ex-lomax 80(3)A

APPENDIX B

DRILL LOGS

This appendix contains records of the 13 holes drilled on Vancouver Island by BP. Records of one water well and one older borehole at Parksville are also presented, as these holes are cited in the text of this report.

A front page has been compiled for each hole, presenting stratigraphic and location data in summary form.

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D. W. Coates

Commenced: Sept. 28/80

Completed: Oct. 4/80

Core Size: HQ 2

Overburden: 2.68 m

HOLE: BP-1

Location: 04710 mE

(UTM) 41490 mN

Collar: 850 m^{+}_{-}

Geophysically logged: Yes

Cemented: Yes

TD: 224.68 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
CATFACE INTR.	16.25	13.57+
DUNSMUIR	71.23	54.98
BENSON		169.70+

SUMMARY: No coal seams.

47.86 N46156

MORIARITY LAKE

BP CANADA
COAL DIVISION

BOREHOLE No. BP-2 LOGGED BY C. BICKFORD DATE 7 October 1980 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				PLEISTOCENE
	25.20	1.47		TILL? - Boulders and cobbles of chloritic quartz diorite, black siltstone, and chloritic hornblende-feldspar porphyritic dacite; with minor amounts of sticky, gravelly clay.
				HASLAM FORMATION
	48.00	21.42	22.80	SANDSTONE - very fine to fine-grained, silty throughout; dark grey. Patchily calcareous, lighter-coloured burrow fillings. Some large burrows; abundant small dark burrows; unit as a whole is intensely bioturbated and devoid of lamination. A few large plant stem impressions; one pyritized (?) ammonite which could not be extracted intact. Scattered calcite-filled fractures throughout; more abundant near base, where some fractures contain salmon-coloured ?siderite. Pyrite blebs (burrow-dillings?) common near base; unit as a whole becomes much harder near base; this may represent a contact effect of the sills below. Intrusive contact with sill at base. Core loss in this unit 1.38 m.
25°? near base				
				CATFACE INTRUSIONS

BOREHOLE

BP CANADA
COAL DIVISION

DASH CREEK

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE 4 October 1980 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	2.68			BASE OF CASING - DD 3.66 m.
				---CATFACE INTRUSIONS---
	16.25	13.57	13.57	HORNBLENDE - FELDSPAR PORPHYRITIC DACITE - light greenish-grey; consists of 0.002 to 0.005 m blocky phenocrysts of saussartised feldspar (30%) 0.001 to 0.003 m lathlike phenocrysts of ?chloritised hornblende (10%), in a light grey to white groundmass (60%). Minor quartz belbs in places. From 8.94 m to 11.15 m, unit is brown-stained and is generally softer; at center of this interval it is broken and ground. From 15.30 to 14.12, another brown-stained zone, but less that before. Basal 0.76 m of unit is finer-grained than above, and probably represents a basal chilled phase. Intrusive, abrupt at base.
				---COMOX FORMATION---
				---DUNSMUIR MEMBER---
	21:16	4.91	4.91	SANDSTONE - very fine-grained at top, coarsening down to fine to medium-grained at base. Non-calcareous. Top 2.90 m is generally bioturbated, with large (0.010 m) dark-rimmed burrows and disrupted laminae of dark grey,

C194

BP CANADA
COAL DIVISION

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE 4 October 1980 SHEET No. 2

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				carbonaceous siltstone. Unit is dark grey, and locally
				is intensely rust-stained, notably towards base, which
				is massive-appearing. Pyrite and mangenese stain common
				on joints and fractures. Unit is locally pyritic. Basal
				0.18 m contains grit, granules and small, rounded pebbles
				of argillite, volcanics and chert (ca. Sicker Group source).
				Poorly preserved, pyritized, robust pelecypods near top
				(one is radially and concentrically ridged). Abrupt.
	27.01	5.85	5.85	SANDSTONE - fine to medium-grained, clean, moderately
				cemented, light grey. Top 2.89 m shows rusty staining
				along joints; following 1.13 m is intensely rust-stained
				throughout, and at base of internal is sheared; below
				only local rusty staining is present, along joints.
				Rare black carbonaceous mudstone laminae. Disseminated
				pyrite; unit is siliceous and moderately calcareous.
				Massive. Gradational.

CL5A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE 4 October 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	35.92	8.91	8.91	SANDSTONE - fine-grained at top, grading downward to very fine-grained at base; silty throughout, with silt content increasing downwards. Common medium large burrows, most of which are filled with strongly calcareous, pyritic, light grey sand; remainder of unit is medium grey, giving a distinctive mottled appearance. Occasional vague planar lamination; unit as a whole is massive-appearing, probably due to intense bioturbation. Occasional rounded pebbles from 0.01 to 0.04 m size; at 33.57 to 33.60 m below top, a band of 0.01 m pebbles with shell fragments; possibly a beach lag deposit. A few pyritized, carbonized plant fragments. Moderately calcareous. Gradational.
5° to 10°	37.08	1.16	1.16	SANDSTONE - medium to coarse-grained, silty at top, becoming gritty and pebbly at base. A few large, dark-rimmed burrows. Medium grey; strongly calcareous. Vague planar lamination. Erosional?

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE 5 October 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	40.53	3.45	3.45	SANDSTONE - medium to coarse-grained; medium grey, silty; except in basal 0.90 m which is cleaner and light grey. 20% of unit consists of sandy grit; up to 10% is composed of small to large, rounded pebbles of cherts and volcanics (Sicker Group clasts?). Base of unit is drawn at disappearance of pebbles. Minor pyrite throughout; moderately to strongly calcareous; massive. Some large, vaguely dark-rimmed burrows towards top. Some shell fragments and finely broken plant debris.
	42.51	1.98	1.98	SANDSTONE - medium to coarse-grained, clean, light grey, well-sorted. A few medium, rounded pebbles at base. Minor pyrite. Moderately to very strongly calcareous. Abrupt.
	46.52	4.01	4.01	SANDSTONE - fine to medium-grained, dark grey, silty, scattered grit and small pebbles throughout. Intensely bioturbated; abundant medium and large burrows; minor relict laminae of dark grey, silty mudstone. Some microerosional contacts within unit. Occasional pyrite-filled burrows. Some calcite-filled joints. Unit is moderately to strongly calcareous. Abrupt.
	5°			

CL3A

BP CANADA

COAL DIVISION

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE 6 October 1980 SHEET No. 5

COM BCA°	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	46.70	0.18	0.18	MUDSTONE - dark grey, silty, carbonaceous. Sheared, with calcite veinlets. Abrupt.	
	20° at base.				
	5° to 10° 49.11	2.41	2.41	SANDSTONE - fine to medium-grained, locally silty, with 10% thin interbeds of dark grey, carbonaceous siltstone. Common large dark-rimmed burrows; unit is generally intensely bioturbated but some large-scale low-angle cross-lamination is still visible. Medium grey; weakly to moderately calcareous. Abrupt.	
	55.87 10°	6.76	6.76	SANDSTONE - very fine to fine-grained, silty, medium grey, with 10% thin interbeds of dark grey, silty mudstone. Interval is moderately bioturbated, with locally abundant small dark burrows, occasionally with larger burrows. Lamination, where visible, is planar, with minor load features at bases of sandstone beds. Minor calcite-filled joints near top. Some medium-scale low-angle cross lamination near base. Moderately calcareous; gradational.	

CLSA

BP CANADA
COAL DIVISION

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE October 1980 SHEET No. 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	69.75	13.42	13.88	SANDSTONE - very fine-grained, silty, with a few granules of chert and volcanics near base. Medium to dark grey. Intensely bioturbated; locally abundant medium and large burrows, filled with lighter, strongly calcareous sand, giving a mottled appearance (is this the "speckled sandstone" of earlier logs?) From 57.42 to 58.72, abundant calcite-filled fractures; core locally badly broken, possible core loss. No sign of dip disturbance. From 61.10 in to 62.01 m unit is brecciated and on the whole rather friable, with minor calcite veining. Again no sign of dip disturbance. Concentrations of calcite veinlets, some slickensided, with broken zones, from 63.87 to 64.24 ; 65.25 to 65.51 m below top, and 66.73 m to 66.97 m below top. Unit varies from weakly to strongly calcareous. Some pelecypod fragments near base. Gradational. Core loss in this unit 0.46 m.
	71.23	1.48	1.48	SANDSTONE - fine-grained, locally with coarse-grained and pebbly phases. Thick-bedded; generally clean although at top it is silty and intensely bioturbated. Medium grey at top, becoming lighter below. Moderately to

C134

BP CANADA
COAL DIVISION

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE October 1980 SHEET No. 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				strongly calcareous; abrupt.
				--- BENSON MEMBER --
	76.35	5.12	5.12	SANDSTONE - fine to coarse-grained/CONGLOMERATE, pebble (50:50) - thickly interbedded, clean, light grey, weakly to strongly calcareous, large-scale low-angle cross-laminated sandstone and granule to pebble (maximum 0.04 m moderate 0.02 m) conglomerate, with framework composed of 70% clasts of Karmutsen greenstone and 30% clasts of sicker chert and volcanics, in an abundant matrix of fine to coarse, strongly calcareous sand. Locally abundant calcite-filled fractures; in places unit approaches brecciation. Abrupt.
	224.68	148.33		CONGLOMERATE - dark green; subangular to rounded granules and pebbles of greenstone, minor chert and dark grey volcanics, in a matrix of fine to coarse-grained, strongly calcareous sand. Unit is generally framework-supported, and matrix is locally altogether absent, with framework being held by interstitial calcite. Occasional pyrite

CL3-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE October 1980 SHEET No. 8

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				patches on surfaces of clasts. Mode of clasts is 0.03 m
				maximum is in excess of core diameter (0.06 m).
				From 88.60 m to 89.32 m, is mudstone, dark grey, very
				silty, pyritic, slightly sheared; abrupt at top and base.
				From 93.08 to 93.48 m sandstone, fine-grained, light grey,
				medium-scale low-angle cross-laminated; minor silty
				laminae. Moderately calcareous; abrupt at top and base.
				A few large burrows. From 95.54 to 96.54 m, sandstone,
				fine to coarse-grained, with silty phases and scattered
				pebbles; medium grey, locally intensely sheared, moderately
				to strongly calcareous; abrupt. From 96.54 to 97.38 m,
				siltstone, dark grey to black, slightly carbonaceous,
				pyritic, grading to very fine-grained silty sandstone in
				basal 0.38 m; sheared at top; weakly calcareous; abrupt.
				From 99.30 to 99.56 m coarse-grained, light grey sandstone,
				with thin dark grey silty laminae; strongly calcareous;
				gradational at top and base. From 105.68 to 106.78 m; 50%
				thick interbeds of coarse to very coarse-grained, light
				grey sandstone with occasional thin dark grey, silty
				laminae. From 142.49 to 143.06 sandstone, coarse-grained,
				clean, light grey, with 20% scattered pebbles.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-1 LOGGED BY C. BICKFORD DATE October 1980 SHEET No. 9

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
				From 190.17 to 190.51 a coarsening-downward sequence of	
				coarse-grained, clean light grey sandstone, passing down	
				through gritstone to small-pebble conglomerate. From	
				197.07 to 197.56, sandstone, medium-grained, clean, light	
				greenish-grey; abrupt at top and base.	
				One granodiorite cobble at 217.33. Overall this uhit	
				appears to coarsen downwards with common cobbles in	
				basal part of unit.	
				----END OF HOLE DD 223.42 -----	

CL84

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D.W. Coates

Commenced: Sept. 28/80

Completed: Oct. 3/80

Core Size: HQ 2

Overburden: 25.20 m

HOLE: BP 2

Location: 00340 mE

(UTM) 46530 mN

Collar: 720 m^{+}_{-}

Geophysically logged: YES

Cemented: YES

TD: 160.57 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM	48.00	22.80+
CATFACE INTR.	49.12	1.12
DUNSMUIR	49.28	0.16
CATFACE INTR.	51.30	2.02
DUNSMUIR	61.29	9.99
BENSON	65.40	4.11
ISLAND INTR.		95.17+

SUMMARY: No coal seams

BP CANADA
COAL DIVISION

BOREHOLE No. BP-2 LOGGED BY C. BICKFORD DATE 7 October 1980 SHEET No. 2

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	49.12	0.73	1.12	DACITE - fine-grained, light pinkish-white; aphanitic and	
top				pale greenish-grey at top (chilled margin?). At base very	
contact				pale ashen-grey, aphanitic, with talc on fractures. In	
at 26°				middle contains abundant small (1 to 2 mm) phenocrysts	
				of white feldspar. Unit is moderately calcareous, with	
				scattered small, rusty specks (leached-out pyrites?).	
				Ground at base. Core loss in this unit 0.33 m.	
				——— COMOX FORMATION ———	
				——— DUNSMUIR MEMBER ———	
	49.28	0.16	0.16	SANDSTONE - very fine-grained, intensely sheared, medium	
				grey; traversed by numerous thin calcite veinlets. Ground	
				at top; intrusive contact with sill at base.	
				——— CATFACE INTRUSIONS ———	
Top	51.30	2.02	2.02	DACITE - fine-grained, light pinkish-white to white; top	
contact				is aphanitic and pale greenish-grey, similar to top of	
at 35°				sill above. Immediate base is also aphanitic but retains	
				pinkish-white to salmon colour. Body of sill contains	
				abundant small (1 to 2 mm) phenocrysts of white feldspar.	
				Talc is common on fractures, throughout all but top 0.52 m.	
				Locally a few rusty specks as in upper sill; also noted one	

BOREHOLE PAGE

BP CANADA
COAL DIVISION

BOREHOLE No. BP-2 LOGGED BY C. BICKFORD DATE 7 October 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				small (1 X 3 mm) euhedral phenocryst of hornblends. Weakly to moderately calcareous. Intrusive contact at base. Broken.
	55.40	3.85	4.10	SANDSTONE - very fine to fine-grained, silty; grading down to fine-grained, silty, with scattered quartz granules in basal 1.60 m; in basal 0.20 m with 30% granules and small, rounded pebbles of quartz and dark grey volcanic rock, (probably derived from Sicker Group). Abundant small, dark burrows and common pyrite blebs. Hairline calcite veinlets throughout. Dark grey; weakly to moderately calcareous; with a few slightly lighter, strongly calcareous phases. Scattered shell fragments near base. Gradational. Core loss in this unit 0.25 m.
	56.27		0.87	SANDSTONE - fine-grained, medium grey, clean, a few granules;
	20°			with minor laminae of very fine-grained, silty, scattered medium and large, dark-rimmed burrows. Moderately to strongly calcareous; erosional?

BOREHOLE

PAGE

CL9-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-2 LOGGED BY C. BICKFORD DATE 8 October 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	56.80	0.53	0.53	SILTSTONE - dark grey to black, very sandy. Pyritic, non-calcareous except for occasional sandy phases which are strongly calcareous. Scattered small quartz granules; very abundant at base. Pelecypod or brachiopod (BP2/F1/MORIARITY) at 0.23 m above base (DD 56.75). Erosional.
	61.29	4.49	4.49	SANDSTONE - coarse to very coarse-grained, with silty bands in top 0.28 m; in basal 0.77 m unit ranges from medium to very coarse-grained. Arkosic; with scattered quartz and feldspar granules. Massive. Light to medium grey. Patchily moderately calcareous; abrupt.
				BENSON MEMBER
	16° 62.89	1.60	1.60	CONGLOMERATE - granules to small, subangular to rounded pebbles of quartz, feldspar, and dark grey volcanic rock. The quartz and feldspar form the granule component (80%) and the volcanic rocks form the pebble component (20%). Light grey; strongly calcareous; massive; abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-2 LOGGED BY C. BICKFORD DATE 8 October 1980 SHEET No. 5

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	65.40	1.71	2.51	SANDSTONE/GRITSTONE (70:30) - thickly interbedded, dark grey, fine-grained (but gritty to pebbly) sandstone and medium grey pebbly gritstone (composed of small granules of quartz and feldspar and minor small pebbles of dark grey volcanic rock). Moderately calcareous. A few large plant stem impressions; one possible shell fragment. Erosional? Core loss in this unit: 0.8 m.	
				ISLAND INTRUSIONS	
	160.57	95.17	95.17	HORNBLENDE GRANODIORITE - weathered, weak, clay-rich and chloritic in top 12 m; base of this weathered zone is drawn arbitrarily as it is very gradational. Fresh rock consists of 2 to 4 mm grains of quartz, plagioclase, potassium feldspar and hornblende, and is overall a light, slightly pinkish-grey. Minor sheared and broken zones; unit as a whole is very strong and hard.	

CL5-A

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D.W. Coates

Commenced: Oct. 5/80

Completed: Oct. 12/80

Core Size: HQ 2

Overburden: 7.60

HOLE: BP 3

Location: 99420 mE

(UTM) 49890 mN

Collar: 780 m±

Geophysically logged: Yes

Cemented: Yes

TD: 371.40 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
CATFACE INTR.	171.20	163.60+
DUNSMUIR	316.00	144.80
BENSON	363.40	47.40
ISLAND INTR		8.00+

SUMMARY: No coal seams

MORIARITY LAKE

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 9 October 1980 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	7.60			CASING -
				CATFACE INTRUSIONS
	171.20	166.55	163.60	HORNBLENDE-FELDSPAR PORPHYRITIC DACITE- pale greenish-grey fine-grained groundmass, with 40% phenocrysts of white feldspar, generally 0.002 m size, but occasionally as large as 0.005 m, and 30% phenocrysts of dark green, chloritized hornblende, lathlike to blocky, and from 0.001 to 0.003 m size. Top 7.79 m is weathered; groundmass has been oxidized to a brownish colour. The base of this weathered zone is very gradational. The bulk of the unit is fresh-appearing and strong; however approximately 10% of the unit is softer, broken, chloritized throughout and containing rusty, chalky joint-fillings. A few, scattered, pebble-sized inclusions of greenstone; one cobble-sized inclusion of granodiorite. A few small (0.003 to 0.004 m) inclusions of sandstone at base. Intrusive basal contact, irregular, dip 10^{o} to 15^{o}.
				COMOX FORMATION
				DUNSMUIR MEMBER

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 10 October 1980 SHEET No. 2

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
3°to5°	180.20	8.74	9.00	SANDSTONE - very fine to fine-grained, silty, ill-sorted, dark grey to black. Vaguely laminated, with scattered medium and large burrows. Locally with disseminated pyrite. Non-calcareous, although minor calcite veinlets are present. Gradational. Core loss in this unit 0.26m.
	198.50	18.11	18.30	SANDSTONE - fine- to medium-grained, dark grey, silty, ill-sorted, with scattered coarse sand grains. Vaguely laminated, with locally abundant small dark burrows. Scattered thin calcite veinlets, occasionally carrying pyrite and medium and large dark-rimmed burrows. Mostly non-calcareous, except in minor slightly lighter phases which are moderately calcareous. Unit is locally darker grey, carbonaceous, and rooty. From 192.90 to 193.22, abundant calcite veinlets, lending a breccia-like appearance to the core. The rocks between are not, however, appreciably rotated. From 193.90 to 195.61, another breccia-like phase which appears to be the result of roof-disturbance. (0.19 m core loss here). From 196.52 to 196.57, Inoceramus fragments. Abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 17 October 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	199.49	0.99	0.99	MUDSTONE/SANDSTONE, fine-grained (50:50) - intensely bioturbated dark grey mudstone and medium grey sandstone, originally thinly interbedded, but lamination is now generally destroyed. Many recognizable medium and large burrows. Patchily weakly calcareous; abrupt.
	265.58	64.94	66.09	SANDSTONE - fine-grained, (locally fine to medium-grained) light grey (except in basal third which is medium grey and silty); with reddish-brown flecks of ?biotite. Locally abundant large, dark-rimmed burrows and small dark burrows. particularly in top 12 m of unit. Unit is locally pyritic at 210.61, light greenish, chalky ?malachite is also present. From 210.57 to 210.61, scattered Inoceramus fragments.
10° @ 220.18				Core locally badly broken below 245.49. Core loss 1.15 m in this unit. Patchily weakly calcareous in top half; rest non-calcareous Scattered dark muddy intraclasts and minor coal spars at base. Basal 0.21 m contains 15% granules, similar to the underlying unit. Gradational.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 18 October 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	267.15	1.57	1.57	GRITSTONE - granules and coarse sand, arkosic, with dark grey, silty matrix. Massive; abrupt.
	269.80	2.65	2.65	SANDSTONE - medium to very coarse-grained, locally grading to gritstone. Medium grey, arkosic, locally silty (?) Biotite flecks. Massive; scattered long, large burrows. Non-calcareous, abrupt.
	270.79	0.99	0.99	SANDSTONE - fine-grained, silty; scattered very coarse-grained sand, in places as distinct, thin bands but generally churned by burrowing. Some recognizable large burrows. Medium grey; patchily calcareous (locally strongly so). Abrupt.
	282.47	11.33	11.33	SANDSTONE - fine-grained, grading down to very fine to fine-grained at base; Silty throughout although silt component is minor at top. Biotite flecks. Abundant small dark burrows; scattered pelecypod fragments, some pyritized. Rare carbonized plant fragments (bark chips). Medium grey; basal contact is gradational, drawn at colour change to dark grey and increase in silt component. Non-calcareous. Core loss is this unit 0.35 m.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 18 October 1980 SHEET No. 5

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	288.50	6.03	6.03	SANDSTONE - very fine-grained, silty, grading down to SILTSTONE at base - dark grey, silty sandstone with biotite flecks, scattered small dark burrows, and disseminated fine sand grains at top; grading down to dark grey, sandy siltstone with locally abundant small dark burrows, and disseminated. Medium to coarse sand grains in basal 0.52 m. Non-calcareous; gradational, carbonaceous in basal 0.03 m with one thin bright, coal band. Some lighter-coloured, well-cemented phases in this unit; may represent concretions.
	290.75	1.43	2.25	SANDSTONE - medium to coarse-grained; very coarse-grained in basal 0.48 m; clean light grey, arkosic. Massive. Rare medium and large dark-rimmed burrows. Non-calcareous. Abrupt. Core loss in this unit 0.82 m.
	293.58	2.83	2.83	SILTSTONE, grading down to SANDSTONE - very fine to fine-grained - dark grey siltstone with scattered fine sand grains and abundant biotite flecks, grading down to medium grey, silty sandstone with abundant small dark grey, muddy intraclasts; biotite flecks and occasional large plant

CLSA

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 18 October 1980 SHEET No. 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				fragments (bark chips); pyrite at base. Basal contact abrupt; possible fault surface (?), slightly polished, with sandy gorge adhering. (Basal contact dip 45°). One shell fragment near base.
	305.16	10.53	11.58	SANDSTONE - medium to coarse-grained from top to 297.99; coarse-grained and friable to 300.03; fine to medium-grained and locally silty to base. Medium to dark grey; arkosic. Locally abundant large dark-rimmed burrows, including some long vertical burrows. Brecciated in top 0.35 m and from 296.70 to 297.73, from 299.48 to 299.89, and from 300.27 to 301.21. General sense of shear, as shown by fracturing, is at 45° to 30° CA. Core loss is this unit 1.03 m.
	309.65	4.49	4.49	SANDSTONE - very fine-grained, silty, dark grey; locally abundant disseminated coarse sand to grit. Pyritic, pyrite flecks and eudhedral crystals on joints. Top 2.04 m is broken stick, with closely spaced joints; below this, to 309.18, unit is badly broken and locally brecciated. Gradational.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 18 October 1980 SHEET No. 7

COM BCA°	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
0° to 10°	316.00	6.35	6.35	SANDSTONE - fine to medium-grained, with scattered coarse sand to grit near base. Locally abundant dark grey silty laminae; intensely bioturbated; abundant large burrows.
				BENSON MEMBER
	317.23	1.23	1.23	GRITSTONE - coarse sand to granules, rare small pebbles; lithic and arkosic; clean, massive, medium grey; minor biotite flecks; moderately cemented; gradational.
	322.08	4.85	4.85	SANDSTONE - coarse-grained, arkosic; light grey; scattered granules and small pebbles, increasing in amounts downwards so that basal 0.48 m consists of pebbly gritstone. Pebbles and granules of light and dark grey chert and volcanics, and are subangular to rounded. Massive. Broken and ground at top; locally friable. Non-calcareous at top and base; moderately calcareous in middle.
	323.00	0.55	0.92	SANDSTONE - medium-grained, light grey, arkosic, friable; carbonaceous at top. Non-calcareous; abrupt. Core loss in this unit 0.3 m.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 20 October 1980 SHEET No. 8

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	323.50	0.10	0.50	SILTSTONE - dark grey, very sandy, carbonaceous, pyritic, ground at base. Core loss in this unit 0.4 m.
	324.96	1.46	1.46	SANDSTONE - medium to coarse-grained, arkosic, clean, light grey, scattered granules of dark grey chert and volcanics. Friable and soft at top. Large-scale low-angle cross-laminated. Weakly calcareous; erosional.
	325.65	0.69	0.69	CONGLOMERATE -granules and small, sub-angular to rounded pebbles of greenstone, dark grey volcanics, and black argillite in an abundant coarse-grained arkosic sand matrix. Erosional.
10°	331.45	5.80	5.80	SANDSTONE, fine to coarse-grained (locally grading to gritstone)/SILTSTONE (50:50) - thin to thick interbeds of generally silty, ill-sorted, medium to dark grey arkosic sandstone and dark grey to black, generally sandy siltstone. Scattered large, carbonized plant fragments, locally associated with pyrite. Approximately 50% of this unit is carbonaceous. Gradational.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-3 LOGGED BY C. BICKFORD DATE 20 October 1980 SHEET No. 9

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	363.40	31.74	31.95	SANDSTONE- coarse-grained to granular, ill-sorted, medium grey, composed of quartz, feldspar and minor biotite grains in a locally abundant matrix of dark grey, silty mud. Essentially an arkose. Thick-bedded. Non-calcareous. Rare angular pebbles of granodiorite. Abrupt. Core loss in this unit 0.21 m. From 355.54 to 355.55, sheared, black, carbonaceous.
				ISLAND INTRUSIONS
	371.40	7.91	8.00	HORNBLENDE GRANODIORITE - coarse-grained, chloritic; abundant inclusions of greenstone, minor inclusions of ?Sicker chert and light grey volcanics. Core loss 0.09 m.
				-----END OF HOLE-----

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D. W. Coates

Commenced: Oct. 5/80

Completed: Oct. 12/80

Core Size: HQ 2

Overburden: 22.50 m

HOLE: BP-4

Location: 71550 mE

(UTM) 53910 mN

Collar: 172 m±

Geophysically logged: Yes

Cemented: Yes

TD: 347.30 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM	49.14	26.64+
UPPER SST. UNIT	96.34	47.20
CATFACE INTR.	99.03	2.69
UPPER SST. UNIT	101.79	2.76
CATFACE INTR.	103.94	2.15
UPPER SST. UNIT	104.60	0.66
CATFACE INTR.	179.80	75.20
UPPER SST. UNIT	197.34	17.54
FINE-GRAINED UNIT	202.43	5.09
CATFACE INTR.	215.73	13.30
FINE-GRAINED UNIT	217.02	1.29
CATFACE INTR.	217.36	0.34

SUMMARY:

Continued on next page.

BP CANADA

VANCOUVER ISLAND EXPLORATION

HOLE: BP-4

Contractor:

Location: mE

Commenced:

(UTM) mN

Completed:

Collar: m^{+}_{-}

Core Size:

Geophysically logged:

Overburden:

Cemented:

TD: m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
FINE-GRAINED UNIT	218.37	1.01
CATFACE INTR.	218.47	0.10
FINE-GRAINED UNIT	274.51	56.04
LOWER SST. UNIT	323.48	48.97
BENSON		23.82+

SUMMARY:

Canneloid mudstone, from 182.12 to 182.32 m depth.
Analysis by Birtley follows.

Birtley Coal
& Minerals Testing

A DIVISION OF GREAT WEST STEEL INDUSTRIES LTD.

February 25, 1981

Mr. Wm. Patrick Lee
Coal Technologist
BP Exploration Canada Ltd.
333-5th Avenue S.W.
Calgary, Alberta
T2P 3B6

Dear Sir:

Enclosed are the test results for Sample A/80/4/1/1 SWO 62694, received February 3, 1981. A BTU test was not run because of the high ash level in the coal.

Yours truly,

BIRTLEY COAL & MINERALS TESTING

F. J. Horvat

Frank J. Horvat
General Manager

FJH/ceb
Encl.

505 - 50th Avenue S.E., P.O. Box 5488, Station "A", Calgary, Alberta T2H 1X9 Telephone (403) 253-8273

CLIENT :BP EXPLORATION CANADA LTD.

PROJECT:SAMPLE A/80/4/1/1 received Feb3,1981 SWO#62694

LAB NO.:6854

ADM%	MOIST%	ASH%	VOL%	FC%	S%	CALC BASIS
0.5	0.6	80.1	8.7	10.6	0.63	a.d.b.
	1.1	79.7	8.7	10.5	0.63	a.r.b.
		80.6	8.8	10.6	0.63	d.b.

Birtley Coal
& Minerals Testing

A DIVISION OF GREAT WEST STEEL INDUSTRIES LTD

BP CANADA
COAL DIVISION

ALBERNI

BOREHOLE No. BP-4 LOGGED BY C. L. BICKFORD DATE October 10/80 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	20.70			OVERBURDEN, triconed
	22.26	1.56	1.56	TILL - pebbles and boulders of granodionite, siltstone, and sandstone in a sandy, clayey matrix.
	22.50	0.24	0.24	GRAVEL - pebbles to cobble size, of sandstone, siltstone, and greenstone.
				HASLAM FORMATION
	42.69	20.70	20.19	SILTSTONE - dark grey to black, massive-appearing; hackly fracture; sandy at base. Abundant quartz/calcite-filled veinlets; some with pyrite. Unit is patchily, weakly calcareous. Minor recemented breccia bands. On the whole, unit appears to be more intensely deformed at top. Abrupt.
	43.80	0.81	1.11	MARLSTONE? - dark grey, silty, very strongly calcareous mudstone, top half is in places brecciated and recemented. Pyrite blebs along fractures. This unit is somewhat lighter than those above and below. (0.30 m core loss). Abrupt.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 10, 1980 SHEET No. 2

COM BCA°	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	49.14	5.22	5.34	SILTSTONE - dark grey to black, massive-appearing except near base, where there are abundant thin laminae of lighter-coloured sand. Scattered medium burrows near base; remainder of unit appears featureless. Abundant calcite-quartz-pyrite veinlets (less common, however, than higher up in hole). Weakly calcareous; gradational. (0.12 m core loss)
				— COMOX FORMATION —
				— UPPER SANDSTONE UNIT —
30°	63.50	14.36	14.36	SANDSTONE - very fine-grained grading down to fine-grained at base; silty throughout. Abundant small dark burrows. Unit is medium grey; patchily calcareous at top; non-calcareous at base. Scattered thin calcite veinlets, with minor recemented breccia bands. Minor pyrite. Abrupt.
45°	65.60	2.10	2.10	SANDSTONE - fine-grained, clean; slightly coarser at base. Light grey, massive-appearing, weakly calcareous; pyrite flecks near base. Abundant calcite veinlets. Abrupt.

CL3-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L. BICKFORD, P. LEE DATE October 10, 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	77.90	12.04	12.30	SANDSTONE, very fine to fine-grained, light grey, slightly calcareous, abundant calcite viens throughout, (up to 1 cm thick) abundant pyrite flecks throughout, clean, slicken-side surfaces along fractures (minor), traces of vugs infilled with calcite crystals, broken stick core, traces of pyritized worm burrows (medium to large), intensely bioturbated. Core loss in this unit 0.26 m.
15°	80.20	2.03	2.30	SANDSTONE - light grey, fine-grained at top grading to medium-grained (grading downwards) abundant dark silty bands at top with abundant sideritic veins throughout, Broken stick to stick. Dip 15° Core loss 0.27 m,
	80.99	0.79	0.79	SANDSTONE - light to medium grey, medium-grained, abundant sideritic veins, slightly calcareous, clean, traces of pyrite flecks, stick core, grading to fine-grained at base.
	81.22	0.23	0.23	SANDSTONE - light to medium-grained, very fine to fine-grained, silty throughout, abundant sideritic veins throughout, slightly calcareous, traces of pyrite flecks

CL3-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY P. LEE DATE October 10, 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				stick core, grading to medium-grained at base.
	86.76	5.54	5.54	SANDSTONE - light to medium-grained, medium grey, calcareous throughout, minor calcite veins throughout, bioturbated, scattered, large worm burrows, argillaceous, scattered pyrite flecks, dark, silty bands from middle to base of section, broken stick core.
	89.87	3.11	3.11	SANDSTONE - fine to medium-grained, light to medium grey with a definite coarsening downward sequence, dark grey silt bands in upper sequence dissipating downwards. Abundant, thin, sideritic veins in upper sequence with several sideritic interclasts (7 - 9 mm diameter). Thin calcite veins throughout section. A few pelecypod burrows and load structures. Stick.
	91.55	1.68	1.68	SANDSTONE - fine to medium-grained, light grey, quite clean, with abundant sideritic veins with sparse inclusions of siderite and calcite. Some flecks of pyrite.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY P. LEE
C. L. BICKFORD
DATE October 10, 1980 SHEET No. 5

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	96.34	3.57	4.79	SANDSTONE - medium to fine-grained, light grey banded with dark silt at top of sequence. Accompanied with sideritic veins. Fining downward sequence in lower section, silty bands dissipate as do the sideritic veins. A few calcite veins can be noted. Core loss 1.22 m.
				CATFACE INTRUSIONS
	99.03	2.69	2.69	FELDSPAR PORPHYRITIC DACITE - fine-grained, very light grey. Intrusive contact at base.
				UPPER SANDSTONE UNIT
	101.79	2.76	2.76	SANDSTONE - fine to medium-grained, with thin, dark, laminae and occasional large, dark-rimmed burrows, light grey from 99.19 to 99.27, dacite, pale, buff, with scattered feldspar phenocrysts; probably a tongue from the sill above. Intrusive contact at base.
				CATFACE INTRUSIONS
	103.94	2.15	2.15	FELDSPAR PORPHYRITIC DACITE - very light, greenish-grey to pale buff. Fine to very fine-grained (aphanitic). Intrusive contact at base.
				UPPER SANDSTONE UNIT
	104.60	0.66	0.66	SANDSTONE - fine to medium-grained, light grey; scattered large, dark-rimmed burrows. Intrusive contact at base.
				CATFACE INTRUSIONS

CL84

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 10, 1980 SHEET No. 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	179.80	73.47	75.20	FELDSPAR PORPHYRITIC DACITE - light greenish-grey, fine-grained; occasional very fine-grained (aphanitic), pale buff phases which appear to be younger than the bulk of the unit (intrusive relationship). At base, unit is very light grey, weakly calcareous, aphanitic, and broken. Intrusive contact at base. Core loss in this unit 1.73 m.
				UPPER SANDSTONE UNIT
55° @181.31	181.31	1.03	1.51	SILTSTONE/DACITE (80:20) - interbedded (intrusive relationship) medium to dark grey siltstone, commonly sheared and baked throughout, locally very pyritic and in places chloritic; with thin (up to 0.08 m) tongues of light grey, aphanitic, weakly calcareous, locally talcose dacite. Entire unit badly broken; Abrupt. Core loss 0.48 m.
	182.10	0.79	0.79	SANDSTONE - coarse-grained, dark grey, carbonaceous, rooty. At base, very carbonaceous and argillaceous.
	182.12	0.02	0.02	MUDSTONE - black, very carbonaceous, intensely listricated. Broken stick.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C. L. BICKFORD DATE October 1980 SHEET No. 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	182.32	0.20	0.20	MUDSTONE - canneloid, black, dull, heavy, sheared, graphitic appearing, locally with pyrite blebs. Broken; badly broken at base.	PLY A/80/4/11
40°	184.40	1.73	2.08	MUDSTONE - black, carbonaceous; very carbonaceous at top. Sheared throughout; with contorted calcite veinlets, in places constituting 50% of rock. Pyrite bands and blebs. Abrupt. Core loss in this unit 0.35 m.	
	185.20	0.80	0.80	MUDSTONE - dark grey, with thin bands of fine-grained sandstone in basal 0.21 m; sheared throughout. Gradational.	
50°	194.10	8.90	8.90	SANDSTONE - top 0.44 m is fine-grained, dark grey, very argillaceous; below is coarse-grained, medium grey, clean, with scattered thin, carbonaceous mudstone laminae; large-scale low-angle cross-laminated; scattered very large (0.01 m+) dark-rimmed burrows (pelecypod burrows?) Patchily weakly calcareous. Abrupt.	

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 1980 SHEET No. 8

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	197.34	3.24	3.24	SANDSTONE - fine-grained, light to medium grey; clean in middle, argillaceous at top and base. Top 0.67 m and basal 0.34 m consist of interlaminated sandstone and dark grey, argillaceous siltstone. Abundant, large burrows, filled with coarse sand, in top 0.24 m. Patchily, weakly calcareous. Gradational.
				FINE-GRAINED UNIT
20°	198.06	0.72	0.72	SILTSTONE/SANDSTONE, very fine to fine-grained (80:20) - interlaminated dark grey, argillaceous siltstone and medium grey sandstone; non-calcareous. Brecciated and recemented by calcite at base; listricated basal contact.
30° near top.	202.43	4.37	4.37	MUDSTONE - black, carbonaceous, spherosideritic. Locally brecciated and recemented, towards base. Intrusive contact at base.
				CATFACE INTRUSIONS
	215.73	13.30	13.30	DACITE - very light grey at top, becoming very light buff at base. Fine-grained. Basal half contains 40% inclusions of dark grey to black, hornfelsic siltstone. Abundant hairline veinlets of a black mineral (? pyrolusite); minor pyrite-calcite veinlets. Sheared. Intrusive basal contact.
				FINE-GRAINED UNIT

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 1980 SHEET No. 9

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	217.02	1.29	1.29	MUDSTONE - dark grey to black, slightly carbonaceous, sheared. Intrusive at base.
				CATFACE INTRUSIONS
	217.36	0.34	0.34	DACITE - very fine-grained (aphanitic), very pale buff; abundant mudstone inclusions at base, with calcite veining. (minor ?chlorite associated) Intrusive contact at base.
				FINE-GRAINED UNIT
	218.37	1.01	1.01	MUDSTONE - dark grey to black; sheared and listricated at top; spherosideritic in middle, basal 0.38 m black, carbonaceous, intensely sheared. Intrusive at base.
				CATFACE INTRUSIONS
	218.47	0.10	0.10	DACITE - very fine-grained (aphanitic), very pale buff. Intrusive contact at base.
				FINE-GRAINED UNIT
	218.66	0.19	0.19	MUDSTONE - dark grey to black, slightly carbonaceous, sheared and badly broken at top. Abrupt.
	220.62	1.96	1.96	SANDSTONE - very fine-grained, abundant silty laminae, medium to dark grey, possible scattered small, dark burrows; definite medium burrows at base. Moderately calcareous; abrupt.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 1980 SHEET No. 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	224.45	3.83	3.83	SILTSTONE - dark grey, argillaceous; some phases of silty mudstone and minor very fine-grained sandstone. Minor sheared, carbonaceous bands; locally a few coal spars. Basal 0.99 m is dominantly sandy siltstone. Non-calcareous. Abrupt.
	225.65	1.20	1.20	MUDSTONE - black, carbonaceous, abundant, thin, bright coal bands and coal spars. Abrupt.
	227.25	1.60	1.60	SILTSTONE - sandy, medium to dark grey, grading down to SANDSTONE - very fine-grained, medium grey; load casts at base. Patchily calcareous; abrupt.
15°	235.60	8.74	8.35	SILTSTONE - dark grey, occasional roots, plant fragments and coal spars. Minor, very fine sandstone phases. Non-calcareous; minor hairline calcite veinlets; some polished joint planes. Abrupt.
	238.12	2.52	2.52	SANDSTONE - very fine-grained, silty, patchily calcareous; medium grey; rippled at base. Abrupt.

C154

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 1980 SHEET No. 11

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
10°	239.88	1.76	1.76	SILTSTONE/SANDSTONE, very fine-grained (80:20) - interbedded dark grey, locally argillaceous siltstone and medium grey, silty sandstone, locally rippled. Scattered large, carbonized leaves. Sandstones are moderately calcareous; siltstones are non-calcareous. Abrupt.
	274.51	34.77	34.63	MUDSTONE - alternation of (70%) thick, dark grey, very silty beds and (30%) black, carbonaceous beds with coal spars. Occasional roots and large, carbonized leaves. Non-calcareous . Gradational. (Unit locally badly broken).
				——— LOWER SANDSTONE UNIT ———
	301.60	27.09	27.09	SILTSTONE/SANDSTONE, coarse to very coarse-grained (60:40) - - thickly interbedded, dark grey, locally sandy, argillaceous
10°to20°				or carbonaceous siltstone and medium grey sandstone, with common thin, silty bands. This unit is basically composed of numerous fining-upward sequences, each from 0.2 to 2 m thick, and is basically devoid of lamination, except for the abrupt and scoured bases of sandstones. Some very large (probably pelecypod) burrows. Sand component is patchily weakly calcareous; silts are non-calcareous. Some slumps. Abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 1980 SHEET No. 12

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	304.61	3.01	3.01	SANDSTONE - coarse to very coarse-grained, locally grading to gritstone. Light grey; arkosic; patchily weakly calcareous. Includes 0.26 m of rippled, very fine-grained silty sandstone. Abrupt.
10°	306.60		1.99	SILTSTONE/SANDSTONE, very fine-grained (50:50) - interlaminated, locally intensely bioturbated, dark grey siltstone and medium grey, silty sandstone. Locally abundant disseminated, coarse sand grains. Patchily weakly calcareous. Abrupt.
25°	309.32	2.72	2.72	SANDSTONE - coarse to very coarse-grained, locally grading to gritstone. Light grey, arkosic, as before. Fine-grained, silty phases near base. A few muddy intraclasts. Massive; patchily weakly calcareous. Erosional.
	318.54	9.22	9.22	SANDSTONE, very fine-grained/coarse to very coarse-grained (50:50) - thickly interbedded, medium to dark grey, generally silty, locally carbonaceous sandstone and light grey, locally gritty sandstone. Unit is mostly massive-appearing although some finer-grained phases show slumped

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 1980 SHEET No. 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				laminae of silt and sand. Locally abundant, carbonized plant fragments in finer-grained phases. Non-calcareous; gradational.
	321.05	2.51	2.51	SANDSTONE - very coarse-grained, light grey, arkosic. Non-calcareous; massive, abrupt.
5°	323.48	2.43	2.43	SANDSTONE, very fine-grained/very coarse-grained to gritstone (70:30) - thickly interbedded, fining-upward sequences of dark grey silty sandstone and medium grey, silty, gritty sandstone to gritstone. Non-calcareous; gradational
				BENSON MEMBER
10° to 25°	332.40	8.92	8.92	SANDSTONE - coarse to very coarse-grained, arkosic, light grey to light buff. Approximately 20% of unit is composed of small to large, angular to subrounded pebbles mainly of granodiorite (but with minor greenstones). Local large-scale low-angle cross-lamination; some dark grey, silty carbonaceous laminae. Gradational.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-4 LOGGED BY C.L.BICKFORD DATE October 1980 SHEET No. 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	336.86	4.46	4.46	CONGLOMERATE - angular to rounded pebbles and cobbles (to 0.08 m+) of greenstone in an arkosic, coarse-grained sand to grit matrix. Gradational.
	338.50	1.64	1.64	SANDSTONE - medium to very coarse-grained, arkosic, locally gritty. Light grey to light buff, minor, medium grey, silty phases. Abrupt.
	347.30	8.65	8.80	CONGLOMERATE - subangular to rounded pebbles and cobbles (to 0.10 m) of granodiorite, greenstone, in a coarse-grained arkosic sand matrix. Occasional phases (to 0.50 m) of coarse to very coarse-grained, light buff arkosic sandstone. Common calcite veining, generally at low angles to core axis. Core loss 0.15 m.
				----END OF HOLE. DD 348.39----

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D. W. Coates

Commenced: Oct. 13/80

Completed: Oct. 19/80

Core Size: HQ 2

Overburden: 83.25 m

HOLE: BP-5

Location: 88590 mE

(UTM) 64410 mN

Collar: 139 m±

Geophysically logged: Yes

Cemented: Yes

TD: 328.36 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM	299.76	216.51+
DUNSMUIR		28.60+

SUMMARY: No coal seams.

PARKSVILLE

BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY C.L.BICKFORD DATE 22 October 1980 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	83.25			----TRICONING: NO CORE----
				HASLAM FORMATION
	104.61	19.77	21.36	MUDSTONE/SANDSTONE, very fine-grained (90:10 at top grading down to 100:0 at base) - interlaminated, dark grey, very silty mudstone and medium grey silty sandstone. Scattered burrows and minor slumping. From 95.09 to 97.60, intense shearing and listrication, forming "cornflakes". Probable core loss. Total core loss in this unit 1.59 m.

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CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 22 October 1980 SHEET No. 2

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	192.42	82.33	87.81	MUDSTONE - dark grey, silty. (Total core loss 5.48 m.) From 22.85 to 23.05 m below top of core displays polished surfaces. From 26.37 m to 26.88 m broken, soft mudstone (Possible core loss) Scattered worm burrows with minor slumping and infrequent veins of calcite. Some polished surfaces on mudstone, broken, possible core loss.

BOREHOLE

FACE

CL5A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 23 October 1980 / 24 October 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				From 52.26 to 56.3 m below top of core, core badly broken and sheared forming "cornflakes". Possible core loss.
				54.89 from top of core. 20 cm band of SANDSTONE - fine-grained, medium grey with pyrite flecks throughout joint. Glauconite found at top of abrupt contact with mudstone.
				Stick 58.04 m from top of core, gastropod shell and fragments of INOCERAMUS fossil.
				From 59.27 m to 59.53 m below top of core 26 cm bed of SANDSTONE; fine-grained, light grey, silty, with numerous fragments of INOCERAMUS fossil within the bed. Basal contact abrupt, returning again to the dark grey mudstone which also molds fragments of INOCERAMUS shell.
				CORE BADLY BROKEN, LISTRICATED, PROBABLE CORE LOSS.

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 26 October 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	204.80	12.38	12.38	Bands of SANDSTONE - medium-grained, light grey, inter-laminated with dark grey mudstone. Sandstone, calcareous.
	212.30	6.44	7.50	MUDSTONE - (as described) with listricated fracture planes badly broken, sheared. Local small veins of calcite. Core loss in this unit 1.06 m.
				Large INOCERAMUS clasts 60 mm in diameter bordered by fragments of shell, strongly calcareous, pyrite flecks noticed in this section.
	223.12	10.82	10.82	MUDSTONE (as described) - showing polished surfaces along fracture planes. Broken stick, frequent thin veins of calcite in local section.
				INOCERAMUS clast 30 mm diameter, calcareous, with fragments of shell found further down, 1.03 m beyond clast.
				Another clast 62 mm diameter, calcareous with shell fragments.

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 26 October 1980 SHEET No. 5

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
Dip 5°	224.20	1.08	1.08	SANDSTONE/SILTSTONE - fine-grained, light grey, interbedded with sandstone, strongly calcareous with multiple veins of calcite 67 cm in length. Contact abrupt and jagged with segments of mudstone detatched and found within sandstone unit. Bioturbated.
	238.00	13.59	13.80	MUDSTONE - dark grey, silty, thin bands of calcareous sandstone (infrequent), scattered fragments of INOCERAMUS, spattering of thin calcite veins.
	240.20	2.20	2.20	SANDSTONE/SILTSTONE - fine-grained sandstone with frequent laminae of dark grey siltstone, slightly calcareous - Extremely Bioturbated - with interjections of jagged segments of mudstone in sandstone, pyrite flecks, sandstone slightly calcareous.
	253.34	12.85	13.14	MUDSTONE - dark grey, silty, thin bank of calcareous sandstone (infrequent) scattered fragments of (calcareous) INOCERAMUS, some very thin calcite veins.
				At 1.43 m down from Distance Drilled 245.98 fossil of braciopod?

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 26 October 1980 SHEET No. 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	254.50	1.16	1.16	Strongly calcareous, zone of banded siltstone and mudstone (lighter in color then bordering mudstone. Contact Abrupt.
	258.17	3.67	3.67	MUDSTONE - dark grey, silty, thin band of calcareous sandstone, scattered fragments of calcareous INOCERAMUS.
Dip 36°	258.37	0.20	0.20	SANDSTONE - fine-grained, light grey, massive, calcareous 20 cm band. Abrupt contact.
	272.01	0.22	0.22	SILTSTONE - light grey, banded, medium grey, 22 cm, hard massive, dense, shell fragments. Strongly calcareous. Contact between siltstone and mudstone is listricated.
	272.74	0.73	0.73	MUDSTONE - as described previously, calcite veining along fractures.
	272.79	0.05	0.05	SANDSTONE - fine- to medium-grained, light grey, very abrupt mudstone/sandstone contact. Strongly calcareous, maximum thickness .05 m.
	273.20	0.41	0.41	MUDSTONE - as described with shell fragments found throughout.

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 27 October 1980 SHEET No. 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	273.72	0.52	0.52	SILTSTONE - light grey, banded dark grey, strongly calcare-	
				ous, contact between siltstone and mudstone abrupt.	
	277.37	4.34	3.65	MUDSTONE - as described.	
	277.50	0.13	0.13	SANDSTONE - light grey, medium-grained, very abrupt contact,	
				13 cm thickness, strongly calcareous.	
	293.00	14.88	15.50	MUDSTONE - as described. Broken stick (Core loss 0.62 m).	
				At base of D.D. 286.82 length silty bleb of calcareous	
				abrupt contact. Badly broken.	
	293.02	0.02	0.02	A 2 cm band of light grey mud (soft)	
	298.20	5.18	5.18	MUDSTONE AS DESCRIBED PREVIOUSLY.	
	298.42	0.22	0.22	SILTSTONE/banded with dark grey MUDSTONE - strongly calcare-	
				ous, with abrupt contact.	

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 27 October 1980 SHEET No. 8

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	299.76	1.34	1.34	MUDSTONE - silty as described.
				COMOX FORMATION
	302.57	2.81	2.81	SANDSTONE/MUDSTONE - (fine-grained) medium grey, extremely bioturbated, with mudstone segments scattered throughout section, calcareous, stick to broken stick, some calcite veins, some listricated surfaces.
	304.42	1.85	1.85	SANDSTONE (fine-grained) massive, clean, medium grey, calcareous, scattered pyrite flecks.
	304.74	0.32	0.32	SANDSTONE/MUDSTONE - bioturbated with displaced blocks of mudstone (dark grey, silty) listricated surfaces in mudstone blocks.
	305.38	0.64	0.64	SANDSTONE - (fine-grained), clean, light grey, calcareous.
	307.01	1.63	1.63	SANDSTONE/MUDSTONE - extremely bioturbated showing displaced blocks of mudstone, scattered flecks of pyrite.
	307.48	0.47	0.47	SILTSTONE/MUDSTONE - medium grey, strongly calcareous with band of dark grey mudstone. Listricated surfaces with

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 27 October 1980 SHEET No. 9

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				calcite intrusions along fracture planes.
	308.52	1.04	1.04	MUDSTONE - dark grey to black, some listricated and polished surfaces. Numerous thin veins of calcite.
	309.31	0.79	0.79	MUDSTONE - dark grey to black, soft 10 cm of mud (claylike) slightly calcareous at top of section. Listricated, badly broken stick.
	309.89	0.58	0.58	SANDSTONE - fine-grained, light to medium grey, clean massive, non-calcareous, abrupt contact with mudstone, sheared and listricated along contact. Stick.
	311.70	1.81	1.81	MUDSTONE - dark grey to black, sheared and listricated with infrequent, thin veins of calcite, random bands of sandstone fine-grained, medium grey, running vertically at random through section. Non-calcareous. When calcite veins intercept sandstone, veins are approximately 3 times as wide as in adjacent mudstone. (sandstone beds running almost randomly through mudstone).

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 28 October 1980 SHEET No. 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	311.78	0.08	0.08	SILTSTONE - light grey, 8 cm band of strongly calcareous siltstone interlaminated with mudstone (dark grey) contains fossil evidence. Abrupt.	
	313.00	1.22	1.22	MUDSTONE - dark grey, listricated surfaces along fracture planes. Sheared, badly broken stick. Infrequent, very thin veins of calcite. (Possible core loss) Abrupt basal contact.	
	314.45	1.45	1.45	SANDSTONE - fine-grained, medium grey, clean, massive at top with several thin bands of calcite - in center of section sandstone contains clasts of siltstone/mudstone - strongly calcareous, with now more frequent veins of calcite up to 1 cm in apparent thickness.	
	314.58	0.13	0.13	SILTSTONE - medium grey, strongly calcareous, 13 cm band. Some thin veins of calcite, polished abrupt contacts.	
	314.97	0.39	0.39	SANDSTONE - fine-grained, light grey, strongly calcareous. Veins of calcite, abundant maximum thickness approximately 1 cm at base of section, there are displaced clasts of	

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 28 October 1980 SHEET No. 11

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				mudstone, abrupt. Stick. Also clasts of elipsoloidial siltstone, highly calcareous. Diameter 0.05 m, abrupt contact with host sandstone.
	315.30	0.33	0.33	MUDSTONE - dark grey, black silty banded with 1.5 cm band of sandstone, fine-grained, medium grained, slightly calcareous. Basal contact abrupt, broken stick.
	316.09	0.79	0.79	SANDSTONE - fine-grained, light grey, strongly calcareous, scattered pyrite flecks, this veins of calcite, clean, massive, abrupt contacts. Broken stick.
	316.35	0.26	0.26	MUDSTONE - dark grey to black, silty, badly broken, fragments display shearing and listrication.
	317.16	0.18	0.81	SANDSTONE - fine-grained, light grey, strongly calcareous, scattered pyrite flecks with displaced fragments of mudstone trhoughout this section. (Bioturbated??)

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 28 October 1980 SHEET No. 12

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	325.10	7.81	7.94	MUDSTONE - dark grey to black, silty, scattered pyrite flecks. At top of unit vertical band of sandstone (fine-grained) light grey, calcareous.
Dip 8°				Further down section horizontal band of sandstone as described above.
				INOCERAMUS shell fragments 1.72 m from top of section.
				Basal contact abrupt. Broken stick. Core loss in this unit 0.13 m.
	325.50	0.40	0.40	SILTSTONE - light grey, strongly calcareous banded with mudstone laminae. Basal contact abrupt, stick.
Dip 4°	327.98	2.48	2.48	MUDSTONE - dark grey to black, silty some pyrite flecks non-calcareous in lower unit, vertical bands of sandstone and some calcite veins. Sandstone bands, fine-grained, slightly calcareous. Broken stick at 1.58 m from top of section, 5 cm band of sandstone, fine-grained, light grey, clean, massive, non-calcareous, abrupt contacts.

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-5 LOGGED BY D. TOMECEK DATE 28 October 1980 SHEET No. 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	328.20	0.22	0.22	SANDSTONE - fine-grained, light grey, strongly calcareous, massive, abrupt contact. Stick.
	328.36	0.16	0.16	MUDSTONE - dark grey to black, silty, some pyrite flecks, slightly calcareous.
				T.D. 330.71
				93 Boxes.

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CL3A

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D. W. Coates

Commenced: Oct. 14/80

Completed: Oct. 29/80

Core Size: HQ 2

Overburden: 20.31 m

HOLE: BP-6

Location: 95160 mE

(UTM) 58870 mN

Collar: 146 m^{+}_{-}

Geophysically logged: Yes

Cemented: Yes

TD: 545.72 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM	334.00	313.69+
DUNSMUIR	456.44	122.44
CATFACE INTR.	457.65	1.21
DUNSMUIR	458.20	0.55
CATFACE INTR.	461.02	2.82
DUNSMUIR	524.90	63.88
BENSON		20.82+

SUMMARY: Minor coals in Dunsmuir.

BP CANADA
COAL DIVISION

PARKSVILLE

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 20 October 1980 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	20.31			BASE OF CASING. DRILLER'S DEPTH - 72 Feet.
				HASLAM FORMATION
	21.06	0.75	0.75	SANDSTONE - fine-grained, medium grey, massive. Moderately calcareous. Scattered finely broken plant fragments; some small muddy intraclasts at base. Abrupt.
	24.95	3.89	3.89	SILTSTONE/SANDSTONE, very fine-grained/MUDSTONE (40:40:20 at top, grading rapidly down to 60:0:40) - interlaminated, medium grey, argillaceous siltstone, sandstone and dark grey mudstone. Common microerosional features; basal half of unit locally slumped. From 24.08 to 24.20, a discrete bed of sandstone, strongly calcareous, medium grey, fine-grained, with scattered intraclasts. Minor broken and gouged zones near top of unit. Locally abundant, very small dark burrows. Except for the sandstone bed near the base, this unit is non-calcareous.
	26.00	1.05	1.05	SANDSTONE - fine-grained, medium grey; scattered plant fragments; one pelecypod valve near top. Massive. Strongly calcareous. Abundant muddy intraclasts at base. Abrupt.

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L.BICKFORD DATE 20 October 1980 SHEET No. 2

COM BCA°	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
0° to				
10°	51.68	24.24	25.68	SILTSTONE/MUDSTONE/SANDSTONE, very fine-grained (50:45:5) interlaminated, locally intensely bioturbated, medium grey siltstone and dark grey silty mudstone, with ripples and lenses of medium grey, silty sandstone. Sandstones only are calcareous; remainder of unit is non-calcareous ellipsoidal concretions. Locally slumped. Locally discernable burrows from very small to large sizes. From 30.34 to 30.49 rippled, fine-grained sandstone with abundant muddy intraclasts. From 31.07 to 31.38, fine-grained sandstone bands comprise 40% of rock. From 37.84 to 38.76 a broken zone with thin gouge and breccia bands and minor calcite, at 40° to 45° CA. Abrupt. Core loss 1.44 m.
10°	55.00	4.32	4.32	SILTSTONE/SANDSTONE/MUDSTONE (55:35:10 at top grading down to 70:20:10 at base) - thinly interbedded and interlaminated fining-upwards medium grey argillaceous siltstone, dark grey, very silty mudstone and light grey, locally rippled sandstone. Common micro-erosional features. Locally abundant small dark burrows.

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FACE

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 20 October 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	58.60	3.47	3.60	MUDSTONE/SILTSTONE/SANDSTONE, Very fine to fine-grained (45:45:10)-interlaminated, pebbly dark grey silty mudstone, medium grey argillaceous siltstone and light grey silty sandstone. Locally slum ped; some concentrations of dark grey, muddy intraclasts. Pebbles generally isolated or in thin bands, although top 0.05m of unit consists of fine to medium-grained pebbly sandstone with pyritised pelecypod shells. From 55.72 to 55.91 a discrete bed of sandstone, fine-grained, large-scale cross-laminated, erosional. Core loss 0.13m.
	76.36	16.83	17.76	MUDSTONE/SANDSTONE, Very fine-grained (95:5)-dark grey, very silty mudstone with ripples and laminae of medium grey, silty sandstone. Mudstones non-calcareous; sandstones strongly calcareous. Locally abundant small and large dark burrows. Gradational. Scattered small pebbles in top 1.07m. Core loss in this unit 0.93m.
	100.00	23.64	23.64	SANDSTONE, very fine-grained/SILTSTONE/MUDSTONE (10:50:40 at top, grading down to 40:40:20 at base) interbedded,

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. RICKEORD DATE 20 October 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
3°@76.36				fining-upwards dark grey silty mudstone, dark to medium
15°@89.06				grey siltstone and light to medium grey silty sandstone,
15°@100.00				which commonly occurs as rippled bands with scoured bases.
				Abundant large and small burrows. Non-calcareous, except
				for occasional moderately calcareous sandstones. From
				78.62 to 82.37, 50% of interval consists of listricated
				and locally broken core. At 78.76 an ammonite fragment.
				Gradational.
	103.65	3.65	3.65	SANDSTONE, very fine-grained/SILSTONE/MUDSTONE (20:50:30)
				-interbedded, as above unit except overall finer than before.
15°@103.65				Abrupt.
	124.68	21.03	21.03	SILTSTONE/MUDSTONE/SANDSTONE, very fine-grained (65:30:5)-
15°@123.96				thinly interbedded, practically indistinguishable dark
				grey silty mudstone and argillaceous siltstone with thin
				lenses and laminae of medium grey, silty sandstone. Entire
				unit is more or less broken, locally with some listrication.
				The most intense deformation appears to have been in the
				interval from 106.54 to 107.71 where the rock is intensely

BOREHOLE

FAULT

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 20 October 1980 SHEET No. 5
22 October 1980

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				sheared and listricated, forming large "cornflakes". Non-calcareous; gradational.
	134.92	10.24	10.24	SILSTONE/MUDSTONE/SANDSTONE, very fine-grained (40:30:30 at top; grading down to 30:50:20 at base)-thinly interbedded dark grey argillaceous siltstone, silty mudstone, and medium grey silty sandstone, basically as thin fining-upwards sequences with common scoured bases. Scattered small dark burrows. Unit locally badly broken but disturbance is markedly less intense than in the unit above. Non-calcareous; gradational.
3°@134.92				
	185.50	48.45	50.58	MUDSTONE-dark grey; very silty at top with silt content rapidly diminishing downwards. From top to (DD 505+0.17 down), 5% sandstone, very fine-grained, medium grey, silty; below this point only very few sand/silt laminae. From 137.48 to 143.91 common broken zones; most intense disturbance is from 140.70 to 142.54, where 70% of recovered core is sheared into "cornflakes" (core loss in this interval 2.13 km). From 164.90 to 165.99 core is sheared and broken with

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 22 October 1980 SHEET No. 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				minor calcite veining. Gradational.
	329.38	139.77	143.88	MUDSTONE-dark grey, silty. Inoceramus fragments from 188.36 to 188.39. From 196.91 to 196.92, 204.38 to 204.40, and 206.46 to 206.47, very fine-grained, tuffaceous, bentonitic sandstone. From 215.76 to 217.20, unit is glauconitic. From 257.94 to 263.74, approximately 50% of interval is badly broken. While some of this way be due to closely-spaced joints, some listric surfaces are evident. (Possible core loss.) From 316.83 to base unit becomes increasing silty with minor disseminated fine sand grains, and abundant fragments of pelecypods and ammonites. From 317.20 to base, approximately 30% of interval is broken, locally with calcite veinlets and minor recemented breccias. Possible minor displacement in this interval, at 30° to 45° CA. Unit is non-calcareous, except for basal sandy/silty phase which is patchily calcareous (locally strongly so). Gradational. Total core loss in this unit 4.11m.

BOREHOLE

CLSA

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 22 October 1980 / 23 October 1980 SHEET No. 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	331.54	2.16	2.16	MUDSTONE/SANDSTONE, fine-grained (90:10 at top, grading down to 60:40 at base) - interlaminated, intensely bioturbated dark grey silty mudstone and medium red sandstone. Common medium, mud-filled burrows. Gradational
	334.00	2.46	2.46	MUDSTONE/SANDSTONE, fine-grained (50:50 at top, grading down to 40:60 at base) - interlaminated, as before except that bioturbation is less thorough and occasional microerosional features have therefore been preserved. Abundant small, medium, and occasional large burrows, filled with dark mud. Gradational.
				COMOX FORMATION
				DUNSMUIR MEMBER
	369.24	35.24	35.24	SANDSTONE, fine-grained/MUDSTONE (95:5) - light grey, clean, rippled "salt and pepper" sandstone with thin wispy laminae of dark grey, silty mudstone. In upper half of unit locally abundant large, dark-rimmed worm burrows. Top 3.50m of unit is transitional to unit above, with up to 10% laminae of dark grey silty mudstone, and common
6° to 8°				

BOREHOLE

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 23 October 1980 SHEET No. 8
25 October 1980

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				small, mud-filled burrows. Non-calcareous. From 352.68 to 352.78, mudstone, dark brown ferruginous, hard, abundant thin bright coal bands. Gradational.
	392.27	23.03	23.03	SANDSTONE-fine-grained, light grey, clean, non-calcareous;
2° to 8°				"salt and pepper". Vague, large-scale, planar-appearing lamination. Scattered large, dark-rimmed burrows; some are associated with concretions.
				From 387.41 to 389.55 slickensides at 80° to 90° CA, on fractures at 0° to 30° CA, soem of which contain calcite. From 388.73 to 388.99 sandstone is friable, (as if ~~cement has been dissolved along fracture zone?~~)
	402.57	10.30	10.30	SANDSTONE-fine-grained; light grey, clean top; becoming medium grey and silty towards base. Minor disrupted laminae of dark grey mudstone at top, increasing in amount to 5% of unit by base. Abundant medium and large dark-rimmed burrows; biofurbation in general becomes more intense towards base. Two thick-shelled pelecypod valves.

BOREHOLE

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 25 October 1980 SHEET No. 9

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
				One large carbonised plant fragment (bark chip or stem).	
				In basal 0.66m are long, near-vertical but irregular	
				fractures (0^{o} to 30^{o} CA) with slickensides and calcite	
				at 72^{o} CA. Gradational; non-calcareous.	
	421.59	19.50	19.02	SANDSTONE-fine-grained to medium; grading down to fine-	
				grained at base, light grey, clean, "salt and pepper",	
				non-calcareous. Vague large-scale planar lamination;	
				locally abundant medium to large burrows, some with dark	
				rims.	
				From top to 403.57, below top, fractures at 0^{o} to 30^{o} CA	
				with slickensides and calcite at 77^{o} CA. From 405.88 to	
				408.50, scattered calcite veinlets near 0^{o} and 45^{o} CA.	
				From 407.79 to 410.29, open fractures at 0^{o} CA with white	
				mud on fracture faces.	
				Gradational.	
	425.70	4.11	4.11	SANDSTONE-fine-grained, medium grey at top, becoming dark	
				grey and argillaceous towards base; abundant medium and	
				large dark-rimmed burrows; possible large ripples	

BOREHOLE

CL5A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 25 October 1980 SHEET No. 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				towards base; non-calcareous; gradational.
	453.07	27.37	27.37	SANDSTONE--medium-grained from top to 437.73; from 437.73 to 437.80, mudstone, light grey, bentonitic with thin ripples and laminae of sandstone; from 437.80 to 440.05, sandstone, fine to medium-grained; from 440.05 to 449.65, medium-grained; from 449.65 to 450.57, fine to medium-grained, with small pebbles and granules in basal 0.03m; from 450.57 to 452.58, fine-grained; from 452.58 to base, medium-grained. Light grey, clean, massive-appearing with rare widely-spaced planar lamination. Large, dark-rimmed burrows in top 0.27m; from 427.01 to 431.76, occasional large Inoceramus fragments. On the whole, a remarkably uniform unit.
2° to 5°	456.30	3.23	3.23	SANDSTONE--fine-grained at top; grading down to fine to very fine-grained with occasional medium-grained interbeds, at base. Silty at base. Medium grey. Large-scale cross-laminated. Sheared dark grey coaly laminae in basal 0.43m. Non-calcareous; abrupt.

BOREHOLE

C134

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 25 October 1980 SHEET No. 11
26 October 1980

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	456.44	0.03	0.14	COAL--dull, slight lustre, slightly sheared; appears to have been coked or baked. Large pieces; basal contact ground out. Core loss 0.11m.
	457.65	1.21	1.21	QUARTZ-FELDSPAR PORPHYRITIC DACITE--light steel grey; 20% phenocrysts of white, blocky feldspar, 1 to 5 mm size; locally up to 5% pyrite as irregular blebs, to 5mm size; in a fine-grained to aphanitic groundmass. Both upper and lower contacts appear to be intrusive. Patchily weakly calcareous.
	457.68	0.03	0.03	MUDSTONE--black, very carbonaceous to canneloid, hard, thin calcite and pyrite veinlets at top. Stick.
	457.80		(0.12)	CORE LOSS--ROCK (probably mudstone)
	457.88	0.08	0.08	MUDSTONE--black, very carbonaceous to canneloid, hard, broken stick
	457.91	0.03	0.03	MUDSTONE--black, very carbonaceous. Stick.
	458.04	0.13	0.13	MUDSTONE--black, very carbonaceous, minor very thin bright

BURRARD

C134

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 26 October 1980 SHEET No.: 12
22 November 1980

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				coal bands. Some listric surfaces. Broken stick.
	458.07	0.03	0.03	COAL--very dull, baked or coked appearance. Stick.
	458.14	0.07	0.07	MUDSTONE--black, very carbonaceous, hard, stick.
	458.20	0.06	0.06	MUDSTONE--black, very carbonaceous, slightly sheared with one veinlet of pyrite. Basal contact broken but appears to be intrusive.
	461.02	2.82	2.82	FELDSPAR-PORPHYRITIC DACITE--fine-grained, white, golden-weathering; with minor disseminated pyrite, becoming more abundant towards base. Also minor amounts of a pale-green mineral (epidote?), and a bright-green mineral (malachite after copper?). Basal 0.22m has dark charcoal-grey groundmass, but has retains phenocrysts. Abrupt basal contact. Unit is weakly to moderately calcareous.
	461.52	0.34	0.50	MUDSTONE--black, very carbonaceous, fissile, locally badly broken and sheared, notably at base. Abrupt. Core loss in this unit 0.16m.

BOREHOLE

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 22 November 1980 SHEET No.: 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	462.30	0.78	0.78	MUDSTONE--black, carbonaceous. Abundant pyritic blebs in top half. Basal half contains some slightly ferruginous phases; possible spherosiderite at base. Abrupt.
	463.32	1.02	1.02	SANDSTONE--fine-grained, clean, quartz-lithic, medium grey, non-calcareous at top, patchily moderately calcareous below. Possible rootlets near top; towards base a few thin coaly laminae. Devoid of lamination. Abrupt?(basal contact ground out).
	463.33	0.01	0.01	COAL--dull; badly broken.
	465.25	1.92	1.92	SANDSTONE--fine-grained, clean, quartz-lithic, light to medium grey, strongly calcareous in middle grading to weakly calcareous at top and base. Top 0.05m is black, carbonaceous with abundant thin bright coal bands and pyrite. Locally abundant, vaguely dark-rimmed, medium to large burrows. Unit is massive-appearing. Abrupt.
	466.32	1.07	1.07	MUDSTONE--dark brown, carbonaceous, with abundant very thin bright coal bands at top. Silty. Minor stringers of

CL84

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 22 November 1980 SHEET No. 14
23 November 1980

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				fine sand grains throughout; in basal 0.26 they are particularly abundant, grading down from 5% to 50% of rock, at base. Gradational. Scattered thin calcite veinlets.
	466.69	0.37	0.37	MUDSTONE/SANDSTONE, fine-grained (50:50 grading down to 30:70 at base)--interlaminated dark brown, slightly carbonaceous mudstone and medium grey sandstone. Weakly calcareous. Minor thin coaly laminae. Abrupt.
7°@466.69				
	467.75	1.06	1.06	SANDSTONE--fine to medium-grained, light to medium grey, clean, quartz-lithic, weakly calcareous at top becoming strongly calcareous towards base. Massive-appearing; abrupt.
	468.22	0.47	0.47	MUDSTONE--dark brown; thick bright coal bands near top; becomes silty and sandy towards base. Broken.
	468.39	0.06	0.17	MUDSTONE--dark brown to black, carbonaceous, with thin bright coal bands. Sheared and pulverized. Core loss 0.11m

BOREHOLE

C134

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 23 November 1980 SHEET No. 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	468.78	0.39	0.39	SILTSTONE/MUDSTONE (70:30)--interbedded and intergrading dark brown to black, sandy, carbonaceous siltstone and darkbrown, slightly carbonaceous mudstone. Locally abundant bright coal bands. Locally badly broken; abrupt.
	473.00	4.22	4.22	SANDSTONE--fine-grained, clean, light grey, quartz-lithic. Top 10m is black and carbonaceous; locally abundant thin carbonaceous laminae in next 0.53m; basal 0.14m is also black and carbonaceous. Remainder of unit is massive-appearing. Locally pyritic. Weakly to moderately (locally strongly) calcareous. Abrupt.
	473.22	0.22	0.22	MUDSTONE--dark brown to black, carbonaceous, scattered thin bright coal bands; listricated at top; gradational.
	473.50	0.28	0.28	SANDSTONE--fine-grained; top half is dark grey to black, carbonaceous with abundant muddy phases; basal half is medium grey, clean, quartz-lithic. Devoid of lamination except for possible ripples in middle. Non-calcareous; abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 23 November 1980 SHEET No. 16

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	474.44	0.94	0.94	SANDSTONE--fine to medium-grained, medium grey, quartz-lithic, clean except for top 0.04m which is black, argillaceous and carbonaceous. Devoit of lamination except for thick carbonaceous laminae towards base. Weakly to moderately calcareous. Abrupt.
	474.74	0.30	0.30	MUDSTONE, grading down to SANDSTONE, fine-grained-dark brown, slightly carbonaceous mudstone with thin laminae of fine sandstone grading rapidly down to fine-grained, darkbrown sandstone with abundant mudstone laminae. A few thin bright coal bands. Basal contact ground out. Broken.
	474.94	0.12	0.20	MUDSTONE--dark brown to black, carbonaceous, badly broken. Soft. Core loss 0.08m.
	475.07	0.13	0.13	SANDSTONE--fine-grained, very argillaceous, dark brown to black, carbonaceous. Abrupt.
	475.11	0.04	0.04	MUDSTONE--dark brown to black, slightly carbonaceous, slightly listricated; gradational.

C131

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY C.L. BICKFORD DATE 23 November 1980 SHEET No.: 17

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	475.20	0.09	0.09	MUDSTONE--light brown, pyritic, some carbonised plant debris; slightly sheared. Non-calcareous. Abrupt.	

CL5-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY D. TOMECEK DATE 23 November 1980 SHEET No. 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
6°to20°	475.26	0.06	0.06	SANDSTONE-(Fine-grained) dark grey carbonaceous, abundant coal laminae (max ICM), bright, slightly bioturbated, pyrtic bands, silty bands.
	495.83	20.54	20.57	SANDSTONE-(fine-grained to medium grained light to medium grey massive clean. Upper .48m medium grey, slightly carbonaceous; rest is light grey, calcareous slightly throughout. Freshly broken areas strongly calcareous sequence of fine to medium grain size grading throughout, stick and broken stick. Core loss 0.03m.
	495.93	0.10	0.10	SANDSTONE-medium grey, very clean grain-fine conglomerate, (pebbles up to 1 cm dia.), erratic sorting and bedding, very hard, stick core.

C154

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY P. LEE DATE 27 October 1980 SHEET No. 19

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	495.98	0.05	0.05	SANDSTONE, very fine-fine grained, medium grey, clean, massive, non calcareous, sharp contact with conglomerate above, stick core
	497.29	1.31	1.31	SANDSTONE, fine-medium grained, medium grey, clean, massive, slightly calcareous, trace of glauconite, stick core
	497.36	0.07	0.07	SANDSTONE, very clean grain--dine conglomerate, large to medium grey, pebbles up to 5 mm in diameter, slightly calcareous on powdered surfaces, stick core
	497.45	0.09	0.09	SANDSTONE, medium grey, massive, clean, slightly calcareous, gradational contact with above sequence, stick core
	498.35	0.90	0.90	SANDSTONE, very clean grained--conglomerate (small scale), slightly calcareous, clean, pebbles up to 1cm in diameter, gradational contact with above sequence, broken stick--stick core
	498.50	0.15	0.15	SANDSTONE, medium-fine grained, medium grey, clean, massive, slightly calcareous, stick core

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BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY P. LEE DATE 27 October 1980 SHEET No. 20

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	498.54	0.04	0.04	SILTSTONE, dark grey-brown, dirty, non calcareous, muddy laminae, scattered coaly laminae, scattered pyrite bands, contact appears to be non depositional
	502.32	3.78	3.78	SANDSTONE, fine-medium grained, large--medium grey, salt & pepper, clean, massive, very slight calcareous throughout, trace pyrite flecks throughout, stick core
	505.04	1.87	2.72	SANDSTONE, fine--very fine grained, massive, calcareous, near top of sequence large pink feldspar cobble (2 cm dia.), trace hornblende pebbles (max 1 cm dia.), gradational contact with sequence above, strongly calcareous @ end of box #177 or 0.63 from bottom of above sequence, broken stick, salt and pepper throughout, same for top 1.24m of box #178. Core loss 0.85m. Conglomerate.
	505.39	0.35	1.42	SANDSTONE, as above with scattered pink feldspar grains

CL5A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY P. LEE DATE 28 October 1980 SHEET No. 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	506.91	0.10	0.10	SANDSTONE, as above, but without feldspars	
				Conglomerate.	
	506.94	0.03	0.03	as above	
	507.69	0.75	0.75	SANDSTONE, as above with pink feldspars-scattered	
				Conglomerate.	
	507.80	0.11	0.11	as above	
	508.19	0.39	0.39	SANDSTONE, as above	
				Conglomerate.	
	508.77	0.58	0.58	as above with some sandy sections	
	508.90	0.13	0.13	SANDSTONE, as above with trace pink feldspars	
				Conglomerate	
	509.01	0.11	0.11	as above	
	509.04	0.03	0.03	SANDSTONE, as above. Conglomerate.	

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY P. LEE DATE 28 October 1980 SHEET No. 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	509.18	0.14	0.14	as above
	509.22	0.04	0.04	SANDSTONE, as above
	509.28	0.06	0.06	as above, Conglomerate.
	509.35	0.07	0.07	SANDSTONE, as above, fine grained, trace pink feldspar
				Conglomerate.
	509.50	0.15	0.15	as above, not as coarse
	518.68	9.18	9.18	SANDSTONE, fine grained, light to medium grey, massive clean,
				scattered pink feldspar, broken stick to stick core,
				non calcareous
	518.91	0.23	0.23	SANDSTONE, fine grained, with blue-grey chert grains,
				with very angular black hornblende grains, sandstone is
				light dirty grey, grading to granitic @ base with pink
				feldspars.

CL5-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY P. LEE DATE 28 October 1980 SHEET No. 23

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	519.00	0.09	0.09	Conglomerate; as previously described, with increased % of pink feldspars.
	519.79	0.79	0.79	SANDSTONE/Conglomerate: 60/40; sandstone fine grained, light grey, non calcareous, clean (i.e. no carby debris) Conglomerate, blue/grey chert grains; pink feldspars grains; angular black hornblende grains -very peculiar sequence -0.65m to end of box 183 plus .14m from top of box 184
	521.57	1.78	1.78	SANDSTONE, fine grained, light grey, massive, clean, non calcareous, trace pink feldspar grains, trace blue/grey chert grains
	522.31	0.74	0.74	SANDSTONE/Conglomerate, 75/25, as previous sandstone/ conglomerate sequence
	522.76	0.38	0.45	SANDSTONE medium grain, large-medium grey, abundant granitic grains (chert, hornblende & pink feldspars), abundant scattered mudstone bands surrounded by thin pyrite laminae, non calcareous, carby debris mixed with

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY P. LEE DATE 28 October 1980 SHEET No. 24

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				muddy bands, broken core, loss 0.07m.
	524.28	1.52	1.52	SANDSTONE, fine grain, grading down to course grain @ base, light grey, non calcareous, abundant conglomerate material @ and near base, massive, otherwise clean, broken stick core
	524.55	0.27	0.27	SANDSTONE, very clean grain, large grey-blue, abundant conglomerate material, non calcareous, only trace pink feldspars, broken stick core
	524.90	0.35	0.35	SANDSTONE, as above, with abundant mudstone blebs & laminae. Mudstone grey-brown, cleaner @ base, broken stick core
				BENSON MEMBER
	525.54	0.64	0.64	CONGLOMERATE, clean, dense, massive, blue/grey trace pink, grains up to 1cm diameter, some core loss?, non calcareous, broken sitck--stick core
	528.56	3.02	3.02	SANDSTONE, fine-medium grain, large grey, clean, massive, no conglomerate material, non calcareous, minor bands of medium grey sandstone throughout, stick core, cross bedding @ bottom of box 186 = 2.31m

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY P. LEE DATE 30 October 1980 SHEET No. 25

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	528.82	0.26	0.26	Conglomerate: mottled light grey, abundant blue/grey grains, scattered black grains, scattered pink feldspar grains, non calcareous, maximum grain size is 0.50cm in diameter, sandy throughout, stick core, grains poorly sorted, subangular
	532.17	3.35	3.35	Sandstone; light and medium grey interbanded, medium grain throughout, minor cross bedding, non calcareous, trace of black and pink course grains throughout, broken stick core
	532.27	0.10	0.10	Conglomerate, as above
	532.73	0.46	0.46	Sandstone, as above
	533.33	0.60	0.60	Conglomerate, as above
	533.44	0.11	0.11	Sandstone, as above
	535.26	1.82	1.82	Conglomerate (Benson Member), as described above with increased sandy content in middle of section

BP CANADA
COAL DIVISION

BOREHOLE No. BP-6 LOGGED BY P. LEE DATE 30 October 1980 SHEET No. 26

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	536.90	1.55	1.64	Sandstone; light grey with minor medium grey bands, scattered very clean grains throughout otherwise all medium grain, slightly calcareous, massive, cross bedding @ top of sequence?, scattered blue/grey chert grains in places, trace pink feldspar grains, broken stick core, gradational contact with lower unit. Core loss 0.09m
	545.72	8.82	8.82	Conglomerate; mottled light grey with blue/grey chert with minor black grains, subangular, fair sorting, slightly calcareous throughout, maximum grain size 0.50cm in diameter scattered pink feldspar grains, black grains--hornblende, coursening downward, @ base 50% blue/grey chert grains (only 30% @ top of sequence), 40% quartz, 10% others, END OF HOLE.

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D. W. Coates

Commenced: Oct. 21/80

Completed: Nov. 12/80

Core Size: NQ 2

Overburden: 218.75 m

HOLE: BP-7

Location: 82650 mE

(UTM) 67660 mN

Collar: 143 m^{+}_{-}

Geophysically logged: Yes

Cemented: Yes

TD: 449.61 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM	349.64	130.89+
DUNSMUIR	350.90	1.26
---FAULT---		
HASLAM	351.50	0.60
DUNSMUIR	408.04	56.54
KARMUTSEN		41.57+

SUMMARY: Carbonaceous horizons only (some bright coal bands), in Dunsmuir.

Fault, possible 335.46 to 335.94 m
Fault, established 350.90
Fault, probable 358.95
Fault, probable 360.50
Fault, possible 370.60
Fault, possible 405.45 to 405.77

BP CANADA
COAL DIVISION

PARKSVILLE

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 7 to 11 Nov. 1980 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	218.75		218.75	CASING THROUGH OVERBURDEN
				HASLAM FORMATION
	230.75		12.00	CASING THROUGH ROCK - geophysics suggest mudstone, minor sandstone.
	273.85		43.10	MUDSTONE - dark grey, slightly silty, massive-appearing, non-calcareous, scattered shell fragments. At 261.16 m specimen BP7/F1.
				Bentonite bands: from 231.30 to 231.33 m, intensely burrowed
				from 231.44 to 231.49 m, intensely burrowed
				from 265.54 to 265.55 m, intensely burrowed
				from 266.09 to 266.13 m, intensely burrowed
				medium grey, sheared, dip 40°.
				Sandstone dykes?: from 235.59 to 235.61 m, dip 50°.
				from 238.52 to 238.56 m, dip 35°.
				from 238.91 to 238.92 m, dip 50°.
				Core badly broken, some mud seams, from 245.04 to 247.22 m.
				Some badly broken and muddy zones between 247.54 and 250.93 with occasional listrication.

CL9A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 7 to 11 Nov. 1980 SHEET No. 2

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
30° to 35° in basal	0.51 m			In basal 0.51 m, 5% (increasing down to 50% at base) of unit is composed of fine- to medium sand as laminae and large burrow-fillings. Abrupt.
	74.25	0.40	0.40	SANDSTONE - fine- to medium-grained, medium grey, massive-appearing; a few large dark-rimmed burrows. Non-calcareous; Abrupt.
	296.50		22.25	SILTSTONE, argillaceous, grading down to MUDSTONE, silty - dark brownish-grey, non-calcareous, massive-appearing. From 293.78 to 294.86, brown, burrowed, bentonitic mudstone (dip 35°). Abundant large, sand-filled burrows at immediate base. Locally abundant small dark burrows. Abrupt.
30° at top. 45° at base.	296.76	0.26	0.26	SANDSTONE - fine-grained, light grey, devoid of lamination; abundant large dark-rimmed burrows. Top 0.01 m is very fine-grained, silty, and rippled. Abrupt base, with minor scouring. Moderately to strongly calcareous.

CL9-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 8 November 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
35°	299.08		2.32	MUDSTONE - dark brown, glauconitic (5% at top and base, increasing to at least 50% in middle of unit) as burrow-replacements, stringers and disseminated grains. Scattered large burrows. This unit may be a marker horizon.
	300.75		1.67	MUDSTONE- dark grey, silty, abundant small dark burrows; weakly calcareous. Pyritic at top; minor glauconite below. Broken, with some shearing and slickensides, in basal half. Basal contact ground out.
35°@ 301.17 35° @ 308.41	318.50		17.75	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained (50:50:0 at top, grading down to 40:40:20 at base). Interlaminated, intensely bioturbated dark grey silty mudstone, siltstone and silty sandstone, with abundant small dark burrows. Scattered shell fragments. Sands are calcareous; rest non-calcareous. Top 0.56 is glauconitic (30% at top, decreasing down to 5%). Gradational.

CLS

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 8 November 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	320.81		2.31	SANDSTONE, very fine-grained/SILTSTONE (40:60 at top, grading down to 60:40 at base) - interlaminated, intensely bioturbated dark grey siltstone and medium grey silty sandstone. Calcareous at top and base; rest non-calcareous. Possible bentonite bands in top 0.20 m (dip 35°). Gradational.
	323.25		2.44	SANDSTONE - very fine to fine-grained, silty, medium grey. Intensely bioturbated; abundant small dark burrows, some larger burrows. Patchily strongly calcareous; gradational.
	328.00		4.75	SANDSTONE, very fine-grained/SILTSTONE/MUDSTONE, (30:50:20) - interbedded; several fining-upward sequences of medium grey silty sandstone, dark grey siltstone and silty mudstone. While burrowing is locally intense, planar lamination is recognizable. Sands are calcareous; remainder is non-calcareous; gradational.
30° @ 326.94				

CL3

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 8 November 1980 SHEET No. 5

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	331.89		3.89	SANDSTONE, very fine-grained/SILTSTONE/MUDSTONE (60:30:10) -
				- thickly interbedded at top, thinly interbedded at base,
40° @				medium grey silty sandstone, dark grey siltstone and silty
329.94				mudstone, with scattered small and large burrows. Scattered
				shell fragments, including some gastropods and pelecypods.
				Strongly calcareous at top and base; rest is non-calcareous;
				gradational.
	337.70		5.81	SILTSTONE/SANDSTONE, very fine-grained (70:30) - thinly
				interbedded, locally bioturbated dark grey argillaceous
				siltstone and medium grey silty sandstone. Scattered
				shell fragments and locally abundant small dark burrows.
				Some recognizable planar lamination. Patchily calcareous.
				The basal part of this unit is locally listricated and
	18° @			slickensided; from DD 335.46 to 335.94, unit is intensely
	base			sheared and listricated (fault, possible.) Gradational.

CL3

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 9 November 1980 SHEET No. 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	342.00		4.30	SANDSTONE, very fine-grained/SILTSTONE (70:30 at top, grading down to 50:50 at base) - thinly interbedded and interlaminated medium grey sandstone and dark grey siltstone, locally intensely bioturbated but laminateon is generally recognizable; primarily planar-laminated with some scours and possible ripples. Locally abundant small, dark and large, dark-rimmed burrows. Minor calcite veining near-parallel to bedding planes. Gradational. Sporadically calcareous.
	348.78		6.78	SILTSTONE/MUDSTONE/SANDSTONE, very fine-grained (50:10:40, at top, grading down to 60:40:0 at base) - very thinly interbedded, dark grey argillaceous siltstone, silty mudstone and medium grey, rippled silty sandstone. Locally abundant small dark burrows and scattered shell fragments; non-calcareous. From 344.30 to 345.65, unit is moderately sheared and listricated and core is in places badly broken. Basal 0.12 m contains 10% glauconite. Gradational.

CL9-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 10 November 1980 SHEET No. 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	349.14	0.36	0.36	SANDSTONE - fine-grained; argillaceous laminae; 30% glauconitic. Moderately calcareous. Abrupt.
	349.64	0.50	0.50	SILTSTONE - dark grey, argillaceous with large glauconitic sand-filled burrows at top and abundant disseminated sand grains towards base. Abundant small dark worm burrows.
10° @ 349.64				One small pelecypod (BP7/F2) at 349.29. Non-calcareous, abrupt.
				COMOX FORMATION
				DUNSMUIR MEMBER
	350.90	1.26	1.26	SANDSTONE - fine-grained, light grey, with locally scattered mudstone laminae in top half and large, dark rimmed burrows throughout. Non-calcareous. Abundant calcite veinlets at 40° to 65° CA. Basal contact is a shear surface, dipping 50°. Fault, established.
				HASLAM FORMATION

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 10 November 1980 SHEET No. 8

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	351.50	0.36	0.60	SILTSTONE - dark grey, argillaceous, with abundant sand grains disseminated throughout. Small dark worm burrows. Non-calcareous; with abundant calcite-filled veinlets at top; crushed and broken at top. Abrupt. Core loss 0.24 m.
				COMOX FORMATION
				DUNSMUIR MEMBER
	357.95	6.45	6.45	SANDSTONE - fine-grained, light grey, with scattered laminae and blebs of dark grey mudstone in top 0.79 m. From 1.14 to 1.17 m below top, a crushed, clayey zone (possible minor displacement). Scattered calcite veinlets at top. Massive-appearing except for basal 0.55 m, which is thickly-laminated. Scattered large dark-rimmed burrows. Gradational.
23° @ 357.64				
	358.95	1.00	1.00	SANDSTONE - fine-grained, light, with 15% dark grey, silty carbonaceous bands. Medium to large-scale low-angle cross-laminated. Some bedding-plane movement along the silty laminae. Polished basal contact with clayey gouge adhering; dip 25° Fault, probable at base.
6° to 13°	6° to 13°			

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 10 November 1980 SHEET No. 9

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
50° at top, increasing to 90° in middle and 60° (overturned) at base.	360.50	1.36	1.55	SANDSTONE - fine-grained, medium grey, with abundant dark grey, silty, carbonaceous laminae, often polished and listricated. Entire unit is more or less sheared and broken particularly at top and base. Fault, probable at base. Core loss in this unit 0.19 m.
	370.60	9.64	10.10	SANDSTONE - medium-grained at top, with less than 5% dark silty laminae, grading down to fine-grained at base with 20% dark silty laminae. These laminae are generally sheared and listricated; the intensity of this shearing increases towards base, and in the basal third of the unit, thin calcite veinlets are also present. Unit as a whole is non-calcareous. At base core badly broken; fault, possible. Core loss in this unit 0.46 m.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 10 November 1980 SHEET No. 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				DIP DETAILS: Depth below top — Depth (gwp.) — Dip°
				8.25 — 368.75 — 30°
				7.40 — 367.90 — 38°
				6.24 — 366.74 — 25°
				4.76 — 365.26 — 38°
				3.72 — 364.22 — 55°
				2.00 — 362.50 — 63°
				0.30 — 360.80 — 70°
	373.15	2.55	2.55	SANDSTONE - fine to medium-grained, light grey, with 5% thin dark grey silty bands towards top. Medium-scale low-angle cross-laminated; scattered large dark-rimmed burrows and locally some dark mudstone blebs (disrupted laminae?). Non-calcareous. Scattered thin calcite veinlets; unit is locally sheared but on the whole is less disturbed than the beds immediately above. Basal contact abrupt with minor brecciation (possible minor movement?).
				DIP DETAILS: Depth(m) below top: — geophysical: — Dip:
				0.08 — 370.68 — 45°
				0.58 — 371.18 — 40°
				1.40 — 372.00 — 35°
				2.43 — 373.03 — 12°

C194

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 10 November 1980 SHEET No. 11

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	375.00	1.85	1.85	MUDSTONE - very silty, grading down to SILTSTONE -- dark grey; abundant tiny pelecypods and small carbonized plant fragments. From 374.05 to 374.41, 5% glauconite present, basal 0.16 m contains scattered sand grains. Non-calcareous Unit is sheared at top; gradational base. (BP7/F4 pelecypod @ 373.39).
	389.40	13.93	14.40	SANDSTONE - fine-grained, light grey, with dark grey silty
15° @ 381.05 10° @ 387.15				and muddy bands (locally dark browish-grey and carbonaceous) increasing in amount from nil at top to 15% of unit at base Non-calcareous. Medium to large-scale low-angle cross-laminated. Some large dark-rimmed burrows. Erosional. Core loss in this unit 0.47 m.
	390.92	1.52	1.52	SANDSTONE - very fine-grained, silty, dark grey. In basal 0.19 m grades down to very coarse-grained. Unit is devoid of lamination, with abundant small dark burrows and scattered pelecypod shells. Patchily calcareous; erosional. (BP7F/3: Pelecypod, @ DD 391.85).

CL5A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 10 November 1980 SHEET No. 12

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	392.50	1.58	1.58	SANDSTONE - fine- to medium-grained, light grey. At top grades up to very fine-grained, silty, dark grey; at base grades down to coarse to very coarse-grained, light grey with shell fragments near base. A few large, vaguely dark-rimmed burrows. Weakly to moderately calcareous, massive-appearing; erosional.
	399.30	6.80	6.80	SANDSTONE - very fine-grained, dark grey, silty, non-calcareous; with occasional very fine to fine-grained, cleaner, lighter-colored, weakly to moderately calcareous. Unit is intensely bioturbated, with abundant large and small pelecypod valves. Occasional carbonized plant fragments (bark chips?); one large (0.06 m) piece of worm-bored, calcified wood. The overall appearance of this unit suggests deposition under shallow marine conditions; (possibly lagoonal?) very gradational.
	402.45	3.15	3.15	SANDSTONE - fine-grained, medium grey, silty (becoming less so downwards), with vague lamination, generally obscured by abundant large burrows. Occasional stringers and burrow-fillings of coarse sand grains, towards base. Some carbonized

CL5-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 11 November 1980 SHEET No. 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				plant debris (chiefly leaves). Patchily calcareous. Minor thin calcite veinlets; gradational.
	403.78	1.33	1.33	SANDSTONE - fine-grained, medium grey, with very coarse sand and grit component increasing from nil at top to 15% at base. Coal spars (abundant towards base); a few pebbles to cobbles of pale green prophyritic felsite in middle of unit. Numerous scours at base; non-calcareous; erosional.
	404.35	0.57	0.57	SANDSTONE, very fine-grained/MUDSTONE (50:50) - rippled, interlaminated, black, carbonaceous to coaly sandstone and mudstone, with abundant thin and thick bright coal bands. Sand component is sporadically calcareous. (Probably an allochthonous deposit.) Erosional?
	405.16	0.81	0.81	SANDSTONE - fine-grained, light to medium grey, abundant large, dark-rimmed worm burrows. Coal spars and scours at base. Weakly to moderately calcareous, erosional.

CL3-1

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 11 November 1980 SHEET No. 14

COM BCA°	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	APPARENT	DESCRIPTION	
7° to	406.06	0.90	0.90	MUDSTONE - black, carbonaceous, pyritic, abundant thin (locally listricated) bright coal bands. Basal 0.25 m contains abundant disseminated sand grains. From 405.45 to 405.77, unit is intensely listricated and core is badly broken. Fault, possible in this interval (probably with minor displacement). Abrupt.	
	406.98	0.92	0.92	MUDSTONE - dark grey, silty. Top 0.24 m is medium grey and ferruginous; next 0.21 m is very sandy. Non-calcareous; gradational. Rooty at top.	
	408.04	1.06	1.06	MUDSTONE? - pale green, with scattered dark specks; devoid of lamiantion, non-calcareous; tuffaceous-appearing. Erosional.	
				——— KARMUTSEN FORMATION ———	
	411.60	2.52	3.56	MUDSTONE - purplish-red to tuscan red, somewhat rusty-appearing, weak, with some harder reddish-violet phases. Locally intensely sheared. Core loss in this unit 1.04 m. Non-calcareous; gradational. This unit most likely is a	

BP CANADA
COAL DIVISION

BOREHOLE No. BP-7 LOGGED BY C. BICKFORD DATE 11 November 1980 SHEET No. 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				paleosol horizon developed on the pre-cretaceous surface.
				It should make an excellent marker for rotary drilling.
	426.47		14.87	DACITE? - amygdaloidal (white feldspar?); dark green and
				weak at top, becoming medium greenish-grey and stronger
				below. Massive. Gradational.
	432.60		6.13	DACITE? - amygdaloidal (pale green fillings) with dark
				mafic clots. Medium grey to greenish-grey, tough, hard,
				massive; becoming darker at base. Gradational.
			17.01+	BASALT? - dark green, massive-appearing, some possible flow-
				banding (near vertical) vermilion to tuscan-red. Joint
				coatings and alteration patches common in top 7 m. Minor
				veinlets of native copper. Unit is hard and strong (but
				less so than the unit immediately above).
				----BASE OF HOLE---- DD 450.19 m ----

CL5A

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D.W. Coates

Commenced: Oct. 27/80

Completed: Nov. 4/80

Core Size: HQ2

Overburden: 30.60 m

HOLE: BP-8

Location: 97090 mE

(UTM) 55750 mN

Collar: 278 m±

Geophysically logged: Yes

Cemented: Yes

TD: 299.82 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM	167.75	137.15
CATFACE INTR.	224.50	56.75
HASLAM	228.56	4.06
DUNSMUIR	230.85	2.29
BENSON	235.56	4.71
KARMUTSEN		64.26+

SUMMARY: No coal seams.

BP CANADA
COAL DIVISION

PARKSVILLE

BOREHOLE No. BP-8 LOGGED BY D. TOMECEK DATE 29 Oct. 1980 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	30.60			----OVERBURDEN - no core
				----HASLAM FORMATION
	91.79	58.76	61.19	MUDSTONE - dark grey, black, silty, non-calcareous, scattered fossils and fragments of INOCERAMUS shells, stick to broken stick, scattered thin bands of sandstone fine-grained, light grey, non-calcareous. From 36.80 to 36.98 mudstone - dark grey to black, soft, friable, within this unit a one cm band of badly fragmented mudstone, broken stick.
				INOCERAMUS shell fragments found at 40.61 to 40.95. At 42.63 sandstone - fine-grained, light grey, approximately ½ cm in width, non-calcareous.
				MUDSTONE - dark grey, black core badly broken from 46.53 to 48.09, some calcite veins (thin), fracture planes show some listrication. (Possible Core Loss).

CL9A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY D. TOMECEK DATE 29 Oct. 1980 SHEET No. 2

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				From 52.05 to 54.41 MUDSTONE - dark grey to black, soft, friable and in some sections a mud with fragments of sheared and listricated mudstone, core badly broken. (Probable Core Loss).
				At 58.64 m SANDSTONE - fine-grained, medium grey, slightly calcareous, clast.
				MUDSTONE - dark grey to black, thin calcite veins, maximum thickness (0.005 m) along fracture planes with pyrite. Also common along fracture planes, broken stick.
				Glaukenite observed in core at 63.30. INOCERAMUS shell fragments (Possible Core Loss) Local Glaukenite.
				(Possible Core Loss) Badly broken sections.
				Probable Core Loss, core mulched in 30 cm sections.
				MUDSTONE - dark grey to black, 0.90 m section very soft friable (Possible Core Loss) some silty bands, slightly

CLSA

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY D. TOMECEK DATE 29 Oct. 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				calcareous.
				Bentonite Band at 87.84 to 88.01 m, contains pulverized
				mudstone, core badly broken (Possible Core Loss).
				MUDSTONE - dark grey to black, calcareous, silty bands,
				thin bank of bentonite 5 cm below the previous one.
				Bentonite band from 88.69 to 88.75 m, again fragmented
				mudstone interjected throughout mudstone (very soft, friable).
				MUDSTONE - dark grey to black, thin bands of bentonite
				(0.2 cm) badly broken core (Probable Core Loss) silty,
				calcareous band 5 cm. Total core loss in this unit 2.43 m.
	92.00	0.21	0.21	SILTSTONE - medium grey, calcareous, interlaminated with
				dark grey to black mudstone. Remnants of fossils through-
				out section, contact is abrupt with mudstone.
				(core is silty, mudstone
				calcareous).

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY D. TOMECEK DATE 31 Oct. 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	95.00	3.00	3.00	MUDSTONE - dark grey to black, top of section displays pyrite clasts (maximum diameter ½ cm) thin veins of calcite.
	95.43	0.43	0.43	MUDSTONE/BENTONITE (80:20) - dark grey, mudstone, soft friable, broken stick.
	107.11	11.68	11.68	MUDSTONE - dark grey to black, very thin bands of bentonite. Core badly broken in some areas, pulverized. Scattered veins of calcite usually along fracture planes.
	110.69	3.58	3.58	MUDSTONE - dark grey to black - pyrite inclusions, some thin beds of bentonite, (Bentonite bands are a misture of 90:10 mudstone fragments). Broken stick.
				----End of Box 30----

CL 5A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY P. LEE DATE 31 Oct. 1980 SHEET No. 5

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	118.47	7.78	7.78	MUDSTONE - as above with traces of thin calcite veins, no bentonite, broken stick core.
	118.56	0.09	0.09	BENTONITIC MUDSTONE - brown, very soft, swollen, core badly broken.
	119.89	1.33	1.33	MUDSTONE - as above.
	119.94	0.05	0.05	BENTONITIC MUDSTONE/MUDSTONE - 50:50.
	120.91	0.97	0.97	MUDSTONE - as above.
	120.94	0.03	0.03	BENTONITIC MUDSTONE / MUDSTONE - 70:30.
	125.86	4.92	4.92	MUDSTONE - dark grey, massive, clean, non-calcareous, trace listricated surfaces, broken stick core, traces glauconite.
	125.89	0.03	0.03	BENTONITIC MUDSTONE - soft, swollen, brown/grey.
	125.97	0.08	0.08	MUDSTONE - as above.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY P. LEE DATE 31 Oct. 1980 SHEET No. 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	126.01	0.04	0.04	BENTONITIC MUDSTONE - as above.
	128.27	2.26	2.26	MUDSTONE - dark grey, massive, clean, non-calcareous, trace pyrite, trace calcite vein, very thin, some listri-cated surfaces, broken core.
	128.33	0.06	0.06	BENTONITIC MUDSTONE - as above.
	129.49	1.16	1.16	MUDSTONE - as above.
	129.52	0.03	0.03	BENTONITIC MUDSTONE
	129.61	0.09	0.09	MUDSTONE - as above, silty in part.
	129.71	0.10	0.10	BENTONITIC MUDSTONE
	129.99	0.28	0.28	MUDSTONE - as above, with no silty parts.
	130.04	0.05	0.05	BENTONITIC MUDSTONE - very soft, medium brown to medium grey, swollen, badly broken.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY P. LEE DATE 1 Nov. 1980 SHEET No. 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	130.38	0.34	0.34	MUDSTONE - as above.	
	130.46	0.08	0.08	BENTONITIC MUDSTONE - as above.	
	131.70	1.24	1.24	MUDSTONE - as above.	
	131.78	0.08	0.08	BENTONITIC MUDSTONE/MUDSTONE - 60:40.	
	138.84	7.06	7.06	MUDSTONE - as above, broken core.	
	138.89	0.05	0.05	BENTONITIC MUDSTONE - as above.	
	140.68	1.79	1.79	MUDSTONE - as above, with traces inoceranus fragments.	
	140.83	0.15	0.15	BENTONITIC MUDSTONE/MUDSTONE - 90:10.	
	166.86	24.84	26.03	MUDSTONE - as above, top of sequence very badly broken, remainder is broken core, scattered pyrite bands in sequence, traces very thin calcite veins, with traces inoceranus fragments. Core loss in this unit 1.19 m.	

C13A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY P. LEE DATE 1 Nov. 1980 SHEET No. 8

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				DD 145.39 3.11 m
				3.04 m DD 163.68
				DD 148.44 3.12 m
				3.12 m DD 166.78
				DD 151.49 1.27 m (end of box 50)
				2.89 m
				DD 154.54
				3.14
				DD 157.58
				3.07
				DD 160.68
	167.75	0.89	0.89	MUDSTONE - this sequence represents the contact zone between the above mudstone and the intrusive dacite below, sequence grades from dark grey @ top to a medium light mottled grey, @ base, extensive veining of a white feldspar, only slightly calcareous, friable mineral (top of box #51), core is badly fractured and broken, although there appears to be little if any core loss, at base of this sequence is sharp contact with dacite which is buff in color, NO CARBONACEOUS DEBRIS.

CATEACE INTRUSIONS

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY P. LEE DATE 1 Nov. 1980 SHEET No. 9

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	224.50	57.02	56.75	PORPHYRITIC DACITE - light grey to buff, fine-grained, aphanitic groundmass, abundant phenocrysts of white feldspar (veins, and maximum diameter of 7 cm) minor quartz phenocrysts, slightly calcareous in part, broken core, traces pyrite, scattered green mineralization along fractures, light grey at base, stick core at base.
				Colour changes from light grey to a light green/grey at base.
				Basal contact not recovered; appears to be abrupt.
				HASLAM FORMATION

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY C. BICKFORD DATE Nov. 1980 SHEET No. 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	226.17	1.67	1.67	ARGILLITE - dark grey to black, hard, with common pyrite along joints. Closely jointed and broken at top; possible minor displacement along contact with overlying dacite? Locally abundant angular intraclasts, towards base. Abrupt. Calcareous.
	226.39	0.22	0.22	MUDSTONE - dark grey, slightly hardened; pyritic, very silty; very abundant grit-sized, angular to rounded, silty, intraclasts. Non-calcareous; abrupt.
	226.83	0.44	0.44	MUDSTONE - dark grey, very silty, slightly hardened, with minor silty intraclasts. Patchily calcareous; erosional.
	228.56	1.73	1.73	MUDSTONE/SANDSTONE - fine-grained, (50:50) - interbedded and interlaminated, locally intensely bioturbated, dark grey, silty mudstone and sandstone. Scattered intraclasts, notably towards top. Pyritic. Patchily calcareous. At 227.89 an ammonite (BP8F/1) - Also one partially pyritized plant fragment. Abrupt.
0° to 10°				
				COMOX FORMATION
				DUNSMUIR MEMBER

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY C. BICKFORD DATE 4 Nov. 1980 SHEET No. 11

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	230.85	2.29	2.29	SANDSTONE - fine-grained at top, coarsening down within 30 cm to fine to medium-grained. Light grey, salt-and-pepper, clean; pyritic at top. Basal 0.77 m contains increasing proportion of granules and small pebbles of Sicker and Karmutsen lithologies; up to cobble size in basal 0.21 m. Massive; non-calcareous; gradational.
				BENSON MEMBER
	235.56	4.71	4.71	CONGLOMERATE - pebbles to boulders of Karmutsen greenstone in a fine to coarse-grained matrix of light grey to greenish-grey sand. At top, matrix is abundant but it becomes very sparse below. Erosional.
				KARMUTSEN FORMATION
	276.56		41.00	GREENSTONE - dark green, fine-grained, hard, pillow basalt or andesite; occasional quartz veinlets. Towards base scattered veinlets of a brick-red mineral. Locally broken; some possible shear zones. Abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-8 LOGGED BY C. BICKFORD DATE 4 Nov. 1980 SHEET No. 12

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION	
	279.50		2.94	TUFF? - light green, aphanitic, very tough ringing when struck. Common dark green, chloritic (?) veinlets. Abrupt.	
	299.82		20.32	GREENSTONE - dark green, fine-grained, hard massive-appearing; from 289.43 to 290.40, brecciated; from 292.33 to 293.58, some manganese staining and dark red mineralization.	
				----BASE OF HOLE DD 300.84----	

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: Ken's Drilling

Commenced: Nov. 4/80

Completed: Nov. 6/80

Core Size: Rotary

Overburden: 105+ m

HOLE: BP-9

Location: 87910 mE

(UTM) 67090 mN

Collar: 90 m^{+}_{-}

Geophysically logged: No

Cemented: No

TD: 105 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS

SUMMARY: Hole abandoned in overburden.

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: Ken's Drilling

Commenced: Nov. 6/80

Completed: Nov. 7/80

Core Size: Rotary

Overburden: 88+ m

HOLE: BP-9A

Location: 87905 mE

(UTM) 67090 mN

Collar: 90 m±

Geophysically logged: No

Cemented: No

TD: 88 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS

SUMMARY: Hole abandoned in overburden.

BP CANADA

VANCOUVER ISLAND EXPLORATION

HOLE: BP-9B

Contractor: Ken's Drilling

Location: 87900 mE

Commenced: Nov. 7/80

(UTM) 67090 mN

Completed: Nov. 18/80

Collar: 90 m±

Core Size: Rotary

Geophysically logged: Yes

Overburden: 108.3 m

Cemented: Yes

TD: 408.4 m

NOTE: geophysics from collar to 261.5 m only, due to caving.

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM		300.1+

SUMMARY: Hole abandoned due to caving, 261.5 m to base. No coal seams.

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

PARKSVILLE

BOREHOLE BP-9B (H) LOGGED BY P. LEE DATE Nov.16, 1980 PAGE 1 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
110.0					Siltstone, medium grey, non calcareous, some very fine
					grain sandstone in part, disintegrates in Hydro Chloric,
					soft and friable
112.8					Very fine grain sandstone/siltstone, 70/30, light-medium
					grey, good sorting, subrounded, argillaceous cementing,
					soft, friable, very slight calcareous, 50% white to
					clear quartz, 50% medium grey minerals, disintegrates
					to completely individual grains in Hydro Chloric,
					salt and pepper sandstone
115.8					as above with 60/40 very fine sandstone/siltstone
118.9					as above with trace of calcite
121.9					very fine grain sandstone, large-medium grey, calcareous,
					soft, 50% white--clear quartz, disintegrates in Hydro
					Chloric to individual grains, trace limonite stained
					quartz grains, subround--round, good sorting,
					argillaceous cementing, calcareous matrix
125.0					fine grain sandstone, large grey, subround--round,
					good sorting, argillaceous cement, slightly calcareous,
					remainder as above

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B (H) LOGGED BY P. LEE DATE Nov. 16, 1980 PAGE 2 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
128.6					siltstone/very fine grain sandstone, 50/50, siltstone,
					medium grey, non calcareous, soft, friable, argillaceous
					cementing, sandstone as above @ 400'
131.4					as above
134.1					as above with scattered pyrite
137.2					siltstone/very fine grain sandstone, 70/30, description
					as above, with scattered pyrite
140.2					as above with trace course quartz grains
143.3					as above
146.3					siltstone/very fine grain sandstone, 80/20, siltstone;
					medium grey, non calcareous, soft friable, argillaceous
					cementing, scattered flecks pyrite, dissolves to
					individual grains in Hydro Chloric with no effervesence
					(no fizz) sandstone; salt and pepper, very fine grain,
					subround--round, good sorting; argillaceous cementing,
					calcareous matrix, dissolves to individual grains in
					Hydro Chloric with some effervesence from calcite matrix

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B (H) LOGGED BY P. LEE DATE Nov. 16, 1980 PAGE 3 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
149.4					as above with 75/25, siltstone/sandstone very fine grain
152.4					as above with 50/50, with minor liominite stained quartz
155.4					siltstone as above, with abundant course size quartz
					grains, frosted--light brown in color, subangular, good
					sorting, sandstone present but only as cavings from
					above
158.5					siltstone/mudstone, 75/25, siltstone description as
					above, mudstone; medium-dark grey, hard, trace very thin
					calcite veins, trace listercated surfaces, non calcareous
161.5					as above with 80/20, siltstone/mudstone, abundant
					pyrite flecks throughout siltstone, mudstone as above
164.6					no sample
167.6					as above with 90/10, siltstone/mudstone
170.7					siltstone, description as above, no mudstone or sandstone
					trace calcite veins
173.7					as above with trace glauconite

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B (H) LOGGED BY P. LEE DATE Nov. 16, 1980 PAGE 4 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
176.8					as above
179.8					siltstone as above with trace inoceramus fragments
182.9					as above
185.9					as above, no glauconite, trace limonite staining
189.0					as above with sandstone cavings from above
197.0					siltstone, medium-dark grey, non calcareous, argillaceous cementing, hard, no breakdown in Hydro Chloric, scattered pyrite flecks, otherwise clean, muddy throughout
195.1					siltstone/mudstone, 50/50, siltstone as above, mudstone, medium-dark grey, scattered pyrite flecks, otherwise clean, non calcareous, trace calcite veins
198.1					mudstone/siltstone, 75/25 as above
201.2					mudstone, as above, trace inoceramus fragments (calcareous fragments)
204.2					mudstone as above, with trace glauconite

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B (H) LOGGED BY P. LEE DATE Nov. 16, 1980 PAGE 5 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
207.3					medium, dark grey, silty. Non calcareous
210.3					medium, dark grey, silty. Slightly calcareous
213.4					medium, dark grey, silty, trace pyrite, trace calcite. Patchily strongly calcareous.
216.4					60% medium dark grey, silty, non calcareous
					20% siltstone medium to dark grey, non calcareous
					20% sandstone very fine grain, light grey, moderately calcareous
219.5					80% siltstone, dark grey, non calcareous
					20% sandstone very fine grain, light grey, moderately calcareous

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B LOGGED BY R.J. MELIN DATE Nov.16, 1980 PAGE 6 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
228.5		Mudstone silty	med-dk grey		85% Mudstone, silty to very silty, slightly calcareous, 15% very fine grain medium sandstone
225.6		Mudstone silty	med-dk grey		No sample
228.6		Mudstone silty	med-dk grey		Mudstone silty, traces of siltstone and minor very fine sandstone bits, slightly calcareous in part
231.6		Mudstone, silty	med-dk grey		Mudstone as above silty
234.7		Mudstone, silty	med-dk grey		Mudstone, as above, minor fine slickensides on calcareous fragments
237.7		Mudstone,silty	med-dk grey		Mudstone silty, slightly calcareous in part
240.8		Mudstone,silty	med-dk grey		As above
243.8		Mudstone,silty	med-dk grey		As above
246.9		Mudstone	med-dk grey		Mudstone, non calcareous, slightly silty
249.9		Mudstone	med-dk grey		Mudstone, slightly calcareous
253.0		Mudstone,silty	med-dk grey		Mudstone as above slightly silty

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B LOGGED BY R.J. MELIN DATE Nov. 16, 1980 PAGE 7 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
256.0		Mudstone	med-dk grey		Mudstone as above traces of slickensides slightly silty, non calcareous
259.1		Mudstone	med-dk grey		Mudstone slightly calcareous in parts silty
262.1		Mudstone	med-dk grey		Mudstone, slightly silty, calcareous fragments and surfaces, calcareous
265.2		Mudstone	med-dk grey		As above with calcite surfaces-veins
268.2		Mudstone	med-dk grey		Mudstone slightly silty traces of pyrite
271.3		Siltstone	med-dk grey		Siltstone muddy, non calcareous, some mudstone
274.3					No sample
277.4		Mudstone/siltstone	med-dk grey		Mudstone and some siltstone, slightly calcareous
280.4		Mudstone, silty	med-dk grey		Mudstone, very silty, stress planes evident, non calcareous
283.5		Siltstone muddy	med-dk grey		Siltstone, muddy, slightly calcareous
286.5		Siltstone, muddy			Siltstone muddy, as above, non calcareous

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B LOGGED BY R.J. MELIN DATE Nov.16, 1980 PAGE 8 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
289.6		Mudstone,silty	med-dk grey		Mudstone, silty, slightly calcareous, minor calcite fragments
					and surfaces
292.6		Mudstone,silty	med-dk grey		Mudstone silty, non calcareous
295.7		Mudstone,silty	med-dk grey		Mudstone, slightly silty, minor sand grains, slightly calcareous
298.7		Mudstone	med-dk grey		Mudstone, slightly calcareous
301.8		Mudstone/Slts	med-dk grey		Mudstone, slightly silty, slightly calcareous, 20% very fine
					grained sandstone
304.8	80%	Mudstone	dk grey		Silty; non calcareous
	10%	Siltstone	dk grey		Non calcareous
	10%	Sandstone	med grey	very fn gr	Moderately calcareous
307.8	80%	Mudstone	dk grey		Silty; non calcareous
	20%	Sandstone	med grey	very fn gr	Non calcareous
	10%	Quartz granules	med grey		Caving?
313.9	80%	Sandstone	light grey	vfg-fg	Clean, quartz-lithic, strongly calcareous
	20%	Siltstone	dk grey		Some argillaceous; non calcareous

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B LOGGED BY C.L. BICKFORD DATE Nov. 16, 1980 PAGE 9 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
310.9	60%	Mudstone	dk grey		Silty; non calcareous
	30%	Siltstone	med-dk grey		Non calcareous
	10%	Granules	dk grey-white		Chert, quartz. Cavings?
317.0		Siltstones	med-dk grey		Non calcareous
320.0	70%	Mudstone	dk grey		Very silty, non calcareous
	30%	Siltstone	med-dk grey		Argillaceous, weakly calcareous
323.1	70%	Mudstone	dk grey		Non calcareous
	30%	Siltstone	dk grey		Some sandy; moderately to strongly calcareous
326.1		NO SAMPLE			
329.2	100%	Mudstone	dk grey		Silty; moderately calcareous
	Trace	Ironstone	lt brown		Very strongly calcareous; calcite veining.

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B LOGGED BY C.L. BICKFORD DATE Nov.17,1980 PAGE 10 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1090'	100	Mudstone	dk grey		Silty, very weakly calcareous
1100'	100	Mudstone	dk grey		Slightly silty, very weakly calcareous. Traces fragment sandstone
1110'	50	Mudstone	dk grey		Silty; non calcareous
	45	Siltstone	med grey		Weakly calcareous
	5	Sandstone	lt to med gy		Weakly calcareous
1120'	80	Mudstone	dk grey		Silty; non calcareous. Traces calcite
	20	Siltstone	med to dk gy		Weakly calcareous
1130'	70	Mudstone	dk grey		Silty, non calcareous. Some slickensides.
	30	Siltstone	dk grey		Argillaceous; weakly calcareous
1140'	80	Mudstone	dk grey		Some silty; non calcareous
	20	Siltstone	med grey		Some sandy; strongly calcareous
1150'	50	Siltstone	dk grey		Argillaceous; very weakly calcareous
	30	Mudstone	dk grey		Silty; non calcareous
	20	Sandstone	lt grey	very fn gr	Clean; strongly calcareous
1160'	60	Siltstone	med grey		Non calcareous
	30	Mudstone	dk grey		Silty, non calcareous. Some slickensides.
	10	Sandstone	med grey	very fn gr	Silty, non calcareous.

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B LOGGED BY C. BICKFORD DATE 17 Nov. 1980 PAGE 11 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1170	50	Sandstone	Med grey	Vfg	Strongly calcareous
	50	Mudstone	Dk. grey		Very silty, Non-calcareous
1180	70	Mudstone	Dk. grey	Vfg	Silty. Trace chalcopyrite? Non-calcareous.
	30	Sandstone	Med grey		Non-calcareous.
1190	70	Mudstone	Dk. grey		Silty; non-calcareous.
	30	Siltstone	Dk. grey		Non-calcareous
1200	50	Mudstone	Dk. grey		Silty; non-calcareous
	50	Siltstone	Dk. grey		Argillaceous; patchily weakly calcareous.
1210	80	Siltstone	Dk. grey		Non-calcareous
	20	Mudstone	Dk. grey		Silty; patchily weakly calcareous.
1220	90	Mudstone	Dk. grey		Very silty; Non-calcareous
	10	Siltstone	Med to dk. grey		Weakly calcareous.
1230	100	Mudstone	Dk. grey		Some silty. Non-calcareous. Trace Ironstone.
1240	100	Mudstone	Dk. grey		Non-calcareous. Trace of calcite veining. Silty.
1250	100	Mudstone	Dk. grey		Some silty; non-calcareous.

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-9B LOGGED BY C. BICKFORD DATE 17 Nov. 1980 PAGE 12 OF 12

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1260	90	Mudstone	Dk. grey		Non-calcareous. (Trace of calcite)
	10	Siltstone	Med to dk	grey	Argillaceous.
1270	100	Mudstone	Dk. grey		Silty; non-calcareous. Poor sample; cavings of
					sandstone and siltstone.
1280	100	Mudstone	Dk. grey		Silty; non-calcareous. Trace calcite. Abundant
					copper-colored metallic specks. (bit metal?)
1290		No Samples			Hole caving badly.
to					
1340					

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: D. W. Coates

Commenced: Nov. 12/80

Completed: Dec. 1/80

Core Size: HQ 2

Overburden: 101.88 m

HOLE: BP-10

Location: 77310 mE

(UTM) 76670 mN

Collar: 102 m±

Geophysically logged: Yes

Cemented: Yes

TD: 624.2 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM		522.32+

SUMMARY: No coal seams.

BP CANADA
COAL DIVISION

PARKSVILLE

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 18 Nov. 1980 SHEET No. 1

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	101.88			OVERBURDEN
				HASLAM FORMATION
10°	108.50		6.62	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained, (80:20:0 at top grading down to 50:45:5 at base) - interbedded dark grey silty non-calcareous mudstone, and dark grey argillaceous non-calcareous siltstone; with thin laminae and beds of light to medium grey, locally rippled sandstone. Abundant small dark burrows. One 0.10 m ferruginous band. Minor calcite veinlets at low angle to CA. Gradational.
	109.25	0.75	0.75	SILTSTONE/SANDSTONE, very fine to fine-grained/MUDSTONE (50:30:20) - interlaminated, fining-upwards, light grey sandstones, medium grey siltstones and dark grey silty
10°				mudstones. Non-calcareous except for sandstones, which are weakly to moderately calcareous, and have loaded and scoured bases. Abundant small dark burrows; a few larger burrows. Abrupt.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 18 Nov. 1980 SHEET No. 2

COM BCA°	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	122.91		13.66	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained (50:45:5
				at top grading down to 25:70:5 at base) - interbedded dark
10° @				grey silty mudstone and argillaceous siltstone with thin
122.91				laminae of light grey sandstone. Some sandstones show
				scoured bases and rippling. Patchily weakly calcareous.
				From DD 119.55 to 121.05 concentration of listric surfaces
				and slickensiding; minor calcite veining and broken zones;
				possible minor fault. Gradational.
	131.80		8.89	SILTSTONE/SANDSTONE, very fine-grained (90:10, grading
17° @				down to 80:20 at base) - interlaminated, fining-upward light
127.15				to medium grey sandstone and dark grey, locally argillace-
				ous siltstone. Weakly calcareous sandstones tend to be
18° @				low-angle cross-laminated. Only rare small burrows. From
130.15				128.64 to 129.63 a probable minor fault: a slickensided,
13° @				broken zone with minor calcite and dips up to 80° within
131.80				the zone. Abrupt.
	137.43		5.63	SILTSTONE/SANDSTONE, very fine-grained (60:40 at top,
15° @				grading down to 80:20 at base) - interlaminated siltstone
136.25				and sandstone, generally as above but sandstones are

CLSA

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 18 Nov. 1980 SHEET No. 3

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
25° @				locally as thick as 0.05 m, and are more clearly cross-
137.43				laminated. Gradational.
	149.36		11.93	SILTSTONE/SANDSTONE, very fine-grained/MUDSTONE (55:40:5) -
10° @				interlaminated dark grey siltstone, light grey, locally
139.40				silty sandstone and dark grey silty mudstone. Sandstones
				are commonly low-angle cross-laminated with scoured bases,
17° @				and are weakly to moderately calcareous; remainder of
146.65				unit is non-calcareous. Local slumping. Abrupt.
	152.31		2.95	SILTSTONE - dark grey, devoid of lamination; non-calcareous
				except for 0.09 m derruginous band in middle.
	161.93		9.62	SILTSTONE/SANDSTONE, very fine-grained (90:10) - thinly
30° @				interbedded and interlaminated dark grey siltstone and
152.76				medium grey silty sandstone. Sandstones generally with
				scoured bases. Abundant small dark burrows. Sandstones
20° @				weakly calcareous; siltstones non-calcareous.
158.95				
	163.05	1.12	1.12	MUDSTONE - dark grey, slightly silty, devoid of lamination;
				non-calcareous. Abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 18 Nov. 1980 SHEET No. 4

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	171.28		8.23	SILTSTONE/MUDSTONE/SANDSTONE, very fine-grained (65:30:5 at top, grading down to 70:0:30 at base) - interbedded, dark grey siltstone and silty mudstone with thin, irregular laminae of light grey sandstone. Sandstone are weakly calcareous; remainder of unit is non-calcareous. Basal half of unit is involved in large-scale slumping (beds locally overturned). Abrupt.
	180.00		8.72	SILTSTONE/SANDSTONE, very fine-grained (70:30) - inter-laminated, slumped and locally intensely bioturbated, dark grey siltstone and medium grey sandstone. Locally abundant burrows. Patchily weakly calcareous. From 177.24 to 177.38, abundant shell fragments (chaotic orientation) (Specimen BP10/F1). From 178.66 to 178.83, 60% very thin interbeds of very fine-grained, ripple-drifted silty sandstone. Abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 19 Nov. 1980 SHEET No. 5

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	181.30	1.30	1.30	SANDSTONE - very fine-grained/SILTSTONE (80:20) - inter-bedded light to medium grey sandstone and dark grey, rippled siltstone. Sandstone alternates between clean, rippled (30%) and intraclast-rich (70%) types. Intraclasts are of dark grey silty mudstone and siltstone, and with them is associated minor shell debris. Sandstones are moderately calcareous; remainder of unit is non-calcareous. This unit might represent the basal part of a turbidite sequence. Erosional.
	187.48		6.18	SILTSTONE - medium grey, sandy; generally massive-appearing but with minor thin laminae of very fine-grained sandstone. (some slumped) shell fragments at top; locally intense bioturbation towards base. Non-calcareous, aburpt.
	191.31		3.83	SILTSTONE/SANDSTONE, very fine-grained/MUDSTONE (75:25:5) - interlaminated medium grey siltstone, light grey sandstone (occasionally rippled) and dark grey silty mudstone. Sand-stones are calcareous, remainder is non-calcareous. Locally abundant small dark burrows. Abrupt.
20° @ 189.40				

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 19 Nov. 1980 SHEET No. 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	194.50		3.19	SILTSTONE - dark grey, locally with abundant sandy and muddy laminae. Some slumping. Non-calcareous. Abrupt.
	196.74		2.24	SANDSTONE, very fine-grained/SILTSTONE, (50:50) - an alternation of thick, unlaminated, light to medium grey, silty sandstones and dark grey argillaceous siltstones with thin laminae of sandstone. Some intraclast horizons at bases of sandstone beds. Sandstones are moderately calcareous; siltstones are non-calcareous.
19° @ 195.35				
	212.44		15.70	SILTSTONE/SANDSTONE, very fine-grained/MUDSTONE (60:25:15)- interlaminated and interbedded, locally slumped dark grey siltstone, medium grey silty sandstone and dark grey silty mudstone. Locally abundant small dark burrows. Some ripples and microerosional features. Non-calcareous. Gradational.
25° @ 210.58				
	214.50		2.06	SILTSTONE, grading down to MUDSTONE, silty- dark grey, non-calcareous; ferruginous at base. Shell fragments near top; one coal spar in middle of this unit. Abrupt.

C134

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 19 Nov. 1980 SHEET No. 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	217.41		2.91	SANDSTONE, very fine-grained/SILTSTONE (50:50) - interbedded and interlaminated medium grey, silty sandstone and dark grey siltstone. Sandstones are moderately to strongly calcareous; siltstones are non-calcareous. Some small dark burrows in silty phases. Gradational.
16° @ 217.01				
	227.50		10.09	SILTSTONE/SANDSTONE, very fine- to fine-grained (80:20) - dark grey, argillaceous siltstone with laminae and thin beds of light to medium grey, locally silty sandstone. Siltstones occasionally contain small dark burrows. Sandstones are occasionally rippled and generally have abrupt bases. Siltstones are non-calcareous; sandstones are moderately calcareous. This unit is characterized by microfaulting and this calcite veinlets (notably in top part). Gradational.
15° @ 222.47				
	235.95		8.45	SILTSTONE, grading down to MUDSTONE, dark grey, with 10% thin bands of very fine sandstone at top; siltstones and mudstones are non-calcareous; sandstones are moderately calcareous. One ferruginous band near base. Abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 19 Nov. 1980 SHEET No. 8

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	236.50	0.55	0.55	SANDSTONE - very fine-grained, medium grey, silty, devoid of lamination except in top, 0.05 m which contain 50% laminae of dark grey mudstone. Abrupt.
	237.33		0.83	MUDSTONE - slightly silty. grading down to SILTSTONE - dark grey, non-calcareous, with minor sandy laminae toward base. Two pelecypods at 236.56 (BP 10/F2). Unit is badly broken at top. Abrupt.
	244.62		7.29	SILTSTONE/SANDSTONE, very fine-grained (60:40) - thinly interbedded dark grey argillaceous siltstone and medium grey, generally silty sandstone. Siltstones non-calcareous; sandstones weakly to moderately calcareous. Scattered small dark burrows; some larger burrows. Abrupt.
16° @ 240.39 17° @ 244.62				
	246.11	1.49	1.49	SANDSTONE, very fine-garined/SILTSTONE (60:40) - thin to thick interbeds of light to medium grey, locally rippled sandstone and dark grey siltstone. Sandstones commonly have scoured bases. Abrupt.
~~16°~~ @ 245.93				

C134

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 19 Nov. 1980 SHEET No. 9

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	249.23		3.12	MUDSTONE - dark grey, very silty at top; silt content disappearing downwards. In centre of unit up to 10% thin bands of very fine-grained sandstone. Non-calcareous except for a ferruginous band near base. Badly broken and ground at base.
	256.45		7.22	SILTSTONE/SANDSTONE, very fine-grained/MUDSTONE (65:25:10) thinly interbedded dark grey siltstone, light grey, locally rippled sandstone, and dark grey silty mudstone. Minor small dark burrows. Some intraclast-rich bands. Sandstones are moderately calcareous; remainder of unit is non-calcareous. Gradational.
10° @ 253.05 18° @ 256.45				
	263.50		7.05	MUDSTONE - dark grey, non-calcareous; scattered shell fragments; at top one small plant fragment. One ferruginous band near base. Abrupt.
	268.70		5.20	MUDSTONE/SANDSTONE, very fine-grained (60:40 at top, grading down to 90:10 at base) - dark grey, silty mudstone with interbeds (at top of unit) and laminae (at base of unit) of medium grey, silty sandstone. Sandstones are weakly to
17° @ 263.50				

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 20 Nov. 1980 SHEET No. 10

COM BCA°	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
14° @				moderately calcareous; mudstones are non-calcareous. Minor
268.70				slumping. Gradational.
	273.62		4.92	MUDSTONE - dark grey, rare sandy and silty laminae; occasional ferruginous bands. Non-calcareous. Scattered shell fragments; abrupt.
	277.75		4.13	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained (60:30:10)
16° @				thinly interbedded, dark grey, locally silty mudstone, dark
274.53				grey siltstone and light to medium grey, locally silty sandstone. Non-calcareous. Sandstones have abrupt to scoured bases some show climbing-ripple cross-lamination. Unit is locally intensely bioturbated. Scattered shell fragments.
	279.00		1.25	MUDSTONE - dark grey, non-calcareous, occasional thin sandy laminae. Ferruginous band at 278.04 to 278.15. Bentonite, mostly badly crushed, From 277.89 to 278.03, and as a solid band from 278.20 to 278.22. Abrupt.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 20 Nov. 1980 SHEET No. 11

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	279.36	0.36	0.36	SANDSTONE - fine-grained, clean at top; becoming very fine-grained and silty at base. Light to medium-grey, weakly calcareous, devoid of lamination; abrupt.
	285.10		5.74	MUDSTONE/SANDSTONE, very fine- to fine-grained (60:40) - dark grey mudstone with laminae and interbeds, (to 0.20 m) of light to medium grey, locally rippled sandstone. From 280.13 to 280.55, core broken, with some listrication and slickensiding and minor calcite veinlets; dip in this interval locally reaches 70°, possible minor fault.
10° @ 284.95				From 281.45 to 283.96, core is badly broken and ground with possible mud seams and, at base a distinct band of clayey gouge. Some listric surfaces and calcite veinlets. Fault, possible. Abrupt.
	285.72	0.62	0.62	SANDSTONE - very fine-grained, medium grey; rippled towards base. Weakly calcareous. From 285.38 to 285.46, dark grey silty mudstone.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 20 Nov. 1980 SHEET No. 12

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	288.00		2.28	MUDSTONE/SANDSTONE, very fine-grained (50:50) - interbedded
13° 0				dark grey silty mudstone and medium grey, medium-scale
286.80				low-angle cross-laminated sandstone, in beds to 0.34 m thick. Scattered small and medium burrows. Non-calcareous. Gradational.
	327.32		39.32	MUDSTONE - dark grey, slightly silty, non-calcareous with 5% to 10% laminae and lenticles of patchily calcareous, very fine-grained silty sandstone and siltstone. Scattered shell fragments. From top to 297.79, minor calcite veining and some broken zones, but no suggestion of significant displacement. From 297.79 to 298.46, core is somewhat sheared and brecciated, with some clayey gouge zones and dips up to 45°. Fault, probable. From 298.46 to 302.45, common slickensides and calcite near-parallel to core axis, suggestive of strike-slip displacement. Below this zone the only structure evident is the occasional bedding plane slip. Occasional thin ferruginous bands. Gradational.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 22 November 1980 SHEET No. 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	383.27		55.95	MUDSTONE/SANDSTONE, very fine-grained (85:15 grading down to 92:8) dark grey, slightly silty mudstone with thin, rippled laminae of light to medium grey, locally silty sandstone. Ocasional thin ferruginous bands. Locally abundant small dark burrows. Sandstones are moderately to strongly calcareous, remainder of unit is non-calcareous. From 340.84 to 342.89, core is broken, with abundant listric surfaces and slickensides; fault, possible. From 344.09 to 347.10, core is broken, with slickensides and listrication concentrated at top of zone, top 0.50 m is particularly badly broken, fault, possible. From 347.10 to 365.01, occasional bedding-plane calcite veins and thin oblique calcite veinlets. From 365.01 to 366.28, core is broken, locally badly broken with slickensides and listric surfaces. Listrication is most intense from 365.71 to 365.84, associated with abundant tiny calcite veinlets and dips to 45°, fault, possible. Basal contact of this unit is very gradational.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 22 Nov. 1980 SHEET No. 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
		403.92	20.65	MUDSTONE/SANDSTONE, very fine fine-grained (95:5) - interlaminated, as above except for lower amount and wider spacing of sandstone laminae. Occasional ferruginous bands as before. At 390.73, abundant Inoceramus fragments. Core broken from 384.38 to 385.98; fragments have "twisted" curly appearance but no listrication or slickensiding. Gradational.
	444.34		40.42	MUDSTONE - dark grey, silty, non-calcareous, with minor thin laminae and lenticles of light grey, very fine-grained, generally silty and moderately to strongly calcareous sandstone. Abundant small dark burrows. From 408.17 to 408.21, light olive-green, slightly-swelling bentonite. Unit is cut by occasional thin calcite veinlets, but on the whole appears undisturbed. Occasional ferruginous bands. Gradational.
	540.35		96.01	MUDSTONE - dark grey, slightly silty; occasional ferruginous bands. At 464.65 a slickensided calcite band (0.01 m @ 35^{o} CA). From 466.78 to 469.00 approximately 60% of core is broken with spiral fractures. From 479.27 to 479.47,

CUA

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 22 Nov. 1980 SHEET No. 15

COM BCA°	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	APPARENT	DESCRIPTION
				calcite veins at 40° to 60° CA and minor calcite-cemented breccia. Fault possible. At 485.36, a calcite vein (0.005 m @ 40° CA).
				From 490.01 to 490.13, Inoceramus fragments and some listrication. From DD 490.45 to 490.49 abundant large Inoceramus fragments. From 490.51 to 490.66 interlaminated bioturbated mudstone and very fine-grained sandstone, grading down to light grey, very fine to fine-grained sandstone, erosional at base. At 491.56, Inoceramus fragments. At 504.87 to 504.88, 0.01 m pale olive green bentonite, hard, sheared at base. From 505.40 to 505.52, some slickensiding. From 505.65 to 505.80, core is crushed and flaky; probably some minor displacement here. From 506.71 to 506.82, light grey, fine-grained sandstone; burrowed at top. Load structures at base. At 507.72, a very thin laminae of olive green, slightly-swelled bentonite. From 507.72 to 507.94, core badly broken, with sprial breaks. From 508.41 to 508.56, the same. At 511.77, Inoceramus fragments. From 513.29 to 513.35, core crushed and flaky. From 513.50 to 513.68, abundant calcite veinlets at 30° to 60° CA; some are vaggy.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 22 Nov. 1980 SHEET No. 16

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				Immediately below is an 0.06 m crushed zone. From 514.28 to 514.43, core badly broken, with some spiral breaks.
				Galuconite Marker: From 480.84 to 481.43, interlaminated, intensely bioturbated dark grey mudstone (70%) and medium grey, fine-grained sandstone (30%), very slightly glauconitic at top, increasing to 30% glauconite at base. The top 0.50 m of underlying mudstone is markedly pyritic.
				From 524.39 to 524.69, core is badly broken and ground. At 530.79, recovered 0.45 m of probable cavings, ground-up sandstone and mudstone. From 532.75 to 532.81, very fine-grained, light grey sandstone, burrowed at top, with load structures at base. From 536.69 to 536.71, very fine to fine-grained, burrowed, light grey sandstone.
				From 539.39 to 539.40, a sandstone dyke: very fine-grained, medium grey sandstone with irregular inclusions of dark grey mudstone, and nearly-matching, irregular, sub-parallel abrupt margins (dip of dyke 50°). From 533.10 to 538.60 occasional shell fragments. Base at end of available core, 27 November 1980.

CL3A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY C. BICKFORD DATE 27 Nov. 1980 SHEET No. 17

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	594.52	60.21	54.17	MUDSTONE - medium to dark grey, non calcareous, traces shell fragments, clean massive, core broken. From 542.58 to 542.65, sandstone, very fine to fine-grained, light to medium grey, non-calcareous, muddy at top, gradational at top. (abundant muddy inclusions in top 0.03 m); abrupt.
				Entire unit has scattered incoceramus shell fragments throughout, core is broken throughout, unit is consistently mudstone as above, calcite veins appear in trace amounts throughout, what appears to be a brachipod shell fragment at 563.61.
				542.09 3.23 m DD 592.84 m
				2.44 m DD 568.15 m 3.09 m
				DD 544.68 m 3.07 m DD 595.89 m
				2.78 m DD 571.20 m .19 m
				DD 547.73 m 3.18 m
				3.21 m DD 574.58 m
				DD 550.89 m 3.07 m
				2.37 m DD 577.60 m
				DD 553.52 m 3.24 m
				3.11 m DD 580.85 m

CL5A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY P. LEE DATE 30 Nov. 1980 SHEET No. 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
				DD 556.57 m 2.96 m
				2.66 m DD 584.00 m
				DD 559.31 m 3.11 m
				2.88 m DD 587.05 m
				DD 562.05 m 2.99 m
				3.46 m DD 590.10 m
				DD 565.60 m 2.93 m
	594.70	0.18	0.18	SANDSTONE/MUDSTONE - Sandstone, very fine- to fine-grained, light grey, non-calcareous, medium grey at base, inter-bedded with dark grey mudstone as above.
	595.00	0.30	0.30	MUDSTONE - dark grey, clean, silty in part, gradational contact with upper zone, very abrupt contact with sandstone below, broken core.
20°	595.09	0.09	0.09	SANDSTONE - very fine- to fine-grained, light grey, abrupt, upper to lower contacts, non-calcareous, band lays 20° from horizontal in core (does not represent dip?).
	595.14	0.05	0.05	MUDSTONE - as above.

CL5A

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY P. LEE DATE 30 Nov. 1980 SHEET No. 19

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	595.41	0.27	0.27	SANDSTONE - light to medium grey, fine to medium-grained, clean, massive, non-calcareous, abrupt upper contact, gradational lower contact into mudstone.
	595.45	0.04	0.04	MUDSTONE - as above, both upper and lower contacts gradational from and into sandstone.
	595.68	0.23	0.23	SANDSTONE - light grey, fine-grained, abundant mudstone inclusions, worm burrows? non-calcareous, massive, stick core, abrupt basal contact with mudstone.
	595.78	0.10	0.10	MUDSTONE - as above.
	595.92	0.14	0.14	SANDSTONE - light to medium grey, very fine-grained, calcareous, type of sandstone that infills large inoceramus shells no shell fragments in core only sandstone, abrupt upper and lower contacts with mudstone.
	600.70	4.17	4.78	MUDSTONE - dark grey, non-calcareous, scattered shell fragments throughout, traces of calcite veins, broken core, abrupt basal contact.

BP CANADA
COAL DIVISION

BOREHOLE No. BP-10 LOGGED BY P. LEE DATE 30 Nov. 1980 SHEET No. 20

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m. MEASURED	THICKNESS m. APPARENT	DESCRIPTION
	601.20	0.50	0.50	SANDSTONE - light grey, fine-grained, non-calcareous, clean
45° @				massive, one single calcite vein in middle of unit, 1 mm
601.20				thick, contact with lower mudstone unit is abrupt and at
				an angle of 45°.
	624.00	19.67	23.00	MUDSTONE - dark grey, non-calcareous, massive abundant shell
				fragments throughout, scattered thin calcite veins through
				out, some listricated surfaces on fractures, scattered
				brachipod fragments throughout. Core loss in this unit
				3.33 m, mainly at base of hole.
				2.61 m T.D. BP #10
				DD 605.33 m 2043' of 622.71 m
				3.21 m 1.95 m
				DD 608.69 m DD 619.66 m
				2.92 m 3.06 m
				DD 611.43 m DD 622.71 m final depth
				2.99 m
				DD 613.68 m
				2.93 m
				DD 617.52 m

C1.5.1

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: Kens' Drilling

Commenced: Nov. 17/80

Completed: Dec. 13/80

Core Size: Rotary

Overburden: 117.5 m

HOLE: BP-11

Location: 80300 mE

(UTM) 72070 mN

Collar: 87 m±

Geophysically logged: Yes

Cemented: Yes

TD: 656.8 m

NOTE: Geophysical logs run from collar to 627.5 m only.

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
HASLAM	547.8	430.3+
DUNSMUIR		109.0+

SUMMARY: No coal seams.

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY R.J. Melin DATE November 23/80 PAGE 1 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
400'		Mudstone	dk-med grey		Silty, grading to siltstone in parts, traces of calcite
410'		Mudstone silty	dk-med grey		Silty, grading to siltstone, as above, slightly calcareous
420'		Mudstone silty	dk-med grey		Silty mudstone as above, minor silty, very fine sandstone, minor
					calcite fragments
430'		Siltstone, muddy	dk-med gy		Siltstone, muddy, non calcareous
440'		Mudstone silty	dk-med grey		Mudstone, slightly silty, slightly calcareous
450'		Siltstone	med-dk grey		Siltstone, minor mudstone and minor very fine grained sandstone,
					slightly calcareous in part
460'		Mudstone	dk-med grey		Mudstone, slightly silty, minor silty portions, non calcareous
470'		Mudstone	dk-med grey		Mudstone, minor silty portions, traces of very fine grained sandstone
					non calcareous
480'		Mudstone	dk-med grey		Mudstone, minor silty portions slightly calcareous
490'		Mudstone	dk-med grey		Mudstone as above
500'		Mudstone	dk-med grey		Mudstone as above
510'		Mudstone	dk-med grey		Mudstone slightly silty, slightly calcareous
520'		Mudstone,silty	dk-med grey		Mudstone silty, slightly calcareous traces of (pyrite flecks?)
530'		Mudstone	dk-med grey		Mudstone, non calcareous, traces pyrite flecks
540'		Mudstone	dk-med grey		Mudstone, slightly calcareous in parts
550'		Mudstone	dk-med grey		Mudstone, as above, minor traces of pyrite
560'		Mudstone	dk-med grey		Mudstone, slightly calcareous, slightly silty
570'		Mudstone	dk-med grey		Mudstone, slightly silty, non calcareous, traces of pyrite flecks
580'		Mudstone	dk-med grey		Mudstone, minor slightly calcareous portions
590'		Mudstone	dk-med grey		Mudstone, non calcareous, traces vitreous flecks
600'		Mudstone	dk-med grey		Mudstone, slightly calcareous in parts

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP11/80 LOGGED BY R.J. Melin DATE November 23/80 PAGE 2 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
610'		Mudstone	dk-med grey		Mudstone as above, slightly silty
620'		Mudstone	dk-med grey		Mudstone, as above
630'		Mudstone	dk-med grey		Mudstone, non-calcareous, well developed pyrite crystalization
640'		Mudstone	dk-med grey		Mudstone, 'clean', non calcareous
650'		Mudstone	dk-med grey		Mudstone, as above
660'		Mudstone	dk-med grey		Mudstone as above, calcareous in portions
670'		Mudstone	dk-med grey		Mudstone, slightly silty in portions, non calcareous
680'		Mudstone	dk-med grey		Mudstone, as above, slightly calcareous in parts
690'		Mudstone	dk-med grey		Mudstone, slightly calcareous, minor fine traces of pyrite
					crystals
700'		Mudstone/Sst	med grey lt gy		Mudstone, as above to Sandstone light grey, green glauconite
					type crystals, abundant well developed calcite group crystals.
					Material which is sandstone in grain appearance may be altered.
					Sandstone is fine grained.
710'		Mudstone	med-dk grey		Mudstone, non calcareous, minor sandstone less than 20%, sandstone
					has abundant crystalization of biotite, glauconite, pyrites, etc.
					fine grained, calcareous
720'					Mudstone grading in portions to siltstone and traces of very
					fine grained sandstone, slightly calcareous
730'		Mudstone silty	dk-med grey		Mudstone, pyrite crystalization,iron staining, silty portions,
					calcareous in part
740'		Mudstone	dk-med grey		Mudstone, slightly minor silty, non calcareous
750'		Mudstone	dk-med grey		Mudstone, non calcareous
760'		Mudstone,silty	dk-med grey		Mudstone as above, silty, non calcareous

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY R.J. Melin, W.P. Lee DATE November 23/80, November 24/80 PAGE 3 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
770'		Mudstone silty	dk-med grey		Mudstone, slightly silty, grading to very fine grained sandstone,
					calcareous on silty portions
780'		Mudstone	dk-med grey		Mudstone, minor traces grading silty, slightly calcareous in
					portions
790'		Mudstone silty	med-dk grey		Mudstone, silty in portions, slightly calcareous
810'		Mudstone	med-dk grey		Mudstone, as above, less siltstone, non calcareous
					Mudstone, slightly silty, slightly calcareous
820'		Mudstone	med-dk grey		traces fine pyrite flecks - crystals
830'		Mudstone	med-dk grey		Mudstone, slightly silty
840'		Mudstone	med-dk grey		Mudstone, non calcareous
850'	No Sample				
860'		Mudstone	med-dk grey		Mudstone, traces pyrite flecks
870'		Mudstone	med-dk grey		Mudstone, traces calcite chips, silty
880'		Silty Mudstone	med-dk grey		Mudstone, silty throughout, traces pyrite flecks, minor calcite veins
890'		Mudstone	dk-med grey		Mudstone, pyrite flecks, traces fossil fragments?
900'		Mudstone	dk-med grey		Mudstone, as above
910'		Mudstone silty	dk-med grey		Mudstone, silty, minor calcite chips
920'		Mudstone	dk-med grey		Mudstone, silty in part, traces pyrite flecks, traces listercated
					surfaces
930'		Mudstone	dk-med grey		Mudstone, as above
940'		Mudstone	dk-med grey		Mudstone, as above
950'		Mudstone	med-dk grey		Mudstone, silty in part, abundant pyrite throughout, traces fossil
					fragments?
960'		Mudstone	med-dk grey		Mudstone, silty in part, minor pyrite flecks, fossil fragments

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE November 24/80 PAGE 4 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
970'		Mudstone	med-dk grey		Mudstone, silty in part, non calcareous
980'		Mudstone	med-dk grey		Mudstone, silty in part, fossil fragments, traces pyrite flecks
990'		Mudstone	med-dk grey		Mudstone, silty in part
1000'		Mudstone, silty	med-dk grey		Mudstone, silty throughout, traces fossil fragments, minor pyrite
					flecks
1010'		Mudstone	med-dk grey		Mudstone, silty in part, remainder as above
1020'		Mudstone	med-dk grey		As above
1030'		Mudstone	med-dk grey		Mudstone, silty part, traces calcite chips
1040'		Mudstone	med-dk grey		Mudstone, silty in part, minor pyrite flecks, traces very fine
					grained sandstone
1050'		Mudstone	med-dk grey		Mudstone, silty, fossil fragments, sandstone chips - traces
1060'		Mudstone	med-dk grey		Mudstone, traces silty, minor pyrite flecks, traces sandstone
					chips as above
1070'		Mudstone	med-dk grey		Mudstone, non calcareous
1080'		Mudstone	med-dk grey		Mudstone, slightly silty, non calcareous
1090'		Mudstone	med-dk grey		Mudstone, traces fossil fragments, scattered pyrite flecks,
					slightly silty
1100'		Mudstone	med-dk grey		Mudstone, scattered pyrite flecks
1110'	No Sample				
1120'		Mudstone	med-dk grey		Mudstone, traces pyrite flecks, slightly silty
1130'		Mudstone	med-dk grey		Mudstone, as above
1140'		Mudstone	med-dk grey		Mudstone, fossil fragments, slightly silty
1150'		Mudstone/s.s.	md-dk gy/buff		Mudstone, slightly silty, sandstone very fine grained, well sorted
					quartz, glauconite, 70/30 (Mudstone/sandstone)

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE November 24/80 November 25/80 PAGE 5 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
		NO SAMPLES from 1150 - 1185			
1185'		Mudstone	med-dk grey		Mudstone, slightly silty, non calcareous, minor calcite veins &
					chips
1195'		Mudstone	med-dk grey		Mudstone as above, with traces sandstone, very fine grained, buff,
					traces glauconite
1210'		Mudstone	med-dk grey		Mudstone, slightly silty
1225'		Mudstone	med-dk grey		Mudstone, slightly silty, non calcareous
1235'		Mudstone	med-dk grey		Mudstone, as above
1245'		Mudstone	med-dk grey		Mudstone, slightly silty, traces pyrite flecks
1255'		Mudstone	med-dk grey		Mudstone, traces pyrite flecks, traces calcite
1265'		Mudstone	med-dk grey		Mudstone, non calcareous
1275'		Mudstone	med-dk grey		Mudstone, as above
1285'		Mudstone	med-dk grey		Mudstone, slightly silty, traces pyrite flecks
1295'	NO SAMPLE				
1305'		Mudstone	med-dk grey		Mudstone, scattered pyrite flecks
1315'		Mudstone	med-dk grey		As above
1325'		Mudstone	med-dk grey		Mudstone, slightly silty, fossil fragments, minor pyrite flecks
1335'		Mudstone	med-dk grey		Mudstone, scattered pyrite flecks
1345'	NO SAMPLE				
1355'		Mudstone	med-dk grey		Mudstone, traces silty, traces pyrite flecks
1365'		Mudstone	med-dk grey		Mudstone, traces sandstone chips
1375'		Mudstone	med-dk grey		Mudstone, traces listercated surfaces, traces pyrite
1385'		Mudstone	med-dk grey		Mudstone, slightly silty
1395'	NO SAMPLE				

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE November 25/80 PAGE 6 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1405'	NO SAMPLE				
1415'		Mudstone/s.s.	med-dk gy/wh		Mudstone, slightly silty, minor pyrite, sandstone very fine
					grained, subround, quartz, glauconite (80/20) sandstone
1425'		Mudstone	med-dk grey		Mudstone, as above, with traces calcite chips
1435'		Mudstone	med-dk grey		Mudstone, traces silty, traces calcite chips
1445'		Mudstone	med-dk grey		Mudstone, traces fossil fragments
1455'		Mudstone	med-dk grey		Mudstone, non calcareous
1465'		Mudstone	med-dk grey		Mudstone, minor pyrite flecks
1475'		Mudstone	med-dk grey		Mudstone, slightly silty, traces pyrite
1485'		Mudstone	med-dk grey		Mudstone, scattered pyrite
1495'		Mudstone	med-dk grey		Mudstone, non calcareous
	NO SAMPLES 1495-1530				
1530'		Mudstone	med-dk grey		Mudstone, slightly silty, traces pyrite flecks
1540'		Mudstone	med-dk grey		Mudstone, as above
1550'		Mudstone	med-dk grey		Mudstone, traces calcite chips
1560'		Mudstone	med-dk grey		Mudstone, traces calcite veins
	NO SAMPLES from 1560-1593 - Drilling Break @				1588 - slower penetration
1593'		Mudstone/Silty	med-dk grey		Mudstone, silty throughout, samples very fine scattered calcite
					chips
1596'		Mudstone/Silty	med-dk grey		As above
1599'		Mudstone/Silty	med-dk grey		Mudstone, silty throughout, very fine samples, scattered calcite
					chips
1602'		Mudstone	med-dk grey		Mudstone, slightly silty, scattered pyrite flecks
1605'		Mudstone	med-dk grey		Mudstone, scattered pyrite

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE November 25/80 November 26/80 PAGE 7 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1608'		Mudstone	med-dk grey		Mudstone, scattered pyrite, traces calcite
1611'		Mudstone	med-dk grey		Mudstone, slightly silty
1614'		Mudstone	med-dk grey		As above
1617'		Mudstone	med-dk grey		As above
1620'		Mudstone	med-dk grey		Mudstone, slightly silty, minor pyrite flecks
1623'		80/20 Mudstone/s.s.	med-dk grey		Mudstone as above, sandstone, fine grained white quartz grains,
					with glauconite and pyrite
1626'		Sandstone	light grey-buff		Sandstone, very fine grained, good sorting, quartz,glauconite,
					pyrite clean
1629'		Sandstone	light grey-buff		Sandstone as above, with minor mudstone chips – cavings?
1632'		Sandstone	light grey-buff		As above, with minor hornblende grains in sandstone, (dark grey-
					black grains)
1635'		Sandstone	light grey-buff		Sandstone, as above, slightly calcareous, breaks down to single
					grains in HydroChloric Acid
1638'		Sandstone	light-med gy		Sandstone, as above, slightly darker color, traces limonite
					staining
1641'		Sandstone	white-light gy		Sandstone, 90% quartz, fine-medium grained, subrounded, 10%
					dark minerals, non calcareous, poor cementing
1644'		Sandstone	white-light gy		Sandstone, as above, with minor clear quartz grains, scattered
					mudstone chips–cavings?
1647'		Sandstone	white-light gy		Sandstone, 90% medium-fine grained, 10% glauconite, pyrite &
					other dark minerals, non calcareous
1650'		Sandstone	white-frosted		Sandstone, 95% clear frosted and white quartz, subrounded,
					good sorting, non calcareous, poor cementing

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE November 26/80 PAGE 8 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1653'		Sandstone	white-frosted		As above, with traces pyrite, glauconite, and darker minerals,
					unconsolidated
1656'		Sandstone	white-frosted		Sandstone, as above, with traces limonite staining
1659'		Sandstone	white-light gy		Sandstone, as above, as well as ingredients
1662'		Sandstone	white-light gy		Sandstone, 90% clear and white frosted quartz, traces pyrite,
					glauconite, limonite stains
1665'		Sandstone	light-medium gy		Sandstone, 90% frosted-grey quartz, rest as above
1668'		Sandstone	light-medium gy		As above, sample muddy
1671'		Sandstone	light-medium gy		Sandstone, 90% frosted-light grey quartz, 10% darker minerals
1674'		Sandstone	light-medium gy		Sandstone, as above, traces of pyrite flecks, traces glauconite
1677'		Sandstone	light grey		Sandstone, as above, subrounded, good sorting, traces limonite
					staining
1680'		Sandstone	light grey-frosted		Sandstone, as above, non calcareous, mudstone cavings containing
					abundant glauconite
1683'		Sandstone	light grey-frosted		Sandstone, 90% quartz as above, 10% dark minerals as above,
					cavings as above
1686'		Sandstone	light grey-frosted		As above
1689'		Sandstone	light grey		Bad sample, small amount
1692'		Sandstone	light grey		Sandstone dirty, 90% quartz; glauconite, traces pyrite, traces
					limonite stain
1695'		Sandstone	light grey		Sandstone, as above, abundant mudstone cavings, bad sample
1698'		Sandstone	light grey-frosted		Sandstone, 90% clear-frosted quartz, subrounded-subangular, good
					sorting, non calcareous, 10% dark minerals
1701'		Sandstone	light grey-frosted		Sandstone, as above, fine-medium grained, scattered mudstone
					cavings

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE November 26/80 November 27/80 PAGE 9 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1704'		Sandstone	light grey-frosted		Sandstone, 90% quartz as above, 10% glauconite, pyrite and dark minerals, clean, loose
1707'		Sandstone	light grey-frosted		Sandstone, as above, fine-medium grained, clean
1710'		Sandstone	light grey-white		Sandstone, quartz clear-white, light grey, minor pyrite, non calcareous
1713'		Sandstone	light grey-white		Sandstone, quartz as above, with traces glauconite
1716'		Sandstone	light grey-white		Sandstone, 90% clear-white quartz, fine-medium grained, subrounded, good sorting, 10% darker minerals
1719'		Sandstone	light grey-white		Sandstone, quartz as above, 10% glauconite, pyrite, dark minerals, excellent sorting
1722'		Sandstone	light grey-white		Sandstone, as above, scattered mudstone cavings, glauconite in mudstone
1725'	NO SAMPLE				
1728'		Sandstone	light grey-white		Sandstone as above, fine-medium grained, traces course quartz grains, traces limonite stain
1731'		Sandstone	light grey-white		Sandstone as above, without glauconite, with pyrite
1734'		Sandstone	light grey		Sandstone as above, non calcareous, completely individual grains (all samples)
1737'		Sandstone	light grey		Sandstone as above, abundant mudstone cavings
1740'		Sandstone	light-medium grey		Sandstone, darker than above, silty throughout
1743'		Sandstone	light-medium grey		Sandstone as above, silty throughout, abundant cavings from mudstone

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE November 27/80 December 1/80 PAGE 10 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1746'		Sandstone			Sample appears to be entirely mudstone cavings
1749'		Sandstone	light-med gy		Sandstone, 90% light grey quartz, abundant mudstone cavings
1752'		Sandstone	light-med gy		Sandstone, very fine-fine grained, good sorting, non calcareous
1755'		Sandstone	light-grey, frosted		Sandstone as above, with traces glauconite, traces pyrite
1758'		Sandstone	light grey		Sandstone, 90% quartz as above
1761'		Sandstone	light grey, frosted		Sandstone 90% quartz, 5% glauconite, 5% darker minerals,
					non calcareous
1764'		Sandstone	light-med gy		Sandstone as above, fair sorting, non calcareous
1767'		Sandstone	light-med gy		Sandstone, very fine-fine grained, 90% quartz, 10% darker
					minerals
1770'		Sandstone	light-med gy		Sandstone, fine grained, 90% grey quartz grains, 10%
					glauconite, pyrite
1773'		Sandstone	light-med gy		Sandstone as above, traces course grained calcite grains
1776'		Sandstone	light-med gy		Sandstone 90% grey quartz, 10% darker minerals, fine grained,
					non calcareous
1779'		Sandstone	light gy-frosted		Sandstone as above, but lighter color, traces limonite staining,
					subround
1782'		Sandstone	light gy-frosted		Sandstone, as above, with traces course grain, angular calcite
					grains
1785'		Sandstone	light grey		Sandstone, 90% light grey quartz, 10% dark minerals, good
					sorting, non calcareous
1788'		Sandstone	light grey		Sandstone as above
1791'		Sandstone	light gy-frosted		Sandstone, 90% light grey-frosted quartz, 5% glauconite, fine
					grained, good sorting

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 10/80 LOGGED BY W.P. Lee DATE December 1/80 PAGE 11 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1797'		Sandstone	light gy-frosted		Sandstone, 90% quartz as above, very fine grained, subrounded-
					subangular, 5% glauconite, 5% accessories
1800'		Sandstone	white-frosted		Sandstone as above, minor course quartz grains
1803'		Sandstone	white-frosted		As above
1806'	NO SAMPLE				
1809'		Sandstone	light grey-white		Sandstone, 90% white quartz, 10% dark minerals, fine grained,
					slightly calcareous
1812'		Sandstone	light grey-white		Sandstone as above, 80% quartz, 20% darker minerals, fair sorting
1815'		Sandstone	light grey-white		Sandstone, as above
1818'		Sandstone	light grey-frosted		Sandstone, 80% quartz grains, 20% glauconite pyrite and other
					darker minerals, non calcareous
1821'		Sandstone	light grey-frosted		Sandstone,80% fine grained quartz, 20% fine grained other,
					good sorting, subrounded, non calcareous
1824'	NO SAMPLE				
1827'	NO SAMPLE				
1830'		Sandstone	light grey-frosted		Sandstone, 80% quartz as above, 20% glauconite, pyrite and
					other darker minerals
1833'		Sandstone	light grey-frosted		Sandstone, as above with traces course grained quartz, and
					traces of course calcite grains
1836'		Sandstone	light grey-frosted		As above
1839'	NO SAMPLE				
1842'		Sandstone	light grey-frsoted		Sandstone, quartz grains clear-frosted-white, fair sorting,
					subrounded
1845'		Sandstone	light grey-frosted		Sandstone, 93% quartz as above, 7% glauconite, pyrite, very
					fine-fine grained, good sorting

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 10/80 LOGGED BY W.P. Lee DATE December 1/80 PAGE 12 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1848'		Sandstone	wh-frosted		Sandstone, 93% quartz, as above, 7% as above, clean, completely
					individual grains
1851'		Sandstone	wh-frosted		As above, good sorting, subrounded, traces calcite fragments
1854'		Sandstone	wh-frosted		Quartz and accessories as above, very clean, very fine - fine
					grained, non calcareous
1857'		Sandstone	wh-frosted		As above, up to 1845 feet
1860'		Sandstone	wh-frosted		As above
1863'		Sandstone	wh-frosted		As above
1866'		Sandstone	wh-frosted		As above
1869'		Sandstone	wh-frosted		Sandstone, 95% clear-frosted-white quartz grains, very fine -
					fine grained, subrounded, good sorting, clean, non calcareous,
					completely individual grains, 5% combination of glauconite,
					pyrite flecks and other darker minerals, must be poorly cemented
1872'		Sandstone	wh-frosted		As above, with traces limonite staining on quartz grains
1875'		Sandstone	wh-frosted		As above
1878'		Sandstone	wh-frosted		As above
1881'		Sandstone	wh-frosted		As above, 90/10
1883'		Sandstone	wh-frosted		Sandstone, 95% white-frosted quartz, very fine - fine grained,
					subrounded - subangular, good sorting, clean, non calcareous,
					completely individual grains, traces limonite stained grains,
					traces course quartz grains, 5% subangular - angular glauconite
					grains, fine grained, remainder very fine - fine grained, sub-
					round - subangular darker minerals
1886'		Sandstone	wh-frosted		Sandstone as above with traces pyrite flecks

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 10/80 / BP 11/80 LOGGED BY W.P. Lee DATE December 1/80 / December 11/80 PAGE 13 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1889'		Sandstone	wh-frosted		Sandstone as above with minor amounts clear quartz grains
1892'		Sandstone	wh-frosted		Sandstone as above with limonite staining more abundant
1895'		Sandstone	wh-frosted		As above
1898'		Sandstone	wh-frosted		As above with traces course grain calcite grains
1901'		Sandstone	wh-frosted		As above with lesser amounts of limonite staining
1904'		Sandstone	wh-frosted		As above, very slightly calcareous
1907'		Sandstone	wh-frosted		As above, glauconite content increasing
1910'		Sandstone	wh-frosted		As above, clean
1913'		Sandstone	wh-frosted		As above with traces pinkish quartz grains
1916'		Sandstone	wh-frosted		As above
1919'		Sandstone	wh-frosted		Sandstone as above, with traces coal-soft, black, very shiny, crumbly
1922'		Sandstone	wh-frosted		Sandstone, as above, appears to be gradual coursening of grains
1925'		Sandstone	wh-buff		As above
1928'		Sandstone	wh-buff		As above, with scattered course quartz grains
1931'		Sandstone	wh-frosted		Sandstone as above with minor course quartz grains
1934'		Sandstone	wh-frosted		Sandstone as above, with traces course quartz grains, subround-subangular
1937'		Sandstone	wh-frosted		As above
1940'		Sandstone	wh-frosted		As above
1943'		Sandstone	wh-frosted		As above
1946'		Sandstone	wh-buff		Sandstone as above, with scattered light brown quartz grains
1949'		Sandstone	wh-buff		Sandstone as above with traces calcite grains
1952'		Sandstone	buff		Sandstone as above, with abundant limonite staining, traces coal

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-11/80 LOGGED BY W.P. Lee DATE Dec.11/80 PAGE 14 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
1955'		Sandstone	buff		As above
1958'		Sandstone	buff		As above with no coal
1961'		Sandstone	wh-buff		Sandstone as above with minor limonite staining, clean
1964'		Sandstone	wh-buff		As above
1967'		Sandstone	wh-buff		Sandstone as above
1970'		Sandstone	wh-frosted		Same description as 1883
1973'		Sandstone	wh-frosted		As above
1976'		Sandstone	wh-frosted		Exactly as above with traces calcite chips
1979'		Sandstone	wh-frosted		As above
1982'		Sandstone	wh-frosted		As above and slightly calcareous
1985'		Sandstone	wh-frosted		Sandstone as above
1988'		Sandstone	wh-frosted		As above
1991'		Sandstone	wh-frosted		As above
1994'		Sandstone	wh-frosted		Sandstone, 90% white-frosted quartz, very fine-fine grained,
					subround, good sorting, traces limonite staining, very slightly
					calcareous, 10% glauconite, pyrite and other darker minerals
1997'		Sandstone	wh-frosted		Sandstone, as above with minor light brown quartz grains
2000'		Sandstone	wh-frosted		As above
2003'		Sandstone	wh-buff		Sandstone as above with quartz grains from clear-white-buff-pink-
					dark brown
2006'		Sandstone	wh-frosted		Sandstone as in 1994
2009'		Sandstone	wh-frosted		Sandstone as above
	NO SAMPLES 2009-2040				

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP-11/80 LOGGED BY W.P. Lee DATE Dec.11/80 Dec.15/80 PAGE 15 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
2040'		Sand/Mudstone	wh-frost/dk gy		Sandstone: 85% clear-white-frosted-light brown quartz, subround,
		60%/40%			good sorting, 15% darker minerals. Mudstone: dark grey, non
					calcareous, traces pyrite flecks, traces listercated surfaces
2043'		Mud/Sandstone	light-med gy		90%/10%: Mudstone light-medium grey, silty throughout,
		90%/10%			slightly calcareous, traces pyrite flecks. Sandstone as above
2046'		Mud/Sandstone	light-med gy		90%/10%, as above
2049'		Mudstone	light-med gy		Mudstone, slightly calcareous, silty throughout
2052'	NO	SAMPLE			
2054'		Mudstone	light-med gy		Mudstone, scattered limonite staining
2057'		Mudstone	medium grey		Mudstone, silty throughout
2060'		Mudstone	medium grey		Mudstone, traces pyrite flecks, traces sandstone fragments
2063'		Mudstone	medium grey		Mudstone, as above with no sandstone fragments
2066'		Mudstone	medium grey		Mudstone, silty throughout
2069'		Mudstone	medium grey		Mudstone, medium grey, silty in part, traces pyrtie flecks
2072'		Mudstone	medium grey		Mudstone, traces calcite chips
2075'		Mudstone	medium grey		Mudstone, as above with traces fossil fragments
2078'		Mudstone	medium grey		Mudstone, silty, traces pyrite flecks
2081'		Mudstone	medium grey		Mudstone, as above
2084'		Mudstone	medium grey		Mudstone, traces glauconite
2087'		Mudstone	medium grey		Mudstone, silty in part, traces calcite chips
2090'		Mudstone	medium grey		Mudstone, scattered pyrite flecks, traces dark grey sandstone chips
2093'		Mudstone	medium grey		Mudstone, silty throughout, traces limonite staining, traces
					pyrite, traces sandstone as above
2096'		Sandstone	wh-frosted		Sandstone fine-medium grained, 95% clear-frosted white quartz,
					5% darker minerals

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE Dec.15/80 PAGE 16 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
2099'		Mud/Sandstone	medium grey		90%/10%. Mudstone (90%), medium grey, silty, sandstone as above
2101'	NO SAMPLES				
2104'		Mudstone	medium grey		Mudstone, silty throughtout, traces coal chips, scattered quartz
					grains
2107'		Mudstone	medium grey		As above
2110'		Mud/Sandstone	medium grey		80%/20%, Mudstone (80%) silty, traces pyrite, snadstone clear-
					white quartz grains
2113'		Mud/Sandstone	medium grey		80%/20% as above
2116'		Mudstone	med-dk grey		Mudstone, silty, traces calcite chips, non calcareous, traces
					glauconite
2119'		Mudstone	medium grey		Mudstone, silty throughout
2122'		Mudstone	medium grey		Mudstone, traces carby debris (rootlet?), silty
2125'		Sandstone	wh-frosted		Sandstone, fine-medium grain, subround-subangular, fair sorting,
					90% clear-frosted white quartz grains, 10% darker minerals,
					pyrite, glauconite and other dark grey-black grains, scattered
					limonite stains, non calcareous
2128'		Mudstone	medium grey		Mudstone, silty, throughout, non calcareous, traces coal chips,
					scattered fine grained quartz grains
2131'		Mudstone	medium grey		Mudstone, silty, traces coal spars, traces calcite grains,
					traces quartz grains
2134'		Mudstone	medium grey		Mudstone, silty in part
2137'		Mudstone	medium grey		Mudstone, as above
2140'		Mudstone	medium grey		Mudstone, slightly silty, non calcareous, traces coal spars,
					traces pyrite flecks
2143'		Mud/Sandstone	lg-med grey		50/50, Mudstone as above, Sandstone, 90% clear-light brown frosted

CHIP SAMPLE DESCRIPTION

VANCOUVER ISLAND 1980 PROJECT

BOREHOLE BP 11/80 LOGGED BY W.P. Lee DATE Dec 15/80 PAGE 17 OF 17

DEPTH (m)	% OF SAMPLE	ROCK TYPE	COLOR	GRAIN SIZE	COMMENTS
					quartz grain, subangular, fair sorting, non calcareous, fine-
					medium grain, 10% darker minerals
2146'		Mudstone	medium grey		Mudstone, slightly silty, non calcareous, traces pyrite flecks,
					scattered quartz grains
2149'		Mudstone	medium grey		Mudstone, as above, with scattered limonite stained chips
2152'		Mudstone	medium grey		Mudstone, slightly silty, traces pyrite flecks, scattered
					dark grey sandstone chips
2155'		Mudstone	medium grey		Mudstone, medium grey, slightly silty throughout, trace pyrite
					flecks, trace carbonaceous debris, trace calcite chips, trace
					dark-medium grey sandstone chips, non calcareous, minor
					listercated surfaces throughout, abundant steel fragments--
					indication of pipe stress
					END OF HOLE
					T.D. 2155 feet

BP CANADA

VANCOUVER ISLAND EXPLORATION

HOLE: PV-8

Contractor: F. H. Wall & H. Carter

Location: see below mE

Commenced: January 28, 1925

(UTM) mN

Completed: May 19, 1925

Collar: m^{+}_{-}

Core Size: Unknown

Geophysically logged: No

Overburden: Unknown m

Cemented: Unknown

TD: 289.26 m

LOCATION: In Hamilton Swamp, ca 4 chains s, 4 chains W of NE corner of Lot 3, Nwecastle District.

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
PENDER	100.13	
EXTENSION	104.85	4.72
HASLAM		184.41+

SUMMARY: Gas reported at 236.22 m.
"Pencil markings of coal" at 244.75 m.
Detailed log not available. Pender consists of shale, sandy shale and sandstone. Extension consists of conglomerate. Haslam consists of shale, sandy shale and sandstone.

BP CANADA

VANCOUVER ISLAND EXPLORATION

Contractor: Dogwood Drilling Ltd.

Commenced: Sept. 30, 1975

Completed: Oct. 6, 1975

Core Size: Rotary

Overburden: 18.29 m

HOLE: SKUJING WATER WELL

Location: mE

(UTM) mN

Collar: m±

Geophysically logged:

Cemented:

TD: 124.97 m

STRATIGRAPHY

UNIT	DEPTH TO BASE	THICKNESS
EXTENSION	92.66	74.37+
HASLAM		32.31+

SUMMARY: No coal seams. See driller's log for details (follows).

LOG OF V. SKUJING WATER WELL

D.L.80, Nanoose District, B.C.

LITHOLOGY

FROM	TO	DESCRIPTION	INTERPRETATION
0 m	0.6 m	Brown topsoil	
0.6	3.0	Brown sand	
3.0	6.1	Blue hardpan	
6.1	18.3	Light sandy hardpan	OB
18.3	21.9	Fine sandstone	KEx
21.9	26.5	Coarse conglomerate rock	
26.5	54.9	Brown shale with sandstone lenses	
54.9	60.0	Conglomerate	
60.0	82.3	Shale and sandstone	
82.3	92.7	Conglomerate and fine sandstone	KEx
92.7	94.5	(not recorded) (water) "¼ gpm"	KH
94.5	125.0	Sandstone and brown shale	

Total depth 125.0 m

From B.C. Dept. of Environment, Water Resources Service, Water Investigations Branch; Water Well Record #Nanoose X1 Y7 No. 13