbon (%):	79.39	80.62
Total sulphur (%):	0.44	0.45
Combustible sulphur (%):	0.13	
Net calorific value (cal/g):	7150.00	7261.00
Gross calorific value (cal/g):	7151.00	7262.00
Volatile matter (dmmf%):	6.20	
Hardgrove index:	78.00	
Specific gravity:	1.43	
Carbon dioxide (%):	0.13	
Phosphorous in coal (%):	0.216	
Chlorine in coal (ppm):	464.00	

Forms of Sulphur (%): PYRITE 00.01 SULPHATE 00.00 ORGANIC 00.43

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	79.49	80.72
Hydrogen (%):	2.73	2.77
Nitrogen (%):	0.90	0.91
Oxygen (%):	2.21	2.25

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1159.00	1098.00
Softening temperature (°C):	1253.00	1219.00
Hemispherical temperature (°C):	1266.00	1232.00
Final temperature (°C):	1280.00	1269.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	45.24	TiO2 (%):	1.31
Al2O3 (%):	18.52	Na2O (%):	1.44
Fe2O3 (%):	6.78	K2O (%):	0.89
CaO (%):	10.24	SO3 (%):	6.06
MgO (%):	4.51	P2O5 (%):	3.89

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00090
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1114.0	initial temp.(C)	1090.0
softening temp.(C)	1201.0	softening temp.(C)	1193.0
hemispherical temp.(C)	1285.0	hemispherical temp.(C)	1259.0
fluid temp.(C)	1330.0	fluid temp.(C)	1317.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00090
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	57.48
aluminium oxide %	(al2o3)	20.04
ferric oxide %	(fe2o3)	5.61
titanium dioxide %	(tio2)	1.00
phosphorous pentoxide %	(p2o5)	0.18
calcium oxide %	(cao)	4.39
magnesium oxide %	(mgo)	3.73
sulphur trioxide %	(so3)	3.29
sodium oxide %	(na2o)	1.42
potassium oxide %	(k2o)	1.28

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00090
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1116.0	initial temp.(C)	1095.0
softening temp.(C)	1264.0	softening temp.(C)	1248.0
hemispherical temp.(C)	1288.0	hemispherical temp.(C)	1274.0
fluid temp.(C)	1348.0	fluid temp.(C)	1335.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00090
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	58.68
aluminium oxide %	(al2o3)	19.66
ferric oxide %	(fe2o3)	5.49
titanium dioxide %	(tio2)	0.78
phosphorous pentoxide %	(p2o5)	0.39
calcium oxide %	(cao)	4.17
magnesium oxide %	(mgo)	3.66
sulphur trioxide %	(so3)	2.60
sodium oxide %	(na2o)	1.35
potassium oxide %	(k2o)	1.02

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00091
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1077.0	initial temp.(C)	1075.0
softening temp.(C)	1211.0	softening temp.(C)	1204.0
hemispherical temp.(C)	1403.0	hemispherical temp.(C)	1301.0
fluid temp.(C)	1443.0	fluid temp.(C)	1441.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00091
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.66
aluminium oxide %	(al2o3)	23.82
ferric oxide %	(fe2o3)	7.06
titanium dioxide %	(tio2)	1.20
phosphorous pentoxide %	(p2o5)	0.34
calcium oxide %	(cao)	2.38
magnesium oxide %	(mgo)	3.10
sulphur trioxide %	(so3)	1.78
sodium oxide %	(na2o)	1.71
potassium oxide %	(k2o)	1.20

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00091
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1148.0	initial temp.(C)	1072.0
softening temp.(C)	1382.0	softening temp.(C)	1317.0
hemispherical temp.(C)	1435.0	hemispherical temp.(C)	1361.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00091
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	57.24
aluminium oxide %	(al2o3)	23.82
ferric oxide %	(fe2o3)	6.75
titanium dioxide %	(tio2)	1.00
phosphorous pentoxide %	(p2o5)	0.31
calcium oxide %	(cao)	2.46
magnesium oxide %	(mgo)	3.22
sulphur trioxide %	(so3)	1.43
sodium oxide %	(na2o)	1.50
potassium oxide %	(k2o)	1.08

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00092
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1095.0
softening temp.(C)	1280.0	softening temp.(C)	1245.0
hemispherical temp.(C)	1288.0	hemispherical temp.(C)	1259.0
fluid temp.(C)	1301.0	fluid temp.(C)	1277.0

normal ranges all temps.
1000.0)= values (= 1500.0
oxidation temps)= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00092
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	43.20
aluminium oxide %	(al2o3)	22.68
ferric oxide %	(fe2o3)	7.06
titanium dioxide %	(tio2)	0.59
phosphorous pentoxide %	(p2o5)	4.84
calcium oxide %	(cao)	9.07
magnesium oxide %	(mgo)	4.21
sulphur trioxide %	(so3)	5.10
sodium oxide %	(na2o)	1.54
potassium oxide %	(k2o)	0.84

90.0 (= total (= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88015

sample id 00092
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1198.0	initial temp.(C)	1106.0
softening temp.(C)	1269.0	softening temp.(C)	1235.0
hemispherical temp.(C)	1277.0	hemispherical temp.(C)	1245.0
fluid temp.(C)	1298.0	fluid temp.(C)	1261.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88015

sample id 00092
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	44.00
aluminium oxide %	(al2o3)	23.82
ferric oxide %	(fe2o3)	7.87
titanium dioxide %	(tio2)	1.31
phosphorous pentoxide %	(p2o5)	4.20
calcium oxide %	(cao)	7.58
magnesium oxide %	(mgo)	4.25
sulphur trioxide %	(so3)	3.28
sodium oxide %	(na2o)	1.44
potassium oxide %	(k2o)	0.80

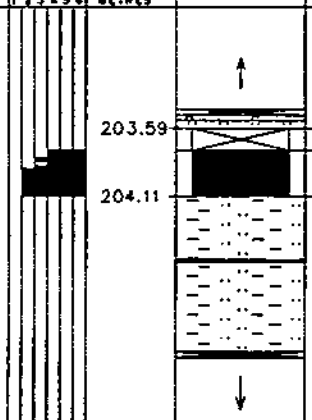
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88015 SEAM : H/1 INTERVAL(M) : 203.59 – 204.11 ELEVATION(M) : 1558.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



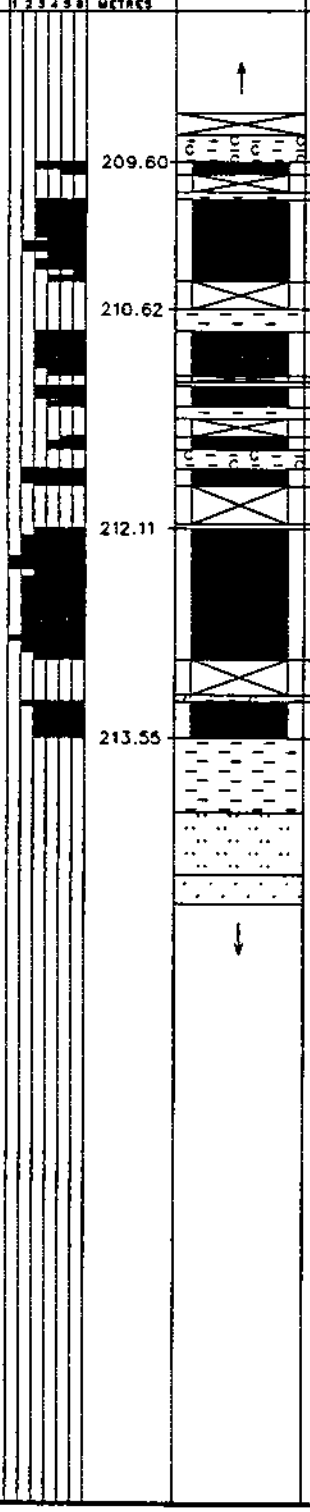
SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	203.59			(0.14)												
				0.29	67.6	8234	93	0.43/0.00		1.09	38.13	8.96	55.82	—	20.88	—
	204.11							0.43								

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88015 SEAM : H INTERVAL(M) : 209.60 – 213.55 ELEVATION(M) : 1558.9

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	209.60			0.68												
				(0.11)												
			0.08													
				0.52	68.6	8237										
				(0.17)												
	210.62		0.14													
				0.27			94	1.88 / 0.43		1.51	48.91	8.18	41.40	0.28	14.83	—
				(0.44)				2.29								
			0.03	0.13												
			0.07													
				(0.11)	71.6	8238										
			0.09						3.15 / 0.48							
			0.12						3.62							
				0.11												
				(0.24)												
	212.11		0.43													
				0.83												
					83.3	8236	95	3.29 / 0.05		1.38	23.83	8.57	68.42	0.42	25.58	—
				(0.22)				1.34								
			0.06													
				0.23												
	213.55															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88015
Coal zone:	H		
Field sample no.:	08237 - 08238	Composite sample no.:	94
True sample thickness:	2.288 meters	Drill core recovery(%):	70.91 %
Coal/Rock:	1.859 / 0.429 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight(%):	25.15	25.60	17.24	24.64	
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight(%):	4.50	2.87			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.51	
Ash(%):	48.91	49.66
Volatile matter(%):	8.18	8.31
Fixed carbon(%):	41.40	42.03
Total sulphur(%):	0.28	0.28
Combustible sulphur(%):	0.02	
Net calorific value(cal/g):	3544.00	3599.00
Gross calorific value(cal/g):	3544.00	3599.00
Volatile matter(dmmf%):	9.20	
Hardgrove index:	66.00	
Specific gravity:	1.59	
Carbon dioxide(%):	0.32	
Phosphorous in coal(%):	0.070	
Chlorine in coal(ppm):	496.00	
Forms of Sulphur(%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.26	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	41.92	42.56
Hydrogen(%):	1.31	1.33
Nitrogen(%):	0.49	0.50
Oxygen(%):	5.58	5.67

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1224.00	1206.00
Softening temperature(°C):	1245.00	1224.00
Hemispherical temperature(°C):	1259.00	1230.00
Final temperature(°C):	1301.00	1291.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	59.38	TiO2(%):	0.82
Al2O3(%):	18.15	Na2O(%):	1.75
Fe2O3(%):	5.49	K2O(%):	0.95
CaO(%):	6.77	SO3(%):	1.33
MgO(%):	3.85	P2O5(%):	0.33

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88015
Coal zone:	H		
Field sample no.:	08239	Composite sample no.:	95
True sample thickness:	1.335 meters	Drill core recovery (%):	83.33 %
Coal/Rock:	1.288 / 0.047 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	19.00	17.62	17.23	35.77
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	6.28	4.10		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.38	
Ash (%):	23.63	23.96
Volatile matter (%):	6.57	6.66
Fixed carbon (%):	68.42	69.38
Total sulphur (%):	0.42	0.43
Combustible sulphur (%):	0.30	
Net calorific value (cal/g):	6114.00	6199.00
Gross calorific value (cal/g):	6114.00	6199.00
Volatile matter (dmmf%):	6.20	
Hardgrove index:	63.00	
Specific gravity:	1.50	
Carbon dioxide (%):	0.17	
Phosphorous in coal (%):	0.191	
Chlorine in coal (ppm):	1840.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.40

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	68.13	69.08
Hydrogen (%):	2.16	2.19
Nitrogen (%):	0.79	0.80
Oxygen (%):	3.49	3.54

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1193.00	1080.00
Softening temperature (°C):	1259.00	1169.00
Hemispherical temperature (°C):	1269.00	1190.00
Final temperature (°C):	1311.00	1285.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	55.14	TiO2 (%):	1.38
Al2O3 (%):	17.01	Na2O (%):	1.83
Fe2O3 (%):	8.75	K2O (%):	0.60
CaO (%):	4.70	SO3 (%):	1.22
MgO (%):	3.74	P2O5 (%):	1.85

gcri coal division ash fusion proj KPN BLK LR DS DDH88015

sample id 00094
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1235.0	1216.0
softening temp.(C)	1390.0	1309.0
hemispherical temp.(C)	1432.0	1340.0
fluid temp.(C)	1472.0	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88015

sample id 00094
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	61.76
aluminium oxide %	(al2o3)	22.30
ferric oxide %	(fe2o3)	3.69
titanium dioxide %	(tio2)	1.05
phosphorous pentoxide %	(p2o5)	0.36
calcium oxide %	(cao)	2.74
magnesium oxide %	(mgo)	2.21
sulphur trioxide %	(so3)	2.26
sodium oxide %	(na2o)	1.61
potassium oxide %	(k2o)	0.96

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88015

sample id 00094
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1238.0	1234.0
softening temp.(C)	1443.0	1327.0
hemispherical temp.(C)	1472.0	1411.0
fluid temp.(C)	1472.0	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88015

sample id 00094
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	60.94
aluminium oxide %	(al2o3)	21.93
ferric oxide %	(fe2o3)	3.35
titanium dioxide %	(tio2)	1.63
phosphorous pentoxide %	(p2o5)	0.39
calcium oxide %	(cao)	2.49
magnesium oxide %	(mgo)	2.34
sulphur trioxide %	(so3)	1.74
sodium oxide %	(na2o)	1.76
potassium oxide %	(k2o)	0.78

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88015

sample id 00095
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1201.0	initial temp.(C)	1087.0
softening temp.(C)	1298.0	softening temp.(C)	1253.0
hemispherical temp.(C)	1322.0	hemispherical temp.(C)	1277.0
fluid temp.(C)	1393.0	fluid temp.(C)	1383.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88015

sample id 00095
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	52.90
aluminium oxide %	(al2o3)	21.55
ferric oxide %	(fe2o3)	4.55
titanium dioxide %	(tio2)	1.42
phosphorous pentoxide %	(p2o5)	1.67
calcium oxide %	(cao)	5.35
magnesium oxide %	(mgo)	3.14
sulphur trioxide %	(so3)	3.33
sodium oxide %	(na2o)	2.10
potassium oxide %	(k2o)	0.59

90.0 <= total <= 100.0

qcri coal division | ash fusion | proj KPN BLK LR DS DDH88015

sample id 00095
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1235.0	initial temp.(C)	1190.0
softening temp.(C)	1406.0	softening temp.(C)	1306.0
hemispherical temp.(C)	1438.0	hemispherical temp.(C)	1353.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN BLK LR DS DDH88015

sample id 00095
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.42
aluminium oxide %	(al2o3)	24.19
ferric oxide %	(fe2o3)	4.23
titanium dioxide %	(tio2)	1.03
phosphorous pentoxide %	(p2o5)	1.59
calcium oxide %	(cao)	4.06
magnesium oxide %	(mgo)	2.84
sulphur trioxide %	(so3)	1.26
sodium oxide %	(na2o)	2.12
potassium oxide %	(k2o)	0.55

90.0 <= total <= 100.0

KPNLRDDH88016

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88016 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/28/88
END DATE - 06/30/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - HEARN
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SEAMS H & I INTERSECTED.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1700.80
ZONE - 9
NORTHING - 6343552.34
EASTING - 506348.64

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571413
LONGITUDE - 1285341

- O R I E N T A T I O N -

LENGTH - 103.40
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-016

SEAM		TRUE SEAM THICKNESS (Coal + Rock)
I		5.19 m
H		5.04 m

NOTE: Seams less than 0.5 m thick are not shown.

SCALE

1:2000

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88016										
	I ROOF	8241	34.72	35.01	100.00		0.283			0.000- 0.283
	I	8242	35.01	37.02	37.81	0.450	0.294	1.222		1.672- 0.294
	I	8243	37.02	40.29	38.84	1.214	0.040	1.815	0.157	3.029- 0.197
	I FLOOR	8244	40.29	41.12	100.00		0.822			0.000- 0.822
	H ROOF	8245	77.49	77.91	100.00		0.406			0.000- 0.406
	H	8246	77.91	81.23	83.43	1.673	0.990	0.527		2.200- 0.990
	H	8247	81.23	83.17	70.10	1.223	0.077	0.555		1.778- 0.077
	H FLOOR	8248	83.17	84.31	100.00		1.090			0.000- 1.090
		10360	28.77	29.23	100.00		0.448			0.000- 0.448
		10361	23.06	23.09	100.00		0.030			0.000- 0.030

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL	TOTAL ROCK
ODH88016													
	I	96	8242	8242	35.01	37.02	37.81	0.46	0.30	1.25	0.00	1.71	0.30
	I	97	8243	8243	37.02	40.29	38.83	1.23	0.04	1.84	0.16	3.07	0.20
	H	98	8246	8246	77.91	81.23	83.43	1.74	1.03	0.55	0.00	2.29	1.03
	H	99	8247	8247	81.23	83.17	70.10	1.28	0.08	0.58	0.00	1.86	0.08
	H	256	8247	8247	81.23	83.17	70.10	1.28	0.08	0.58	0.00	1.86	0.08
	H	348	8246	8247	77.91	83.17	78.51	3.02	1.11	1.13	0.00	4.15	1.11

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88016 SEAM : 1 INTERVAL(M) : 35.01 – 40.29 ELEVATION(M) : 1700.8

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

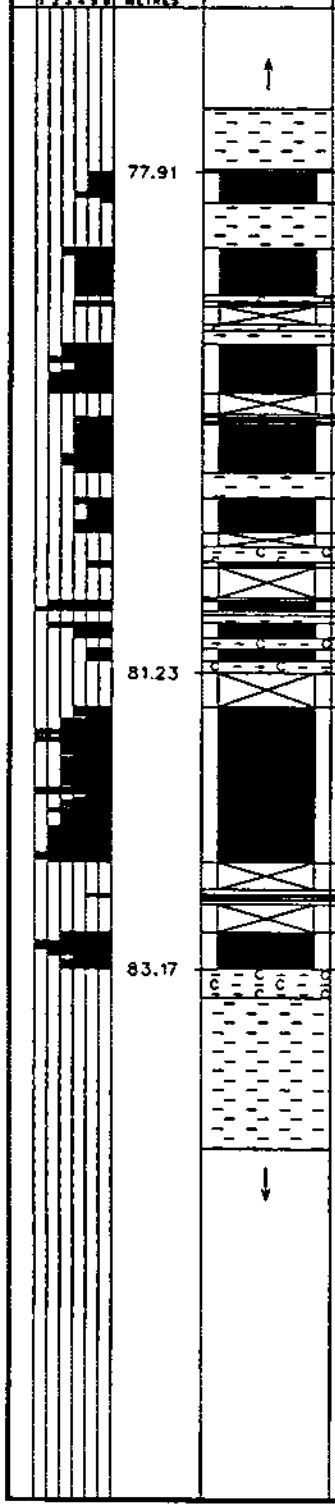
SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
1 2 3 4 5 6	35.01			0.04												
				(0.67)												
				0.29	37.8	8242	98	1.67 / 0.29 1.97		1.28	45.72	7.69	45.31	—	16.80	—
				(0.55)												
			0.22													
	37.02		0.03	0.07												
			(0.16)													
				(0.55)												
				0.47					4.70 / 0.49 5.19							
			0.02	0.18												
			0.02	0.37	38.9	8243	97	3.03 / 0.20 3.23		1.14	15.46	5.10	78.30	—	28.85	—
				(1.27)												
				0.20												
	40.29															

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88016 | SEAM : H | INTERVAL(M) : 77.91 – 83.17 | ELEVATION(M) : 1700.8

GEOLOGIST : HEARN | SCALE: 1:40 | DATE : JAN 25/89 | DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	77.91		0.19											
		0.29												
			0.31											
			(0.12)											
			0.31											
			(0.13)											
			0.31	83.5	8246	98	2.20 / 0.99 3.19		1.22	53.37	7.86	37.55	1.16	13.67
		0.16												
			0.22											
			(0.09)											
			(0.19)					3.98/ 1.07 5.04						
			0.10											
	81.23		(0.21)											
			0.98	70.1	8247	99	1.78 / 0.08 1.86		1.32	24.19	6.97	67.52	0.39	25.12
			(0.17)											
			(0.17)											
	83.17		0.23											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88016
Coal zone:	H		
Field sample no.:	08246	Composite sample no.:	98
True sample thickness:	3.190 meters	Drill core recovery(%):	83.43 %
Coal/Rock:	2.200 / 0.990 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight(%):	35.92	28.07	13.46	18.38	
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight(%):	2.86	1.31			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.22	
Ash(%):	53.37	54.03
Volatile matter(%):	7.86	7.96
Fixed carbon(%):	37.55	38.01
Total sulphur(%):	1.16	1.17
Combustible sulphur(%):	0.96	
Net calorific value(cal/g):	3267.00	3308.00
Gross calorific value(cal/g):	3267.00	3308.00
Volatile matter(dmmf%):	7.80	
Hardgrove index:	74.00	
Specific gravity:	1.70	
Carbon dioxide(%):	0.23	
Phosphorous in coal(%):	0.040	
Chlorine in coal(ppm):	496.00	

Forms of Sulphur(%): PYRITE 01.01 SULPHATE 00.01 ORGANIC 00.14

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	37.43	37.89
Hydrogen(%):	1.29	1.31
Nitrogen(%):	0.38	0.38
Oxygen(%):	5.15	5.22

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1216.00	1064.00
Softening temperature(°C):	1288.00	1224.00
Hemispherical temperature(°C):	1306.00	1235.00
Final temperature(°C):	1382.00	1327.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	62.82	TiO2(%):	0.71
Al2O3(%):	15.50	Na2O(%):	1.44
Fe2O3(%):	6.58	K2O(%):	1.03
CaO(%):	4.59	SO3(%):	0.95
MgO(%):	3.61	P2O5(%):	0.17

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88016
Coal zone:	H		
Field sample no.:	08247	Composite sample no.:	99
True sample thickness:	1.855 meters	Drill core recovery (%):	70.10 %
Coal/Rock:	1.778 / 0.077 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	36.60	22.39	13.75	21.61	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	3.68	1.97			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.32	
Ash (%):	24.19	24.51
Volatile matter (%):	6.97	7.06
Fixed carbon (%):	67.52	68.43
Total sulphur (%):	0.39	0.40
Combustible sulphur (%):	0.32	
Net calorific value (cal/g):	6004.00	6084.00
Gross calorific value (cal/g):	6004.00	6084.00
Volatile matter (dmmf%):	6.80	
Hardgrove index:	54.00	
Specific gravity:	1.50	
Carbon dioxide (%):	0.19	
Phosphorous in coal (%):	0.070	
Chlorine in coal (ppm):	842.00	
Forms of Sulphur (%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.37	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	68.23	69.14
Hydrogen (%):	2.01	2.04
Nitrogen (%):	0.62	0.63
Oxygen (%):	3.24	3.28

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1175.00	1137.00
Softening temperature (°C):	1237.00	1206.00
Hemispherical temperature (°C):	1248.00	1216.00
Final temperature (°C):	1274.00	1267.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	46.56	TiO2 (%):	1.36
Al2O3 (%):	17.39	Na2O (%):	1.84
Fe2O3 (%):	7.46	K2O (%):	9.03
CaO (%):	8.26	SO3 (%):	0.72
MgO (%):	4.68	P2O5 (%):	0.66

gcri coal division ash fusion proj KPN BLK LR DS DDH88016

sample id 00098
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1238.0	initial temp.(C)	1206.0
softening temp.(C)	1285.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1280.0
fluid temp.(C)	1359.0	fluid temp.(C)	1354.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88016

sample id 00098
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	58.38
aluminium oxide %	(al2o3)	20.79
ferric oxide %	(fe2o3)	5.49
titanium dioxide %	(tio2)	0.92
phosphorous pentoxide %	(p2o5)	0.19
calcium oxide %	(cao)	4.00
magnesium oxide %	(mgo)	3.63
sulphur trioxide %	(so3)	0.78
sodium oxide %	(na2o)	1.93
potassium oxide %	(k2o)	1.15

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88016

sample id 00098
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1248.0	initial temp.(C)	1232.0
softening temp.(C)	1295.0	softening temp.(C)	1269.0
hemispherical temp.(C)	1324.0	hemispherical temp.(C)	1295.0
fluid temp.(C)	1390.0	fluid temp.(C)	1388.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88016

sample id 00098
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	57.32
aluminium oxide %	(al2o3)	22.30
ferric oxide %	(fe2o3)	5.15
titanium dioxide %	(tio2)	0.88
phosphorous pentoxide %	(p2o5)	0.20
calcium oxide %	(cao)	3.86
magnesium oxide %	(mgo)	3.50
sulphur trioxide %	(so3)	0.63
sodium oxide %	(na2o)	2.01
potassium oxide %	(k2o)	1.33

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88016

sample id 00099
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1269.0	initial temp.(C)	1164.0
softening temp.(C)	1274.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1285.0	hemispherical temp.(C)	1251.0
fluid temp.(C)	1353.0	fluid temp.(C)	1351.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88016

sample id 00099
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	54.04
aluminium oxide %	(al2o3)	21.93
ferric oxide %	(fe2o3)	6.52
titanium dioxide %	(tio2)	1.20
phosphorous pentoxide %	(p2o5)	0.60
calcium oxide %	(cao)	4.31
magnesium oxide %	(mgo)	3.62
sulphur trioxide %	(so3)	2.05
sodium oxide %	(na2o)	1.79
potassium oxide %	(k2o)	1.08

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88016

sample id 00099
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1253.0	initial temp.(C)	1238.0
softening temp.(C)	1295.0	softening temp.(C)	1264.0
hemispherical temp.(C)	1343.0	hemispherical temp.(C)	1290.0
fluid temp.(C)	1390.0	fluid temp.(C)	1385.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88016

sample id 00099
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	53.92
aluminium oxide %	(al2o3)	22.30
ferric oxide %	(fe2o3)	6.03
titanium dioxide %	(tio2)	0.99
phosphorous pentoxide %	(p2o5)	0.54
calcium oxide %	(cao)	3.81
magnesium oxide %	(mgo)	3.30
sulphur trioxide %	(so3)	2.93
sodium oxide %	(na2o)	1.76
potassium oxide %	(k2o)	1.10

90.0 <= total <= 100.0

KPNLRDDH88017

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88017 DATE - 02/15/89

- H I S T O R Y -

START DATE - 06/28/88
END DATE - 06/30/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MURRAY
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTS G AT 24.08, I (OVT) AT 58.80, I AT 79.5
5. POOR RECOVERY OF G DUE TO TOOL PROBLEMS.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1716.35
ZONE - 9
NORTHING - 6343811.32
EASTING - 506440.57

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571421
LONGITUDE - 1285336

- O R I E N T A T I O N -

LENGTH - 169.94
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-017

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
G	1.38 m
I	8.29 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE		SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88017											
	I	OVT FLOOR	8251	57.61	58.80	24.37		0.050		0.148	0.000- 0.198
	I	OVT	8252	58.80	59.65	69.41	0.062	0.022	0.038		0.100- 0.022
	I	OVT ROOF	8253	59.65	60.58	100.00		0.112			0.000- 0.112
	I	ROOF	8254	78.74	79.55	100.00		0.529			0.000- 0.529
	I		8255	79.55	85.01	34.43	1.423	0.218	3.120		4.543- 0.218
	I		8256	85.01	89.03	44.03	1.553		1.978		3.531- 0.000
	I	FLOOR	8257	89.03	89.51	100.00		0.423			0.000- 0.423
			8299	60.58	62.38	100.00		0.157			0.000- 0.157
			10355	74.46	74.55	100.00		0.083			0.000- 0.083
	G		99998	24.08	25.68	9.38	0.134		0.640	0.608	0.774- 0.608

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE		SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88017													
	I	OVT	100	8252	8252	58.80	59.65	69.41	0.44	0.15	0.26	0.00	0.70- 0.15
	I		101	8255	8255	79.55	85.01	34.43	1.63	0.25	3.58	0.00	5.21- 0.25
	I		102	8256	8256	85.01	89.03	44.02	1.77	0.00	2.25	0.00	4.02- 0.00
	I		257	8255	8255	79.55	85.01	34.43	1.63	0.25	3.58	0.00	5.21- 0.25
	I		258	8256	8256	85.01	89.03	44.02	1.77	0.00	2.25	0.00	4.02- 0.00
	I	ovt	349	8252	8252	58.80	59.65	69.41	0.44	0.15	0.26	0.00	0.70- 0.15
	I		350	8255	8256	79.55	89.03	38.50	3.40	0.25	5.83	0.00	9.23- 0.25

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR 88017 SEAM : G INTERVAL(M) : 24.08 – 25.68 ELEVATION(M) : 1716.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	24.08			0.13											
			(0.35)												
				(0.26)	9.7	99998		0.77 / 0.61		—	—	—	—	—	—
			(0.26)					1.38							
	25.68			(0.32)											

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88017 SEAM : I OVT INTERVAL(M) : 58.80 – 59.65 ELEVATION(M) : 1716.4

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	58.80															
	59.65				68.9	8252	100	0.10 / 0.02		1.29	35.60	5.03	38.08	0.32	12.30	—
								0.12								

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88017
Coal zone:	I OVT		
Field sample no.:	08252	Composite sample no.:	100
True sample thickness:	0.122 meters	Drill core recovery (%):	69.41 %
Coal/Rock:	0.100 / 0.022 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM								
Size analysis:	SZ1								
Fraction size (mm):	35.00 X	25.00	25.00 X	12.00	12.00 X	6.00	6.00 X	0.50	
Relative weight (%):		43.03		25.62		8.89		15.00	
Fraction size (mm):	0.50 X	0.15	0.15 X	0.00					
Relative weight (%):		4.61		2.85					

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.29	
Ash (%):	55.60	56.33
Volatile matter (%):	5.03	5.10
Fixed carbon (%):	38.08	38.57
Total sulphur (%):	0.32	0.32
Combustible sulphur (%):	0.49	
Net calorific value (cal/g):	2940.00	2978.00
Gross calorific value (cal/g):	2940.00	2978.00
Volatile matter (dmmf%):	1.20	
Hardgrove index:	78.00	
Specific gravity:	1.69	
Carbon dioxide (%):	0.17	
Phosphorous in coal (%):	0.019	
Chlorine in coal (ppm):	1206.00	
Forms of Sulphur (%):	PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.29	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	35.68	36.15
Hydrogen (%):	1.37	1.39
Nitrogen (%):	0.37	0.37
Oxygen (%):	5.37	5.44

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1472.00	1472.00
Softening temperature (°C):	1472.00	1472.00
Hemispherical temperature (°C):	1472.00	1472.00
Final temperature (°C):	1472.00	1472.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	79.22	TiO2 (%):	0.22
Al2O3 (%):	6.05	Na2O (%):	0.30
Fe2O3 (%):	4.32	K2O (%):	0.18
CaO (%):	2.43	SO3 (%):	3.65
MgO (%):	2.40	P2O5 (%):	0.08

qcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88017

sample id 00100
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1264.0	initial temp.(C)	1190.0
softening temp.(C)	1390.0	softening temp.(C)	1338.0
hemispherical temp.(C)	1432.0	hemispherical temp.(C)	1364.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88017

sample id 00100
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	62.52
aluminium oxide %	(al2o3)	18.90
ferric oxide %	(fe2o3)	4.92
titanium dioxide %	(tio2)	0.50
phosphorous pentoxide %	(p2o5)	0.36
calcium oxide %	(cao)	1.62
magnesium oxide %	(mgo)	2.79
sulphur trioxide %	(so3)	2.20
sodium oxide %	(na2o)	1.25
potassium oxide %	(k2o)	0.86

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88017

sample id 00100
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1322.0	initial temp.(C)	1306.0
softening temp.(C)	1390.0	softening temp.(C)	1343.0
hemispherical temp.(C)	1432.0	hemispherical temp.(C)	1385.0
fluid temp.(C)	1453.0	fluid temp.(C)	1446.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88017

sample id 00100
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	60.02
aluminium oxide %	(al2o3)	20.79
ferric oxide %	(fe2o3)	5.58
titanium dioxide %	(tio2)	0.50
phosphorous pentoxide %	(p2o5)	0.23
calcium oxide %	(cao)	1.60
magnesium oxide %	(mgo)	3.37
sulphur trioxide %	(so3)	4.01
sodium oxide %	(na2o)	1.19
potassium oxide %	(k2o)	0.67

90.0 <= total <= 100.0

GULF CANADA CORPORATION

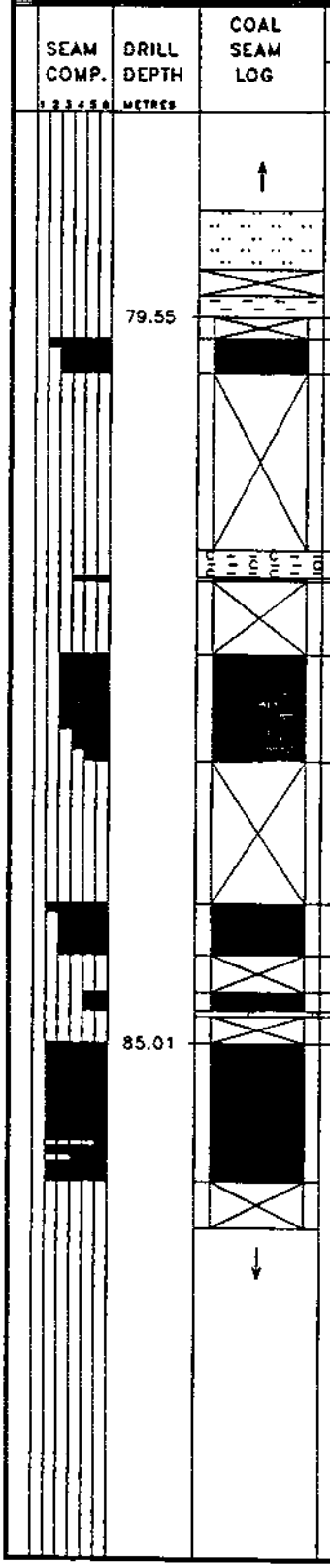
PAGE : 1 / 2

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88017 SEAM : 1 TOTAL INTERVAL(M) : 79.55 – 89.03 ELEVATION(M) : 1716.4
INTERVAL(M) : 79.55 – 85.01
GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	79.55			(0.14)												
				0.23												
				(1.15)												
			0.18													
				(0.48)												
				0.71	34.5	8255	101	4.54 / 0.22 4.76		1.05	23.52	8.64	68.79	—	25.37	—
				(0.94)												
				0.34												
				(0.24)												
				0.12												
	85.01			(0.18)												

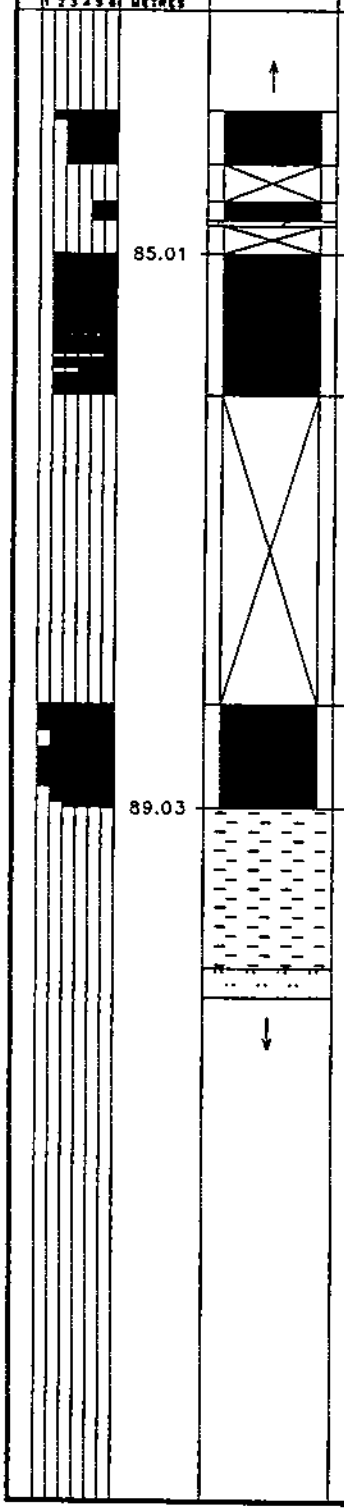
GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88017 SEAM : 1 TOTAL INTERVAL(M) : 79.55 – 89.03 ELEVATION(M) : 1716.4
INTERVAL(M) : 85.01 – 89.03
GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	85.01			0.90												
				(1.98)	44.0	8258	102	3.33/ 0.00 3.33	8.07/ 0.22 8.29	0.76	23.91	9.25	66.08	—	24.98	—
				0.65												
	89.03															

KPNLRDDH88018

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88018 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/01/88
END DATE - 07/03/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - KRAUS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED SEAMS M, L, K/L, K, J, I, H/I, H. TWO CASING DEPTHS DUE TO LOST CIRC.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1602.71
ZONE - 9
NORTHING - 6344349.25
EASTING - 507385.50

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571439
LONGITUDE - 1285239

- O R I E N T A T I O N -

LENGTH - 260.51
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH(M) - 13.72
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

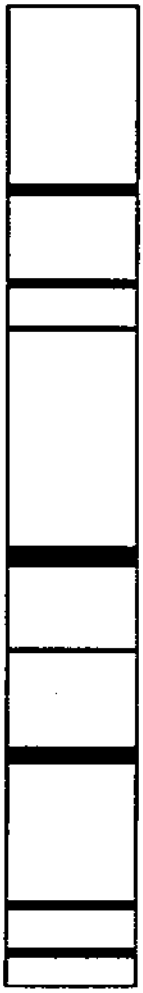
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-018

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
M	2.58 m
L	2.26 m
K/L	0.67 m
K	5.09 m
J	0.56 m
I	4.10 m
H/I	2.17 m
H	1.86 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88018										
	M ROOF	8288	46.26	47.08	100.00		0.790			0.000- 0.790
	M	8289	47.08	49.02	73.20	0.479	0.855	0.489		0.968- 0.855
	M	8290	49.02	51.80	54.32	1.233	0.165	1.178		2.411- 0.165
	M FLOOR	8291	51.80	52.20	65.00		0.238		0.128	0.000- 0.366
	L ROOF	8292	72.21	72.54	100.00		0.326			0.000- 0.326
	L	8293	72.54	73.92	57.97	0.786		0.570		1.356- 0.000
	L	8294	73.92	74.85	34.41	0.176	0.136	0.594		0.770- 0.136
	L FLOOR	8295	74.85	75.28	100.00		0.417			0.000- 0.417
	K/L ROOF	8296	84.08	85.53	100.00		1.292			0.000- 1.292
	K/L	8297	85.53	86.25	97.22	0.624	0.028	0.019		0.643- 0.028
	K/L FLOOR	8298	86.25	87.09	100.00		0.763			0.000- 0.763
	K ROOF	8301	142.53	143.57	100.00		1.018			0.000- 1.018
	K	8302	143.57	146.57	77.00	2.195	0.049	0.667		2.862- 0.049
	K	8303	146.57	147.66	92.66	0.394	0.576	0.077		0.471- 0.576
	K	8304	147.66	148.85	83.19	0.841	0.105	0.191		1.032- 0.105
	K FLOOR	8305	148.85	149.13	100.00		0.266			0.000- 0.266
	I ROOF	8306	196.09	196.77	100.00		0.456			0.000- 0.456
	I	8307	196.77	199.72	83.05	2.017	0.053	0.307	0.112	2.324- 0.165
	I	8308	199.72	201.50	85.96	1.381		0.227		1.608- 0.000
	I FLOOR	8309	201.50	201.82	100.00		0.292			0.000- 0.292
	H/I ROOF	8310	237.65	238.00	100.00		0.344			0.000- 0.344
	H/I	8311	238.00	240.49	81.53	1.637	0.134	0.404		2.041- 0.134
	H/I FLOOR	8312	240.49	240.76	100.00		0.193			0.000- 0.193
	H ROOF	8313	249.69	250.50	56.79		0.444		0.338	0.000- 0.782
	H	8314	250.50	251.95	95.86	0.222	1.120	0.058		0.280- 1.120
	H	8315	251.95	253.87	83.85	1.200	0.357	0.299		1.499- 0.357
	H FLOOR	8316	253.87	254.35	100.00		0.464			0.000- 0.464
		10357	139.57	139.58	100.00		0.010			0.000- 0.010

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 2

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
		10358	195.61	195.64	100.00		0.024			0.000- 0.024
		10447	32.40	32.57	100.00		0.048			0.000- 0.048
	J	99999	170.96	171.58	33.87	0.190		0.374		0.564- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88018												
	M	103	8289	8289	47.08	49.02	73.19	0.51	0.91	0.52	0.00	1.03- 0.91
	M	104	8290	8290	49.02	51.80	54.31	1.33	0.18	1.27	0.00	2.60- 0.18
	L	105	8293	8293	72.54	73.92	57.97	0.80	0.00	0.58	0.00	1.38- 0.00
	L	106	8294	8294	73.92	74.85	34.40	0.18	0.14	0.61	0.00	0.79- 0.14
	K/L	107	8297	8297	85.53	86.25	97.22	0.67	0.03	0.02	0.00	0.69- 0.03
	K	108	8302	8302	143.57	146.57	77.00	2.26	0.05	0.69	0.00	2.95- 0.05
	K	109	8303	8303	146.57	147.66	92.66	0.41	0.60	0.08	0.00	0.49- 0.60
	K	110	8304	8304	147.66	148.85	83.19	0.88	0.11	0.20	0.00	1.08- 0.11
	I	111	8307	8307	196.77	199.72	83.05	2.38	0.07	0.37	0.13	2.75- 0.20
	I	112	8308	8308	199.72	201.50	85.95	1.53	0.00	0.25	0.00	1.78- 0.00
	H/I	113	8311	8311	238.00	240.49	81.52	1.88	0.15	0.46	0.00	2.34- 0.15
	H	114	8314	8314	250.50	251.95	95.86	0.23	1.16	0.06	0.00	0.29- 1.16
	H	115	8315	8315	251.95	253.87	83.85	1.24	0.37	0.31	0.00	1.55- 0.37
	K/L	259	8297	8297	85.52	86.24	97.22	0.67	0.03	0.02	0.00	0.69- 0.03
	K	260	8302	8302	143.57	146.57	77.00	2.26	0.05	0.69	0.00	2.95- 0.05
	K	261	8303	8304	146.56	148.85	87.71	1.29	0.71	0.28	0.00	1.57- 0.71
	I	262	8307	8307	196.76	199.71	83.05	2.38	0.07	0.37	0.13	2.75- 0.20
	I	263	8308	8308	199.71	201.49	85.95	1.53	0.00	0.25	0.00	1.78- 0.00
	H/I	264	8311	8311	238.00	240.49	81.52	1.88	0.15	0.46	0.00	2.34- 0.15
	H	265	8315	8315	251.95	253.87	83.85	1.24	0.37	0.31	0.00	1.55- 0.37
	M	351	8289	8290	47.08	51.80	62.07	1.84	1.09	1.79	0.00	3.63- 1.09
	K/L	352	8297	8297	85.52	86.24	97.22	0.67	0.03	0.02	0.00	0.69- 0.03
	K	353	8302	8304	143.57	148.85	81.62	3.55	0.76	0.97	0.00	4.52- 0.76
	I	354	8307	8308	196.76	201.49	84.14	3.91	0.07	0.62	0.13	4.53- 0.20
	H/I	355	8311	8311	238.00	240.49	81.52	1.88	0.15	0.46	0.00	2.34- 0.15
	H	356	8314	8315	250.50	253.87	89.02	1.47	1.53	0.37	0.00	1.84- 1.53

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88018 SEAM : M INTERVAL(M) : 47.08 – 51.80 ELEVATION(M) : 1602.7

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

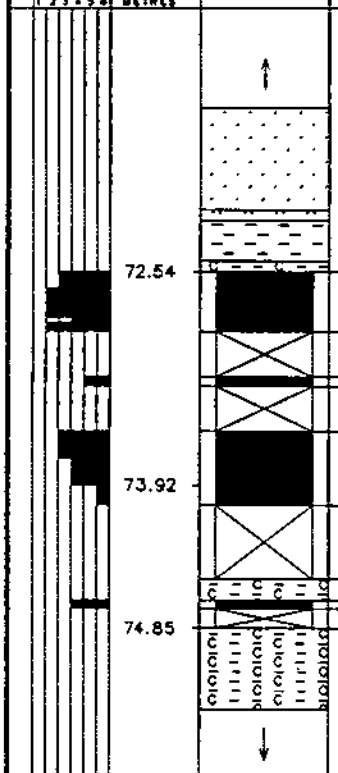
SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	47.08			(0.13) 0.03 (0.10) 0.20												
			0.16													
				0.12												
			0.22	0.03 (0.13)	72.7	8288	103	0.97 / 0.86 1.82		1.11	67.65	9.90	21.34	—	7.96	—
			0.31													
				0.08 (0.10) 0.08 (0.03)												
			0.11													
	49.02			0.31												
				(0.51)												
				0.09												
				(0.45)												
				0.50	54.3	8290	104	2.41 / 0.17 2.58	2.41 / 0.17 2.58	1.11	42.59	8.41	47.89	—	17.72	—
			0.02	0.02												
				0.21												
			0.09													
				0.09												
	51.80			(0.22)												

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88018 SEAM : L INTERVAL(M) : 72.54 – 74.85 ELEVATION(M) : 1602.7

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	72.54			0.38												
				(0.29)												
				0.05	58.0	8293	105	1.36 / 0.00		1.03	22.26	6.81	69.86	—	26.48	—
				(0.29)				1.36								
	73.92			0.47					2.13 / 0.14							
									2.26							
				(0.47)	34.4	8294	106	0.77 / 0.14		—	—	—	—	—	—	—
			0.14					0.91								
				0.05												
	74.85			(0.13)												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88018 SEAM : K/L INTERVAL(M) : 85.53 – 86.25 ELEVATION(M) : 1602.7

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	85.53															
				0.30	97.2	8287	107	0.64/ 0.03	0.64/ 0.03	0.94	35.33	7.25	56.48	0.50	21.63	
				0.28				0.67	0.67							
	86.25															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88018
Coal zone:	K/L		
Field sample no.:	08297	Composite sample no.:	107
True sample thickness:	0.671 meters	Drill core recovery (%):	97.22 %
Coal/Rock:	0.643 / 0.028 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	49.02	16.14	9.53	20.17
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.49	1.65		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.94	
Ash (%):	35.33	35.67
Volatile matter (%):	7.25	7.32
Fixed carbon (%):	56.48	57.01
Total sulphur (%):	0.50	0.50
Combustible sulphur (%):	0.04	
Net calorific value (cal/g):	5170.00	5219.00
Gross calorific value (cal/g):	5170.00	5219.00
Volatile matter (dmmf%):	7.00	
Hardgrove index:	48.00	
Specific gravity:	1.56	
Carbon dioxide (%):	2.01	
Phosphorous in coal (%):	0.082	
Chlorine in coal (ppm):	1296.00	
Forms of Sulphur (%):	PYRITE 00.15 SULPHATE 00.00 ORGANIC 00.35	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	58.13	58.68
Hydrogen (%):	2.12	2.14
Nitrogen (%):	0.71	0.72
Oxygen (%):	2.27	2.29

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1224.00	1137.00
Softening temperature (°C):	1264.00	1190.00
Hemispherical temperature (°C):	1285.00	1232.00
Final temperature (°C):	1319.00	1314.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	67.10	TiO2 (%):	0.79
Al2O3 (%):	10.96	Na2O (%):	1.20
Fe2O3 (%):	6.78	K2O (%):	0.45
CaO (%):	4.87	SO3 (%):	3.24
MgO (%):	3.05	P2O5 (%):	0.53

qcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00107
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1253.0	initial temp.(C)	1200.0
softening temp.(C)	1274.0	softening temp.(C)	1219.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1243.0
fluid temp.(C)	1330.0	fluid temp.(C)	1327.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00107
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	61.30
aluminium oxide %	(al2o3)	18.99
ferric oxide %	(fe2o3)	5.16
titanium dioxide %	(tio2)	1.01
phosphorous pentoxide %	(p2o5)	0.77
calcium oxide %	(cao)	4.67
magnesium oxide %	(mgo)	2.66
sulphur trioxide %	(so3)	1.32
sodium oxide %	(na2o)	1.36
potassium oxide %	(k2o)	1.34

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88018

sample id 00107
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1266.0	initial temp.(C)	1209.0
softening temp.(C)	1295.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1319.0	hemispherical temp.(C)	1274.0
fluid temp.(C)	1369.0	fluid temp.(C)	1353.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88018

sample id 00107
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	58.50
aluminium oxide %	(al2o3)	22.51
ferric oxide %	(fe2o3)	4.30
titanium dioxide %	(tio2)	0.82
phosphorous pentoxide %	(p2o5)	1.21
calcium oxide %	(cao)	5.15
magnesium oxide %	(mgo)	2.45
sulphur trioxide %	(so3)	1.81
sodium oxide %	(na2o)	1.38
potassium oxide %	(k2o)	1.07

90.0 <= total <= 100.0

GULF CANADA CORPORATION

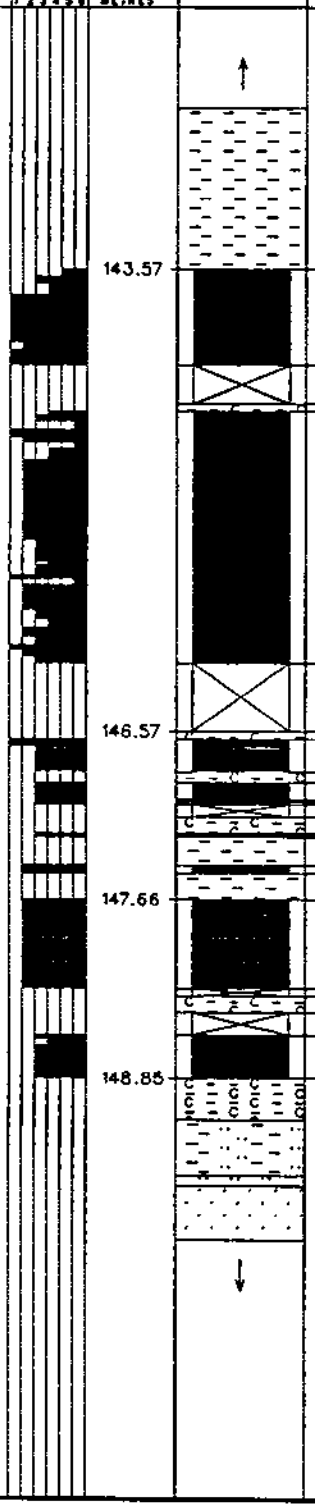
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88018 SEAM : K INTERVAL(M) : 143.57 – 148.85 ELEVATION(M) : 1602.7

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	143.57			0.61												
				(0.24)												
				1.58	77.1	8302	108	2.66 / 0.05 2.91		1.19	23.23	7.46	68.12	0.43	25.84	—
				(0.42)					4.38 / 0.73 5.09							
	146.57			0.20												
			0.07	0.11												
			0.01	(0.08)												
			0.11	0.02	92.8	8303	109	0.47 / 0.58 1.05		1.25	62.30	7.18	29.27	0.32	11.58	—
			0.18													
			0.16	0.03												
	147.66			0.56												
			0.11	0.03	83.2	8304	110	1.03 / 0.11 1.14		1.00	43.20	6.38	49.42	0.37	18.04	—
				(0.14)												
				0.26												
	148.85															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88018
Coal zone:	K		
Field sample no.:	08302	Composite sample no.:	108
True sample thickness:	2.911 meters	Drill core recovery (%):	77.00 %
Coal/Rock:	2.862 / 0.049 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	40.26	18.23	12.18	21.98	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	4.48	2.87			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.19	
Ash (%):	23.23	23.51
Volatile matter (%):	7.46	7.55
Fixed carbon (%):	68.12	68.94
Total sulphur (%):	0.43	0.44
Combustible sulphur (%):	0.04	
Net calorific value (cal/g):	6128.00	6201.00
Gross calorific value (cal/g):	6128.00	6201.00
Volatile matter (dmmf%):	7.40	
Hardgrove index:	56.00	
Specific gravity:	1.52	
Carbon dioxide (%):	1.08	
Phosphorous in coal (%):	0.171	
Chlorine in coal (ppm):	1176.00	
Forms of Sulphur (%):	PYRITE 00.03 SULPHATE 00.00 ORGANIC 00.40	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	66.83	67.63
Hydrogen (%):	2.28	2.31
Nitrogen (%):	0.85	0.86
Oxygen (%):	5.19	5.25

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1190.00	1101.00
Softening temperature (°C):	1248.00	1177.00
Hemispherical temperature (°C):	1261.00	1182.00
Final temperature (°C):	1280.00	1216.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	38.00	TiO2 (%):	1.11
Al2O3 (%):	18.50	Na2O (%):	1.31
Fe2O3 (%):	13.80	K2O (%):	1.30
CaO (%):	12.00	SO3 (%):	4.15
MgO (%):	5.71	P2O5 (%):	1.69

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88018
Coal zone:	K		
Field sample no.:	08303	Composite sample no.:	109
True sample thickness:	1.047 meters	Drill core recovery (%):	92.66 %
Coal/Rock:	0.471 / 0.576 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	38.43	26.90	13.05	15.65	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	3.55	2.42			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.25	
Ash (%):	62.30	63.09
Volatile matter (%):	7.18	7.27
Fixed carbon (%):	29.27	29.64
Total sulphur (%):	0.32	0.32
Combustible sulphur (%):	0.10	
Net calorific value (cal/g):	2768.00	2803.00
Gross calorific value (cal/g):	2768.00	2803.00
Volatile matter (dmmf%):	6.70	
Hardgrove index:	60.00	
Specific gravity:	1.72	
Carbon dioxide (%):	1.33	
Phosphorous in coal (%):	0.147	
Chlorine in coal (ppm):	800.00	
Forms of Sulphur (%):	PYRITE 00.11 SULPHATE 00.00 ORGANIC 00.21	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	31.69	32.09
Hydrogen (%):	1.31	1.33
Nitrogen (%):	0.50	0.51
Oxygen (%):	2.63	2.66

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1224.00	1169.00
Softening temperature (°C):	1306.00	1216.00
Hemispherical temperature (°C):	1327.00	1248.00
Final temperature (°C):	1401.00	1374.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	60.88	TiO2 (%):	1.00
Al2O3 (%):	21.03	Na2O (%):	1.63
Fe2O3 (%):	5.81	K2O (%):	2.21
CaO (%):	2.43	SO3 (%):	0.88
MgO (%):	2.94	P2O5 (%):	0.54

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88018
Coal zone:	K		
Field sample no.:	08304	Composite sample no.:	110
True sample thickness:	1.137 meters	Drill core recovery (%):	83.19 %
Coal/Rock:	1.032 / 0.105 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	31.15	25.94	13.82	23.07
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.94	2.08		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.00	
Ash (%):	43.20	43.64
Volatile matter (%):	6.38	6.44
Fixed carbon (%):	49.42	49.92
Total sulphur (%):	0.57	0.58
Combustible sulphur (%):	0.43	
Net calorific value (cal/g):	4312.00	4355.00
Gross calorific value (cal/g):	4312.00	4355.00
Volatile matter (dmmf%):	5.20	
Hardgrove index:	60.00	
Specific gravity:	1.63	
Carbon dioxide (%):	1.26	
Phosphorous in coal (%):	0.038	
Chlorine in coal (ppm):	1056.00	
Forms of Sulphur (%):	PYRITE 00.05 SULPHATE 00.00 ORGANIC 00.52	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	47.39	47.87
Hydrogen (%):	1.80	1.82
Nitrogen (%):	0.65	0.66
Oxygen (%):	5.39	5.43

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1245.00	1169.00
Softening temperature (°C):	1443.00	1295.00
Hemispherical temperature (°C):	1472.00	1348.00
Final temperature (°C):	1472.00	1472.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	60.44	TiO2 (%):	1.11
Al2O3 (%):	24.01	Na2O (%):	1.45
Fe2O3 (%):	4.20	K2O (%):	2.58
CaO (%):	1.38	SO3 (%):	0.81
MgO (%):	2.84	P2O5 (%):	0.20

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 0108
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1243.0	initial temp.(C)	1169.0
softening temp.(C)	1280.0	softening temp.(C)	1256.0
hemispherical temp.(C)	1293.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1301.0	fluid temp.(C)	1274.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 0108
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	40.92
aluminium oxide %	(al2o3)	25.19
ferric oxide %	(fe2o3)	7.35
titanium dioxide %	(tio2)	1.40
phosphorous pentoxide %	(p2o5)	3.10
calcium oxide %	(cao)	8.74
magnesium oxide %	(mgo)	3.66
sulphur trioxide %	(so3)	3.68
sodium oxide %	(na2o)	1.44
potassium oxide %	(k2o)	1.49

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 0108
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1201.0	initial temp.(C)	1199.0
softening temp.(C)	1295.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1301.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1317.0	fluid temp.(C)	1280.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 0108
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	43.80
aluminium oxide %	(al2o3)	27.50
ferric oxide %	(fe2o3)	7.32
titanium dioxide %	(tio2)	1.12
phosphorous pentoxide %	(p2o5)	2.57
calcium oxide %	(cao)	7.11
magnesium oxide %	(mgo)	3.41
sulphur trioxide %	(so3)	3.05
sodium oxide %	(na2o)	1.34
potassium oxide %	(k2o)	1.44

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00109
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1211.0	initial temp.(C)	1185.0
softening temp.(C)	1272.0	softening temp.(C)	1206.0
hemispherical temp.(C)	1282.0	hemispherical temp.(C)	1222.0
fluid temp.(C)	1353.0	fluid temp.(C)	1327.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00109
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	57.56
aluminium oxide %	(al2o3)	21.16
ferric oxide %	(fe2o3)	6.23
titanium dioxide %	(tio2)	1.73
phosphorous pentoxide %	(p2o5)	0.28
calcium oxide %	(cao)	3.54
magnesium oxide %	(mgo)	3.70
sulphur trioxide %	(so3)	1.78
sodium oxide %	(na2o)	1.41
potassium oxide %	(k2o)	1.69

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88018

sample id 00109
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1253.0	1193.0
softening temp.(C)	1309.0	1222.0
hemispherical temp.(C)	1338.0	1253.0
fluid temp.(C)	1406.0	1385.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88018

sample id 00109
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	56.02
aluminium oxide %	(al2o3)	22.23
ferric oxide %	(fe2o3)	6.19
titanium dioxide %	(tio2)	1.73
phosphorous pentoxide %	(p2o5)	0.28
calcium oxide %	(cao)	2.93
magnesium oxide %	(mgo)	3.58
sulphur trioxide %	(so3)	1.81
sodium oxide %	(na2o)	1.34
potassium oxide %	(k2o)	1.56

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00110
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1256.0	initial temp.(C)	1193.0
softening temp.(C)	1427.0	softening temp.(C)	1317.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1369.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00110
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.40
aluminium oxide %	(al2o3)	26.25
ferric oxide %	(fe2o3)	5.48
titanium dioxide %	(tio2)	1.27
phosphorous pentoxide %	(p2o5)	0.41
calcium oxide %	(cao)	1.96
magnesium oxide %	(mgo)	3.57
sulphur trioxide %	(so3)	1.13
sodium oxide %	(na2o)	1.10
potassium oxide %	(k2o)	2.23

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00110
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1311.0	initial temp.(C)	1216.0
softening temp.(C)	1438.0	softening temp.(C)	1374.0
hemispherical temp.(C)	1448.0	hemispherical temp.(C)	1411.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00110
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.22
aluminium oxide %	(al2o3)	27.13
ferric oxide %	(fe2o3)	5.71
titanium dioxide %	(tio2)	1.07
phosphorous pentoxide %	(p2o5)	0.47
calcium oxide %	(cao)	1.94
magnesium oxide %	(mgo)	3.72
sulphur trioxide %	(so3)	0.92
sodium oxide %	(na2o)	1.08
potassium oxide %	(k2o)	2.11

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88018 SEAM : J INTERVAL(M) : 170.96 – 171.58 ELEVATION(M) : 1602.7

GEOLOGIST : KRAUS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	170.96			0.19												
				(0.37)	33.7	99999		0.56/ 0.00		—	—	—	—	—	—	—
	171.58							0.56								

GULF CANADA CORPORATION

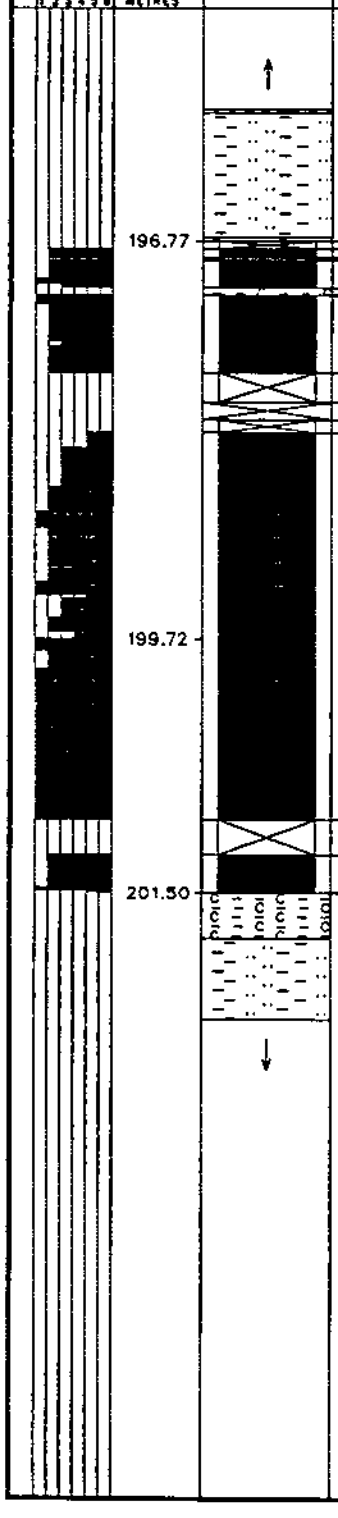
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR 00H88018 SEAM : 1 INTERVAL(M) : 196.77 – 201.50 ELEVATION(M) : 1602.7

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	196.77			0.17	83.2	8307	111	2.32 / 0.17 2.49	3.93 / 0.17 4.10	1.12	29.00	7.56	62.32	0.34	23.55	—
				0.49												
				(0.18)												
				(0.11)												
				(0.04)												
	199.72			2.43	85.9	8308	112	1.61 / 0.00 1.61		1.11	9.98	6.08	82.82	0.47	31.27	—
				(0.23)												
	201.50			0.25												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88018
Coal zone:	I		
Field sample no.:	08307	Composite sample no.:	111
True sample thickness:	2.489 meters	Drill core recovery(%):	83.05 %
Coal/Rock:	2.324 / 0.165 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM			
Size analysis:	SZ1			
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	17.65	20.82	20.00	33.86
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	4.74	2.93		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.12	
Ash(%):	29.00	29.33
Volatile matter(%):	7.56	7.65
Fixed carbon(%):	62.32	63.02
Total sulphur(%):	0.34	0.34
Combustible sulphur(%):	0.04	
Net calorific value(cal/g):	5628.00	5692.00
Gross calorific value(cal/g):	5628.00	5692.00
Volatile matter(dmmf%):	7.60	
Hardgrove index:	54.00	
Specific gravity:	1.53	
Carbon dioxide(%):	1.96	
Phosphorous in coal(%):	0.041	
Chlorine in coal(ppm):	1456.00	

Forms of Sulphur(%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.32

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	61.93	62.63
Hydrogen(%):	1.99	2.01
Nitrogen(%):	0.77	0.78
Oxygen(%):	4.85	4.91

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1148.00	1122.00
Softening temperature(°C):	1256.00	1216.00
Hemispherical temperature(°C):	1266.00	1232.00
Final temperature(°C):	1301.00	1298.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	58.56	TiO2(%):	0.73
Al2O3(%):	18.27	Na2O(%):	1.78
Fe2O3(%):	6.47	K2O(%):	1.39
CaO(%):	5.03	SO3(%):	2.58
MgO(%):	4.39	P2O5(%):	0.32

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88018
Coal zone:	I		
Field sample no.:	08308	Composite sample no.:	112
True sample thickness:	1.608 meters	Drill core recovery (%):	85.95 %
Coal/Rock:	1.608 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	20.55	23.49	18.92	29.49
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	4.30	3.25		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.11	
Ash (%):	9.99	10.10
Volatile matter (%):	6.08	6.15
Fixed carbon (%):	82.82	83.75
Total sulphur (%):	0.47	0.48
Combustible sulphur (%):	0.23	
Net calorific value (cal/g):	7473.00	7556.00
Gross calorific value (cal/g):	7474.00	7557.00
Volatile matter (dmmf%):	5.80	
Hardgrove index:	44.00	
Specific gravity:	1.41	
Carbon dioxide (%):	1.13	
Phosphorous in coal (%):	0.202	
Chlorine in coal (ppm):	544.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.45

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	81.78	82.70
Hydrogen (%):	3.01	3.04
Nitrogen (%):	0.98	0.99
Oxygen (%):	2.66	2.69

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1143.00	1108.00
Softening temperature (°C):	1277.00	1253.00
Hemispherical temperature (°C):	1282.00	1264.00
Final temperature (°C):	1298.00	1295.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	36.92	TiO2 (%):	1.68
Al2O3 (%):	25.25	Na2O (%):	1.75
Fe2O3 (%):	7.55	K2O (%):	1.14
CaO (%):	9.23	SO3 (%):	5.95
MgO (%):	4.13	P2O5 (%):	4.62

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00111
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1180.0	initial temp.(C)	1174.0
softening temp.(C)	1264.0	softening temp.(C)	1243.0
hemispherical temp.(C)	1285.0	hemispherical temp.(C)	1251.0
fluid temp.(C)	1348.0	fluid temp.(C)	1317.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00111
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.14
aluminium oxide %	(al2o3)	22.18
ferric oxide %	(fe2o3)	6.36
titanium dioxide %	(tio2)	0.82
phosphorous pentoxide %	(p2o5)	0.55
calcium oxide %	(cao)	3.79
magnesium oxide %	(mgo)	3.62
sulphur trioxide %	(so3)	3.05
sodium oxide %	(na2o)	1.82
potassium oxide %	(k2o)	1.65

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00111
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1219.0	initial temp.(C)	1174.0
softening temp.(C)	1285.0	softening temp.(C)	1264.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1280.0
fluid temp.(C)	1372.0	fluid temp.(C)	1338.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00111
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	57.52
aluminium oxide %	(al2o3)	23.05
ferric oxide %	(fe2o3)	5.88
titanium dioxide %	(tio2)	0.63
phosphorous pentoxide %	(p2o5)	0.47
calcium oxide %	(cao)	3.17
magnesium oxide %	(mgo)	3.44
sulphur trioxide %	(so3)	2.27
sodium oxide %	(na2o)	1.46
potassium oxide %	(k2o)	1.43

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88018

sample id 00112
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1232.0	initial temp.(C)	1137.0
softening temp.(C)	1280.0	softening temp.(C)	1245.0
hemispherical temp.(C)	1293.0	hemispherical temp.(C)	1256.0
fluid temp.(C)	1311.0	fluid temp.(C)	1301.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88018

sample id 00112
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	38.80
aluminium oxide %	(al2o3)	24.91
ferric oxide %	(fe2o3)	7.23
titanium dioxide %	(tio2)	1.45
phosphorous pentoxide %	(p2o5)	4.10
calcium oxide %	(cao)	9.21
magnesium oxide %	(mgo)	4.45
sulphur trioxide %	(so3)	4.62
sodium oxide %	(na2o)	1.33
potassium oxide %	(k2o)	1.07

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00112
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1132.0	initial temp.(C)	1130.0
softening temp.(C)	1253.0	softening temp.(C)	1248.0
hemispherical temp.(C)	1301.0	hemispherical temp.(C)	1261.0
fluid temp.(C)	1343.0	fluid temp.(C)	1306.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00112
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	41.72
aluminium oxide %	(al2o3)	27.26
ferric oxide %	(fe2o3)	7.07
titanium dioxide %	(tio2)	1.25
phosphorous pentoxide %	(p2o5)	3.26
calcium oxide %	(cao)	6.19
magnesium oxide %	(mgo)	5.35
sulphur trioxide %	(so3)	2.18
sodium oxide %	(na2o)	0.71
potassium oxide %	(k2o)	1.00

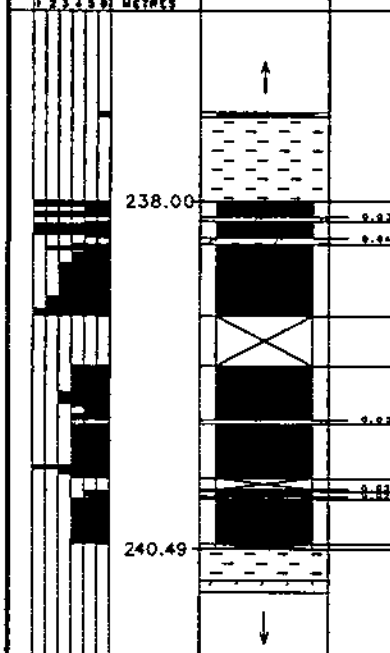
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88018 | SEAM : H/I | INTERVAL(M) : 238.00 - 240.49 | ELEVATION(M) : 1602.7

GEOLOGIST : KRAUS | SCALE: 1:40 | DATE : JAN 26/89 | DRAWING NO. :



SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
1 2 3 4 5 6				0.10											
			0.03	0.11											
			0.44	0.45											
				(0.31)											
				0.33	81.4	8311	113	2.04 / 0.13 2.17	2.04 / 0.13 2.17	1.14	36.58	7.26	55.02	0.42	20.83
			0.02	0.34											
			0.03	(0.05)											
				0.28											
				(0.03)											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88018
Coal zone:	H/I		
Field sample no.:	08311	Composite sample no.:	113
True sample thickness:	2.175 meters	Drill core recovery (%):	81.52 %
Coal/Rock:	2.041 / 0.134 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	12.64	19.98	18.15	38.09	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	6.42	4.72			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.14	
Ash (%):	36.58	37.00
Volatile matter (%):	7.26	7.34
Fixed carbon (%):	55.02	55.66
Total sulphur (%):	0.42	0.42
Combustible sulphur (%):	0.09	
Net calorific value (cal/g):	4978.00	5036.00
Gross calorific value (cal/g):	4978.00	5036.00
Volatile matter (dmmf%):	7.10	
Hardgrove index:	68.00	
Specific gravity:	1.57	
Carbon dioxide (%):	1.55	
Phosphorous in coal (%):	0.096	
Chlorine in coal (ppm):	1736.00	
Forms of Sulphur (%):	PYRITE 00.06 SULPHATE 00.00 ORGANIC 00.36	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	56.05	56.69
Hydrogen (%):	1.91	1.93
Nitrogen (%):	0.62	0.63
Oxygen (%):	3.28	3.33

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1127.00	1056.00
Softening temperature (°C):	1264.00	1219.00
Hemispherical temperature (°C):	1290.00	1243.00
Final temperature (°C):	1322.00	1317.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	58.60	TiO2 (%):	0.89
Al2O3 (%):	18.44	Na2O (%):	1.57
Fe2O3 (%):	5.27	K2O (%):	1.17
CaO (%):	5.78	SO3 (%):	2.24
MgO (%):	3.48	P2O5 (%):	0.60

qcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00113
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1264.0	initial temp.(C)	1180.0
softening temp.(C)	1338.0	softening temp.(C)	1285.0
hemispherical temp.(C)	1374.0	hemispherical temp.(C)	1311.0
fluid temp.(C)	1438.0	fluid temp.(C)	1427.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00113
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	58.26
aluminium oxide %	(al2o3)	23.81
ferric oxide %	(fe2o3)	4.09
titanium dioxide %	(tio2)	1.27
phosphorous pentoxide %	(p2o5)	0.68
calcium oxide %	(cao)	3.68
magnesium oxide %	(mgo)	2.77
sulphur trioxide %	(so3)	2.54
sodium oxide %	(na2o)	1.53
potassium oxide %	(k2o)	1.12

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00113
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1232.0	initial temp.(C)	1216.0
softening temp.(C)	1453.0	softening temp.(C)	1374.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1411.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00113
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide	%	(sio2)	57.16
aluminium oxide	%	(al2o3)	27.02
ferric oxide	%	(fe2o3)	3.80
titanium dioxide	%	(tio2)	1.03
phosphorous pentoxide	%	(p2o5)	0.60
calcium oxide	%	(cao)	2.84
magnesium oxide	%	(mgo)	2.58
sulphur trioxide	%	(so3)	1.72
sodium oxide	%	(na2o)	1.51
potassium oxide	%	(k2o)	0.98

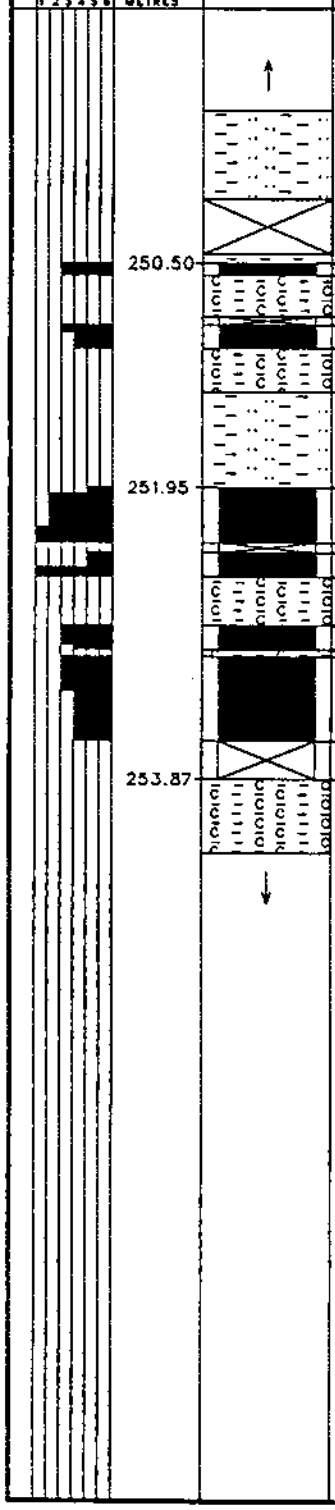
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88018 SEAM : H INTERVAL(M) : 250.50 – 253.87 ELEVATION(M) : 1602.7

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	250.50			0.08												
			0.25													
				0.18												
			0.27		95.9	8314	114	0.28 / 1.12		0.52	84.21	5.72	9.55	—	3.26	—
			0.60					1.40								
	251.95			0.35												
				0.08												
				0.18												
			0.31													
				0.14	83.9	8315	115	1.50 / 0.36	1.50 / 0.36	1.00	55.84	5.75	37.41	0.38	13.31	—
								1.86	1.86							
				0.54												
	253.87			(0.24)												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88018
Coal zone:	H		
Field sample no.:	08315	Composite sample no.:	115
True sample thickness:	1.856 meters	Drill core recovery (%):	83.85 %
Coal/Rock:	1.499 / 0.357 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	53.65	21.18	9.38	13.26
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	1.67	0.86		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.00	
Ash (%):	55.84	56.40
Volatile matter (%):	5.75	5.81
Fixed carbon (%):	37.41	37.79
Total sulphur (%):	0.38	0.38
Combustible sulphur (%):	0.23	
Net calorific value (cal/g):	3181.00	3213.00
Gross calorific value (cal/g):	3181.00	3213.00
Volatile matter (dmmf%):	3.00	
Hardgrove index:	50.00	
Specific gravity:	1.97	
Carbon dioxide (%):	1.47	
Phosphorous in coal (%):	0.068	
Chlorine in coal (ppm):	2056.00	

Forms of Sulphur (%): PYRITE 00.09 SULPHATE 00.00 ORGANIC 00.29

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	37.67	38.05
Hydrogen (%):	1.41	1.42
Nitrogen (%):	0.51	0.52
Oxygen (%):	3.19	3.23

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1101.00	1048.00
Softening temperature (°C):	1327.00	1248.00
Hemispherical temperature (°C):	1356.00	1274.00
Final temperature (°C):	1401.00	1396.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	66.72	TiO2 (%):	0.92
Al2O3 (%):	18.38	Na2O (%):	1.12
Fe2O3 (%):	4.61	K2O (%):	2.76
CaO (%):	1.59	SO3 (%):	0.66
MgO (%):	2.31	P2O5 (%):	0.28

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00115
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1159.0	initial temp.(C)	1150.0
softening temp.(C)	1332.0	softening temp.(C)	1253.0
hemispherical temp.(C)	1359.0	hemispherical temp.(C)	1285.0
fluid temp.(C)	1411.0	fluid temp.(C)	1395.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00115
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	57.78
aluminium oxide %	(al2o3)	22.55
ferric oxide %	(fe2o3)	7.46
titanium dioxide %	(tio2)	0.84
phosphorous pentoxide %	(p2o5)	0.62
calcium oxide %	(cao)	2.26
magnesium oxide %	(mgo)	3.09
sulphur trioxide %	(so3)	1.07
sodium oxide %	(na2o)	1.53
potassium oxide %	(k2o)	1.81

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88018

sample id 00115
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1148.0	initial temp.(C)	1064.0
softening temp.(C)	1380.0	softening temp.(C)	1274.0
hemispherical temp.(C)	1417.0	hemispherical temp.(C)	1309.0
fluid temp.(C)	1446.0	fluid temp.(C)	1443.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88018

sample id 00115
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	56.48
aluminium oxide %	(al2o3)	24.56
ferric oxide %	(fe2o3)	7.30
titanium dioxide %	(tio2)	0.70
phosphorous pentoxide %	(p2o5)	0.54
calcium oxide %	(cao)	1.87
magnesium oxide %	(mgo)	2.89
sulphur trioxide %	(so3)	0.78
sodium oxide %	(na2o)	1.66
potassium oxide %	(k2o)	0.85

90.0 <= total <= 100.0

KPNLRDDH88019

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88019 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/05/88
END DATE - 07/07/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - WALLACE
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED SEAMS G, GL, GL(OVT), G(OVT), G,GL.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1814.25
ZONE - 9
NORTHING - 6344022.04
EASTING - 505694.40

LICENCE/LEASE NUMBER - 7152

LATITUDE - 571428
LONGITUDE - 1285420

- O R I E N T A T I O N -

LENGTH - 155.14
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH(M) - 3.66
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

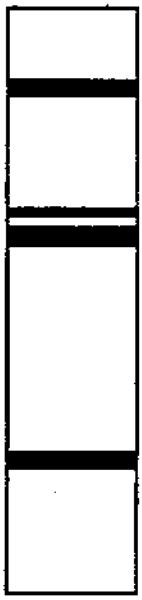
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-019

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
$G_u + G_l$	4.17 m
G_l ovt.	2.25 m
G_u ovt.	5.23 m
$G_u + G_l$	4.37 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88019										
	G ROOF	8258	17.96	18.72	73.68		0.502		0.179	0.000- 0.681
	G & G LO	8259	18.72	21.28	46.88	0.965	0.076	0.998	0.193	1.963- 0.269
	G & G LO	8260	21.28	23.69	24.90	0.183	0.302	1.314	0.137	1.497- 0.439
	G LO FLR	8261	23.69	24.18	100.00		0.377			0.000- 0.377
	G LO OVT FLR	8262	52.36	53.04	100.00		0.630			0.000- 0.630
	G LO & G OVT	8263	53.04	55.50	14.23	0.318		1.930		2.248- 0.000
	G LO & G OVT	8264	55.50	57.51	77.11	0.169	1.196		0.404	0.169- 1.600
	G LO & G OVT	8265	57.51	64.81	28.90	1.289	0.276	3.448	0.219	4.737- 0.495
	G OVT RF	8266	64.81	65.26	100.00		0.153			0.000- 0.153
	G ROOF	8267	116.97	117.84	100.00		0.737			0.000- 0.737
	G & G LO	8268	117.84	123.36	46.38	1.853	0.148	2.064	0.308	3.917- 0.456
	G LO FLOOR	8269	123.36	124.49	29.20		0.225		0.546	0.000- 0.771
		10356	68.96	69.07	100.00		0.055			0.000- 0.055

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88019												
	G & G LO	116	8259	8259	18.72	21.28	46.87	1.11	0.09	1.14	0.22	2.25- 0.31
	G & G LO	117	8260	8260	21.28	23.69	24.89	0.23	0.37	1.64	0.17	1.87- 0.54
	G LO & G OVT	118	8263	8263	53.04	55.50	14.22	0.35	0.00	2.11	0.00	2.46- 0.00
	G LO & G OVT	119	8264	8264	55.50	57.51	77.11	0.19	1.36	0.00	0.46	0.19- 1.82
	G LO & G OVT	120	8265	8265	57.51	64.81	28.90	1.76	0.35	4.78	0.41	6.54- 0.76
	G & G LO	121	8268	8268	117.84	123.36	46.37	2.37	0.19	2.57	0.39	4.94- 0.58
	G & G LO	357	8268	8268	117.84	123.36	46.37	2.37	0.19	2.57	0.39	4.94- 0.58

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

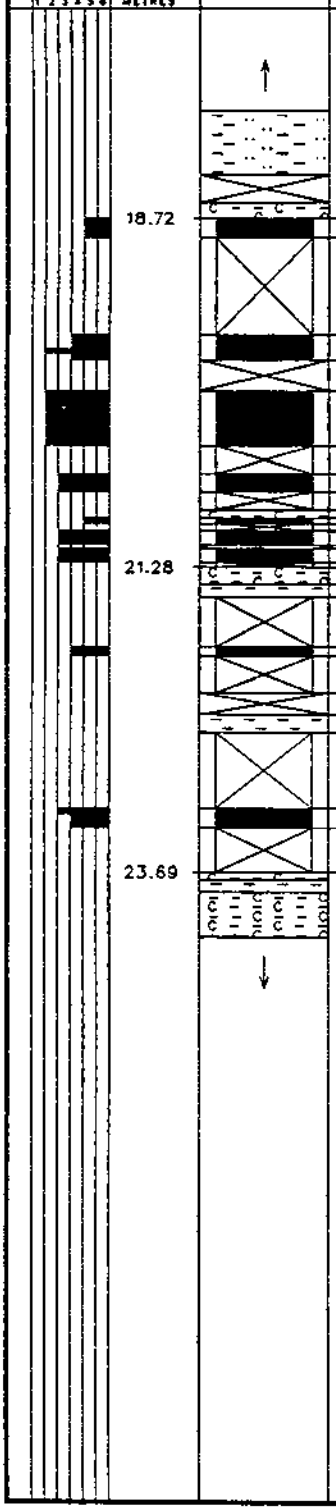
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88019 SEAM : G & G LO INTERVAL(M) : 18.72 – 23.69 ELEVATION(M) : 1814.3

GEOLOGIST : WALLACE SCALE: 1:40 DATE : FEB 06/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	18.72			0.13												
				(0.62)												
				0.16												
			(0.19)		48.6	8259	116	1.96 / 0.27		1.07	34.84	6.67	57.42	—	21.79	—
				0.35				2.23								
				(0.18)												
				0.11												
				(0.12)												
									3.46 / 0.71							
	21.28		0.11						4.17							
			0.09													
				(0.32)												
				0.05												
				(0.24)												
			(0.14)													
			0.11		25.1	8260	117	1.50 / 0.44		1.38	64.21	7.36	27.05	—	9.93	—
								1.94								
				(0.48)												
				0.13												
				(0.28)												
	23.69															

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88019 SEAM : G LO & COAL INTERVAL(M) : 53.04 – 64.81 ELEVATION(M) : 1814.3
INTERVAL(M) : 53.04 – 55.50
GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	53.04			(1.30)	14.1	8263	118	2.25 / 0.00 2.25		0.88	30.74	7.42	60.96	—	23.02	—
				0.32												
	55.50			(0.63)												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88019 SEAM : G LO & GOAL INTERVAL(M) : 53.04 – 64.81 ELEVATION(M) : 1814.3
INTERVAL(M) : 55.50 – 57.51

GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
									2.25 / 0.00 2.25						
	55.50		0.47												
				0.17											
			(0.40)		77.2	8264	119	0.17 / 1.60 1.77		1.93	72.53	7.28	18.26	—	6.18
			0.72												
	57.51														

GULF CANADA CORPORATION

PAGE : 3 / 4

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88019 SEAM : G LO & GOAL INTERVAL(M) : 53.04 – 64.81
INTERVAL(M) : 57.51 – 64.34
ELEVATION(M) : 1814.3

GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	57.51			(0.45)	31.1	8265	120								
				0.18											
				(0.58)											
			(0.30)												
			0.15												
				(0.23)											
				0.60											
				(0.65)											
			0.04												
				(0.33)											
				0.24											
			(0.03)												
			0.03												
				(0.85)											
				0.28											
				(0.24)											
	64.34														

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88019 SEAM : G LO & GOAL INTERVAL(M) : 53.04 – 64.81 ELEVATION(M) : 1814.3
INTERVAL(M) : 64.34 – 64.81

GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 31/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	64.34		(0.12)		0.0	8265	120	4.74 / 0.50	4.74 / 0.50	1.12	41.71	6.92	50.25	—	18.30	—
	64.81			(0.07)				5.23	5.23							

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — TRUE THICKNESS

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88019 SEAM : G & G LO INTERVAL(M) : 117.84 – 123.36 ELEVATION(M) : 1814.3

GEOLOGIST : WALLACE SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	117.84			(0.50)	45.8	8268	121	3.92/ 0.46 4.37	3.92/ 0.46 4.37	1.27	38.64	8.76	53.33	—	19.93	—
				0.45												
				(0.41)												
				(0.29)												
				0.35												
				(0.08)												
			(0.31)													
				(0.40)												
				0.54												
				(0.26)												
			0.08													
				(0.12)												
				0.52												
	123.36															

KPNLRDDH88020

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88020 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/04/88
END DATE - 07/05/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - ETMANSKI

OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED J, I, H SEAMS.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1530.78

ZONE - 9
NORTHING - 6344976.92
EASTING - 507600.29

LICENCE/LEASE NUMBER - 7145

LATITUDE - 571459
LONGITUDE - 1285227

- O R I E N T A T I O N -

LENGTH - 135.55

INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 4.57
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

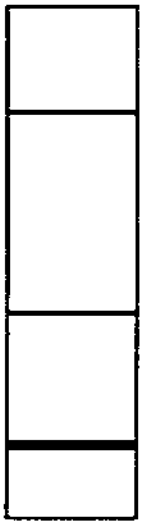
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-020

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
J	0.53 m
I	0.85 m
H	2.05 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE		SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88020											
	I	ROOF	8270	80.01	80.65	100.00		0.558			0.000- 0.558
	I		8271	80.65	81.60	53.68	0.401	0.053	0.391		0.792- 0.053
	I	FLOOR	8272	81.60	82.28	100.00		0.613			0.000- 0.613
	H	ROOF	8273	114.36	114.66	100.00		0.299			0.000- 0.299
	H		8274	114.66	115.46	46.25	0.288	0.080	0.428		0.716- 0.080
	H		8275	115.46	116.75	86.05	0.119	0.981	0.178		0.297- 0.981
	H		8276	116.75	118.03	67.19	0.755	0.088	0.410		1.165- 0.088
	H	FLOOR	8277	118.03	118.63	100.00		0.580			0.000- 0.580
			10362	71.25	71.29	100.00		0.030			0.000- 0.030
			10363	73.39	73.40	100.00		0.008			0.000- 0.008
			10364	73.56	73.57	100.00		0.008			0.000- 0.008
	U		99999	27.16	27.81	10.77	0.056		0.469		0.525- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88020												
	I	122	8271	8271	80.65	81.60	53.68	0.45	0.06	0.44	0.00	0.89- 0.06
	H	123	8274	8274	114.66	115.46	46.25	0.29	0.08	0.43	0.00	0.72- 0.08
	H	124	8275	8275	115.46	116.75	86.04	0.12	0.99	0.18	0.00	0.30- 0.99
	H	125	8276	8276	116.75	118.03	67.18	0.77	0.09	0.42	0.00	1.19- 0.09
	H	266	8276	8276	116.75	118.03	67.18	0.77	0.09	0.42	0.00	1.19- 0.09
	H	358	8276	8276	116.75	118.03	67.18	0.77	0.09	0.42	0.00	1.19- 0.09

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88020 | SEAM : J | INTERVAL(M) : 27.16 – 27.81 | ELEVATION(M) : 1530.8

GEOLOGIST : ETMANSKI | SCALE: 1:40 | DATE : FEB 01/89 | DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	27.16			0.53												
				(0.47)	10.7	99999		0.53/ 0.00		—	—	—	—	—	—	—
	27.81							0.53								

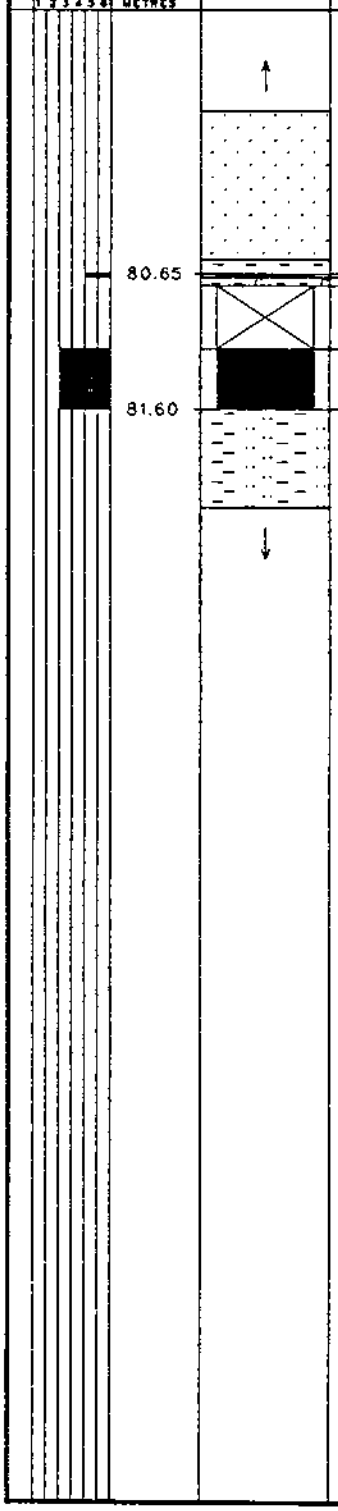
GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88020 SEAM : 1 INTERVAL(M) : 80.65 – 81.60 ELEVATION(M) : 1530.8

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	80.65			(0.39)	53.7	8271	122	0.79 / 0.05	0.79 / 0.05	1.08	34.64	8.43	55.85	—	21.74	—
				0.38				0.85	0.85							
	81.60															

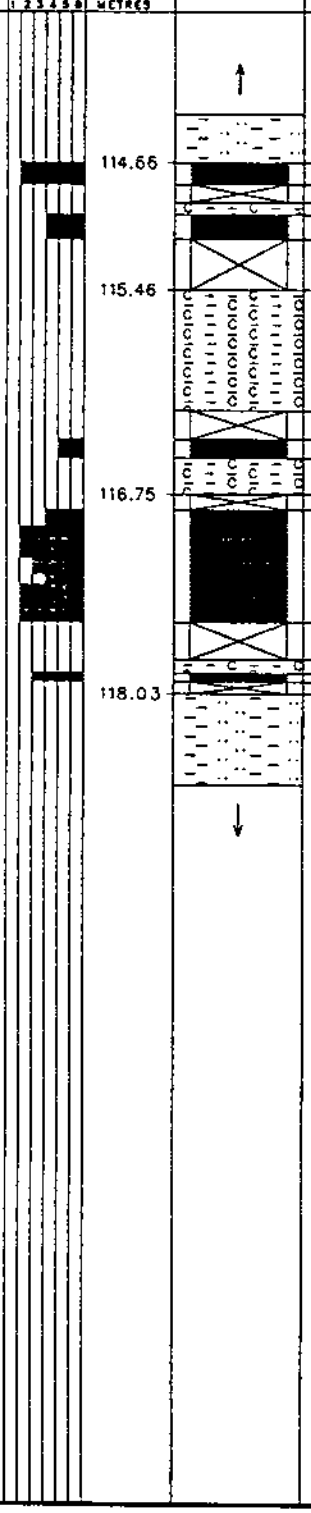


GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88020 SEAM : H INTERVAL(M) : 114.66 – 118.03 ELEVATION(M) : 1530.8

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	114.66			0.14												
				(0.11)												
			0.08													
				0.15	46.2	8274	123	0.72 / 0.08	0.72 / 0.08	1.11	50.20	7.74	40.95	—	15.15	—
				(0.32)				0.80	0.80							
	115.46		0.75													
				(0.18)	86.1	8275	124	0.30/ 0.98		1.36	81.62	6.73	10.29	—	3.27	—
				0.12				1.28								
			0.23													
	116.75			(0.10)												
				0.71	67.3	8276	125	1.17 / 0.09	1.17 / 0.09	0.90	42.22	9.20	47.68	0.38	16.13	—
				(0.23)				1.25	1.25							
			0.08													
				0.05												
	118.03			(0.08)												

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88020
Coal zone:	H		
Field sample no.:	08276	Composite sample no.:	125
True sample thickness:	1.253 meters	Drill core recovery (%):	67.18 %
Coal/Rock:	1.165 / 0.088 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	24.53	22.63	14.14	30.68
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	4.77	3.25		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.90	
Ash (%):	42.22	42.60
Volatile matter (%):	9.20	9.28
Fixed carbon (%):	47.68	48.12
Total sulphur (%):	0.38	0.38
Combustible sulphur (%):	0.02	
Net calorific value (cal/g):	4333.00	4373.00
Gross calorific value (cal/g):	4333.00	4373.00
Volatile matter (dmmf%):	10.70	
Hardgrove index:	58.00	
Specific gravity:	1.60	
Carbon dioxide (%):	1.60	
Phosphorous in coal (%):	0.234	
Chlorine in coal (ppm):	1376.00	

Forms of Sulphur (%): PYRITE 00.04 SULPHATE 00.01 ORGANIC 00.33

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	51.23	51.70
Hydrogen (%):	1.99	2.01
Nitrogen (%):	0.67	0.68
Oxygen (%):	2.61	2.63

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1172.00	1122.00
Softening temperature (°C):	1243.00	1169.00
Hemispherical temperature (°C):	1253.00	1180.00
Final temperature (°C):	1288.00	1232.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	52.16	TiO2 (%):	0.75
Al2O3 (%):	18.03	Na2O (%):	1.19
Fe2O3 (%):	8.77	K2O (%):	1.66
CaO (%):	8.23	SO3 (%):	2.38
MgO (%):	4.77	P2O5 (%):	1.27

gcri coal division ash fusion proj KPN BLK LR DS DDH88020

sample id 00125
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1185.0	initial temp.(C)	1132.0
softening temp.(C)	1290.0	softening temp.(C)	1248.0
hemispherical temp.(C)	1327.0	hemispherical temp.(C)	1290.0
fluid temp.(C)	1403.0	fluid temp.(C)	1401.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88020

sample id 00125
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.08
aluminium oxide %	(al2o3)	25.15
ferric oxide %	(fe2o3)	5.45
titanium dioxide %	(tio2)	0.80
phosphorous pentoxide %	(p2o5)	1.04
calcium oxide %	(cao)	4.20
magnesium oxide %	(mgo)	2.95
sulphur trioxide %	(so3)	1.59
sodium oxide %	(na2o)	1.50
potassium oxide %	(k2o)	1.85

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88020

sample id 00125
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1253.0	initial temp.(C)	1230.0
softening temp.(C)	1390.0	softening temp.(C)	1367.0
hemispherical temp.(C)	1446.0	hemispherical temp.(C)	1395.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88020

sample id 00125
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.18
aluminium oxide %	(al2o3)	27.05
ferric oxide %	(fe2o3)	4.53
titanium dioxide %	(tio2)	0.67
phosphorous pentoxide %	(p2o5)	0.89
calcium oxide %	(cao)	3.20
magnesium oxide %	(mgo)	2.67
sulphur trioxide %	(so3)	0.95
sodium oxide %	(na2o)	1.53
potassium oxide %	(k2o)	1.58

90.0 <= total <= 100.0

KPNLRDDH88021

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88021 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/04/88
END DATE - 07/05/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MURRAY
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - I SEAM INTERSECTED AT 29.77 M. H SEAM AT 73.16 M.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1654.17
ZONE - 9
NORTHING - 6343411.21
EASTING - 506647.21

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571408
LONGITUDE - 1285324

- O R I E N T A T I O N -

LENGTH - 99.56
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

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

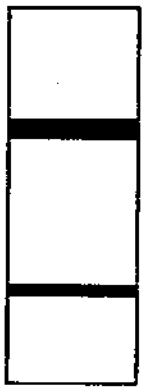
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-021

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
I	4.49 m
H	2.86 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE		SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88021											
	I	ROOF	8278	29.37	29.77	100.00		0.395			0.000- 0.395
	I		8279	29.77	31.15	55.80	0.728	0.030	0.597		1.325- 0.030
	I		8280	31.15	32.73	65.19	0.549	0.442	0.529		1.078- 0.442
	I		8281	32.73	34.46	78.03	1.242	0.019	0.356		1.598- 0.019
	I	FLOOR	8282	34.46	34.96	100.00		0.457			0.000- 0.457
	H	ROOF	8283	72.43	73.16	100.00		0.713			0.000- 0.713
	H		8284	73.16	74.67	62.91	0.893	0.040	0.549		1.442- 0.040
	H		8285	74.67	75.14	100.00	0.168	0.296			0.168- 0.296
	H		8286	75.14	76.07	80.65	0.741		0.178		0.919- 0.000
	H	FLOOR	8287	76.07	76.31	100.00		0.238			0.000- 0.238
			10359	25.57	25.60	100.00		0.030			0.000- 0.030

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88021												
	I	126	8279	8279	29.77	31.15	55.79	0.74	0.03	0.61	0.00	1.35- 0.03
	I	127	8280	8280	31.15	32.73	65.18	0.57	0.46	0.55	0.00	1.12- 0.46
	I	128	8281	8281	32.73	34.46	78.03	1.33	0.02	0.38	0.00	1.71- 0.02
	H	129	8284	8286	73.16	76.07	74.57	1.83	0.34	0.74	0.00	2.57- 0.34
	I	267	8279	8280	29.77	32.73	60.81	1.31	0.49	1.16	0.00	2.47- 0.49
	I	268	8281	8281	32.73	34.46	78.03	1.33	0.02	0.38	0.00	1.71- 0.02
	H	269	8284	8286	73.16	76.07	74.57	1.83	0.34	0.74	0.00	2.57- 0.34
	I	359	8279	8281	29.77	34.46	67.16	2.64	0.51	1.54	0.00	4.18- 0.51
	H	360	8284	8286	73.16	76.07	74.57	1.83	0.34	0.74	0.00	2.57- 0.34

COAL SEAM DATA SHEETS

AND

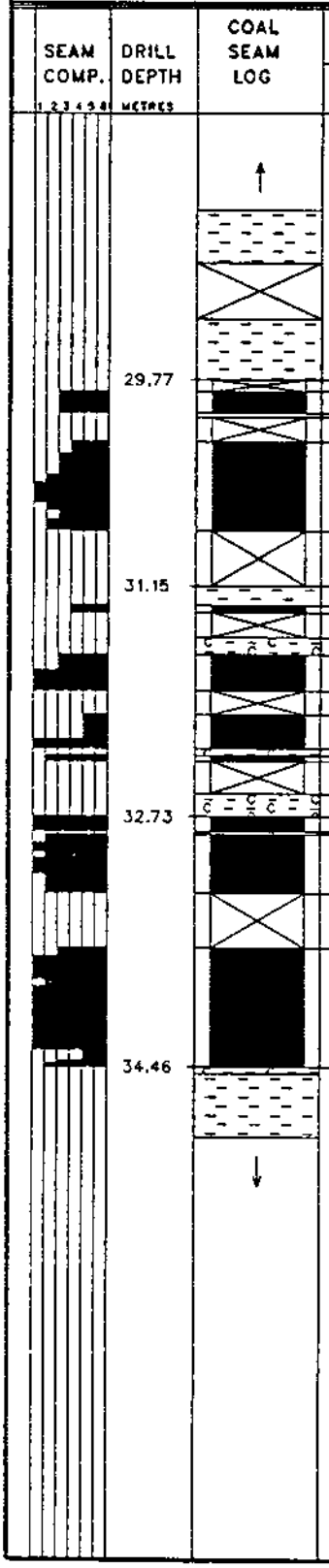
COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88021 SEAM : 1 INTERVAL(M) : 29.77 – 34.46 ELEVATION(M) : 1654.2

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :



SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
1 2 3 4 5 6	29.77			(0.08)											
			0.03	0.34											
				(0.10)											
				0.59	55.9	8279	126	1.33 / 0.03 = 1.36		0.85	24.34	8.13	68.68	0.37	25.41
	31.15			(0.36)											
			0.13												
				(0.17)											
			0.12												
				0.24											
				(0.15)	65.2	8280	127	1.08 / 0.44 = 1.52	4.00 / 0.49 = 4.49	0.68	38.87	7.87	52.58	0.31	19.71
				0.22											
			0.04	0.04											
				(0.21)											
	32.73		0.15												
			0.02	0.10											
				0.38											
				(0.36)	78.0	8281	128	1.60 / 0.02 = 1.62		1.66	13.29	7.09	77.96	0.43	29.57
				0.77											
	34.46														

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88021
Coal zone:	1		
Field sample no.:	08279	Composite sample no.:	126
True sample thickness:	1.355 meters	Drill core recovery(%):	55.79 %
Coal/Rock:	1.325 / 0.030 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	35.04	25.38	14.18	21.43
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	2.70	1.27		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	0.85	
Ash(%):	24.34	24.55
Volatile matter(%):	6.13	6.18
Fixed carbon(%):	68.68	69.27
Total sulphur(%):	0.37	0.37
Combustible sulphur(%):	0.29	
Net calorific value(cal/g):	6073.00	6125.00
Gross calorific value(cal/g):	6073.00	6125.00
Volatile matter(dmmf%):	5.60	
Hardgrove index:	53.00	
Specific gravity:	1.50	
Carbon dioxide(%):	1.46	
Phosphorous in coal(%):	0.039	
Chlorine in coal(ppm):	2016.00	

Forms of Sulphur(%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.35

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	66.01	66.58
Hydrogen(%):	2.05	2.07
Nitrogen(%):	0.72	0.73
Oxygen(%):	5.66	5.70

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1190.00	1053.00
Softening temperature(°C):	1296.00	1245.00
Hemispherical temperature(°C):	1327.00	1274.00
Final temperature(°C):	1422.00	1359.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	57.04	TiO2(%):	1.00
Al2O3(%):	22.93	Na2O(%):	1.49
Fe2O3(%):	7.69	K2O(%):	1.96
CaO(%):	2.10	SO3(%):	0.87
MgO(%):	3.47	P2O5(%):	0.37

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88021
Coal zone:	I		
Field sample no.:	08280	Composite sample no.:	127
True sample thickness:	1.520 meters	Drill core recovery (%):	65.18 %
Coal/Rock:	1.078 / 0.442 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	25.27	28.21	18.27	23.55
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.27	1.43		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	0.68	
Ash (%):	38.87	39.13
Volatile matter (%):	7.87	7.92
Fixed carbon (%):	52.58	52.95
Total sulphur (%):	0.31	0.31
Combustible sulphur (%):	0.22	
Net calorific value (cal/g):	4711.00	4743.00
Gross calorific value (cal/g):	4711.00	4743.00
Volatile matter (dmmf%):	8.20	
Hardgrove index:	63.00	
Specific gravity:	1.60	
Carbon dioxide (%):	1.10	
Phosphorous in coal (%):	0.020	
Chlorine in coal (ppm):	2136.00	

Forms of Sulphur (%): PYRITE 00.05 SULPHATE 00.00 ORGANIC 00.26

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	55.97	56.35
Hydrogen (%):	1.76	1.77
Nitrogen (%):	0.61	0.61
Oxygen (%):	1.80	1.83

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1232.00	1080.00
Softening temperature (°C):	1338.00	1238.00
Hemispherical temperature (°C):	1359.00	1285.00
Final temperature (°C):	1417.00	1359.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	60.26	TiO2 (%):	0.97
Al2O3 (%):	20.33	Na2O (%):	2.38
Fe2O3 (%):	7.76	K2O (%):	1.50
CaO (%):	1.43	SO3 (%):	0.57
MgO (%):	3.45	P2O5 (%):	0.12

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88021
Coal zone:	I		
Field sample no.:	08281	Composite sample no.:	128
True sample thickness:	1.617 meters	Drill core recovery (%):	78.03 %
Coal/Rock:	1.598 / 0.019 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	29.71	24.67	11.77	27.27
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	4.11	2.47		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.66	
Ash (%):	13.29	13.51
Volatile matter (%):	7.09	7.21
Fixed carbon (%):	77.96	79.28
Total sulphur (%):	0.43	0.44
Combustible sulphur (%):	0.20	
Net calorific value (cal/g):	7066.00	7186.00
Gross calorific value (cal/g):	7067.00	7187.00
Volatile matter (dmmf%):	7.00	
Hardgrove index:	45.00	
Specific gravity:	1.43	
Carbon dioxide (%):	1.61	
Phosphorous in coal (%):	0.148	
Chlorine in coal (ppm):	560.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.41

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	77.64	78.95
Hydrogen (%):	2.48	2.52
Nitrogen (%):	0.81	0.82
Oxygen (%):	3.69	3.76

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1185.00	1159.00
Softening temperature (°C):	1248.00	1198.00
Hemispherical temperature (°C):	1264.00	1203.00
Final temperature (°C):	1274.00	1243.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	45.40	TiO2 (%):	1.10
Al2O3 (%):	19.45	Na2O (%):	1.26
Fe2O3 (%):	6.60	K2O (%):	1.41
CaO (%):	8.79	SO3 (%):	4.34
MgO (%):	4.99	P2O5 (%):	2.55

acri coal division ash fusion proj KPN BLK LR DS DDH88021

sample id 00126
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1169.0	initial temp.(C)	1122.0
softening temp.(C)	1343.0	softening temp.(C)	1285.0
hemispherical temp.(C)	1401.0	hemispherical temp.(C)	1327.0
fluid temp.(C)	1472.0	fluid temp.(C)	1448.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

acri coal division ash mineral proj KPN BLK LR DS DDH88021

sample id 00126
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	54.64
aluminium oxide %	(al2o3)	26.68
ferric oxide %	(fe2o3)	5.51
titanium dioxide %	(tio2)	0.94
phosphorous pentoxide %	(p2o5)	0.30
calcium oxide %	(cao)	2.78
magnesium oxide %	(mgo)	3.49
sulphur trioxide %	(so3)	1.20
sodium oxide %	(na2o)	1.29
potassium oxide %	(k2o).	2.14

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88021

sample id 00126
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1214.0	initial temp.(C)	1210.0
softening temp.(C)	1448.0	softening temp.(C)	1406.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1446.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88021

sample id 00126
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.32
aluminium oxide %	(al2o3)	28.45
ferric oxide %	(fe2o3)	4.52
titanium dioxide %	(tio2)	0.79
phosphorous pentoxide %	(p2o5)	0.29
calcium oxide %	(cao)	2.41
magnesium oxide %	(mgo)	3.05
sulphur trioxide %	(so3)	0.91
sodium oxide %	(na2o)	1.37
potassium oxide %	(k2o)	2.29

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88021

sample id 00127
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1200.0	initial temp.(C)	1182.0
softening temp.(C)	1359.0	softening temp.(C)	1311.0
hemispherical temp.(C)	1395.0	hemispherical temp.(C)	1345.0
fluid temp.(C)	1443.0	fluid temp.(C)	1440.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88021

sample id 00127
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.02
aluminium oxide %	(al2o3)	25.87
ferric oxide %	(fe2o3)	7.05
titanium dioxide %	(tio2)	0.93
phosphorous pentoxide %	(p2o5)	0.09
calcium oxide %	(cao)	1.60
magnesium oxide %	(mgo)	3.77
sulphur trioxide %	(so3)	0.86
sodium oxide %	(na2o)	1.68
potassium oxide %	(k2o)	1.89

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88021

sample id 00127
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1211.0	initial temp.(C)	1190.0
softening temp.(C)	1443.0	softening temp.(C)	1327.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1403.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88021

sample id 00127
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.68
aluminium oxide %	(al2o3)	27.25
ferric oxide %	(fe2o3)	5.74
titanium dioxide %	(tio2)	0.87
phosphorous pentoxide %	(p2o5)	0.10
calcium oxide %	(cao)	1.42
magnesium oxide %	(mgo)	3.25
sulphur trioxide %	(so3)	0.67
sodium oxide %	(na2o)	1.76
potassium oxide %	(k2o)	2.19

90.0 <= total <= 100.0

qcri coal division ash fusion proj KPN BLK LR DS DDH88021

sample id 00128
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1206.0	initial temp.(C)	1180.0
softening temp.(C)	1227.0	softening temp.(C)	1190.0
hemispherical temp.(C)	1238.0	hemispherical temp.(C)	1195.0
fluid temp.(C)	1264.0	fluid temp.(C)	1222.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88021

sample id 00128
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	42.44
aluminium oxide %	(al2o3)	18.23
ferric oxide %	(fe2o3)	7.32
titanium dioxide %	(tio2)	0.72
phosphorous pentoxide %	(p2o5)	2.63
calcium oxide %	(cao)	11.50
magnesium oxide %	(mgo)	6.35
sulphur trioxide %	(so3)	5.17
sodium oxide %	(na2o)	1.06
potassium oxide %	(k2o)	1.26

90.0 <= total <= 100.0

qcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88021

sample id 00128
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1248.0	initial temp.(C)	1185.0
softening temp.(C)	1259.0	softening temp.(C)	1203.0
hemispherical temp.(C)	1264.0	hemispherical temp.(C)	1211.0
fluid temp.(C)	1269.0	fluid temp.(C)	1227.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88021

sample id 00128
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	43.08
aluminium oxide %	(al2o3)	21.40
ferric oxide %	(fe2o3)	6.35
titanium dioxide %	(tio2)	0.60
phosphorous pentoxide %	(p2o5)	3.14
calcium oxide %	(cao)	10.93
magnesium oxide %	(mgo)	5.65
sulphur trioxide %	(so3)	4.69
sodium oxide %	(na2o)	1.19
potassium oxide %	(k2o)	1.60

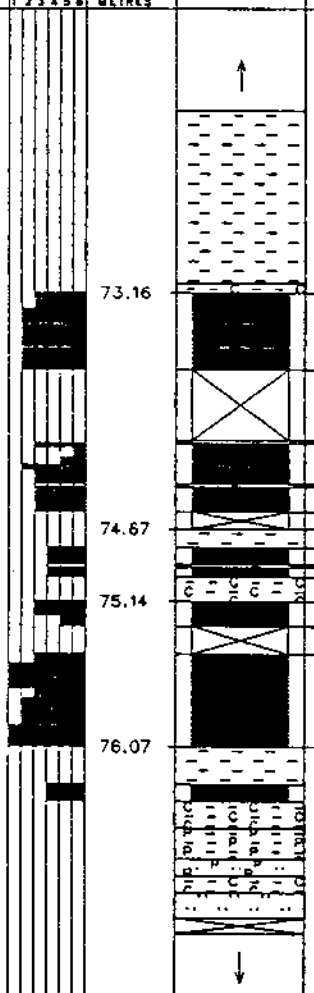
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88021 SEAM : H INTERVAL(M) : 73.16 – 76.07 ELEVATION(M) : 1654.2

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	73.16		0.48											
			(0.44)	63.0	8284									
		0.02												
			0.26											
		0.03												
			0.16											
	74.67		(0.11)			128	2.53/0.34 2.86	2.53/0.34 2.88	1.83	33.03	6.83	58.31	0.53	21.95
		0.12												
		0.03	0.11	100.0	8285									
			0.04											
	75.14	0.18												
			0.16											
			(0.18)											
			0.58	80.6	8286									
	76.07													

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88021
Coal zone:	H		
Field sample no.:	08284 - 08286	Composite sample no.:	129
True sample thickness:	2.865 meters	Drill core recovery (%):	74.57 %
Coal/Rock:	2.529 / 0.336 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	35.92	23.91	14.58	21.13
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	2.81	1.65		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.83	
Ash (%):	33.03	33.64
Volatile matter (%):	6.83	6.96
Fixed carbon (%):	58.31	59.40
Total sulphur (%):	0.53	0.54
Combustible sulphur (%):	0.15	
Net calorific value (cal/g):	5246.00	5344.00
Gross calorific value (cal/g):	5246.00	5344.00
Volatile matter (dmmf%):	6.40	
Hardgrove index:	54.00	
Specific gravity:	1.54	
Carbon dioxide (%):	1.70	
Phosphorous in coal (%):	0.069	
Chlorine in coal (ppm):	64.00	
Forms of Sulphur (%):	PYRITE 00.41 SULPHATE 00.00 ORGANIC 00.12	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	58.10	59.18
Hydrogen (%):	1.78	1.81
Nitrogen (%):	0.57	0.58
Oxygen (%):	4.16	4.25

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1206.00	1169.00
Softening temperature (°C):	1245.00	1185.00
Hemispherical temperature (°C):	1266.00	1198.00
Final temperature (°C):	1319.00	1311.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	59.18	TiO2 (%):	0.93
Al2O3 (%):	17.07	Na2O (%):	1.65
Fe2O3 (%):	6.52	K2O (%):	1.15
CaO (%):	5.80	SO3 (%):	2.89
MgO (%):	3.66	P2O5 (%):	0.48

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88021

sample id 00129
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1248.0	initial temp.(C)	1200.0
softening temp.(C)	1359.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1398.0	hemispherical temp.(C)	1306.0
fluid temp.(C)	1446.0	fluid temp.(C)	1443.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88021

sample id 00129
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	52.28
aluminium oxide %	(al2o3)	26.55
ferric oxide %	(fe2o3)	5.40
titanium dioxide %	(tio2)	1.13
phosphorous pentoxide %	(p2o5)	0.33
calcium oxide %	(cao)	3.30
magnesium oxide %	(mgo)	3.45
sulphur trioxide %	(so3)	1.54
sodium oxide %	(na2o)	2.25
potassium oxide %	(k2o)	1.91

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88021

sample id 00129
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1222.0	initial temp.(C)	1182.0
softening temp.(C)	1446.0	softening temp.(C)	1298.0
hemispherical temp.(C)	1451.0	hemispherical temp.(C)	1364.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88021

sample id 00129
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	52.78
aluminium oxide %	(al2o3)	28.03
ferric oxide %	(fe2o3)	4.66
titanium dioxide %	(tio2)	1.03
phosphorous pentoxide %	(p2o5)	0.32
calcium oxide %	(cao)	2.81
magnesium oxide %	(mgo)	3.02
sulphur trioxide %	(so3)	1.15
sodium oxide %	(na2o)	2.21
potassium oxide %	(k2o)	2.00

90.0 <= total <= 100.0

KPNLRDDH88022

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88022 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/05/88
END DATE - 07/05/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - KRAUS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - ONE SEAM INTERSECTED: 0?

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1665.58
ZONE - 9
NORTHING - 6342274.25
EASTING - 505620.28

LICENCE/LEASE NUMBER - 7148

LATITUDE - 571332
LONGITUDE - 1285425

- O R I E N T A T I O N -

LENGTH - 99.26
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

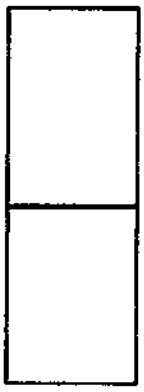
CASING DEPTH (M) - 2.13
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-022

SEAM		TRUE SEAM THICKNESS (Coal + Rock)
K		0.92 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88022										
	0? ROOF	8317	52.19	52.44	100.00		0.241			0.000- 0.241
	0?	8318	52.44	53.39	65.26	0.597		0.318		0.915- 0.000
	0? FLOOR	8319	53.39	53.70	100.00		0.298			0.000- 0.298
		10365	47.22	47.60	100.00		0.361			0.000- 0.361
		10366	51.16	51.29	100.00		0.103			0.000- 0.103

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88022												
	0 ?	130	8318	8318	52.44	53.39	65.26	0.62	0.00	0.33	0.00	0.95- 0.00
	0 ?	361	8318	8318	52.44	53.39	65.26	0.62	0.00	0.33	0.00	0.95- 0.00

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

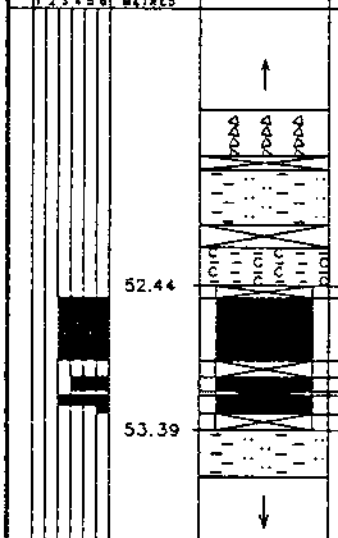
GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — TRUE THICKNESS

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88022 SEAM : 0? INTERVAL(M) : 52.44 – 53.39 ELEVATION(M) : 1665.6

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	52.44			(0.08)											
				0.40											
				(0.11)											
				(0.09)											
				0.12											
				(0.11)											
	53.39				65.2	8318	130	0.92/ 0.00	0.92/ 0.00	1.33	34.32	8.20	58.15	1.40	22.05
								0.92	0.92						

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88022
Coal zone:	0?		
Field sample no.:	08318	Composite sample no.:	130
True sample thickness:	0.915 meters	Drill core recovery (%):	65.26 %
Coal/Rock:	0.915 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	17.57	14.87	10.95	36.01
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	12.64	7.96		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.33	
Ash (%):	34.32	34.78
Volatile matter (%):	6.20	6.28
Fixed carbon (%):	58.15	58.94
Total sulphur (%):	1.40	1.42
Combustible sulphur (%):	1.25	
Net calorific value (cal/g):	5270.00	5341.00
Gross calorific value (cal/g):	5270.00	5341.00
Volatile matter (dmmf%):	4.80	
Hardgrove index:	79.00	
Specific gravity:	1.56	
Carbon dioxide (%):	0.68	
Phosphorous in coal (%):	0.186	
Chlorine in coal (ppm):	1072.00	

Forms of Sulphur (%): PYRITE 00.74 SULPHATE 00.00 ORGANIC 00.66

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	57.03	57.80
Hydrogen (%):	1.90	1.93
Nitrogen (%):	0.73	0.74
Oxygen (%):	3.29	3.33

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1227.00	1190.00
Softening temperature (°C):	1311.00	1227.00
Hemispherical temperature (°C):	1353.00	1259.00
Final temperature (°C):	1446.00	1353.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	66.72	TiO2 (%):	0.81
Al2O3 (%):	15.40	Na2O (%):	0.93
Fe2O3 (%):	5.10	K2O (%):	1.53
CaO (%):	2.69	SO3 (%):	1.08
MgO (%):	2.70	P2O5 (%):	1.24

gcri coal division ash fusion proj KPN BLK LR DS DDH88022

sample id 00130
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1182.0	initial temp.(C)	1137.0
softening temp.(C)	1274.0	softening temp.(C)	1169.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1182.0
fluid temp.(C)	1319.0	fluid temp.(C)	1311.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88022

sample id 00130
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	57.24
aluminium oxide %	(al2o3)	18.91
ferric oxide %	(fe2o3)	7.32
titanium dioxide %	(tio2)	1.27
phosphorous pentoxide %	(p2o5)	3.34
calcium oxide %	(cao)	5.22
magnesium oxide %	(mgo)	2.95
sulphur trioxide %	(so3)	0.79
sodium oxide %	(na2o)	0.75
potassium oxide %	(k2o)	1.14

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88022

sample id 00130
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1200.0	initial temp.(C)	1148.0
softening temp.(C)	1269.0	softening temp.(C)	1235.0
hemispherical temp.(C)	1282.0	hemispherical temp.(C)	1245.0
fluid temp.(C)	1306.0	fluid temp.(C)	1304.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88022

sample id 00130
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.16
aluminium oxide %	(al2o3)	21.95
ferric oxide %	(fe2o3)	5.98
titanium dioxide %	(tio2)	1.06
phosphorous pentoxide %	(p2o5)	3.39
calcium oxide %	(cao)	5.43
magnesium oxide %	(mgo)	3.65
sulphur trioxide %	(so3)	0.79
sodium oxide %	(na2o)	0.68
potassium oxide %	(k2o)	0.95

90.0 <= total <= 100.0

KPNLRDDH88023

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88023 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/06/88
END DATE - 07/07/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MATTHEWS

OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SEAMS INTERSECTED: ?, P?, 0?. TWO CASING DEPTHS DU
E TO LOST CIRC.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1573.58

ZONE - 9
NORTHING - 6343395.95
EASTING - 507899.95

LICENCE/LEASE NUMBER - 7145

LATITUDE - 571408
LONGITUDE - 1285209

- O R I E N T A T I O N -

LENGTH - 98.88

INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 11.89
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

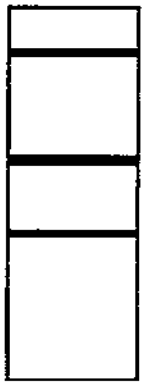
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-023

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
?	1.61 m
P?	1.84 m
O?	1.55 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88023										
	P? ROOF	8331	39.03	39.39	100.00		0.354			0.000- 0.354
	P?	8332	39.39	41.26	32.09	0.551	0.039	1.249		1.800- 0.039
	P? FLOOR	8333	41.26	41.67	100.00		0.404			0.000- 0.404
	?	99998	11.35	12.98	0.00			1.614		1.614- 0.000
	D?	99999	59.35	61.32	11.17	0.038	0.133	0.995	0.387	1.033- 0.520

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88023												
	P?	131	8332	8332	39.39	41.26	32.08	0.56	0.04	1.27	0.00	1.83- 0.04

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

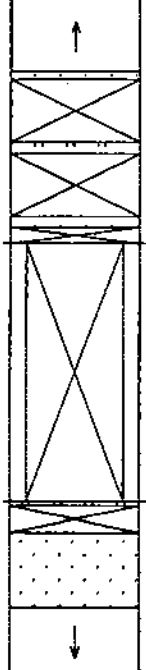
COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88023 SEAM : ? INTERVAL(M) : 11.35 – 12.98 ELEVATION(M) : 1573.6

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	11.35															
				(1.61)	0.0	99998		1.61 / 0.00 1.61		—	—	—	—	—	—	—
	12.98															



GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88023 SEAM : P? INTERVAL(M) : 39.39 – 41.26 ELEVATION(M) : 1573.6

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	39.39			(0.52)												
			0.04	(0.14)												
				0.18	32.1	8332	331	1.80 / 0.04 1.84	1.80 / 0.04 1.84	0.96	41.39	10.16	47.51	—	18.04	—
				(0.48)												
				0.34												
	41.26			(0.11)												

GULF CANADA CORPORATION

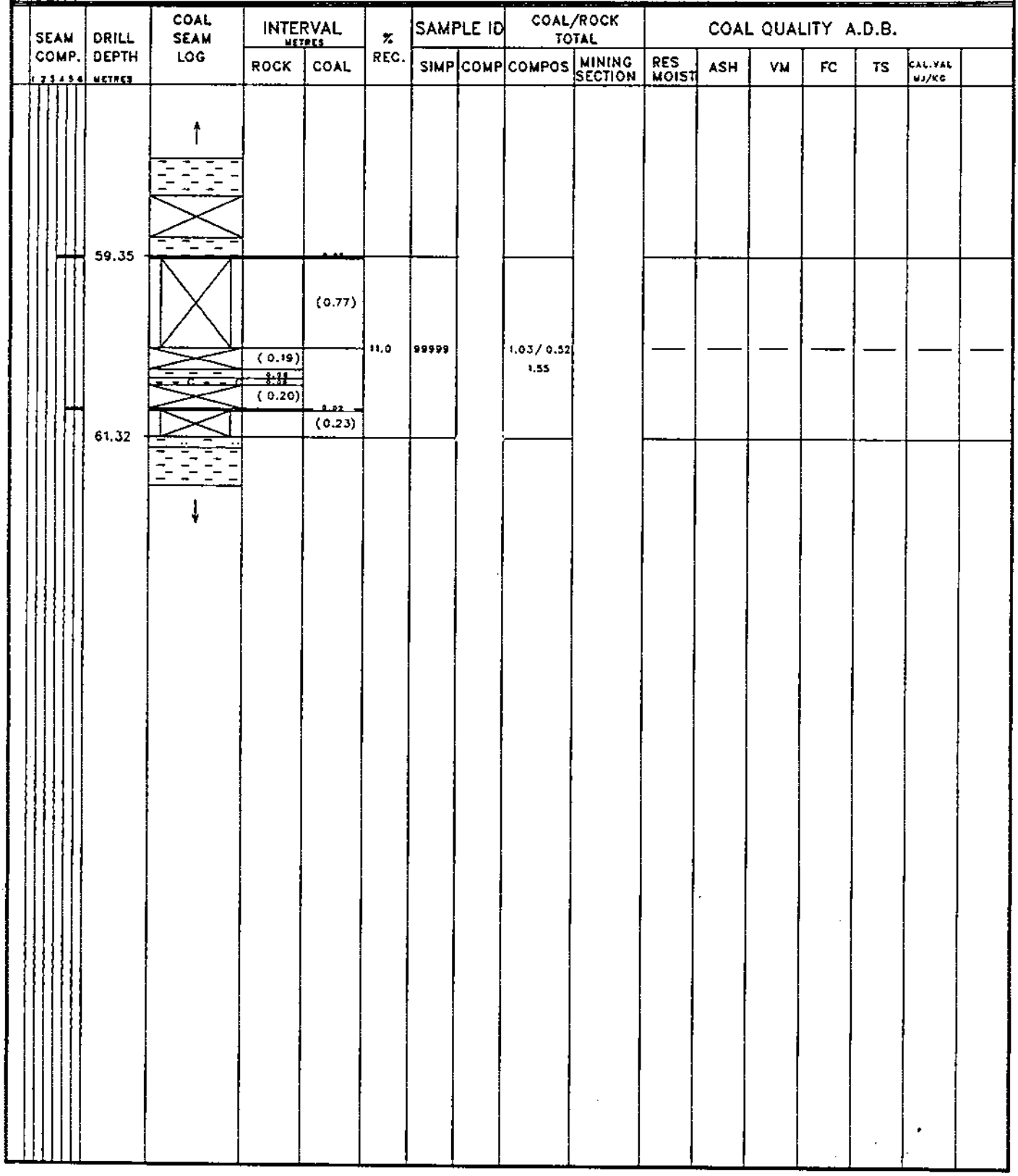
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88023 SEAM : 07 INTERVAL(M) : 59.35 – 61.32 ELEVATION(M) : 1573.6

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :



KPNLRDDH88024

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88024 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/06/88
END DATE - 07/07/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - LEE
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED SEAMS: ?, P.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1639.06
ZONE - 9
NORTHING - 6342395.85
EASTING - 506335.17

LICENCE/LEASE NUMBER - 7147

LATITUDE - 571336
LONGITUDE - 1285342

- O R I E N T A T I O N -

LENGTH - 105.84
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH (M) - 9.75
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

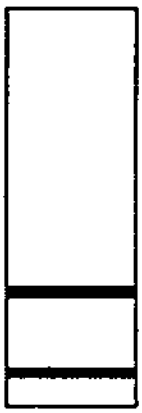
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-024

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
?	2.23 m
P	1.82 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE		SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88024											
	?	ROOF	8320	73.14	73.63	100.00		0.466			0.000- 0.466
	?		8321	73.63	74.37	52.70	0.304	0.067	0.181	0.153	0.485- 0.220
	?		8322	74.37	74.93	53.57		0.287	0.115	0.134	0.115- 0.421
	?		8323	74.93	75.96	67.96	0.624	0.048	0.317		0.941- 0.048
	?	FLOOR	8324	75.96	76.22	100.00		0.250			0.000- 0.250
	P	ROOF	8328	95.55	95.82	100.00		0.265			0.000- 0.265
	P		8329	95.82	97.67	64.86	1.061	0.118	0.640		1.701- 0.118
	P	FLOOR	8330	97.67	98.20	100.00		0.522			0.000- 0.522

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK	
DDH88024													
	?	132	8321	8321	73.63	74.37	52.70	0.32	0.07	0.19	0.16	0.51-	0.23
	?	133	8322	8322	74.37	74.93	53.57	0.00	0.30	0.12	0.14	0.12-	0.44
	?	134	8323	8323	74.93	75.96	67.96	0.65	0.05	0.33	0.00	0.98-	0.05
	P	135	8329	8329	95.82	97.67	64.86	1.08	0.12	0.65	0.00	1.73-	0.12
	?	270	8321	8323	73.63	75.96	61.58	0.97	0.12	0.52	0.16	1.49-	0.28
	P	271	8329	8329	95.82	97.67	64.86	1.08	0.12	0.65	0.00	1.73-	0.12
	?	362	8321	8323	73.63	75.96	61.58	0.97	0.12	0.52	0.16	1.49-	0.28
	P	363	8329	8329	95.82	97.67	64.86	1.08	0.12	0.65	0.00	1.73-	0.12

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88024 SEAM : ? INTERVAL(M) : 73.63 – 75.96 ELEVATION(M) : 1639.1

GEOLOGIST : LEE SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	73.63			(0.08) 0.21												
			0.07													
				0.10	52.6	8321	132	0.49/0.22 0.71		1.10	39.03	7.38	52.49	—	20.01	—
			(0.16)													
	74.37			(0.11)												
			0.15													
			(0.09)													
				(0.12)	53.5	8322	133	0.12/0.42 0.54	1.54/0.69 2.23	0.68	77.27	11.83	10.22	—	3.29	—
			0.11													
	74.93			(0.03) 0.16												
				(0.08) 0.19												
				(0.08) (0.03)												
				0.27	67.9	8323	134	0.94/0.05 0.99		1.28	38.42	7.01	53.28	1.12	20.27	—
				(0.11)												
	75.96															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88024
Coal zone:	?		
Field sample no.:	08323	Composite sample no.:	134
True sample thickness:	0.989 meters	Drill core recovery(%):	67.96 %
Coal/Rock:	0.941 / 0.048 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	21.62	20.06	14.19	31.19
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	8.35	4.59		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.29	
Ash(%):	38.42	38.92
Volatile matter(%):	7.01	7.10
Fixed carbon(%):	53.28	53.98
Total sulphur(%):	1.12	1.13
Combustible sulphur(%):	0.85	
Net calorific value(cal/g):	4845.00	4908.00
Gross calorific value(cal/g):	4845.00	4908.00
Volatile matter(dmmf%):	6.20	
Hardgrove index:	73.00	
Specific gravity:	1.60	
Carbon dioxide(%):	1.51	
Phosphorous in coal(%):	0.280	
Chlorine in coal(ppm):	312.00	

Forms of Sulphur(%): PYRITE 00.70 SULPHATE 00.00 ORGANIC 00.42

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	53.50	54.20
Hydrogen(%):	1.84	1.86
Nitrogen(%):	0.73	0.74
Oxygen(%):	3.10	3.15

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1198.00	1137.00
Softening temperature(°C):	1264.00	1195.00
Hemispherical temperature(°C):	1285.00	1209.00
Final temperature(°C):	1332.00	1301.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	61.02	TiO2(%):	0.75
Al2O3(%):	16.57	Na2O(%):	0.82
Fe2O3(%):	8.27	K2O(%):	1.63
CaO(%):	4.36	SO3(%):	1.78
MgO(%):	2.91	P2O5(%):	1.67

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88024

sample id 00134
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1180.0	initial temp.(C)	1161.0
softening temp.(C)	1274.0	softening temp.(C)	1235.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1317.0	fluid temp.(C)	1285.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88024

sample id 00134
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	48.50
aluminium oxide %	(al2o3)	23.05
ferric oxide %	(fe2o3)	6.25
titanium dioxide %	(tio2)	1.05
phosphorous pentoxide %	(p2o5)	3.98
calcium oxide %	(cao)	7.51
magnesium oxide %	(mgo)	2.77
sulphur trioxide %	(so3)	2.61
sodium oxide %	(na2o)	1.17
potassium oxide %	(k2o)	2.09

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88024

sample id 00134
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1164.0
softening temp.(C)	1285.0	softening temp.(C)	1251.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1327.0	fluid temp.(C)	1295.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88024

sample id 00134
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	47.14
aluminium oxide %	(al2o3)	23.86
ferric oxide %	(fe2o3)	5.62
titanium dioxide %	(tio2)	0.89
phosphorous pentoxide %	(p2o5)	4.16
calcium oxide %	(cao)	7.50
magnesium oxide %	(mgo)	2.51
sulphur trioxide %	(so3)	2.00
sodium oxide %	(na2o)	1.32
potassium oxide %	(k2o)	2.20

90.0 <= total <= 100.0

GULF CANADA CORPORATION

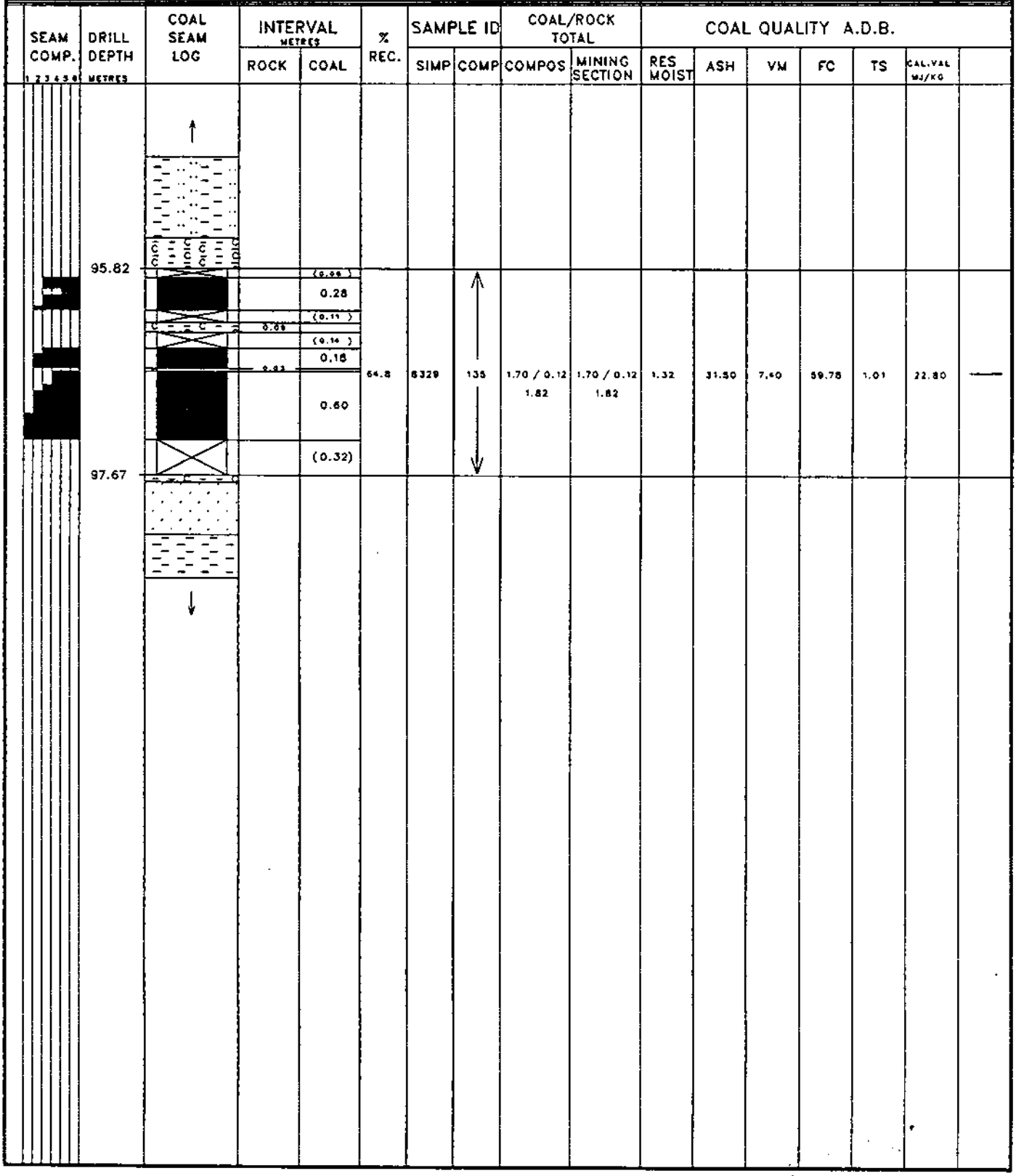
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88024 SEAM : P INTERVAL(M) : 95.82 – 97.67 ELEVATION(M) : 1639.1

GEOLOGIST : LEE SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88024
Coal zone:	P		
Field sample no.:	08329	Composite sample no.:	135
True sample thickness:	1.819 meters	Drill core recovery (%):	64.86 %
Coal/Rock:	1.701 / 0.118 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	25.94	21.46	15.95	30.17
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	4.38	2.10		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.32	
Ash (%):	31.50	31.92
Volatile matter (%):	7.40	7.50
Fixed carbon (%):	59.78	60.58
Total sulphur (%):	1.01	1.02
Combustible sulphur (%):	0.73	
Net calorific value (cal/g):	5449.00	5522.00
Gross calorific value (cal/g):	5449.00	5522.00
Volatile matter (dmmf%):	7.00	
Hardgrove index:	55.00	
Specific gravity:	1.55	
Carbon dioxide (%):	1.39	
Phosphorous in coal (%):	0.106	
Chlorine in coal (ppm):	504.00	

Forms of Sulphur (%): PYRITE 00.58 SULPHATE 00.00 ORGANIC 00.43

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	58.92	59.71
Hydrogen (%):	2.02	2.05
Nitrogen (%):	0.82	0.83
Oxygen (%):	4.41	4.47

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1185.00	1145.00
Softening temperature (°C):	1259.00	1190.00
Hemispherical temperature (°C):	1269.00	1200.00
Final temperature (°C):	1332.00	1251.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	56.20	TiO2 (%):	1.00
Al2O3 (%):	20.49	Na2O (%):	1.45
Fe2O3 (%):	7.88	K2O (%):	1.80
CaO (%):	4.09	SO3 (%):	2.24
MgO (%):	3.14	P2O5 (%):	0.77

qcri coal division | ash fusion | proj KPN BLK LR DS DDH88024

sample id 00135
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1195.0	initial temp.(C)	1180.0
softening temp.(C)	1290.0	softening temp.(C)	1206.0
hemispherical temp.(C)	1306.0	hemispherical temp.(C)	1232.0
fluid temp.(C)	1380.0	fluid temp.(C)	1332.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN BLK LR DS DDH88024

sample id 00135
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	49.24
aluminium oxide %	(al2o3)	24.69
ferric oxide %	(fe2o3)	9.02
titanium dioxide %	(tio2)	1.11
phosphorous pentoxide %	(p2o5)	0.94
calcium oxide %	(cao)	4.04
magnesium oxide %	(mgo)	3.47
sulphur trioxide %	(so3)	1.88
sodium oxide %	(na2o)	1.45
potassium oxide %	(k2o)	1.44

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88024

sample id 00135
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1209.0	initial temp.(C)	1190.0
softening temp.(C)	1311.0	softening temp.(C)	1222.0
hemispherical temp.(C)	1374.0	hemispherical temp.(C)	1243.0
fluid temp.(C)	1411.0	fluid temp.(C)	1395.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88024

sample id 00135
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	50.38
aluminium oxide %	(al2o3)	26.00
ferric oxide %	(fe2o3)	7.71
titanium dioxide %	(tio2)	0.82
phosphorous pentoxide %	(p2o5)	0.84
calcium oxide %	(cao)	4.29
magnesium oxide %	(mgo)	3.06
sulphur trioxide %	(so3)	1.39
sodium oxide %	(na2o)	1.71
potassium oxide %	(k2o)	1.51

90.0 <= total <= 100.0

KPNLRDDH88025

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88025 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/05/88
END DATE - 07/07/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - ETMANSKI
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED SEAM ? AT 30.11 M.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1640.23
ZONE - 9
NORTHING - 6342487.06
EASTING - 507089.56

LICENCE/LEASE NUMBER - 7147

LATITUDE - 571338
LONGITUDE - 1285257

- O R I E N T A T I O N -

LENGTH - 102.11
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

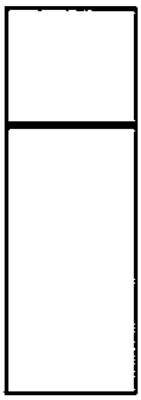
CASING DEPTH (M) - 4.57
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-025

SEAM		TRUE SEAM THICKNESS (Coal + Rock)
?		1.54 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88025										
	? ROOF	8334	29.58	30.11	100.00		0.478			0.000- 0.478
	?	8335	30.11	31.74	19.63	0.142	0.163	1.237		1.379- 0.163
	? FLOOR	8336	31.74	32.02	100.00		0.276			0.000- 0.276

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK	
DDH88025													
	?	136	8335	8335	30.11	31.74	19.63	0.15	0.17	1.31	0.00	1.46-	0.17

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

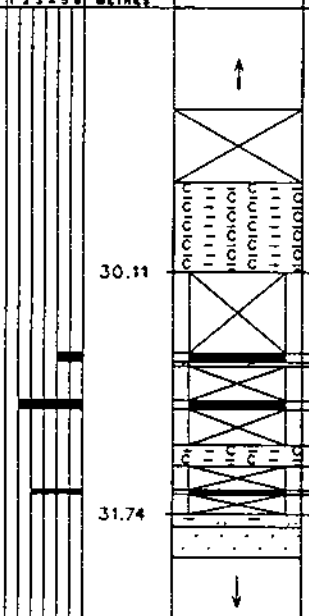
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88025 SEAM : ? INTERVAL(M) : 30.11 – 31.74 ELEVATION(M) : 1640.2

GEOLOGIST : ETMANSKI SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	30.11			(0.51)												
			0.03	0.08												
				(0.22)	19.8	8335	136	1.38 / 0.16	1.38 / 0.16	—	—	—	—	—	—	—
				0.08				1.54	1.54							
				(0.23)												
			0.14													
				(0.14)												
				0.03												
	31.74			(0.13)												

KPNLRDDH88025

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88026 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/08/88
END DATE - 07/10/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MURRAY
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTS SEAMS L?, K/L, K, J & I. PROBABLE FAULT AT 174M. REPEATS ROCK INTERVAL BETWEEN SEAMS H AND I. H SEAM NOT INTERSECTED.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1539.66
ZONE - 9
NORTHING - 6344068.20
EASTING - 507973.77

LICENCE/LEASE NUMBER - 7145

LATITUDE - 571430
LONGITUDE - 1285204

- O R I E N T A T I O N -

LENGTH - 222.00
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH(M) - 24.38
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

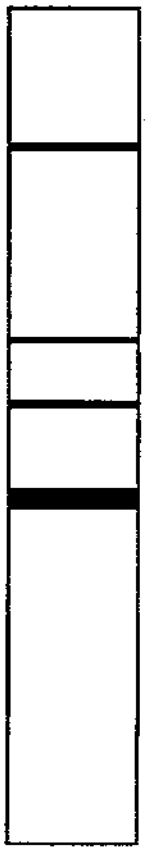
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-026

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
K/L	1.51 m
K	1.00 m
J	1.56 m
I	4.80 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88026										
	K/L ROOF	8337	35.34	35.61	100.00		0.247			0.000- 0.247
	K/L	8338	35.61	37.22	59.01	0.653	0.233	0.624		1.277- 0.233
	K/L FLOOR	8339	37.22	37.80	100.00		0.567			0.000- 0.567
	K ROOF	8340	86.84	87.50	100.00		0.640			0.000- 0.640
	K	8341	87.50	88.64	60.53	0.315	0.286	0.396		0.711- 0.286
	K FLOOR	8342	88.64	89.03	100.00		0.294			0.000- 0.294
	I ROOF	8343	126.91	127.33	100.00		0.388			0.000- 0.388
	I	8344	127.33	130.69	65.48	2.021	0.037	1.084		3.105- 0.037
	I	8345	130.69	132.44	86.86	1.438		0.217		1.655- 0.000
	I FLOOR	8346	132.44	133.11	100.00		0.637			0.000- 0.637
		10367	67.38	67.49	100.00		0.106			0.000- 0.106
	J	99998	104.18	105.85	37.13	0.224	0.355	0.683	0.299	0.907- 0.654
	L?	99999	23.08	23.28	0.00			0.196		0.196- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88026												
	K/L	137	8338	8338	35.61	37.22	59.00	0.70	0.25	0.66	0.00	1.36- 0.25
	K	138	8341	8341	87.50	88.64	60.52	0.36	0.33	0.45	0.00	0.81- 0.33
	I	139	8344	8344	127.33	130.69	65.47	2.16	0.04	1.16	0.00	3.32- 0.04
	I	140	8345	8345	130.69	132.44	86.85	1.52	0.00	0.23	0.00	1.75- 0.00
	K/L	272	8338	8338	35.61	37.22	59.00	0.70	0.25	0.66	0.00	1.36- 0.25
	I	273	8344	8344	127.33	130.69	65.47	2.16	0.04	1.16	0.00	3.32- 0.04
	K/L	364	8338	8338	35.61	37.22	59.00	0.70	0.25	0.66	0.00	1.36- 0.25
	K	365	8341	8341	87.50	88.64	60.52	0.36	0.33	0.45	0.00	0.81- 0.33
	I	366	8344	8345	127.33	132.44	72.79	3.68	0.04	1.39	0.00	5.07- 0.04

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH88026 | SEAM : L? | INTERVAL(M) : 23.08 – 23.28 | ELEVATION(M) : 1539.7

GEOLOGIST : MURRAY | SCALE: 1:40 | DATE : FEB 01/89 | DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	23.08			(0.20)	0.0	99999		0.20/ 0.00		—	—	—	—	—	—	—
	23.28		0.40					0.20								
			0.14													
			0.19													
			0.18													
			0.23													

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR 00H88026 SEAM : K/L INTERVAL(M) : 35.61 – 37.22 ELEVATION(M) : 1539.7

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	35.61			0.20 (0.17) (0.14)	58.7	8338	137	1.28 / 0.23 1.51	1.28 / 0.23 1.51	1.54	48.27	6.80	43.39	0.49	15.82	—
	37.22															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88026
Coal zone:	K/L		
Field sample no.:	08338	Composite sample no.:	137
True sample thickness:	1.510 meters	Drill core recovery (%):	59.00 %
Coal/Rock:	1.277 / 0.233 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	46.03	23.58	12.51	14.19	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	2.51	1.18			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.54	
Ash (%):	48.27	49.02
Volatile matter (%):	6.80	6.91
Fixed carbon (%):	43.39	44.07
Total sulphur (%):	0.49	0.50
Combustible sulphur (%):	0.15	
Net calorific value (cal/g):	3733.00	3791.00
Gross calorific value (cal/g):	3733.00	3791.00
Volatile matter (dmmf%):	6.00	
Hardgrove index:	58.00	
Specific gravity:	1.62	
Carbon dioxide (%):	1.55	
Phosphorous in coal (%):	0.200	
Chlorine in coal (ppm):	776.00	
Forms of Sulphur (%):	PYRITE 00.20 SULPHATE 00.00 ORGANIC 00.29	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	41.57	42.22
Hydrogen (%):	1.76	1.79
Nitrogen (%):	0.54	0.55
Oxygen (%):	5.83	5.92

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1182.00	1132.00
Softening temperature (°C):	1269.00	1203.00
Hemispherical temperature (°C):	1285.00	1214.00
Final temperature (°C):	1348.00	1314.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	61.00	TiO2 (%):	0.91
Al2O3 (%):	17.16	Na2O (%):	1.75
Fe2O3 (%):	5.21	K2O (%):	1.78
CaO (%):	5.54	SO3 (%):	1.77
MgO (%):	3.00	P2O5 (%):	0.95

qcri coal division ash fusion proj KPN BLK LR DS DDH88026

sample id 00137
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1243.0	initial temp.(C)	1193.0
softening temp.(C)	1332.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1380.0	hemispherical temp.(C)	1288.0
fluid temp.(C)	1453.0	fluid temp.(C)	1432.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division ash mineral proj KPN BLK LR DS DDH88026

sample id 00137
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.82
aluminium oxide %	(al2o3)	24.25
ferric oxide %	(fe2o3)	4.58
titanium dioxide %	(tio2)	1.14
phosphorous pentoxide %	(p2o5)	1.18
calcium oxide %	(cao)	3.67
magnesium oxide %	(mgo)	2.34
sulphur trioxide %	(so3)	1.61
sodium oxide %	(na2o)	1.99
potassium oxide %	(k2o)	2.21

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88026

sample id 00137
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1259.0	initial temp.(C)	1206.0
softening temp.(C)	1348.0	softening temp.(C)	1264.0
hemispherical temp.(C)	1395.0	hemispherical temp.(C)	1303.0
fluid temp.(C)	1472.0	fluid temp.(C)	1453.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88026

sample id 00137
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.28
aluminium oxide %	(al2o3)	25.47
ferric oxide %	(fe2o3)	4.36
titanium dioxide %	(tio2)	0.96
phosphorous pentoxide %	(p2o5)	1.32
calcium oxide %	(cao)	3.68
magnesium oxide %	(mgo)	2.21
sulphur trioxide %	(so3)	1.26
sodium oxide %	(na2o)	2.10
potassium oxide %	(k2o)	2.13

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88028 SEAM : K INTERVAL(M) : 87.50 – 88.79 ELEVATION(M) : 1539.7

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 26/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	87.50			(0.08) 0.13 (0.13) 0.22 (0.08) 0.15 (0.13) 0.08 0.49	60.3	8341	138	0.71 / 0.29 1.00	0.71 / 0.29 1.00	1.44	70.49	6.74	21.33	—	8.30	—
	88.64														
	88.79				100.0	8342									

GULF CANADA CORPORATION

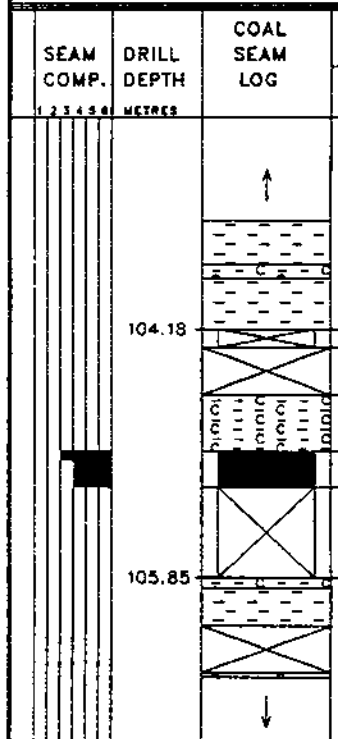
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88026 SEAM : J INTERVAL(M) : 104.18 – 105.85 ELEVATION(M) : 1539.7

GEOLOGIST : MURRAY SCALE: 1:40 DATE : FEB 03/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	104.18			(0.11)												
			(0.30)													
			0.36													
				0.22	37.1	98998		0.91/0.65 1.56	0.91/0.65 1.56	—	—	—	—	—	—	—
				(0.57)												
	105.85															

GULF CANADA CORPORATION

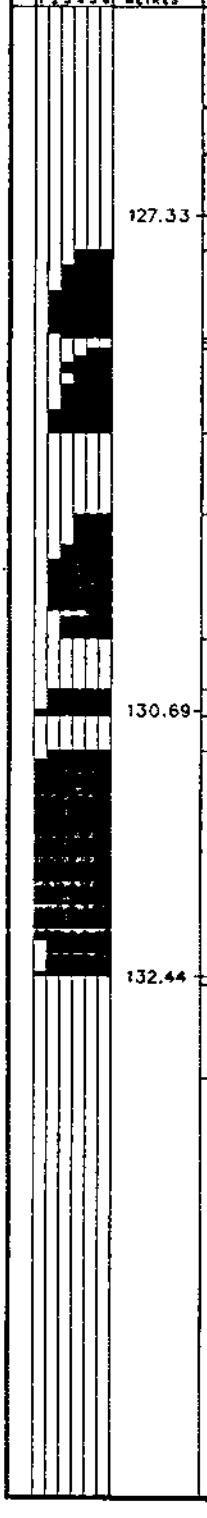
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88026 SEAM : 1 INTERVAL(M) : 127.33 – 132.44 ELEVATION(M) : 1539.7

GEOLOGIST : MURRAY SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	127.33			(0.22)												
				0.56												
				(0.03)												
				0.54												
				(0.51)	65.5	8344	139	3.11 / 0.04 3.14		1.33	23.48	5.45	69.74	0.35	25.45	—
				0.79					4.76 / 0.04 4.80							
				(0.32)												
	130.69			0.17												
				(0.22)												
				1.40	86.9	8345	140	1.66 / 0.00 1.66		1.88	8.94	4.89	84.29	0.43	31.35	—
	132.44															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88026
Coal zone:	1		
Field sample no.:	08344	Composite sample no.:	139
True sample thickness:	3.142 meters	Drill core recovery (%):	65.47 %
Coal/Rock:	3.105 / 0.037 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	4.31	12.92	18.46	38.24	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	16.34	9.73			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.33	
Ash (%):	23.48	23.80
Volatile matter (%):	5.45	5.52
Fixed carbon (%):	69.74	70.68
Total sulphur (%):	0.35	0.35
Combustible sulphur (%):	0.12	
Net calorific value (cal/g):	6083.00	6165.00
Gross calorific value (cal/g):	6083.00	6165.00
Volatile matter (dmmf%):	4.70	
Hardgrove index:	77.00	
Specific gravity:	1.50	
Carbon dioxide (%):	1.23	
Phosphorous in coal (%):	0.021	
Chlorine in coal (ppm):	384.00	
Forms of Sulphur (%):	PYRITE 00.04 SULPHATE 00.00 ORGANIC 00.31	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	66.44	67.34
Hydrogen (%):	2.09	2.12
Nitrogen (%):	0.76	0.77
Oxygen (%):	5.55	5.62

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1137.00	1085.00
Softening temperature (°C):	1264.00	1200.00
Hemispherical temperature (°C):	1274.00	1216.00
Final temperature (°C):	1306.00	1280.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	58.70	TiO2 (%):	0.89
Al2O3 (%):	18.24	Na2O (%):	1.61
Fe2O3 (%):	8.56	K2O (%):	1.13
CaO (%):	3.77	SO3 (%):	2.45
MgO (%):	4.00	P2O5 (%):	0.20

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88026
Coal zone:	I		
Field sample no.:	08345	Composite sample no.:	140
True sample thickness:	1.655 meters	Drill core recovery (%):	86.85 %
Coal/Rock:	1.655 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight (%):	24.17	20.93	16.24	27.81	
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight (%):	6.38	4.47			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.88	
Ash (%):	8.94	9.11
Volatile matter (%):	4.89	4.98
Fixed carbon (%):	84.29	85.91
Total sulphur (%):	0.43	0.44
Combustible sulphur (%):	0.24	
Net calorific value (cal/g):	7493.00	7637.00
Gross calorific value (cal/g):	7493.00	7637.00
Volatile matter (dmmf%):	4.60	
Hardgrove index:	43.00	
Specific gravity:	1.42	
Carbon dioxide (%):	0.92	
Phosphorous in coal (%):	0.224	
Chlorine in coal (ppm):	480.00	
Forms of Sulphur (%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.41	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	80.13	81.67
Hydrogen (%):	2.22	2.26
Nitrogen (%):	0.92	0.94
Oxygen (%):	5.48	5.58

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1235.00	1159.00
Softening temperature (°C):	1264.00	1190.00
Hemispherical temperature (°C):	1269.00	1206.00
Final temperature (°C):	1280.00	1259.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	34.20	TiO2 (%):	1.13
Al2O3 (%):	21.81	Na2O (%):	1.44
Fe2O3 (%):	9.90	K2O (%):	1.16
CaO (%):	10.80	SO3 (%):	5.42
MgO (%):	4.54	P2O5 (%):	5.73

gcri coal division ash fusion proj KPN BLK LR DS DDH88026

sample id 00139
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1095.0
softening temp.(C)	1338.0	softening temp.(C)	1264.0
hemispherical temp.(C)	1369.0	hemispherical temp.(C)	1280.0
fluid temp.(C)	1411.0	fluid temp.(C)	1377.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88026

sample id 00139
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.82
aluminium oxide %	(al2o3)	24.15
ferric oxide %	(fe2o3)	7.24
titanium dioxide %	(tio2)	1.22
phosphorous pentoxide %	(p2o5)	0.41
calcium oxide %	(cao)	2.41
magnesium oxide %	(mgo)	3.50
sulphur trioxide %	(so3)	1.78
sodium oxide %	(na2o)	1.68
potassium oxide %	(k2o)	1.38

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88026

sample id 00139
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1200.0	initial temp.(C)	1106.0
softening temp.(C)	1235.0	softening temp.(C)	1169.0
hemispherical temp.(C)	1395.0	hemispherical temp.(C)	1301.0
fluid temp.(C)	1427.0	fluid temp.(C)	1382.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88026

sample id 00139
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	56.06
aluminium oxide %	(al2o3)	24.00
ferric oxide %	(fe2o3)	6.99
titanium dioxide %	(tio2)	0.90
phosphorous pentoxide %	(p2o5)	0.31
calcium oxide %	(cao)	2.07
magnesium oxide %	(mgo)	3.68
sulphur trioxide %	(so3)	1.41
sodium oxide %	(na2o)	1.90
potassium oxide %	(k2o)	1.23

90.0 <= total <= 100.0

qcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88026

sample id 00140
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1232.0	1153.0
softening temp.(C)	1243.0	1206.0
hemispherical temp.(C)	1266.0	1211.0
fluid temp.(C)	1288.0	1269.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88026

sample id 00140
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	31.88
aluminium oxide %	(al2o3)	22.10
ferric oxide %	(fe2o3)	8.52
titanium dioxide %	(tio2)	1.13
phosphorous pentoxide %	(p2o5)	5.65
calcium oxide %	(cao)	12.42
magnesium oxide %	(mgo)	5.27
sulphur trioxide %	(so3)	6.07
sodium oxide %	(na2o)	1.20
potassium oxide %	(k2o)	1.17

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88026

sample id 00140
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1243.0	initial temp.(C)	1148.0
softening temp.(C)	1274.0	softening temp.(C)	1243.0
hemispherical temp.(C)	1277.0	hemispherical temp.(C)	1248.0
fluid temp.(C)	1280.0	fluid temp.(C)	1274.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88026

sample id 00140
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	36.66
aluminium oxide %	(al2o3)	24.19
ferric oxide %	(fe2o3)	8.29
titanium dioxide %	(tio2)	0.91
phosphorous pentoxide %	(p2o5)	5.53
calcium oxide %	(cao)	10.16
magnesium oxide %	(mgo)	4.38
sulphur trioxide %	(so3)	3.51
sodium oxide %	(na2o)	1.30
potassium oxide %	(k2o)	1.33

90.0 <= total <= 100.0

KPNLRDDH88027

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88027 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/08/88
END DATE - 07/09/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - KRAUS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - SEAMS L?, K/L, K, J, I AND I OVERTURNED.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1631.43
ZONE - 9
NORTHING - 6343131.90
EASTING - 506605.23

LICENCE/LEASE NUMBER - 7147

LATITUDE - 571359
LONGITUDE - 1285326

- O R I E N T A T I O N -

LENGTH - 176.40
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH(M) - 4.57
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

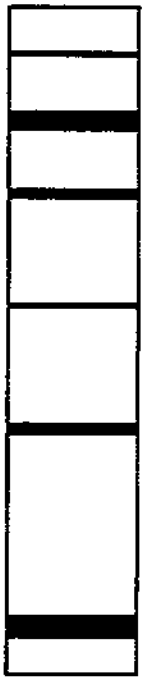
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-027

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
L ?	0.76 m
K/L	4.69 m
K	1.86 m
J	0.82 m
I	2.59 m
I ovt.	5.59 m



NOTE: Seams less than 0.5 m thick are not shown.

SCALE

1:2000

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88027										
	K/L ROOF	8356	27.34	27.52	100.00		0.156			0.000- 0.156
	K/L	8357	27.52	29.61	93.78	1.666	0.061	0.114		1.780- 0.061
	K/L	8358	29.61	33.97	45.87	1.051	0.782	2.146		3.197- 0.782
	K/L FLOOR	8359	33.97	34.91	100.00		0.883			0.000- 0.883
	I ROOF	8360	109.80	109.98	100.00		0.169			0.000- 0.169
	I	8361	109.98	111.06	28.70	0.189	0.104	0.724		0.913- 0.104
	I	8362	111.06	112.13	57.94	0.585		0.425		1.010- 0.000
	I	8363	112.13	112.73	100.00	0.567				0.567- 0.000
	I FLOOR	8364	112.73	114.30	100.00		1.484			0.000- 1.484
	I OVT FLOOR	8365	158.97	160.30	100.00		0.725			0.000- 0.725
	I OVT	8366	160.30	166.01	73.91	2.367	0.091	0.858		3.225- 0.091
	I OVT	8367	166.01	166.34	100.00		0.203			0.000- 0.203
	I OVT	8368	166.34	169.63	90.58	1.730	0.150	0.196		1.926- 0.150
	I OVT ROOF	8369	169.63	170.47	100.00		0.329			0.000- 0.329
	K ROOF	8370	47.74	47.97	100.00		0.225			0.000- 0.225
	K	8371	47.97	49.87	80.00	1.166	0.322	0.373		1.539- 0.322
		10368	102.34	102.61	100.00		0.260			0.000- 0.260
	L?	99998	12.24	13.05	0.00			0.756		0.756- 0.000
	J	99999	78.16	78.99	100.00		0.817			0.000- 0.817

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88027												
	K/L	141	8357	8357	27.52	29.61	93.77	1.89	0.07	0.13	0.00	2.02- 0.07
	K/L	142	8358	8358	29.61	33.97	45.87	1.15	0.85	2.36	0.00	3.51- 0.85
	K	143	8371	8371	47.97	49.87	80.00	1.19	0.33	0.38	0.00	1.57- 0.33
	I	144	8361	8361	109.98	111.06	28.70	0.20	0.11	0.77	0.00	0.97- 0.11
	I	145	8362	8363	111.06	112.73	73.05	1.22	0.00	0.45	0.00	1.67- 0.00
	I OVT	146	8366	8366	160.30	166.01	73.90	4.07	0.15	1.49	0.00	5.56- 0.15
	I OVT	147	8367	8368	166.01	169.63	91.43	2.75	0.56	0.31	0.00	3.06- 0.56
	K/L	274	8357	8357	27.52	29.61	93.77	1.89	0.07	0.13	0.00	2.02- 0.07
	K	275	8371	8371	47.97	49.87	80.00	1.19	0.33	0.38	0.00	1.57- 0.33
	I	276	8362	8363	111.06	112.73	73.05	1.22	0.00	0.45	0.00	1.67- 0.00
	I ovt	277	8366	8366	160.30	166.01	73.90	4.07	0.15	1.49	0.00	5.56- 0.15
	I ovt	278	8367	8368	166.01	169.63	91.43	2.75	0.56	0.31	0.00	3.06- 0.56
	K/L	367	8357	8357	27.52	29.61	93.77	1.89	0.07	0.13	0.00	2.02- 0.07
	K	368	8371	8371	47.97	49.87	80.00	1.19	0.33	0.38	0.00	1.57- 0.33
	I	369	8362	8363	111.06	112.73	73.05	1.22	0.00	0.45	0.00	1.67- 0.00
	I ovt	370	8366	8368	160.30	169.63	80.70	6.82	0.71	1.80	0.00	8.62- 0.71

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

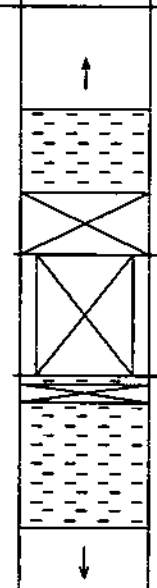
GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88027 SEAM : L? INTERVAL(M) : 12.24 - 13.05 ELEVATION(M) : 1631.4

GEOLOGIST : KRAUS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	12.24															
				(0.76)	0.0	99999		0.76 / 0.00 0.76		—	—	—	—	—	—	—
	13.05															



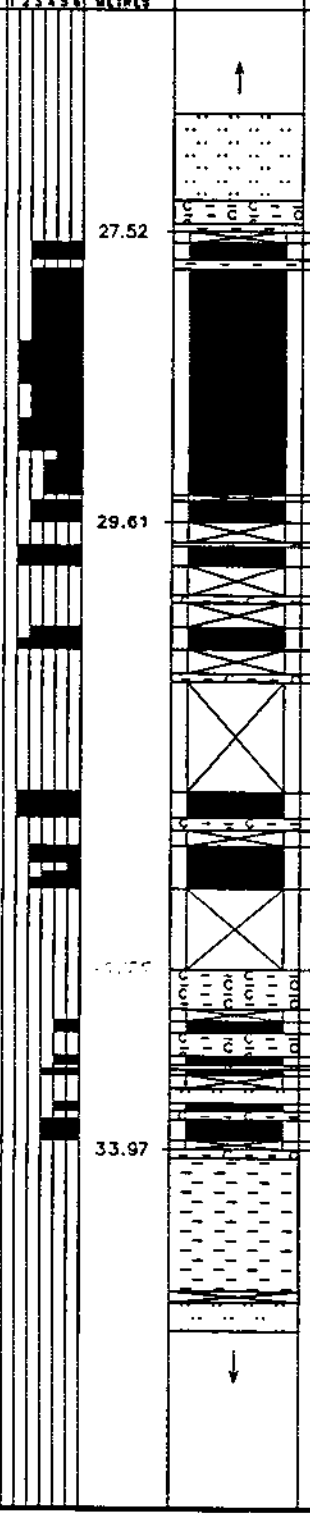
GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **TRUE THICKNESS**

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88027 SEAM : K/L INTERVAL(M) : 27.52 – 33.97 ELEVATION(M) : 1631.4

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	27.52			(0.07)											
				0.11											
				1.43	93.8	8357	141	1.78 / 0.00		1.71	37.39	6.63	54.27	0.58	19.93
								1.84							
	29.61			0.13											
				(0.13)											
				0.13											
				(0.19)					4.42 / 0.27						
				(0.13)					4.69						
				0.16											
				(0.13)											
				(0.70)											
				0.16											
				(0.10)	46.1	8388	142	3.20 / 0.78		1.12	50.26	6.09	42.53	—	14.98
				0.27				3.98							
				(0.51)											
			0.25												
				(0.07)											
				0.07											
			0.18												
				0.03											
				(0.08)											
			0.09												
				0.13											
	33.97			(0.03)											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88027
Coal zone:	K/L		
Field sample no.:	08357	Composite sample no.:	141
True sample thickness:	1.841 meters	Drill core recovery(%):	93.77 %
Coal/Rock:	1.780 / 0.061 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight(%):	48.66	23.67	9.66	15.08	
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight(%):	2.00	0.93			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.71	
Ash(%):	37.39	38.04
Volatile matter(%):	6.63	6.75
Fixed carbon(%):	54.27	55.21
Total sulphur(%):	0.58	0.59
Combustible sulphur(%):	0.26	
Net calorific value(cal/g):	4763.00	4846.00
Gross calorific value(cal/g):	4763.00	4846.00
Volatile matter(dmmf%):	6.00	
Hardgrove index:	61.00	
Specific gravity:	1.59	
Carbon dioxide(%):	1.85	
Phosphorous in coal(%):	0.142	
Chlorine in coal(ppm):	1776.00	
Forms of Sulphur(%):	PYRITE 00.06 SULPHATE 00.00 ORGANIC 00.52	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	54.18	55.12
Hydrogen(%):	1.79	1.82
Nitrogen(%):	0.67	0.68
Oxygen(%):	3.68	3.75

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1222.00	1169.00
Softening temperature(°C):	1253.00	1185.00
Hemispherical temperature(°C):	1264.00	1193.00
Final temperature(°C):	1317.00	1311.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	57.24	TiO2(%):	0.84
Al2O3(%):	18.15	Na2O(%):	1.27
Fe2O3(%):	7.50	K2O(%):	1.89
CaO(%):	6.08	SO3(%):	2.15
MgO(%):	3.22	P2O5(%):	0.87

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00141
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1232.0	initial temp.(C)	1180.0
softening temp.(C)	1295.0	softening temp.(C)	1253.0
hemispherical temp.(C)	1317.0	hemispherical temp.(C)	1274.0
fluid temp.(C)	1432.0	fluid temp.(C)	1401.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00141
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	57.94
aluminium oxide %	(al2o3)	22.84
ferric oxide %	(fe2o3)	4.43
titanium dioxide %	(tio2)	0.93
phosphorous pentoxide %	(p2o5)	0.97
calcium oxide %	(cao)	4.20
magnesium oxide %	(mgo)	2.29
sulphur trioxide %	(so3)	2.02
sodium oxide %	(na2o)	1.95
potassium oxide %	(k2o)	1.59

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00141
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

	oxidizing atmosphere	reducing atmosphere
initial temp.(C)	1243.0	1185.0
softening temp.(C)	1327.0	1274.0
hemispherical temp.(C)	1364.0	1306.0
fluid temp.(C)	1472.0	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00141
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	55.56
aluminium oxide %	(al2o3)	24.44
ferric oxide %	(fe2o3)	4.03
titanium dioxide %	(tio2)	0.78
phosphorous pentoxide %	(p2o5)	1.02
calcium oxide %	(cao)	4.10
magnesium oxide %	(mgo)	2.07
sulphur trioxide %	(so3)	1.62
sodium oxide %	(na2o)	1.93
potassium oxide %	(k2o)	1.59

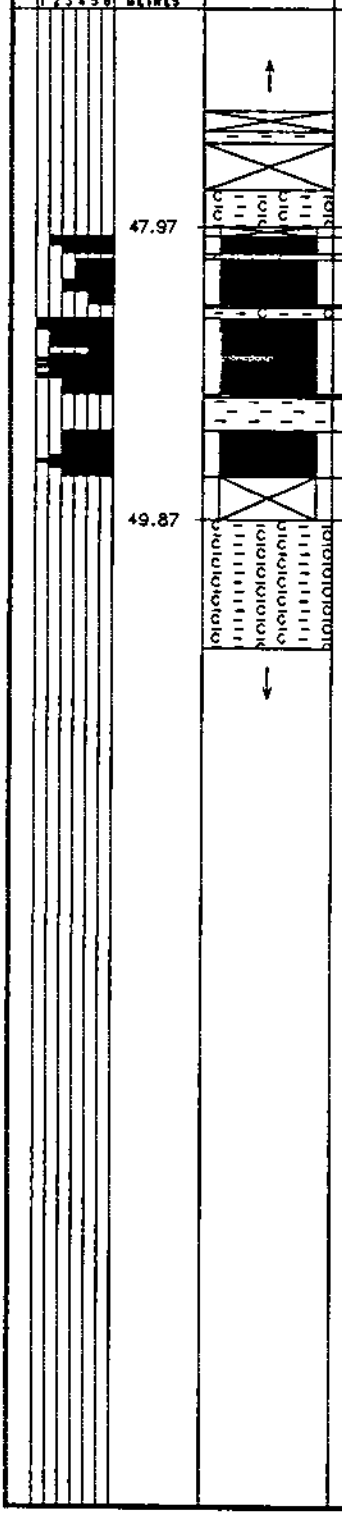
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88027 SEAM : K INTERVAL(M) : 47.97 – 49.87 ELEVATION(M) : 1631.4

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	47.97			(0.03) 0.11											
			9.84	0.28											
			9.87	(0.02)											
				0.48	80.0	8371	143	1.54 / 0.32 1.86	1.54 / 0.32 1.86	1.93	43.80	8.05	46.22	0.45	17.34
			0.22												
				0.29											
	49.87			(0.27)											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88027
Coal zone:	K		
Field sample no.:	08371	Composite sample no.:	143
True sample thickness:	1.861 meters	Drill core recovery (%):	80.00 %
Coal/Rock:	1.539 / 0.322 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM								
Size analysis:	SZ1								
Fraction size (mm):	35.00 X	25.00	25.00 X	12.00	12.00 X	6.00	6.00 X	0.50	
Relative weight (%):		48.66		23.67		9.66		15.08	
Fraction size (mm):	0.50 X	0.15	0.15 X	0.00					
Relative weight (%):		2.00		0.93					

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.93	
Ash (%):	43.80	44.66
Volatile matter (%):	8.05	8.21
Fixed carbon (%):	46.22	47.13
Total sulphur (%):	0.45	0.46
Combustible sulphur (%):	0.22	
Net calorific value (cal/g):	4144.00	4226.00
Gross calorific value (cal/g):	4144.00	4226.00
Volatile matter (dmmf%):	8.70	
Hardgrove index:	59.00	
Specific gravity:	1.63	
Carbon dioxide (%):	2.23	
Phosphorous in coal (%):	0.065	
Chlorine in coal (ppm):	40.00	
Forms of Sulphur (%):	PYRITE 00.04 SULPHATE 00.00 ORGANIC 00.41	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	46.57	47.49
Hydrogen (%):	1.29	1.32
Nitrogen (%):	0.50	0.51
Oxygen (%):	5.46	5.56

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1224.00	1137.00
Softening temperature (°C):	1274.00	1169.00
Hemispherical temperature (°C):	1295.00	1185.00
Final temperature (°C):	1361.00	1274.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	56.72	TiO2 (%):	0.82
Al2O3 (%):	16.94	Na2O (%):	1.81
Fe2O3 (%):	12.50	K2O (%):	1.54
CaO (%):	2.92	SO3 (%):	1.30
MgO (%):	4.77	P2O5 (%):	0.34

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00143
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1156.0
softening temp.(C)	1274.0	softening temp.(C)	1227.0
hemispherical temp.(C)	1298.0	hemispherical temp.(C)	1253.0
fluid temp.(C)	1348.0	fluid temp.(C)	1335.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00143
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.64
aluminium oxide %	(al2o3)	22.06
ferric oxide %	(fe2o3)	6.70
titanium dioxide %	(tio2)	0.83
phosphorous pentoxide %	(p2o5)	0.34
calcium oxide %	(cao)	3.29
magnesium oxide %	(mgo)	3.85
sulphur trioxide %	(so3)	1.50
sodium oxide %	(na2o)	1.99
potassium oxide %	(k2o)	1.36

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00143
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1227.0	initial temp.(C)	1161.0
softening temp.(C)	1322.0	softening temp.(C)	1288.0
hemispherical temp.(C)	1388.0	hemispherical temp.(C)	1332.0
fluid temp.(C)	1438.0	fluid temp.(C)	1435.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00143
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	56.84
aluminium oxide %	(al2o3)	24.37
ferric oxide %	(fe2o3)	5.39
titanium dioxide %	(tio2)	0.69
phosphorous pentoxide %	(p2o5)	0.35
calcium oxide %	(cao)	2.44
magnesium oxide %	(mgo)	3.05
sulphur trioxide %	(so3)	0.97
sodium oxide %	(na2o)	2.41
potassium oxide %	(k2o)	1.49

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION, MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88027 | SEAM : J | INTERVAL(M) : 78.16 – 78.99 | ELEVATION(M) : 1631.4

GEOLOGIST : KRAUS | SCALE: 1:40 | DATE : FEB 01/89 | DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	78.16														
				0.82	100.0	99999		0.00/ 0.82 0.82		—	—	—	—	—	—
	78.99														

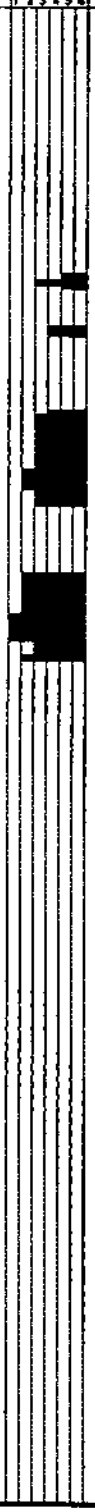
GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **TRUE THICKNESS**

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88027 SEAM : 1 INTERVAL(M) : 109.98 – 112.73 ELEVATION(M) : 1631.4

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	109.98			(0.12)											
				0.10											
				(0.17)											
			8.67	0.37											
				(0.43)	28.8	8361	144	0.91 / 0.10 1.02		1.16	58.23	8.42	34.19	—	22.40
	111.06		9.24												
				0.61					2.49 / 0.10 2.59						
					57.9	8362									
				(0.43)			145	1.58 / 0.00 1.58		1.71	15.29	4.32	78.68	0.54	29.51
	112.13														
				0.57	100.0	8363									
	112.73														

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88027
Coal zone:	I		
Field sample no.:	08362 - 08363	Composite sample no.:	145
True sample thickness:	1.577 meters	Drill core recovery (%):	73.05 %
Coal/Rock:	1.577 / 0.000 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	7.14	11.92	16.75	53.46
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	6.80	3.93		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.71	
Ash (%):	15.29	15.56
Volatile matter (%):	4.32	4.40
Fixed carbon (%):	78.68	80.04
Total sulphur (%):	0.54	0.55
Combustible sulphur (%):	0.22	
Net calorific value (cal/g):	7053.00	7176.00
Gross calorific value (cal/g):	7053.00	7176.00
Volatile matter (dmmf%):	3.60	
Hardgrove index:	61.00	
Specific gravity:	1.44	
Carbon dioxide (%):	1.63	
Phosphorous in coal (%):	0.196	
Chlorine in coal (ppm):	1040.00	

Forms of Sulphur (%): PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.52

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	77.41	78.76
Hydrogen (%):	2.26	2.30
Nitrogen (%):	0.80	0.81
Oxygen (%):	1.99	2.02

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1169.00	1127.00
Softening temperature (°C):	1243.00	1200.00
Hemispherical temperature (°C):	1264.00	1206.00
Final temperature (°C):	1280.00	1243.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	43.30	TiO2 (%):	1.05
Al2O3 (%):	20.61	Na2O (%):	1.47
Fe2O3 (%):	8.00	K2O (%):	1.57
CaO (%):	7.50	SO3 (%):	5.29
MgO (%):	4.70	P2O5 (%):	2.94

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00145
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1185.0	initial temp.(C)	1174.0
softening temp.(C)	1248.0	softening temp.(C)	1190.0
hemispherical temp.(C)	1259.0	hemispherical temp.(C)	1200.0
fluid temp.(C)	1269.0	fluid temp.(C)	1227.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00145
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	44.30
aluminium oxide %	(al2o3)	19.55
ferric oxide %	(fe2o3)	8.42
titanium dioxide %	(tio2)	0.95
phosphorous pentoxide %	(p2o5)	3.14
calcium oxide %	(cao)	8.51
magnesium oxide %	(mgo)	5.04
sulphur trioxide %	(so3)	5.12
sodium oxide %	(na2o)	1.46
potassium oxide %	(k2o)	1.24

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00145
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1153.0
softening temp.(C)	1238.0	softening temp.(C)	1195.0
hemispherical temp.(C)	1264.0	hemispherical temp.(C)	1206.0
fluid temp.(C)	1282.0	fluid temp.(C)	1248.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00145
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	46.28
aluminium oxide %	(al2o3)	19.59
ferric oxide %	(fe2o3)	7.91
titanium dioxide %	(tio2)	0.73
phosphorous pentoxide %	(p2o5)	3.45
calcium oxide %	(cao)	8.97
magnesium oxide %	(mgo)	4.80
sulphur trioxide %	(so3)	3.97
sodium oxide %	(na2o)	1.24
potassium oxide %	(k2o)	1.25

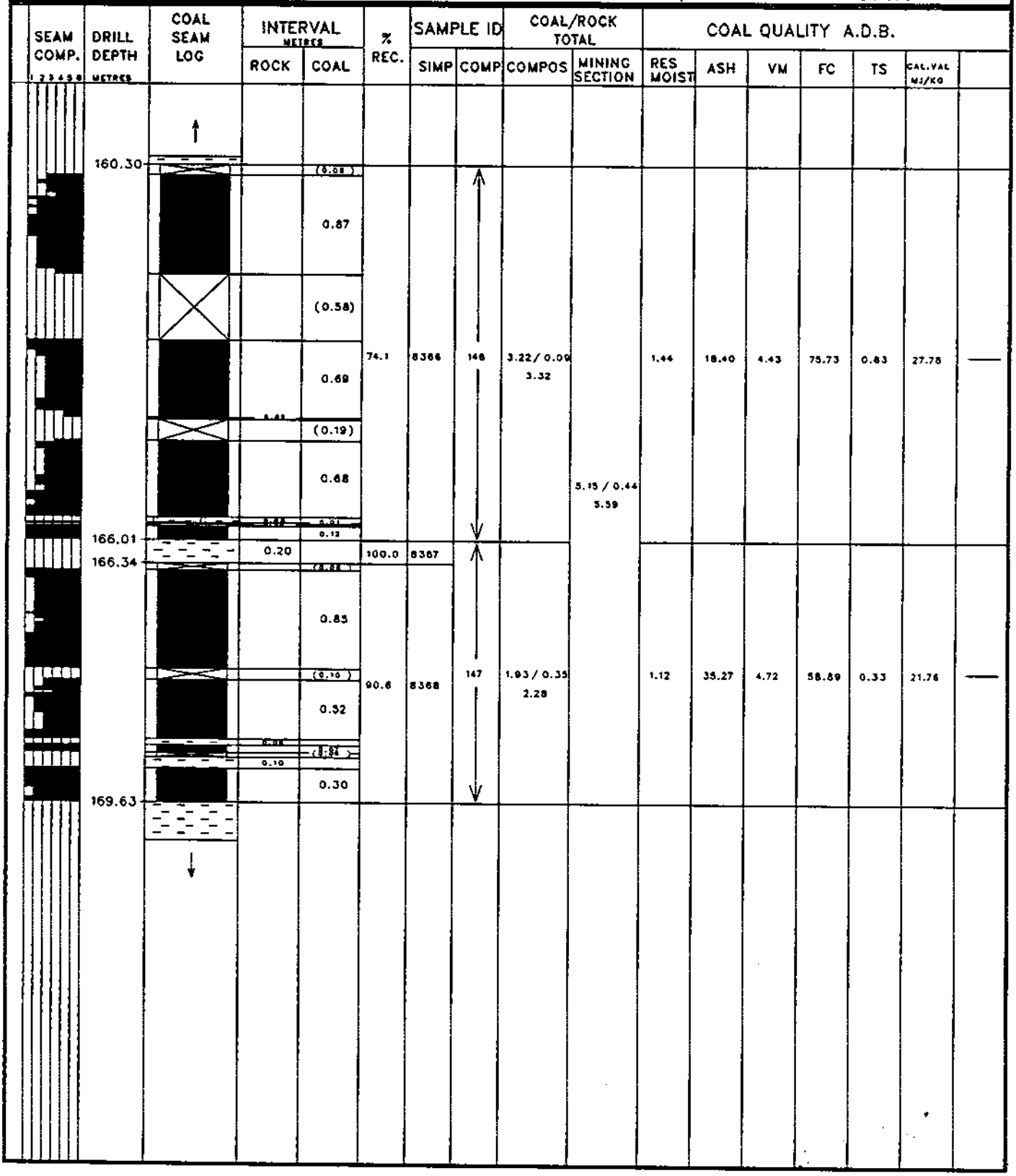
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88027 SEAM : I OVT INTERVAL(M) : 160.30 – 169.63 ELEVATION(M) : 1631.4

GEOLOGIST : KRAUS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	160.30			(5.58)												
				0.87												
				(0.58)												
				0.69	74.1	8366	148	3.22 / 0.09 3.32		1.44	18.40	4.43	75.73	0.83	27.78	—
				(0.19)												
				0.68					5.15 / 0.44 5.59							
	166.01			0.12												
	166.34		0.20	(5.84)	100.0	8367										
				0.85												
				(0.10)												
				0.52	90.6	8368	147	1.93 / 0.35 2.28		1.12	35.27	4.72	58.89	0.33	21.76	—
			0.10	(5.84)												
				0.30												
	169.63															

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88027
Coal zone:	I OVT		
Field sample no.:	08366	Composite sample no.:	146
True sample thickness:	3.316 meters	Drill core recovery(%):	73.90 %
Coal/Rock:	3.225 / 0.091 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight(%):	11.00	14.02	16.49	45.14	
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight(%):	8.09	5.26			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.44	
Ash(%):	18.40	18.67
Volatile matter(%):	4.43	4.49
Fixed carbon(%):	75.73	76.84
Total sulphur(%):	0.63	0.64
Combustible sulphur(%):	0.42	
Net calorific value(cal/g):	6639.00	6736.00
Gross calorific value(cal/g):	6639.00	6736.00
Volatile matter(dmmf%):	3.50	
Hardgrove index:	61.00	
Specific gravity:	1.46	
Carbon dioxide(%):	0.71	
Phosphorous in coal(%):	0.123	
Chlorine in coal(ppm):	712.00	
Forms of Sulphur(%):	PYRITE 00.02 SULPHATE 00.00 ORGANIC 00.61	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	71.59	72.64
Hydrogen(%):	2.06	2.09
Nitrogen(%):	0.76	0.77
Oxygen(%):	5.12	5.19

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1153.00	1085.00
Softening temperature(°C):	1259.00	1169.00
Hemispherical temperature(°C):	1266.00	1180.00
Final temperature(°C):	1301.00	1259.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	48.68	TiO2(%):	1.23
Al2O3(%):	21.75	Na2O(%):	2.27
Fe2O3(%):	8.38	K2O(%):	1.66
CaO(%):	4.53	SO3(%):	2.90
MgO(%):	4.00	P2O5(%):	1.53

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88027
Coal zone:	I OVT		
Field sample no.:	08367 - 08368	Composite sample no.:	147
True sample thickness:	2.279 meters	Drill core recovery(%):	91.43 %
Coal/Rock:	1.926 / 0.353 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight(%):	16.93	16.03	19.08	38.58	
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight(%):	5.72	3.66			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.12	
Ash(%):	35.27	35.67
Volatile matter(%):	4.72	4.77
Fixed carbon(%):	58.89	59.56
Total sulphur(%):	0.33	0.33
Combustible sulphur(%):	0.13	
Net calorific value(cal/g):	5201.00	5259.00
Gross calorific value(cal/g):	5201.00	5259.00
Volatile matter(dmmf%):	3.00	
Hardgrove index:	60.00	
Specific gravity:	1.57	
Carbon dioxide(%):	1.03	
Phosphorous in coal(%):	0.029	
Chlorine in coal(ppm):	248.00	
Forms of Sulphur(%):	PYRITE 00.01 SULPHATE 00.00 ORGANIC 00.32	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	57.81	58.46
Hydrogen(%):	1.87	1.89
Nitrogen(%):	0.66	0.67
Oxygen(%):	2.94	2.98

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1159.00	1116.00
Softening temperature(°C):	1322.00	1248.00
Hemispherical temperature(°C):	1343.00	1280.00
Final temperature(°C):	1433.00	1422.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	60.02	TiO2(%):	0.80
Al2O3(%):	21.25	Na2O(%):	2.19
Fe2O3(%):	4.91	K2O(%):	1.79
CaO(%):	2.22	SO3(%):	1.39
MgO(%):	3.33	P2O5(%):	0.19

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88027

sample id 00146
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1180.0	initial temp.(C)	1156.0
softening temp.(C)	1264.0	softening temp.(C)	1190.0
hemispherical temp.(C)	1269.0	hemispherical temp.(C)	1203.0
fluid temp.(C)	1290.0	fluid temp.(C)	1285.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88027

sample id 00146
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	43.90
aluminium oxide %	(al2o3)	23.17
ferric oxide %	(fe2o3)	8.64
titanium dioxide %	(tio2)	1.14
phosphorous pentoxide %	(p2o5)	2.97
calcium oxide %	(cao)	6.61
magnesium oxide %	(mgo)	4.50
sulphur trioxide %	(so3)	3.42
sodium oxide %	(na2o)	1.49
potassium oxide %	(k2o)	1.46

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00146
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1161.0
softening temp.(C)	1282.0	softening temp.(C)	1224.0
hemispherical temp.(C)	1290.0	hemispherical temp.(C)	1235.0
fluid temp.(C)	1306.0	fluid temp.(C)	1295.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00146
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	46.68
aluminium oxide %	(al2o3)	24.46
ferric oxide %	(fe2o3)	7.23
titanium dioxide %	(tio2)	0.81
phosphorous pentoxide %	(p2o5)	3.49
calcium oxide %	(cao)	7.49
magnesium oxide %	(mgo)	4.01
sulphur trioxide %	(so3)	2.44
sodium oxide %	(na2o)	1.34
potassium oxide %	(k2o)	1.43

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00147
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1222.0	initial temp.(C)	1137.0
softening temp.(C)	1306.0	softening temp.(C)	1227.0
hemispherical temp.(C)	1327.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1395.0	fluid temp.(C)	1390.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00147
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	57.12
aluminium oxide %	(al2o3)	22.04
ferric oxide %	(fe2o3)	6.26
titanium dioxide %	(tio2)	0.76
phosphorous pentoxide %	(p2o5)	0.29
calcium oxide %	(cao)	3.04
magnesium oxide %	(mgo)	3.78
sulphur trioxide %	(so3)	1.54
sodium oxide %	(na2o)	1.70
potassium oxide %	(k2o)	1.67

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88027

sample id 00147
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1148.0	initial temp.(C)	1022.0
softening temp.(C)	1295.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1348.0	hemispherical temp.(C)	1295.0
fluid temp.(C)	1417.0	fluid temp.(C)	1411.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88027

sample id 00147
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	58.36
aluminium oxide %	(al2o3)	22.94
ferric oxide %	(fe2o3)	5.55
titanium dioxide %	(tio2)	0.63
phosphorous pentoxide %	(p2o5)	0.24
calcium oxide %	(cao)	2.63
magnesium oxide %	(mgo)	3.55
sulphur trioxide %	(so3)	1.07
sodium oxide %	(na2o)	1.60
potassium oxide %	(k2o)	1.63

90.0 <= total <= 100.0

KPNLRDOH88028

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88028 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/09/88
END DATE - 07/12/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - MATTHEWS
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - INTERSECTED SEAMS O?, N?, N(OVT), O, N, M/N, ?, MU , M, L.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1406.82
ZONE - 9
NORTHING - 6346457.20
EASTING - 508436.32

LICENCE/LEASE NUMBER - 7162

LATITUDE - 571547
LONGITUDE - 1285137

- O R I E N T A T I O N -

LENGTH - 167.96
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH(M) - 6.71
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** O INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-028

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
N ovt.	0.79 m
O	0.68 m
N	1.11 m
M/N	0.53 m
M	0.61 m/1.90 m

SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88028										
	N OVT FLOOR	8373	66.28	66.73	100.00		0.129			0.000- 0.129
	N OVT	8374	66.73	68.96	70.40	0.486	0.061	0.245		0.731- 0.061
	N OVT ROOF	8375	68.96	70.11	100.00		0.504			0.000- 0.504
	N ROOF	8376	91.32	93.07	100.00		1.740			0.000- 1.740
	N	8377	93.07	94.19	69.64	0.568	0.209	0.337		0.905- 0.209
	N FLOOR	8378	94.19	95.01	100.00		0.812			0.000- 0.812
	M UPPER ROOF	8379	138.94	139.64	100.00		0.685			0.000- 0.685
	M UPPER	8380	139.64	140.91	92.13	0.185	0.953	0.098		0.283- 0.953
	M UPPER	8381	140.91	141.54	80.95	0.407	0.087	0.116		0.523- 0.087
	M UPPER FLR	8382	141.54	141.88	100.00		0.328			0.000- 0.328
	M ROOF	8383	143.14	143.98	100.00		0.772			0.000- 0.772
	M	8384	143.98	146.24	68.14	1.059	0.252	0.556	0.033	1.615- 0.285
	M FLOOR	8385	146.24	147.02	80.77		0.451		0.110	0.000- 0.561
		10370	55.80	55.83	100.00		0.005			0.000- 0.005
	O ?	99994	19.70	19.83	30.77		0.039	0.089		0.089- 0.039
	N?	99995	33.09	33.94	0.00			0.153	0.029	0.153- 0.029
	O	99996	87.29	87.98	0.00			0.466	0.218	0.466- 0.218
	M/N	99997	113.38	113.91	60.38	0.318		0.209		0.527- 0.000
	?	99998	121.43	121.82	43.59	0.162		0.209		0.371- 0.000
	L	99999	159.78	160.11	84.85	0.272		0.049		0.321- 0.000

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE		SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88028													
	N	OVT	148	8374	8374	66.73	68.96	70.40	1.41	0.16	0.66	0.00	2.07- 0.16
	N		149	8377	8377	93.07	94.19	69.64	0.57	0.21	0.34	0.00	0.91- 0.21
	M	UPPER	150	8380	8380	139.64	140.91	92.12	0.19	0.98	0.10	0.00	0.29- 0.98
	M	UPPER	151	8381	8381	140.91	141.54	80.95	0.42	0.09	0.12	0.00	0.54- 0.09
	M		152	8384	8384	143.98	146.24	68.14	1.24	0.30	0.68	0.04	1.92- 0.34
	N		279	8377	8377	93.07	94.19	69.64	0.57	0.21	0.34	0.00	0.91- 0.21
	M	UPPER	280	8381	8381	140.91	141.54	80.95	0.42	0.09	0.12	0.00	0.54- 0.09
	M		281	8384	8384	143.98	146.24	68.14	1.24	0.30	0.68	0.04	1.92- 0.34
	N	ovt	371	8374	8374	66.73	68.96	70.40	1.41	0.16	0.66	0.00	2.07- 0.16
	N		372	8377	8377	93.07	94.19	69.64	0.57	0.21	0.34	0.00	0.91- 0.21
	M	UPPER	373	8381	8381	140.91	141.54	80.95	0.42	0.09	0.12	0.00	0.54- 0.09
	M		375	8384	8384	143.98	146.24	68.14	1.24	0.30	0.68	0.04	1.92- 0.34

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88028 SEAM : 0? INTERVAL(M) : 19.70 – 19.83 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 03/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	19.70															
	19.83			(0.09)	30.5	99904		0.09/0.04								
								0.13								

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **TRUE THICKNESS**

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88028 SEAM : N? INTERVAL(M) : 33.09 – 33.94 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	33.09		(0.93)	(0.67)	0.0	99995		0.15 / 0.03		—	—	—	—	—	—	—
	33.94			(0.08)				0.18								

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION, MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE:	KPN LR DDH88028	SEAM : N OVT	INTERVAL(M) : 66.73 – 68.96	ELEVATION(M) :	1406.8
GEOLOGIST :	MATTHEWS	SCALE: 1:40	DATE : JAN 25/89	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	
	66.73		[illegible]	0.14 (0.01) 0.14 (0.04) [illegible] (0.08) [illegible] (0.11) 0.11	68.1	8374	148	0.73 / 0.06 0.79	0.73 / 0.06 0.79	1.14	42.70	6.39	49.77	0.40	19.04	—
	68.96															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88028
Coal zone:	N OVT		
Field sample no.:	08374	Composite sample no.:	148
True sample thickness:	0.792 meters	Drill core recovery(%):	70.40 %
Coal/Rock:	0.731 / 0.061 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM			
Size analysis:	SZ1			
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	20.99	20.87	16.39	29.14
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	7.83	4.78		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.14	
Ash(%):	42.70	43.19
Volatile matter(%):	6.39	6.46
Fixed carbon(%):	49.77	50.35
Total sulphur(%):	0.40	0.40
Combustible sulphur(%):	0.30	
Net calorific value(cal/g):	4551.00	4603.00
Gross calorific value(cal/g):	4551.00	4603.00
Volatile matter(dmmf%):	5.40	
Hardgrove index:	24.00	
Specific gravity:	1.60	
Carbon dioxide(%):	0.55	
Phosphorous in coal(%):	0.177	
Chlorine in coal(ppm):	72.00	
Forms of Sulphur(%):	PYRITE 00.04	SULPHATE 00.00 ORGANIC 00.36

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	50.51	51.09
Hydrogen(%):	1.83	1.85
Nitrogen(%):	0.65	0.66
Oxygen(%):	2.77	2.81

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1216.00	1098.00
Softening temperature(°C):	1353.00	1269.00
Hemispherical temperature(°C):	1369.00	1301.00
Final temperature(°C):	1427.00	1425.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	62.96	TiO2(%):	0.97
Al2O3(%):	20.14	Na2O(%):	1.00
Fe2O3(%):	4.63	K2O(%):	2.94
CaO(%):	2.00	SO3(%):	0.57
MgO(%):	2.30	P2O5(%):	0.95

gcri coal division ash fusion proj KPN BLK LR DS DDH88028

sample id 00148
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1164.0	initial temp.(C)	1080.0
softening temp.(C)	1330.0	softening temp.(C)	1238.0
hemispherical temp.(C)	1353.0	hemispherical temp.(C)	1259.0
fluid temp.(C)	1411.0	fluid temp.(C)	1407.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88028

sample id 00148
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.02
aluminium oxide %	(al2o3)	22.95
ferric oxide %	(fe2o3)	7.18
titanium dioxide %	(tio2)	1.22
phosphorous pentoxide %	(p2o5)	1.44
calcium oxide %	(cao)	2.63
magnesium oxide %	(mgo)	3.07
sulphur trioxide %	(so3)	0.63
sodium oxide %	(na2o)	1.00
potassium oxide %	(k2o)	2.37

90.0 <= total <= 100.0

qcri coal division | ash fusion | proj KPN BLK LR DS DDH88028

ample id 00148
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1227.0	initial temp.(C)	1132.0
softening temp.(C)	1374.0	softening temp.(C)	1285.0
hemispherical temp.(C)	1401.0	hemispherical temp.(C)	1322.0
fluid temp.(C)	1438.0	fluid temp.(C)	1435.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

qcri coal division | ash mineral | proj KPN BLK LR DS DDH88028

ample id 00148
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.16
aluminium oxide %	(al2o3)	25.03
ferric oxide %	(fe2o3)	7.18
titanium dioxide %	(tio2)	1.15
phosphorous pentoxide %	(p2o5)	1.32
calcium oxide %	(cao)	2.36
magnesium oxide %	(mgo)	3.09
sulphur trioxide %	(so3)	1.13
sodium oxide %	(na2o)	0.99
potassium oxide %	(k2o)	2.18

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88028 SEAM : 0 INTERVAL(M) : 87.29 – 87.98 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	87.29			(0.24)	0.0	99996		0.47 / 0.22 0.66		—	—	—	—	—	—	—
			(0.22)													
	87.98			(0.23)												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88028 SEAM : N INTERVAL(M) : 93.07 – 94.19 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	93.07			0.14	69.7	8377	149	0.91/ 0.21 1.11	0.81/ 0.21 1.11	1.14	38.91	7.70	64.26	0.40	20.97	—
				(0.14)												
				0.31												
			0.18													
	94.19			(0.19)												

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88028
Coal zone:	N		
Field sample no.:	08377	Composite sample no.:	149
True sample thickness:	1.114 meters	Drill core recovery(%):	69.64 %
Coal/Rock:	0.905 / 0.209 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM				
Size analysis:	SZ1				
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50	
Relative weight(%):	33.16	23.02	11.34	23.37	
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00			
Relative weight(%):	6.11	3.00			

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.14	
Ash(%):	36.91	37.33
Volatile matter(%):	7.70	7.79
Fixed carbon(%):	54.25	54.88
Total sulphur(%):	0.40	0.40
Combustible sulphur(%):	0.19	
Net calorific value(cal/g):	5012.00	5069.00
Gross calorific value(cal/g):	5012.00	5069.00
Volatile matter(dmmf%):	7.90	
Hardgrove index:	63.00	
Specific gravity:	1.57	
Carbon dioxide(%):	1.94	
Phosphorous in coal(%):	0.084	
Chlorine in coal(ppm):	32.00	
Forms of Sulphur(%):	PYRITE 00.06	SULPHATE 00.00 ORGANIC 00.34

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	56.53	57.18
Hydrogen(%):	2.06	2.08
Nitrogen(%):	0.68	0.69
Oxygen(%):	2.28	2.32

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1169.00	1027.00
Softening temperature(°C):	1264.00	1174.00
Hemispherical temperature(°C):	1282.00	1187.00
Final temperature(°C):	1317.00	1290.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	61.98	TiO2(%):	0.89
Al2O3(%):	17.10	Na2O(%):	0.79
Fe2O3(%):	8.01	K2O(%):	2.21
CaO(%):	3.37	SO3(%):	1.40
MgO(%):	3.36	P2O5(%):	0.52

gcri coal division ash fusion proj KPN BLK LR DS DDH88028

sample id 00149
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1206.0	initial temp.(C)	1064.0
softening temp.(C)	1277.0	softening temp.(C)	1182.0
hemispherical temp.(C)	1288.0	hemispherical temp.(C)	1206.0
fluid temp.(C)	1338.0	fluid temp.(C)	1306.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88028

sample id 00149
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	52.80
aluminium oxide %	(al2o3)	21.93
ferric oxide %	(fe2o3)	9.08
titanium dioxide %	(tio2)	1.07
phosphorous pentoxide %	(p2o5)	0.96
calcium oxide %	(cao)	4.02
magnesium oxide %	(mgo)	3.82
sulphur trioxide %	(so3)	1.79
sodium oxide %	(na2o)	1.12
potassium oxide %	(k2o)	1.77

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88028

sample id 00149
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1211.0	initial temp.(C)	1074.0
softening temp.(C)	1290.0	softening temp.(C)	1232.0
hemispherical temp.(C)	1317.0	hemispherical temp.(C)	1251.0
fluid temp.(C)	1380.0	fluid temp.(C)	1338.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88028

sample id 00149
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	52.86
aluminium oxide %	(al2o3)	23.04
ferric oxide %	(fe2o3)	8.46
titanium dioxide %	(tio2)	0.97
phosphorous pentoxide %	(p2o5)	0.82
calcium oxide %	(cao)	3.46
magnesium oxide %	(mgo)	3.66
sulphur trioxide %	(so3)	1.87
sodium oxide %	(na2o)	1.16
potassium oxide %	(k2o)	1.74

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **TRUE THICKNESS**

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88028 SEAM : M/N INTERVAL(M) : 113.38 – 113.91 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 03/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	113.38			(0.14)												
				0.32	60.3	99987		0.83/ 0.00	0.53/ 0.00	—	—	—	—	—	—	—
	113.91							0.53	0.53							

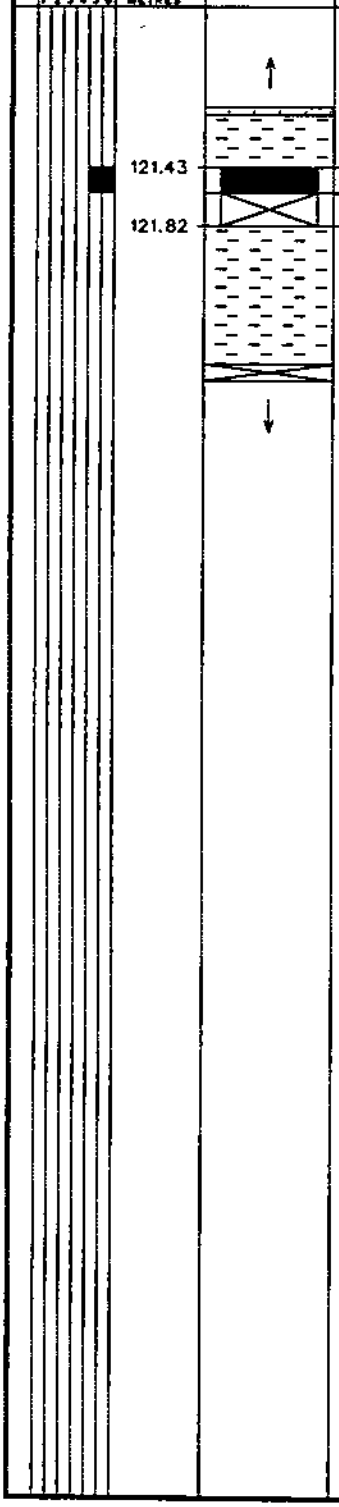
GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **TRUE THICKNESS**

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH88028 SEAM : ? INTERVAL(M) : 121.43 – 121.82 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :



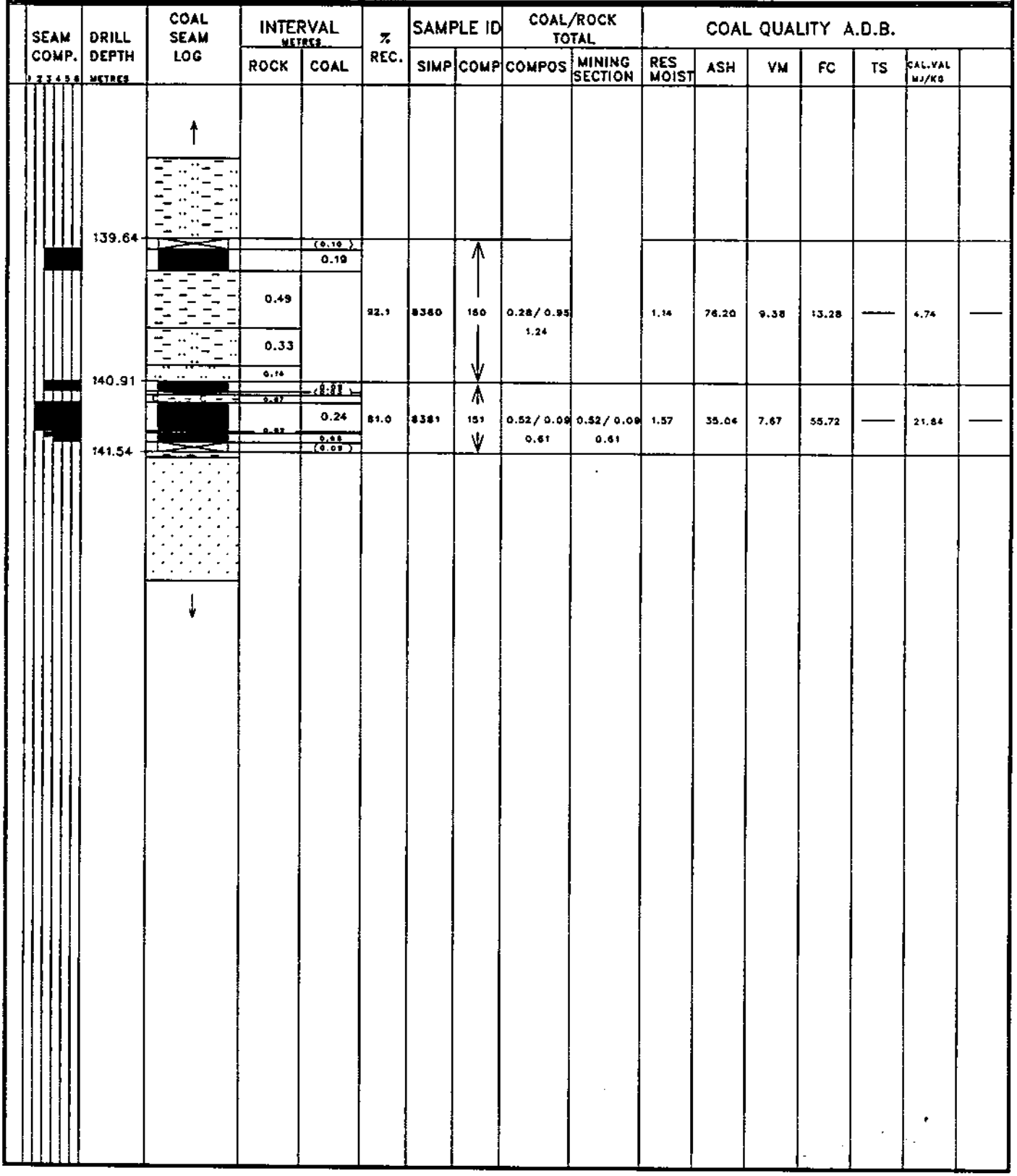
SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	121.43			0.16	43.7	99998		0.37/ 0.00		—	—	—	—	—	—	—
	121.82			(0.21)				0.37								

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88028 SEAM : M UPPER INTERVAL(M) : 139.64 – 141.54 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 07/89 DRAWING NO. :

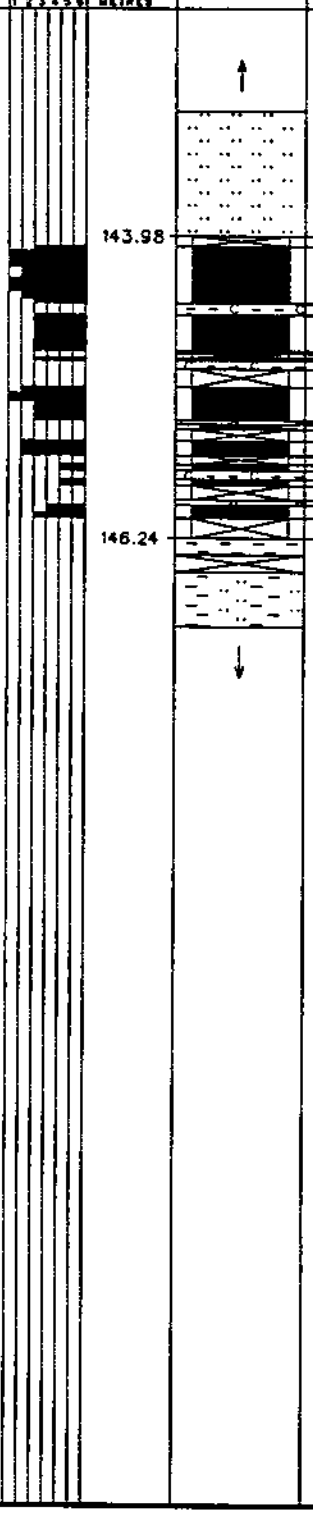


GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88028 SEAM : M INTERVAL(M) : 143.98 – 146.24 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 07/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	143.98			0.35	69.0	8384	152	1.62 / 0.29	1.62 / 0.29	1.95	36.38	9.02	52.65	0.41	20.71	
				0.23				1.90	1.90							
				0.21												
				0.09												
	146.24															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88028
Coal zone:	M		
Field sample no.:	08384	Composite sample no.:	152
True sample thickness:	1.900 meters	Drill core recovery(%):	68.14 %
Coal/Rock:	1.615 / 0.285 meters		

RAW HEAD ANALYSIS (HD1)

Standard:	ASTM			
Size analysis:	SZ1			
Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	20.12	16.84	14.36	35.40
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	7.72	5.56		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.95	
Ash(%):	36.38	37.10
Volatile matter(%):	9.02	9.20
Fixed carbon(%):	52.65	53.70
Total sulphur(%):	0.41	0.42
Combustible sulphur(%):	0.18	
Net calorific value(cal/g):	4950.00	5048.00
Gross calorific value(cal/g):	4950.00	5048.00
Volatile matter(dmmf%):	10.20	
Hardgrove index:	69.00	
Specific gravity:	1.55	
Carbon dioxide(%):	0.96	
Phosphorous in coal(%):	0.143	
Chlorine in coal(ppm):	72.00	
Forms of Sulphur(%):	PYRITE 00.24 SULPHATE 00.00 ORGANIC 00.17	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	56.98	58.11
Hydrogen(%):	1.11	1.13
Nitrogen(%):	0.76	0.78
Oxygen(%):	2.41	2.46

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1177.00	1043.00
Softening temperature(°C):	1285.00	1211.00
Hemispherical temperature(°C):	1327.00	1243.00
Final temperature(°C):	1385.00	1356.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	54.66	TiO2(%):	1.06
Al2O3(%):	22.37	Na2O(%):	1.77
Fe2O3(%):	7.43	K2O(%):	2.00
CaO(%):	3.28	SO3(%):	1.60
MgO(%):	3.08	P2O5(%):	0.90

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88028

sample id 00152
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1222.0	initial temp.(C)	1153.0
softening temp.(C)	1359.0	softening temp.(C)	1251.0
hemispherical temp.(C)	1406.0	hemispherical temp.(C)	1285.0
fluid temp.(C)	1448.0	fluid temp.(C)	1441.0

normal ranges all temps.
1000.0)= values (= 1500.0
oxidation temps)= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88028

sample id 00152
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	52.56
aluminium oxide %	(al2o3)	25.83
ferric oxide %	(fe2o3)	7.11
titanium dioxide %	(tio2)	1.51
phosphorous pentoxide %	(p2o5)	0.85
calcium oxide %	(cao)	2.80
magnesium oxide %	(mgo)	3.25
sulphur trioxide %	(so3)	1.63
sodium oxide %	(na2o)	1.65
potassium oxide %	(k2o)	1.90

90.0 (= total (= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88028

sample id 00152
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1214.0	initial temp.(C)	1095.0
softening temp.(C)	1438.0	softening temp.(C)	1290.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1345.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88028

sample id 00152
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	52.88
aluminium oxide %	(al2o3)	26.95
ferric oxide %	(fe2o3)	7.17
titanium dioxide %	(tio2)	1.29
phosphorous pentoxide %	(p2o5)	0.70
calcium oxide %	(cao)	2.23
magnesium oxide %	(mgo)	3.03
sulphur trioxide %	(so3)	1.26
sodium oxide %	(na2o)	1.76
potassium oxide %	(k2o)	1.72

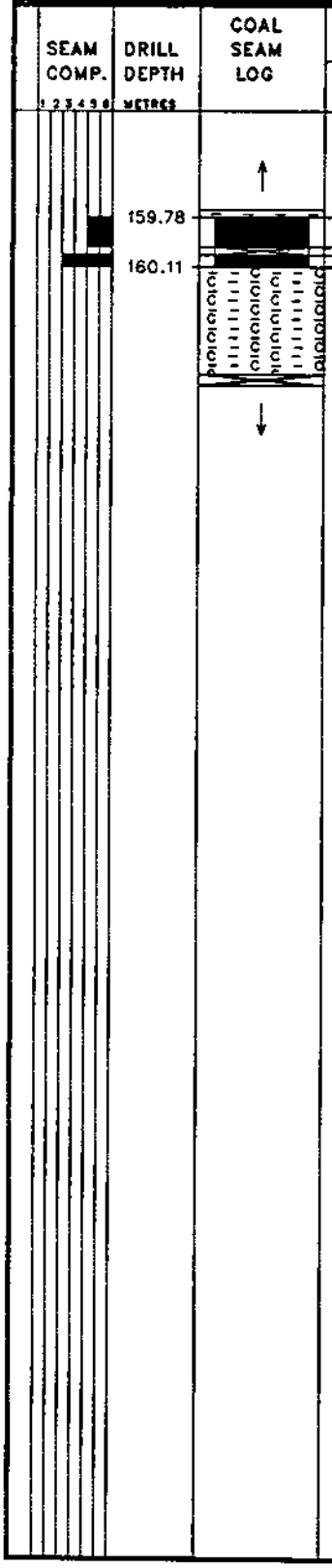
90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88028 SEAM : L INTERVAL(M) : 159.78 – 160.11 ELEVATION(M) : 1406.8

GEOLOGIST : MATTHEWS SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	159.78			0.19	84.7	99999		0.32/ 0.00		—	—	—	—	—	—	—
	160.11							0.32								

KPNLRDDH88029

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH88029 DATE - 02/15/89

- H I S T O R Y -

START DATE - 07/14/88
END DATE - 07/16/88

CONTRACTOR - J.T. THOMAS
GEOLOGIST - HEARN
OPERATOR - G.C.R.L.
SURVEYOR - TRONNES

REMARKS - FINAL DRILL HOLE FOR 1988. SEAMS INTERSECTED: O, N , M, L, & K/L.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1615.94
ZONE - 9
NORTHING - 6343983.57
EASTING - 507393.93

LICENCE/LEASE NUMBER - 7151

LATITUDE - 571427
LONGITUDE - 1285239

- O R I E N T A T I O N -

LENGTH - 158.09
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ -

CASING DEPTH(M) - 3.66
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

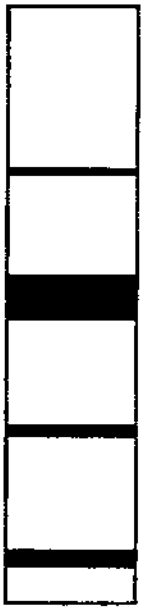
*** NOTE *** 0 INDICATES NO VALUE

MOUNT KLAPPAN ANTHRACITE PROJECT

SCHEMATIC PROFILE

DDH88-029

SEAM	TRUE SEAM THICKNESS (Coal + Rock)
N	1.65 m
M	11.13 m
L	2.69 m
K/L	4.27 m



SCALE

1:2000

NOTE: Seams less than 0.5 m thick are not shown.

Gulf Canada Resources Limited

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH88029										
	N ROOF	8386	42.56	43.16	100.00		0.328			0.000- 0.328
	N	8387	43.16	45.90	75.55	0.801	0.445	0.403		1.204- 0.445
	N FLOOR	8388	45.90	46.47	100.00		0.382			0.000- 0.382
	L ROOF	8389	110.42	110.71	100.00		0.252			0.000- 0.252
	L	8390	110.71	111.76	89.52	0.790	0.035	0.096		0.886- 0.035
	L	8391	111.76	113.72	84.69	1.185	0.315	0.216	0.054	1.401- 0.369
	L FLOOR	8392	113.72	113.99	100.00		0.248			0.000- 0.248
	K/L ROOF	8393	143.59	143.84	100.00	0.144	0.096			0.144- 0.096
	K/L	8394	143.84	145.30	100.00	0.958	0.427			0.958- 0.427
	K/L PARTING	8395	146.84	147.45	100.00	0.027	0.528			0.027- 0.528
	K/L PARTING	8396	149.52	149.84	100.00		0.284			0.000- 0.284
	K/L	8397	149.84	152.85	52.49	0.971	0.333	1.070	0.086	2.041- 0.419
	K/L FLOOR	8398	152.85	153.17	100.00		0.235			0.000- 0.235
	M ROOF	8399	69.56	70.84	92.19		1.112		0.094	0.000- 1.206
	M	8400	70.84	79.07	64.03	3.010	0.950	1.996	0.258	5.006- 1.208
	M	8401	79.07	79.66	100.00		0.517			0.000- 0.517
	M	8402	79.66	82.82	100.00	2.218	0.631			2.218- 0.631
	M	8403	82.82	84.53	85.38	0.622	0.698	0.233		0.855- 0.698
	M FLOOR	8404	84.53	85.08	100.00		0.520			0.000- 0.520
	K/L	8405	145.30	146.84	100.00	0.646	0.775			0.646- 0.775
	O	99999	15.48	16.31	63.86		0.274		0.155	0.000- 0.429

GULF CANADA CORPORATION - COAL DIVISION

20/FEB/89 COMPOSITE SAMPLE SUMMARY PAGE 1

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH88029												
	N	153	8387	8387	43.16	45.90	75.54	1.34	0.73	0.67	0.00	2.01- 0.73
	L	154	8390	8391	110.71	113.72	86.37	2.21	0.39	0.35	0.06	2.56- 0.45
	K/L	155	8394	8394	143.84	145.30	100.00	1.01	0.45	0.00	0.00	1.01- 0.45
	K/L	156	8405	8405	145.30	146.84	100.00	0.70	0.84	0.00	0.00	0.70- 0.84
	K/L	157	8395	8396	146.84	149.84	100.00	0.03	0.90	0.00	0.00	0.03- 0.90
	K/L	158	8397	8397	149.84	152.85	52.49	1.18	0.40	1.32	0.11	2.50- 0.51
	M	159	8400	8400	70.84	79.07	64.03	4.02	1.25	2.66	0.30	6.68- 1.55
	M	160	8401	8401	79.07	79.66	100.00	0.00	0.59	0.00	0.00	0.00- 0.59
	M	161	8402	8403	79.66	84.53	94.86	3.14	1.48	0.25	0.00	3.39- 1.48
	L	282	8390	8391	110.71	113.72	86.37	2.21	0.39	0.35	0.06	2.56- 0.45
	K/L	283	8397	8397	149.84	152.85	52.49	1.18	0.40	1.32	0.11	2.50- 0.51
	M	284	8402	8403	79.66	84.53	94.86	3.14	1.48	0.25	0.00	3.39- 1.48
	N	376	8387	8387	43.16	45.90	75.54	1.34	0.73	0.67	0.00	2.01- 0.73
	L	377	8390	8391	110.71	113.72	86.37	2.21	0.39	0.35	0.06	2.56- 0.45
	K/L	378	8394	8397	143.84	152.85	68.00	2.19	0.85	1.32	0.11	3.51- 0.96
	M	379	8400	8403	70.84	84.53	75.49	7.16	2.73	2.91	0.30	10.07- 3.03

COAL SEAM DATA SHEETS

AND

COAL QUALITY ANALYSES

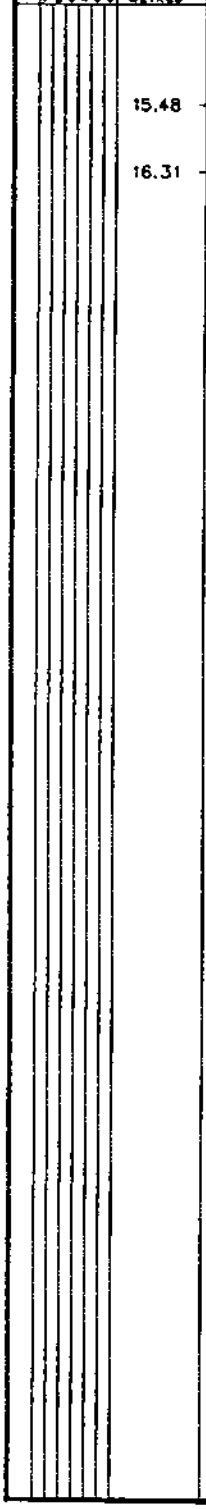
GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **MOUNT KLAPPAN PROJECT** — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88029 SEAM : O INTERVAL(M) : 15.48 – 16.31 ELEVATION(M) : 1615.9

GEOLOGIST : HEARN SCALE: 1:40 DATE : FEB 01/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	15.48		0.22		63.9	99999		0.00/ 0.43		—	—	—	—	—	—	—
			0.05					0.43								
	16.31		(0.10)													



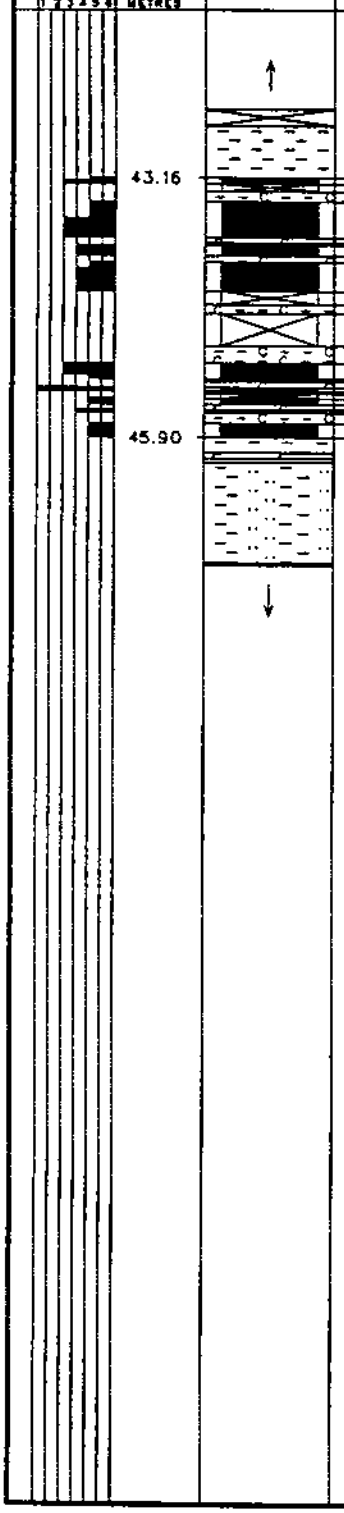
GULF CANADA CORPORATION

SEAM DETAIL — **COAL DIVISION** — **TRUE THICKNESS**

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR 00H88029 SEAM : N INTERVAL(M) : 43.16 – 45.90 ELEVATION(M) : 1615.9

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	43.16			0.23												
				0.18												
				(0.09)												
				(0.21)												
					75.6	8387	153	1.20 / 0.45 1.65	1.20 / 0.45 1.65	1.85	44.80	9.04	44.51	4.57	17.23	—
	45.90															

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88029
Coal zone:	N		
Field sample no.:	08387	Composite sample no.:	153
True sample thickness:	1.649 meters	Drill core recovery (%):	75.54 %
Coal/Rock:	1.204 / 0.445 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	12.63	16.52	16.93	40.36
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	7.75	5.81		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.65	
Ash (%):	44.80	45.55
Volatile matter (%):	9.04	9.19
Fixed carbon (%):	44.51	45.26
Total sulphur (%):	4.57	4.65
Combustible sulphur (%):	4.05	
Net calorific value (cal/g):	4118.00	4187.00
Gross calorific value (cal/g):	4118.00	4187.00
Volatile matter (dmmf%):	7.70	
Hardgrove index:	90.00	
Specific gravity:	1.61	
Carbon dioxide (%):	1.19	
Phosphorous in coal (%):	0.211	
Chlorine in coal (ppm):	408.00	

Forms of Sulphur (%): PYRITE 04.11 SULPHATE 00.17 ORGANIC 00.29

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	42.08	42.79
Hydrogen (%):	1.54	1.57
Nitrogen (%):	0.59	0.60
Oxygen (%):	4.77	4.84

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1164.00	1027.00
Softening temperature (°C):	1272.00	1132.00
Hemispherical temperature (°C):	1280.00	1140.00
Final temperature (°C):	1338.00	1266.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	45.62	TiO2 (%):	0.98
Al2O3 (%):	16.63	Na2O (%):	1.67
Fe2O3 (%):	19.56	K2O (%):	1.25
CaO (%):	4.59	SO3 (%):	2.89
MgO (%):	2.72	P2O5 (%):	1.08

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88029

ample id 00153
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1180.0	initial temp.(C)	1058.0
softening temp.(C)	1277.0	softening temp.(C)	1153.0
hemispherical temp.(C)	1295.0	hemispherical temp.(C)	1200.0
fluid temp.(C)	1343.0	fluid temp.(C)	1317.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88029

ample id 00153
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	48.62
aluminium oxide %	(al2o3)	17.01
ferric oxide %	(fe2o3)	14.10
titanium dioxide %	(tio2)	1.23
phosphorous pentoxide %	(p2o5)	1.66
calcium oxide %	(cao)	4.87
magnesium oxide %	(mgo)	2.80
sulphur trioxide %	(so3)	2.28
sodium oxide %	(na2o)	1.94
potassium oxide %	(k2o)	1.19

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88029

sample id 00153
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1190.0	initial temp.(C)	1116.0
softening temp.(C)	1348.0	softening temp.(C)	1211.0
hemispherical temp.(C)	1382.0	hemispherical temp.(C)	1259.0
fluid temp.(C)	1417.0	fluid temp.(C)	1401.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88029

sample id 00153
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	51.40
aluminium oxide %	(al2o3)	21.93
ferric oxide %	(fe2o3)	10.78
titanium dioxide %	(tio2)	1.18
phosphorous pentoxide %	(p2o5)	1.63
calcium oxide %	(cao)	3.83
magnesium oxide %	(mgo)	2.19
sulphur trioxide %	(so3)	1.81
sodium oxide %	(na2o)	1.91
potassium oxide %	(k2o)	1.11

90.0 <= total <= 100.0

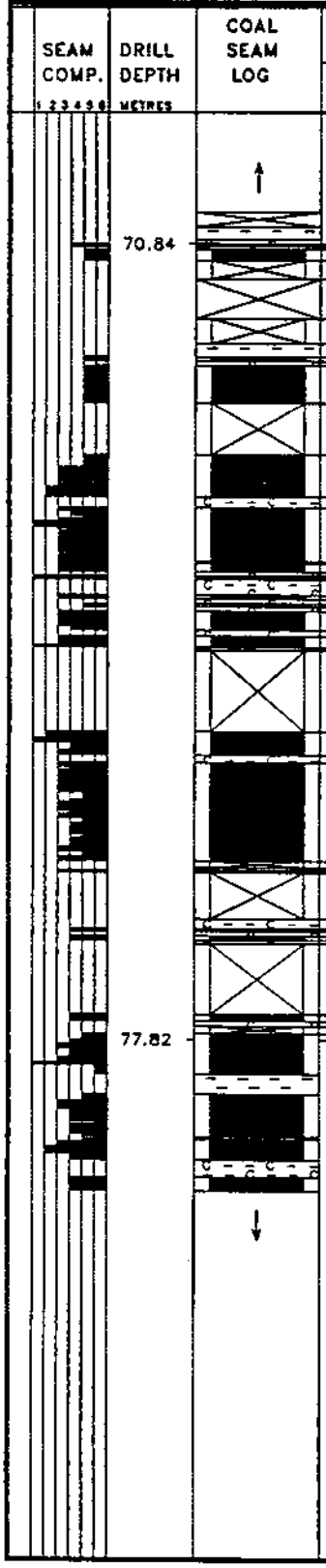
GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : M TOTAL INTERVAL(M) : 70.84 – 84.53 ELEVATION(M) : 1615.9
INTERVAL(M) : 70.84 – 77.82
GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	70.84			0.12 0.07 (0.12) (0.26) (0.16) 0.09 0.03 0.24 (0.33) 0.27 0.07 0.35 0.01 0.03 0.03 0.10 0.04 0.13 0.04 0.03 (0.53) 0.13 0.04 0.64 0.03 (0.30) 0.07 0.03 0.04 (0.47) 0.04 1.08	56.5	8400	139								
	77.82														

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : M TOTAL INTERVAL(M) : 70.84 – 84.53 ELEVATION(M) : 1615.9
INTERVAL(M) : 77.82 – 79.07
GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	77.82			0.23												
			0.14													
				0.28	100.0	8400	159	5.01 / 1.21		1.41	42.62	7.82	48.15	0.57	17.37	—
			0.83	0.14				6.21								
			0.11													
	79.07			0.13												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : M TOTAL INTERVAL(M) : 70.84 – 84.53 ELEVATION(M) : 1615.9
INTERVAL(M) : 79.07 – 79.66
GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	79.07		0.12													
			0.18													
			0.25		100.0	8401	160	0.00/ 0.52		1.21	66.18	8.59	26.02	—	7.80	—
	79.66							0.52								

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

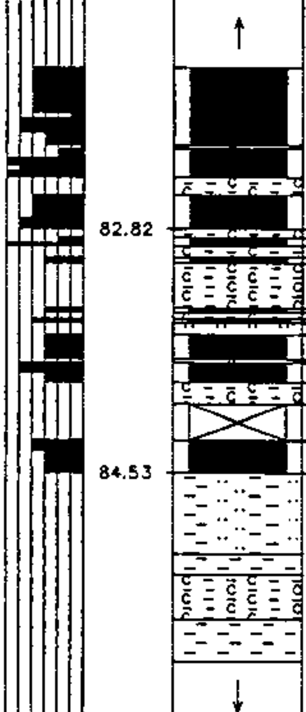
DATA SOURCE: KPN LR DDH88029 SEAM : M TOTAL INTERVAL(M) : 70.84 – 84.53 ELEVATION(M) : 1615.9
INTERVAL(M) : 79.66 – 82.82
GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	79.66			0.16	100.0	8402	161								
			0.10	0.32											
			0.08	0.09											
				0.45											
			0.07	0.08											
			0.03	0.56											
			0.12	0.18											
	82.82			0.21											

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH88029 SEAM : M TOTAL INTERVAL(M) : 70.84 – 84.53 ELEVATION(M) : 1615.9
INTERVAL(M) : 82.82 – 84.53
GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	COAL	% REC.	SAMPLE ID SIMP	COMP	COAL/ROCK TOTAL COMPOS	MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	82.82		[illegible]												
				[illegible]											
			0.07	0.06											
			0.29						8.06/ 3.05 11.13						
			[illegible]	[illegible]											
				[illegible]											
			0.07												
				0.73	85.0	8403	161	3.07/ 1.33 4.40		1.30	48.61	9.88	40.21	0.46	15.35
			0.03												
				0.12											
			0.14												
				(0.23)											
	84.53			0.21											

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88029
Coal zone:	M		
Field sample no.:	08400	Composite sample no.:	159
True sample thickness:	6.214 meters	Drill core recovery(%):	64.03 %
Coal/Rock:	5.006 / 1.208 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size(mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight(%):	13.76	19.64	18.20	39.05
Fraction size(mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight(%):	5.66	3.69		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture(%):	1.41	
Ash(%):	42.62	43.23
Volatile matter(%):	7.82	7.93
Fixed carbon(%):	48.15	48.84
Total sulphur(%):	0.57	0.58
Combustible sulphur(%):	0.23	
Net calorific value(cal/g):	4151.00	4211.00
Gross calorific value(cal/g):	4151.00	4211.00
Volatile matter(dmmf%):	8.10	
Hardgrove index:	83.00	
Specific gravity:	1.61	
Carbon dioxide(%):	1.39	
Phosphorous in coal(%):	0.076	
Chlorine in coal(ppm):	25.00	

Forms of Sulphur(%): PYRITE 00.23 SULPHATE 00.00 ORGANIC 00.34

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon(%):	48.80	49.50
Hydrogen(%):	1.84	1.87
Nitrogen(%):	0.67	0.68
Oxygen(%):	4.09	4.14

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature(°C):	1222.00	1169.00
Softening temperature(°C):	1269.00	1206.00
Hemispherical temperature(°C):	1290.00	1227.00
Final temperature(°C):	1335.00	1322.00

ASH MINERAL ANALYSIS (AM1)

SiO2(%):	55.04	TiO2(%):	1.00
Al2O3(%):	20.04	Na2O(%):	1.83
Fe2O3(%):	6.69	K2O(%):	1.32
CaO(%):	4.14	SO3(%):	1.97
MgO(%):	3.14	P2O5(%):	0.41

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88029
Coal zone:	M		
Field sample no.:	08402 - 08403	Composite sample no.:	161
True sample thickness:	4.402 meters	Drill core recovery (%):	94.86 %
Coal/Rock:	3.073 / 1.329 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	32.24	24.85	15.17	22.20
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	3.33	2.21		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.30	
Ash (%):	48.61	49.25
Volatile matter (%):	9.88	10.01
Fixed carbon (%):	40.21	40.74
Total sulphur (%):	0.48	0.49
Combustible sulphur (%):	0.20	
Net calorific value (cal/g):	3669.00	3717.00
Gross calorific value (cal/g):	3669.00	3717.00
Volatile matter (dmmf%):	12.70	
Hardgrove index:	61.00	
Specific gravity:	1.65	
Carbon dioxide (%):	2.39	
Phosphorous in coal (%):	0.127	
Chlorine in coal (ppm):	32.00	
Forms of Sulphur (%):	PYRITE 00.04 SULPHATE 00.00 ORGANIC 00.44	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	43.18	43.75
Hydrogen (%):	1.60	1.62
Nitrogen (%):	0.61	0.62
Oxygen (%):	4.22	4.27

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1161.00	1058.00
Softening temperature (°C):	1259.00	1164.00
Hemispherical temperature (°C):	1264.00	1174.00
Final temperature (°C):	1327.00	1306.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	51.28	TiO2 (%):	1.06
Al2O3 (%):	17.77	Na2O (%):	1.87
Fe2O3 (%):	11.38	K2O (%):	1.24
CaO (%):	4.59	SO3 (%):	1.45
MgO (%):	4.10	P2O5 (%):	0.60

gcri coal division ash fusion proj KPN BLK LR DS DDH88029

sample id 00159
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1174.0	initial temp.(C)	1116.0
softening temp.(C)	1411.0	softening temp.(C)	1306.0
hemispherical temp.(C)	1432.0	hemispherical temp.(C)	1327.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88029

sample id 00159
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.88
aluminium oxide %	(al2o3)	23.82
ferric oxide %	(fe2o3)	5.69
titanium dioxide %	(tio2)	1.46
phosphorous pentoxide %	(p2o5)	0.71
calcium oxide %	(cao)	2.69
magnesium oxide %	(mgo)	2.46
sulphur trioxide %	(so3)	1.65
sodium oxide %	(na2o)	2.20
potassium oxide %	(k2o)	1.22

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88029

sample id 00159
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1232.0	initial temp.(C)	1140.0
softening temp.(C)	1472.0	softening temp.(C)	1359.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1398.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88029

sample id 00159
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.54
aluminium oxide %	(al2o3)	25.71
ferric oxide %	(fe2o3)	5.26
titanium dioxide %	(tio2)	1.23
phosphorous pentoxide %	(p2o5)	0.70
calcium oxide %	(cao)	2.41
magnesium oxide %	(mgo)	2.28
sulphur trioxide %	(so3)	1.31
sodium oxide %	(na2o)	2.17
potassium oxide %	(k2o)	1.07

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88029

ample id 00161
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1248.0	initial temp.(C)	1122.0
softening temp.(C)	1306.0	softening temp.(C)	1230.0
hemispherical temp.(C)	1327.0	hemispherical temp.(C)	1259.0
fluid temp.(C)	1443.0	fluid temp.(C)	1411.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88029

ample id 00161
ample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	53.10
aluminium oxide %	(al2o3)	23.06
ferric oxide %	(fe2o3)	6.35
titanium dioxide %	(tio2)	1.23
phosphorous pentoxide %	(p2o5)	1.19
calcium oxide %	(cao)	4.11
magnesium oxide %	(mgo)	3.09
sulphur trioxide %	(so3)	2.04
sodium oxide %	(na2o)	2.30
potassium oxide %	(k2o)	1.25

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88029

sample id 00161
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1200.0	initial temp.(C)	1077.0
softening temp.(C)	1411.0	softening temp.(C)	1269.0
hemispherical temp.(C)	1435.0	hemispherical temp.(C)	1338.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88029

sample id 00161
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	51.78
aluminium oxide %	(al2o3)	23.82
ferric oxide %	(fe2o3)	6.18
titanium dioxide %	(tio2)	1.12
phosphorous pentoxide %	(p2o5)	1.31
calcium oxide %	(cao)	3.64
magnesium oxide %	(mgo)	2.90
sulphur trioxide %	(so3)	1.72
sodium oxide %	(na2o)	2.25
potassium oxide %	(k2o)	1.19

90.0 <= total <= 100.0

GULF CANADA CORPORATION

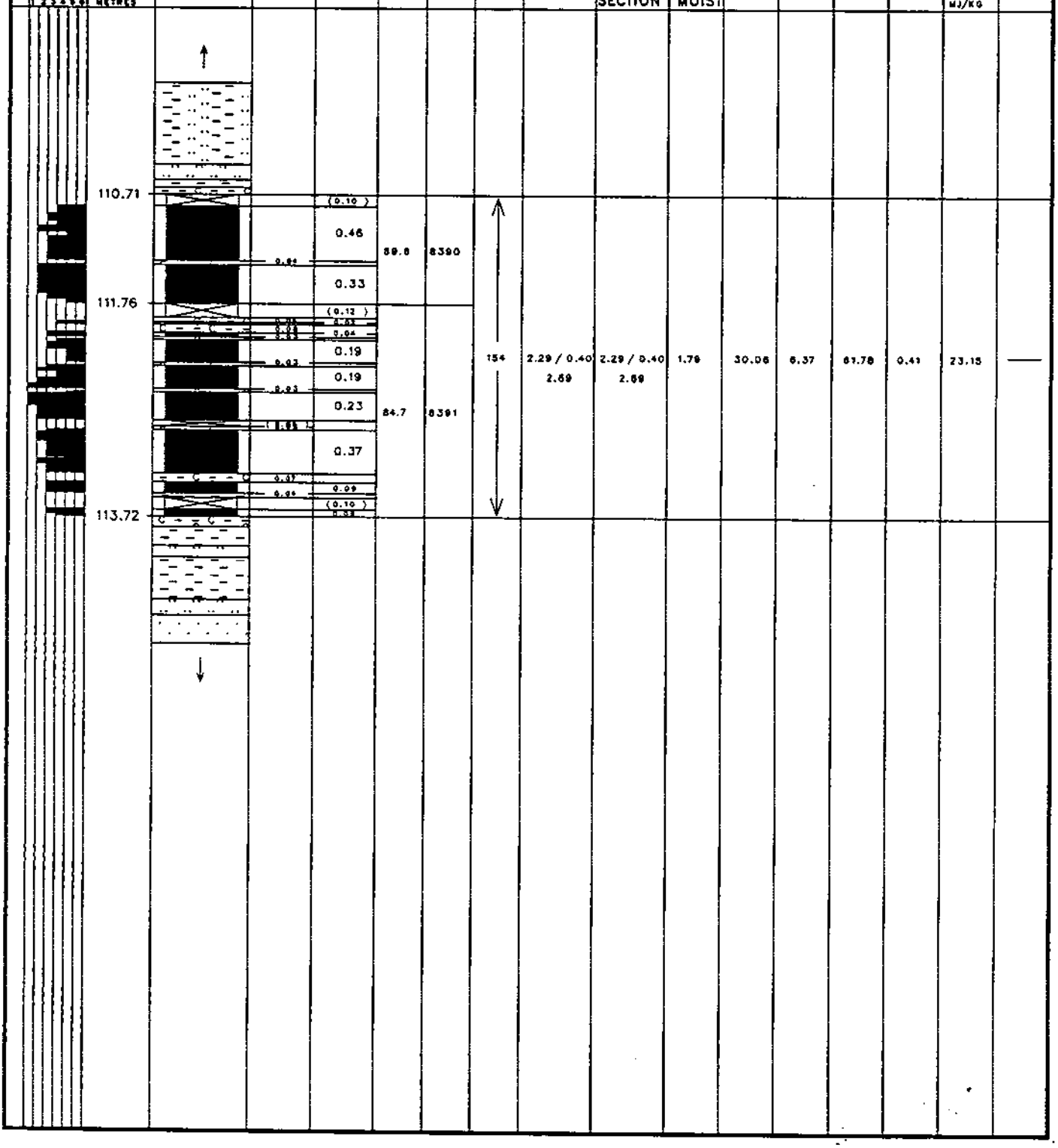
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : L INTERVAL(M) : 110.71 – 113.72 ELEVATION(M) : 1615.9

GEOLOGIST : HEARN SCALE: 1:40 DATE : JAN 25/89 DRAWING NO. :



GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88029
Coal zone:	L		
Field sample no.:	08390 - 08391	Composite sample no.:	154
True sample thickness:	2.691 meters	Drill core recovery (%):	86.37 %
Coal/Rock:	2.287 / 0.404 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	20.32	20.40	17.75	32.41
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	5.64	3.48		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.79	
Ash (%):	30.06	30.61
Volatile matter (%):	6.37	6.49
Fixed carbon (%):	61.78	62.90
Total sulphur (%):	0.41	0.42
Combustible sulphur (%):	0.03	
Net calorific value (cal/g):	5533.00	5634.00
Gross calorific value (cal/g):	5533.00	5634.00
Volatile matter (dmmf%):	5.90	
Hardgrove index:	65.00	
Specific gravity:	1.53	
Carbon dioxide (%):	1.13	
Phosphorous in coal (%):	0.185	
Chlorine in coal (ppm):	20.00	
Forms of Sulphur (%):	PYRITE 00.02	SULPHATE 00.00 ORGANIC 00.39

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	61.50	62.62
Hydrogen (%):	2.06	2.10
Nitrogen (%):	0.72	0.73
Oxygen (%):	3.46	3.52

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1148.00	1048.00
Softening temperature (°C):	1277.00	1243.00
Hemispherical temperature (°C):	1282.00	1253.00
Final temperature (°C):	1353.00	1338.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	55.82	TiO2 (%):	1.06
Al2O3 (%):	18.52	Na2O (%):	1.87
Fe2O3 (%):	6.46	K2O (%):	0.98
CaO (%):	5.15	SO3 (%):	3.18
MgO (%):	2.98	P2O5 (%):	1.41

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88029

sample id 00154
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AF3 | date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1185.0	initial temp.(C)	1074.0
softening temp.(C)	1432.0	softening temp.(C)	1348.0
hemispherical temp.(C)	1448.0	hemispherical temp.(C)	1395.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88029

sample id 00154
sample product id SP1 | data type (real,boro,aver,calc) REAL
split sample id AM3 | date analysed 31/07/88

silicon dioxide %	(sio2)	52.56
aluminium oxide %	(al2o3)	26.46
ferric oxide %	(fe2o3)	5.46
titanium dioxide %	(tio2)	1.38
phosphorous pentoxide %	(p2o5)	1.04
calcium oxide %	(cao)	3.13
magnesium oxide %	(mgo)	2.49
sulphur trioxide %	(so3)	1.59
sodium oxide %	(na2o)	2.33
potassium oxide %	(k2o)	1.08

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88029

ample id 00154
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1211.0	initial temp.(C)	1132.0
softening temp.(C)	1472.0	softening temp.(C)	1390.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1438.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88029

sample id 00154
sample product id SP1 data type (real,boro,aver,calc) REAL
plit sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	51.64
aluminium oxide %	(al2o3)	27.22
ferric oxide %	(fe2o3)	5.09
titanium dioxide %	(tio2)	1.14
phosphorous pentoxide %	(p2o5)	0.99
calcium oxide %	(cao)	2.77
magnesium oxide %	(mgo)	2.42
sulphur trioxide %	(so3)	1.25
sodium oxide %	(na2o)	2.25
potassium oxide %	(k2o)	1.02

90.0 <= total <= 100.0

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : K/L TOTAL INTERVAL(M) : 143.59 – 152.85 ELEVATION(M) : 1615.9
INTERVAL(M) : 143.59 – 143.84
GEOLOGIST : HEARN SCALE: 1:40 DATE : FEB 07/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	143.59			0.14	100.0	8393	155								
	143.84		0.01	0.09											

GULF CANADA CORPORATION

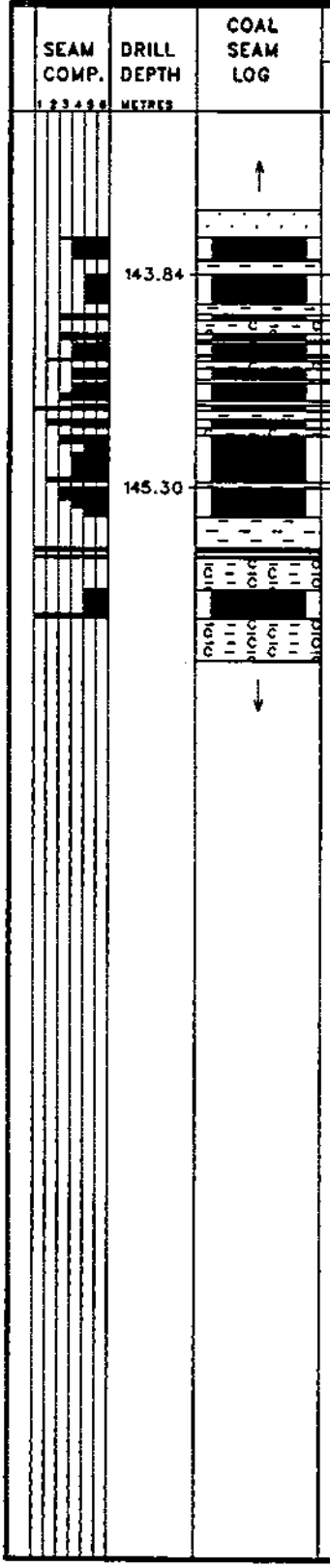
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : K/L TOTAL INTERVAL(M) : 143.59 – 152.85 ELEVATION(M) : 1615.9
INTERVAL(M) : 143.84 – 145.30

GEOLOGIST : HEARN SCALE: 1:40 DATE : FEB 07/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	143.84			0.19												
			0.07	0.44												
			0.09													
			0.23	0.45												
			0.41	0.58												
			0.06	0.07												
			0.43		100.0	8394	155	1.15 / 0.43 1.58		1.55	40.10	9.68	48.69	0.41	18.57	—
				0.11												
			0.43	0.54												
			0.08	0.08												
			0.06	0.05												
				0.30												
	145.30		0.94													

GULF CANADA CORPORATION

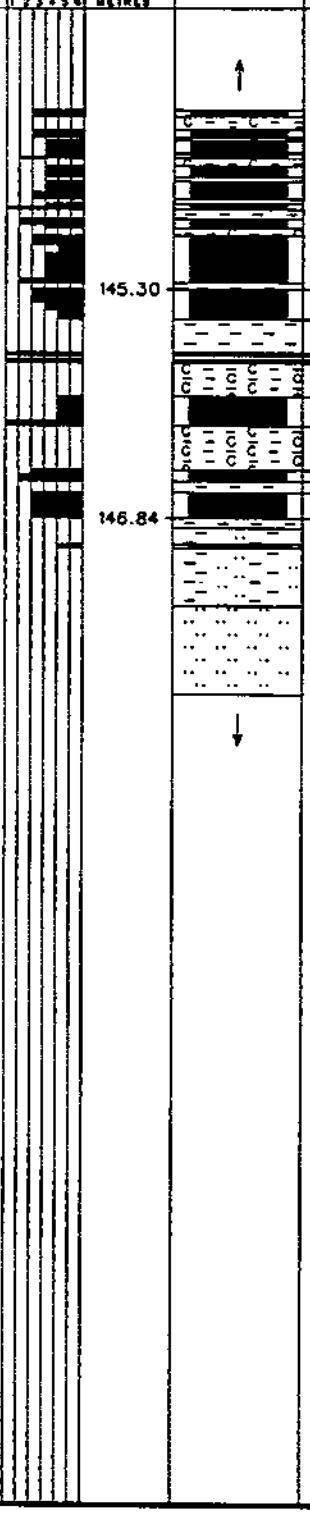
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : K/L TOTAL INTERVAL(M) : 143.59 – 152.85 ELEVATION(M) : 1615.9
INTERVAL(M) : 145.30 – 146.84

GEOLOGIST : HEARN SCALE: 1:40 DATE : FEB 07/89 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
									1.29 / 0.52 1.81							
	145.30			0.19												
			0.20													
			0.20													
				0.19	100.0	8408	186	0.65 / 0.78 1.42		1.10	64.47	7.28	27.17	—	8.65	—
			0.28													
				0.15												
	146.84															

GULF CANADA CORPORATION

PAGE : 4 / 5

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : K/L TOTAL INTERVAL(M) : 143.59 – 152.85 ELEVATION(M) : 1615.9
INTERVAL(M) : 146.84 – 149.84
GEOLOGIST : HEARN SCALE: 1:40 DATE : FEB 07/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	146.84		0.16	0.37	100.0	8395										
	147.45		0.75													
			0.37		99.1	0	157	0.06/2.68 2.74		1.24	55.01	6.76	23.99	—	8.86	—
			0.37													
			0.11	0.41												
			0.08													
	149.52		0.18													
	149.84		0.28		100.0	8396										

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH88029 SEAM : K/L TOTAL INTERVAL(M) : 143.59 – 152.85 ELEVATION(M) : 1615.9
INTERVAL(M) : 149.84 – 152.85
GEOLOGIST : HEARN SCALE: 1:40 DATE : FEB 07/89 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	149.84			0.20											
				(0.15)											
			0.11												
				0.19											
				(0.34)					2.04 / 0.42						
									2.46						
			0.43	0.07											
				(0.18)	93.0	8397	158	2.04 / 0.42		1.83	36.60	10.55	50.72	0.39	19.01
				0.20				2.46							
			0.16												
				0.18											
				(0.31)											
			(0.22)												
				0.13											
	152.85			(0.09)											

GULF CANADA CORPORATION - COAL DIVISION

R A W C O A L A N A L Y S I S R E P O R T

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88029
Coal zone:	K/L		
Field sample no.:	08394	Composite sample no.:	155
True sample thickness:	1.385 meters	Drill core recovery (%):	100.00 %
Coal/Rock:	0.958 / 0.427 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	22.06	21.52	13.81	34.77
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	4.47	3.37		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.55	
Ash (%):	40.10	40.73
Volatile matter (%):	9.66	9.81
Fixed carbon (%):	48.69	49.46
Total sulphur (%):	0.41	0.42
Combustible sulphur (%):	0.01	
Net calorific value (cal/g):	4438.00	4508.00
Gross calorific value (cal/g):	4438.00	4508.00
Volatile matter (dmmf%):	11.50	
Hardgrove index:	73.00	
Specific gravity:	1.58	
Carbon dioxide (%):	2.44	
Phosphorous in coal (%):	0.128	
Chlorine in coal (ppm):	344.00	

Forms of Sulphur (%): PYRITE 00.11 SULPHATE 00.00 ORGANIC 00.30

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	50.93	51.73
Hydrogen (%):	1.65	1.68
Nitrogen (%):	0.67	0.68
Oxygen (%):	4.69	4.76

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1164.00	1116.00
Softening temperature (°C):	1235.00	1174.00
Hemispherical temperature (°C):	1245.00	1185.00
Final temperature (°C):	1311.00	1306.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	48.22	TiO2 (%):	0.84
Al2O3 (%):	17.01	Na2O (%):	1.73
Fe2O3 (%):	12.53	K2O (%):	1.14
CaO (%):	7.47	SO3 (%):	2.52
MgO (%):	5.42	P2O5 (%):	0.73

GULF CANADA CORPORATION - COAL DIVISION

RAW COAL ANALYSIS REPORT

February 15, 1989.

PROJECT:	KLAPPAN	DATA SOURCE:	KPNLRDDH88029
Coal zone:	K/L		
Field sample no.:	08397	Composite sample no.:	158
True sample thickness:	2.460 meters	Drill core recovery (%):	52.49 %
Coal/Rock:	2.041 / 0.419 meters		

RAW HEAD ANALYSIS (HD1)

Standard: ASTM
Size analysis: SZ1

Fraction size (mm):	35.00 X 25.00	25.00 X 12.00	12.00 X 6.00	6.00 X 0.50
Relative weight (%):	20.06	16.07	18.28	39.02
Fraction size (mm):	0.50 X 0.15	0.15 X 0.00		
Relative weight (%):	4.17	2.40		

	AIR DRY BASIS	DRY BASIS
Proximate analysis		
Residual moisture (%):	1.93	
Ash (%):	36.80	37.52
Volatile matter (%):	10.55	10.76
Fixed carbon (%):	50.72	51.72
Total sulphur (%):	0.39	0.40
Combustible sulphur (%):	0.09	
Net calorific value (cal/g):	4543.00	4633.00
Gross calorific value (cal/g):	4543.00	4633.00
Volatile matter (dmmf%):	12.90	
Hardgrove index:	76.00	
Specific gravity:	1.60	
Carbon dioxide (%):	2.13	
Phosphorous in coal (%):	0.093	
Chlorine in coal (ppm):	24.00	
Forms of Sulphur (%):	PYRITE 00.10 SULPHATE 00.00 ORGANIC 00.29	

ULTIMATE ANALYSIS (UL1)

	AIR DRY BASIS	DRY BASIS
Carbon (%):	55.93	57.03
Hydrogen (%):	0.99	1.01
Nitrogen (%):	0.64	0.65
Oxygen (%):	3.32	3.39

ASH FUSION ANALYSIS (AF1)

	OXIDIZING ATM	REDUCING ATM
Initial temperature (°C):	1232.00	1169.00
Softening temperature (°C):	1264.00	1206.00
Hemispherical temperature (°C):	1290.00	1238.00
Final temperature (°C):	1348.00	1327.00

ASH MINERAL ANALYSIS (AM1)

SiO2 (%):	47.90	TiO2 (%):	1.12
Al2O3 (%):	18.52	Na2O (%):	2.17
Fe2O3 (%):	9.21	K2O (%):	1.10
CaO (%):	9.52	SO3 (%):	2.06
MgO (%):	4.92	P2O5 (%):	0.58

gcri coal division ash fusion proj KPN BLK LR DS DDH88029

ample id 00155
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1156.0	initial temp.(C)	1080.0
softening temp.(C)	1380.0	softening temp.(C)	1259.0
hemispherical temp.(C)	1417.0	hemispherical temp.(C)	1285.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88029

sample id 00155
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	56.24
aluminium oxide %	(al2o3)	21.55
ferric oxide %	(fe2o3)	5.78
titanium dioxide %	(tio2)	1.23
phosphorous pentoxide %	(p2o5)	0.73
calcium oxide %	(cao)	3.61
magnesium oxide %	(mgo)	2.64
sulphur trioxide %	(so3)	2.24
sodium oxide %	(na2o)	1.93
potassium oxide %	(k2o)	1.29

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN BLK LR DS DDH88029

sample id 00155
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1195.0	initial temp.(C)	1122.0
softening temp.(C)	1472.0	softening temp.(C)	1390.0
hemispherical temp.(C)	1472.0	hemispherical temp.(C)	1432.0
fluid temp.(C)	1472.0	fluid temp.(C)	1472.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN BLK LR DS DDH88029

sample id 00155
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.08
aluminium oxide %	(al2o3)	25.71
ferric oxide %	(fe2o3)	4.92
titanium dioxide %	(tio2)	1.06
phosphorous pentoxide %	(p2o5)	0.82
calcium oxide %	(cao)	2.94
magnesium oxide %	(mgo)	2.30
sulphur trioxide %	(so3)	1.69
sodium oxide %	(na2o)	2.14
potassium oxide %	(k2o)	1.24

90.0 <= total <= 100.0

gcri coal division | ash fusion | proj KPN | BLK LR | DS DDH88029

ample id 00158
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF3 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1193.0	initial temp.(C)	1164.0
softening temp.(C)	1298.0	softening temp.(C)	1240.0
hemispherical temp.(C)	1322.0	hemispherical temp.(C)	1264.0
fluid temp.(C)	1390.0	fluid temp.(C)	1380.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division | ash mineral | proj KPN | BLK LR | DS DDH88029

ample id 00158
ample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM3 date analysed 31/07/88

silicon dioxide %	(sio2)	55.18
aluminium oxide %	(al2o3)	23.06
ferric oxide %	(fe2o3)	4.78
titanium dioxide %	(tio2)	1.17
phosphorous pentoxide %	(p2o5)	1.20
calcium oxide %	(cao)	4.25
magnesium oxide %	(mgo)	3.08
sulphur trioxide %	(so3)	2.30
sodium oxide %	(na2o)	2.06
potassium oxide %	(k2o)	1.20

90.0 <= total <= 100.0

gcri coal division ash fusion proj KPN BLK LR DS DDH88029

sample id 00158
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AF4 date analysed 31/07/88

oxidizing atmosphere		reducing atmosphere	
initial temp.(C)	1206.0	initial temp.(C)	1174.0
softening temp.(C)	1340.0	softening temp.(C)	1290.0
hemispherical temp.(C)	1393.0	hemispherical temp.(C)	1343.0
fluid temp.(C)	1448.0	fluid temp.(C)	1443.0

normal ranges all temps.
1000.0 >= values <= 1500.0
oxidation temps >= reduction temps

gcri coal division ash mineral proj KPN BLK LR DS DDH88029

sample id 00158
sample product id SP1 data type (real,boro,aver,calc) REAL
split sample id AM4 date analysed 31/07/88

silicon dioxide %	(sio2)	54.48
aluminium oxide %	(al2o3)	24.57
ferric oxide %	(fe2o3)	5.09
titanium dioxide %	(tio2)	1.07
phosphorous pentoxide %	(p2o5)	1.03
calcium oxide %	(cao)	4.03
magnesium oxide %	(mgo)	2.84
sulphur trioxide %	(so3)	1.64
sodium oxide %	(na2o)	2.17
potassium oxide %	(k2o)	1.23

90.0 <= total <= 100.0