

PR-Rocky Creek 81(3)A
Book 1

93P145
Drill hole Logs & Trenches
Rocky Creek
BP81-06 - BP81-19 inc. Book 1

620

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY CHOWDRY DATE 8 JUNE 1981 SHEET NO. 1 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	5.78			Casing, no recovery	
10-30	8.63	2.46	2.85	SANDSTONE/SILTSTONE - medium grey, sands (dominant) very fine-grained, highly argillaceous, calcareous, laminated, locally grading to silts, minor slump structures, minor erosional features, sporadic burrows and coal spars; core broken and locally weathered, gradational below. Core loss in this unit 0.39m	DD5.49
80-100	11.33	2.70	2.70	SANDSTONE - medium grey, top 0.9m very fine-grained and calcareous, remainder fine-grained; laminated and cross-laminated, local slumped laminae, intraclasts restricted to three zones - some of these clasts are well-rounded, other barely removed from the site of their origins; abundant carbonized plant material, overall coarsening of grain size downwards. Core broken.	DD8.23
90-120	16.78	5.45	5.45	SANDSTONE - medium grey, medium/coarse grained, top 0.8m fine grained and cross-laminated, bottom 0.75m fine grained with abundant coal spars, chert grains dominant, siliceous listric basal contact. Core broken.	0.06 DD11.28 2.54 DD14.33 0.55 DD14.94 2.30
	16.96		(0.18)	CORE LOSS - COAL	0.06m
	17.02	0.06	0.06	COAL - dull and breaks readily, fragmented.	DD17.37
	17.04	0.02	0.02	MUDSTONE - black, carbonaceous, grind marks	
	17.19	0.15	0.15	COAL - hard, dull banded, broken core.	
	17.44	0.25	0.25	MUDSTONE - slightly carbonaceous. Core broken.	
	17.67		(0.23)	CORE LOSS - COAL	
60-80	19.48	1.81	1.81	SILTSTONE/MUDSTONE - medium/dark grey, top 0.32m and bottom 0.35m mudstone, slightly carbonaceous, remainder laminated and rippled siltstones, tentacles of very fine grained sands, calcareous in places. Core broken.	

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COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY CHOWDRY DATE 8 JUNE 1981 SHEET NO. 2 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	19.75	0.27	0.27	COAL - dull, very hard, minor vitrinite streaks, core badly fragmented.	0.27m
	19.94		(0.17)	CORE LOSS - ROCK	DD20.42
	20.15		(0.21)	CORE LOSS - COAL	0.20
	20.23		(0.08)	CORE LOSS - ROCK	
	20.37	0.04	0.04	MUDSTONE - black, slightly carbonaceous, abundant carbonized plant fragments, grind marks at the bottom.	
	21.39	1.12	1.12	MUDSTONE - dark grey/black, very carbonaceous and thin coaly laminae, broken stick but at places listricated, gradational.	
	21.49	0.10	0.10	COAL - hard, dull, overall muddy but has considerable amount of vitrinite (dispersed as well as thin laminae), broken stick.	BP81/6/1/1
	21.57		(0.08)	CORE LOSS - COAL	
	21.58		(0.01)	CORE LOSS - ROCK	
	21.70	0.12	0.12	MUDSTONE - black, hard, sporadically carbonaceous, appears gradational, broken stick.	BP81/6/1/2
	21.87	0.17	0.17	COAL - dull, hard, locally lustrous, irregularly dispersed bright bands, some muddy intervals, broken core, listric surfaces.	BP81/6/1/3
	22.02		(0.15)	CORE LOSS - COAL AND ROCK	
	22.07	0.05	0.05	COAL - sheared, pulverized, type indeterminate.	BP81/6/1/4
	22.13	0.06	0.06	MUDSTONE - black, hard, somewhat canneloid, abundant thin bright laminae, stick.	BP81/6/1/5
	22.17	0.04	0.04	COAL - dull, lustrous, minor streaks of bright coal. Broken stick.	BP81/6/1/6
	22.27	0.10	0.10	COAL - dull lustrous, middle section with bright coal bands. Broken stick.	
	22.36	0.09	0.09	COAL - dull banded, cleats parallel to cone axis. broken stick.	
	22.39	0.03	0.03	MUDSTONE - black, carbonaceous, canneloid, minor bright streaks, stick.	BP81/6/1/7.

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COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY CHOWDRY DATE 8 JUNE 1981 SHEET NO. 3 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	22.45	0.06	0.06	COAL - dull, banded, stick, closely spaced cleats parallel to core axis. Abundant bright bands towards base.	
	22.57	0.12	0.12	COAL - dull, lustrous, hard, appears high ash, broken stick.	BP81/6/1/8
	22.62	0.05	0.05	COAL - highly sheared, pulverized, indeterminate.	
	22.76	0.14	0.14	COAL - badly fragmented and jumbled up, many fragments of dull lustrous coal.	
	22.78	0.02	0.02	MUDSTONE - dark grey, friable (might be due to shearing), small pieces and powdery. Grind marks on one piece.	
	22.81	0.03	0.03	COAL - dull banded, lustrous, large pieces.	DD23.47
	22.84		(0.03)	CORE LOSS - COAL	
	22.96		(0.12)	CORE LOSS - -ROCK	
	23.14	0.18	0.189	MUDSTONE - black, highly carbonaceous, broken core, some grind marks.	BP81/6/1/9
	23.26	0.12	0.12	COAL - dull banded, closely spaced dull and bright bands, white powdery lining on some of the cleats, broken core.	BP81/6/1/10
	23.50		(0.24)	CORE LOSS - COAL AND ROCK	
	23.70	0.20	0.20	MUDSTONE - black, carbonaceous, coaly laminae especially in middle 2cm broken stick.	BP81/6/1/11
	23.74	0.04	0.04	COAL - dull banded, broken stick.	BP81/6/1/12
	24.01	0.27	0.27	COAL/MUDSTONE - highly carbonaceous mudstone and dirty hard muddy coal with bright bands, broken stick.	BP81/6/1/13
	24.06		(0.05)	CORE LOSS - COAL AND ROCK	
	24.18		(0.12)	CORE LOSS - ROCK	
	24.88	0.70	0.70	MUDSTONE - dark grey, almost totally devoid of silts, closely lustricated throughout, basal 0.2m carbonaceous, core broken, but bottom core in contact with coal.	
	24.93	0.05	0.05	COAL - dull, hard, probably high-ash increasing bright laminae downward	

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BOREHOLE NO. BP81-06 LOGGED BY CHOWDRY DATE 8 JUNE 1981 SHEET NO. 4 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	24.97	0.04	0.04	COAL - bright fragmented but appears to have full recovery.	
	24.99	0.02	0.02	MUDSTONE - black, carbonaceous, broken core.	
	25.03	0.04	0.04	COAL - mostly bright, fragmented, small pieces.	
	25.06	0.03	0.03	MUDSTONE - dark grey, black, carbonaceous, broken core.	
	25.11	0.05	0.05	COAL - dull and bright, broken core.	
	25.16	0.05	0.05	COAL - dull banded, lustrous, broken core.	
	25.20	0.04	0.04	COAL - dull lustrous, minor bright bands, broken stick.	
	25.21	0.01	0.01	MUDSTONE - dark grey, carbonaceous, broken stick.	
	25.30	0.09	0.09	COAL - dull banded, broken stick, gradational.	
	25.83	0.53	0.53	MUDSTONE - dark grey/black, locally highly carbonaceous, abundant carbonized plant debris, few thin coal bands, broken stick but basal part in large pieces.	
	25.86	0.03	0.03	COAL - dull with thin bright bands, fragmented.	
	25.83	0.02	0.02	MUDSTONE - black, highly carbonaceous, large pieces.	DD26.52
	26.18		(0.30)	CORE LOSS - ROCK	
	26.44	0.26	0.26	MUDSTONE - black, carbonaceous, broken core, base in tact.	
	26.60	0.16	0.16	MUDSTONE - black, coaly mudstone with abundant widely dispersed bright laminae, broken stick, grind marks at base.	
	26.82	0.22	0.22	SANDSTONE - dark grey, very fine-grained, highly argillaceous, carbonaceous, riddled rootlets, siliceous, broken stick, gradational.	

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BOREHOLE NO. BP81-06 LOGGED BY CHOWDRY DATE 8 JUNE 1981 SHEET NO. 5 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	27.88	1.06	1.06	SILTSTONE - medium/dark grey, locally very argillaceous, sporadic rootlets, siliceous, devoid of lamination, broken core, gradational.	
	28.15	0.27	0.27	SANDSTONE - dark grey, very fine grained, argillaceous, relics of ripple lamination, very gradational, broken stick.	
	29.33	1.06	1.18	SILTSTONE/MUDSTONE - upper half dominantly muddy, remainder silty, entirely lacking lamination, occasional rootlets, rock ground around DD29.56, gradational. Core loss in this unit 0.12m	0.84 DD29.50 0.22
	29.80	0.47	0.47	SANDSTONE - medium grey, very fine-grained argillaceous and silty, highly burrowed and locally bioturbated, few ripples, calcareous, gradational, broken stick.	
	32.31	2.51	2.51	SILTSTONE/MUDSTONE - predominantly argillaceous, medium grey siltstone sporadically with small sandy ripples, few burrows, mudstones silty, occasional laminated, mostly lacking plant detritus, entire sequence non-calcareous, broken stick, gradational below.	2.05 DD32.61 0.46
	32.88	0.57	0.57	MUDSTONE - dark grey, little or no silty content, structureless, scarce carbonized plant detritus, basal contact slickensided, core broken.	
70-80	37.60	4.08	4.72	SANDSTONE/SILTSTONE/MUDSTONE - sands predominant; broadly interbedded sequence of medium/dark, very fine grained, laminated and micro-rippled, sandstone, micrograding, locally strongly calcareous, silts irregularly laminated, passing into silty mudstones. Minor disturbing of laminae, few isolated burrows, broken stick, gradational below. Core loss in this unit 0.64m.	1.93 DD35.66 2.15
	37.99	0.39	0.39	MUDSTONE - dark grey/black, lower half highly carbonaceous and minor coaly bands, otherwise structureless, broken stick, gradational at base.	

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COAL DIVISION

BOREHOLE NO. BP81-06LOGGED BY CHOWDRYDATE 8 JUNE 1981SHEET NO. 6 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	38.80		0.81	MUDSTONE - medium/dark grey, upper half riddled with rootlets, carbonized plant debris, listricated, remainder very silty, occasional plant debris, gradational, broken core.	
9 ⁰ -10 ⁰	39.63	0.83	0.83	SANDSTONE - medium grey, very fine-grained, argillaceous, silty interbeds, irregularly laminated, small units show microslumping, abundant carbonized plant debris, few burrows strongly calcareous, 0.15m mudstone, broken stick, abrupt below.	
	40.60	0.97	0.97	MUDSTONE - medium grey, upper 2/3 very silty, locally ferruginous, 4cm very fine-grained rippled sandstone, basal 0.28m listricated with plant matter, only sandstone calcareous, gradational. Core broken and basal sequence fragmented.	
	40.74	0.14	0.14	MUDSTONE - dark grey, highly silty, broken stick.	
	41.30	0.56	0.56	SANDSTONE - medium/dark grey, very fine-grained, silty/argillaceous, totally chaotic fabrics due to bioturbation, patchily calcareous, gradational, broken stick.	0.37 DD41.76 0.19
	42.56	0.76	1.26	MUDSTONE - dominantly black, slightly silty in upper sequence, basal 0.29m carbonaceous, listricated, broken stick, grind marks at base. Core loss in this unit 0.50m	
10-11 ⁰	47.44	4.88	4.88	SANDSTONE - light grey, fine-grained, very clean, well-sorted, dominantly quartzitic, weakly calcareous, cross-bedded. Top 0.49m dark grey, argillaceous with coal spars, some zones have slumped laminae, brief intervals of fine to medium-grained sands, gradual coarsening downward.	1.35 DD44.81 3.05 DD47.24 0.48
15 ⁰	54.20	6.76	6.76	SANDSTONE - medium grey, dominantly medium grained, locally coarse-grained, basal 1.46m very coarse sands, and gritty intervals, sporadic tiny silty intraclasts and coal spars, cross-bedded throughout, minor very fine-grained sandstone zones, patchily calcareous, some intervals apparently dominantly cherty abrupt basal contact.	2.39 DD50.29 3.00 DD53.34 1.37

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COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY CHOWDRY DATE 8 JUNE 1981 SHEET NO. 7 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	55.00	0.29	0.80	MUDSTONE - black, hard, carbonaceous, abundant carbonized plant debris, silty (especially upper half), gradational. Core loss in this unit 0.51m	
60-80	58.44	3.44	3.44	SANDSTONE/SILTSTONE - medium/dark grey, rapidly interlayered sequence of very fine grained sandstone and slightly argillaceous siltstone; cross-laminated and rippled throughout, occasional burrowing, locally abundant carbonized plant debris. Sandstone predominantly, strongly calcareous throughout; sand/silt contacts though generally gradual sometimes are deeply channeled.. Top 0.6m lacking lamination and shows sporadic chaotic fabrics - perhaps reworked sediments.	0.16 DD56.39 2.34 DD58.22 0.94
	59.26	0.82	0.82	MUDSTONE - black, highly silty, locally argillaceous silts, abundant carbonized plant fragments, brief discontinuous lamination, mostly calcareous, gradational.	0.56 DD60.04 0.26
	59.64	0.38	0.38	MUDSTONE - black, highly carbonaceous, 7cm thick ferruginous band. (top) with calcite precipitation around carbonized plant fragments, core broken and fragmented.	
	59.93		(0.29)	CORE LOSS - ROCK	
	60.01	0.08		MUDSTONE - black, very hard, coaly, fragmented.	BP81/6/2/1
	60.11	0.10	0.10	COAL - dull, hard, muddy, fragmented core.	
	60.20	0.09	0.09	COAL - badly fragmented, appears dominantly dull and bright coal.	BP81/6/2/2
	60.25	0.05	0.05	COAL - dull banded, lustrous, fragmented.	
	60.36	0.11	0.11	COAL - fragmented with small pieces, appears dominantly bright coal.	
	60.49	0.13	0.13	COAL - hard distinctly muddy, broken stick.	
	60.52	0.03	0.03	COAL - dull lustrous with abundant fine vitrinite laminae, large pieces.	

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COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY CHOWDRY DATE 8 JUNE 1981 SHEET NO. 8 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	60.55	0.03	0.03	COAL - dull and bright, broken core.	BP81/6/2/2
	60.60	0.05	0.05	COAL - dull banded, hard, broken core.	
	61.34	0.74	0.74	MUDSTONE - dark grey/black, highly carbonaceous, abundant plant fragments, 20cm highly silty zone, argillaceous, structureless, gradational at base.	
	61.88	0.54	0.54	MUDSTONE - medium/dark grey, abundant carbonized plant debris, rootlets leached appearance, basal 8cm very carbonaceous.	
	62.01	0.13	0.13	MUDSTONE - black, coaly, fragmented core.	
	62.40	0.35	0.39	MUDSTONE - dark grey, slightly carbonaceous, fragmented. Lost 0.04m.	DD63.09
	62.59	0.19	0.19	MUDSTONE - black, coaly, broken core.	
	62.69	0.10	0.10	COAL - dull and bright, broken stick.	
	62.76	0.07	0.07	MUDSTONE - black, very carbonaceous, minor coaly bands, broken stick.	
	63.20	0.44	0.44	MUDSTONE - dark grey, slightly silty, carbonaceous, very gradational below.	
50-60	64.90	1.70	1.70	SILTSTONE/MUDSTONE - medium/dark grey, dominance of silts, muds highly silty and locally slightly carbonaceous, sporadic lamination, carbonized plant fragments, patchily calcareous, gradational.	
	66.53	1.12	1.63	SANDSTONE - medium grey, very fine grained, laminated, cross-laminated and rippled, locally argillaceous, some dark laminae (occasioned by concentration of finely comminuted carbonized plant debris; strongly calcareous, abrupt and slightly erosional at base. Core loss in this unit 0.51m	0.14 DD66.14 0.98

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COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY CHOWDRY DATE 8 JUNE 1981 SHEET NO. 9 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	67.46	0.93	0.93	MUDSTONE/SILTSTONE - dark grey, dominantly muddy and locally carbonaceous and ferruginous. Calcareous in parts. Gradational.	
	67.72	0.26	0.26	SILTSTONE - dark grey, highly argillaceous, abundant carbonized plant debris, occasional laminated, calcareous, gradational.	
	68.29	0.48	0.48	SANDSTONE - top 0.2m very fine-grained, argillaceous and silty; remainder essentially very fine-grained, clean cross-laminated, strongly calcareous throughout, abrupt below.	
	69.38	1.18	1.18	MUDSTONE - dark grey, very silty especially top and bottom section, some lamination, slightly calcareous at top. Gradational at base.	0.32 DD69.19 0.86
	69.73	0.35	0.35	MUDSTONE - dark grey, black, abundant carbonaceous plant fragments, carbonaceous, mostly badly fragmented core.	
	69.77	0.04	0.04	COAL - bright banded, broken core.	
	69.83	0.06	0.06	MUDSTONE - black, slightly calcareous, abrupt with coal below.	
	69.86	0.03	0.03	COAL - mostly fragmented, mostly dull, some bright chunks of bright coal.	
	70.36	0.50	0.50	MUDSTONE - dark grey, plant fragments, silty, structureless, gradual at base.	
	70.41	0.05	0.05	COAL - bright banded, broken core.	
	70.46	0.05	0.05	MUDSTONE - black, very carbonaceous, coaly, broken stick.	
	70.52	0.06	0.06	COAL - bright banded, basal 1cm sheared with ankerite encrustation.	
	71.70	0.13	1.18	MUDSTONE - dark grey/black, locally highly carbonaceous, ferruginous, broken core.	1.05 DD72.24
	71.93		(0.23)	CORE LOSS - COAL AND ROCK	0.13

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COAL DIVISION

BOREHOLE NO. BP81-06LOGGED BY CHOWDRYDATE 8 JUNE 1981SHEET NO. 10 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	71.97	0.04	0.04	COAL - dull, hard, minor bright laminae, stick.	
	72.01	0.04	0.04	COAL - dull banded, dull and bright towards base. Stick.	
	72.90	0.89	0.89	MUDSTONE - dark grey, locally but predominantly black, carbonaceous and coaly. Gradational.	
	72.95	0.05	0.05	COAL - bright banded, broken stick.	
	73.03	0.08	0.08	MUDSTONE - black, top half very carbonaceous, gradational at base. Broken stick.	
	73.11	0.08	0.08	COAL - predominantly dull banded, broken stick.	
	73.28	0.17	0.17	MUDSTONE - dark grey, slightly carbonaceous, listric surfaces, broken stick, gradational at base.	
	73.33	0.05	0.05	COAL - highly fragmented and pulverized, white powder (Ankerite?).	
	73.59	0.26	0.26	MUDSTONE - black, carbonaceous, coaly, broken stick.	
	73.62	0.03	0.03	COAL - dull lustrous, banded, large piece.	
	73.69		(0.07)	CORE LOSS - COAL	
	73.87	0.18	0.18	MUDSTONE - black, locally very carbonaceous, thin bright coal bands, broken core, gradational.	
	73.94	0.07	0.07	MUDSTONE - black, hard, boney, minor vitrinite laminae, gradational at base, broken stick.	
	73.97	0.03	0.03	COAL - bright and bright banded, stick.	
	73.99	0.02	0.02	COAL - hard, dull lustrous, bright laminae, broken stick.	

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COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY W. P. LEE DATE 9 JUNE 1981 SHEET NO. 12 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				STARTING AT BOX 25	
	74.21	0.05	0.05	COAL - dull banded (dull 65/bright 35), broken stick, hard.	0.05m
	74.22	0.01	0.01	MUDSTONE - black, sil carbonaceous, listricated contact with coal below	0.01m
	74.30	0.08	0.08	COAL -dull banded, stick core, hard.	0.08m
	74.35	0.05	0.05	COAL - dull with minor bright bands, core, hard.	0.05m
	74.48	0.13	0.13	MUDSTONE - carbonaceous, black, broken stick, hard.	0.13m
	74.53	0.05	0.05	COAL - bright (vitrinite) hard, broken stick.	0.05m
	74.60	0.07	0.07	COAL - dull, very hard, probably high ash, stick core, gradational towards base.	0.07m
	74.67	0.11	0.11	MUDSTONE - carbonaceous, black, hard, stick, gradational towards base to cleaner mudstone.	0.11m
	74.72	0.05	0.05	MUDSTONE - dark grey, black, scattered coaly debris, throughout lower contact abrupt with lower mudstone in that lower mudstone non-carbonaceous, 5mm diameter plant fragments (stem - parallel to bedding) near base, coaly, debris is bright, hard, stick.	
	74.92	0.20	0.20	MUDSTONE - medium/dark grey, non-calcareous, frequent coal spars, broken stick, gradational at base becoming silty.	0.10 DD75.29 0.10
	77.67	2.75	2.75	SANDSTONE - light-medium grey, very fine-fine grained, non-calcareous, siliceous cementing, unit contains; 6 very fine grained silty bands up to 0.13m thick which are medium grey, clean, and non-calcareous; these units are all gradational at top and base into and out of the sandstone, traces of winnowing in sandstone otherwise is massive.	

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COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY W. P. LEE DATE 9 JUNE 1981 SHEET NO. 13 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	77.91	0.24		SANDSTONE - light/medium grey, very fine-fine grained slightly calcareous. Massive	0.22 DD78.33
3-90	83.69	5.78	5.78	SANDSTONE - light to medium grey, fine to very fine grained, with abundant darker silty laminae throughout, calcareous throughout, abundant cross-bedding, massive to thinly bedded at 1cm above base, bedding represented by slump (.22m of disturbance), at 1.25m above base, core break represented by stylitized sandstone, strongly calcareous at base, lower 46m contains abundant coal spars, lower contact abrupt. Broken stick.	0.02 3.05m 81.38 2.73
	85.45	1.61	1.76	SILTSTONE - medium grey, very fine grained, sandstone laminae in lower 0.37m, listricated calcite lined fracture at 0.05m above base, clean, gradational at base into coarser sequence, calcareous throughout broken stick. Core loss in this unit 0.15m	0.29m 84.43 1.32m
	87.22	1.77	1.77	SANDSTONE - medium grey, fine grained, thinly bedded, calcite lined (39°) fracture 0.49m from top, 0.12m above base, 0.37m unit where core is conical towards centre, core ground and broken to broken stick, calcareous and slightly calcareous at base.	1.65 87.48 0.12m
	88.30	1.08	1.08	MUDSTONE - dark grey-black, scattered silty bands throughout carby debris. Broken stick.	1.08
	88.33	0.03	0.03	MUDSTONE - dark grey to black, very carbonaceous with abundant very thin coal bands. Stick.	
	88.37	0.04	0.04	MUDSTONE - carbonaceous approaching coaly.	
	88.40	0.03	0.03	COAL - dull, lustrous, banded bright, stick.	
	88.42	0.02	0.02	COAL - bright, broken.	
	88.48		(0.06)	CORE LOSS - COAL	

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COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY W. P. LEE DATE 9 JUNE 1981 SHEET NO. 14 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	88.50	0.02	0.02	MUDSTONE - black, highly carbonaceous, abundant plant fragments, broken stick.	
	89.07	0.57	0.57	MUDSTONE - medium grey, very fine siltstone laminae, ripple drift with occasional coal spar, mudstone contains abundant vegetal matter, highly calcareous, basal contact quite abrupt, with basal section of unit much cleaner than above, broken stick.	
	89.17	0.10	0.10	MUDSTONE - dark grey to black, listricated surfaces, slightly calcareous badly broken (probable core loss).	0.10
	90.57	1.40	1.40	MUDSTONE - dark grey to black, contains abundant carbonized plant matter, calcareous, broken core.	0.39 DD90.22 1.01
	90.90	0.33	0.33	SANDSTONE - fine grained to medium grained, medium grey to dark grey, fining downwards sequence, abundant carbonaceous matter, several coal spars with pyritical matter vegetal matter, thin laminae, highly calcareous, fine grained light grey sandstones, gradational basal contact, broken stick.	0.33
	92.69	1.79	1.79	MUDSTONE - medium grey - dispersed carbonaceous plant fragments, patchily calcareous, some listricated surfaces infrequent mica fleck. 24cm from base of unit - mudstone highly brecciated zone 2cm in length cemented with calcite. Broken stick.	1.71 DD93.27 0.08
	96.03	3.34	3.34	SANDSTONE - fine to very fine grained, light to medium grey, slumped with worm burrows, some carbonaceous debris, strongly calcareous, some micro erosional features and slickensided surfaces. Broken stick.	2.98 DD96.32 1.36

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP06-81

LOGGED BY

DARREN TOMECEKDATE 11 JUNE 1981

SHEET NO.

15 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	98.56	1.45	2.53	MUDSTONE - dark grey to black, highly carbonaceous with a 15cm coaly sequence 0.75m from top of unit. Coal - dull lustrous, with canneloid muds, badly broken basal unit becomes silty mudstone, gradational, broken to ground. Core loss in this unit 1.08m.	
	98.45	0.89	0.89	SILTSTONE - dark grey, abundant carbonaceous debris with thin laminae, strongly calcareous, slightly argillaceous, some burrows and moderate slumping observed, gradational lower contact grading to mudstone. broken stick.	0.32 DD99.37 0.56
	100.10	0.65	0.65	MUDSTONE - dark grey to black - with abundant thin laminae of slightly calcareous silts in upper section of unit, grading down to mudstone, carbonaceous, some listric surfaces, broken core.	0.65
	100.15	0.05	0.05	MUDSTONE - black, with very thin bright coals, canneloid.	
	100.17	0.02	0.02	COAL - dull lustrous, bright banded.	BP81/6/3/1
	100.18	0.01	0.01	MUDSTONE - canneloid, stick.	
	100.19	0.01	0.01	MUDSTONE - black very carbonaceous.	
	100.20	0.01	0.01	MUDSTONE - canneloid.	
	100.22	0.02	0.02	COAL - dull and bright. Stick.	
	100.24	0.02	0.02	MUDSTONE - canneloid, abundant very thin bright coals.	
	100.28	0.04	0.04	COAL - bright banded, lustrous. Stick.	
	100.31	0.03	0.03	COAL - dull banded bright.	
	100.33	0.02	0.02	MUDSTONE - black very carbonaceous, abundant very thin bright coals, canneloid	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 11 JUNE 1981 SHEET NO. 16 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	100.35	0.02	0.02	COAL - bright	
	100.37	0.02	0.02	COAL - dull lustrous, stick.	
	100.39	0.02	0.02	COAL - dull lustrous, listric surfaces.	
	100.41	0.02	0.02	MUDSTONE - canneloid.	
	100.42	0.01	0.01	COAL - dull and bright.	
	100.45	0.03	0.03	COAL - dull lustrous. stick broken.	
	100.46	0.01	0.01	COAL - dull banded bright.	
	100.48	0.02	0.02	COAL - dull lustrous.	
	100.51	0.03	0.03	MUDSTONE - canneloid, banded bright, very thin coals, stick.	BP81/6/3/1
	100.52	0.01	0.01	COAL - bright banded lustrous. Broken.	
	100.55	0.03	0.03	COAL - bright. Broken stick.	
	100.57	0.02	0.02	MUDSTONE - canneloid, banded bright.	
	100.63	0.06	0.06	COAL - banded bright, stick.	
	100.67	0.04	0.04	MUDSTONE - black carbonaceous - canneloid, stick.	
	100.70	0.03	0.03	COAL - dull lustrous, banded bright.	
	100.74	0.04	0.04	MUDSTONE - canneloid.	
	100.76	0.02	0.02	COAL - bright, banded lustrous, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 11/12 JUNE 1981 SHEET NO. 17 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	100.78	0.2	0.02	MUDSTONE - black, highly carbonaceous, listricated, surfaces, broken.	
	100.82	0.04	0.04	MUDSTONE - canneloid, stick.	
	100.85	0.03	0.03	COAL - dull and bright.	BP81/6/3/1
	100.88	0.03	0.03	COAL - bright banded, lustrous, broken.	
	101.00		(0.12)	CORE LOSS - COAL	
	101.10		(0.10)	CORE LOSS - COAL AND ROCK	
	101.21	0.11	0.11	COAL - dull, lustrous with an increasing amount of bright bands in lower section.	BP81/6/3/2
	101.28	0.07	0.07	COAL - dull and bright.	
	101.30	0.02	0.02	COAL - bright, stick.	
	101.32	0.02	0.02	COAL - bright, broken.	
	101.34	0.02	0.02	COAL - dull, lustrous, pulverized.	
	101.42	0.08	0.08	COAL - bright, badly broken.	
	101.81	0.39	0.39	MUDSTONE - dark grey, abundant plant fragments, slightly silty displays some listric surfaces, gradational lower contact becoming coaly.	
	101.83	0.02	0.02	COAL - dull lustrous.	
	101.85	0.02	0.02	COAL - dull lustrous, banded bright, stick.	
	101.89	0.04	0.04	COAL - badly fragmented, dull and bright.	
	101.93	0.04	0.04	COAL - dull and bright.	
	101.94	0.01	0.01	MUDSTONE - canneloid, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06LOGGED BY DARREN TOMECEK/W. P. LEEDATE 12 JUNE 1981SHEET NO. 18 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	102.06	0.12	0.12	MUDSTONE - dark grey to black, plant fragments, coal spars, non-calcareous, broken stick.	0.12
	10.213	0.07	0.07	MUDSTONE/SILTSTONE - medium grey, muddy at top and silty at base, calcareous, stick. Possible core loss.	0.07 DD102.72
	105.57	3.32	3.44	SANDSTONE - very fine to fine, light to medium grey, abundant silty laminae scattered throughout thin bedded to massive calcite veining 130° to core axis. Broken to broken stick, badly ground in places, trace coal spars, strongly calcareous. Core loss in this unit 0.12m	3.07 DD105.77 0.25
	106.70	1.13	1.13	SILTSTONE - medium grey with scattered very fine grained sandstone laminae, slightly calcareous, core has been ground in places, trace calcite veins, trace coal spars, some listric surfaces, calcareous throughout, grading down to muddy at base. Broken.	1.13
	107.00	0.28	0.30	MUDSTONE - very carbonaceous, dark grey to black, non-calcareous, coal chunks noted, coal is hard dull and bright, ground sticks found in unit. Core is broken strick to badly fragmented, core loss 0.02m	0.28
	108.57	1.57	1.57	SANDSTONE - very fine to fine grained, light to medium grey upper 10cm silty, massive, clean, non-calcareous gradational basal contact, broken stick.	1.37 DD108.81 0.20
	111.48	2.91	2.91	SANDSTONE - fine to medium grained, light to medium grey, with abundant laminae of silty argillaceous medium grey in colour, worm burrows 5cm in length with ripple bedded sequences. 44cm above base is an argillaceous carbonaceous throughout, massive very fine grained sandstone section, non-calcareous, traces of calcite vining at top off fine grained sandstone. sequence is a 5cm medium grained dyke. Broken stick.	2.84 DD111.86 0.07

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY W. P. LEE DATE 12 JUNE 1981 SHEET NO. 19 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	111.64	2.16	2.16	SANDSTONE - very fine to fine grained, medium grey, thinly bedded with cross-beds, ripple marked, to slumped with badly distorted laminae containing medium grained light grey sandstone slumps with dark grey silty angular interclasts scattered throughout lower 28cm bioturbated, interclasts small scale slumping with distortion within bedding, very calcareous, broken stick.	2.16
	114.20	0.56	0.56	SILTSTONE/MUDSTONE - medium to dark grey, becoming muddy at base, quite clean at 0.56 top of unit gradationally becoming carbonaceous, with clasts of coal, argillaceous, listric surfaces along carbonaceous planes. Calcareous at top of unit.	0.56
	114.33	0.13	0.13	MUDSTONE - dark grey to black, very carbonaceous, abundant rootlets listric. Surfaces with ground core, abundant coal spars (max 1cm) broken to fragmented.	0.13
	116.85	2.52	2.52	SANDSTONE - very fine to fine grained, highly disturbed cross-bedded, ripple slumping 80cm above base is a 20cm dark grey muddy unit, contains very thin calcite veins. In sands, small interclasts, pyritized plant remains, bedding becomes massive at base, strongly calcareous, broken stick.	0.49 DD114.91 1.53
	118.11	1.26	1.26	SANDSTONE - very fine grained - medium grey, argillaceous, calcareous, a homogenous massive unit.	1.06 DD117.96 0.20
	120.42	2.37	2.31	SILTSTONE - medium to dark grey, trace carby debris throughout, some listric surfaces, scattered plant remains, (metasequoia?) 47cm core has been ground in places, calcareous in lower 90cm of unit with upper section non-calcareous.	2.37

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 12 JUNE 1981 SHEET NO. 20 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	120.69	0.27	0.27	SANDSTONE - very fine grained, light to medium grey, interbedded silts medium grey in colour, abundant carbonized plant fragments with occasional slumping, strongly calcareous, a few thin calcite viens. Stick.	0.27
	120.94	0.25	0.25	MUDSTONE - dark grey to black, abundant carbonaceous matter, slightly silty at top of unit, some listric surfaces, coal spars 1cm, non-calcareous, carbonaceous content increases in basal unit, broken stick.	0.13 DD121.01 0.12
	120.96	0.02	0.02	MUDSTONE - abundant carbonaceous matter, canneloid, broken stick.	
	120.99	0.03	0.03	COAL - dull lustrous, banded bright, broken stick.	
	121.05	0.06	0.06	COAL - dull lustrous, stick.	
	121.10	0.05	0.05	COAL - dull lustrous, banded bright, stick.	
	121.53	0.43	0.43	MUDSTONE - dark grey, carbonaceous, trace plant stems, grading downwards to silt, non-calcareous, broken stick grounded top, lower contact gradational.	
	121.86	0.33	0.33	SILTSTONE - medium grey, abundant plant stem fragments on coaly argillaceous, gradional lower contact into fine grain sand. Stick.	
	129.20	6.58	7.34	SANDSTONE - very fine to fine, light to medium grey massive to thinly bedded cross-bedded ripple bedded small scale slumping, unit silty in places, at base of sequence abundant coal spars, scattered calcite viens, winnowed? non-calcareous at top, calcareous throughout rest of unit, coal spars scattered throughout broken to broken stick. Core loss in this unit 0.76m	1.08 DD124.05 2.70 DD127.10 2.80 DD129.85

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 8 JUNE 1981 SHEET NO. 22 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				BOX 47 START	
	139.11	2.23	2.23	SANDSTONE/SILTSTONE (60:40) - very fine grained, light grey to medium grey, abundant laminae displaying a fining upwards sequence with minor erosional contacts, also noted are abundant ripple structures with micro-erosional features. Considerable slumping is noted throughout this unit. The upper section of this unit is strongly calcareous, basal member is lesser so and contains more carbonaceous material. (Broken stick).	DD139.30
	139.60	0.49	0.49	MUDSTONE - dark grey to black, highly carbonaceous, abundant vegetal matter, displays highly listricated surfaces also occasional coal spars (broken to ground core) (Possible core loss).	0.49
	140.42	0.82	0.82	SILTSTONE - dark grey, very argillaceous with abundant carbonized plant fragments and rootlets, non-calcareous, basal section shows gradational change to very fine sandstone. (Stick).	0.82
	142.47	2.05	2.05	SANDSTONE - very fine grained, medium grey - uppermost 90cm very clean and highly calcareous. 1cm diameter worm burrows found in basal 10cm. Occasional mica flecks - gradational contact.	1.49 DD142.34 0.56
	145.31	2.67	2.84	SANDSTONE - fine grained, medium grey, highly bioturbated containing worm burrows (pyritic), highly argillaceous, silts and sands, strongly calcareous, with calcite lined slickensides orientated possibly parallel to bedding planes, in the middle section of unit are abundant carbonized plant fragments, basal section predominantly siltstone with interclasts of fine grained, medium grey sandstone and carby muds. Basal contact erosional grading into fine grained sandstones. (Broken stick). Core loss in this unit 0.17m.	2.47 DD145.59 0.20

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 8 JUNE 1981 SHEET NO. 23 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	163.20	17.89	17.89	SANDSTONE - fine grained, light to medium grey, very clean, upper section contains interbeds of siltstone which are calcareous X-bedding has an inclination of 15° (average) middle section of unit slightly calcareous. Basal contact is abrupt. (Core is broken stick). (Possible small loss).	2.39 DD148.44 2.74 DD151.18 3.01 DD153.93 2.73 DD156.97 3.09 DD160.02 2.73 DD163.07 1.20
	165.16	1.58	1.96	MUDSTONE - dark grey, listricated surfaces with coal spars found in upper 0.21m of unit. Below this is 0.37m section of fine grained sandstone, medium grey, with large angular elongated (2-3 cm in diameter) interclasts of dark grey mudstone as described above. Subrounded pebbles of chert, largest having a diameter of 2.5cm. This is followed by another 18cm of muds as described still followed by a repeat of the mudstone elongated, angular interclasts in the fine grained, medium grey sandstone (1.03m) (core is broken with probable core loss). Core loss in this unit 0.38m	1.58 DD165.51
7°	177.90	12.74	12.74	SANDSTONE - medium grained, light to medium grey, abundant cross beds, with some showing signs of slumping, occasional micra flecks. 4.30cm from top of unit slightly calcareous. 4.42m from top of unit is a 90cm section containing coal spars (map width in core 1cm) and a slickensides this section also has pyritized plant material. 5.41m from top of unit a 90cm unit of sandstone as described above looting interclasts of dark grey, subrounded, non-calcareous siltstone with occasional coal spars 7.81m from top of unit a 0.25cm section of fine grained medium grey sandstone with abundant small coal spars grading up into a coarse grained sandstone, also sporatic sequences of conglomerate with well rounded clasts of chert and siltstone, light grey to medium grey, basal contact is abrupt with coal below. (stick core)	3.09 DD168.56 3.02 DD171.60 3.10 DD174.65 3.03 DD177.70 0.50

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 9 JUNE 1981 SHEET NO. 24 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	177.95	0.05	0.05	COAL - dull, lustrous, slightly sheared. Broken.	
	178.13		(0.18)	CORE LOSS - COAL	
	178.16	0.03	0.03	COAL - dull, lustrous, stick.	
	178.17	0.01	0.01	COAL - dull, lustrous, broken.	
	178.19	0.02	0.02	COAL - dull, banded, lustrous.	
	178.20	0.01	0.01	COAL - dull, lustrous.	
	178.22	0.02	0.02	COAL - dull, banded, lustrous.	
	178.24	0.02	0.02	COAL - bright.	
	178.30	0.06	0.06	COAL - bright banded, lustrous, stick.	
	178.81	0.41	0.51	MUDSTONE - dark grey, abundant carbonized plant material grading down to a dark grey silt with occasional mica flecks. (broken stick) Core loss in this unit 0.10m.	0.21 DD178.92 0.20
	179.20	0.39	0.39	SILTSTONE - medium grey - abundant thin muddy laminae with mica flecks throughout this unit, with an abrupt basal contact with abundant pyrite flecks.	
	179.23	0.03	0.03	MUDSTONE - black, canneloid, abundant thin bright coal bands.	
	179.26	0.03	0.03	MUDSTONE - black, carbonaceous, abundant thin bright coal bands, stick.	
	179.29	0.01	0.01	COAL - bright, badly broken.	
	179.38		(0.11)	CORE LOSS - COAL AND ROCK	
	179.40	0.02	0.02	MUDSTONE - black, carbonaceous, a few thin bright coal bands. (stick).	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06LOGGED BY DARREN TOMECEKDATE 9 JUNE 1981SHEET NO. 25 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	181.53	2.13	2.13	SILTSTONE - medium grey to dark grey, abundant thin dark grey muddy laminae displaying micro erosional features and some slumping, calcite along slickenside orientated parallel to bedding, highly calcareous (Broken stick).	2.13 DD181.97
	181.61	0.06	0.08	MUDSTONE - dark grey to black, carbonaceous, badly broken to ground; core loss in this unit 0.02m.	0.06
	182.50	0.89	0.89	SILTSTONE - medium to dark grey, abundant mudstone thin dark laminae, strongly calcareous lesser so in the darker grey basal section, a large listricated surface at 0.71m from the top of the unit.	0.89
	182.55	0.05	0.05	CANNELOID MUD - dull lustrous.	
	182.56	0.01	0.01	COAL - bright.	
	182.61	0.05	0.05	CANNELOID MUD - dull, lustrous.	
	182.65	0.04	0.04	COAL - dull, banded, lustrous stick. (possible core loss as next stick begins ground).	0.41
	182.70		(0.05)	CORE LOSS - COAL	
	182.79		(0.09)	COAL LOSS - ROCK	
	183.20	0.41	0.41	MUDSTONE - dark grey to black, abundant plant fragments.	0.05
	183.23	0.03	0.03	COAL - dull, lustrous	
	183.27	0.04	0.04	COAL - dull, lustrous, banded bright.	
	183.30	0.03	0.03	COAL - dull and bright.	
	183.33	0.03	0.03	COAL - dull, lustrous, banded bright. Stick.	
	183.42	0.09	0.09	COAL - dull, lustrous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 9/10 JUNE 1981 SHEET NO. 26 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	183.49	0.07	0.07 -	COAL - dull bright.	
	183.51	0.02	0.02	COAL - bright, stick.	
	183.55	0.04	0.04	COAL - bright, broken.	
	183.60		(0.05)	CORE LOSS - COAL	
	187.08	3.48	3.48	MUDSTONE - medium grey to dark grey uppermost 20cm carbonaceous containing abundant plant begins 30cm from top of unit a light grey silty calcareous laminae, bioturbated with occasional worm burrows. A non-calcareous emerald green mineral possibly apatite also found in small quantities in this section. 0.80cm from bottom of unit is a 23cm sheared and listricated sequence of mudstone with sections further down in the unit showing listricated surfaces also basal contact is abrupt. Stick to broken stick.	0.93 DD185.02 2.55
	189.11	0.03	0.03	MUDSTONE - dark grey to black, highly carbonaceous with occasional coal spars. Stick.	
	187.14	0.03	0.03	COAL - dull, lustrous, broken stick, probable core loss.	
	187.34		(0.20)	CORE LOSS - COAL AND ROCK	
	189.95	2.61	2.61	MUDSTONE - dark grey to black, occasional coal spar non-calcarious. 0.69m from top of unit mudstone argillaceous with abundant light grey to medium grey highly calcareous silts laminae with frequent worm burrows and micro-erosional features. and some slumping. Basal contact with coal below abrupt, core is broken stick.	0.45 DD189.06 2.16
	189.96	0.01	0.01	COAL - bright banded, lustrous.	
	189.98	0.02	0.02	MUDSTONE - black, carbonaceous with occasional coal spar; stick.	
	189.99	0.01	0.01	COAL - bright.	
	190.00	0.01	0.01	MUDSTONE - black, carbonaceous, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 10 JUNE 1981 SHEET NO. 27 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	190.02	0.02	0.02	COAL - bright.	
	190.03	0.01	0.01	COAL - dull, banded, bright.	
	190.05	0.02	0.02	COAL - dull and bright.	
	190.10	0.05	0.05	MUDSTONE - black, highly carbonaceous with occasional very thin band of bright coal, stick.	
	190.22		(0.12)	CORE LOSS - COAL AND ROCK	
	190.27	0.05	0.05	MUDSTONE - dark grey, abundant carbonized vegetal matter, broken stick	0.05
	191.78	1.51	1.51	SILTSTONE - medium grey to light grey, abundant thin laminae with interdispersed carbonized plant fragments; calcareous, bioturbated, broken stick.	0.48 DD191.11 1.03
	192.66	0.88	0.88	MUDSTONE - dark grey to black, abundant plant fragments, displays slickensided surfaces throughout the unit. Non-calcareous, broken stick.	0.88
	193.64	0.98	0.98	SILTSTONE - medium grey, very clean, occasional mica fleck, non-calcareous, broken stick.	0.98
	199.70	6.06	6.06	SANDSTONE - fine-grained, medium grey to light grey with upper 30cm being dark grey and non-calcareous, remainder is calcareous, cross-bedded with finer dark grey silts, abundant mica flecks, abrupt basal contact, stick.	DD194.16 3.02 DD197.21 2.95 DD200.26
	204.23	4.15	4.53	MUDSTONE - dark grey, contains abundant carbonaceous plant material and several coal spars, highly lustrated surfaces few burrows, basal contact abrupt, Broken stick. Core loss in this unit 0.38m	2.95 DD203.30 1.20

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-06 LOGGED BY DARREN TOMECEK DATE 10 JUNE 1981 SHEET NO. 28 OF 29

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	204.95	0.72	0.72	SANDSTONE/SILTSTONE (30:70) - very fine grained light grey, sandstone inter mingled with medium grey siltstone in a homogenous, structurally possibly non disturbed unit, non-calcareous, gradational lower contact. Stick.	0.72m
	207.41	2.46	2.46	SANDSTONE - fine grained, medium grey with upper 0.58m very clean and slightly calcareous calcite infilling along listricated surfaces, remainder of unit argillaceous with dark grey abundant thin laminae with observable slumping and cross-bedding, some carbonaceous debris in lower section of unit.	1.14m DD206.35 1.32m
	211.00	3.59	3.59	SANDSTONE/CONGLOMERATE - sandstone medium/coarse grained, medium grey saltland pepper with coarse grains being sub-angular, subrounded, some carby debris, found at top of fining upwards sequence. Conglomerates consists of rounded pebbels of medium to large quartzite and chert cemented by coarse granular sandstone very slightly calcareous. Occasional coal spar. Lower contact on unit abrupt. (stick).	1.55 DD209.40 2.04
	217.15	6.04	6.15	MUDSTONE - dark grey to medium grey, abundant carbonaceous plant debris highly listricated surfaces, plant debris is not found in the lower portion of this unit. Non-calcarious (Broken stick). Core loss in this unit 0.11m.	0.90m DD212.45 2.96 DD215.5 1.35 DD217.02 0.83
0-5 ⁰	221.20	4.05	4.05	SILTSTONE - medium grey, highly burrowed with abundant very thin laminae, displaying micro-erosional features and some possible slumping, highly calcareous with the basal section of this unit showing listricated surfaces, contact with conglomerate. Stick.	2.25 DD220.07 1.72 DD221.59 0.08

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 9 JUNE 1981 SHEET NO. 1 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.87		SILTSTONE - dark grey, very well cemented, strongly calcareous, sandy towards base. Blocky at top, with rusty stain along joints. Gradational.	0.87
130 at top		2.10		SANDSTONE - very fine-grained at top, grading down to fine-grained at base/SILTSTONE (60:40) - interlaminated, light to medium grey, rippled sandstone and dark grey siltstone, with rare phases of light grey fine to medium grained clean sandstone. Unit is moderately to strongly calcareous throughout. Locally abundant burrows; unit is slumped at base. Calcite band (0.01m @ 65° CA) at 0.39m below top. In basal 0.09m the siltstone component is darker grey and carbonaceous. Core locally broken with rusty joint faces; possible core loss. Abrupt.	0.14 DD 4.57 1.96
		1.33		SANDSTONE - medium to coarse-grained, light grey, with a few thin bands and intraclasts of dark grey to black, carbonaceous siltstone. This unit is moderately to well-cemented and is weakly calcareous with scattered dark stylolitic surfaces. One coal spar. Overall coarsening downward tendency; some large ripples. Abrupt.	1.03 DD 7.32 0.30
		1.01		CONGLOMERATE - granules and small pebbles, chiefly of chert with minor quartz, in a variable proportion of coarse-grained sand matrix. Weakly calcareous, moderately to well cemented. Abrupt.	0.30 DD 8.23 0.71
		0.12		SANDSTONE - very fine grained; silty, dark brownish-grey; non-calcareous, broken and ground at top. Abrupt.	0.12
		1.40		SANDSTONE - medium to coarse-grained; locally gritty, light to medium grey cherty, generally clean although some zones contain common laminae and interclasts of dark grey carbonaceous siltstone along with scattered coal spars. Stylolites; some large ripples. Patchily weakly calcareous. Abrupt.	1.40

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 9 JUNE 1981 SHEET NO. 2 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.51		GRITSTONE - well-sorted very coarse sand to granules, and rare small pebbles of grey chert with a few carbonaceous mudstone interclasts; moderately cemented and moderately calcareous. Ground at base; basal 0.09m consists of rusty-stained, medium-grained sandstone.	0.51
60		2.89		SANDSTONE - very fine-grained/SILTSTONE (80:20 at top, grading down to 50:50 at base) - thinly interbedded light to medium grey silty sandstone and dark grey siltstone. Occasional large burrows; locally rippled with slumping and microerosional sand/silt contacts. Sands strongly calcareous; silts weakly to non-calcareous. Gradational.	0.06 DD 37' 2.83
		0.24		MUDSTONE - dark grey, silty at top, carbonaceous at base. Basal contact not recovered.	0.24 DD 14.32
		0.59		MUDSTONE - medium to dark grey, crumbly, locally listricated; gradational.	0.59
		0.22		MUDSTONE - dark grey to black, carbonaceous; listricated at top; abrupt Broken stick.	0.22
		0.03		MUDSTONE - black, canneloid, abundant very thin and thin bright coal bands. Gradational. Stick.	
		0.43		MUDSTONE - dark grey to black, carbonaceous, listricated towards base. Occasional coal spars and thin-bright coal bands. Stick, broken towards base.	
		0.05		MUDSTONE - black, canneloid, abundant very thin bright coal bands. Stick	
		0.11		MUDSTONE - black carbonaceous, occasional thin bright coal bands; soft at top, harder below. Broken stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 9 JUNE 1981 SHEET NO. 3 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.04		COAL - bright, badly broken	
		0.02		MUDSTONE - black, canneloid, abundant very thin bright coal bands; gradational.	
		0.10		MUDSTONE - black, carbonaceous, scattered thin bright coal bands.	
		0.03		MUDSTONE - black canneloid, abundant very thin bright coal bands.	
		0.10		MUDSTONE - black carbonaceous, scattered very thin bright coal bands.	
		0.45		MUDSTONE - dark grey, carbonaceous at top, grading down to SILTSTONE argillaceous, at base; ferruginous phases and plant fragments throughout; calcareous. Gradational.	
		0.10		MUDSTONE - dark grey, slightly carbonaceous with a few thin bright coal bands. Silty at base. Stick.	
		0.38		MUDSTONE - dark grey, crumbly, locally listricated, silty at top. Broken stick.	
		0.04		MUDSTONE - dark grey to black, carbonaceous, with thin bright coal bands; some fragments of dark grey silty mudstone; badly broken and mixed in core box.	
		0.02		MUDSTONE - dark grey, carbonaceous, a few thin bright coal bands; broken stick.	
		0.06		MUDSTONE - dark grey to black, carbonaceous, a few thin bright coal bands, stick.	
		0.02		MUDSTONE - dark grey, carbonaceous, listricated, a few thin bright coal bands, broken stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7

LOGGED BY

C. BICKFORDDATE 9/10 JUNE 1981SHEET NO. 4 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.04		MUDSTONE - dark grey, carbonaceous, a few thin bright coal bands; stick.	
		0.12		MUDSTONE - dark grey, with abundant plant fragments. Stick.	
		0.05		MUDSTONE - dark grey, silty ferruginous, ground at top and base. Stick.	
	16.67	0.19		SILTSTONE/MUDSTONE (80:20) - finely interlaminated. Medium grey siltstone and dark grey mudstone with tiny plant fragments; strongly calcareous; broken stick.	
					DD17.37 Base of X5
	20.88		(4.21)	CORE LOSS - ROCK	
	21.33		(0.45)	CORE LOSS - COAL	
	21.77		(0.44)	CORE LOSS - ROCK	
	21.93	0.16		MUDSTONE - dark grey, silty, abundant plant fragments, non-calcareous. Abrupt.	
	22.96	1.03	1.03	SILTSTONE - medium to dark grey with delicately laminated very fine grained sandstone phases in top 0.48m; becoming argillaceous towards base. Moderately calcareous. Common plant fragments. Gradational.	0.84 DD23.47 0.19
	23.40	0.44	0.44	MUDSTONE - dark grey, silty, rubbly to splintery. Non-calcareous. Abrupt.	
	26.79	3.39	3.39	SANDSTONE - very fine-grained/SILTSTONE (70:30) - interbedded and interlaminated locally structureless, homogenized (slumped?) medium grey silty sandstone and dark grey, locally argillaceous siltstone. Some ripples towards base. Locally friable, with fractures sub- parallel to core axis. Some plant debris towards base. Non- calcareous. Gradational.	2.43 DD26.52 0.96

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JAN 1981 SHEET NO. 5 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
12 ⁰	30.06	3.27	3.27	SANDSTONE - very fine to fine-grained/SILTSTONE (70:30 grading down to 90:10) - interlaminated, rippled light grey sandstone and dark grey, argillaceous siltstone. Scattered coal spars and carbonaceous laminae, increasing in number towards base, with small silty intraclasts at base. Siliceous; non-calcareous. Abrupt.	2.14 DD29.56 1.13
	36.15	6.09	6.09	SILTSTONE/SANDSTONE - very fine to fine-grained (90:10 grading down to 40:60) - interlaminated and interbedded dark grey, locally argillaceous siltstone and light grey, rippled sandstone. Locally abundant burrows, including some possible pelecypod burrows. Non-calcareous. Abrupt.	1.85 DD32.61 3.10 DD35.66 1.14
	39.00	2.85	2.85	SILTSTONE/MUDSTONE/SANDSTONE - very fine-grained (75:20:5) - vaguely interbedded dark grey siltstone and silty mudstone with occasional phases of light grey rippled sandstone. Bedding largely obliterated by slumping; with some bioturbated zones. A few coal spars and possible rootlets. Gradational.	1.89 DD38.71 0.96
	39.89	0.89	0.89	MUDSTONE - dark grey, very silty at top, fining downward and becoming slightly carbonaceous towards base, with tiny plant fragments and rootlets. Gradational.	
	40.07	0.18	0.18	MUDSTONE - black carbonaceous with abundant thin bright coal bands towards base.	
	40.08	0.01	0.01	COAL - bright with penny bands of cannenoid mudstone. Stick	
	40.16	0.08	0.08	COAL - dull banded, lustrous, broken stick.	
	40.21	0.05	0.05	COAL - dull, lustrous, broken.	
	40.91	0.70	0.70	MUDSTONE - medium to dark grey, locally soft and crumbly with some lustrification and rootlets; probable seatearth mudstone. Non-calcareous; abrupt. Stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7LOGGED BY C. BICKFORDDATE 10 JUNE 1981SHEET NO. 6 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	41.01	0.10	0.10	MUDSTONE - dark grey, slightly carbonaceous with thin bright coal bands broken stick	DD41.76
	41.09	0.08	0.08	MUDSTONE - black, carbonaceous, with a few thin bright coal bands.	
	41.10	0.01	0.01	COAL - dull banded, lustrous, stick.	
	41.14	0.04	0.04	MUDSTONE - dark brownish-grey, stick.	
	41.23	0.09	0.09	MUDSTONE - dark brown to black, carbonaceous, homogeneous, with a few plant fragments. Stick. Ground at top.	
	41.63	0.40	0.40	MUDSTONE - dark brown to black and carbonaceous at top, becoming dark brownish-grey and slightly carbonaceous towards base. Some tiny plant fragments, with minor listrication towards base. Stick.	
	41.68	0.05	0.05	MUDSTONE - black carbonaceous, with abundant plant debris. Stick.	
	41.71	0.03	0.03	MUDSTONE - black, carbonaceous, listricated with one large coal spar, Broken stick.	
	41.73		(0.02)	CORE LOSS - ROCK	
	41.98	0.25	0.25	MUDSTONE - dark grey, slightly carbonaceous, crumbly; black and carbonaceous at top and base. Gradational.	
	42.06	0.08	0.08	COAL - dull banded lustrous.	
	42.10	0.04	0.04	MUDSTONE - black, carbonaceous, abundant plant debris, Gradational.	
	42.44	0.34	0.34	MUDSTONE - dark grey crumbly, locally listricated; slightly carbonaceous at base with thin bright coal bands; Gradational.	
	42.51	0.07	0.07	MUDSTONE - black canneloid with thin and thick, bright coal bands.	
	42.52	0.01	0.01	COAL - dull lustrous	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 7 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	42.55	0.03	0.03	MUDSTONE - black, carbonaceous with thin and thick bright coal bands.	
	42.59	0.04	0.04	MUDSTONE - black, canneloid with abundant very thin bright coal bands.	
	42.60	0.01	0.01	COAL - dull lustrous.	
	42.64	0.04	0.04	MUDSTONE - dark grey, carbonaceous.	
	42.66	0.02	0.02	MUDSTONE - black, canneloid, with abundant very thin bright coal bands.	
	42.67	0.01	0.01	MUDSTONE - black, carbonaceous, with very thin bright coal bands.	
	42.68	0.01	0.01	COAL - bright.	
	42.73	0.05	0.05	MUDSTONE - black, canneloid with locally abundant thin bright coal bands.	
	42.74	0.01	0.01	MUDSTONE - black, carbonaceous.	
	42.76	0.02	0.02	MUDSTONE - black, canneloid with thin bright coal bands.	
	42.78	0.02	0.02	COAL - dull banded, lustrous.	
	42.83	0.05	0.05	MUDSTONE - black, canneloid.	
	42.86	0.03	0.03	COAL - dull lustrous, sooty soft.	
	43.13	0.27	0.27	MUDSTONE - dark grey, listricated, gradational.	
	43.18	0.05	0.05	MUDSTONE - black, carbonaceous.	
	43.21	0.03	0.03	COAL - bright	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 8 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	43.30	0.09	0.09	COAL/MUDSTONE (50:50) - interlaminated bright coal and canneloid mudstone.	
	43.31	0.01	0.01	COAL - bright.	
	43.33	0.02	0.02	MUDSTONE - black, canneloid with very thin bright coal bands.	
	43.40	0.07	0.07	MUDSTONE - black, carbonaceous.	
	43.43	0.03	0.03	MUDSTONE - black, canneloid with very thin coal bands. Broken stick.	
	43.52		(0.09)	CORE LOSS - ROCK	
	43.56	0.04	0.04	MUDSTONE - black carbonaceous with abundant thin bright coal bands. Slightly listricated. Stick.	
	43.70	0.14	0.14	MUDSTONE - black, carbonaceous, slightly listricated, with a few thin bright coal bands.	
	44.02	0.32	0.32	COAL - dull, lustrous.	↑ BP81/7/1/1
	44.03	0.01	0.01	COAL - bright.	
	44.10	0.07	0.07	COAL - dull, lustrous.	
	44.11	0.01	0.01	COAL - dull and bright, lustrous.	
	44.13	0.02	0.02	COAL - dull lustrous. Broken stick.	
	44.16		(0.03)	CORE LOSS - COAL	↓ DD44.81
	44.23	0.07	0.07	COAL - dull lustrous, stick.	↑
	44.30	0.07	0.07	COAL - dull lustrous, hard, stick.	BP81/7/1/2
	44.34	0.04	0.04	COAL - dull banded, lustrous, hard; broken	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81.7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 9 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	44.37	0.03	0.03	COAL - dull banded, sooty.	
	44.40	0.03	0.03	COAL - dull, sooty.	
	44.72	0.32	0.32	COAL - dull lustrous. Stick.	
	44.75	0.03	0.03	COAL - dull lustrous. Stick.	
	44.81	0.06	0.06	COAL - dull banded; lustrous. Stick.	BP81/7/1/2
	44.82	0.01	0.01	MUDSTONE - black, canneloid, a few thin bright coal bands.	
	44.95	0.13	0.13	COAL - dull and bright, lustrous. Stick.	
	44.98	0.03	0.03	MUDSTONE - black, canneloid, abundant thin bright coal bands.	
	45.00	0.02	0.02	COAL/MUDSTONE (50:50) - interlaminated bright coal and black, carbonaceous mudstone.	BP81/7/1/3
	45.05	0.05	0.05	MUDSTONE - dark grey, rooty; carbonaceous in top 0.01m. Stick.	
	45.12		(0.07)	CORE LOSS - ROCK	
	45.16	0.04	0.04	COAL/MUDSTONE (50:50) - interlaminated bright coal and black, canneloid mudstone.	
	45.17	0.01	0.01	COAL - dull, lustrous.	
	45.19	0.02	0.02	COAL/MUDSTONE (50:50) - interlaminated bright coal and black, carbonaceous mudstone. Stick.	
	45.22	0.03	0.03	COAL/MUDSTONE (50:50) - interlaminated bright coal and black canneloid mudstone with abundant very thin bright coal bands.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 10 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	45.25	0.03	0.03	COAL/MUDSTONE - (50:50) - interlaminated dull banded, lustrous and bright coal with dark grey slightly ferruginous mudstone.	
	45.26	0.01	0.01	COAL - dull and bright lustrous.	
	45.34	0.08	0.08	MUDSTONE - black, canneloid, abundant thin bright coal bands.	
	45.41	0.07	0.07	MUDSTONE - black carbonaceous, a few thin bright coal bands; listricated.	
	45.42	0.01	0.01	COAL/MUDSTONE(50:50) - interlaminated, listricated, bright coal and black, canneloid mudstone.	
	45.44	0.02	0.02	COAL - bright.	
	45.46	0.02	0.02	MUDSTONE - black, canneloid, abundant very thin bright coal bands.	
	45.48	0.02	0.02	COAL/MUDSTONE (50:50) - interlaminated bright coal and black canneloid mudstone.	BP81/7/1/3
	45.51	0.03	0.03	COAL - bright banded lustrous. Listricated at base.	
	45.53	0.02	0.02	MUDSTONE - black, carbonaceous, abundant plant debris. Broken stick.	
	45.54	0.01	0.01	COAL - bright. Listricated at base.	
	45.55	0.01	0.01	COAL/MUDSTONE(50:50) - dull, lustrous coal, overlain by lens of black carbonaceous mudstone.	
	45.58	0.03	0.03	MUDSTONE - black, carbonaceous.	
	45.59	0.01	0.01	MUDSTONE - dark grey.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 11 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	45.61	0.02	0.02	MUDSTONE - black, carbonaceous, thin bright coal bands.	
	45.76	0.15	0.15	MUDSTONE - dark grey, slightly carbonaceous, scattered plant debris, a few thin bright coal bands; locally slightly ferruginous.	
	45.77	0.01	0.01	COAL - bright.	
	46.07	0.30	0.30	MUDSTONE - dark grey, slightly carbonaceous, scattered plant debris including some well-preserved leaves. A few thin bright coal bands; locally slightly ferruginous. Gradational.	
		0.04		MUDSTONE - black, canneloid with increasing amount of bright coal bands, base.	
		0.03		COAL - bright. Broken stick.	
		0.03		MUDSTONE - black, canneloid, with abundant thin bright coal bands. Broken stick.	
		0.02		MUDSTONE - black canneloid.	
		0.02		COAL - bright banded, lustrous, sheared.	
		0.03		MUDSTONE - black, carbonaceous, sheared.	
		0.03		COAL - dull, lustrous, sheared.	
		0.06		COAL - bright.	
		0.02		COAL/MUDSTONE - (50:50) - interlaminated bright coal and black, canneloid mudstone with abundant very thin bright coal bands.	
		0.03		MUDSTONE - black, canneloid very thin bright coal bands, listrictated at base	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 12 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.33		MUDSTONE - medium to dark grey, rooty, listricated, crumbly; possible seatearth mudstone. Gradational.	
		0.08		MUDSTONE - dark grey to black, carbonaceous, rooty, thin bright coal bands towards base.	
		0.04		COAL - bright banded, sheared.	
		0.03		MUDSTONE - black canneloid, sheared.	
		0.03		MUDSTONE - black, carbonaceous, listricated.	
		0.17		MUDSTONE - medium grey intensely listricated, crumbly; possible seatearth. Broken stick.	
		0.16		MUDSTONE - dark brownish-grey, rooty, listricated, soft. Broken stick.	DD47.85
		0.03		COAL/MUDSTONE (50:50) - interlaminated bright coal and black, canneloid mudstone. Stick.	
		0.04		MUDSTONE - black canneloid.	
		0.05		COAL - dull banded, lustrous.	
		0.04		MUDSTONE - black, canneloid. Stick.	
		0.03		MUDSTONE - black, canneloid, abundant very thin bright coal bands.	
		0.11		MUDSTONE - black, carbonaceous.	
		0.10		MUDSTONE - black, canneloid, abundant very thin bright coal bands. Stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 13 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.02		COAL - bright, broken.	
		0.02		MUDSTONE - black, canneloid, stick.	
		0.27		MUDSTONE - medium to dark grey, listricated, crumbly Possible seatearth.	
		0.14		MUDSTONE - dark grey to black, carbonaceous, rooty and listricated at top.	
		0.08		COAL - dull lustrous.	
		0.02		MUDSTONE - black, carbonaceous.	
		0.05		MUDSTONE - black, canneloid, abundant very thin bright coal bands. Stick.	
		0.04		MUDSTONE - black, canneloid with thin and thick bright coal bands. Broken and ground.	
		0.73		MUDSTONE - medium to dark grey, locally brownish-grey; listricated especially at top; rooty, crumbly, possible seatearth. A few thick bright coal bands. Broken stick.	
		0.01		COAL - bright, friable.	
		0.85		MUDSTONE - dark grey rooty plant debris, ferruginous phases, a few thin bright coal bands. Broken stick. Gradational.	
		2.42		MUDSTONE - dark grey, silty, occasional ferruginous phases, some roots locally splintery. Abrupt. Non-calcareous.	0.07 DD50.90 2.35

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 14 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
0°		0.28		SANDSTONE - very fine-grained/SILTSTONE (50:50) - interlaminated, rooty, light grey silty sandstone and medium grey siltstone. A few ripples. Gradational. Non-calcareous.	
		0.61		MUDSTONE - dark grey; silty and ferruginous at top; slightly carbonaceous at base. Some plant fragments. Non-calcareous. Gradational.	
		0.17		MUDSTONE - black, carbonaceous to canneloid; locally abundant thin bright coal bands.	
		0.12		COAL dull banded, lustrous, heavy, possibly high ash.	
11°		2.76		MUDSTONE/SILTSTONE (50:50) - interbedded locally interlaminated dark grey, silty, mudstone and siltstone; mudstone rich phases tend to be listricated. A few roots. Non-calcareous. Abrupt	2.57 DD57.00 0.19
		1.18		SILTSTONE - very sandy, light grey, non-calcareous; structureless; a few possible vague burrows. Non-calcareous. Gradational.	
13°		3.42		SANDSTONE - very fine to fine-grained/SILTSTONE (90:10) - rippled light grey sandstone with occasional silty phases and laminae. Bioturbated at top; some roots below. Some slickenside and calcite in lower third of unit; possible minor thrust at 1.02m above base. Moderately calcareous at top; strongly so below. Gradational.	1.33 DD60.04 2.09
8° at Base		10.90		SILTSTONE/MUDSTONE/SANDSTONE, very fine to fine-grained (45:40:15) - thin to medium interbeds of dark grey siltstone, silty mudstone (locally somewhat carbonaceous) and light grey, rippled sandstone. Some bioturbation is evident in sandstone/siltstone phases. Top 2.5m is non-calcareous, remainder is moderately to strongly calcareous. Gradational.	1.07 DD62.79 2.84 DD65.84 3.03 DD68.88 2.71 DD71.93 1.25

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7LOGGED BY C. BICKFORDDATE 10 JUNE 1981SHEET NO. 15 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
0to50		4.19		MUDSTONE/SILTSTONE (60:40 at top, grading down to 100:0 at base) - thinly interbedded dark grey mudstone and siltstone, locally with ferruginous bands. Common finely broken plant debris; unit is slightly carbonaceous at base. Occasional thin bright coal bands; minor listrication. Moderately calcareous at top, diminishing to non-calcareous at base. Gradational.	1.74 DD74.98 2.45
		0.17		MUDSTONE - black canneloid, locally abundant thin bright coal bands. Stick.	
		0.06		MUDSTONE - canneloid as above with some thick bright coal bands . Broken.	
		0.04		MUDSTONE - black, very carbonaceous, some thick bright coal bands. Broken stick.	
		0.09		COAL/MUDSTONE(50:50) - interlaminated bright coal and canneloid mudstone, Broken stick.	
		0.09		COAL - pulverised type indistiguishable.	
		0.05		COAL - sheared and pulverised - type indistinguishable.	
		0.13		COAL - bright. badly broken.	
		0.02		MUDSTONE - black, carbonaceous, a few thin bright coal bands. Stick.	
		0.05		MUDSTONE - black, carbonaceous, listricated, badly broken.	DD78.03
		0.75		SILTSTONE - dark grey, rooty, locally listricated, minor sandy phase in centre; some large plant fragments. Non-calcareous. Gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 16 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.35		MUDSTONE - dark grey, silty. Minor carbonaceous phases, some rootlets and ferruginous bands. Locally intensely listricated. Some badly broken and ground zones; possible core loss. Gradational. Non-calcareous at top, moderately calcareous towards base.	2.28 DD245'
					0.07
0to5°		0.25		SANDSTONE - very fine-grained/SILTSTONE/MUDSTONE (40:40:20) - interlaminated, rippled, light grey sandstone, dark grey siltstone and mudstone. A few tiny burrows and rootlets. Moderately calcareous. Gradational.	
		0.67		MUDSTONE - dark grey, very silty, moderately calcareous. Abrupt.	
		0.87		SANDSTONE - very fine-grained, medium grey, silty, rippled. Strongly calcareous; Abrupt.	
		3.76		MUDSTONE - dark grey, with occasional ferruginous mottles and bands; basal 1.0m is locally intensely intricated with sphaeroiditic phases; this interval is medium grey locally appearing somewhat "bleached". Some silty phases toward top of unit. Moderately to strongly calcareous at top; non-calcareous at base. Abrupt.	1.21 DD84.12 2.38 DD86.26 0.17
		0.14		MUDSTONE - black, carbonaceous, locally approaching canneloid with abundant thin bright coal bands. Gradational.	
		1.29		MUDSTONE - dark grey, locally very silty; plant fragments at top, minor carbonaceous intervals towards base. Locally listricated; some rootlets. Non-calcareous; gradational.	
		0.13		MUDSTONE - black, carbonaceous, a few thick bright coal bands. Broken stick.	
		0.03		MUDSTONE - black, canneloid, abundant very thin bright coal bands.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10 JUNE 1981 SHEET NO. 17 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.02		COAL - dull lustrous, hard. Broken stick	
		0.01		COAL - dull; white non-calcareous incrustation on cleat.	
		0.01		COAL - bright. Broken stick.	
		0.01		MUDSTONE - black, carbonaceous. Stick.	
		0.01		COAL - bright.	
		0.05		MUDSTONE - black, canneloid, locally abundant thin bright coal bands.	
		0.02		COAL/MUDSTONE (50:50) - interlaminated bright coal and black canneloid mudstone.	
		0.02		MUDSTONE - black, canneloid, very thin bright coal bands.	
		0.04		COAL - bright banded, lustrous. Stick	
		0.41		MUDSTONE - dark grey, carbonaceous, listricated, rooty, a few bright coal bands. Broken stick.	
		0.02		MUDSTONE - black, carbonaceous, minor bright coal bands.	
		0.01		COAL - bright. Stick.	
		0.04		COAL - bright. Broken.	
		0.02		COAL - bright.	
		0.01		MUDSTONE - black, canneloid.	
		0.01		COAL - dull lustrous. Stick.	

BP CANADA

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 10/11 JULY 1981 SHEET NO. 18 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.04		COAL - dull and bright, lustrous, with 0.002m lamina of black carbonaceous mudstone at top. Stick.	
		0.06		MUDSTONE - black, carbonaceous to canneloid, some thick bright coal lenses. Stick.	
		0.05		COAL - bright. Broken.	
		0.03		MUDSTONE - black, canneloid, abundant thin bright coal bands.	
		0.04		COAL - dull banded lustrous.	
		0.02		COAL - bright.	
		0.03		MUDSTONE - black, carbonaceous.	
		0.01		COAL - dull banded lustrous.	
		0.03		COAL/MUDSTONE (50:50) - interlaminated dull lustrous coal and black canneloid mudstone.	
		0.03		MUDSTONE - black, carbonaceous, abundant plant debris.	
		0.03		MUDSTONE - black, canneloid abundant thin bright coal bands.	
		0.03		COAL - bright.	
		0.01		MUDSTONE - black, canneloid.	
		0.01		COAL - bright.	
		0.02		MUDSTONE - black, carbonaceous, listricated.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7LOGGED BY C. BICKFORDDATE 11 JUNE 1981SHEET NO. 19 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.02		MUDSTONE - dark brown, ferruginous. Stick.	
		0.02		COAL - dull banded, lustrous. Broken.	
		0.11		MUDSTONE - dark grey, slightly carbonaceous, listricated. Stick.	
		0.18		MUDSTONE - dark grey, slightly carbonaceous, rooty, listricated. Broken stick.	
		0.01		COAL - dull lustrous, slightly sheared, broken.	
		0.17		MUDSTONE - dark grey, as above. Broken stick.	
		0.06		MUDSTONE - black carbonaceous, listricated, rooty, stick.	
		0.05		COAL - dull banded, lustrous, stick.	
		0.02		MUDSTONE - black, carbonaceous, bright coal bands. Stick.	
		0.02		COAL - dull and bright. Broken.	
		0.02		MUDSTONE - black, carbonaceous. Stick.	
		0.03		MUDSTONE - black, canneloid.	
		0.01		COAL - dull, lustrous. Stick.	
		0.03		MUDSTONE - black, canneloid. Stick.	
		0.02		COAL - dull banded, lustrous. Broken.	
		0.02		MUDSTONE - black carbonaceous, some very thin bright coal bands. Stick.	

BOX 30/31

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 11 JUNE 1981 SHEET NO. 20 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.15		MUDSTONE - black, carbonaceous.	
		0.03		COAL - dull banded lustrous. Stick.	
		0.02		MUDSTONE - black, carbonaceous, some very thin bright coal bands. Stick.	
		0.03		MUDSTONE - black, canneloid, abundant very thin bright coal bands. Stick.	
		0.07		COAL - dull, lustrous. Broken stick.	
		0.03		COAL - dull banded, stick.	
		0.04		COAL - dull. Gradational.	
		0.02		MUDSTONE - black, canneloid, carbonaceous stick.	
		0.02		COAL - dull lustrous, broken.	
		1.57		SANDSTONE - very fine grained, medium grey, silty, rooty at top, bioturbated. Top 0.02m carbonaceous. Non-carbonaceous at top, strongly calcareous towards base. Gradational.	
		2.85		MUDSTONE/SILTSTONE (70:30) - thickly interbedded dark grey mudstone, locally ferruginous and medium grey siltstone. Muds non-calcareous; silty, moderately to strongly calcareous; gradational.	0.19 DD92.66 2.66
		5.33		MUDSTONE - dark grey, silty in basal 1.5m, occasional thin carbonaceous phases, increasing in number towards base. Some lustrous zones. Gradational. Non calcareous except towards base, moderately so.	0.23 DD96.01 3.23 DD99.36 1.87

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 11 JUNE 1981 SHEET NO. 21 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		3.06		SILTSTONE/MUDSTONE/SANDSTONE - very fine grained (40:40:20) - interbedded medium grey siltstone, dark grey silty mudstone and light grey rippled sandstone. Locally bioturbated. Strongly calcareous. Abrupt.	0.93 DD102.72 2.13
		1.29		MUDSTONE - dark grey silty at top. Minor carbonaceous phases. Strongly calcareous except for basal 0.52m which is non-calcareous. Gradational.	0.29 DD105.16 0.41 0.59
		0.19		MUDSTONE - black, canneloid, abundant very thin, bright coal bands. Abrupt.	
		0.40		MUDSTONE - dark grey, non-calcareous. Abrupt.	
		0.04		MUDSTONE - black, canneloid, as above. Broken.	
		1.12		MUDSTONE - dark grey, silty, minor carbonaceous phases. Some ferruginous bands. Non-calcareous. Abrupt.	
		6.33		SILTSTONE/SANDSTONE - very fine grained (70:30) - interbedded, locally bioturbated medium grey argillaceous siltstone and light grey rippled silty sandstone. Strongly calcareous. Gradational.	0.12 DD108.2 1.98 DD110.2 3.06 DD113.3 1.17
		1.22		MUDSTONE - dark grey; basal 0.02m consists of siltstone. Top 0.26m is strongly calcareous; remainder is non-calcareous.	
		0.09		COAL - dull, lustrous. Stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 11 JUNE 1981 SHEET NO. 22 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.03		COAL - dull, lustrous. Stick	
		0.14		COAL - dull, lustrous, slightly sheared. Broken.	
		0.05		MUDSTONE - dark grey, ferruginous; ground. Stick.	
		0.10		COAL - dull lustrous, sheared. Broken.	
		0.01		MUDSTONE - black, carbonaceous. Broken.	
		0.93		SILTSTONE - dark grey, argillaceous, scattered plant fragments, with 0.20m mudstone phase rich in plant debris. Strongly calcareous; gradational.	0.24 DD116.4 0.69
		1.27		SANDSTONE - very fine grained, light grey, silty, rippled, locally slumped, some burrows. Strongly calcareous. Abrupt.	
		2.57		MUDSTONE - dark grey, very silty, minor phases of very fine grained rippled sandstone. Locally carbonaceous. Strongly calcareous. Gradational.	1.09 DD119 1.48
0-10°		1.38		SILTSTONE/SANDSTONE, very fine-grained, MUDSTONE (50:40:10) - thinly interbedded, locally burrowed, medium grey siltstone, light grey rippled sandstone and dark grey silty mudstone. Strongly calcareous. Abrupt.	
		0.25		MUDSTONE - black, carbonaceous, with thin bright coal bands. Badly broken and ground towards base. Possible core loss. Gradational	0.13 DD122.5 0.12
		2.19		MUDSTONE - dark grey, silty, locally grading to siltstone. Carbonaceous phases, toward top and base. Non calcareous. Gradational	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 11/12 JUNE 1981 SHEET NO. 23 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.76		SANDSTONE - fine-grained, light to medium grey, generally clean, with minor very fine grained silt phases. Rooty at top. Some large scale low-angle cross-lamination, with mica flecks and carbonaceous laminae. Very weakly calcareous. Erosional.	0.76 DD412' 1.00
		0.07		COAL - dull lustrous, broken stick.	
		0.06		COAL - dull, banded, lustrous, broken.	
		0.03		COAL - dull banded, lustrous.	
		0.08		COAL - dull lustrous.	
		0.05		COAL - dull banded, lustrous. Broken stick.	
		0.05		COAL - dull and bright, lustrous, Broken.	
		0.01		COAL - dull banded, lustrous.	
		0.05		MUDSTONE - black, carbonaceous. Stick.	
		0.04		MUDSTONE - black, carbonaceous.	
		0.01		COAL - dull lustrous, sheared, Stick.	
		0.04		COAL - sheared and pulverised.	
		0.05		MUDSTONE - dark grey; one thick bright band.	
		0.03		MUDSTONE - black, carbonaceous, fissile.	
		0.14		MUDSTONE - black, carbonaceous, locally listricated. Broken stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 12 JUNE 1981 SHEET NO. 24 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
90		2.16		MUDSTONE - dark grey, locally ferruginous, scattered rootlets, silty and sandy phases towards base, locally slumped. Non-calcareous. Gradational.	1.33 DD423' 0.83
		1.04		SILTSTONE - dark grey argillaceous at top becoming very sandy towards base. Locally bioturbated; overall vaguely stratified. Patchily, weakly calcareous at top, increasing below to strongly calcareous. Gradational.	
		1.25		SANDSTONE - very fine-grained, medium grey, silty, grading to siltstone at top. Some ripples although unit is generally slumped or bioturbated. Strongly calcareous. Abrupt.	1.21 DD433' 0.04
		0.87		SILTSTONE - medium grey, minor bands of very fine-grained sandstone and mudstone. Possibly some slumping; some burrows towards top. Strongly calcareous; abrupt.	
		2.58		SILTSTONE/MUDSTONE (70:30) - interbedded dark grey siltstone and silty mudstone. Locally rooty, non-calcareous. Abrupt	2.20 DD443' 0.38
		0.69		SANDSTONE - fine-grained, medium grey, large scale cross-laminated; minor silty phases. Non-calcareous. Abrupt.	
		2.34		SILTSTONE/MUDSTONE/SANDSTONE, very fine-grained - interbedded, locally burrowed medium grey siltstone, dark grey locally carbonaceous mudstone and light grey rippled sandstone. Strongly calcareous. Abrupt.	2.06 DD453' 0.28
		2.83		SANDSTONE - very fine-grained/SILTSTONE - (50:50 grading down to 80:20) - thinly interbedded locally rippled, generally bioturbated light grey sandstone and medium grey siltstone. Minor slumping. Some large (pelecypod?) burrows. Strongly calcareous; abrupt.	2.82 0.01

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 12 JUNE 1981 SHEET NO. 25 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.36		MUDSTONE/SILTSTONE/SANDSTONE - very fine-grained (40/40/20) - interbedded slumped dark grey mudstone, siltstone and medium grey silty sandstone. Strongly calcareous. Abrupt.	
		0.94		SANDSTONE - very fine grained, light grey, silty phases and dark carbonaceous laminae towards top. Large scale low-angle, cross-laminated, strongly calcareous. Abrupt.	
		0.80		MUDSTONE - dark grey, silty at base; core broken and ground, possible core loss. Gradational.	
		2.19		SILTSTONE/SANDSTONE - very fine-grained (50/50) - thickly interbedded dark grey rooty siltstone and silty sandstone. A few large burrows. Non-calcareous. Gradational.	
		5.04		SANDSTONE - fine to coarse grained, medium grey, large scale low-angle cross-laminated, locally convolute-laminated, some silty phases; Common intraclastic bands and occasional coal spars. Non-calcareous at top, becoming moderately to strongly calcareous below. Minor calcite veining. Abrupt.	
	80°	0.61		SILTSTONE - medium grey, sandy, massive. Moderately calcareous. Ground at base.	
	30° at top 80 to 100° (overturning) at 0.35m below top 50° at 0.80m below top. 0 to 5° at 2.66m below top.	4.23		SANDSTONE - fine to medium grained, locally coarse grained, minor silty carbonaceous phases. Scattered coal spars, some intraclast bands. Top 1.07m is a sheared and broken zone with calcite veinlets, with locally vertical to overturned lamination. Fault probable at 0.35m below top. Moderately to strongly calcareous. Abrupt. Probable core loss towards top.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 12/13 JUNE 1981 SHEET NO. 26 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
10 to 28°		4.13		SANDSTONE - very fine-grained/SILTSTONE (50:50) - thickly interbedded. locally bioturbated, rippled and slumped medium grey silty sandstone and dark grey siltstone. This unit is locally broken and slickensided with calcite veinlets and fracture fillings. Moderately to strongly calcareous. Abrupt.	1.43 DD516'
					2.70
11°		0.58		SANDSTONE - fine-grained/SILTSTONE (70:30) - interbedded light grey, cross-laminated sandstone and dark grey, argillaceous locally rippled siltstone. Sands weakly to moderately calcareous, silts non-calcareous. Abrupt.	0.20 DD526'
					0.38
		2.69		SANDSTONE - medium to coarse-grained, medium to dark grey, stylolitic, large-scale low-angle cross-laminated; minor silty phases towards top. Small coal spars at immediate base. Weakly calcareous at top; remainder is non-calcareous. Abrupt.	2.55 DD536'
					0.14
8° at top 0° at base		9.32		SILTSTONE/MUDSTONE (70:30) - interbedded medium to dark grey siltstone and dark grey silty mudstone. Minor bands of very fine-grained rippled sandstone. Bedding in this sequence is generally vague. Some rooty intervals. Some large burrows at base. Muds are non-calcareous; silts are moderately to strongly calcareous. Abrupt.	1.75 DD542'
					0.85
					2.39
					DD552'
					1.90
					DD558'
					2.40
					DD567'
					0.03
		3.76		SANDSTONE - very fine-grained/SILTSTONE (80:20) interbedded, locally severely slumped and homogenized medium grey silty sandstone and dark grey argillaceous siltstone. Locally rippled, rare rootlets. Near base are some mudstone intraclasts with a possible slump block of mudstone 0.14m along. Abrupt. Non-calcareous at top becoming strongly calcareous below	3.02 DD577'
					0.74

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7

LOGGED BY

C. BICKFORD

DATE 13 JUNE 1981

SHEET NO. 27 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
18 ^m at base		1.36		SILTSTONE - medium to dark grey with 40% thin bands of light grey, very fine-grained sandstone in basal 0.17m, fining upward to dark grey silty mudstone in top 0.10m. Non-calcareous. Abrupt.	
		13.75		SANDSTONE - medium-grained, light grey, clean throughout except in top 0.27 (grading to very fine-grained and silty) and basal 0.42m (fine to very fine-grained with carbonaceous laminae). Large-scale low-angle cross-laminated, with rare coal spars and silty intraclasts. On the whole a remarkably uniform unit. Abrupt; load structures at base. Very weakly calcareous.	0.91 DD587' 3.02 DD597' 2.99 DD607' 3.00 DD617' 0.64 DD619' 2.49 DD627' 0.70
		0.51		SANDSTONE - very fine-grained, silty, medium grey grading to dark grey silty mudstone at top and base with minor bright coal laminae. Weakly to moderately calcareous. Abrupt.	
	194.08	2.59		SANDSTONE - fine to medium-grained, locally silty, light to medium grey. Locally very abundant coal spars. Very fine-grained, silty and rippled in basal 0.10m. Weakly to moderately calcareous. Abrupt. Occasional stylolites.	1.72 DD637' 0.87
				TOP OF CADOMIN ZONE	
	194.50	0.42	0.42	MUDSTONE - dark grey, silty at top, carbonaceous at base, abundant finely broken plant debris throughout. Gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7LOGGED BY C. BICKFORDDATE 13 JUNE 1981SHEET NO. 28 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	194.63	0.13	0.13	MUDSTONE - black, lustrous, coaly, hard.	BP81/7/2/1
	194.77	0.14	0.14	COAL - dull lustrous very light.	BP81/7/2/2
	195.00	0.23	0.23	COAL - dull, lustrous, hard, stick.	
	195.08	0.08	0.08	COAL - dull, lustrous. Stick.	
	195.16	0.08	0.08	COAL - dull banded, lustrous. Stick.	
	195.26	0.10	0.10	COAL - dull, lustrous. Broken stick.	
	195.40		(0.14)	CORE LOSS - COAL	
				BASE OF CADOMIN ZONE?	
	195.45	0.05	0.05	SILTSTONE - black, carbonaceous. Gradational.	
	195.92	0.47	0.47	SANDSTONE - very fine-grained, dark grey, rippled, abundant silty laminae. Rooty; non-calcareous. Gradational.	
	196.22	0.30	0.30	MUDSTONE - dark grey, silty, thinly laminated. Abundant plant debris well-preserved leaves. Basal contact ground.	DD647 ¹
	196.39		(0.17)	CORE LOSS - ROCK	
	196.86	0.47	0.47	SANDSTONE - very fine-grained silty, medium grey, large-scale low-angle cross-laminated, grades to siltstone at top and base. Non-calcareous. Abrupt.	
	198.08	1.22	1.22	MUDSTONE - dark grey, silty, ferruginous phases. Non-calcareous. Locally carbonaceous, Gradational.	
	198.90	0.82	0.82	SANDSTONE - very fine to fine grained, silty, medium grey, grading to dark grey, sandy siltstone at top and base. Locally slumped. Some vague ripples and scours, and zones of delicate fine interlamination of sands and silts. Non-calcareous. Abrupt.	
				TOP OF LAKE ZONE?	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 13 JUNE 1981 SHEET NO. 29 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	199.02	0.12	0.12	MUDSTONE - black, canneloid. Stick.	BP81/7/3/1
	199.08	0.06	0.06	COAL - dull and bright, lustrous. Stick.	
	199.09	0.01	0.01	MUDSTONE - black, canneloid.	
	199.10	0.01	0.01	COAL - dull, lustrous.	
	199.11	0.01	0.01	COAL - bright. Stick.	BP81/7/3/2
	199.16	0.05	0.05	COAL - dull and bright, lustrous, stick.	
	199.17	0.01	0.01	COAL - dull and bright, lustrous. Stick.	
	199.21	0.04	0.04	COAL - dull and bright, lustrous, Stick.	
	199.22	0.01	0.01	COAL - dull and bright, lustrous,	
	199.28	0.06	0.06	COAL - dull lustrous. Stick.	
	199.30	0.02	0.02	COAL - dull, lustrous. Stick.	
	199.32	0.02	0.02	COAL - bright banded, lustrous. Broken.	DD657'
	199.34	0.02	0.02	MUDSTONE - black, canneloid.	
	199.39	0.05	0.05	MUDSTONE - dark grey.	
	199.43	0.04	0.04	MUDSTONE - black, canneloid, abundant very thin bright coal bands. Stick.	BP81/7/3/3
	199.47	0.04	0.04	MUDSTONE - dark grey carbonaceous, abundant plant debris. Stick.	

B.P. CANADA

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 13 JUNE 1981 SHEET NO. 30 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	199.51	0.04	0.04	MUDSTONE - carbonaceous, as above. Stick.	BP81/7/3/3
	199.56	0.05	0.05	COAL - dull, lustrous. Stick.	
	199.61	0.05	0.05	COAL - dull and bright, lustrous, hard. Stick.	
	199.65	0.04	0.04	COAL - dull lustrous. Stick.	BP/81/7/3/4
	199.67	0.02	0.02	COAL - dull and bright, lustrous, slightly sheared. Broken stick.	
	199.76		(0.09)	CORE LOSS - COAL	
	199.79	0.03	0.03	COAL - bright, slightly sheared.	
	199.80	0.01	0.01	COAL - dull, lustrous. Broken stick.	
	199.82	0.02	0.02	MUDSTONE - black, carbonaceous. Gradational.	
	200.60	0.78	0.78	SILTSTONE - dark grey, locally argillaceous. Carbonaceous at top. Rooty. Non-calcareous. Abrupt.	
	201.95	1.35	1.35	MUDSTONE - dark grey. Minor ferruginous mottles. Non-calcareous. Abrupt.	
	202.19	0.24	0.24	MUDSTONE - dark grey, slightly carbonaceous; gradational.	
	202.40	0.21	0.21	MUDSTONE - black, carbonaceous. Abundant very thin bright coal bands. Gradational	0.08 DD667' 0.13
	202.50	0.10	0.10	MUDSTONE - black, canneloid, abundant very thin bright coal bands. Abrupt.	
				BASE OF LAKE ZONE?	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-7 LOGGED BY C. BICKFORD DATE 14 JUNE 1981 SHEET NO. 31 OF 32

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.69		SILTSTONE - dark grey, very argillaceous towards top. Black and carbonaceous with thin bright coal bands in top 0.02m. Scattered thin bright coal bands. Weakly calcareous. Abrupt.	
				CADOMIN FORMATION	
13 ⁰		7.14		SANDSTONE - fine to very coarse grained/GRITSTONE (80:20) - interbedded sandstone, locally silty and gritstone with rare small pebbles. Unit is dominately thick-bedded and devoid of lamination, with rare thin-bedded, ripples sandstones. Locally abundant silty intraclasts with rare coal spars. Moderately (locally strongly calcareous). Abrupt. Occasional stylolites.	2.15 DD677' 0.73 DD679' 0.53 DD681' 1.74 DD687' 1.99
		0.59		SILTSTONE - dark grey, grading down to very fine-grained sandstone with abundant muddy intraclasts. Sands locally calcareous; unit otherwise non-calcareous. Abrupt.	
		4.94		SANDSTONE - medium-grained, locally fine-grained; clean, light to medium grey, medium and large-scale low-angle cross-laminated. Rare granules and pebbles; some coal spars and carbonaceous laminae, notably in top half. Weakly to moderately calcareous; gradational.	0.41 DD697' 3.06 DD707' 1.47
		5.86		SANDSTONE - fine to coarse grained/CONGLOMERATE (65:35) - thickly interbedded, light to medium grey, low-angle, cross-laminated clean sandstone and sandy, granule to pebble-conglomerate. Maximum clast size 45mm. Minor local concentrations of coal spars; at top of one conglomeratic band are large coal spars and ?roots, suggesting at least minor plant growth. Weakly to moderately calcareous. Abrupt.	1.61 DD717' 3.02 DD727' 1.23
				MINNES GROUP BICKFORD FM	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY W. P. LEE DATE 13 JUNE 1981 SHEET NO. 1 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				BOX 1	
		0.84		SANDSTONE - light to medium grey, very fine to fine grained, becoming silty at base, thinly bedded, rippled bedding, cross bedding, small scale slumping, carbonaceous plant fragments scattered throughout, some fragments pyritized along edges, strongly calcareous throughout, stick to broken stick.	0.84
		1.01		SILTSTONE - medium grey, scattered carbonaceous debris throughout, minor ferruginous band (0.5cm) in middle of unit, gradational at top and base to very fine sandstone, ferruginous staining scattered throughout lower half of unit.	0.40 DD17.37 0.61
		1.02		SANDSTONE - light to medium grey, fine to medium grained, bedded (up to 5cm), rippled, winnowed, trace carby root debris micro erosional contact at base, strongly calcareous throughout, 0.17m from top weathered ferruginous zone 0.25m.	1.02m
		0.30		SANDSTONE - medium grey, fine grained, massive, clean, strongly calcareous, stick.	0.30m
		0.23		SANDSTONE - light to medium grey, fine to medium grained, thin bedded rippled and winnowed, small scale cross-beds, abrupt, lower contact, stick, calcareous throughout.	0.23m
		0.14		SANDSTONE - medium grey, fine grained, very fine in parts, 1 silty band 0.5cm thick, 3cm from base, strongly calcareous throughout, massive, upper and lower contact abrupt, trace rooty debris.	0.14m
		0.18		SANDSTONE - light to medium grey, fine to medium grained, bedding highly distorted at base, slumped and winnowed, clasts up to 0.5cm diameter, very thin calcite veining near and at base, abrupt lower contact, strongly calcareous throughout.	0.18m

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY W.P. LEE/DARREN TOMECEK DATE 13/14 JUNE 1981 SHEET NO. 2 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.32		SANDSTONE - medium grey, fine grained to very fine grained, massive, scattered pyritized plant material, strongly calcareous with occasional very thin calcite veining at base. Stick.	0.32m
		1.25		SANDSTONE - very fine to fine grained, medium grey, abundant thin silty laminae displaying micro erosional features with some small scale slumping, scattered carbonized plant impressions, some pyritized, strongly calcareous, broken stick, core ground in places.	0.12m DD20.42 1.13
		0.29		SILTSTONE - medium to dark grey, muddy laminae, medium grey, abundant carbonaceous matter, moderately calcareous, core ground in some places, broken stick.	0.29
		1.53		MUDSTONE - medium grey, abundant plant fragments, core is broken stick to badly fragmented.	1.35 DD23.47 0.18
		1.12		MUDSTONE - light grey, bleached appearance, easily crumbled, some plant fragment increasingly so towards base of unit, in basal 3cm of unit a light grey brownish mud, core is broken stick to badly fragmented.	1.12
		0.62		MUDSTONE - dark grey to black, abundant plant fragments with occasional coal spar, rootlets, some listric surfaces near base of unit, broken stick.	0.62
		0.03		COAL - dull, lustrous, stick.	0.09
		0.06		MUDSTONE - dark grey, very carbonaceous with thin bright bands of coal, canneloid broken stick.	
		0.58		MUDSTONE - medium grey, abundant plant fragments, listrication, occasional coal - bright (spar) at base of unit, broken stick.	0.58

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 14 JUNE 1981 SHEET NO. 3 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.14		MUDSTONE - dark grey, highly carbonaceous with several bands of coal and mudstone 4cm in width, maximum measured was 8cm of bright, dull, lustrous coal with interbedded muds, core badly broken, possible loss.	0.05 DD26.52 1.09
		0.64		MUDSTONE - dark grey, abundant carbonaceous vegetal matter with very thin, wispy bands of bright coal in upper section of unit. Rootlets in lower section gradational, basal contact, broken stick.	0.64
		2.37		SILTSTONE - medium grey, scattered plant fragments with very thinly bedded sandstone laminae, very fine grained light grey in colour, strongly calcareous, stick.	0.29 DD29.57 2.08
26 ⁰		0.66		SANDSTONE/SILTSTONE (70:30) - light to medium grey, very fine to fine grained, thinly interbedded sands and silts, strongly calcareous, stick	0.66
		1.18		SILTSTONE/SANDSTONE - medium, grey silts interbedded with light grey, fine grained sandstone displaying load structures at top of section, locally slumped, rippled cross bedding, strongly calcareous, stick.	0.32 DD32.61 0.86
20 ⁰		1.27		SANDSTONE - very fine grained at top coarsening downwards to medium grained at base, medium grey to light grey, top of unit silty sandstone, interbedded siltstone, 30cm from top of unit is a medium grained sandstone dyke passing through a dark grey silty layer (appears to be out of place), abundant pyrite in middle of unit, basal contact erosionally abrupt, strongly calcareous, broken stick.	1.27
		2.29		SANDSTONE - light to medium grey, another coarsening downwards sequence, very fine grained at top of unit becoming coarse grained near base, top of unit silty very fine grained sandstone with abundant very thinly interbedded silts some carbonaceous debris, medium grained sandstone contains several coal spars, some listricated surfaces, abrupt contact, broken stick calcareous in upper fine section non-calcareous in lower coarse section.	0.86 DD35.66 1.43

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 14 JUNE 1981 SHEET NO. 4 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.08		SANDSTONE - light grey to medium grey, fine grained at top coarsening downwards into a coarse grained sandstone, some listricated surfaces, in middle of unit are abundant thin carbonaceous laminae, followed by a 30cm section of quite clean medium grained sandstone, the basal coarse grained sandstone are quite argillaceous with angular carbonaceous grains as a constituent the lower contact is again erosionally abrupt with clasts of underlying silty sands floating in coarse grained sandstone, moderately calcareous, broken stick.	1.49 DD38.71 0.59
15 ⁰		4.76		SANDSTONE - medium grey to light grey, very fine grained, coarsening downwards to very coarse grained near base, top 70cm of unit a massive fine grained sandstone, medium grey with some scattered carbonaceous debris in upper 40cm. Thinly bedded medium grained sandstone with carbonaceous laminae, occasional coal spar. In the basal 1 meter are several stylolites found in the coarse to very coarse sandstones, base of unit is a pebble conglomerate with subrounded pebbles of up to 1/2cm in diameter, basal contact erosionally abrupt, slightly calcareous at top and base remainder non-calcareous, broken stick.	2.34 DD41.76 2.42
		0.44		SILTSTONE/SANDSTONE (40:60) - dark grey siltstone with interbeds of fine grained light grey sandstone in upper 18cm of unit, sandstone begins to dominate coarsening downwards to a medium grained argillaceous salt and pepper sandstone, abundant carbonaceous debris throughout this section strongly calcareous lower half of unit, upper half non-calcareous, broken stick.	0.44
		5.26		SILTSTONE/MUDSTONE - medium grey to dark grey, upper 50cm interbedded with very fine grained sandstone, light grey abundant carbonaceous plant fragments, slumping with micro-erosional features, scattered coal spars, upper 80cm strongly calcareous, middle of unit is a muddy siltstone, scattered plant fragments, pyrite, structureless with some listrication and more abundant carby debris in the dark grey muddy sequences, middle and basal unit non-calcareous, broken stick to badly broken	0.16 DD44.81 2.94 DD47.85 2.16

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 15 JUNE 1981 SHEET NO. 5 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		8.30		SILTSTONE/SANDSTONE (50:50) - medium grey, very fine grained sandstone, rootlets in upper most 40cm, also some very thin calcite veining, worm burrows throughout unit, scattered zones of slumping, dispersed carbonaceous vegetal matter, strongly calcareous, stick	0.94 DD50.90 3.03 DD53.95 3.04 DD57.00 1.29
20 ⁰		1.03		SANDSTONE - fine grained at top of unit coarsening downwards to medium to coarse grained at base. Light to medium grey with some silty laminae at top of unit, slumped, occasional coal spars, very thin calcite veins, sparse, angular dark grey silty interclasts 1cm in diameter, strongly calcareous, broken stick.	1.03
		0.88		SANDSTONE/SILTSTONE (50:50) - fine-grained to medium grained, medium grey interbedded sands and silts some carby debris, scattered rootlets, slumped near base of unit, strongly calcareous, broken stick, fragmented.	0.56 DD60.05 0.32
		0.80		MUDSTONE - argillaceous at top of unit, silty, becoming almost homogeneous at base, dark grey to black, abundant carbonized plant debris friable, non-calcareous abrupt basal contact with underlying coals, badly broken stick.	0.80
		0.18		COAL - bright, banded, lustrous, badly fragmented, probable core loss.	
		0.02		COAL - bright banded, lustrous.	
		0.09		COAL - dull banded, lustrous some pyrite flecks, stick.	
		0.07		COAL - dull banded, lustrous, stick.	
		0.04		COAL - bright banded, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 15 JUNE 1981 SHEET NO. 6 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.06		COAL - dull and bright, badly fragmented, pulverized, possible core loss.	DD62.48
		0.38		SANDSTONE - fine grained, medium grey, abundant rootlets, with some carbonized plant remains, pyrite, small highly angular clasts of dark grey silts, strongly calcareous. Core is ground at top of unit, stick.	
		0.35		MUDSTONE - dark grey to black, silty at top of unit, very abundant carbonaceous debris throughout, several very thin calcite veins through middle section, listricated surfaces, becoming silty at base 10cm calcareous, broken stick.	0.35
200		1.58		SILTSTONE - medium grey some carby debris throughout with lower 70cm laminated with fine ground light grey sandstone, slumped, basal contact abrupt with underlying mudstone, stick, strongly calcareous.	1.58
		0.69		MUDSTONE - dark grey to black, top 26cm of unit structureless, remainder is silty with scattered carbonaceous debris, strongly calcareous, broken stick.	
		0.05		COAL - dull lustrous, stick.	DD65.84
		0.02		MUDSTONE - dark grey to black, carbonaceous.	
		0.03		COAL - dull lustrous, stick.	
		0.02		MUDSTONE - dark grey to black, highly carbonaceous, canneloid, stick.	
		0.04		COAL - dull lustrous, stick.	
		0.04		COAL - dull, lustrous, badly fragmented.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 15 JUNE 1981 SHEET NO. 7 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.03		MUDSTONE - black, carbonaceous.	
		0.02		COAL - dull banded.	
		2.90		SILTSTONE/SANDSTONE (50:50) - medium grey siltstone with fine grained light grey interbedded sandstone, upper 90cm of unit contains rootlets and other scattered carby debris, slumped, moderately calcareous at base with upper sequence non-calcareous abrupt basal contact with underlying coal, broken stick.	2.85 DD69.19 0.05
		0.03		COAL - dull banded, lustrous, hard, stick.	
		0.04		COAL - dull, lustrous, stick.	
		0.02		COAL - dull lustrous, stick.	
		0.04		COAL - dull, lustrous, stick.	
		0.02		COAL - dull, lustrous, stick.	
		0.05		COAL - dull and bright, stick.	
		0.05		COAL - dull, banded, lustrous, stick.	
		0.02		COAL - dull, lustrous.	
		0.02		MUDSTONE - black, highly carbonaceous.	
		0.03		COAL - dull, lustrous.	
		0.02		COAL - dull.	
		0.02		COAL - dull and bright, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 14 JUNE 1981 SHEET NO. 8 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.07		MUDSTONE - black, highly carbonaceous, with abundant very thin bright coals, stick.	
		0.84		MUDSTONE - dark grey to black, abundant carbonized vegetal matter, some lustrification, occasional coal spars, non-calcareous, broken stick..	
		6.27		SANDSTONE - light to medium grey, very fine to fine grained, silty at top of unit, scattered plant fragments, thinly bedded with silts and sands slumped, petroliferous odor, some burrowing in thinly bedded zones, strongly calcareous throughout, stick.	1.47 DD72.24 3.05 DD75.29 1.75
		0.54		SANDSTONE - fine grained, medium grey to light grey, micro-erosional features on thinly laminated silts and sands with some rippled features and small scale slumping, some carbonaceous debris at base of unit, strongly calcareous basal contact abrupt, stick.	0.54
		0.55		SANDSTONE - medium grained, light to medium grey, abundant carbonaceous material, coal spar, 0.5cm in width strongly calcareous, stick.	0.55
		0.09		MUDSTONE - dark grey, silty, plant fragments, strongly calcareous, stick.	0.09 DD78.33
		0.07		MUDSTONE - chocolate brown, soft, moderately calcareous.	0.07
		0.08		MUDSTONE - dark grey, abundant plant matter, moderately calcareous, stick.	0.08
		0.56		SILTSTONE - medium grey contains carbonaceous debris throughout, interbedded with very fine grained light grey sandstone, some calcite found along small slickensides, weakly calcareous, broken stick.	0.57

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 15/16 JUNE 1981 SHEET NO. 9 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.57		SANDSTONE - fine grained, light to medium grey, very argillaceous, some carby material, massive very thin calcite veins in upper portion of section with slickensides along calcite veinlets, gradational contact, stick.	0.57
		1.92		SILTSTONE/SANDSTONE (80:20) - medium grey, argillaceous siltstone thinly interbedded with a very fine grained light grey sandstone, burrowed and slumped slightly calcareous, stick.	1.76 DD81.38 0.16
		1.45		SANDSTONE - very fine grained medium grey interbedded with fine grained, light grey sandstone, convoluted laminae with slumping, trace carby debris, scattered very thin calcite veinlets (58° to core), 40cm above base is a 30cm zone of silty sands highly carbonaceous, occasional slickensided surfaces, moderately calcareous, broken stick.	1.45
		1.33		SANDSTONE/SILTSTONE - fine to medium grained, medium grey abundant carby material throughout, occasional coal spar, some subrounded interclasts of dark grey silty nature floating in sandstone, sandstone becomes very fine to silty in zones, some slumping in basal units, sandstone slightly calcareous, abrupt lower contact with underlying sandstone, broken stick.	1.20 DD84.43 0.13
60		0.63		SANDSTONE - fine to medium grained, light grey abundant thin laminae of silts showing rippled marks and lower in the unit some small scale cross-bedding, also some micro-erosional features, a few very thin calcite veins orientated 40° to core axis almost parallel, moderately calcareous, stick.	0.63
		1.35		SLITSTONE/MUDSTONE (60:40) - medium grey to dark grey with top 0.15cm being muddy siltstone thinly interbedded, followed by a 0.16cm section of black mudstone, with abundant thin calcite bands throughout this section, carbonaceous, the remainder of unit is a muddy siltstone with slumping and more mudstone with calcite veining near base, muddy siltstone sections moderately calcareous with mudstone non-calcareous, broken stick.	1.35

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08LOGGED BY DARREN TOMECEKDATE 16 JUNE 1981SHEET NO. 10 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
10 ⁰		2.26		SANDSTONE - very fine grained to fine grained, light to medium grey, some sections intensely slumped, thinly bedded sands, some burrows scattered carbonaceous material, abundant pyrite flecks, strongly calcareous, broken stick, very abrupt basal contact with probable core loss here.	0.89 DD87.48 1.37m
		2.04		MUDSTONE - dark grey to black, top 0.23m of unit silty, remainder of unit structureless carbonaceous mudstone with scattered plant remains throughout and some listrication around rootlets in the lower 70cm of unit with this section becoming gradually silty in basal 20cm, non-calcareous, broken stick with very top of this unit having grind marks on core (possible loss).	1.45 DD90.55 0.59
15 ⁰		1.15		SANDSTONE - very fine grained to fine grained, carbonaceous scattered rootlets, minor slumping, thin calcite veins orientated approx. 70 ⁰ to core axis, moderately calcareous in lowest 30cm of unit, broken stick.	1.15
		0.79		SILTSTONE - medium grey, scattered carbonaceous debris, uppermost 35cm homogeneous, remainder interlaminated with darker grey muds, some micro-erosional features, moderately calcareous, broken stick.	0.79
		1.81		SANDSTONE - fine grained, light grey, several coal spars in upper 30cm of unit, listricated surfaces through this zone. Calcite veins in this section are orientated 80 ⁰ to core axis, strongly calcareous at top to non-calcareous at base. Basal 80cm sandstone very clean, abrupt basal contact, broken stick.	0.35 DD93.57 0.68 DD94.18 0.78
		0.28		SANDSTONE - fine grained, light grey, abundant very thin carbonaceous laminae, listricated surfaces abundant intersecting thin calcite veins very near vertical orientation, sheared, badly broken stick, moderately calcareous.	0.28

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08

LOGGED BY DARREN TOMECEK

DATE 16 JUNE 1981

SHEET NO. 11 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
35°		1.12		SILTSTONE - medium grey, fault zone, abundant calcite veins, slickensided surfaces, sheared and listricated zone. Core badly fragmented, probable core loss, siltstone slightly calcareous.	1.12 DD96.62
		0.69		SILTSTONE - dark grey, massive, sporadic, calcite veining orientated about 60° to core axis, some slickensided surfaces along veining; core ground near top of unit, overall broken stick, non-calcareous, basal contact abrupt with underlying mudstone.	0.69
		0.96		MUDSTONE - dark grey to black, abundant carbonaceous plant material, silty at base, some listrication slightly calcareous at base, broken stick, fragmented at base.	0.75 DD99.67 0.21
		2.43		SILTSTONE - dark grey to medium grey, listrication in upper section, thin calcite vein 45cm from top of unit orientated almost horizontally to core axis, core is ground in places calcite veining about 10° to core axis, in lower sections locally slumped with small scale cross-bedding in lower 55cm, calcareous reaction increases from moderate at top of unit to strongly calcareous at base, broken stick.	2.43
5°		0.67		SANDSTONE - fine grained, weathering light grey, medium grey, abundant plant fragments throughout, scattered calcite veining. In lower 23cm interclasts of dark grey siltstones, rounded, strongly calcareous, broken stick ground core at end of unit.	0.46 DD102.72 0.21
		0.17		SILTSTONE - dark grey, sandy at top, grading to very clean siltstone, slightly calcareous, core ground in three separate places in which may suggest a core loss.	0.17
		2.14		SANDSTONE - fine grained silty in places, medium grey, frequent very thin calcareous laminae, subrounded interclasts of siltstone dispersed in zones throughout section, scattered calcite veins, strongly calcareous, non-calcareous silts, broken stick.	2.14

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 17 JUNE 1981 SHEET NO. 12 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.76		MUDSTONE - dark grey to black, finely broken, carbonaceous plant debris, some listricated surfaces, core has been ground in places, moderately calcareous, broken stick.	0.31 DD105.77 0.45
		1.50		SILTSTONE - medium grey, pyritized carbonaceous plant debris scattered, non-calcareous at top metre of unit becoming slightly calcareous in middle, lower section interbedded silts and very fine grained light grey sandstone, patchily calcareous, broken stick.	1.50
18 ^o		0.18		MUDSTONE - dark grey to black, scattered finely broken carbonaceous plant debris, calcite veining and slickensides orientated at 45 ^o to core axis, basal contact becoming gradationally silty, non-calcareous, broken stick.	0.18
		2.06		SILTSTONE - medium grey, scattered fragmented carbonaceous plant debris argillaceous, core ground in places, non-calcareous, basal contact becoming sandy, gradational.	0.43 DD108.81 1.63
		0.56		SANDSTONE - fine grained, medium to light grey, finely interbedded sands and silts, winnowed bedding, slumped, with micro-erosional features, basal contact abrupt, weakly calcareous.	0.56
		1.55		SILTSTONE - medium grey, top of unit sandy, very fine grained, grading down to very clean siltstone in middle of unit with silts becoming more carbonaceous with depth, fragmented plant debris, lower contact is gradational with increasing fine grained, slightly calcareous, broken stick.	0.84 DD111.86 0.71
20 ^o		1.18		SANDSTONE - fine to medium grained, light grey, sporadic burrowing in upper 20cm, the uppermost 30cm is a coarsening downwards sequence starting with silty sands and passing through medium grained sandstone, interbedded sands some micro-graded, 40cm from base of unit the interbedded sands show slumping and several very thin calcite veins are noted orientated approx. 30 ^o to core axis, this basal unit overall becomes silty towards base with occasional plant fragments in this section, moderately calcareous, stick.	1.18

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 18 JUNE 1981 SHEET NO. 13 OF 14

COM BCA*	DEPTH m (GÉOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.69		SILTSTONE - light grey to medium grey, uppermost 32cm contain abundant carbonaceous plant material (matted), next 0.20cm are clean with very little carby debris, 52cm from top of unit a 50cm section of medium grey clean silts, massive remainder of unit contains plant fragments and becomes muddy gradational at base, slightly calcareous, broken stick.	1.18 DD114.91 0.51
		0.27		MUDSTONE - medium grey to dark grey, silty at top and base of unit with fragmented carbonaceous plant remains throughout unit, basal contact erosional, uppermost 12cm of unit slightly calcareous bottom non-calcareous, broken stick.	0.27
		1.30		SANDSTONE/SILTSTONE (60:40) - fine grained, light grey sandstone, interbedded with a medium grey siltstone, some worm burrows, slumping, small scale cross bedding, several disorientated thin calcite veins throughout section with unit becoming silty at base, strongly calcareous throughout gradational basal contact over 20cm with underlying silty mudstone, stick.	1.30
		1.45		MUDSTONE - medium to dark grey, silty at top of unit becoming cleaner 25cm from top of unit the mudstone has become more carbonaceous lower 40cm are abundant plant fragments, listricated some rootlets in basal section, slightly calcareous in upper silty section, non-calcareous in middle and lower sections, contact abrupt with underlying sands, broken.	0.61 DD117.96 0.84
		4.43		SANDSTONE - fine to very fine grained, light grey muddy at top of unit (15cm) in upper 1.90m of unit sandstone abundant rootlets, scattered worm burrows, micro-erosional features, micro-grading in a coarsening downwards sequence, thin calcite veining 30° to core axis, moderately calcareous, stick.	1.90 DD121.01 2.53

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-08 LOGGED BY DARREN TOMECEK DATE 18 JUNE 1981 SHEET NO. 14 OF 14

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.33		SANDSTONE - fine grained at top, coarsening downwards to medium grained light grey, scattered thin calcite veins orientated about 5° to core axis, basal section contains large interclasts of medium grained subrounded siltstone, erosional basal contact, broken stick. broken	0.33
		0.62		SANDSTONE - fine grained to medium grained coarsening downwards, light grey, thin calcite vein, unit contains a base with silty interclasts subrounded moderately calcareous, erosionally abrupt contact.	0.62
		0.52		SANDSTONE - fine grained to medium grained coarsening downwards moderately calcareous abrupt erosional contact.	0.52
		0.56		SANDSTONE - fine grained to medium grained, light to medium grey, moderately calcareous, coarsening downwards, thin calcite vein, interclasts angular siltstone, another erosionally abrupt contact.	0.56
		1.02		SILTSTONE - medium grey, interbedded very fine grained, light grey sandstone, some burrowing, slumping, abundant fragmented carbonaceous matter throughout unit, very slightly calcareous, stick.	1.02
		1.29		SILTSTONE - medium grey, infrequent zones of mudstone dark grey 3cm in width abrupt lower and upper contact with silts on both zones of mudstone, siltstone contains scattered carbonaceous plant fragments, silts appear structureless, excluding the muds, very slightly calcareous, stick.	0.23 DD127,10 1.06
10-150		4.62		SILTSTONE/SANDSTONE (50:50) - siltstone medium grey sandstone light grey, fine grained, small scale cross-bedding winnowed, scattered carbonaceous plant fragments throughout unit, slumping more observable in upper metre of unit with micro-erosional features also noted here thin calcite vein 1.40cm from base of unit orientated 20° to core axis, slightly calcareous, broken stick.	1.56 DD130,15 3.06 132.89
				END OF CORE BOX 41 TD DD132,89	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 14 JUNE 1981 SHEET NO. 1 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				LOWER GETTING	
		2.67		SILTSTONE - dark grey, locally sandy; some mudstone phases, core broken and rusty, locally ground. Core is more continuous towards base.	2.33 DD24'
					0.34 DD27'
		0.67		SANDSTONE - medium to coarse grained, medium grey, rippled, moderately calcareous. Core badly broken at top, ground throughout.	
		0.15		SILTSTONE - dark grey, argillaceous, slumped, hard, strongly calcareous, ground at top and base.	
90°		0.15		SANDSTONE - very fine grained, medium grey, abundant silty laminae. Strongly calcareous; abrupt.	0.14 DD36'
					0.01
		0.18		SANDSTONE - very coarse grained, medium grey, stylolitic. Moderately calcareous; core broken.	
150°		0.72		SILTSTONE - dark grey, argillaceous; some well-preserved narrow deciduous leaves. Strongly calcareous. Ground at base.	
		0.47		SANDSTONE - very fine grained, silty, locally burrowed, medium grey. Strongly calcareous, gradational. Core locally ground; possible core loss.	
		3.55		MUDSTONE - dark grey, locally slightly carbonaceous with scattered rootlets and abundant plant fragments. Some softer crumbly, slightly lighter grey zones (possible soil horizons?). Core locally badly broken; some mud seams.	0.83 DD46'
					2.72
		0.04		MUDSTONE - dark grey, carbonaceous. Stick.	
		0.08		COAL - dull, dirty. Stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 14 JUNE 1981 SHEET NO. 2 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.04		MUDSTONE - black, carbonaceous, listricated at top. Broken stick.	
		0.04		MUDSTONE - black, carbonaceous. Stick.	DD 57'
		0.42		MUDSTONE - dark grey, silty at base. Non-calcareous at top, moderately calcareous below.	
		1.50		SILTSTONE/SANDSTONE (70:30) - interlaminated, locally slumped dark grey siltstone and medium grey silty sandstone. Some ripples. Strongly calcareous. Abrupt.	
		0.47		SILTSTONE - dark grey, strongly calcareous; abrupt.	
		0.63		SANDSTONE - very fine grained, light to medium grey, silty at base, rippled, strongly calcareous; abrupt.	
		0.06		MUDSTONE - black, carbonaceous, broken.	DD 67'
21° at top		0.86		MUDSTONE - dark grey, silty with plant debris. Grades up to siltstone in top 0.11m. Slightly carbonaceous at base. Strongly calcareous.	
		0.13		MUDSTONE - black, carbonaceous, very thin bright coal bands towards base.	
		0.04		MUDSTONE - black, canneloid.	
		0.08		MUDSTONE - black, canneloid, broken, mixed with fragments of bright and dull lustrous coal.	
		0.44		MUDSTONE - dark grey, silty; carbonaceous at top. Scattered finely broken, locally pyritized plant fragments. Non-calcareous gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 14 JUNE 1981 SHEET NO. 3 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		5.25		MUDSTONE/SILTSTONE/SANDSTONE - very fine grained (50:40:10) - interbedded rooty dark grey mudstone, medium grey argillaceous siltstone and light grey rippled sandstone. Local interlamination of sands and silts. Abundant plant debris. Strongly calcareous except top 1.0m which is non-calcareous.	1.25 DD 77' 2.83 DD 87' 1.17
		1.39		SILTSTONE - grading down to MUDSTONE, silty, dark grey, carbonaceous at base, with abundant plant fragments towards base. Strongly calcareous at top, decreasing to non-calcareous at base.	
		0.03		COAL - dull banded, lustrous, ground at top.	
		0.07		COAL - dull, lustrous. Stick.	
		0.08		MUDSTONE - black, carbonaceous. Broken stick.	
		0.10		MUDSTONE - dark grey, silty, stick.	
		0.34		MUDSTONE - dark grey, carbonaceous at top; silty below. Non-calcareous gradational. Broken at base.	DD 97'
		3.38		SILTSTONE - dark grey, rooty at top, becoming sandy towards base. Strongly calcareous.	2.41 DD 107 0.97
	17° at 0.75m below top	5.14		SANDSTONE - very fine to fine grained/SILTSTONE (60:40) - thinly interbedded, rippled, generally bioturbated light grey silty sandstone and medium to dark grey, locally argillaceous siltstone. Top 1.2m consists of 90% sandstone, 10% siltstone. Strongly calcareous. Abrupt.	2.17 DD 117 2.97
	36° at 2.5m below top				
	30° at base				

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 14 JUNE 1981 SHEET NO. 4 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.79		SANDSTONE - very fine to medium grained, dark grey, carbonaceous abundant dark silty, carbonaceous laminae, coal spars and plant fragments. Large scale low-angle cross-laminated, locally abundant interclasts. Strongly calcareous. Abrupt.	0.02 1.77
14 ⁰ at 1.90 above base		4.73		SILTSTONE/MUDSTONE/SANDSTONE - very fine grained (70:25:5) - inter-bedded medium to dark grey, locally argillaceous siltstone, dark grey siltstone and light grey, rippled sandstone. Minor bioturbated intervals; a few rootlets some slumping towards base. Strongly calcareous. Lower part of unit is mostly thinly laminated, reminiscent of Upper Gething "laminates".	0.95 DD 137' 2.96 DD 147' 0.82
15-20 ⁰		1.23		SANDSTONE - very fine grained, light grey, ripple drift cross-laminated. Minor thin interbeds of dark grey, argillaceous siltstone, with associated bioturbation. Strongly calcareous. Abrupt.	
		0.82		MUDSTONE/SILTSTONE (50:50) - interlaminated dark grey mudstone and argillaceous siltstone. Moderately calcareous at top, decreasing to non-calcareous at base. Basal contact broken. Gradational.	0.67 DD 157' 0.15
		0.27		MUDSTONE - dark grey, silty, abrupt.	
		0.29		MUDSTONE - black, carbonaceous, abundant finely broken plant debris. Abrupt.	
		1.03		MUDSTONE - dark grey, silty, rooty, locally listricated. Non-calcareous. Gradational.	
		1.95		SILTSTONE - medium grey, locally sandy. Rooty phases. Ferruginous bands. Non-calcareous; gradational.	1.33 DD 167' 0.62

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 14 JUNE 1981 SHEET NO. 5 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
14 ⁰		2.01		MUDSTONE/SILTSTONE (80:20) - interbedded dark grey, silty, (locally becoming black, carbonaceous with thin bright coal bands), mudstone and medium grey, locally sandy siltstone. Occasional roots. Strongly calcareous except for basal 0.6m which is non-calcareous. Gradational.	1.97 DD 176' 0.04
		2.92		SILTSTONE - medium grey, locally sandy, with 40% thin bands of dark grey mudstone in top 0.6m. A few rootlets; locally slumping. Strongly calcareous except in top 0.6m which grades up to non-calcareous at top. Abrupt.	DD 186'
18 ⁰		2.86		SILTSTONE/MUDSTONE/SANDSTONE, very fine-grained (70:25:5) - interlaminated medium grey siltstone and dark grey silty, locally carbonaceous mudstone with ripples and laminae of light grey sandstone. Rare burrows and locally abundant rootlets. Strongly calcareous. Abrupt.	
		0.50		SANDSTONE - very fine grained, silty, light to medium grey, rippled, a few rootlets. Non-calcareous at top, becoming moderately calcareous below. Gradational.	0.21 DD 196' 0.29
		0.63		MUDSTONE/SANDSTONE - very fine grained (100:0 grading down to 80:20) - dark grey, plant fragment - rich silty mudstone with downward increasing laminae of light grey, silty sandstone. At base of unit is devoid of lamination and is best described as "sandy mudstone". Patchily calcareous. Abrupt.	
20 ⁰		0.38		SANDSTONE - very fine to fine grained, light to medium grey; silty bands towards top and base, abundant dark grey carbonaceous laminae and large ripples, decreasing in size towards top. Weakly to moderately calcareous. Abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 15 JUNE 1981 SHEET NO. 6 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.32		SILTSTONE/SANDSTONE - very fine to fine grained (70:30 - interbedded locally interlaminated medium grey argillaceous siltstone and silty sandstone. Minor slumping; a few rootlets. Weakly to moderately calcareous; gradational.	1.61 DD 207 0.71
		0.63		MUDSTONE - dark grey, carbonaceous, abundant plant debris. Abrupt.	
		0.96		SILTSTONE - dark grey, sandy towards base, locally somewhat carbonaceous. Some burrows and ?rootlets. This unit has been thoroughly churned. Non-calcareous. Abrupt.	
34° at base		4.46		SANDSTONE - fine to medium grained, grading down to medium-grained at base; light to medium grey, clean, large scale low-angle cross-laminated; locally silty, rippled, towards top. Top 0.16m is dark grey, carbonaceous with abundant coal spars. Weakly to moderately calcareous. Abrupt.	0.53 DD 216' 0.27 DD 217' 2.99 DD 227" 0.67
		1.24		SILTSTONE - grading down to SANDSTONE - very fine grained, silty - dark grey, massive at top, becoming moderately calcareous below. Gradational	
21°		3.54		SANDSTONE - very fine to fine grained/SILTSTONE (90:10) - light to medium grey, locally silty, medium to large scale, low-angle cross-laminated sandstone with occasional interbeds of dark grey argillaceous to sandy siltstone. Some ripple intervals. A few large silty interclasts.	1.16 DD 237' 2.38
18°		5.17		SANDSTONE - very fine to medium grained, light grey, clean, large scale low-angle cross-laminated; locally devoid of lamination, some ripples towards top. Some very thin, dark grey carbonaceous laminae towards base. This unit is similar in appearance to the Upper Gething sandstones. Abrupt. Weakly calcareous.	0.09 DD 245' 3.09 DD 255' 1.99

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 15 JUNE 1981 SHEET NO. 7 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.16		CONGLOMERATE - large well-rounded pebbles of light and dark grey chert, quartz and brown siltstone in an abundant matrix of light grey, clean medium sand. Maximum chert size at least 50mm. Weakly calcareous. Erosional?.	
		0.19		SILTSTONE - dark brownish-grey, hard, grading down to silty mudstone at base. Moderately calcareous, gradational.	
		0.08		MUDSTONE - dark grey, slightly carbonaceous, abundant plant debris, slightly listricated. Abrupt.	0.07 0.01
		0.05		MUDSTONE - dark grey, abundant plant debris.	
		0.13		MUDSTONE - dark grey, carbonaceous at base. Abundant plant debris; slightly listricated. One thick bright coal band. Abrupt.	
		0.28		MUDSTONE - dark grey, silty, ferruginous bands, locally rooty. Gradational. Calcareous.	
		0.39		MUDSTONE - dark grey, becoming slightly carbonaceous towards base. Carbonaceous in basal 0.03m. Locally listricated; some thin bright coal bands towards base. Abrupt.	
		0.53		SILTSTONE - dark grey, very argillaceous at top. Listricated, with plant debris, at top. Non-calcareous. Abrupt.	
		0.58		SANDSTONE - very fine grained, silty, medium grey. Strongly calcareous. Abrupt.	
		0.60		SILTSTONE - medium grey; hard. Strongly calcareous. Abrupt.	0.45 DD 273'
		1.81		MUDSTONE - dark grey, silty. Top 0.75m is moderately calcareous, below is non-calcareous. Gradational.	0.15 1.26 DD 277'
					0.55

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 15 JUNE 1981 SHEET NO. 8 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.48		SILTSTONE - dark grey, scattered plant fragments, non-calcareous, gradational.	
		1.47		SILTSTONE/SANDSTONE - very fine grained (50:50) - intermixed, dark grey siltstone and light to medium grey, silty sandstone. About 50% of unit is devoid of lamination and is essentially a very sandy siltstone; in remainder it consists of small interclasts of blebs of siltstone in a matrix of sandstone. In basal 0.25m, sand component diminishes downwards to nil at base. Non-calcareous, gradational.	
		0.32		MUDSTONE - dark grey, silty at top 0.05m. Locally intensely listricated.	
		1.59		SILTSTONE - medium to dark grey, locally sandy. Some large burrows. Listricated at top. Moderately to strongly calcareous. Gradational.	0.15 DD 287' 1.44
		0.18		MUDSTONE - dark grey, silty, abrupt.	
		0.19		MUDSTONE - black, canneloid.	
		0.05		COAL - dull, lustrous.	
		0.02		COAL - pulverized.	
		0.05		MUDSTONE - black, carbonaceous.	
		0.03		COAL - dull, lustrous.	
		0.04		MUDSTONE - black, canneloid.	
		0.07		MUDSTONE - dark grey to black, carbonaceous, silty, abundant plant debris, Gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 15 JUNE 1981 SHEET NO. 9 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.47		SILTSTONE/MUDSTONE/SANDSTONE - very fine grained (65:20:15) - interbedded medium to dark grey siltstone, dark grey silty mudstone and medium grey, silty sandstone, vaguely laminated, a few ripples, rooty and carbonaceous at top. Weakly calcareous towards top, becomes moderately to strongly calcareous below. Gradational.	0.68 DD 297 1.79
35° at base		1.91		SANDSTONE - very fine grained, grading down to fine-grained. Silty, particularly at top and immediate base. Medium grey. Moderately to strongly calcareous. Gradational.	1.25 DD 307' 0.66
		0.22		SILTSTONE - sandy at top, becoming argillaceous below. Medium grey. Moderately calcareous. Gradational.	
		0.27		MUDSTONE - dark grey, very silty. Some large plant fragments and rootlets. Non-calcareous. Gradational.	
		2.42		SILTSTONE, grading down to SANDSTONE, very fine grained - dark grey, devoid of lamination at top, some rippled phases toward base. Some fine grained sandstone in basal 0.40m. Non-calcareous except in basal 0.40m which is weakly so. Gradational.	1.82 DD 317' 0.60
				CADOMIN FORMATION	
20°		11.74		SANDSTONE - medium grained, medium grey, clean. Minor fine grained, silty phases. Unit is large-scale, low-angle, cross-laminated to massive-appearing. Some interclast bands and locally abundant coal spars. One stringer of small pebbles. In coal spar-bearing zones, core is broken and ground. Possible core loss. Patchily weakly calcareous. Abrupt.	2.37 DD 327 2.89 DD 337 2.96 DD 347 2.84 DD 357 0.68

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 15 JUNE 1981 SHEET NO. 10 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
12 ⁰		0.47		SANDSTONE - very fine grained, medium grey, silty, rippled, abundant dark grey argillaceous carbonaceous laminae. Top 0.17m contains 60% mudstone, dark brownish-grey, silty. Muds non-calcareous; sands strongly calcareous. Gradational.	
		1.13		SANDSTONE - very fine to fine grained, medium to dark grey, medium-scale, low-angle, cross laminated; abundant dark carbonaceous laminae and occasional coal spars, particularly in top half. Strongly calcareous.	
		2.52		SANDSTONE - fine to very coarse grained, locally granular; four fining upward sequences. Medium grey, abundant large coal spars towards top. Large-scale, low-angle, cross-laminated to massive. Moderately to strongly calcareous. Abrupt.	0.47 DD 366' 2.05
25 ⁰		0.72		SANDSTONE - very fine to fine grained, silty; a few burrows. Abundant muddy interclasts toward top; thin dark carbonaceous laminae towards base. Strongly calcareous. Abrupt.	
		1.18		SANDSTONE - fine to medium grained, cleaner than above. Medium grey, minor carbonaceous laminae at base. Massive at top; some low-angle, cross-lamination at base. Strongly calcareous. Abrupt.	0.31 DD 376 0.87
		0.08		SILTSTONE - dark grey, with thin laminae of very fine grained sandstone at top and base. One coal spar in basal 0.02m abundant black, carbonaceous laminae. Non-calcareous; abrupt.	
16-20 ⁰		1.38		SANDSTONE - very fine to fine grained, locally silty (particularly towards base) and thinly laminated, with abundant dark grey to black carbonaceous laminae. Strongly calcareous; abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 15/16 JUNE 1981 SHEET NO. 11 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				MINNES GROUP BICKFORD FORMATION	
		0.08		MUDSTONE - black, carbonaceous, abrupt.	
		1.39		MUDSTONE - dark grey, scattered plant fragments, becoming silty in lower half. At base, becomes carbonaceous, locally listricated, with a few thick bright coal bands. Non-calcareous. Abrupt.	0.67 DD 386 0.72
		0.65		SILTSTONE - medium grey, becomes argillaceous towards base and in basal 0.12m grades down to silty mudstone. A few rootlets. Weakly calcareous. Gradational.	
		1.13		MUDSTONE - dark grey, scattered plant fragments and rootlets, non-calcareous. Gradational.	
		0.38		MUDSTONE - dark grey, silty, grading down to SILTSTONE, medium grey - weakly calcareous at top, becoming moderately calcareous below. Occasional rootlets. Abrupt.	
		0.07		COAL - sheared and pulverized.	
		0.05		MUDSTONE- black, carbonaceous, a few very thin bright coal bands. Slightly sheared; broken.	DD 396'
		0.43		MUDSTONE - dark grey, silty, carbonaceous in top 0.02m and in basal 0.05m (here broken, with a few thin bright coal bands). Rooty, non-calcareous, gradational.	
270		1.85		SANDSTONE - very fine grained/SILTSTONE (50:50) - interbedded, locally rippled and interlaminated medium grey silty sandstone and dark grey siltstone, locally argillaceous. Rooty in upper part, strongly calcareous. Abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 16 JUNE 1981 SHEET NO. 12 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.45		MUDSTONE - dark grey, silty at top; minor carbonaceous phases. Scattered finely broken plant debris. Weakly calcareous at top; non-calcareous below. Abrupt.	
		0.02		COAL - bright, sheared and broken.	
		0.04		MUDSTONE - black, coaly, sheared and pulverized.	
		0.22		MUDSTONE - dark grey to black, carbonaceous, particularly at top. Abundant finely broken plant debris. Gradational.	
		5.61		MUDSTONE - dark grey, commonly rooty and listricated. Very minor carbonaceous phases; a few thin bright coal bands. Abrupt. Locally broken. Possible core loss.	0.05 DD 406' 2.94 DD 416' 2.62
		0.38		SILTSTONE - light to medium grey, rooty; "bleached" appearance at top, grading down to MUDSTONE - dark grey, silty. Ferruginous; non- calcareous. Gradational.	
		5.83		MUDSTONE - dark grey, silty. Listricated at top. Minor bands of medium grey, hard siltstone, possibly ferruginous. Ferruginous phases throughout mudstone. Non-calcareous. Gradational.	0.02 DD 426' 3.05 DD 436' 2.76
		1.17		MUDSTONE grading down to SILTSTONE - a fining upwards sequence of medium grey silty mudstone and light to medium grey, ferruginous, locally rooty siltstone. Non-calcareous. Abrupt.	0.29 DD 447 0.88
		2.00		MUDSTONE - dark grey; silty towards base. Top 0.25m is medium grey, rooty. Non-calcareous; gradational.	2.00

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 16 JUNE 1981 SHEET NO. 13 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		8.84		SILTSTONE/SANDSTONE, very fine grained/MUDSTONE (50:30:20) - interbedded, locally intensely bioturbated medium grey siltstone, light grey silty sandstone and dark grey silty mudstone. Strongly calcareous. Abrupt.	0.14 DD 457 3.07 DD 467 2.98 DD 477 2.65
12°		1.90		SANDSTONE - very fine to fine grained, light grey, clean except in top 0.30m which is silty. Medium-scale, low-angle, cross-laminated; some ripples in top half. Scattered large burrows in top 0.30m. Minor pebbly-gritty bands; from 0.97 to 1.19m below top. CONGLOMERATE, granules and towards base small pebbles of light and dark grey chert and quartz in an abundant coarse to very coarse grained sand matrix. Moderately to strongly calcareous. Abrupt.	0.37 DD 487 1.53
		0.98		SANDSTONE, medium to coarse grained/CONGLOMERATE (70:30) - interbedded light to medium grey, clean, locally conglomeratic, massive sandstone and conglomerate, consisting of granules and small pebbles of quartz and chert as before in a coarse grained sand matrix. A few coal spars. Weakly calcareous; abrupt. Core broken in middle of unit; possible core loss.	
		0.85		CONGLOMERATE - granules to large pebbles (max 44mm+) of light and dominantly dark grey chert and quartz in a sparse matrix of coarse grained sand. Porous. Non-calcareous; erosional.	0.57 DD 497 0.28
		0.15		SANDSTONE - very fine grained, dark grey grading up to black, carbonaceous siltstone at top. Non-calcareous. Gradational.	
		0.39		MUDSTONE - black, coaly, hard, sheared and listricated, forming "cornflakes" at top. Abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 16 JUNE 1981 SHEET NO. 14 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.45		SILTSTONE grading down to SANDSTONE, very fine grained - medium grey, rooty; carbonaceous at top, non-calcareous, gradational.	
12 ⁰		0.31		SANDSTONE - very fine grained, grading down to coarse grained. Vague large ripples, locally abundant finely broken plant debris. Non-calcareous. Gradational.	
		1.01		CONGLOMERATE - granules to medium pebbles of light and dark grey chert and quartz, in a locally abundant matrix of medium to coarse grained sand. Maximum clast size 35mm. Styolitic in top half. Non-calcareous; abrupt.	
		0.30		MUDSTONE - dark grey, locally carbonaceous. Gradational. Ground at top.	
		0.14		SILTSTONE - medium grey, argillaceous at top, becoming sandy at base. Slumped with one large intraclast of dark grey, carbonaceous mudstone. Non-calcareous at top, becoming strongly calcareous at base. Abrupt.	
		0.08		MUDSTONE - black, carbonaceous, includes 0.01m bright coal. Abrupt.	
		0.06		SILTSTONE - medium grey, abundant sandy laminae. Strongly calcareous. Abrupt.	
20 ⁰		0.90		MUDSTONE - dark grey, abundant silty laminae in middle, becoming carbonaceous at top and base. Strongly calcareous. Abrupt.	
20 ⁰		0.36		SANDSTONE very fine grained/SILTSTONE (60:40) - thinly interbedded fining- upward medium grey siltstone and light grey silty sandstone. Minor slumping, some rootlets. Strongly calcareous. Abrupt.	
		0.01		MUDSTONE - black, carbonaceous. Stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 16 JUNE 1981 SHEET NO. 15 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.10		COAL - bright, banded, lustrous, badly broken.	
		0.04		COAL - dull, lustrous.	
		0.05		MUDSTONE - black, carbonaceous.	
		0.03		SANDSTONE - very fine grained, dark grey rooty.	
		0.19		MUDSTONE - black, carbonaceous. Stick.	
		0.08		MUDSTONE - black, canneloid. Ground at top. Abrupt.	
		1.26		MUDSTONE - dark grey; locally carbonaceous. Scattered plant debris; some rootlets. Abrupt.	0.04 DD 517' 1.22
		0.02		MUDSTONE - black, carbonaceous. Broken stick.	
		0.06		MUDSTONE - black, canneloid. Intensely sheared and listricated. Broken.	
		0.04		MUDSTONE - black, canneloid, slightly listricated. Stick.	
		0.30		MUDSTONE - dark grey, two thick bright coal bands. Locally abundant plant debris. Gradational. Calcareous at base.	
		1.11		MUDSTONE - dark grey, silty, particularly towards base. Strongly calcareous; ferruginous phases; gradational.	
		0.58		SILTSTONE, grading down to MUDSTONE, silty - medium grey, hard at top; devoid of lamination, non-calcareous, gradational.	0.16 DD 527' 0.42

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 16 JUNE 1981 SHEET NO. 16 OF 18

COM. BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.50		MUDSTONE - medium grey, intensely listricated, soft. Possible seatearth horizon. Broken, non-calcareous. Abrupt.	
		0.64		MUDSTONE - dark grey, carbonaceous at top. Gradational.	
		1.43		MUDSTONE - dark grey, silty, non-calcareous. Basal 0.61m is moderately to strongly calcareous and very silty including 0.17m of rippled, silty very fine grained sandstone. Gradational.	
		1.32		SANDSTONE - very fine grained, silty, medium grey, locally rippled. Abundant thin interbeds of dark grey silty mudstone in top 0.35m. Strongly calcareous. Abrupt.	0.05 DD 537' 1.27
20 ⁰		1.58		SILTSTONE/SANDSTONE, very fine grained/MUDSTONE (50:30:20) - interbedded medium grey, argillaceous siltstone and silty sandstone, with locally abundant interbeds of dark grey, silty mudstone. Some slumping. Strongly calcareous; abrupt.	
		3.71		MUDSTONE - dark grey, a few ferruginous bands. Patchily calcareous. Abrupt.	0.11 DD 547 3.06
		0.27		SILTSTONE - medium to dark grey, argillaceous at top, becoming sandy towards base. Non-calcareous, gradational.	DD 557 0.54
		2.84		SANDSTONE - very fine to fine grained, silty, medium grey, large ripples towards base. Basal 0.85m is dark grey fine to medium grained with a few coal spars. Non-calcareous at top, becoming patchily moderately calcareous towards base. Erosional 0.06m+ relief.	0.16 2.08 DD 567' 0.60
		0.07		MUDSTONE - black, carbonaceous, hard. Gradational.	
		4.22		MUDSTONE/SILTSTONE (50:50) - thickly interbedded dark grey mudstone and medium to dark grey, locally argillaceous siltstone. Some listricated broken zones. Non-calcareous, Gradational.	2.37 DD 577' 1.85

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-09 LOGGED BY C. BICKFORD DATE 16 JUNE 1981 SHEET NO. 17 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
20°		5.54		SILTSTONE/SANDSTONE, very fine grained/MUDSTONE (40:35:25) - thin to	0.99
				medium interbeds of medium grey siltstone, light grey, locally rippled	DD 587
				sandstone and dark grey silty, mudstone. Locally intensely bioturbated	2.84
				abundant medium and large burrows. Some small scours at bases of	DD 596
				sandstone bands. Strongly calcareous. Gradational.	1.71
		0.28		MUDSTONE - dark grey, very silty and strongly calcareous, with locally	
				abundant plant fragments. Abrupt.	
		0.25		MUDSTONE - dark grey to black, disseminated sand grains increasing	
				in amount towards base. Non-calcareous, gradational.	
17°		0.53		SANDSTONE - fine to medium grained, dark grey. Very argillaceous at	
				top, carbonaceous in basal 0.26m, with abundant thin bright coal	
				bands. Basal 0.07m is black and carbonaceous to coaly. Non-	
				calcareous. abrupt.	
		1.14		MUDSTONE - dark grey, silty. In top 0.14m grades up to very fine	0.22
				grained silty sandstone. Strongly calcareous. Abrupt.	DD 606
					0.92
		0.77		SANDSTONE - very fine grained light to medium grey, a few rootlets.	0.77
				Dark argillaceous laminae at top and base; grading down to dark grey	
				siltstone in basal 0.17m. Strongly calcareous. Abrupt.	
		0.51		MUDSTONE - dark grey at top, grading down to black, carbonaceous, at	
				base. Non-calcareous. Abrupt.	
		0.65		SILTSTONE/SANDSTONE, very fine grained(60:40) - interbedded, locally	
				intensely bioturbated, dark grey, argillaceous siltstone and light	
				grey sandstone. Non-calcareous at top, becoming strongly calcareous	
				below. Abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY W. P. LEE DATE 18 JUNE 1981 SHEET NO. 1 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				Box 1 - casing depth 5.18m	
			1.63m	SANDSTONE - medium grey, fine to medium grain, scattered coal spars throughout (up to 0.5cm thick), bedding; cross bedding (small scale) minor micro erosional contact, slumping in places, low angle, dips, very fine grain sequences interbedded throughout, 15cm from base is a 5cm zone with abundant calcite veins with a 62° relative to core axis (veins are result of tension fractures), similar vein @ 41cm from base, 1.5cm thick @ 90° relative to core axis, 86cm from base ferruginous stained fracture, very strongly calcareous throughout, broken to broken stick core, base ground.	DD 5.18m
			0.70m	SILTSTONE/MUDSTONE (70/30) - medium to dark grey, core broken to ground at top with badly broken and crumbled where muddy, 3cm from base carby mudstone 2cm thick, gradational @ base, carbonaceous plant fragments scattered throughout, calcareous throughout.	
			1.33m	SANDSTONE - very fine to fine grained at top becoming fine to medium towards base, light to medium grey, bedding massive at top in finer sequence becoming thinly bedded with small scale cross beds with scattered ripple marks towards base, at base unit fining into siltstone, in middle of unit is 18cm long calcite lined fracture cross cutting the bedding plane, calcareous throughout, broken stick.	0.38m DD 8.23 0.95m
			1.79m	SILTSTONE/MUDSTONE - dark grey massive, gradational contacts at top and at base, silty mud sequences dominant, 0.95m from top is a 0.26m unit of leached muds with abundant rooty debris, preceeding unit is a 1cm thick coal spar, scattered coal spars through remainder of unit, core broken to crumbled, calcareous where silty, non-calcareous where muddy, minor listricated surfaces in muddy sequences.	1.78 DD 11.28 0.02m
			0.24m	MUDSTONE - dark grey, scattered coal spars throughout, listricated surfaces, core broken, non-calcareous, upper contact gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY W. P. LEE DATE 18/19 JUNE 1981 SHEET NO. 2 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
			0.70	COALY MUDSTONE - dark grey to black, definite core loss as core is broken to crumbled, abundant coal spars/laminae, coal dull lusterous, friable, dirty, non-calcareous, canneloid mud in places.	
			1.39	SILTSTONE - medium grey, massive, no bedding structures, scattered light grey clasts throughout, (average dia 0.5cm), traces carbonaceous rooty and/or plant debris throughout, non-calcareous at top and base, calcareous throughout remainder of unit, broken stick.	
			0.12m	CARBY MUDSTONE - dark grey to black, abundant bright, hard coal spars, core ground and broken, minor listricated surfaces, trace plant fragments, non-calcareous, silty at top and base.	
			0.34m	SILTSTONE - medium grey, massive, with no representative bedding, abundant coal spars throughout, scattered coaly plant fragments, muddy towards base, non-calcareous, broken core.	0.21m DD 14.33 0.13m
			0.10m	CARBY MUDSTONE - dark grey to black, abundant bright hard coal spars throughout, tr listricated surfaces, non-calcareous, scattered plant fragments, tr pyrite, broken to crumbled.	0.10
			0.34	SILTSTONE - medium grey, massive, muddy at top and base, broken stick, to coaly plant fragments throughout, non calcareous.	0.34
			0.79	MUDSTONE - dark grey, highly carbonaceous, abundant plant fragments, 15cm from base of unit a coaly muds zone 8cm in length, core ground in places, possible loss, non-calcareous, broken stick to fragmented.	0.79
			0.84	SILTSTONE - medium grey, highly carbonaceous in upper unit and void of such matter in lower unit, upper section contains scattered rootlets, strongly calcareous, unit becomes sandy at base, gradational basal contact, stick.	0.84

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10LOGGED BY DARREN TOMECEKDATE 20 JUNE 1981SHEET NO. 3 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.38		SANDSTONE/SILTSTONE (70/30) - light to medium grey, very fine to fine grained sandstone with thin laminae of silts, some rippling, small scale medium angle, cross-bedding, basal contact lost, strongly calcareous, stick.	0.38 DD 17.37
		0.81		MUDSTONE/CLAYSTONE - dark grey structureless and featureless with ferruginous bands, moderately calcareous, lower 30cm of section becoming silty at base, basal contact is erosionally abrupt. Stick.	0.81
5 ⁰		1.61		SANDSTONE/SILTSTONE (50/50) - fine grained sandstone with thinly laminated silts, light to medium grey, sporadic small vertical worm burrows, small scale rippled sequences, 25cm from top of unit are abundant thin calcite veins with an average orientation 75 ⁰ to core axis, this zone of 20cm, sheared, some slickensided surfaces, strongly calcareous, broken stick.	1.61
		1.16		MUDSTONE - dark grey, top 20cm of unit silty, becoming structureless, homogeneous mudstone, conchoidal fracture moderately calcareous, basal 30cm becoming coaly mudstone with abundant plant material, broken stick.	0.65 DD 20.42 0.51
		1.91		SILTSTONE/MUDSTONE (70/30) - medium grey, highly carbonaceous at top, with abundant carbonized plant fragments, basal contact gradational as unit becomes silty, non-calcareous, stick.	
		1.84		SILTSTONE/SANDSTONE (60/40) - medium grey siltstone with thinly interbedded fine to very fine light grey sandstones, some slumping with ripped up subrounded interclasts of muddy siltstones, micro-erosional features, scattered carbonaceous stems and other plant fragments, slightly calcareous, stick.	0.25 DD 23.47 1.59

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 20/21 JUNE 1981 SHEET NO. 4 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
10-15 ⁰		1.09		SANDSTONE - fine grained to medium grained light grey, interlaminated sands and medium grey silts, medium scale, low angle cross-bedding, ripple marked, tiny vertical worm burrows, some thin calcite veining with slickensided surfaces along fractures orientated at 25 ⁰ and 70 ⁰ to core, axis moderately calcareous, stick - broken stick, basal contact abrupt.	1.09
20 ⁰		2.28		SILTSTONE/MUDSTONE/SANDSTONE (60/35/5) - light to medium grey, fine grained sandstone, interlaminated, scattered worm burrows and carby debris, micro-erosional features, abundant mica flecks, rooty near base several thin calcite veins parallel to bedding, base is silty with abrupt contact, slightly calcareous, stick.	0.36 DD 26.52 1.92
		1.01		MUDSTONE - dark grey to black, highly carbonaceous, 27cm from top of unit a coaly mudstone, with adjoining stick having a ground end, 79cm from top of unit another 15cm zone of coaly mudstone, some listrication near base of unit, abrupt basal contact, non-calcareous, broken stick.	0.87 DD 29.57 0.14
13 ⁰		1.38		SANDSTONE - light to medium grey, fine grained, silty at top 15cm, becoming rooty with a 9cm stick of network veining of calcite, some rust staining in this block, thinly interlaminated sands and some silts some tiny vertical worm burrows, some scale medium angle, cross-bedding calcite lined slickensided orientated 45 ⁰ to core axis, non-calcareous.	1.38
		0.57		SANDSTONE/SILTSTONE (50/50) - light to medium grey, sandstone very fine grained, thinly interbedded, some slumping, abundant small worm burrows some rippling, slightly calcareous stick.	0.57
		1.43		SILTSTONE - medium grey, some scattered plant fragments in upper section of unit, remainder a massive dense, homogeneous, featureless, structureless, barren section, slightly calcareous, becomes slightly muddy at base, stick.	0.89 DD 32.61 0.54

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 21 JUNE 1981 SHEET NO. 5 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.28		MUDSTONE - dark grey to black, some scattered carbonaceous debris 18cm from top of unit a 20cm band of highly listricated mudstone and coaly mudstone, listrication occurs in more than one direction - major listrication occurs perpendicular to core axis and minor is of right angles to major surfaces unit becomes silty near base, moderately calcareous throughout, broken stick.	1.28
		0.61		SILTSTONE - light to medium grey, some carbonized plant fragments several very thin calcite veins orientated 65° to core, slickensided along fractures, laminated sands, fine grained, strongly calcareous broken stick.	0.61
		1.76		MUDSTONE - dark grey to black, large plant fragments throughout unit, 35cm from top of unit a 20cm section of coaly mudstone 30cm from base of unit are thinly interbedded silts and sands (15cm), very slightly calcareous, basal contact erosionally abrupt.	0.47 DD 35.66 1.29
		3.00		SILTSTONE/SANDSTONE (60/40) - light to medium grey, very fine grained sandstone, rootlets found throughout section, some slumping, thin calcite veins at 65° to core axis, moderately calcareous, basal contact abrupt, broken stick.	1.70 DD 38.71 1.30
		2.03		MUDSTONE/SILTSTONE/SANDSTONE (50/30/20) - light grey to medium grey, mudstone contains abundant fragmented, carbonaceous debris becoming silty and sandy, some tiny vertical burrows some ripple marks, some slumping, basal contact gradational strongly calcareous, broken stick.	1.63 DD 41.76 0.40
		2.73		MUDSTONE - dark grey to black, abundant carbonaceous fragmented plant material, some listricated surfaces near base of unit, non-calcareous massive abrupt erosional basal contact, stick.	2.49 DD 44.81 0.24m

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 21 JUNE 1981 SHEET NO. 6 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
12 ⁰		7.41		SILTSTONE/SANDSTONE - light grey to medium grey, some scattered very small plant fragments, occasional near horizontal worm burrows in silt infilled with lighter grey sands, thinly bedded fine grained light grey sands in dominating siltstone, mica flecks, in middle of unit is found an abundance of carbonaceous material including coal spars. Also noted are listricated surfaces, at 2.05 meters from base of unit is a 1 meter section of slightly bleached ferruginous rooty silts, containing abundant mica flecks, 50cm from base is a section of laminated sands, silts and muds, basal contact transitional, non-calcareous stick.	2.75 DD 47.85 3.04 DD 50.90 1.62
		1.45		SANDSTONE - fine to medium grained, light grey, scattered carbonized plant remains, rootlets, small vertical worm burrows, calcite veins some 1/2cm in width orientated between 60 ⁰ and 10 ⁰ to core axis some slickensides associated with veining, some listric surfaces near base of unit with two coal spars, slightly calcareous, basal contact ground.	1.45 DD 53.95
		0.10		MUDSTONE - medium grey, greasy feature, abundant carbonized fragments non-calcareous stick, top contact missing.	0.10
		0.08		MUD - chocolate brown, dense, barren, non-calcareous, basal contact ground, possible core loss.	0.08
		0.27		MUDSTONE - medium to dark grey, abundant carbonaceous debris, listrication, a calcite vein 5cm from base orientated 60 ⁰ to core axis with accompanying slickenside, basal contact transitional, non-calcareous, broken stick.	0.27
		2.17		SILTSTONE - bleached, light grey, ferruginous, some listrication 45cm from top of unit is a 15cm unit of anchorite and calcite forming a brecciated siltstone by hairline veinlets and veins, non-calcareous, broken stick, basal contact missing.	2.17m

B P C A N A D A

COAL DIVISION.

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECECK DATE 22 JUNE 1981 SHEET NO. 7 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.19		MUDSTONE - dark grey to black, highly carbonaceous in places, occasional coal spar, abundant listricated surfaces in several directions, 35cm from base of unit a 12cm zone of badly fragmented COAL sheared and pulverized followed by a 7cm section of highly carbonaceous listricated, mudstone, base of unit ground with pulverized muds at base of unit probable core loss.	1.19m
20 ⁰		3.53		MUDSTONE/SILTSTONE (70/30) - dark grey to medium grey, laminated silts and muds, several calcite veins, orientated on average 50 ⁰ to core axis, along these fractures are pyrite deposits and some slickensides, where mudstone dominants core appears massive dense and featureless and breaks with a slightly conchoidal fracture, some slumping in laminated areas, some microerosional features also, strongly calcareous broken stick.	1.10 DD 60.05 2.43
		2.53		MUDSTONE - dark grey abundant thin calcite veins running parallel to core axis with fracture planes forming along them, occasional coal spar, moderately calcareous, broken stick.	0.62 DD 63.09 1.91
		0.95		MUDSTONE - medium grey, abundant carbonized small, plant fragments, occasional thin calcite vein with adjoining surfaces polished some listrication base contact obliterated with underlying coal, non-calcareous, broken stick.	0.74 DD 66.14 0.21
		0.04		COAL - dull, friable, stick, cleating appears near vertical.	
		0.07		COAL - dull, lustrous, stick.	
		1.88		MUDSTONE - medium grey to dark grey, abundant very thin calcite veins orientated approx. 80 ⁰ to core axis, some pyrite associated with slickensides along fractures. Featureless bedding, scattered carbonaceous debris, strongly calcareous, basal contact ground and badly fragmented, core fragmented.	1.88

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 23 JUNE 1981 SHEET NO. 8 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
85 ⁰		2.94		SILTSTONE/SANDSTONE (60/40 - light grey fine grained sandstone and medium to dark grey silts, burrows in upper 60cm of unit, abundant slickensided surfaces along thin calcite veins throughout unit, near base of unit fine grained sands laminated with silts containing sets of calcite veins with displacement along some calcite filled fractures, strongly calcareous, broken and sheared.	0.10 DD 69.19 2.84 DD 72/24
		0.58		MUDSTONE - dark grey to black, extremely listricated in top 40cm of unit, basal 18cm badly broken and not listricated, the whole unit is badly fragmented, and sheared, possible core loss, slightly calcareous.	0.58
				SILTSTONE/MUDSTONE (70/30) - dark grey mudstone and medium grey siltstone, contains abundant disorientated calcite vein sets, near base of unit a section of thinly bedded muds and silts, extremely slumped containing some coal spars and some displacement along calcite filled fractures, nearer the base are abundant listric surfaces, strongly calcareous.	1.77 DD 75.29 0.43
		2.97		SILTSTONE - light grey to medium grey, bleached, slightly ferruginous abundently rooty throughout, scattered thin calcite veins orientated 30 ⁰ to core axis, non-calcareous, basal contact gradational with underlying siltstone.	2.51 DD 78.33 0.46
85-90 ⁰		15.79		SILTSTONE/MUDSTONE - dark grey, scattered abundant carbonaceous plant material, some anchorite found along fractures, the beds appear as vertical, listricated surfaces throughout, some slickensides along anchorite and calcite fracture fillings (45 ⁰ to core axis on average) 9.12m from top of unit is a 34cm zone of badly fragmented and pulverized mudstone/siltstone, 18cm from base of unit is a sandstone dyke of light grey fine grained sandstone orientated 28 ⁰ to core axis, non-calcareous, broken stick to fragmented core, basal contact is abrupt.	2.41 DD 81.38 3.05 DD 84.42 1.79 DD 86.87 1.87 0.34 DD 89.61 2.88 DD 92.36

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 23/25 JUNE 1981 SHEET NO. 9 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
					1.68
					DD 93.88
					0.44
					DD 94.49
					1.15
					0.18
		5.57		SILTSTONE - light grey to medium grey, bleached with uppermost 1.50cm containing abundant scattered thin calcite veins, remainder of unit consists of networks of calcite forming a brecciated siltstone, abundant slickensides some carby debris in muddy siltstone 2.05m from base of unit, non-calcareous, broken stick, fragmented in places, basal contact apparently lost.	0.92
					DD 96.62
					2.66
					DD 99.34
					1.99
					DD102.41
5 ⁰		6.13		MUDSTONE/SILTSTONE (90/10) - medium to dark grey, first 16cm of unit, mudstone, carbonaceous, pulverized abundant carbonaceous material, highly listricated, occasional coal spar, ample plant impressions throughout unit non-calcareous for most of unit. 1.80cm from top of unit is a dense mudstone with thin calcite veins and abundant plant impressions and fragments dominating feature this unit was strongly calcareous, basal contact is transitional into a silty sand unit.	2.62
					DD105.77
					1.47
					DD108.81
					2.04
0-5 ⁰		1.69		MUDSTONE - dark grey to black, abundant carbonaceous plant material and fragments throughout, slightly silty, locally listricated, non-calcareous, basal contact transitional, broken stick.	0.67
					DD111.86
					1.02
0-3 ⁰		5.46		SILTSTONE/SANDSTONE - light brown to medium grey, upper most 1.3m of unit abundantly rooty, very ferruginous, some rust staining along weathered surfaces, very dense light brown in colour becoming an interbedded silt and sand unit, this unit has several rounded concretions of ferruginous silts containing pyrite and some calcite the maximum measured diameter was 4cm. The surrounding sands and silts accommodated the injection of this clast by conforming to its shape, also noted in the hosting sands and silts are small burrows and some angular erosionally ripped-up clasts of silts floating in the sands, also, some slumping, slightly calcareous broken stick.	1.33
					DD114.30
					3.05
					DD117.35
					1.08

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 25 JUNE 1981 SHEET NO. 10 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		4.97		SANDSTONE/SILTSTONE (60/40) - fine grained, light grey sandstone with interbedded medium grey silts sands contain abundant carbonaceous matter, some coal spars, small subrounded clast of silty muds scattered throughout with some clasts are ferruginous, slumping becoming evident near base of unit. 2.95m from top of unit is very highly slumped and burrowed, with silt clasts ripped up, bioturbated, slightly calcareous, broken stick.	1.95 DD120.70 2.74 0.21 DD124.06 0.07
		2.99		SILTSTONE - medium grey to dark grey, scattered carbonaceous debris and plant impressions near base of unit, some thin calcite veinlets 70cm from top of unit orientated 45° to core axis, some slickensides associated with these calcite veins, occasional coal spar near base, non-calcareous, broken stick.	2.95 DD127.10 0.04
4°		2.29		SANDSTONE/SILTSTONE (60/40) - light to medium grey, scattered rootlets, interlaminated sand and silts in lower half of unit are pyrite nodules of disorientated pyrite with some small circular clasts of concentrated pyrite within the large 3cm in diameter nodule also noted with zone of nodules is an increased abundance of plant fragments, non-calcareous, broken stick, basal contact gradational becoming muddy at base.	2.29
		0.82		MUDSTONE - black, highly carbonaceous, some small coal spars abundant plant impressions, mudstone very friable, 37cm from top of unit an 11cm section of badly fragmented and pulverized highly carbonaceous mudstone some coaly mudstone also associated with this section, non-calcareous, basal contact, transitional, broken stick to badly fragmented	0.71 DD130.15 0.11
1-30.		2.67		MUDSTONE - medium grey, silty throughout, scattered plant fragments in upper and lower sections, 2.20m from top of unit is a 10cm section of siltstone interlaminated with silty mudstone. Nearer the base of the unit mudstone becomes more friable and more highly carbonaceous, non-calcareous, broken stick.	2.20 0.10 0.37

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEKDATE 26 JUNE 1981SHEET NO. 11 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
1-30		3.78		SILTSTONE/SANDSTONE (70/30) - light grey to medium grey uppermost 40cm ferruginous with small amounts of anchorite scattered throughout this section. Beyond this ferruginous section is the dominating interlaminated silt and sand sequence containing scattered carbonaceous matter and plant impressions, occasional calcite vein orientated 60° to core axis with pyrite found along fractures, some slumping in lower section basal contact transitional with underlying muds, from middle of unit to base is slightly calcareous, stick.	0.12 DD133.26 3.05 DD136.25 0.61
		0.60		MUDSTONE - black, abundant coaly fragments, with other carbonaceous material dispersed throughout, some minor listrication, non-calcareous, broken stick.	0.60
		0.02		COAL - dull and bright.	
		0.02		MUDSTONE - black, highly carbonaceous with some coaly bands in upper half.	
		0.02		COAL - dull, banded, stick.	
		0.04		COAL/MUDSTONE (50/50) - coal dull and bright, thinly interbedded with black highly carbonaceous mudstone.	
		0.02		COAL - dull, lustrous, stick.	
		0.05		MUDSTONE - black, minor coaly bands, highly carbonaceous, stick .	
		0.02		COAL - dull and bright.	
		0.02		MUDSTONE - black, highly carbonaceous, lower half coal bright, banded, stick.	
		0.02		COAL - bright.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 26 JUNE 1981 SHEET NO. 12 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.01		MUDSTONE - black, highly carbonaceous, stick	
		0.03		MUDSTONE - black, highly carbonaceous, stick.	
		0.04		COAL - bright, badly fragmented, possible loss.	
		0.12		MUDSTONE - black, abundant plant fragments, occasional small coal spar, basal contact appears abrupt, broken stick.	
		2.00		SILTSTONE - medium grey, abundant rootlets in upper 0.70m, 1m from top	1.22
				minor lustration beginning to appear in unit. 1.36m from top is	DD139.30
				thinly interbedded, light grey, fine grained sandstone with very thin	0.78
				laminae of carbonaceous material, siltstone non-calcareous sandstone	
				slightly calcareous, basal contact transitional, stick.	
7 ⁰		3.78		SANDSTONE - -fine grained to medium grained, light to medium grey,	2.27
				interlaminated carbonaceous material and sandstone, some minor	DD142.34
				slickensides, strongly calcareous, stick.	1.51
5-7 ⁰		0.46		SANDSTONE/SILTSTONE (75/25) - sandstone, fine grained, light grey	0.46
				salt and pepper, siltstone medium grey, carbonaceous with some mudstone	
				20cm from top is a 10cm zone of ripped-up rounded clasts of silty mud,	
				sandstone strongly calcareous, remainder non-calcareous, some	
				slumping in upper 10cm of section, basal contact appears abrupt, stick.	
		0.55		SANDSTONE/SILTSTONE (80/20) - sandstone fine to very fine grained,	0.55
				light grey, siltstone medium to dark grey, interbedded sequences,	
				microerosional features, this whole unit is slumped, some scattered	
				carbonaceous debris, moderately calcareous throughout, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 26 JUNE 1981 SHEET NO. 13 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.48		SANDSTONE - very fine grained to coarse grained base in a coarsening downwards sequence, light grey, top 40cm of unit contains fine to very fine grained sandstone, with subrounded clasts of silty mudstone floating in a 20cm band found in the lower half of this section, remainder of this unit is sandstone medium to coarse grained with abundant carbonaceous bands and some small coal spars in a series of medium size, medium angle crossbeds, some slumping, strongly calcareous, stick basal contact abrupt with a finer sequence of sandstone found below.	0.54 DD145.39 0.94
		1.21		SANDSTONE - fine grained to coarse grained coarsening downwards sequence, abundant thin coal spars, in middle of section are several thin calcite veinlets, lower half of unit contains clasts of silty muds, subrounded, small clasts, non-calcareous, broken stick.	1.21
		0.66		SANDSTONE - fine grained to coarse grained, coarsening downwards light to medium grained, small abundant coal spars at top of unit but remainder contains thin carbonaceous laminae, 10cm from base is a 5cm zone of fine grained sands highly carbonaceous with highly listricated surfaces found through this section, basal contact erosionally abrupt with large clasts of very fine grained sands and silts floating in the described coarse sandstone, slightly calcareous stick.	0.66
50		1.82		SANDSTONE/SILTSTONE - light to medium grey, sandstone is fine to very fine grained interlaminated sands and silts, some micro erosional features, with minor post sedimentation displacement, wavy to crinkled laminations, carbonaceous material also interlaminated within this unit, calcite veins are also noted perpendicular to core axis, 35cm from base of unit are very fine grained slightly rounded pebbles of medium grey sands in light grey fine grained sands, slightly calcareous, stick core.	0.29 DD148.44 1.53

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 26/27 JUNE 1981 SHEET NO. 14 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
30		5.10		MUDSTONE/SILTSTONE (70/30) - dark grey to black, highly carbonaceous, interbedded with a medium grey siltstone, several coal spars 1/2cm in width 4.27m from top of unit is a 10cm band of coaly mudstone with some listricated surfaces within this section, mudstone non-calcareous, silts strongly calcareous, stick to broken stick.	1.42 DD151.49 3.05 DD154.54 0.63
		0.02		MUDSTONE - coaly, scattered bright bands of coal within unit, black, stick.	
		0.04		COAL - dull, banded, lustrous, stick.	
		3.99		MUDSTONE/SILTSTONE (50/50) - medium to dark grey, abundant laminae of mudstone, siltstone and carbonaceous debris, plant impressions and other carby marterial form mats, scattered very thin calcite veins, a couple of 10cm bands of very dense, slumped silt mud laminae slightly calcareous, throughout the basal half of the unit are scattered several thin coal spars, basal 50cm dominantly mudstone, friable, highly listricated, becoming more carbonaceous towards base, broken stick.	1.23 DD157.58 2.76
		0.03		MUDSTONE - black carbonaceous, 1cm coal spar at top of unit.	
		0.03		COAL - dull and bright, stick.	DD160.63
		0.02		MUDSTONE - coaly, several thin spars of bright coal.	
		0.03		COAL - dull, banded, lustrous, stick.	
		0.02		MUDSTONE - coaly, abundant very thin bright coal bands, stick.	
		0.52		MUDSTONE/SILTSTONE (80/20) - dark grey to black, highly carbonaceous, occasional thin coal spar, minor listrication, basal 15cm slightly silty with contact abrupt with underlying muds and coal.	0.52

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 27 JUNE 1981 SHEET NO. 15 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.28		MUDSTONE - black highly calcareous, listricated surfaces throughout this unit, unit approaches coaly mudstone towards scattered thin coal spars.	0.25
		0.02		COAL - dull, lustrous, stick.	0.02
		1.05		MUDSTONE - dark grey, some anchorite at top of unit, abundant plant fragments throughout, highly listricated surfaces, unit becomes slightly more carbonaceous towards base.	1.05
		0.06		MUDSTONE - coaly, abundant very thin bright bands of coal, stick.	0.06
		0.03		COAL - dull banded, lustrous, stick.	0.03
		0.14		MUDSTONE - black, highly carbonaceous with abundance of fragmented plant debris, top 2cm a coaly mudstone, abundant very thin bright coaly bands, abrupt basal contact.	0.14
3-5 ⁰		2.46		SILTSTONE - light grey to medium grey, uppermost 35cm of unit contains rootlets, massive and structureless, remainder interlaminated silts and very fine grained sandstone still containing some rootlets, some scattered carbonaceous material, some cross bedding, several very thin calcite veins parallel to bedding, some slumping, infrequent coal spar found near base of unit 1cm in width, non-calcareous at top to strongly calcareous at base, contact appears abrupt.	0.45 DD163.38 2.01
		2.27		MUDSTONE - black, highly carbonaceous, highly listricated, coal spars 2cm in width found in middle of unit, lowest 20cm of unit badly broken and ground possible core loss. Lower contact would appear to be missing, would imagine contact to be abrupt with underlying sandstone.	0.85 DD166.73 1.22 DD168.25 0.20

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEKDATE 27 JUNE 1981SHEET NO. 16 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
30		1.92		SANDSTONE - very fine to fine grained, light grey, top of unit 25cm silty, medium grey sandstone, remainder of unit thinly interbedded fine grained to very fine grained sandstone with lower half of unit contains abundant carbonaceous matter in thin laminae, several thin coal spars found in this section, several thin calcite veins with slickensides developed along fractures, strongly calcareous, basal contact erosional as angular clasts of mudstone are found floating in sands.	1.92
00		9.21		MUDSTONE/SILTSTONE (50/50) - medium grey muddy silts and dark grey to black mudstones, several very thin calcite veins found at top and base of unit, several zones where mudstones become very carbonaceous almost approaching coaly mudstone, these zones are highly listricated, occasional coal spar 1cm in width, 5.73m from top of unit appears a 5cm band of coal, dull banded, lustrous, followed again by the above described sequence with carbonaceous mudstone being listricated and thinly coated with pyrite, silty sequences strongly calcareous, muds calcareous, stick to broken stick.	0.87 DD172.82 2.53 DD175.87 2.33 0.05 0.61 DD178.92 1.59
		1.21		SANDSTONE - very fine grained, light to medium grey, contains ripped up muddy interclasts in upper 25cm, some small scale, low-angle, cross-bedding, with some carbonaceous material and some slumping, a calcite vein is found 30cm from base of unit orientated 55° to core axis, basal contact appears to be transitional with base of unit to drillers depth block, strongly calcareous.	DD181.97
		1.74		MUDSTONE - dark grey to black, slightly silty at top becoming more so towards middle of unit then regresses back to slightly silty at base, occasional coal spar in lower half of unit; basal unit is transitional, non-calcareous, stick.	1.74

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 27 JUNE 1981 SHEET NO. 17 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		3.25		SILTSTONE/SANDSTONE - light to medium grey, upper 38cm rooty silt transitionally becoming carbonaceous mudstone for 10cm then abruptly back into is siltstone/sandstone laminations, some slumping, sandstone very fine grained, some small scale cross-bedding, slightly calcareous with sandy sequences being slightly more calcareous, stick.	1.06 DD185.02 3.01 DD188.06 0.18
270		1.36		SANDSTONE - essentially fine grained with basal 10cm containing some interbeds of medium, grained sandstone, medium grey thinly interlaminated fine grained sands top 25cm, followed by a 35cm zone of highly slumped sands truncated at top, remainder of unit is interlaminated sands as described above, basal contact abrupt with underlying mudstone, slightly calcareous, stick.	1.36
		0.80		MUDSTONE - dark grey to black, abundant fragmented, carbonaceous, plant material, in top 5cm are 2 coal spars, 20cm from top is a 6cm band of hard coaly mudstone, very dense, followed by highly listricated mudstones for 15cm, remainder of unit highly carbonaceous, non- calcareous, stick, basal contact abrupt.	0.80m
		1.21		SANDSTONE - very fine grained at top coarsening downwards to medium grained at base, scattered infrequent carby debris, mica flecks throughout, very fine and fine grained sandstone non-calcareous and argillaceous, medium grained sands strongly calcareous and clean, several very thin calcite veins, basal contact very abrupt and non erosional, stick.	0.54 DD191.11 0.67
		0.25		SANDSTONE - very fine grained, silty, abundant carbonaceous matter throughout, abundant mica flecks, slightly calcareous, basal contact abrupt, stick.	0.25
		1.75		MUDSTONE - light grey to medium grey, very silty, scattered carbonaceous fragmented plant matter throughout unit, silt content decreases towards base, slightly calcareous, basal contact transitional	1.75

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEKDATE 29 JUNE 1981SHEET NO. 18 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.59		MUDSTONE - medium grey to black, top of unit has coal spars and highly listricated, abundant fragmented carbonaceous plant material, basal 10cm of unit coaly muds, highly listricated, non-calcareous, broken stick.	0.23 DD194.16 0.36
		0.38		SILTSTONE - medium grey, muddy at top of unit becoming sandy at base, very argillaceous, transitional from top to bottom, non-calcareous, stick.	0.35
		2.79		SANDSTONE - very fine grained with sequences of fine grained, light to medium grey, top of unit slightly silty with carbonized plant remains, in the cleaner fine sequence are abundant worm burrows, some slumping, occasional calcite vein orientated 55° to core axis, some zones in base of unit slightly carbonaceous, pyrite found in these areas, and also some listrication, in basal 20cm are abundant large interclasts of silty sandstone which appears to be ripped up but not transported, 5cm from base of unit is a thin coal spar, unit is strongly calcareous, basal contact is erosionally abrupt stick.	2.31 DD197.21 0.48
		2.33		SILTSTONE - dark grey to light grey, very carbonaceous and muddy in upper 15cm of unit, a coal spar has also been absorbed in the 15cm, highly listricated, remainder of unit transitional from muds to sandy silts, lower 35cm contains clasts of 3cm in diameter angular muds appear to be ripped up from an interbed of muddy silts found below, non-calcareous, stick.	2.33
		1.93		SANDSTONE/SILTSTONE (60/40) - light grey to black, sands are very fine to medium grained, some rootlets, silty sections contain interlaminated highly fragmented carbonaceous material, sandstone unit has occasional coal spar and some signs of slumping, some erosional features with interbedded siltstone, sands are very argillaceous, a very thin calcite vein orientated parallel to bedding slickensides, non-calcareous, erosional contact, stick.	0.22 DD200.06 1.71

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 29 JUNE 1981 SHEET NO. 19 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
0-50		2.48		SANDSTONE - light to medium grey, very fine grained to fine grained, 50cm from top of unit is an 8cm band of carbonaceous mudstone with tiny coal spars, remainder of unit is interbedded sands, cleaner in nature than those above, microerosional some areas slumped, the entire unit is extremely bioturbated, slightly calcareous stick.	1.34 DD203.30 1.14
		1.94		SILTSTONE/SANDSTONE (70/30) - medium grey to light grey, sands are fine grained, sands begin to appear in core 70cm from top of unit, silts above sands are host to abundant carbonaceous fragmented plant material, sandstone has interlaminated silts and carbonaceous material, micro erosional features, some small scale, low-angle cross beds, sands are quite clean, sands strongly calcareous, silts slightly calcareous.	1.90 DD206.35 0.04
		3.05		MUDSTONE - dark grey to black, top 70cm of unit a dense homogeneous, massive featureless mudstone, remainder of unit highly carbonaceous, fragmented plant matter, 1.05m from top a 20cm zone of highly lustrated zone, 1.92m from top of unit mudstone approaches coaly with an abundance of thin bright coal laminae over a 10cm unit. 2.59m from top another 11cm unit of coaly mudstone with abundant very thin bright coal laminae, mudstone below becoming slightly silty, sporadic coal spars, non-calcareous, stick, basal contact gradational.	2.01 0.10 0.48 0.11 0.26 DD209.40 0.35
		2.26		SILTSTONE - medium grey, uppermost 50cm of unit void of vegetal matter, thinly interbedded, remainder of unit contains scattered vegetal matter and some polished surfaces, some slumping in lower 30cm of unit, non-calcareous, stick.	2.26
		2.22		SANDSTONE - fine grained to very fine grained, light to medium grey, sporadic plant fragments, winnowed bedding, small scale, medium angle cross-bedding, some slumping occurring in areas producing quite high artificial dips, abundant mica flecks in upper fine grained sequence, lower very fine grained sequence almost void of these flecks, carbonaceous material content increases towards base as does the silt and mud content, slightly calcareous, basal contact erosional, stick..	0.46 DD212.45 1.76

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 29/30 JUNE 1981 SHEET NO. 20 OF 22

COM BCA*	DEPTH m (GEOH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.39		SANDSTONE - very fine to fine grained, medium grey silty at top, very carbonaceous, abundant very thin discontinuous coal laminae, abundant plant debris, mica flecks, some erosional features between sands and laminated silts at base of unit, slightly calcareous, stick.	0.39
50		1.77		MUDSTONE - medium grey, some calcite veining in uppermost 10cm orientated parallel to bedding occasional carbonized plant material throughout the unit, some minor slumping, microerosional features, 15cm from base is a 5cm unit of coaly mudstone, abundant laminae of bright coals, below this section unit becomes silty, slightly calcareous, stick.	0.88 DD215.5 0.89
		1.89		SILTSTONE - light to medium grey silts interbedded with very fine grained sandstone displaying some rippling and small scale cross-bedding, rootlets are sporadic throughout the unit, abundant carbonaceous plant remains, one coal spar 1cm in width 62cm from base, several very thin calcite veins displaying slickensides, orientated 75° to core axis, basal contact abrupt, slightly calcareous in light grey sandy sequences, stick.	1.89
		0.19		SANDSTONE - fine grained, medium grey, abundant carbonaceous debris, interlaminated with sandstone, slickensides associated with calcite veins, basal contact abrupt, non-calcareous, stick.	0.19m
		1.78		SANDSTONE - very fine grained, light grey, uppermost 15cm littered with silty mudstone interclasts, thinly interbedded sands and silts, some small scale medium angle cross-bedding, sporadic burrows in lower section, scattered carbonaceous plant impressions throughout unit, abundant mica flecks, basal contact erosionally abrupt and slightly listricated as is the lower 25cm of this unit, slightly calcareous, stick.	0.06 DD218.54 1.72

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-10 LOGGED BY DARREN TOMECEK DATE 30 JUNE 1981 SHEET NO. 21 OF 22

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.75		SILTSTONE/SANDSTONE (80/20) - siltstone medium grey with sandstone being very fine grained to fine grained, light grey, abundant tiny vertical burrows, the thinly interbedded sands and silts have slightly bioturbated contacts, abundant plant impressions, the unit becomes slightly more carbonaceous and muddy towards base, slightly calcareous sands, stick.	0.75
		0.21		MUDSTONE - dark grey to black, silty, very carbonaceous, abundant thin coal spars, non-calcareous, stick, some scattered pyrite.	0.21
		0.73		SANDSTONE - very fine grained to fine grained, light to medium grained, thinly bedded, abundant burrows throughout some pyritized, slumping in lower 30cm of unit, with an erosionally abrupt basal contact, slightly calcareous, stick.	0.35 DD221.58 0.38
		0.56		MUDSTONE - black to dark grey, coaly mudstone in upper most 10cm with abundant laminae of bright coals, remainder of unit carbonaceous mudstone with abundant vegetal matter, non-calcareous, broken stick.	0.56
0-5 ⁰		1.79		SILTSTONE/SANDSTONE (90/10) - uppermost 20cm are interlaminated very fine grained light grey sands with medium grey silts, remainder of unit is muddy siltstone containing abundant plant impressions and fragments, observed coal spar 50cm from base of unit, several very thin calcite veins also noted in this unit orientated parallel to bedding, slightly calcareous, stick.	1.79
		0.52		SANDSTONE - fine grained, light to medium grey, abundant carbonized pyritized plant material, some mica flecks lower 10cm displays abundant very thin black carbonaceous laminae in a silty medium grained sandstone, slightly calcareous, stick, basal contact abrupt with underlying mudstone.	0.20 DD228.64 0.32

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY B. CORMIER DATE 27 JUNE 1981 SHEET NO. 1 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.08		SANDSTONE - grey, medium grained, 70% dark grains - 30% light coloured grains, many small mudstone clasts and carbonaceous streaks, calcareous.	.08 .10 Box1
		0.10		CARBONACEOUS MUDSTONE - soft, pulverized with coaly fragments.	5.1
		0.06		SANDSTONE/MUDSTONE - dark to medium grey, fine grained, silty, non-calcareous.	
10 ⁰		1.10		SANDSTONE - grey to light grey, alternating thin mudstone/carbonaceous and coaly laminae, distinct bedding, minor irregular fractures fine grained to medium grained, mostly siliceous matrix, non-calcareous with highly calcareous sections.	0.70
		0.73		SANDSTONE - medium grained, grey, to light grey, silty, thin, irregular light and dark laminae, siliceous and non-calcareous matrix, possible slump zone-faint near vertical irregular bedding, some large carbonaceous and coaly clasts - minor fractures.	DD 5.1
		0.42		CARBONACEOUS MUDSTONE - black, hard, thin coaly streaks, non-calcareous.	
		0.34		SANDSTONE - medium grey, very fine grained, very muddy base, minor carbonaceous and coaly streaks, small fractures throughout, faint bedding, rooted base, non-calcareous.	
		0.75		MUDSTONE - dark grey, slightly silty occasional coaly or carbonaceous streak, non-calcareous.	Box 2
5-7 ⁰		0.60		SANDSTONE/MUDSTONE - gradational interbedded, very fine grained sandstone silty throughout, small cross-bedding near sharp base, dark grey to light grey, non-calcareous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY B. CORMIER DATE 27 JUNE 1981 SHEET NO. 2 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.27		MUDSTONE - very silty, dark grey, non-calcareous.	
7-8 ⁰		0.62		SILTY MUDSTONE/SANDSTONE - gradational from mudstone at top to very fine grained cross-bedded silty sandstone at base, dark grey to medium grey, non-calcareous to slightly calcareous, gradational to mudstone at base, iron staining along a fracture.	
		0.62		SILTSTONE - muddy, medium grey, faint bedding, slightly argillaceous, highly calcareous, iron oxide staining along fracture.	
		1.33		MUDSTONE/SILTSTONE - dark to medium grey, gradational sequence from silty mudstone at top to muddy siltstone base, faint bedding, some carbonaceous debris, non-calcareous to highly calcareous bands.	DD 11.2 Box 3
		0.17		MUDSTONE - slightly silty, black to very dark grey, carbonaceous debris and coaly streaks, soft muddy band in centre of unit, non-calcareous.	
		0.83		SILTSTONE/MUDSTONE - intermixed, dark grey to grey, becoming increasingly siltier towards base, rooted and carbonaceous debris throughout, non-calcareous.	
		0.41		MUDSTONE/SILTSTONE - intermixed, dark grey to grey, becoming increasingly siltier towards base, rooted, non-calcareous.	
		0.11		MUDSTONE - black, slightly carbonaceous, non-calcareous.	Box 4
		0.40		MUDSTONE - black to dark grey, coaly streaks and carbonitized debris.	DD 14.3
		0.19		MUDSTONE/SILTSTONE - mudstone predominates, with thin siltstone laminae, dark grey to light grey, silty throughout, non-calcareous, gradational contacts top and bottom.	
		1.32		MUDSTONE - silty, dark grey, non-calcareous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY B. CORMIER DATE 27 JUNE 1981 SHEET NO. 3 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.35		SILTSTONE/MUDSTONE - intermixed, grey to light grey, non-calcareous.	
7-90		2.10		SILTSTONE/MUDSTONE - interbedded, dark grey to light grey, thin cross-laminations of very fine grained sandstone, with many small burrows and ripples, inter-tidal or inter-lagoonal zone, mudstone predominates toward gradational base, non-calcareous to calcareous.	DD 17.3 Box 5
		0.16		MUDSTONE - silty, dark grey, non-calcareous SILTSTONE -muddy, faint bedding and laminations, dark grey to medium grey, coaly and carbonized fragments, non-calcareous, gradational contact at base.	
		0.39		MUDSTONE - slightly silty, dark grey, many coaly streaks throughout.	
		0.38		MUDSTONE - slightly silty, dark grey, coaly streaks and fine carbonized fragments, becoming siltier towards gradational base, non-calcareous.	
		0.76		SILTSTONE - muddy at top, dark grey to medium grey, faint, irregular banding, increasing siltiness towards gradational base, coaly streaks, non-calcareous.	
		1.22		SILTSTONE/SANDSTONE - siltstone predominates with increasing amounts of thin very fine grained sandy laminae, medium grey to light grey.	
		0.58		SANDSTONE/SILTSTONE/MUDSTONE - interlaminated, light grey to dark grey, non-calcareous, gradational base.	
100		1.76		SANDSTONE/SILTSTONE - interlaminated and interbedded, medium grey to light grey, occasional muddy lamination, minor small cross-laminations and small burrows, increasing amounts of sand towards base, coarseness of sand increases towards base from very fine grained at top to fine grained at base, moderately abrupt lower contact, non-calcareous to slightly calcareous sections.	DD 23.47 Box 7

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY B. CORMIER DATE 28 JUNE 1981 SHEET NO. 4 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
50°		1.34		MUDSTONE/SILTSTONE - mudstone predominates thinly inter-laminated, dark grey to medium grey, small carbonaceous debris along laminations, slightly calcareous.	
		0.59		MUDSTONE - dark grey with thin medium grey siltstone laminations, conifer needle impressions on lamination surfaces mudstones, non-calcareous; silty material, calcareous.	DD 26.52 Box 8
				MUDSTONE - black, carbonaceous, listricated fractures, non-calcareous.	
		1.00		MUDSTONE - silty, dark grey, thin very fine grained sandstone laminations and ripples at top of unit, coaly spars and streaks at bottom of unit; listricated surfaces, calcareous upper half while lower half generally non-calcareous.	
		0.86		MUDSTONE - silty, dark grey, with light bluish grey leaching residue, non-calcareous.	
12-15°		0.90		MUDSTONE - silty, dark grey at top, with increased silty - very fine grained sandy content towards base, lighter grey, faint bedding, top half calcareous.	DD 29.57 Box 9
15-20°		2.00		SANDSTONE/MUDSTONE - interbedded and interlaminated, ripples and burrows, medium grey to light grey, occasional calcite filled fracture, mudstone predominates at top while very fine grained and fine grained sandstone becomes more prominent toward base, mostly highly calcareous with non-calcareous base.	
10°		0.25		MUDSTONE - with a few sandy very fine grain laminations coal spars and streaks and carbonaceous streaks, dark grey, gradational base, non-calcareous.	Box 10
		0.32		MUDSTONE - very silty with very fine grained, sandy lenses, and laminations, dark grey to light grey, non-calcareous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY B. CORMIER DATE 29 JUNE 1981 SHEET NO. 5 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
18-20 ⁰		1.17		SANDSTONE - silty, light grey to medium grey, thin laminations and minor small cross-beds, very fine grained to fine grained top and base muddy, base gradational to silty mudstone, slightly calcareous to highly calcareous.	DD 32.61
		0.63		MUDSTONE - dark grey to black, silt content decreasing towards base, increase in carbonaceous material and listricated fracture planes, non-calcareous, gradational base.	
		1.18		SILTSTONE - medium grey, muddy, and occasional very fine grained, disseminated sandy lens, non-calcareous, gradational contact at base.	Box 11
		0.40		MUDSTONE/SILTSTONE - mudstone predominates, interlaminated dark grey to light grey with odd coal streak, and much carbonized stem/plant remains on laminar surfaces, non-calcareous, gradational base contact.	
15-25 ⁰		1.01		SANDSTONE - silty, fine grained, light grey, with medium grey, silty to muddy laminations, several sections of fairly clean thicker sandstone lenses, one or two calcite filled fractures, basal contact gradational, non-calcareous upper portion, lower portion calcareous.	
		0.43		SILTSTONE/MUDSTONE - siltstone at top becoming increasingly muddy towards base, mudstone predominates in basal 20cm, medium grey to dark grey, faint laminations occasional leaf or plant stem carbonized impression, calcareous, poorly defined contact.	
10-12 ⁰		0.83		SANDSTONE - very silty, irregular laminations and ripples, very fine grained, occasional plant stem impression, calcareous.	Box 12
		0.65		MUDSTONE - black to dark grey, slightly silty, occasional coal streaks and fine plant leaf and stem impressions.	DD 34.71

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY B. CORMIER DATE 29 JUNE 1981 SHEET NO. 6 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.46		SILTSTONE/MUDSTONE - ferruginous, dark grey to medium grey, some sections of thin laminated alternating silt/mud, small pyritic burrows, tiny stem and leaf impressions, non-calcareous.	
		1.05		SILTSTONE/SANDSTONE - medium grey to light grey, becoming more sandy towards base, very fine grained sandstone, thin laminations, bottom 10cm bioturbated, calcareous.	
		0.07		SANDSTONE/SILTSTONE - very fine grained bioturbated continuation of above unit, gradational lower contact.	DD 41.76
		0.27		MUDSTONE - with thin laminar siltstone wisps, dark grey to medium grey, non-calcareous.	Box 14
		0.78		MUDSTONE/SILTSTONE - black to medium grey, mudstone at top becoming increasingly silty toward base, lower contact gradational, coaly streaks in mudstone, non-calcareous.	
10 ⁰		1.55		SILTSTONE/MUDSTONE - laminated, dark grey to medium grey, many leaf and stem impressions, siltstone ripples, fine cross-bedding, non-calcareous.	
		0.23		SANDSTONE - very fine grained, medium grey, silty, faint laminations, calcareous.	
		0.30		SANDSTONE - very fine grained, medium to light grey, silty, laminated, calcareous, gradational basal contact.	DD 44.81
		0.57		SILTSTONE - muddy dark grey to medium grey, numerous leaf and stem impressions non-calcareous, gradational basal contact.	
		2.12		SILTSTONE - sandy, very fine grained, increasingly sandier toward base, occasional muddy clast, gradational basal contact, non-calcareous.	Box 15

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY B. CORMIER DATE 29 JUNE 1981 SHEET NO. 7 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.11		SILTSTONE - very sandy, very fine grained, medium grey, faint laminations, non-calcareous.	
		0.28		SILTSTONE - muddy, ferruginous, medium grey, gradational contact at base, non-calcareous.	DD 47.85
		0.19		SANDSTONE - very fine grained, thin cross-laminations, light to medium grey, slightly silty, gradational basal contact, calcareous.	
6-7 ⁰		2.40		MUDSTONE/SILTSTONE - very fine grained sandstone, interbedded and thin laminations, minor cross-bedded sandstone, variable colours from dark to light grey, siltstone calcareous, all else non-calcareous.	
10-15 ⁰		2.88		SANDSTONE - light to medium grey, medium grained, slightly silty, fairly clean, faint bedding, fine grained muddy gradational top, general slight coarsening downward, non-calcareous.	DD 50.90
15-20 ⁰		2.49		SANDSTONE - light to medium grey, medium grained to coarse grained, faint bedding and thin laminations becoming coarse grained towards base. very clean, non-calcareous.	
		0.40		SANDSTONE - light grey, fine grained, faint bedding, coal spars in lower half, rounded pebbles of quartz and shale up to 2cm at base of unit contained within 3 to 4cm thick siliceous sandstone, having many coal spars throughout, all non-calcareous.	
		0.29		SANDSTONE - light grey, clean, fine grained to medium grained, non-calcareous.	
		0.20		SANDSTONE - light grey, variable grain sizes from fine to medium grained matrix to 10% pebbles up to 6cm diameter, lower 5cm of unit contains many shale or mudstone clasts, up to 3cm in length, and occasional quartz pebbel of similar size, non-calcareous base - channel, fractures and recemented with silica.	DD 56.69

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY B. CORMIER DATE 30 JUNE 1981 SHEET NO. 8 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.15		MUDSTONE - dark grey, slightly ferruginous, non-calcareous, abrupt basal contact, small sandstone lenses near base, siliceous fracture.	
		2.37		SANDSTONE - medium grained, light grey relatively clean, top 13cm contain many mudstone/shale lenticular clasts coal spars and streaks in upper half of unit, sharp basal contact, non-calcareous.	Box 19
		0.56		MUDSTONE - very silty, dark grey, thin sandy lenses and siliceous fractures, filling, gradational basal contact, non-calcareous.	
21 ⁰		0.43		SANDSTONE - silty fine grained, light grey with numerous thin mudstone laminae dark grey, less silty towards base, non-calcareous.	DD 59.74
18 ⁰		0.21		SANDSTONE - fine grained, light grey, numerous muddy laminations, dark grey.	
		0.24		SANDSTONE - light grey, variable grain size from medium grained to 1cm pebbles (5%) poorly sorted, mudstone/shale clasts irregularly shaped, up to 3 to 4cm in top half of unit, non-calcareous.	
20 ⁰		0.69		SANDSTONE - light grey, fine grained, silty, with numerous thin mudstone laminae, dark grey non-calcareous.	Box 20
		2.09		SANDSTONE - light grey, poorly sorted medium to very coarse grained with sub-rounded pebbles up to 1cm diameter, coal spars and streaks midway in unit, non-calcareous.	
		0.47		SANDSTONE - light grey, poorly sorted medium grained matrix with very coarse grained fragments up to pebbles (1-2cm) abrupt lower contact, non-calcareous.	DD 63.09

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY W. P. LEEDATE 29 JUNE 1981SHEET NO. 9 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.51m		CONGLOMERATE - light-medium grey, coarse grain sandstone matrix, max pebble diameter is 3cm pebbles subround-rounded, fair sorting, trace white pebbles, majority of pebbles cherty, non-calcareous, broken stick.	
		1.47m		SANDSTONE - light-medium grey, medium grain, with minor amounts coarse grain, tr. muddy clasts with 1cm diameter, abrupt lower contact, massive bedding with no apparent structures, non-calcareous, tr. stylotized surfaces on breaks, tr. mica flecks, core broken and ground in places.	
		0.40m		SILTSTONE - medium grey, muddy at top, abrupt lower contact, tr. thin coal spars, massive scattered carby rooty debris throughout, scattered mica flecks throughout, non-calcareous, broken stick core.	
			0.39m	SANDSTONE - light grey, very fine to fine grained, scattered mica flecks throughout, minor carby plant fragments, massive bedding, calcareous throughout, broken stick, core.	0.24m 66.14 0.15m
			1.83m	SILTSTONE - medium grey, minor very fine grain siltstone bands scattered throughout, minor mica flecks throughout, minor listrication on fractures, broken stick core, lower contact gradational, calcareous throughout.	
			2.07m	SANDSTONE/SILTSTONE (50/50) - light to medium grey, unit consists of deformation as a result of both slumping and microerosional features, siltstone interbedded, with siltstone throughout, siltstone represented as medium to dark grey, abundant plant impressions throughout, calcareous throughout, broken stick.	1.02m 69.19 1.05m
		0.15m		SANDSTONE - light grey, fine grey, very thinly bedded, abundant small silty clasts throughout, gradational upper contact and abrupt lower contact, abundant mica flecks throughout, core throughout, stick core.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY W. P. LEE DATE 29 JUNE 1981 SHEET NO. 10 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.09m		SILTSTONE - medium grey, massive, abrupt upper and lower contacts, listricated surfaces, scattered plant impressions, broken core, minor calcite veining, calcareous.	
		16.20m		SANDSTONE - light grey, fine to medium grain, scattered coarse grain bands throughout, traces of very fine grain sandstone clasts throughout, traces of thin coal spars throughout, some with pyritized edges, bedding; massive to thinly bedded with minor cross-bedding, some calcite lined listricated surfaces, lower 19cm has abundant medium grey siltstone clasts, scattered mica flecks throughout, tr. carby plant impressions, broken stick to crumbled in part, slightly calcareous, abrupt lower contact.	1.60m 72.24 3.15m 75.29 3.01m 78.33 2.85m 81.38 3.03m 84.43 2.56m
		5.23m		SILTSTONE - medium grey, scattered very fine grain sandstone laminae throughout, minor calcite veins (61° to core axis), massive, minor coal spars in upper 1/2 abundant carby plant impressions in upper 1/2 only minor in lower 1/2, minor winnowing in siltstone bands, broken core, gradational lower contact, non-calcareous at top slightly calcareous at lower 1/2.	0.41m 87.48 3.09m 90.53 1.73m 92.35
		1.70m		SANDSTONE - light-medium grey, fine grain, massive with minor cross-bedding, minor coal spars, (0.5cm thick), tr. calcite veining throughout, minor listricated surfaces, scattered carby plant debris, tr. mica flecks, slightly calcareous, broken.	1.10m 93.57 .60m
		1.64		SANDSTONE - medium grey, very fine grain with minor fine grain sandstone laminae throughout, massive, scattered listricated surfaces, minor slumping and bioturbated bands associated with fine grain laminaes, minor calcite coating on listricated surfaces, non-calcareous, broken core.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY W. P. LEE DATE 30 JUNE 1981 SHEET NO. 11 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
65 ⁰		1.85m		SANDSTONE - light to minor medium grey, abundant coal spars, throughout	0.22m
				medium grain with minor fine grain lenses, abundant listricated	96.62
				surfaces with calcite lining on some calcite veins cross-cutting	1.19m
				bedding scattered throughout, distinct distortion throughout unit,	97.53
				abrupt lower contact into clean uniform sandstone, carby plant debris	0.44m
				scattered throughout, core crumbled to ground, slightly calcareous.	
4-7 ⁰		2.95m		SANDSTONE - light grey, fine grain, with minor amounts medium grain tr.	1.42
				coal spars and tr. calcite veins parallel to bedding, lower contact	99.7
				gradational into poorly sorted pebbly laced sandstone, scattered	1.53m
				small scale cross-bedding, winnowed? scattered mica-flecks, broken.	
2-5 ⁰		0.85m		SANDSTONE - light-medium grain, with pebbles up to 2cm in diameter	0.85
				scattered throughout, cherty pebbles scattered coal spars and carby	102.41
				debris, thinly bedded, vuggy, non-calcareous, badly broken to rubble.	
		1.30m		SANDSTONE - light-medium grey, fine grain with minor very fine grain	1.30m
				lenses, tr. coal spars (0.5cm thick), scattered very thin calcite	
				veins, massive, lower contact gradational into coarser unit, minor very	
				fine grain light brown clasts, 33cm up from base is 2cm band of	
				dolomite veins-beige, broken stick, non-calcareous.	
		0.26m		CONGLOMERATE - light grey matrix, pebbles are white to bluish to dark	
				grey, quartz pebbles, chert pebbles and up to 5cm in diameter, chert	
				pebbles banded, matrix is fine-medium grain sandstone, pebbles subrounded	
				to round and poorly sorted, pebbles fractured, gradational lower	
				contact into clean finer sequence, broken stick, non-calcareous.	
		1.40m		SANDSTONE - light grey, fine grain, clean, massive tr coal spars, tr.	1.40m
				very thin calcite veins, tr. dark grey very fine grain/siltstone clasts,	
				base of unit coal spars with unknown thickness (max 10cm) core at base	
				rumble, remainder of unit broken stick, non-calcareous, minor carby	
				debris scattered throughout, lower contact gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY W. P. LEE DATE 1 JULY 1981 SHEET NO. 12 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		3.01m		SANDSTONE - medium grey at top remainder light grey, fine grain with pebbly bands scattered throughout, pebbly bands fair sorting with subrounded-subangular and with banded chert pebbles, scattered coal spars throughout, minor stylotized fractures, abundant carby debris non-calcareous, maximum pebble dia 2cm broken core to rumble in part.	0.39m 105.77 2.62m 108.5
		0.59m		SILTSTONE - medium grey, massive, both upper and lower contacts gradational tr. coal spars, carbonaceous plant debris scattered throughout, non-calcareous, broken core.	
		0.32m		SANDSTONE - light grey, very fine grain, clean, massive, non-calcareous gradational upper and lower contacts, tr. calcite veins, broken core.	
		1.19m		SANDSTONE - light grey, fine grain, scattered calcite lined fractures, becoming medium grey towards base, abundant calcite veins - very thin minor listricated surfaces, tr. coal spars - thin, non-calcareous, massive with minor evidence of small scale slumping, both contacts radational, broken.	
		0.92m		SANDSTONE - medium grey, very fine grain, massive, tr very thin calcite veins, minor bands of fine grain large grey sandstone, both contacts gradational, massive, clean, non-calcareous, broken stick.	
		0.63m		SILTSTONE - medium-dark grey, massive, minor listricated surfaces, gradational upper and lower contacts, core broken and ground in places, tr. carby plant fragments, non-calcareous.	0.13m 111.56 0.15m
		1.34m		MUDSTONE - medium-dark grey, silty in part, moreso at base, gradational contacts, tr. coal spars, scattered listricated surfaces, abundant carbonaceous plant debris throughout, core broken to rumble in places.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY W. P. LEE DATE 1 JULY 1981 SHEET NO. 13 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.40m		SILTSTONE/SANDSTONE (40/60) - light grey, very fine grain to silty, siltier at top, scattered coal spars, tr. worm burrows, abundant calcite veining in lower 1/2 of unit, minor dolomitized veins, massive bedding deformation in lower 1/2, non-calcareous, minor listrication in lower 1/2, broken core.	0.71m 114.60 0.69m
		0.52m		SILTSTONE - medium grey, massive, abundant listricated surfaces through out, minor very fine grain large grey siltstone lenses, non-calcareous, carby plant debris scattered throughout, core broken and crumbled, lower contact gradational.	0.52m 116.40
3-50		1.90m		SANDSTONE - light grey, very fine-fine grain, gradational upper contact abrupt lower contact, tr. coal spars, minor calcite veins massive at top becoming thinly bedded at base, minor medium grey bands near base, minor listricated surfaces non-calcareous, broken stick to broken.	
				CADOMIN (approx. 118.30m)	
			0.12m	CONGLOMERATE - light to medium grey, fine grain large grey siltstone matrix, fair sorting, subrounded-subangular maximum pebble diameter 1cm, minor coal spars, cherty pebbles, gradational at base, stick core, non calcareous.	
			0.99m	SANDSTONE - light grey, medium grain with abundant small pebbles, minor coal spars, non-calcareous, becoming gritty towards base, bluish banded chert pebbles, gradational at base - becoming coarser, broken stick.	
		1.27m		CONGLOMERATE - light grey, with pebbles ranging from white to faded blue to medium grey, fair sorting, subrounded to subangular, matrix consists of medium grain light grey sandstone, cherty pebbles with maximum dia. of 5cm, some pebbles showing residual stress fractures, lower contact abrupt, stick to broken stick, non-calcareous	0.11m 119.5 1.16m

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11 LOGGED BY W. P. LEE DATE 1 JULY 1981 SHEET NO. 14 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.36m		SANDSTONE - light grey, medium-coarse grain, abundant fractures through out, tr. thin coal spars, tr. thin calcite veins, non-calcareous, tr. listricated surfaces, scattered fractures throughout, broken stick, abrupt upper and lower contacts.	
		2.40m		CONGLOMERATE - light-medium grey, matrix fine grain, light grey sandstone, pebbles poorly sorted, subrounded-subangular, banded and fractured cherts, tr. coal spars-thin pebbles up to 5cm in diam, pebbles dirty white to bluish to medium grey, abrupt upper and lower contacts, broken stick, hard, non-calcareous, (1.21m from base - 23cm fine-medium grain, large grey siltstone band with abrupt upper contact and gradationl lower contact).	1.54m 122.83 0.86m
		0.62m		MUDSTONE/SILTSTONE (40/60) - muddy at top, abrupt upper contact, medium dark grey, massive abrupt listricated surfaces, becoming silty towards base, abrupt lower contact, non-calcareous, minor calcite lines fractures, tr. coal spars, core badly broken to crumbled, minor ferruginous bands.	
		0.25m		CONGLOMERATE - light to medium grey, very little if any matrix, siliceous cementing between pebbles, abundant stress fracturing through out unit, poorly sorted, subrounded-subangular, tr. coal spars, non calcareous, hard, stick, abrupt upper and lower contacts, quartz infilling/replacing chert pebbles.	0.25m 125.27
		0.66m		SANDSTONE - light-medium grey, fine grain at top to coarse at base, gradational lower contact, massive to thinly bedded with low-angle cross-beds, tr. thin coal spars, non-calcareous, broken stick.	
		1.14m		CONGLOMERATE - light-medium grey, light grey coarse grain siltstone matrix, fair sorting, subrounded-subangular, scattered stress fractures within cherty pebbles, (pre-depositional) tr. coal spars-thin non-calcareous, hard, broken stick core, pebbles range from dirty white to faded bluish to dark grey, pebbles 8-% chert, 10% quartz.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-11LOGGED BY W. P. LEEDATE 1 JULY 1981SHEET NO. 15 OF 15

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				- base of CADOMIN	
				MINNES	
	4.25m			MUDSTONE - medium-dark grey, abrupt upper contact, gradational lower contact, silty throughout (mudstone 80% - siltstone 20%), scattered ferruginous bands throughout upper 1/2 of unit - up to 10cm thick providing a distinct light brown appearance, abundant rooty debris throughout, minor listrication, tr. very thin calcite bands, becoming siltier towards base, non-calcareous.	1.35m 128.32 2.90m
	3.04m			SILTSTONE - light-medium grey, muddy throughout, 90% siltstone - 10% mudstone, massive clean, minor thin calcite veins, minor listricated surfaces, scattered carbonaceous rooty debris, upper contact gradational, tr. thin coal spars, lower contact gradational, non-calcareous at top becoming strongly calcareous towards and at base, broken core minor ferruginous bands throughout.	0.15m 131.37 1.77m 133.19 1.12m
	1.42m			MUDSTONE - medium-dark grey, silty throughout, mudstone 80%-siltstone 20%, abundant listricated surfaces throughout, abundant carbonaceous rooty debris, core badly broken to crumbled to ground, non-calcareous, core loss.	0.66m 135.64 0.76m 136.86
	4.23			SILTSTONE - light-medium grey, massive, becoming muddy towards base, abundant listricated surfaces throughout, tr. coal spars - thin, scattered thin calcite veins crossing each other at 90° (stress from 2 directions?) upper contact ground, lower contact end of hole, slightly calcareous, tr. ferruginous bands, carby plant fragments scattered throughout, core badly broken to crumbled in places.	2.27m 139.29 1.96m 141.12
				END OF HOLE	
				- drillers depth 141.12m/463 feet	

B P CANADA

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY C. BICKFORD DATE 17 JUNE 1981 SHEET NO. 1 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				- CASING -	DD 16'
				- LOWER GETTING FORMATION -	
		1.87		MUDSTONE - dark brown, soft, weathered, broken and ground, strongly calcareous.	
43°		1.04		SANDSTONE, very fine grained/SILTSTONE (50/50) - interbedded and interlaminated, ripples light grey sandstone and medium to dark grey siltstone. Gradational. Strongly calcareous.	0.32 DD 25' 0.72
		1.96		MUDSTONE - dark grey, minor black, carbonaceous phases. Strongly calcareous, gradational. Some badly broken and ground zones.	1.72 DD 11.28m 0.24
45° at 0.20m above base		3.14		SILTSTONE - medium grey, sandy, non-calcareous, locally broken and ground. Abrupt.	2.53 DD 47' 0.61
		0.04		MUDSTONE - black, coaly. Abrupt.	
35° at 0.30m above base		4.12		SILTSTONE, grading down to MUDSTONE - a fining downward unit of medium grey silty mudstone, in turn passing to dark brownish-grey, soft mudstone. Unit locally badly broken and somewhat sheared toward base. Ground out at base. One thin sandstone band towards base. Non-calcareous.	1.75 DD 57' 2.37 DD 67'
		0.80		SANDSTONE - very fine grained, silty, medium to dark grey, rooty at top, burrowed below. Hard, non-calcareous, dark grey and somewhat carbonaceous at top. Abrupt.	
		0.36		MUDSTONE - dark olive grey, soft, locally broken. Non-calcareous; abrupt.	
35°		1.94		SANDSTONE - very fine to fine grained, silty at top, medium grey. Thinly laminated, locally bioturbated. Ground at base, probable core loss. Locally weakly calcareous.	1.75 DD 77' 0.19

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY C. BICKFORD DATE 17 JUNE 1981 SHEET NO. 2 OF 6

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.94		SANDSTONE - very fine to fine-grained, silty at top; medium grey. Thinly laminated, locally bioturbated. Ground at base, probable core loss. Locally weakly calcareous.	1.75 DD77' 0.19
		0.87		SANDSTONE - fine to medium-grained, clean, well cemented, medium grey; a few plant fragments. Silty at top; medium-scale cross-lamination at base. Ground and broken at top. Non-calcareous. Gradational.	
		4.51		SANDSTONE - fine to medium-grained at top, with occasional coarse-grained phases; downward becoming more abundant until at base unit is principally coarse to very coarse-grained with minor fine-grained phases. Unit is thick-bedded and mainly unlaminated, with a few planar to low-angle cross-laminated zones, medium grey; Typically clean porous and poorly-cemented, notably at base. Occasional coal spars and intraclast bands. Siliceous; compare to Lower Gething coarse sands at Sukunka. Towards base, some granular phases, not more than 10% of interval. Stylolitic; common broken zones. Probable core loss. Basal contact broken.	1.68 DD87' 2.73 DD97' 0.10
25°		0.74		SANDSTONE - fine-grained, medium grey, better-cemented - non above. Towards base becomes darker grey with abundant thin carbonaceous laminae. Basal 0.14m is black carbonaceous to coaly sandstone. Non-calcareous; abrupt.	
		0.04		MUDSTONE - black, carbonaceous, abundant bright coal bands. Stick.	
		0.06		COAL - dull and bright, lustrous, slightly sheared. Broken.	
		0.07		COAL - dull, lustrous, slightly sheared.	
		0.10		COAL - dull banded, lustrous, slightly sheared.	
		0.14		MUDSTONE - dark olive grey, very soft, sheared. Stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY C. BICKFORD DATE 18 JUNE 1981 SHEET NO. 3 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
46°		1.41		SILTSTONE/SANDSTONE, very fine grained (75/25) - interbedded, locally intensely bioturbated dark grey argillaceous siltstone and light to medium grey silty sandstone, strongly calcareous. Gradational.	
		4.86		MUDSTONE - dark grey, occasional ferruginous bands, abrupt. Moderately to strongly calcareous in top 0.75m, non-calcareous below. Locally broken.	0.94 DD117 282 DD127
		0.58		MUDSTONE - dark grey at top, becoming black below, carbonaceous; thin bright coal bands towards base. Broken at top.	1.10
		0.15		MUDSTONE - black, carbonaceous, badly broken. Abundant fragments of bright COAL at top.	
31° at base		4.06		SILTSTONE/MUDSTONE/SANDSTONE very fine grained (65/20/15) - interbedded unlaminated dark grey siltstone and silty mudstone with thin bands of light grey, silty, locally rippled sandstone. Alternately non-and strongly calcareous, abrupt.	DD137 3.00 DD147 1.06
		1.88		MUDSTONE - dark grey, a few silty bands. Patchily strongly calcareous. Abrupt.	
		0.07		MUDSTONE - black, carbonaceous, minor thin bright coal bands. Broken, Abrupt.	DD157
		0.78		MUDSTONE - dark grey, non-calcareous, silty at base. Gradational.	
		1.44		SILTSTONE, grading down to SANDSTONE, very fine grained - medium grey, locally burrowed. Non-calcareous at top, becoming moderately calcareous below. Gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY C. BICKFORD DATE 18 JUNE 1981 SHEET NO. 4 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		4.35		SANDSTONE - very fine to fine grained at top, grading to fine grained below. Silty at top, becoming cleaner towards base. Light to medium grey, locally abundant burrows in top 1m, with rare relict cross-lamination. Below, unit is medium to large scale low-angle cross-laminated. Occasional stylolites. Moderately calcareous, abrupt.	0.86 DD167 3.12 DD177 0.37
		1.01		SANDSTONE - coarse to very coarse grained, clean, medium grey, siliceous, stylolitic. Non-calcareous, abrupt.	
350		1.43		SANDSTONE - very fine grained, silty medium grey, locally slumped. Moderately to strongly calcareous, abrupt.	
		1.90		SANDSTONE - fine to medium grained, clean, light to medium grey, large scale low-angle cross-laminated; weakly to moderately calcareous; abrupt.	0.30 DD187 1.60
		1.37		SANDSTONE - fine to coarse grained, medium to dark grey siliceous; abundant coal spars, locally broken. Minor bands of granules and small pebbles. Abrupt. Very weakly calcareous.	
		0.25		GRITSTONE - granules, dominantly of dark grey chert, in a coarse sand matrix. Weakly calcareous; abrupt.	DD197
		1.88		SANDSTONE - fine to coarse grained, medium to dark grey, siliceous, with abundant coal spars. Broken. Very weakly calcareous, abrupt.	
		0.44		SANDSTONE, very fine grained grading down to SILTSTONE - a fining downward unit of medium grey, silty sandstone and dark grey siltstone, argillaceous at base. Non-calcareous; abrupt.	0.13 DD206 0.31
		1.08		SANDSTONE - fine to coarse grained, locally pebbly and conglomeratic, medium grey, a few large coal spars and dark silty intraclasts. Except for one 0.20m strongly calcareous phase, unit is weakly calcareous. Abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY C. BICKFORD DATE 17 JUNE 1981 SHEET NO. 5 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.01		SANDSTONE - medium grained, clean, medium grey, well sorted. Non-calcareous; abrupt.	
36° at 0.20 above base		0.94		SANDSTONE - very fine to fine grained, silty medium grey, minor slumping. Strongly calcareous at top, weakly calcareous below. Gradational.	0.59 DD216.5 0.15 0.20
		1.42		MUDSTONE - dark grey, silty, locally calcareous, abrupt.	
		1.55		SILTSTONE - dark grey, rooty, and ferruginous at top. In basal 0.08m grades down to dark grey, silty mudstone, strongly calcareous, abrupt.	1.29 DD226.5 0.26
33°		0.41		SANDSTONE, very fine grained/SILTSTONE/MUDSTONE (60/30/10) - thinly interlaminated medium grey silty sandstone, siltstone and dark grey silty mudstone. Strongly calcareous; gradational.	
		6.46		MUDSTONE/SILTSTONE (85/15) - dark grey, locally silty mudstone with scattered thin bands and occasional interbeds to 0.32m of medium grey, locally ferruginous, sandy siltstone. Scattered finely broken plant debris. Locally broken and ground. Possible core loss. Silts moderately to strongly calcareous; mudstones are locally calcareous. Abrupt.	1.78 DD235 3.00 DD246 1.68
29°		1.44		SILTSTONE/MUDSTONE/SANDSTONE, very fine grained (50/30/20) - thickly interbedded, locally interlaminated medium grey siltstone, dark grey silty mudstone and light grey silty sandstone. Some slumping. Locally broken, Possible core loss. Strongly calcareous. Abrupt.	0.99 DD256 0.45
33°		0.18		MUDSTONE/SILTSTONE (60/40) - interlaminated dark grey, silty mudstone and siltstone. Moderately calcareous.	
					BASE X25

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY DATE 18 JUNE 1981 SHEET NO. 6 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.24		MUDSTONE - medium grey, highly silty, few plant fragments, strongly calcareous, fragmented core.	
		0.23		SANDSTONE - medium grey, very fine grained, argillaceous, strongly calcareous, one listric calcite encrusted surface, listric basal contact.	
		1.96		MUDSTONE - dark grey/black, upper half somewhat 'bleached', remainder locally carbonaceous abundant plant fragments, listricated throughout; appears coaly in top most 0.29m but this interval badly fragmented and might be a significant core loss here.	0.29 DD 81.08 1.67
		0.77		MUDSTONE - black, hard, locally approaching coaly mudstone but generally very carbonaceous, much listrication, broken core, gradational at base.	
		1.29		MUDSTONE - black, carbonaceous, sporadic coal intervals, especially in top 0.30m and basal 0.40m (these intervals badly fragmented and appear to contain substantial core loss). Mudstone have large amounts of finely broken carbonaceous plant fragments, gradational at base.	0.28 DD 84.13 1.01
		0.39		SILTSTONE - dark grey, siliceous, argillaceous, few plant fragments, gradational at base.	
		0.16		MUDSTONE - dark grey/black, abundant carbonized plant debris, slightly carbonaceous, gradational.	
		0.72		SILTSTONE - dark grey, coarse grained, locally slightly argillaceous, slightly calcareous, sporadic lamination, very gradational.	0.43 DD 87.48 0.29
		9.69		SANDSTONE - dominantly medium grey, basal 2/3 varies from fine to medium grained intervals, top 1/3 essentially fine grained cherts dominant component mostly strongly calcareous; sequence cross-bedded throughout and brief zones cross-laminated, especially within upper 1.35m. Much finely macerated plant debris (emphasising laminae). Coal spars and intraclasts occur in lower 2/3 sequence.	2.66 DD 90.53 2.93 DD 93.57 2.79 DD 96.62
20-30°					

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY DATE 18 JUNE 1981 SHEET NO. 7 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				Core yielding at numerous places along zones carbonaceous debris, slump structures; two intervals of very fine grained, argillaceous sandstone, totalling 0.3m. Basal 0.6m has abundant silty/muddy intraclasts, broken stick, erosional at base.	1.31
31 ⁰		1.01		SANDSTONE - medium grey, very fine grained, 0.15m argillaceous/silty layer, laminated, strongly calcareous, small 'calcite' fractures, lustricated core, abrupt basal contact.	
30 ⁰				SANDSTONE/SILTSTONE - medium/dark grey, sandstone, very fine grained, highly argillaceous, sporadically laminated, muddy bands, calcareous, gradational, basal 0.3m fragmented.	0.59 DD 99.64 0.46
28-30 ⁰		1.44		SANDSTONE/SILTSTONE/MUDSTONE - medium/dark grey, broadly interlayered, sandstone (dominant) very fine grained, laminated, slumped, silts highly argillaceous; mudstone with carbonaceous intervals, calcareous throughout, gradational at base.	
		0.57		SILTSTONE - medium grey, highly argillaceous, plant fragments, strongly calcareous, sporadic lamination, gradational.	
		0.79		MUDSTONE - dark grey/black, locally very carbonaceous, coaly mudstone in upper 0.3m, silty and ferruginous, calcareous downward, passage below by interlamination.	0.32 DD102.72 0.47
		0.59		SILTSTONE - dark grey, highly argillaceous, sparsely laminated, strongly calcareous, abundant carbonized plant detritus, gradational.	
		3.10		MUDSTONE - predominantly black, locally highly carbonaceous and grading to coaly mudstone, silty intervals but devoid of lamination, much lustricated surfaces, slightly ferruginous zones, continuous below.	1.43 DD105.77 1.67

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY DATE 18 JUNE 1981 SHEET NO. 8 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.33		MUDSTONE - black, badly fragmented and pulverized throughout, appears to have oval intervals but difficult to estimate due to core condition.	
		4.32		MUDSTONE - black, carbonaceous, locally develops into thin coaly mudstone, abundant carbonized plant detritus, disseminated silts, lacking lamination throughout, non-calcareous, broken core.	DD108.81 1.81 DD111.25 2.51
		3.19		SILTSTONE - medium grey, very argillaceous, sparsely laminated, few plant fragments, siliceous, gradational.	0.52 DD114.30 2.67
30-32 ⁰		4.67		SANDSTONE - medium grey, brief interval, light grey, dominantly very fine grained, laminated, cross-laminated and rippled throughout, locally argillaceous, sparse burrows 0.25m argillaceous siltstone, strong to moderately calcareous throughout, core locally fractured, one calcite zone (116.8m) but no significant structure suspected.	1.80 DD117.35 1.75 DD119.48 1.12
30 ⁰		2.20		SANDSTONE - light/medium grey, dominantly fine-grained, sequence characterized by rare abundance of finely broken carbonized plant debris and locally concentrated along laminae (carbonaceous laminae), slumping of laminae and embodying tiny silty clasts, two very fine grained argillaceous sandstone band, (7cm thick), cross-bedded and cross-laminated, weak to strongly calcareous, few coal spars, strongly erosional below.	0.45 DD121.01 1.75
		3.67		MUDSTONE - dominantly dark grey, very silty in top 1-1m and sporadically laminated 3cm finely fragmented and 26cm above base, locally slightly ferruginous, non-calcareous throughout, gradational at base.	1.01 DD124.06 2.66
		0.70		SILTSTONE/MUDSTONE - medium/dark grey, silts highly argillaceous and mudstone silty, carbonaceous and rooty matter very fine grained thin lenticular sands in basal 15cm, gradational at base.	0.10 DD127.10 0.06

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY DATE 18 JUNE 1981 SHEET NO. 9 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.64		SANDSTONE - light grey at top, clean and fine grained, lower half dark grey, very fine grained, argillaceous and muddy laminae, whole interval finely laminated and rippled, hairline calcite veining in top 20cm section, very gradational at base.	
		0.34		SILTSTONE/MUDSTONE - medium/dark grey, interlayered mudstone dominant, silty laminae slightly calcareous, gradational at base.	
		0.75		MUDSTONE - black, locally highly carbonaceous, thin coaly mudstone bands, core broken and fragmented, gradational at base.	
		0.23		MUDSTONE - dark grey, highly silty, carbonized plant fragments, rootlets; gradational at base.	
		0.36		SANDSTONE - medium grey, very fine grained, argillaceous, silty, micrograded units, laminated, sparse finely broken plant fragments, basal 7cm highly muddy/silty, very gradational at base.	
		0.67		MUDSTONE - dark grey, homogenously silty, occasional carbonized plant fragments, structureless, vague occasional lamination toward base, gradational.	
28-30°		1.18		SANDSTONE - light/medium grey, very fine grained, argillaceous, silty, small ripples, fractures 45° to core axis, strongly calcareous, gradational at base.	
		0.39		MUDSTONE - medium grey, very silty (disseminated), calcareous, erosional at base.	
		0.11		SANDSTONE - medium grey, fine to very fine grained, laminated, calcareous, gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY DATE 18 JUNE 1981 SHEET NO. 10 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.25		SILTSTONE - medium grey, coarse grained, argillaceous, irregularly laminated, calcareous, very gradational at base.	0.17 DD133.25 0.08
		0.28		MUDSTONE - dark grey, calcareous, silty, very transitional at base.	
		0.64		SILTSTONE - medium grey, coarse grained, very argillaceous, strongly calcareous, carbonaceous plant fragments, sporadically laminated, gradational at base.	
		0.87		MUDSTONE - medium grey, homogenously silty, lacking lamination, gradational.	
		0.33		SILTSTONE - medium/dark grey, argillaceous, siliceous, rootlets, gradual at base.	
		0.37		SANDSTONE - brownish grey, very fine grained, silty, argillaceous, calcareous, disturbed laminae (?bioturbation), gradual passage.	
270		1.67		SILTSTONE/MUDSTONE - medium/dark grey, about equal, frequently interlaminated, generally gradational from one to another, delicate ripples of very fine-grained sands, calcareous, passage by inter-bedding at base.	0.45 DD136.25 1.22
		0.46		SANDSTONE/SILTSTONE - light/medium grey, dominantly sandy, rapidly interlaminated sequence of very fine grained sands and silts with abundant argillaceous contents, sporadic ripples, strongly calcareous, gradational below.	
250		2.16		SANDSTONE - light/medium grey, dominantly very fine grained, (5% fine grained clean and sorted) very silty (as laminae) and argillaceous, cross-laminated and rippled throughout, local concentration of finely broken carbonized plant debris, pyrite occasional sand-filled burrows, strongly calcareous, gradational at base.	2.1 DD139.30 0.06

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY DATE 18 JUNE 1981 SHEET NO. 11 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.27		SILTSTONE/MUDSTONE - slight dominance of silts, medium grey, argillaceous, dark grey, lamination of silts/muds, almost imperceptible transition to each other, slightly calcareous, gradual at base.	
		0.29		MUDSTONE - black, carbonaceous, broken 8cm badly fragmented and some of which is coaly mudstone. Few coal spars towards top.	
28 ⁰		0.70		MUDSTONE/SILTSTONE - dark grey, dominantly muddy, with widely dispersed very fine grained thin sand laminae, sequence broadly gradational (internally) as well as toward base, silty laminae slightly calcareous.	
		0.50		MUDSTONE - black, locally canneloid, carbonaceous and coaly mudstone, broken core.	
		0.86		MUDSTONE - medium/dark grey, abundant plant debris and rootlets, structureless, increasing silty content downward.	0.33 DD142.34
		0.58		SILTSTONE - medium grey, very argillaceous, plant fragments, siliceous, gradational at base.	0.53
28-30 ⁰		1.89		SILTSTONE/MUDSTONE - medium grey/dark grey (muddy zones) dominance of silts, siliceous, argillaceous, sporadically laminated, locally rippled with rootlets, gradational at base.	DD145.39
		0.44		MUDSTONE - dominantly black, carbonaceous about 10cm thick coaly hard mudstone, coal spars, gradational at base.	
		0.89		SILTSTONE/MUDSTONE - dark grey, dominance of silts, mudstone interspersed abundant rootlets and carbonaceous plant material, siliceous, structureless, gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY DATE 21 JUNE 1981 SHEET NO. 12 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.84		MUDSTONE - dark grey, locally highly silty, ferruginous, homogenous, transitional.	1.47 DD148.44 0.37
		0.55		MUDSTONE - black, locally very carbonaceous and coaly canneloid mudstone, broken core, listricated, gradual at base.	
		1.12		MUDSTONE - dark grey/black, top 15cm very silty and calcareous, remainder slightly silty and ferruginous, structureless, gradational.	
		2.73		MUDSTONE/SILTSTONE - dominantly muddy, medium grey, interlayered, strongly calcareous, sporadic vague lamination, ferruginous, fragmented basal contact.	0.77 DD151.48 1.96
30°		0.76		SANDSTONE - light/medium grey, very fine grained, silty argillaceous, strongly calcareous, numerous brittle fractures, (non calcite filled), small-scale cross-lamination, sporadic burrows, gradational at base.	
		1.74		SILTSTONE/MUDSTONE - medium/dark grey siltstone predominant, argillaceous strongly calcareous, sparsely laminated, gradational.	0.16 DD154.54 1.58
		1.94		MUDSTONE - dark grey, slightly silty, and locally brief carbonaceous mudstone, listric surfaces, gradational at base.	1.30 DD157.58 0.64
		0.46		MUDSTONE - dark grey/black, carbonaceous, coaly intervals (mostly badly fragmented), gradational at base.	
28-31°		1.99		SANDSTONE/SILTSTONE - medium grey, slight dominance of sands - argillaceous, regularly laminated, very fine grained, silts rapidly interlaminated, strongly calcareous, very gradational at base.	1.79 DD160.63 0.20
		1.46		SANDSTONE/SILTSTONE - medium/dark grey, top half dominantly sandstone, very fine grained, rippled, argillaceous and silty laminae, lower half predominantly silty, argillaceous, entire section strongly calcareous, erosional at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY DATE 21 JUNE 1981 SHEET NO. 13 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.00		SANDSTONE - light/medium grey, top 0.3m very fine grained and very silty, remainder, fine-grained, rippled, cross-laminated, with slump structures, sporadic burrows, strongly calcareous, passage at base by gradation and interbedding, core broken towards base.	
		0.17		MUDSTONE - medium grey, homogenously silty, occasional isolated laminae, strongly calcareous.	
		0.79		SANDSTONE/SILTSTONE - about equal, very fine-grained finely rippled and burrowed sandstone interlayed with dark grey coarse grained and argillaceous siltstone, strongly calcareous.	DD163.68
27-30 ^o		5.36		SANDSTONE/SILTSTONE - dominance of sands, medium-dark grey, predominantly very fine grained, abundantly silty/argillaceous, cross-laminated and microrippled, locally graded and vaguely banded, gradual at base.	2.15 DD166.37 2.94 DD169.78
		1.22		MUDSTONE - upper half black, dense, totally lacking silt content, canneloid with some zones rich in carbonized plant debris associated with sphaerosiderite grains, remainder medium grey, increasingly silty downward, fragmented base.	0.27
		0.35		SILTSTONE - medium grey, abundant thin laminae and layers of very fine-grained sands, muddy band in middle, strongly calcareous, fragmented at base.	
		5.05		MUDSTONE - top 2.75m dark grey to black, the remainder black, dense and breaks with conchoidal fracture, the entire sequence strongly calcareous totally lacking in lamination and free of discernible silty content. Certain intervals very hard and rich in finely broken carbonized plant fragments, locally abundant pelecypod and gastropod shells (some fragmented and tiny). Pyrite and sphaerosiderite locally present, basal 1.75m core fragmented and broken.	DD172.82 3.0 DD175.87 1.17 DD177.09 0.33 DD178.92 0.55

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY CHOWDRY/B. CORMIER DATE 24 JUNE 1981 SHEET NO. 14 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.98		MUDSTONE - dark grey/black, hard, abundant carbonized plant detritus, locally listricated, non-calcareous, transitional at base; fragmented core.	
		0.43		MUDSTONE - dark grey, vaguely banded, apparently silty, calcareous, gradual.	
		3.10		MUDSTONE - black, carbonaceous, abundant carbonized plant debris, core fragmented throughout, locally listricated, gradational	0.32 DD181.97 2.78 DD185.02
		0.52		MUDSTONE - dark grey, very highly silty, 10cm thick very fine grained, laminated and silty, strongly calcareous sandstone in middle of unit, abrupt at base.	
32 ⁰		0.42		SANDSTONE - light/medium grey, very fine grained, regularly rippled, bottomward highly muddy/silty and with finely comminuted carbonized plant matter, strongly calcareous, abrupt at base.	
		0.40		MUDSTONE - dark grey, slightly silty, highly calcareous, carbonaceous fragments.	
		0.28		MUDSTONE - dark grey, very homogenous lacks visible carbonaceous material, highly carbonaceous, very gradual contact.	DD188.06 BOX 62
		0.57		MUDSTONE - very silty, dark grey to grey, occasional calcite-filled fracture, highly calcareous, gradational basal contact.	
35 ⁰		0.28		SANDSTONE/MUDSTONE - interlaminated, dark grey to light grey, and silty throughout irregular contact at base, calcareous.	
35 ⁰		1.40		MUDSTONE - silty, dark grey, occasional faint bedding, highly calcareous, sharp lower contact.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY B. CORMIER DATE 25 JUNE 1981 SHEET NO. 15 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.16		MUDSTONE - black, small carbonaceous and coaly fragments, non-calcareous.	
		1.23		MUDSTONE - black, homogenous, slightly calcareous to non-calcareous.	
		1.24		MUDSTONE - black to dark grey, slightly silty, non-calcareous, possible core loss 20cm from top.	191.11 BOX 63
		0.67		MUDSTONE - black to dark grey, ferruginous in part, slightly silty throughout, calcareous.	194.16 BOX 64
		0.18		MUDSTONE - black, non-calcareous, gradational.	
		0.63		MUDSTONE - dark grey, silty, non-calcareous.	
		0.23		SANDSTONE/MUDSTONE - thin laminations dark grey to grey banding, silty, non-calcareous, very fine grained.	196.60
400		0.31		SANDSTONE - very silty, grey to light grey banding, very fine grained, calcareous.	BOX 65
		0.72		MUDSTONE/SILTSTONE - dark grey to grey, occasional carbonaceous debris, calcareous.	
450		0.25		SANDSTONE - very silty and muddy, very fine grained to fine grained, small cross-beds grey to light grey, highly calcareous, gradational lower contact.	
		0.32		MUDSTONE - silty, dark grey, faint bedding, non-calcareous.	
		0.50		MUDSTONE, very dark grey, thin coaly spars, and carbonaceous debris along fractures, lower part of unit - core pulverized or broken. Non-calcareous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY B. CORMIER DATE 25 JUNE 1981 SHEET NO. 16 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.17		MUDSTONE - very dark grey, thin coaly spars, and carbonaceous debris along fractures, non-calcareous.	179.34
		1.70		MUDSTONE - slightly silty, dark grey, ferruginous concentrations, no visible banding, non-calcareous, ferruginous material-calcareous.	BOX 66
35°		0.85		MUDSTONE - very silty with occasional band of very fine grained sandstone, distinct banding throughout, highly calcareous.	
		0.40		MUDSTONE - slightly silty, ferruginous zones, dark grey to brownish grey, faint banding, highly calcareous.	
		0.75		MUDSTONE - black, some coaly debris and carbonaceous throughout, slightly silt, calcareous top, non-calcareous at base.	202.39
		0.34		MUDSTONE - black, listricated on fracture surfaces.	BOX 67
		0.08		COAL - bright and dull 2 to 4mm bands, partially pulverized and broken stick.	
		0.07		COAL - dull, lustrous, occasional thin bright band, broken stick.	0.34
		0.02		CARBONACEOUS SHALE - dull, black, bright, thin coal spars throughout, stick.	0.08 0.10 0.24
		0.01		COAL - dull and bright, banded, stick.	1.35
		0.24		MUDSTONE - black, sharp contact at base.	
25°		1.36		SILTSTONE/SANDSTONE - slight predominance of siltstone, very fine grain sandstone, grey gradational bedding within unit, thin mudstone bands, thin mudstone/siltstone laminae throughout, mudstone predominates at base, slightly calcareous to non-calcareous.	DD206.05

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY B. CORMIER DATE 25 JUNE 1981 SHEET NO. 17 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.12		MUDSTONE - silty bands, black to dark grey, sharp contact at base.	
150		2.12		SANDSTONE - grey to light grey, clean, uniform texture, with faint bedding throughout, fine grained, several thin calcite filled fractures, rooted in top one metre of unit, non-calcareous.	BOX 68
		0.03		SILTSTONE - argillaceous, dark grey, non-calcareous.	
130		0.29		SANDSTONE - fine grained, generally clean, grey a thin mudstone band in middle of unit, moderately calcareous, lower contact, soft mud-filled fracture zone.	
		0.41		SANDSTONE/MUDSTONE - dark grey to grey, very fine grained to fine grained sand, irregularly interlaminated, slumping, slightly calcareous, lower contact-fractures, veins filled with calcite and brecciated at bottom, one cm.	DD202.09
150		0.37		SANDSTONE/MUDSTONE - thin interlaminae, dark grey to grey, very fine grained sand, occasional calcite filled fracture, non-calcareous.	DD202.09
		0.09		MUDSTONE - brecciated zone, dark grey to black, lower 2cm ferruginous mudstone, bronish grey, calcite filling, vuggy in part, non-calcareous.	BOX 69
250		0.67		SANDSTONE - light grey, fine grained, generally clean and faintly bedded occasional thin mudstone laminae, upper portion rooted and calcite filled fractures present, moderately to slightly calcareous, sharp basal contact.	
200		0.28		SANDSTONE - grey, very fine grained, thin intraclastic zone in middle of unit, slightly calcareous.	
		0.03		INTERCLASTIC - very fine-grained sandstone and mudstone, grey, calcareous, sharp contacts.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY B. CORMIER DATE 25 JUNE 1981 SHEET NO. 18 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.50		SILTSTONE - grey, with thin occasional mudstone laminae and bands, slightly calcareous, lower contact gradational.	DD211.23
		0.38		MUDSTONE - black, upper 5cms silty and lower contact gradational to siltstone.	
35 ⁰		0.60		SILTSTONE - grey, faint banding, several mudstone bands near gradational base, calcareous to slightly calcareous.	
		0.48		SANDSTONE/MUDSTONE - interlaminae, predominantly sandstone silty, very fine grained, slump structure in middle of unit.	BOX 70
		0.92		SANDSTONE - silty very fine grained to fine grain, grey to light grey, much calcite filled, vuggy fracturing upper part contains 20cms of broken core.	DD213.06
		0.43		MUDSTONE - with minor siltstone bands, dark grey to grey, calcite filled fractures throughout, non-calcareous, top half broken core.	
		2.53		MUDSTONE - silty, dark grey, gradational silt banding coal or carbonaceous shale along occasional shears, cross-hatched network of calcite filled fractures plentiful throughout.	DD214.58 BOX 71
		1.00		MUDSTONE - silty, dark grey, some calcite-filled fractures, 2 to 3cm carbonaceous mudstone zone approximately 1/3 of the distance from the top of the unit.	DD220.37 BOX 72
65 ⁰		2.47		MUDSTONE - silty, dark grey, many irregular patterned calcite filled fractures top 10-15cm of unit badly broken, non-calcareous	DD222.20 BOX 73
		0.51		MUDSTONE - silty, dark grey, numerous irregularly patterned calcite-filled fractures, non-calcareous, sharp basal contact.	224.64

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY B. CORMIER DATE 25 JUNE 1981 SHEET NO. 19 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.15		MUDSTONE - black, core badly broken throughout but most of unit, listricated fracture surfaces.	
50-55°		2.02		CARBONACEOUS MUDSTONE - black, coal spars dispersed throughout, broken content in basal 10cm.	
		0.09		COAL - dull, black, listricated cleats.	BOX 74 226.77
		0.06		COAL - bright, black.	
		0.10		COAL - dull, lustres, within bright streaks.	
		0.35		COALY MUDSTONE - with bright coal spars and streaks, soft pulverized section near base.	
50°		0.50		MUDSTONE - black, occasional coal spar, slightly carbonaceous.	BOX 75 230.73
50°		2.93		MUDSTONE - black, occasional calcite filled fracture.	BOX 76 233.78
		0.56		MUDSTONE - black, listricated fracture surfaces.	
50°		0.83		MUDSTONE/SILTSTONE - 50% split, cut by numerous calcite filled vuggy fractures, 5cm very fine grained sandstone bed in middle of unit.	
		0.17		MUDSTONE - black, with 2mm fracture zone filled with calcite and reworked mudstone, gradational at base.	
35°		0.36		SILTSTONE/MUDSTONE - thin interlaminae medium grey to black with hairline calcite-filled fracture sets, stick.	
		0.46		SANDSTONE - very fine grained, medium grey bedding disturbed and disected by numerous calcite filled fractures and carbonaceous mudstone filling along listricated surfaces. Fracture set perpendicular to each other at 50° and 45°, large burrow at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY B. CORMIER DATE 25 JUNE 1981 SHEET NO. 20 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.46		SILTSTONE/SANDSTONE - argillaceous, very fine grained sandstone, medium grey, thin laminations in upper half, slumping in lower half calcareous mudstone fracture fill at centre thin calcite filled fracture in upper half perpendicular to bedding, gradational base to mudstone.	
		0.08		MUDSTONE - black, slightly silty.	
			1.19	MUDSTONE - black, minor silty intervals and slump structures, occasional hairline calcite filled fractures, and listriacted, stick.	DD236.83
					DD238.66
70-80°			3.73	MUDSTONE - black to dark grey, silty intervals, occasional calcite filled fractures and listricated surfaces.	
70-80°			1.56	MUDSTONE/SILTSTONE - mudstone dominates black to dark grey, high angle irregular laminations, slump structures, thin discontinuous calcite-filled fractures at 25° highly sheared, broken sections.	BOX 78 241.71
					243.23
			2.45	MUDSTONE/SILTSTONE - mudstone dominated black to dark grey, high angle bedding and shear structures, gradational laminae and calcite filling.	
			0.45	MUDSTONE - black, highly sheared parallel to bedding (vert) with network of calcite veins and coaly debris infilling.	
			0.10	SILTSTONE/MUDSTONE - near vertical bedding, contorted, dark to medium grey.	
					DD245.97
85-90°		0.74		SILTSTONE/SANDSTONE - medium grey, very fine grain sand, impure variable thin laminae, sheared along bedding plane (near vertical) contorted, minor low-angle calcite filled fracture sets, listricated along shears with pyritic coal debris, slightly calcareous.	

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COAL DIVISION

BOREHOLE NO. BP81-12 LOGGED BY B. CORMIER DATE 25 JUNE 1981 SHEET NO. 21 OF 21

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.12		MUDSTONE/SILTSTONE - mudstone predominated black to dark grey, indistinct bedding at high angle to horizontal, 0.2m from top 0.25m shear zone - broken core, listricated surfaces, occasional thin calcite veinlet.	
		0.22		MUDSTONE - black, becoming silty towards base.	DD249.02
60°		2.13		MUDSTONE/SILTSTONE - mudstone predominates dark grey, calcite filling irregular shears in top 1m, a few thin calcite filled fractures, calcareous, gradational base.	
		0.70		MUDSTONE - black, occasional calcite filled fracture, 251.75-255.0 crushed core.	
		0.56		MUDSTONE - black, gradational contact at base.	252.07
55-60°		0.20		MUDSTONE/SILTSTONE - dark grey, no distinct bedding boundaries, gradational base.	
		1.91		MUDSTONE - black to dark grey, slightly silty bands throughout, a few shears, listricated with coaly debris.	
45°		2.00		MUDSTONE - black to dark grey, slightly silty bands throughout, some fracturing parallel to bedding, lower 0.5m contains a few coal spars.	DD255.12
		2.15		MUDSTONE - black, fragments of coaly debris on shears, gradational base.	DD257.25
		0.62		MUDSTONE - carbonaceous, with numerous coal spars throughout, 0.27 from top, 0.05m coal seam, gradational contact at base of unit.	
		0.37		MUDSTONE - black,	
		2.34		MUDSTONE - slightly carbonaceous, black, non-calcareous.	DD260.90
				END OF HOLE	263.96

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 18 JUNE 1981 SHEET NO. 1 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	13.20		(13.20)	CASING - NO CORE	
				LOWER GETTING FORMATION?	
50	15.35	2.15	2.15	SANDSTONE - very fine to fine grained/SILTSTONE (60/40) - interbedded locally intensely bioturbated medium grey silty sandstone and dark grey argillaceous siltstone, strongly calcareous, abrupt.	0.78 DD47 1.37
	23.98	8.63	8.63	SILTSTONE/SANDSTONE very fine grained (70/30) - thickly interbedded. locally intensely bioturbated medium to dark grey, locally argillaceous siltstone and medium grey silty sandstone, strongly calcareous, abrupt.	1.55 DD57 3.05 DD67 3.03 DD77 1.00
	24.71	0.73	0.73	SANDSTONE - very fine to fine grained, silty, medium grey, some bioturbation towards top; medium-scale low-angle cross-lamination, strongly calcareous, abrupt.	
	26.21	1.50	1.50	SANDSTONE - fine grained, clean, medium grey at top, becoming slightly darker below. Abundant coal spars and intraclasts towards base. Strongly calcareous; abrupt.	1.12 DD87 0.38
	27.07	0.86	0.86	SANDSTONE very fine grained/SILTSTONE (80/20) - medium grey, silty sandstone with occasional thin bands of dark grey siltstone. Strongly calcareous, abrupt.	
	32.20	5.13	5.13	SILTSTONE - dark grey locally with alternating thin argillaceous and sandy bands. Consistently sandy towards base. One thin ferruginous band near top. Strongly calcareous; gradational.	1.77 DD97 3.05 DD107
5-120	34.02	1.82	1.82	SANDSTONE - fine to very fine grained, silty dark grey. Largely devoid of lamination; some medium scale low-angle cross-lamination. Strongly calcareous; gradational.	0.31

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 18 JUNE 1981 SHEET NO. 2 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	37.28	3.08	3.26	SANDSTONE very fine grained/SILTSTONE (50/50) - interbedded medium grey silty, medium-scale low-angle cross-laminated sandstone and dark grey siltstone. Sandstones generally rippled, silts devoid of lamination. Strongly calcareous; abrupt. Core loss in this unit 0.18m.	0.96 DD117 2.12
	42.10	4.82	4.82	SANDSTONE - fine-grained, clean, medium grey at top becoming darker below. Medium to large-scale low-angle cross-laminated; some ripple-drifted phases and intraclast bands towards top; abundant dark, carbonaceous laminae, with scattered coal spars, toward base. Strongly calcareous at top, becoming weakly to moderately calcareous towards base. Abrupt.	0.95 DD127 3.00 DD137 0.83 0.04
	42.37	0.27	0.27	MUDSTONE - dark grey carbonaceous, abundant plant fragments. A few thin bright coal bands at top. Gradational.	
	43.40	1.03	1.03	MUDSTONE - medium to dark grey, scattered plant debris. Slightly lustrated at top. Non-calcareous, abrupt.	
	43.50	0.10	0.10	MUDSTONE - black, carbonaceous, occasional thick bright coal bands.	
	43.78		(0.28)	CORE LOSS-ROCK	
	43.79	0.01	0.01	COAL - bright broken.	
	43.82	0.03	0.03	MUDSTONE - black, carbonaceous, a few thin bright coal bands. Broken.	
	43.87	0.05	0.05	MUDSTONE - black, carbonaceous, some thin bright coal bands at top. Stick.	
	44.02	0.15	0.15	MUDSTONE - black, carbonaceous, scattered thin bright coal bands throughout, becoming thicker and more abundant at base. Stick.	
	44.09	0.07	0.07	MUDSTONE - black, carbonaceous. Stick	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 19 JUNE 1981 SHEET NO. 3 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	44.23	0.14	0.14	MUDSTONE - black, carbonaceous, abundant bright coal bands. Broken.	
	44.28	0.05	0.05	MUDSTONE - dark grey, carbonaceous, one thick bright coal band. Broken stick.	DD147
	45.82	1.54	1.54	MUDSTONE - dark grey, slightly carbonaceous at top, ferruginous in basal 0.20m. Abundant plant fragments. Locally calcareous; gradational.	
	45.84		0.02	COAL - dull, banded. Broken stick.	
	45.86		(0.02)	CORE LOSS - COAL	
	45.89	0.03	0.03	MUDSTONE - black, carbonaceous, one thick bright coal band.	
	45.93	0.04	0.04	COAL - dull banded.	
	45.95	0.02	0.02	COAL - dull and bright.	
	45.99	0.04	0.04	MUDSTONE - black, carbonaceous, abundant thin bright coal bands. Stick.	
	46.04	0.05	0.05	MUDSTONE - dark grey, carbonaceous, sheared broken. Abrupt.	
	46.13		(0.09)	CORE LOSS - ROCK	
	46.50	0.37	0.37	MUDSTONE - dark brownish grey, soft, sheared and listricated. Abrupt. Broken stick.	
	46.52	0.02	0.02	COAL - bright, blocky, broken.	GSC65/81
	46.74	0.22	0.22	MUDSTONE - dark brownish-grey, as above, harder, gradational. Stick.	
	46.77	0.03	0.03	MUDSTONE - black, carbonaceous, abundant thin bright coal bands.	BP81/13/1/R

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 19 JUNE 1981 SHEET NO. 4 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	46.79	0.02	0.02	COAL/MUDSTONE (50/50) - interlaminated bright coal and black, carbonaceous mudstone.	BP81/13/1/R
	46.81	0.02	0.02	MUDSTONE - black, carbonaceous, a few thin bright coal bands. Stick.	
	46.82	0.01	0.01	MUDSTONE - black, canneloid, abundant thin bright coal bands.	
	46.86	0.04	0.04	COAL - dull banded.	BP81/13/1/I
	46.87	0.01	0.01	COAL - dull, lustrous.	
	46.92	0.05	0.05	COAL - dull and bright.	
	46.94	0.02	0.02	MUDSTONE - black, canneloid, abundant thin bright coal bands.	GSC66/81
	46.96	0.02	0.02	COAL - bright	
	47.09	0.13	0.13	COAL - dull, banded. Stick.	
	47.19		(0.10)	CORE LOSS - COAL	
	47.21	0.02	0.02	COAL/MUDSTONE (50/50) - interlaminated, slightly sheared, bright coal and black carbonaceous mudstone.	BP81/13/1/2
	47.23	0.02	0.02	COAL - dull, sheared.	
	47.24	0.01	0.01	MUDSTONE - black, carbonaceous, slightly sheared, stick.	
	47.28	0.04	0.04	COAL - dull, banded, sheared. Stick.	
	47.34	0.06	0.06	COAL - dull, banded, badly broken.	
	47.48		(0.14)	CORE LOSS - ROCK	DD157

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 19 JUNE 1981 SHEET NO. 5 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	47.52	0.04	0.04	MUDSTONE - black, carbonaceous, abundant bright coal bands. Stick.	
	47.57	0.05	0.05	MUDSTONE - black, carbonaceous, a few thick bright coal bands. Stick.	
	47.63	0.06	0.06	MUDSTONE - dark brown, small pyritised roots. Stick.	
	47.65	0.02	0.02	MUDSTONE - dark brownish grey, carbonaceous, a few thin bright coal bands, stick.	
	47.67	0.02	0.02	MUDSTONE - as above, broken stick.	
	48.70	1.03	1.03	MUDSTONE - dark brownish grey, slightly carbonaceous, rare thin bright coal bands. Local minor lustrification. Abrupt. Broken stick.	
	48.80	0.10	0.10	BENTONITE - light brown, some mudstone laminae and load tongues at top. Possibly somewhat reworked. Stick. Abrupt.	Basal 4cm: GSC68/81
	48.86		(0.06)	CORE LOSS - ROCK.	
	49.13	0.27	0.27	COAL - dull	BP81/13/2/1
	49.25	0.12	0.12	COAL - dull, banded.	
	49.55	0.30	0.30	COAL - dull, banded, lustrous.	GSC67/81
	49.73	0.18	0.18	COAL - dull, lustrous.	
	49.79	0.06	0.06	COAL - dull, banded, lustrous, stick, broken at base.	BP81/13/2/2
	49.87	0.08	0.08	COAL - dull lustrous.	GSC68/81
	49.92	0.05	0.05	COAL - dull banded, lustrous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 20 JUNE 1981 SHEET NO. 6 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	49.99	0.07	0.07	COAL - dull, lustrous.	
	50.00	0.01	0.01	COAL - bright.	
	50.16	0.16	0.16	COAL - dull, lustrous.	BP81/13/2/2
	50.19	0.03	0.03	COAL - dull and bright, lustrous.	
	50.23	0.04	0.04	COAL - dull banded, lustrous	
	50.29	0.06	0.06	COAL - bright banded.	
	50.32	0.03	0.03	COAL - dull and bright, stick; broken at base.	
	50.43		(0.11)	CORE LOSS - COAL	DD167
	50.55	0.12	0.12	COAL - dull and bright, broken.	BP81/13/2/3
	50.60	0.05	0.05	COAL/MUDSTONE (50/50) - interlaminated thick bands of bright coal and black, carbonaceous to canneloid mudstone; broken stick.	
	50.67	0.07	0.07	MUD - dark brown, soft, non-calcareous.	BP81/13/2/4
	50.75	0.08	0.08	MUDSTONE - dark brownish grey, carbonaceous, stick.	
	50.83	0.08	0.08	MUDSTONE - medium to dark brown, bentonitic (probable reworked/alterd bentonite band) gradational.	
	50.88	0.05	0.05	COAL/MUDSTONE (50/50) - interlaminated bright coal and black carbonaceous mudstone. Abrupt	
	50.99	0.11	0.11	MUDSTONE - dark brownish grey, carbonaceous at top and base, bentonitic in centre. Stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 20 JUNE 1981 SHEET NO. 7 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	51.04		(0.05)	CORE LOSS - ROCK	
					BP81/13/2/4
	51.06	0.02	0.02	MUDSTONE - dark brownish grey, carbonaceous, abundant plant debris. Stick ground at top.	
	51.38		(0.32)	CORE LOSS - COAL	
	51.40	0.02	0.02	COAL - dull and bright, badly broken.	BP81/13/2/5
	51.49	0.09	0.09	MUDSTONE - dark brownish grey carbonaceous, abundant finely broken plant debris. Stick.	
	51.53	0.04	0.04	MUDSTONE - black, carbonaceous, abundant very thin bright coal bands. Stick.	BP81/13/2/6
	51.56	0.03	0.03	MUDSTONE - black, carbonaceous, as above, slightly listricated. Stick.	
	51.60	0.04	0.04	COAL/MUDSTONE (50/50) - interlaminated bright coal and black, carbonaceous mudstone. Slightly sheared, broken stick.	BP81/13/2/7
	51.80		(0.20)	CORE LOSS - COAL AND ROCK.	
	51.89	0.09	0.09	COAL/MUDSTONE (50/50) - as above. Abrupt.	
	51.96	0.07	0.07	MUDSTONE - dark brownish grey, carbonaceous, abundant finely broken plant debris; abrupt.	
	52.25	0.29	0.29	MUDSTONE - dark brownish grey, slightly carbonaceous, ferruginous, hard. Non-calcareous, gradational.	
	52.94	0.69	0.69	MUDSTONE - dark grey, carbonaceous, locally with abundant bright coal bands. Gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 18 JUNE 1981 SHEET NO. 8 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	53.08	0.14	0.14	MUDSTONE/SILTSTONE (50/50) - interlaminated, dark grey mudstone and slightly lighter, argillaceous siltstone. Some possible ripples of siltstone. Moderately calcareous. Abrupt.	
	53.35	0.27	0.27	MUDSTONE - dark grey to black, carbonaceous, locally abundant bright coal bands. Broken stick.	DD177
	54.34	0.99	0.99	MUDSTONE - dark grey, slightly carbonaceous at top. A few rootlets and plant fragments. Silty towards base, moderately calcareous, gradational.	
13°	54.63	0.29	0.29	SILTSTONE/MUDSTONE (65/35) - thickly interbedded, dark grey argillaceous siltstone and silty mudstone. Strongly calcareous; gradational.	
	57.29	2.66	2.66	MUDSTONE - dark grey, locally silty, a ferruginous modules towards top. Moderately to strongly calcareous, strongly slumped at base, with contorted interbeds of sandstone in basal 0.16m. Abrupt.	1.69 DD187 0.81 0.16
12°	58.03	0.74	0.74	SANDSTONE very fine grained/MUDSTONE (80/20) - medium grey, rippled locally silty sandstone with thin interbeds of dark grey silty mudstone. Occasional slickensides and calcite in sandstones, (possibly compactional, or the result of this unit being an isolated competent band?) Strongly calcareous. Gradational.	
	58.73	0.70	0.70	MUDSTONE - dark grey, with occasional slightly lighter silty bands. Thin laminae and ripples of very fine grained sandstone near top. Moderately to strongly calcareous, gradational.	
	59.04	0.31	0.31	MUDSTONE - dark grey, locally carbonaceous. Broken. Weakly calcareous.	
	59.14	0.10	0.10	MUDSTONE - dark grey, carbonaceous, abrupt.	
	59.24	0.10	0.10	MUDSTONE - dark grey, silty, ferruginous at base. Strongly calcareous. Abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 20 JUNE 1981 SHEET NO. 9 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	60.28	0.96	1.04	MUDSTONE - dark grey, carbonaceous. Minor silty phases; locally broken. Abrupt. Core loss in this unit 0.08m.	0.19 DD197 0.77
	60.68	0.40	0.40	MUDSTONE - dark grey, slightly listricated; gradational. Locally broken.	
	61.22	0.54	0.54	MUDSTONE - dark grey to black, carbonaceous. Gradational. Broken stick.	
	61.29	0.07	0.07	MUDSTONE - black, canneloid.	
	61.33	0.04	0.04	COAL/MUDSTONE (50/50) - interbedded, patchy, dull lustrous coal and black, carbonaceous mudstone.	BP81/13/3/1
	61.34	0.01	0.01	COAL - dull banded, lustrous	
	61.40	0.06	0.06	MUDSTONE - black, canneloid.	GSC70/81
	61.42	0.02	0.02	COAL/MUDSTONE (50/50) - interlaminated bright coal and black, canneloid mudstone.	
	61.44	0.02	0.02	COAL - dull lustrous. Broken stick.	
	61.46	0.02	0.02	COAL/MUDSTONE (50/50) - interlaminated bright coal and black, canneloid mudstone.	
	61.48	0.02	0.02	MUDSTONE - black, carbonaceous, rooty, dense, slightly ferruginous.	
	61.49	0.01	0.01	COAL - dull lustrous.	
	61.60	0.11	0.11	COAL - dull lustrous, hard, stick.	BP81/13/3/2 GSC71/81
	61.67	0.07	0.07	COAL - dull and bright, lustrous. Broken.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 21 JUNE 1981 SHEET NO. 10 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	61.74	0.07	0.07	COAL - dull lustrous. Broken stick.	
					BP81/13/3/2
	61.78	0.04	0.04	COAL - dull lustrous.	
					GSC71/81
	61.84	0.06	0.06	COAL - dull banded lustrous.	
	61.87	0.03	0.03	COAL - dull lustrous. Broken stick.	
	61.88	0.01	0.01	COAL - bright banded, lustrous.	
	61.95	0.07	0.07	COAL - dull lustrous. Broken stick.	
	62.15	0.20	0.20	COAL - dull lustrous. Broken stick.	BP81/13/3/3
	62.22	0.07	0.07	COAL - dull, lustrous.	
	62.23	0.01	0.01	COAL - dull and bright. Broken stick.	
	62.26	0.03	0.03	COAL - dull lustrous.	GSC72/81
	62.28	0.02	0.02	COAL - dull banded, lustrous. Stick	
	62.39	0.11	0.11	COAL - dull and bright, lustrous. Stick.	
	62.45		(0.06)	CORE LOSS - COAL	DD207
	62.50	0.05	0.05	COAL - dull lustrous, stick.	BP81/13/3/4
	62.53	0.03	0.03	COAL3- dull banded.	
	62.54	0.01	0.01	MUDSTONE - black, canneloid, broken.	BP81/13/3/5
	62.55	0.01	0.01	MUDSTONE - black, canneloid. Stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 21 JUNE 1981 SHEET NO. 11 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	62.58	0.03	0.03	MUDSTONE - black, carbonaceous, abundant thick bright coal bands. Stick.	
	62.61	0.03	0.03	COAL - bright.	
	62.62	0.01	0.01	MUDSTONE - black, carbonaceous. Stick.	
	62.69	0.05	0.05	MUDSTONE - black, canneloid. Stick.	BP81/13/3/5
	62.71	0.04	0.04	MUDSTONE - black, canneloid.	
	62.73	0.02	0.02	COAL - bright, stick, broken at base.	BP81/13/3/6
	62.74	0.01	0.01	COAL - bright, broken.	
	62.91		(0.17)	CORE LOSS - COAL	
	62.92	0.01	0.01	MUDSTONE - black, carbonaceous, broken stick.	BP81/13/3/7
	62.96	0.04	0.04	MUDSTONE - black, carbonaceous, abundant thin bright coal bands. stick.	
	63.94	0.98	0.98	MUDSTONE - dark grey, locally silty and ferruginous. Non-calcareous. Abrupt.	
	63.96	0.02	0.02	MUDSTONE - dark brownish grey, soft, friable, ?bentonitic. Abrupt.	
	64.82	0.86	0.86	MUDSTONE - dark grey, non-calcareous, abrupt.	
	65.06	0.24	0.24	MUDSTONE - dark grey, locally carbonaceous with abundant thick bright coal bands. Abrupt.	
	65.07	0.01	0.01	COAL - bright. Abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 21 JUNE 1981 SHEET NO. 12 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	65.42	0.35	0.35	MUDSTONE - dark grey, locally carbonaceous with abundant thick bright coal bands. Abrupt.	
	65.52	0.10	0.10	MUDSTONE - dark grey, carbonaceous, ferruginous, abundant plant debris moderately calcareous.	DD217
	65.65	0.13	0.13	MUDSTONE - dark grey to black, carbonaceous, a few thick bright coal bands. Minor ferruginous phases. Patchily calcareous. Abrupt.	
	66.98	1.33	1.33	MUDSTONE - dark grey, silty, a few thick bright coal bands. Ferruginous throughout top 0.45m and in discrete bands below. Strongly calcareous. Abrupt.	
	67.19	0.21	0.21	SANDSTONE - very fine grained, silty, medium grey, some large ripples. Strongly calcareous. Gradational.	
10 ⁰	69.53	2.34	2.34	SILTSTONE/MUDSTONE/SANDSTONE very fine grained (50/40/10) - thinly interbedded medium to dark grey, locally argillaceous siltstone and dark grey, locally argillaceous siltstone and dark grey silty mudstone with occasional bands of medium grey silty rippled sandstone. Some convolute lamination in sands, along with occasional large burrows and a few small coal spars. Strongly calcareous. Gradational.	1.34 DD227 1.00
	69.76	0.23	0.23	SANDSTONE - fine grained, locally silty, light to medium grey, some large ripples and scattered large dark rimmed burrows. Strongly calcareous. Abrupt.	
	70.61	0.85	0.85	MUDSTONE/SILTSTONE (75/25) - thickly interbedded dark grey, plant fragment bearing mudstone and medium grey, locally sandy rippled, burrowed siltstone. Silts calcareous, muds non-calcareous. Gradational.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13

LOGGED BY C. BICKFORD

DATE 21 JUNE 1981

SHEET NO. 13 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
10 ⁰	71.04	0.43	0.43	SANDSTONE very fine grained/MUDSTONE (70/30) - light to medium grey, rippled sandstone with thin bands of dark grey silty mudstone. Weakly calcareous at top. Non-calcareous below. Abrupt.	
	71.82	0.70	0.78	MUDSTONE - dark grey, with thin silty laminae at top. Ferruginous mottles at base; non-calcareous, abrupt. Core loss in this unit 0.08m.	0.29 DD237 0.41
	71.94	0.12	0.12	MUDSTONE - dark grey, carbonaceous bands, a few plant fragments. Stick.	
	72.06		(0.12)	CORE LOSS - COAL.	
	72.08	0.02	0.02	COAL - dull banded, lustrous, broken, and ground.	
	72.15	0.07	0.07	COAL - dull lustrous, broken stick.	BP81/13/4/1
	72.21	0.06	0.06	COAL - bright banded, broken.	
	72.27	0.06	0.06	COAL - dull banded, lustrous. Broken stick.	GSC73/81
	72.34	0.07	0.07	COAL - dull banded, lustrous.	
	72.51	0.17	0.17	COAL - dull. Broken stick.	
	72.53	0.02	0.02	COAL - dull and bright lustrous.	
	72.57	0.04	0.04	MUDSTONE - black, lustrous, coaly.	BP81/13/4/2 GSC74/81
	72.60	0.03	0.03	COAL - dull and bright.	BP81/13/4/3
	72.66	0.06	0.06	COAL - dull	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 21 JUNE 1981 SHEET NO. 14 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	72.67	0.01	0.01	COAL - dull lustrous, granular, (allochthonous?)	BP81/13/4/3
	72.92	0.25	0.25	MUDSTONE - coaly? sperosideritic, black, lustrous, heavy. Granular texture, varying from very coarse sand size in middle to fine sand size at top and base. Calcareous in middle. Gradational at top and base.	BP81/13/4/4 GSC75/81
	73.00	0.08	0.08	COAL - dull lustrous.	BP81/13/4/5
	73.04	0.04	0.04	COAL - dull banded, lustrous.	
	73.05	0.01	0.01	COAL - dull, lustrous	GSC76/81
	73.07	0.02	0.02	COAL - dull banded, lustrous.	
	73.69	0.62	0.62	COAL - dull, lustrous.	
	73.70	0.01	0.01	COAL - dull banded, lustrous.	
	73.77	0.07	0.07	COAL - dull lustrous.	
	73.79	0.02	0.02	COAL - dull banded, lustrous.	BP81/13/4/6 GSC76/81
	73.96	0.17	0.17	COAL - dull lustrous.	
	74.02	0.06	0.06	COAL - dull banded, lustrous	
	74.17	0.15	0.15	COAL - dull lustrous.	
	74.19	0.02	0.02	COAL - bright. Broken stick.	
	74.20	0.01	0.01	COAL - bright. Broken.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 21 JUNE 1981 SHEET NO. 15 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	74.59		(0.39)	CORE LOSS - COAL	DD247
	74.77		(0.18)	CORE LOSS - ROCK	
	74.93		(0.16)	CORE LOSS - COAL AND ROCK	
	75.09	0.16	0.16	MUDSTONE - dark grey, carbonaceous; broken and ground. Gradational.	
	77.24	2.15	2.15	MUDSTONE - dark grey, scattered tiny plant fragments. Non-calcareous. Gradational.	
	77.69	0.45	0.45	MUDSTONE - dark brownish grey, weak, slightly carbonaceous, abundant tiny plant fragments.	
	77.80		(0.11)	CORE LOSS - ROCK	DD257
	77.81	0.01	0.01	MUDSTONE - dark grey, carbonaceous. Broken and ground.	
	77.88		(0.07)	CORE LOSS - COAL	
	77.98	0.10	0.10	COAL - dull lustrous, strong bituminous odor when broken; sheared and broken at base. Broken stick.	BP81/13/5/1 GSC77/81
	78.00	0.02	0.02	COAL - dull, lustrous, slightly sheared.	
	78.05	0.05	0.05	COAL - dull lustrous.	
	78.07	0.02	0.02	COAL - dull.	
	78.10	0.03	0.03	COAL - dull lustrous.	
	78.13	0.03	0.03	COAL - dull, sheared.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13LOGGED BY C. BICKFORDDATE 21 JUNE 1981SHEET NO. 16 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	78.26	0.13	0.13	COAL - dull lustrous.	
	78.27	0.01	0.01	COAL - dull and bright, lustrous.	
	78.32	0.05	0.05	COAL - dull lustrous.	
	78.33	0.01	0.01	COAL - dull and bright, lustrous.	
	78.41	0.08	0.08	COAL - dull lustrous.	
	78.44	0.03	0.03	COAL - dull banded, lustrous, sheared. Broken stick.	
	78.45	0.01	0.01	COAL - dull lustrous, stick.	
	78.48	0.03	0.03	COAL - dull lustrous	
	78.50	0.02	0.02	COAL - dull banded, lustrous.	BP81/13/5/1 GSC77/81
	78.57	0.07	0.07	COAL - dull lustrous, stick.	
	78.94	0.37	0.37	COAL - dull lustrous.	BP81/13/5/2 GSC77/81
	79.02	0.08	0.08	COAL - dull banded, lustrous	
	79.24	0.22	0.22	COAL - dull, lustrous.	
	79.27	0.03	0.03	COAL - dull banded, lustrous.	BP81/13/5/3
	79.31	0.04	0.04	COAL - dull lustrous. Stick.	GSC77/81
	79.41	0.10	0.10	COAL - dull lustrous.	
	79.42	0.01	0.01	COAL - bright..	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 21 JUNE 1981 SHEET NO. 17 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	79.46	0.04	0.04	COAL - dull lustrous. Stick	BP81/13/5/3
	79.48	0.02	0.02	COAL - dull lustrous	
	79.49	0.01	0.01	COAL - dull banded, lustrous	GSC77/81
	79.57	0.08	0.08	COAL - dull lustrous	
	79.64	0.07	0.07	COAL - dull banded, lustrous.	
	79.65	0.01	0.01	MUDSTONE - black, carbonaceous.	
	79.66	0.01	0.01	COAL - dull lustrous, slightly sheared. Stick	
	79.68	0.02	0.02	COAL - dull banded, lustrous.	
	79.74	0.06	0.06	MUDSTONE - black, coaly	BP81/13/5/4
	79.78	0.04	0.04	COAL - dull, banded, lustrous.	
	79.87	0.09	0.09	MUDSTONE - black, coaly.	
	79.90	0.03	0.03	COAL - dull banded, lustrous. Stick.	BP81/13/5/5
	79.95	0.05	0.05	COAL - dull, banded, lustrous with thin fusain bands. Stick.	GSC77/81
	80.03	0.08	0.08	COAL - bright banded. Broken stick.	
	80.05	0.02	0.02	COAL - dull banded, broken	
	80.07		(0.02)	CORE LOSS - ROCK	
	80.28	0.21	0.21	MUDSTONE - black, carbonaceous. Gradational	BP81/13/5/6

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13

LOGGED BY

C. BICKFORD

DATE

22 JUNE 1981

SHEET NO.

18 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
80	80.35	0.07	0.07	MUDSTONE - dark grey, silty, abrupt.	BP81/13/5/6
	80.38	0.03	0.03	COAL - dull lustrous.	
	80.43	0.05	0.05	COAL - dull banded, lustrous	BP81/13/5/7
	80.45	0.02	0.02	COAL - dull lustrous.	
	80.46	0.01	0.01	COAL - dull banded lustrous.	GSC77/81
	80.47	0.01	0.01	COAL - bright	
	80.48	0.01	0.01	MUDSTONE - black, coaly; lenticular, ranging in thickness from nil to 0.01m	
	80.52	0.04	0.04	COAL - dull banded	BP81/13/5/8
	80.53	0.01	0.01	COAL - bright	
	80.56	0.03	0.03	COAL - bright banded	GSC78/81
	80.62	0.06	0.06	COAL - dull and bright	
	80.65	0.03	0.03	COAL - dull banded	
	80.68	0.05	0.05	COAL - dull and bright.	
	80.75	0.07	0.07	COAL - dull. Broken stick.	
	80.81		(0.06)	CORE LOSS - COAL	DD267
	80.83	0.02	0.02	COAL - dull banded	BP81/13/5/9 GSC77/81

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13LOGGED BY C. BICKFORDDATE 22 JUNE 1981SHEET NO. 19 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	80.84	0.01	0.01	MUDSTONE - black canneloid. Broken stick	
	80.89	0.05	0.05	COAL - dull banded, lustrous. Stick	BP81/13/5/9 GSC77/81
	80.91	0.02	0.02	COAL - dull banded stick.	
	80.94	0.03	0.03	COAL - dull banded, slightly sheared. Stick.	
	80.97	0.03	0.03	MUDSTONE - black, canneloid. Broken.	
150	82.12	1.15	1.15	SILTSTONE/SANDSTONE very fine grained/MUDSTONE (50/50 grading down to 50/40/10) - interbedded medium grey argillaceous siltstone, light grey silty, locally rippled sandstone and dark grey silty mudstone. Rooty at top. Sheared at top. Non-calcareous at top, calcareous towards base. Abrupt.	
	82.79	0.67	0.67	MUDSTONE - dark brownish grey, abundant plant debris, ferruginous bands. Non-calcareous. Abrupt.	
	82.85	0.06	0.06	MUDSTONE - dark grey, carbonaceous to canneloid.	
	83.02	0.11	0.17	MUDSTONE - dark grey, fissile, badly broken, core loss in this unit 0.06m.	
	83.20	0.18	0.18	MUDSTONE - dark grey, carbonaceous, broken at top. Abrupt.	
	83.47	0.27	0.27	MUDSTONE - dark grey, silty, ferruginous, abundant plant debris. A few rootlets. Non-calcareous, abrupt.	
	83.89	0.42	0.42	SILTSTONE - dark grey, argillaceous, sandy towards base. Ferruginous, rooty. Non-calcareous. Gradational.	0.35 DD277 0.07

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13LOGGED BY C. BICKFORDDATE 22 JUNE 1981SHEET NO. 20 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
16°	84.84	0.95	0.95	SILTSTONE/SANDSTONE, very fine grained/MUDSTONE (50/30/20) - thinly interbedded medium grey siltstone, light grey locally silty rippled sandstone and dark grey silty mudstone. Rooty at top. Top half is non-calcareous; basal half is moderately to strongly calcareous. Abrupt.	
	85.10	0.26	0.26	MUDSTONE - dark grey, silty abundant plant debris. Strongly calcareous Abrupt.	
	85.66	0.56	0.56	MUDSTONE - dark grey carbonaceous at top and base. Abrupt.	
	86.41	0.75	0.75	SILTSTONE - dark grey, ferruginous, rooty. Non-calcareous; abrupt.	
4°	88.29	1.88	1.88	MUDSTONE/SILTSTONE/SANDSTONE, very fine grained (40/30/30) - interbedded dark grey siltstone and silty rippled sandstone. Occasional plant fragments, some rootlets. Strongly calcareous, gradational.	0.39 DD287 1.49
	88.91	0.62	0.62	MUDSTONE - dark grey, Top 0.32m is silty and strongly calcareous, with ferruginous phases and thin siltstone laminae. Remainder is non-calcareous, increasingly so towards base. Abrupt.	
	88.96	0.05	0.05	COAL - dull lustrous	GSC79/81
	88.97	0.01	0.01	MUDSTONE - black, carbonaceous	
	88.98	0.01	0.01	COAL - bright. Broken stick.	
	89.00	0.02	0.02	MUDSTONE - black, carbonaceous. Sheared and listricated at base. Stick	
	89.05	0.05	0.05	MUDSTONE - black, carbonaceous, slightly listricated. Broken stick.	
	89.33		(0.28)	CORE LOSS - COALY ROCK	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 23 JUNE 1981 SHEET NO. 21 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	89.35	0.02	0.02	COAL - sheared and pulverised.	
	89.36	0.01	0.01	MUDSTONE - black, carbonaceous, sheared and broken.	
	89.40	0.04	0.04	MUDSTONE - black, carbonaceous to canneloid. Stick.	
	89.55	0.15	0.15	MUDSTONE - black, carbonaceous, scattered thin bright coal bands. Slightly listricated. Abrupt.	
	90.75	1.20	1.20	MUDSTONE - dark grey, silty. In basal 0.36m grading down to SILTSTONE occasional coal spars. Non-calcareous at top, becoming moderately calcareous below. Abrupt.	0.34 DD297 0.86
	91.35	0.60	0.60	MUDSTONE - medium to dark grey, intensely listricated, badly broken.	
	91.39	0.04	0.04	COAL/MUDSTONE (50/50) - broken and pulverized fragments of dull coal and black carbonaceous mudstone.	
	91.76	0.37	0.37	MUDSTONE - dark grey, weak. Gradational.	
	92.33	0.57	0.57	SILTSTONE - dark grey, argillaceous, ferruginous, strongly calcareous. Grades down to silty MUDSTONE in basal 0.17m.	
	92.37	0.04	0.04	MUDSTONE - black, canneloid, broken.	
	92.43	0.06	0.06	MUDSTONE - black, carbonaceous, sheared, badly broken. Some fragments of dark grey, listricated mudstone.	
	92.53	0.10	0.10	MUDSTONE - black, carbonaceous, hard, broken.	
	92.56	0.03	0.03	MUDSTONE - black, carbonaceous to canneloid, hard, Gradational.	
	93.41	0.85	0.85	SILTSTONE/SANDSTONE, very fine grained (60/40) - thinly interbedded, rooty dark grey siltstone and silty sandstone, carbonaceous at top non-calcareous, abrupt.	0.26 DD307 0.59

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 23 JUNE 1981 SHEET NO. 22 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
24 ⁰	94.21	0.80	0.80	SANDSTONE, very fine grained/SILTSTONE (80/20) - interlaminated light to medium grey sandstone and dark grey siltstone. Occasional roots. Sands are small-scale low-angle cross-laminated. Non-calcareous. Abrupt.	
	94.66	0.45	0.45	SILTSTONE - dark grey, sandy. Non-calcareous, gradational.	
	95.13	0.47	0.47	SANDSTONE- very fine to fine grained, medium grey, very argillaceous; coal spars and carbonaceous laminae. Non-calcareous. Abrupt.	
5 ⁰	98.63	3.50	3.50	SILTSTONE/MUDSTONE/SANDSTONE, very fine grained (50/40/10) - interbedded dark grey argillaceous siltstone and silty mudstone with occasional coal spars and rippled medium grey silty sandstone bands. Some large burrows towards base. Strongly calcareous, gradational	0.70 DD317 2.80
	99.54	0.91	0.91	MUDSTONE - dark grey, silty, strongly calcareous, gradational.	0.19 DD327 0.72
	100.29	0.40	0.75	MUDSTONE - dark grey to black, carbonaceous a few thin bright coal bands, locally broken, gradational.	
	100.67	0.38	0.38	MUDSTONE - dark grey, weak locally sheared and broken, particularly towards base.	
	100.69	0.02	0.02	COAL - badly broken, type indistinguishable.	GSC80/81
	100.74	0.05	0.05	COAL - bright banded, broken.	
	104.80	4.06	4.06	MUDSTONE/SILTSTONE (80/20) - dark grey, locally silty, mudstone with occasional interbeds of dark grey, argillaceous siltstone. Rooty at top. Locally broken and ground towards base. Non-calcareous, gradational.	1.28 DD337 2.61 DD345 0.17
					BOX /32/33

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13

LOGGED BY C. BICKFORD

DATE 23 JUNE 1981

SHEET NO. 23 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
70	117.21	12.41	12.41	SANDSTONE, very fine to fine grained/SILTSTONE (85/15) - light to medium grey, locally silty. Sandstone with interbeds of dark grey siltstone. Abundant large ripples, minor bands of dark grey silty mudstone, strongly calcareous, abrupt.	2.83 DD355 3.05 DD365 3.10 DD375 3.10
	118.37	1.16	1.16	MUDSTONE - dark grey, silty, minor siltstone bands. Moderately to strongly calcareous, gradational.	DD385 0.33
	118.79	0.42	0.42	MUDSTONE - dark grey, locally silty; carbonaceous at base. Broken at base.	
	118.92		(0.13)	CORE LOSS - COAL AND ROCK.	
	118.95	0.03	0.03	COAL - bright badly broken.	GSC81/81
	118.97	0.02	0.02	MUDSTONE - black, canneloid, badly broken.	
	119.15	0.18	0.18	MUDSTONE - black, carbonaceous.	
	119.89	0.74	0.74	MUDSTONE - dark grey, scattered plant fragments.	
	120.76	0.87	0.87	MUDSTONE - dark grey to black, carbonaceous, locally abundant bright coal bands. Locally intensely sheared. Broken towards top. Abrupt.	0.17 DD396 0.70
	123.12	2.36	2.36	MUDSTONE - dark grey to black, locally carbonaceous; commonly rooty and lustrated. Minor broken zones. Abrupt.	2.36
	123.40	0.28	0.28	MUDSTONE - black, carbonaceous, locally abundant thick bright coal bands.	DD407
	123.85		(0.45)	CORE LOSS - COAL AND ROCK	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 24 JUNE 1981 SHEET NO. 24 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	123.88	0.03	0.03	COAL - bright	GSC82/81
	123.94	0.06	0.06	COAL/MUDSTONE (50/50) - interlaminated bright coal and black carbonaceous to canneloid mudstone.	
	124.22	0.28	0.28	MUDSTONE - black, carbonaceous. Locally abundant finely broken plant debris; some listrication towards base. Abrupt.	
	124.38	0.16	0.16	MUDSTONE - dark grey, listricated, abrupt.	
	124.50	0.12	0.12	MUDSTONE - black, carbonaceous.	
	124.52	0.02	0.02	COAL - dull, lustrous.	
	124.56	0.04	0.04	COAL - dull banded, lustrous, broken stick.	
	124.83		(0.27)	CORE LOSS - COAL.	
	124.85	0.02	0.02	COAL - dull lustrous, broken.	
	124.90	0.05	0.05	COAL - dull lustrous, stick.	
	125.86	0.96	0.96	MUDSTONE - dark grey, scattered tiny plant fragments. Minor local listrication.	
	125.97	0.11	0.11	MUDSTONE - black, carbonaceous, intensely sheared.	
	125.99	0.02	0.02	COAL - sheared and pulverized.	
	126.03	0.04	0.04	MUDSTONE - black, carbonaceous, sheared at base. Stick.	
	126.04	0.01	0.01	MUDSTONE - dark grey, carbonaceous, listricated.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 24 JUNE 1981 SHEET NO. 25 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	126.05	0.01	0.01	COAL - bright.	
	126.06	0.01	0.01	MUDSTONE - dark grey, carbonaceous, listricated, gradational.	
	128.65	2.59	2.59	MUDSTONE - dark grey, locally listricated; a few bright coal lenses. Gradational.	0.28 DD417 2.31
	129.74	0.69	1.09	MUDSTONE - dark grey to black, carbonaceous. Locally abundant bright coal bands. Unit locally intensely sheared. Gradational. Core loss in this unit 0.40m.	0.64 DD427 0.05
	130.01	0.27	0.27	MUDSTONE - dark grey, gradational.	
	130.70	0.69	0.69	MUDSTONE - dark grey, silty, rooty, non-calcareous, abrupt.	
	130.99	0.29	0.29	MUDSTONE - dark grey, gradational.	
	131.90	0.83	0.91	MUDSTONE - black, carbonaceous, locally abundant thin bright coal bands. Abrupt. Sheared at base. Core loss in this unit 0.08m.	
	132.85	0.95	0.95	MUDSTONE - dark grey, abundant finely broken plant debris. Abrupt.	0.80 DD437
	132.95	0.10	0.10	MUDSTONE - dark grey, carbonaceous.	0.15
	132.20	0.20	0.25	MUDSTONE - black, canneloid, broken mixed with fragments of dull lustrous coal up to 0.02m thick. Core loss in this unit 0.05m.	
5°	134.27	1.07	1.07	MUDSTONE - drak grey, silty with 50% laminae of medium grey siltstone in basal 0.19m listricated at top. Non-calcareous at top, becoming weakly calcareous below. Abrupt.	
	134.66	0.39	0.39	MUDSTONE - dark grey, abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 24 JUNE 1981 SHEET NO. 26 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	134.48	0.82	0.82	SILTSTONE/SANDSTONE, very fine grained/MUDSTONE (60/20/20) - interbedded medium grey argillaceous siltstone, silty sandstone and dark grey silty mudstone. Burrowed at base. Strongly calcareous at top, becoming weakly calcareous below. Abrupt.	
	138.95	3.47	3.47	MUDSTONE - dark grey, silty at top, locally ferruginous. One 0.02m lense of bright coal. Locally strongly calcareous, abrupt.	0.20 DD447 3.08 DD457 0.19
	139.82	0.87	0.87	SILTSTONE - medium grey, sandy rooty, locally somewhat listricated. Non-calcareous, abrupt.	
0-5°	141.00	1.18	1.18	SANDSTONE, very fine-grained/SILTSTONE (70/30 - grading down to 20/80) - interlaminated, rippled medium grey, silty sandstone and dark grey siltstone. Non-calcareous; gradational.	
8°	143.94	2.94	2.94	SILTSTONE - medium to dark grey, sandy at top, becoming more argillaceous towards base. On the whole, unit appears to be intensely bioturbated, with some relict fine interlamination of sands and silts. Non-calcareous, gradational. Locally abundant plant debris; some listricated phases. Non-calcareous; gradational.	0.02 DD465 2.27 DD475 0.65
	147.21	3.27	3.27	MUDSTONE - dark grey, silty at top, and base; locally abundant plant debris, some listricated phases, non-calcareous, gradational.	
	147.99	0.78	0.78	SANDSTONE - very fine-grained medium grey, silty, particularly at top. Rooty, non-calcareous; gradational.	
	153.98	5.99	5.99	SANDSTONE - very fine-grained, grading down to fine grained at base; silty at immediate top, otherwise clean, some ripple-drift cross-lamination at top. Some drift towards base. Light to medium grey; locally moderately calcareous towards top, non-calcareous below. Styolitic; abrupt.	1.87 DD496 2.98 DD506 1.14

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 24 JUNE 1981 SHEET NO. 27 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	157.66	3.68	3.68	SANDSTONE, fine to coarse grained/CONGLOMERATE (75/25) - clean light grey, stylolitic sandstone with scattered muddy intraclasts and abundant large coal spars; with interbeds of granule to small-pebble, (rare to 33mm), sandy conglomerate. Weakly calcareous, erosional.	1.90 DD517 1.78 GSC83/81 from coal spar at 0.31m below top of unit
	157.68	0.02	0.02	MUDSTONE - dark grey, silty carbonaceous, abrupt.	
	158.85	1.17	1.17	SANDSTONE - medium to coarse grained, with 50% bands of grit and small pebbles in basal 0.40m. Light to medium grey, high-angle large-scale cross-lamination at top. Weakly calcareous; abrupt.	
	158.88	0.03	0.03	COAL - fusain band, soft, sooty dull.	GSC83/81 0.02 DD527 0.01
	162.60	2.81	3.72	SANDSTONE, coarse to very coarse grained/CONGLOMERATE (50/50) - interbedded medium grey cherty sandstone with occasional large coal spars and granule to small pebble (rarely to 44mm+) conglomerate with variable proportion of coarse sand matrix. Non-calcareous; abrupt. Core loss in this unit 0.91.	
12 ^o	163.88	1.12	1.28	MUDSTONE, grading down to SANDSTONE very fine grained - a coarsening downward sequence of dark grey silty mudstone, siltstone and silty sandstone; some interlaminated zones of sand and silt towards base with minor gritty bands. Possibly some burrowing towards base. Non-calcareous, abrupt. (core loss in this unit 0.16m).	0.26 DD547 0.86
	166.72	2.84	2.84	CONGLOMERATE/SANDSTONE, fine to coarse grained (30/70 grading down to 100/0) - interbedded granule to small-pebble (rare to 26mm+) conglomerate, variable proportion of coarse, sand matrix, and medium grey, clean cherty sandstone. Occasional large coal spar. Non-calcareous, abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 26 JUNE 1981 SHEET NO. 28 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	167.30	0.58		SANDSTONE - very fine to fine grained light to medium grey, with 60% interbeds of dark grey, argillaceous siltstone in top 0.25m; grading to coarse-grained and pebbly in basal 0.08m. Abundant large, coal spars towards base. Non-calcareous at top. locally strongly calcareous toward base. Erosional.	
	167.35		(0.05)	CORE LOSS - COAL	
	167.44	0.09	0.09	COAL - bright banded, broken.	GSC84/81
	167.49	0.05	0.05	COAL - dull and bright, broken stick.	
	167.50	0.01	0.01	MUDSTONE - black, cannelloid, badly broken.	
	168.28	0.78	0.78	MUDSTONE - dark grey, locally silty. Non-calcareous, ground at top. Gradational.	
8°		11.85		SILTSTONE/MUDSTONE/SANDSTONE, very fine grained (50/20/30) - interbedded locally ripples, medium grey, silty sandstone, dark grey, siltstone and silty mudstone. Occasional small, sub-vertical burrows. Dominantly strongly calcareous. Abrupt.	0.79 DD567 3.09 DD577 2.96 DD587 3.08 DD597 1.93
		0.27		MUDSTONE - black, carbonaceous, locally with abundant bright coal bands.	
		0.06		COAL - dull banded, stick.	GSC85/81
		0.50		MUDSTONE - alternating black, carbonaceous and dark grey, listricated beds.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 26 JUNE 1981 SHEET NO. 29 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.04		COAL - dull banded, lustrous, grading to canneloid mudstone at top. Stick.	
	181.50				DD607
10°		1.58		SILTSTONE - dark grey; grades up to silty mudstone in top 0.18m with abundant bands of very fine grained sandstone in basal 0.20m; a few roots toward top. Strongly calcareous, gradational.	
		3.38		MUDSTONE - dark grey, minor carbonaceous mudstone near base. Abrupt.	1.40 DD617
		1.47		SANDSTONE, very fine grained/SILTSTONE (70/30) - interlaminated and interbedded light to medium grey, ripples sandstone and dark grey siltstone. Strongly calcareous, gradational.	1.98 1.07 DD627
					0.40
		0.76		MUDSTONE - dark grey, silty, strongly calcareous, abrupt.	
		0.06		MUDSTONE - black, carbonaceous to canneloid,, a few thick bright coal bands. Stick.	
		0.08		MUDSTONE - black, coaly stick.	
		0.03		MUDSTONE - black, canneloid, stick.	
		0.02		MUDSTONE - black, canneloid.	
		0.15		COAL - dull, lustrous. Broken stick.	GSC86/81
		0.02		MUDSTONE - black, canneloid; broken.	
					1.29
7°		6.68		SILTSTONE/SANDSTONE, very fine-grained/MUDSTONE (55/35/10) - thin to medium interbeds, locally bioturbated, of medium to dark grey, siltstone, silty, sandstone and dark grey silty mudstone. Abundant coal spars towards base. Rooty at top, abrupt.	DD637 3.07 DD647
					2.50

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD DATE 26 JUNE 1981 SHEET NO. 30 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.34		SANDSTONE - medium grained, light to medium grey, a few pebbles, notably at base, locally abundant coal spars; on the whole a uniform sequence. Non-calcareous; abrupt.	0.35 DD657 1.99
		0.33		MUDSTONE - dark grey, very silty, non-calcareous; abrupt.	
		0.36		SANDSTONE - medium grained, medium grey, clean, large-scale, low-angle, cross-laminated, strongly calcareous, abrupt.	0.30 DD665 0.06
		1.88		MUDSTONE/SANDSTONE, very fine grained (70/30) - interlaminated, locally churned, (bioturbated) dark grey silty mudstone and medium grey sandstone. Minor scouring. Non-calcareous; gradational.	0.54 DD 1.34
		2.86		SANDSTONE - fine to medium grained medium grey, burrowed with locally abundant interbeds of dark grey silty mudstone, in top 0.79m. From here down to base abundant bright coal spars and bands, up to 0.02m thick. In basal 0.12m large muddy intraclasts. Dominantly non- calcareous; erosional?	1.64 DD677 1.22
		0.05		MUDSTONE - dark grey, silty, mica flecks, non-calcareous, abrupt.	
		1.65		SANDSTONE - fine to medium grained clean, minor coarse-grained bands towards base, weakly calcareous, abrupt.	1.40 DD686 0.25
		0.54		SANDSTONE - fine to coarse grained, very silty. In basal 0.31m grades to large pebble CONGLOMERATE (max 43mm+). Scattered coal spars. Non-calcareous, abrupt.	0.19 DD687 0.35
		3.83		MUDSTONE - dark grey, silty at base, minor carbonaceous phases with thin bright coal bands. Locally ferruginous and calcareous toward top; otherwise non-calcareous. Gradational	2.51 DD697 1.32

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY C. BICKFORD/CHOWDRY DATE 26 JUNE 1981 SHEET NO. 31 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
130		0.86		SILTSTONE/SANDSTONE very fine grained (65/35) - interlaminated medium to dark grey, locally argillaceous siltstone and light grey sandstone. A few roots. Moderately calcareous. Abrupt.	0.76 X69/70 0.10
		0.12		MUDSTONE - black, carbonaceous; a few thin bright coal bands. Broken stick.	
		0.41		MUDSTONE/SANDSTONE very fine grained (80./20) - dark grey, very silty mudstone with thin, slumped bands of sandstone. Moderately calcareous at top becoming non-calcareous towards base. Stick, abrupt.	
		0.02		COAL - dull banded, broken.	GSC87/81
		0.06		COAL - dull, banded.	
		0.04		MUDSTONE - dark grey hard, large plant fragments, broken stick.	
		0.02		MUDSTONE - dark grey, stick.	
		0.08		COAL/MUDSTONE (50/50) - interbedded bright coal and black carbonaceous to canneloid mudstone. Badly broken.	
		2.67		SILTSTONE/MUDSTONE - medium grey, predominantly siltstone, laminated and rippled, minor erosion structures, sporadic burrows, thin laminae of very fine grained sands; mudstone silty and comprise 20% of unit, strongly calcareous throughout, gradual at base.	DD707 2.67
		0.71		MUDSTONE - black, locally very carbonaceous and thin band of coaly mudstone, gradual.	0.61 DD218.54 0.10
		0.33		MUDSTONE/SILTSTONE - slight dominance of mudstone, medium/dark grey and interlaminated with argillaceous siltstone, locally slightly ferruginous, strongly calcareous, abrupt contact at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 28 JUNE 1981 SHEET NO. 32 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
2-40		0.80		SANDSTONE - medium grey, top 0.14m fine grained, remainder very fine grained, with frequent thin silty laminae, strongly calcareous, gradual at base.	
		3.42		MUDSTONE/SILTSTONE (50/50) - medium grey, very broadly interlayered, locally laminated some very fine grained intervals, calcareous abrupt at base.	1.45 DD221.5 1.97
		0.83		SANDSTONE - medium grey, top half fine-to-very fine grained with 0.15m thick silty mudstone, remainder fine grained regularly cross-laminated and clean, calcareous abrupt at base.	
		0.05		COAL - hard, dull, canneloid, sparse minor bright laminae, broken stick.	BP81/13/6/1
		0.07		COAL - dull, lustrous to dull, vitrinite laminae, broken stick.	GSC88/81
		0.03		COAL - mostly small fragments, appears dull coal.	DD224.63
		0.12		COAL - dull, hard, submetallic lustre, listric surfaces, broken core.	
		0.05		COAL - dull, lustrous, fragmented.	
		0.13		COAL - dominantly bright, fragmented and broken core, listricated at base.	
		0.96		MUDSTONE - dark grey to black, locally very highly silty and carbonaceous, sporadic laminae, very weakly calcareous, small calcite fracture, core yielding along larger plant debris, gradual at base.	
		0.48		SILTSTONE - dark grey, homogeneously argillaceous, silty, discontinuous lamination, calcareous, transitional at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13

LOGGED BY

CHOWDRY

DATE

28 JUNE 1981

SHEET NO.

33 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
5-6 ⁰		1.27		SANDSTONE - medium grey, very fine grained, silty laminae and interbeds	1.16
				0.22m fractured and calcite lined zone, thin mudstone bands, strongly calcareous throughout, abrupt at base.	DD227.68
					0.11
		0.56		SILTSTONE - medium grey, very muddy, brief very fine grained argillaceous layers, slightly calcareous.	
		0.15		MUDSTONE - black, abundance of carbonaceous matter, hard, becoming ferruginous at base.	
		0.25		SILTSTONE - medium grey, argillaceous, ferruginous, very gradational at base.	
8-10 ⁰		1.5		SANDSTONE - light/medium grey, top 0.72m very fine grained and silty in its basal 6cm interval, remainder fine grained, clean, cross-laminated strongly calcareous, sharp basal contact, numerous calcite filled fractures at varying angles to core axis.	
		1.01		SILTSTONE - medium grey, basal 0.25 very argillaceous, sequence sporadically laminated few burrows, calcareous, gradational at base. Core slickensided and traversed by calcite veins, mostly subparallel to core axis.	0.45
					DD230.70
					0.56
		0.06		MUDSTONE - black, hard, very carbonaceous.	
		0.18		MUDSTONE - dark grey, hard, slightly ferruginous, carbonaceous toward base, broken and listricated core fragments.	
		0.04		COAL - hard, boney, tiny vitrinite finely dispersed large piece.	
		0.49		MUDSTONE - top 8cm and basal 15cm and carbonaceous, remainder medium/dark grey, very silty, abundant carbonaceous debris, very gradational at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 29 JUNE 1981 SHEET NO. 34 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.82		SANDSTONE - medium grey, very fine grained, silty, argillaceous laminae dark laminae (due to concentration of finely macerated carbonaceous matter, calcareous; gradual.	
				SILTSTONE - medium grey, highly argillaceous, vague irregular laminae, calcareous, gradational.	
15-18 ⁰		3.51		SILTSTONE/MUDSTONE (75/25) - medium grey silts, locally very argillaceous, much slumped laminae; mud/silts sequences imperceptibly blending into each other, 8cm thick very carbonaceous mudstone, strongly calcareous throughout, sporadic burrows, locally ferruginous, numerous hairline calcite veins, gradational at base.	1.30 DD233.78 2.21
		0.92		MUDSTONE - medium grey, very silty, rooty and ferruginous, gradual at base.	0.50 DD236.22 0.42
		0.94		MUDSTONE - black, slightly carbonaceous, much listrications, colour banding suggest high structural dip, gradual at base.	
		2.09		MUDSTONE - black, very carbonaceous throughout, locally develops into dull/bony coal. Core badly fragmented and listricated throughout, coaly zones badly pulverized basal 0.06m cornflaky. Colour banding and occasinal lamination point to heigh dip.	GSC89/81* 1.07 DD239.57 1.02
50-55 ⁰		0.86		SILTSTONE - medium grey, argillaceous, siliceous, rooty, fine plant fragments, middle section slickensided, fractured, quartz veins.	0.34 DD241.40 0.52
65.75 ⁰		2.53		SILTSTONE - medium grey, highly argillaceous top 0.27m interlaminated with dark grey mudstone. Remainder homogeneously argillaceous with some differentiated laminated zones, minor carbonized plant fragments, few hairline quartz veins, locally slickensided and listricated. Very gradual at base.	1.04 DD242.9 1.49

* NOTE: GSC 89/81 is a sample of selected coal from within this unit.

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 29 JUNE 1981 SHEET NO. 35 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.76		MUDSTONE - medium grey, somewhat silty, locally dense and approaching clay grade, colour banding and occasional silty laminae indicate high dips, gradual at base.	1.40 DD245.97 0.36
70°		3.95		SILTSTONE - top 2.3m medium/dark grey, rest black, muddy laminae and layers throughout though muddy content increases substantially baseward, small plant fragments dispersed throughout. Basal 1.75m with frequent hairline fractures.	2.39 DD249.0 1.56
		0.25		MUDSTONE - dark grey/black, highly sheared, listricated and partly pulverized.	
65-70°		1.70		SILTSTONE - medium grey, top 0.52m coarse grained clean, siliceous and traversed by quartz veins and laminated, rest very argillaceous and locally passing into structureless silty mudstone, very gradational at base.	0.56 DD251.46 1.14
		0.38		MUDSTONE - dark grey/black, carbonaceous, silty, listricated surfaces, listric contact at base.	
		1.38		MUDSTONE - black, locally highly carbonaceous, top 0.45m very silty and with occasional vaguely discernible lamination, 14cm very hard coaly mudstone at 253.9m - 254.04m, gradual at base.	0.85 DD253.90 0.53
		0.34		MUDSTONE - medium grey, very silty, slightly ferruginous, vague lamination, listric and slickensided surfaces with thin siliceous coating, fragmented basal contact.	
		0.32		MUDSTONE - black, badly fragmented and locally very carbonaceous, listricated fragments.	
40°		0.62		SILTSTONE - medium grey, very argillaceous, rootlets and finely broken plant matter, mottled laminated zones, locally very weakly calcareous, gradational at base.	0.45 DD256.33 0.17

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13

LOGGED BY

CHOWDRY

DATE 29 JUNE 1981

SHEET NO. 36 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.27		MUDSTONE - dark grey/black, silty laminae, gradational.	
		0.42		SILTSTONE - medium grey, very muddy, irregularly laminated, occasional finely divided plant material, very gradual at base.	
		0.87		MUDSTONE - dark grey, locally highly silty and slightly ferruginous homogeneous; abrupt.	
		0.29		SANDSTONE - medium grey, very fine grained argillaceous, micromicaceous getting cleaner downward, highly irregular and scoured basal contact.	
		0.17		SANDSTONE - medium grey, fine-grained, clean, siliceous, listric basal contact.	
20°		0.73		SANDSTONE - medium grey, dominantly very fine-grained, regular thin laminae of silts and argillaceous matter along which carbonized plant matter abounds. Basal 0.2m very muddy and slightly calcareous.	
		0.35		MUDSTONE - dominantly dark grey, silty laminae, carbonaceous, very gradational.	
18-20°		1.76		SANDSTONE/SILTSTONE - dominance of very fine grained argillaceous and regularly thinly laminated, sands interlaminated with argillaceous silts. Thin tiny rippled zones in sandy sequences strongly calcareous throughout, gradational at base.	1.37 DD261.2 0.39.
		0.24		MUDSTONE/SILTSTONE - dominance mudstone, medium/dark grey, irregular sparse lamination, calcareous, gradual at base.	
		0.27		MUDSTONE - dark grey/black, very silty and locally carbonaceous, fragmented core.	
		0.59		MUDSTONE - medium grey, homogeneous, top 0.17m highly silty (or argillaceous siltstone) gradually darkening toward base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 29 JUNE 1981 SHEET NO. 37 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.61		MUDSTONE - dark grey/black, locally carbonaceous, very few thin coaly bands, 9cm zone with three sandstone layers, gradational.	1.34 DD264.2 0.27
		0.73		MUDSTONE - medium grey, dominantly dense strongly calcareous, devoid of lamination, getting darker toward base.	
		0.39		MUDSTONE - dark grey/black, slightly ferruginous, lower half carbonaceous, calcareous, abrupt basal contact.	
		0.66		MUDSTONE - top 0.32m medium grey, silty, slightly ferruginous with sparing lamination, calcareous, remainder dark grey/black, slightly carbonaceous, structureless, very gradual transition at base.	
5-80		3.63		SANDSTONE - light/medium grey, dominantly very fine grained, frequent siltstone laminae and interbeds; top 0.65m dominantly silty, laminated broadly but many zones with chaotic fabrics probably due to bioturbation, isolated burrows, calcareous throughout, abrupt at base.	0.75 DD267.3 2.88
5-60		4.38		SANDSTONE - light grey, fine to medium grained, very well washed, sorted, cherty/quartzose, cross-bedded 8cm very fine grained band, slightly calcareous to siliceous, basal few centimetres with tiny coal spars and muddy intraclasts, erosional at base.	0.13 DD270.35 3.05 DD273.40 1.20
		0.63		MUDSTONE/SILTSTONE - top 13cm carbonaceous/coaly mudstone mixed with fragments of lustrated siltstone, followed by 0.30m sheared and badly fragmented siltstone with hairline quartz veins and encrustation, followed by 10cm powdered pulverized coal, followed by 10cm very carbonaceous mudstone. Overall, the entire sequence represents a structurally dispersed zone.	
6-70		1.08		MUDSTONE/SILTSTONE - medium grey, top half dominantly silty, mudstone remainder sporadically laminated siltstone, slightly calcareous to siliceous, few isolated burrows, very gradational downward.	0.58 DD276.1 0.50

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 1 JULY 1981 SHEET NO. 38 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.06		SANDSTONE - medium grey, very fine grained, very argillaceous, vague irregular lamination, few hairline calcite veins, calcareous.	
		2.17		SANDSTONE - light grey, fine grained small-scale cross-lamination and cross-bedded, 6cm fragmented zone with calcite encrustation, mostly calcareous.	0.48 DD278.2 1.69
		5.43		SANDSTONE - medium grained, light grey, very clean, and generally well-sorted, cross-bedded, occasional very thin zone of tiny spars and carbonaceous matter, middle 1.5m has coarse to very coarse grained sands, slightly calcareous.	1.25 DD281.33 2.97 DD284.3 1.17
		1.06		SANDSTONE - light grey, medium grained but with frequent gritty zones and fine pebbles, cross-bedded siliceous,	DD285.6 0.04
		1.05		CONGLOMERATE - essentially gritty, 0.3m pebbly zones, basal 8cm has large pebbles. Mostly siliceous cement. Chert pebble assemblage. Predominates over quartz and volcanics; Poorly sorted, abrupt but planar basal contact.	
8-10 ⁰		1.46		SANDSTONE - medium grey, dominantly very fine grained, basal 0.26m silty, middle 0.35m light grey, fine grained, clean and strongly calcareous, entire sequence with small scale cross-lamination, frequent recurrence of finely macerated carbonaceous matter, emphasising laminae, abrupt at base.	0.79 DD288.64 0.67
		1.42		CONGLOMERATE - chert/quartz pebble conglomerate, some very large pebbles (55mm across) set in abundant gritty/sandy matrix, few coal pebbles, siliceous cement, gradual.	GSC91/81 @ 0.30m to 0.45m below top
		1.29		GRITSTONE/SANDSTONE - lower half essentially medium grained, cross-laminated siliceous sands with occasional chert pebbles, middle 0.27m with large pebbles, remainder a mixture of gritty granular assemblage with substantial sand matrix, one well-developed stylolite.	0.74 DD291.7 0.55

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 1 JULY 1981 SHEET NO. 39 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.53		CONGLOMERATE/GRITSTONE - dominantly conglomerate (75%) interlayered with gritty intervals. Basal 0.25m with large ferruginous mudstone bands, some mudstone clasts in matrix, abrupt at base.	
		0.96		SILTSTONE/SANDSTONE - dominantly medium grey, dominance silts, coarse grained, frequently interlaminated with very fine grained light coloured laminated sands. Much burrowing, slumping and erosional features, few coal spars, siliceous, abrupt at base.	0.86 DD294.7 0.10 GSC90/81 from basal
		0.32		SANDSTONE - dark grey, ill-sorted mixture of very fine-to-fine grained argillaceous sands with smattering of granules, sequence infested with a variety of coal spars, siliceous, abrupt at base.	0.10m
		7.96		CONGLOMERATE - a variety of chert/quartz pebbles, mostly medium/coarse range, some stylolite, 12cm siltstone band 1.3m from base. Significant gritty content in top 2m sequence, larger pebbles in basal 1.75m. Base of Cadomin is characterized by 5cm thick finely pebbly conglomerate with abundant sandstone matrix, this overlaying by 9cm thick highly ferruginous dense mudstone - top of which is sharply erosional but its base lower conglomerate gradual.	2.56 DD297.79 1.48 DD299.0 1.49 DD300.83 2.18 DD303.88
		1.98		MUDSTONE - dark grey, sparse carbonaceous plant fragments, structureless, sporadically silty, and slightly ferruginous, gradual at base.	0.25
		0.91		SILTSTONE - medium grey, very argillaceous toward top and base, dispersed finely broken carbonaceous debris, vague lamination, siliceous very transitional at base.	0.82 DD306.3 0.09
		0.25		SANDSTONE - light/medium grey, very fine grained, rippled and cross-laminated, siliceous, gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 1 JULY 1981 SHEET NO. 40 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.05		CONGLOMERATE - quartz/chert pebbles dominantly very fine or granular, in gritty/very coarse grained sandstone matrix. Larger pebbles confined to basal 0.25m, erosional.	
		0.43		SANDSTONE - medium grey, very fine grained, argillaceous vague discontinuous laminations, siliceous basal 8cm has scattered granules.	
50		1.36		SANDSTONE/CONGLOMERATE - light grey, dominantly fine to medium grained sands, clean, frequently passing from one to the other. A total of 0.63m fine-pebble conglomerate bands occurring at base, middle and top. Abrupt at base.	0.67 DD309.6 0.66 DD310.59 0.03
		0.69		MUDSTONE - black, locally very carbonaceous, silty, ferruginous, abundant listric surfaces, basal 0.19m very silty gradational.	0.50 DD311.2 0.19
5-70		2.67		SILTSTONE/SANDSTONE (85/15), medium, grey, sporadically laminated and rippled, argillaceous, sandstone very fine grained and broadly interbedded, top 0.35 highly argillaceous and carbonaceous siltstone and non-calcareous remainder with sparse carbonized plant debris and strongly calcareous, gradual.	1.58 DD313.0 1.09
		1.02		SANDSTONE - light grey, clean, ill-sorted fine pebble zones, basal 17cm granular and some fine pebbles, calcareous, coarsening at base.	
		0.48		CONGLOMERATE - poorly sorted pebbles with abundant gritty component, patchily calcareous.	
6-70		0.63		SANDSTONE - light grey, fine to medium grained, main section well-sorted, strongly calcareous, very pebbly, conglomeratic in basal 0.28m, abrupt at base.	0.35 DD316.0 0.28

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 1 JULY 1981 SHEET NO. 41 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.60		CONGLOMERATE - fine pebble conglomerate with abundant gritty/granual matrix, some pebbles strongly calcareous, abrupt at base.	
		0.19		SANDSTONE - medium to coarse grained and granular, calcareous, coarsening towards base.	
		0.20		CONGLOMERATE - fine pebble conglomerate, granular matrix, abrupt at base.	
		0.21		SANDSTONE - medium grained, occasional very fine pebbles and granules, slightly calcareous.	
		1.25		CONGLOMERATE - fine to medium pebbles, 15mm very fine grained carbonaceous sandstone, patchily slightly calcareous, abrupt at base.	0.16 DD317.9
		0.24		SANDSTONE - light grey, fine/medium grained, fairly calcareous, structureless, abrupt.	1.09 0.14 DD319.10
		2.18		CONGLOMERATE - essentially fine pebble conglomerate abundant sandy matrix, at times pebbles 'floating' few large silty mudstone clasts, calcareous, interbedded at base.	0.10
		1.78		GRITSTONE/CONGLOMERATE - broadly interbedded lithologies of poorly sorted calcareous, abrupt below.	0.69 DD322.1
60		1.51		SANDSTONE - light/medium grey, fine to very fine grained, silty/argillaceous laminae, scattered silty clasts, laminated and cross-laminated, fine carbonaceous matter associated with muddy band in top 0.12m, strongly calcareous, abrupt at base.	1.09
		5.41		CONGLOMERATE - chert/quartz pebbles set in large amounts of sandstone and mudstone clasts, rock is calcareous where there is substantial sand matrix, abrupt at base.	0.19 DD325.2 3.06 DD328.2 2.16

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 1 JULY 1981 SHEET NO. 42 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.17		MUDSTONE - medium grey, very silty, structureless.	
		0.24		SILTSTONE - light/medium grey, highly argillaceous, muddy layers very gradational at base.	
		1.12		MUDSTONE - dark grey, slightly silty, gradual.	0.39 DD331.3
		0.27		MUDSTONE - black, hard, coaly, mudstone, core broken and fragmented, gradual at base.	0.73
5-6 ⁰		2.37		SANDSTONE - medium grey, top 1.2m dominantly very fine grained with frequent thin laminae of silts and muds, remainder dominantly fine grained, laminated, cross-laminated, concentration of fine carbonaceous matter along laminae, sporadic burrows and slumping, bottom 0.19m poorly sorted incorporating abundant tiny coal spars, lower half sequence strongly calcareous, abrupt at base.	1.71 DD334.36 0.66
		0.06		MUDSTONE - black, very carbonaceous, coaly mudstone, broken stick.	
		0.08		COAL - bright friable, broken stick.	GSC92/81
		0.03		COAL - bright banded, listricated large piece.	
		0.01		MUDSTONE - bony, coaly, mudstone, fragments.	
		0.30		MUDSTONE - dark grey, silty, locally slightly carbonaceous, core broken.	
		0.24		SILTSTONE - medium grey, very argillaceous, rootlets, gradual at base.	
		0.38		MUDSTONE - dark grey, thin bands of black carbonaceous mudstone, homogeneous, gradual.	
		0.29		MUDSTONE - black, sporadically coaly but the entire sequence highly carbonaceous very gradual passage at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13

LOGGED BY

CHOWDRY

DATE

2 JULY 1981

SHEET NO.

43 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.03		SILTSTONE - medium grey, very argillaceous, rootlets, few calcite fractures, gradual at base.	0.56 DD337.4 0.47
		0.83		MUDSTONE - black, few silty laminae in top half, remainder very carbonaceous, gradual at base.	
		0.91		SILTSTONE/MUDSTONE - slight dominance of silts, medium grey, occasional vague lamination, strongly calcareous, transitional at base.	
		1.52		MUDSTONE - top 0.45m black with large amounts of carbonaceous plant debris, remainder medium grey, homogeneously silty, structureless, gradual.	0.52 DD340.4 1.00
		0.73		SILTSTONE - medium to ash grey, middle 0.2m very fine grained argillaceous sandstone with tiny clasts, rootlets, siliceous, transitional at base.	
		0.20		MUDSTONE - medium grey, highly silty, structureless, gradual at base.	
		0.25		SANDSTONE/MUDSTONE - interbedded sequences of very fine grained argillaceous sands burrowed and with distinct chaotic fabrics, mudstone dark grey and has erosional contacts with sands, fragmented at base.	
		0.23		MUDSTONE - black, hard, abundant carbonaceous plant debris, abrupt at base, fragmented core.	
		1.41		SANDSTONE - medium to dark grey, basal 0.36m very fine grained, argillaceous with abundant finely macerated carbonaceous matter and coal spars; overlain by 0.55m fine/medium grained poorly sorted, locally laminated with minor coal spars and siliceous, remainder at top alternating layers of very fine grained dark grey argillaceous sands and silts with abundant carbonaceous matter, highly scoured contacts, top most 0.1m fine/medium grained siliceous sands with numerous silty intraclasts.	0.50 DD343.5 0.91

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 2 JULY 1981 SHEET NO. 44 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.05		COAL - dull, submetallic lustre, large pieces.	GSC93/81
		0.10		MUDSTONE - black, abundant carbonaceous plant matter, structureless, broken stick.	
		0.20		MUDSTONE - medium to dark grey, 6cm zone highly pulverized, remainder fragmented and listricated, abrupt at base.	
8-10 ⁰		0.57		SANDSTONE - bottom 18cm and top 14cm dark grey very argillaceous and silty, remainder light grey, fine grained with occasional thin silty laminae, local small-scale cross-lamination, strongly calcareous (save top 14cm) transitional at base.	
		0.19		MUDSTONE - brownish grey, very silty, ferruginous isolated silty laminae and ripples, strongly calcareous, gradual at base.	
		0.27		MUDSTONE - black, very carbonaceous, locally passing to coaly mudstone, broken core, gradual.	
		0.71		MUDSTONE - rusty brown, silty, highly ferruginous, structureless, few coal spars.	0.24 DD346.2
		0.08		MUDSTONE - black, highly carbonaceous, core broken and fragmented.	0.39 DD346.5
		0.05		COAL - dull lustrous, badly fragmented.	0.08
		0.13		MUDSTONE - black, locally very hard and passing to coaly mudstone, badly fragmented throughout.	
5-7 ⁰		3.10		SILTSTONE/SANDSTONE/MUDSTONE (75/15/10) - predominantly silty sequence, medium grey, highly argillaceous, irregularly laminated, frequently interlayed with very fine grained argillaceous sandstone, dark grey silty mudstone. Contacts of various lithologies generally erosional, much disturbed and slumped laminae clusts of burrows, top 0.65m siliceous, remainder strongly calcareous, gradual.	1.30 DD348.3 1.16 DD349.6 0.64

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 2 JULY 1981 SHEET NO. 45 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.11		MUDSTONE - dark grey, very silty at top, calcareous.	
	347.01	0.14		MUDSTONE - black, very carbonaceous, locally grading to coaly mudstone, gradual at base. Core broken and fragmented.	
	347.50	0.49	0.49	MUDSTONE - dark grey/black, carbonaceous at top and base, middle-section highly silty, gradual	
	347.60	0.10	0.10	MUDSTONE - black, very hard, canneloid, fragmented.	BP81/13/7/1
	347.90	0.30	0.30	COAL - dominantly dull, some dull lustrous, some listricated and sheared zones, some fragments but mostly broken stick.	BP81/13/7/2 GSC94/81
	347.93	0.03	0.03	COAL - dull lustrous, listricated, fragmented.	
	348.20		(0.27)	CORE LOSS - COAL	
	348.24	0.04	0.04	COAL - dominantly bright, broken stick.	
	348.27	0.03	0.03	COAL - dull lustrous, minor bright laminae, broken core.	BP81/13/7/3 GSC94/81
	348.30	0.03	0.03	COAL - dull banded, broken stick.	
	348.37	0.07	0.07	COAL - dull lustrous, some bright bands at top, broken stick.	
	348.42	0.05	0.05	COal - bright and bright banded, broken stick and fragmented.	
	348.59	0.17	0.17	MUDSTONE - black, carbonized plant debris, broken core and listriacted surfaces.	BP81/13/7/4
	348.65		(0.06)	CORE LOSS - ROCK	
	348.69		(0.04)	CORE LOSS - COAL	BP81/13/7/5 GSC95/81

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 2 JULY 1981 SHEET NO. 46 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	348.83	0.14	0.14	COAL - dominantly bright and bright banded, fragmented core.	BP81/13/7/5 GSC95/81
		1.05		SILTSTONE - medium/dark grey, very argillaceous, carbonized plant debris, occasional vague lamination ferruginous, abrupt at base.	0.17 DD352.6 0.50 DD353.26 0.38
5-70		1.20		SANDSTONE - medium grey, very fine grained, two zones totalling 0.53m well laminated and rippled, remainder either devoid of lamination or only remnants of lamination seen, much bioturbation, strongly calcareous, base sharp with tiny muddy intraclasts.	
		0.57		MUDSTONE - grey, very silty, basal 0.2m with hairline calcite veins, transitional at base.	
		0.17		SILTSTONE - medium grey, irregularly laminated, argillaceous downward, strongly calcareous.	
		1.22		MUDSTONE - top half medium grey, remainder dark grey, generally structureless, gradual.	0.05 DD356.0 1.17
		0.06		MUDSTONE - black, very hard, very carbonaceous, abundant minor bright coal laminae, gradual.	
		1.17		SILTSTONE/MUDSTONE (85/15) - silts brownish grey, argillaceous, sproadically laminated, dark grey mudstone blending with silts, strongly calcareous throughout.	
		0.12		MUDSTONE - black, very carbonaceous, listricated surfaces, transitional at base.	
		0.39		SILTSTONE - medium grey, top 0.25m abundantly argillaceous, remainder with large slump block, much burrowing, strongly calcareous, abrupt at base.	0.25 DD358.75 0.14

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 2 JULY 1981 SHEET NO. 47 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.19		MUDSTONE - dark grey, very silty, hard, gradational.	
		0.12		MUDSTONE - black, very carbonaceous, coaly mudstone.	
		0.05		SANDSTONE - light grey, very fine grained, abundant rootlets, gradual at base.	
		0.42		MUDSTONE/SILTSTONE - dominance dark grey muds, middle 0.17m laminated argillaceous silts, darker towards base.	
		0.37		MUDSTONE - black, top half fragmented coaly mudstone, remainder broken core, carbonaceous, gradual at base.	
		2.50		SILTSTONE - top 0.95m very argillaceous with 5cm zone very carbonaceous, remainder mostly medium grey, occasionally rooty and sporadic lamination (some disturbed laminae) siliceous, gradual at base.	1.44 DD361.8 1.06
		0.87		MUDSTONE - dark grey/black, silty, locally slightly carbonaceous, rooty, increasingly silty downward.	
50		3.14		SANDSTONE - medium grey, dominantly very fine grained, silty intervals, vaguely discernible small scale cross-lamination, occasional muddy clasts, very slightly calcareous, locally ripple drifted, cross-lamination.	1.00 DD364.5 2.14
		0.32		MUDSTONE/SILTSTONE - dark grey, top half silty mudstone, gradually passing below to argillaceous siltstone; erosional at base.	
5-80		2.61		SANDSTONE - light grey, fine grained, regularly cross-laminated throughout, ubiquitous concentration of finely macerated carbonaceous matter along laminae, 20cm slumped zone toward top (some intraclasts here), strongly calcareous throughout.	0.53 DD368.2 2.08

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 2 JULY 1981 SHEET NO. 48 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		5.23		SANDSTONE - light grey, fine/medium grained, generally clean, well sorted, cross bedded, strongly calcareous, 12cm zone with muddy clasts, fine grits within 0.25m zone, about 0.98m above base.	0.84 DD371.0 2.92 DD373.9 1.47
		5.13		SANDSTONE - light grey, medium/coarse grained, top 1.40m has substantial gritty intervals, (also large pebbles and frequent coal spars) generally well-washed and well sorted (in a given interval), cross-bedded throughout, very slightly calcareous (but dominantly siliceous), abrupt, and clean basal contact.	1.31 DD377.03 3.15 DD380.08 0.67
		0.20		SANDSTONE - brown to buffish, very fine grained, weakly calcareous, clean, vague lamination, gradually coarsening bottomward.	
6 ⁰		1.24		SANDSTONE - light grey, medium/coarse grained, middle 0.27m with scattered silty angular clasts, very few thin chert pebbles, abrupt.	
		0.11		MUDSTONE - black, hard, abundant carbonized plant fragments, broken stick.	
		0.18		COAL - dull lustrous, broken stick.	BP81/13/8/1
		0.08		COAL - dull and bright, broken core.	
		0.01		COAL - dull lustrous, large piece.	GSC63/81
		0.06		COAL - predominantly bright, some dull and bright, broken core and fragments.	
		0.05		COAL - dull and bright broken stick.	
		0.02		COAL - mostly bright, broken stick.	
		0.03		COAL - mostly bright, broken stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13LOGGED BY CHOWDRYDATE 2 JULY 1981SHEET NO. 49 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.03		COAL - dominantly bright, broken core.	DD383.13
		0.51		SILTSTONE - medium grey, very argillaceous, abundantly rooty, progressively muddier toward base.	
		0.06		COAL - badly fragmented, appears dull and bright.	
		0.76		MUDSTONE - dark grey/black, locally carbonaceous and very silty, broken core.	
		0.10		COAL - bright banded, hard, 3cm carbonaceous mudstone in middle, gradual at base.	GSC64/81
		0.15		MUDSTONE - dark grey/black, very carbonaceous at top, lower half with abundant carbonaceous plant debris, slightly silty, gradual at base.	
		0.63		SILTSTONE - medium grey, disturbed lamination, abundant rootlets, argillaceous, very transitional at base, core broken.	
		0.02		COAL - dull banded, bright and dull laminae, very thin and frequently interlaminated, broken stick.	
		0.23		MUDSTONE - black, hard, almost coaly mudstone, core broken, some fragmented.	
		0.06		COAL - dominantly dull with bright bands, broken stick.	
		0.16		COAL - dull banded and dull and bright. Broken stick.	GSC96/81
		0.05		MUDSTONE - black, carbonaceous, coaly mudstone, stick gradual at base.	
		0.17		MUDSTONE - dark grey/black, slightly carbonaceous, hard stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-13 LOGGED BY CHOWDRY DATE 2 JULY 1981 SHEET NO. 50 OF 51

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.16		MUDSTONE - hard, black, ferruginous, coaly mudstone, core fragmented throughout.	DD386.18
		0.64		MUDSTONE - medium grey, a thin silty band increasing silt downward.	
		0.92		SILTSTONE - medium grey, slightly argillaceous, thin laminae of very fine grained sands, siliceous, mostly structureless, gradual.	
		1.14		SILTSTONE/SANDSTONE - (60/40) medium grey rapidly interlaminated and interbedded very fine grained sands and silts, much evidence of penecontemporaneous erosion, sporadic burrows, slightly calcareous, erosional at base.	
12-14 ⁰		0.78		SANDSTONE - light/medium grey, fine to very fine grained cross-laminated, 13cm mudstone bed in lower half, intraclastic zones, slightly calcareous, erosional at base.	0.13 DD389.2 0.65
		5.82		SANDSTONE - light grey, medium/coarse grained, remarkably clean, well-sorted, cross-bedded to structureless, slightly calcareous, gradual at base.	2.23 DD391.2 3.06 DD395.32
		1.02		CONGLOMERATE/GRITSTONE - poorly sorted assemblage of quartz/chert granules/fine pebbles silt in a medium/coarse grained sandstone matrix, largest pebble about 1cm long.	0.53
		1.40		SANDSTONE - light grey, medium grained, very well washed, sorted, generally lacking lamination, calcareous, gradual.	DD398.37
		1.03		SANDSTONE - as above, coarse to very coarse grained, gradual at base.	
15-20 ⁰		1.06		SANDSTONE - light grey, medium grained, clean, cross-bedded, quartz pebble, gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14

LOGGED BY CHOWDRY

DATE 25 JUNE 1981

SHEET NO. 1 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				Casing. No core at all.	
					DD 13.11
30		0.44		SILTSTONE/MUDSTONE - dominance of silts, dark grey, vaguely laminated, abundant carbonized plant fragments, muds dark grey to black, highly silty (homogeneously), plant debris, calcareous throughout, interbedded at base. Core broken at base.	
2-40		0.59		SANDSTONE - medium to dark grey, very fine grained, laminated, cross-laminated and minor ripples, silty lenses and layers, locally listrically burrowed, microerosional contacts, strongly calcareous, gradational at base.	
		0.82		SILTSTONE/MUDSTONE - dominance of mudstone, medium grey, sparse plant debris, silty muddy, with thin laminae of very fine-grained sands, strongly calcareous; gradational.	DD 14.33
		0.47		SANDSTONE/SILTSTONE - dominance of sands - very fine grained, dark grey very silty, wavy/parallel to ripple lamination, minor graded units, silts badly interlayered, sporadic isolated burrowing, upper 2/3 siliceous, remainder at base strongly calcareous; passage below by interbedding.	
30		0.28		MUDSTONE/SANDSTONE - mudstone dominant, dark grey and silty, interlayered with light to medium grey, very fine grained, silty, finely laminated sandstone; mudstone/sandstone boundaries commonly erosional, strongly calcareous, interbedded below.	
		0.60		MUDSTONE - black, structureless, abundant finely broken carbonized plant debris, locally somewhat carbonaceous and slightly silty, gradual at base; broken core.	
		0.84		SILTSTONE - medium grey, slightly silty, argillaceous, occasional rootlets, minor lenses of very fine-grained sands, siliceous, homogeneous, erosional at base.	0.27 DD17.30 0.57

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14LOGGED BY CHOWDRYDATE 25 JUNE 1981SHEET NO. 2 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
3-40		0.36		SANDSTONE - light to medium grey, fine to very fine grained, clean, small scale, cross-lamination, weakly calcareous to siliceous, abrupt but not erosional at base.	
		0.67		MUDSTONE/SILTSTONE - slight dominance of mudstone, dark grey, very silty, broadly interbedded with argillaceous, sporadically laminated siltstone, gradational at base.	
4-50		0.54		SANDSTONE - top 20cm dark grey, very fine grained, silty and small-scale ripples; remainder fine grained light, rippled and small scale cross-laminated calcareous sands, micromicaceous and with carbonized leaf fragments, slightly erosional at base.	
		1.19		MUDSTONE - dark, locally dense, sporadically very silty, calcareous throughout, gradational.	0.81 DD 20.42
		0.40		SILTSTONE - medium grey, very argillaceous, sparse burrows but essentially lacking lamination, calcareous, gradual at base.	0.38
50		2.07		SANDSTONE - top 0.4m medium grey, very fine grained, silty, argillaceous, locally cross-laminated/rippled with sporadic dark silt-filled burrowing tubes; remainder fine-grained, cleaner, regularly cross-laminated with widely dispersed 2-4cm thick silty band, strongly calcareous throughout, abrupt at base.	
3-50		14.81		SANDSTONE - light grey, dominantly medium grained, very clean and well sorted throughout, cherty/quartzose, dominantly calcareous (locally weakly calcareous to siliceous), cross-bedded, brief intervals with some carbonaceous laminae, occasionally sand grain approaches coarse-grained and one quartzite pebble. Thin coal spars in basal 0.9m; abrupt at base.	DD 23.47 2.99 DD 26.52 3.0 DD 29.57 3.04 DD 32.61 2.96 DD 35.66 2.82

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14LOGGED BY CHOWDRYDATE 26 JUNE 1981SHEET NO. 3 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.46		MUDSTONE - top half dark grey with finely disseminated carbonaceous matter, remainder medium grey and silty, gradational at base.	DD 38.71
		0.15		SANDSTONE - light/medium grey, very fine grained, vague remnants of lamination, compaction features, silty, siliceous; gradual at base.	
		0.09		MUDSTONE - dark grey, silty, slightly carbonaceous at base.	
		0.36		MUDSTONE/COAL - top half dominantly carbonaceous mudstone, remainder bony coal but this interval badly fragmented.	
		0.69		MUDSTONE - dark grey/black, very silty, abundant carbonaceous plant debris, listricated, gradual at base.	
		0.62		SANDSTONE - medium grey, very fine grained, silty laminae, delicately rippled and cross-laminated, rootlets, top 1/2 siliceous, rest strongly calcareous, gradational.	
		0.78		MUDSTONE - top 0.26m black with abundant carbonaceous debris, remainder medium grey, highly silty, strongly calcareous, vague and sparse lamination, gradational.	0.32 DD 41.76 0.46
2-3 ⁰		0.35		SILTSTONE - medium grey, well-laminated with thin laminae and layers of very fine grained sands, slightly banded appearance argillaceous, strongly calcareous, gradational.	
		0.36		MUDSTONE - medium grey, very highly silty and calcareous throughout; passage by interbedding.	
		2.61		SANDSTONE/SILTSTONE medium grey, dominantly sandy, very fine grained locally very silty, laminated cross-laminated, microerosional contacts, 0.27m silty mudstone; siltstone very argillaceous, slight slumping, burrows, strongly calcareous throughout, very gradational at base.	1.32 DD 44.81 1.29

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14 LOGGED BY CHOWDRY DATE 26 JUNE 1981 SHEET NO. 4 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.56		MUDSTONE - dark grey/black, dense, locally carbonaceous, strongly calcareous, gradual.	
		0.59		MUDSTONE - black, carbonaceous, locally approaching muddy coal, broken core.	
		0.16		COAL - hard, dominantly dull, fragmented.	
		0.08		MUDSTONE - dark grey/black, highly silty, abundant carbonized plant debris, structureless, broken core.	
		0.15		COAL - distinctly dull with minor vitrinite large pieces and fragmented core.	
		0.12		MUDSTONE - black, highly carbonaceous, abundant well packed carbonized vegetal matter, core fragmented.	
		0.03		COAL - mostly small pieces, not clear whether in place.	
40		3.49		MUDSTONE/SILTSTONE - medium grey, predominantly mudstone, very silty, local lenses and layers of very fine grained laminated sands, strongly calcareous throughout, basal 0.4m black slightly carbonaceous and calcareous, interbedded at base.	DD 47.55 2.40 DD 50.60 1.09
		0.14		SANDSTONE - dark grey, very fine grained, highly argillaceous and carbonaceous laminae, laminated, abrupt at base.	
		0.39		COAL - dominantly dull banded, large pieces and broken core.	
				MUDSTONE - black, locally abundant carbonaceous plant debris, 2cm bony coal broken core and some fragmented.	
		0.88		SILTSTONE - medium grey, abundant argillaceous laminae and layers, siliceous, gradational.	0.71 DD 53.64 0.17

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14LOGGED BY CHOWDRYDATE 26 JUNE 1981SHEET NO. 5 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
4-6 ⁰		1.10		SANDSTONE - light/medium grey, highly argillaceous and silty, sparse lamination; mudstone band toward base, calcareous.	
4-5 ⁰		2.09		SANDSTONE - light grey, dominantly fine to very fine grained, vaguely laminated intervals punctuated by homogeneous/structureless zones, local bands of silts, 10cm dark grey mudstone band, strongly calcareous throughout, gradual at base.	1.15 DD 56.39 0.94
		0.62		SANDSTONE - light grey, fine grained, clean, well sorted strongly calcareous, small-scale, cross-lamination, abrupt at base.	
		1.15		SILTSTONE - medium grey, top 0.58m highly argillaceous with sparse carbonaceous vegetal matter, remainder with numerous bands of very fine grained sands, sporadic burrowing and discontinuous disturbed laminae (might be due to organic activity) basal 0.40m strongly calcareous, rest siliceous, passage below by interbedding.	
		2.29		SANDSTONE - light grey, dominantly fine grained, generally clean, sorted, cross-laminated, occasional thin silty laminae, along which finely comminuted carbonized plant debris abound, strongly calcareous throughout, abrupt.	0.49 DD 59.13 1.80
		0.27		MUDSTONE - black, abundant large sized carbonized plant fragments, 4cm argillaceous/silty very fine grained sandstone with small silty/muddy intraclasts. Very gradational at base.	
		0.04		COAL - dull with submetallic lustre, minor bright bands, appears high ash coal, listric contact with mudstone at top.	
		0.06		COAL - pulverized and small pieces, appears dull banded, lustrous.	
4 ⁰		0.57		MUDSTONE - medium grey, very highly silty (laminae as well as disseminated), sparse large carbonized plant fragments, abrupt at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14 LOGGED BY CHOWDRY DATE 27 JUNE 1981 SHEET NO. 6 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.06		COAL - small fragments, a mixture of dull banded and dull and bright.	
		0.35		MUDSTONE - medium grey, very silty, occasional isolated laminae, gradual at base.	0.16 DD62.48 0.19
		0.07		COAL - large pieces, dull banded and dull.	
		0.86		MUDSTONE - medium grey, very silty and differentiated locally into argillaceous siltstone, sporadic laminae, 1cm thick fine grained sandstone at base.	
		0.06		COAL - dull, banded, broken stick.	
		0.08		COAL - mostly fragmented into small pieces, appears dull with minor vitrinite.	
		0.50		SANDSTONE - medium grey, very fine-grained, occasional remnants of sedimentary laminae, otherwise essentially root disturbed, silty, siliceous, gradual at base.	
		0.97		SANDSTONE - medium grey, fine grained, regularly laminated and cross-bedded, frequently passing to very thin laminae of very fine sands, large silty/muddy intraclasts, siliceous, gradual at base.	
5-7 ⁰		1.68		SANDSTONE - medium grey, fine to medium grained, cross-bedded, 12cm thick sandstone interval, tiny coal spars, basal 0.36m fine-grained, clean and calcareous, abrupt basal contact.	0.27 DD 65.53 1.41
		0.43		MUDSTONE - medium/dark grey, highly silty, sparse plant fragments, increasing silt content towards base.	
		0.31		SILTSTONE/SANDSTONE - medium grey, appears to be bioturbated, slightly calcareous, dominantly silty, passage below by interbedding.	

B P . C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14 LOGGED BY CHOWDRY DATE 27 JUNE 1981 SHEET NO. 7 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.67		SANDSTONE/SILTSTONE - dominance of sands, light grey, very fine grained, sparsely laminated and bioturbated, silts medium grey, argillaceous and interlayed with sands, weakly calcareous sequence, abrupt.	
6-8°		7.74		SANDSTONE - light grey, medium grained, very clean and well-sorted, several thin (6-8cm) muddy/silty layers in upper 1.20m, very weakly calcareous, gradual at base.	0.09 DD 68.88 2.95 DD 71.93 3.02 DD 74.98 1.68
		1.58		SANDSTONE - as above but few brief coarse-grained sand intervals, coal spar at base.	0.93 DD 78.03 0.65
		0.72		SANDSTONE/GRITSTONE - medium grey, ill-sorted gritty sands infested with coal spars, locally some fine pebbles.	
5°		1.75		SANDSTONE - light grey, fine to medium grained well-washed, well-sorted, cross-bedded, top 0.8m with fine sand laminae and coal spars, basal 0.6m strongly calcareous.	1.57 DD 81.08 0.18
		0.16		CONGLOMERATE/SANDSTONE - gritty sands and fine pebbles floating in medium grained sand matrix, small pebbles 15mm (longest dimension).	
		0.40		SANDSTONE - light grey, medium grained, clean, cross-bedded, slightly calcareous, abrupt at base.	
		0.71		CONGLOMERATE - quartzite/chert pebbles of various hues, some 5cm (longest dimension), angular to subrounded (larger ones), in fine grained sand matrix; abrupt at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14 LOGGED BY CHOWDRY DATE 27 JUNE 1981 SHEET NO. 8 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		3.80		SANDSTONE - light grey, medium grained, clean, well-sorted, cross-bedded, two thin very coarse/gritty sands, few floating pebbles, weakly calcareous, abrupt at base.	1.41 DD 84.12 2.39
		3.64		MUDSTONE - dark grey/black, dominantly clay grade, much carbonized and variously broken plant debris, some lighter coloured muds, may have been subjected to leaching, basal 0.65m black and with high concentration of carbonaceous matter, core listricated and broken and readily yielding along planes of greater concentrations of carbonaceous debris, abrupt at base.	0.93 DD 87.17 2.1 DD 90.22 0.61
		2.02		SILTSTONE/MUDSTONE - siltstone medium grey very argillaceous, with chaotic laminae (root disturbed), mudstone highly silty devoid of laminae, calcareous throughout, dominance of silts, gradational at base.	
		4.34		MUDSTONE - medium grey, uniformly disseminated silts but locally forming argillaceous siltstone, basal 0.90m calcareous, rest predominantly non-calcareous, interbedded at base.	0.35 DD 92.36 3.05 DD 95.40 0.94
50		3.90		SILTSTONE/MUDSTONE 80/20 - medium grey, coarse grained, highly argillaceous, vaguely laminated, mudstone broadly interlayered, sporadic burrowing, strongly calcareous throughout, abrupt at base.	2.03 DD 98.45 1.87
		1.02		SANDSTONE - medium grey, dominantly very fine grained, lenses of fine sands and siltstone, small-scale cross-lamination, microerosional features, strongly calcareous, abrupt at base.	
		8.02		CONGLOMERATE - medium to coarse pebbles of cherts, quartzites (cream coloured) metamorphic and igneous rocks, set in granular, coarse grained sandstone matrix, basal 3.5m sporadically calcareous, 8cm fine/medium grained sandstone band.	0.10 DD101.5 1.15 DD102.72 2.81

B P . C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-14LOGGED BY CHOWDRYDATE 28 JUNE 1981SHEET NO. 9 OF 10

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
					DD105.77
					3.09
					DD108.81
					0.87
60		0.16		SANDSTONE - light grey, fine grained, very clean, well-sorted, cross-laminated throughout, strongly calcareous, abrupt at base.	
		2.41		CONGLOMERATE - quartzite/chert pebbles (come several cms across) set essentially in siliceous matrix. Abrupt at base. Note that there is no reworked muddy matrix in the basal part of the conglomerate.	1.97 DD111.86
		0.24		MUDSTONE - medium grey, dense, splintery carbonized plant matter, silty and slightly ferruginous locally, grind marks at top of core run.	0.44
		0.03		COAL - bony, carbonaceous, large piece.	
		0.13		COAL - dull and dull lustrous, minor bright bands fragments and broken core.	
		1.30		MUDSTONE - top 0.45m black, hard, very carbonaceous, remainder dark grey silty and with carbonized plant debris.	
		0.86		MUDSTONE - medium/dark grey, slightly silty, sparing carbonaceous plant matter; interval fragmented and listricated throughout.	
		2.13		MUDSTONE - medium grey, abundantly silty, much carbonaceous debris, structureless, locally ferruginous, abrupt basal contact.	DD114.91

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY B. CORMIER DATE 1 JULY 1981 SHEET NO. 1 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		9.4	9.4	CASING	9.6
		0.70		SANDSTONE - light grey, medium grained, laminated, slumps and ripples, silty, many coal spars and streaks, iron staining along fractures, broken core, non-calcareous.	0.70 Box 1
		0.35		SANDSTONE - light grey, with much iron staining, medium grained, laminated, silty, cross-bedded, occasional coal spar or streak, calcareous.	DD 10.3
15 ⁰		0.38		SANDSTONE - light grey, medium grained, cleaner than about faint laminations, slightly silty, slightly calcareous.	DD 10:6
		0.95		SANDSTONE - light grey, medium to fine grained, irregular laminations, much coaly and carbonaceous spars and streaks and disseminated carbonaceous debris throughout, abrupt contact, slightly calcareous.	
		1.40		SANDSTONE/SILTSTONE - interbedded sandstone, fine grained, light grey, gradational laminae contacts, ripples, and a few small cross-laminations, and whisps, medium grey siltstones, occasional burrow, calcareous, gradational basal contact with less sand content.	Box 2
		0.67		SILTSTONE - medium grey, muddy, a few whisps of very fine grained, light grey sandstone, slightly calcareous.	
		0.54		SILTSTONE/SANDSTONE - siltstone predominates, medium grey, with laminations of very fine grained, light grey sandstone, becoming more sandy towards base, gradation contact, non-calcareous.	DD 16.7
13 ⁰		2.15		SANDSTONE/MUDSTONE - interlaminated, sandstone predominates with more sand content towards base, fine grained at top to medium grained bottom, occasional ripple bedding and calcite filled small fractures, calcareous.	Box 3

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY B. CORMIER DATE 1 JULY 1981 SHEET NO. 2 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.03?		SANDSTONE - light grey, medium grained, faint silty laminations throughout, cleaner than unit above, lower half contains numerous mudstone clasts, up to 5cm in diameter, but averaging a few mm in size, abrupt basal contact, erosional, slightly calcareous.	DD 20.12 Box 4
		1.52		MUDSTONE - dark grey, very silty, occasional whisps or laminations of very fine grained sandstone, small carbonaceous plant remains and impressions, sharp basal contact non-calcareous sands and silts, slightly calcareous.	
10-12 ⁰		0.11		SANDSTONE - light grey, fine to medium grained, laminated with mudstone slightly calcareous.	
		0.06		MUDSTONE - carbonaceous, black, coaly streaks, non-calcareous.	DD 24.4
		0.16		MUDSTONE/COAL - black, coal from streaks to spars of 2 to 4cm thickness dull and bright, lustrous, non-calcareous.	
		0.30		MUDSTONE - carbonaceous, black, coaly streaks, non-calcareous.	
		0.71		SILTSTONE - sandy very fine grained, light to medium grey, many roots, interval structure of sediment root disturbed, root preservation less prevalent towards base, lower contact gradational, non-calcareous.	Box 5
		1.00		MUDSTONE - silty at top, dark grey calcite-filled fracture, occasional coal streak, and mud-filled fracture, some broken core, non-calcareous.	
		0.64		SILTSTONE - sandy, very fine grained, medium grey, non-calcareous, gradational contact.	DD 26.5
		0.90		MUDSTONE - black, slightly carbonaceous, coal streaks, non-calcareous.	Box 6

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY DARREN TOMECEK DATE 1 JULY 1981 SHEET NO. 4 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				BOX 10 START	
		2.59		SILTSTONE/SANDSTONE (50/50) - medium grey silts thinly interbedded with light grey, fine grained, argillaceous, sandstone, scattered carbonaceous debris, sporadic burrows, some pyrite along fractures microerosional features, slickensides and listrication along calcite veins, a quartz vein located 1.09m from base of unit and contains abundant well developed crystals, this vein is orientated at 85° to core axis, some calcite found in conjunction with this quartz, the unit becomes predominantly silty towards base and also slightly ferruginous, sands are very slightly calcareous, silts are non-calcareous, erosional contact, broken stick.	10cm End Box 9 1.16 DD41.76 1.33
		0.35		MUDSTONE - dark grey to black, slightly silty at top, throughout the unit is scattered carbonized plant material some listrication, non-calcareous, broken stick, adjoining box has badly broken core, may be loss at basal contact of this unit.	0.35 End Box 10
		0.20		MUD - chocolate brown, containing abundant angular fragments of dark grey to black mudstone; soft badly broken and fragmented, possible core loss.	0.20m DD44.81
		1.24		MUDSTONE - black, top of unit is highly listricated with abundant carbonaceous matter and occasional coal spar, 0.74m from top of unit is a 40cm zone of silty mudstone, some coaly mudstone, 60cm from base.	1.24
		0.02		MUDSTONE - coaly abundant, thin bright coaly laminae, stick.	0.07
		0.03		COAL - dull lustrous, stick.	
		0.02		MUDSTONE - coaly abundant bright coaly laminae, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY DARREN TOMECEKDATE 1 JULY 1981SHEET NO. 6 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
10-15 ⁰		1.83		SANDSTONE - fine grained to medium grained in a coarsening downwards sequence, light to medium grey, small scale low-angle, cross-bedding and cross-laminations. 1.25m from base of unit is a 15cm unit of concentrated burrows in the cross-bedding, more carbonaceous laminae towards base as grain size increases, in basal 20cm of unit are abundant coal spars in medium grained sand, basal contact highly erosionally abrupt, with small angular clasts of underlying silty mud floating in medium grained medium grey sandstone, also along contact is an 8cm ferruginous clast which appears to be formed from a highly eroded channel infilling, strongly calcareous, stick.	1.83
		2.40		SILTSTONE - medium grey to dark grey, uppermost 60cm very muddy siltstone, laminated medium grey silts, some carbonized material in basal 1.35m, some burrowing, minor slumping, strongly calcareous, transitional basal contact, stick.	0.28 DD53.95 2.12
10 ⁰		6.26		SILTSTONE/SANDSTONE (30/70) - light grey, fine grained sandstone, medium grey silts, thinly interbedded, abundant burrows, some rippling, some thin sporadic calcite veining, unit strongly calcareous, base of unit contains subrounded and angular clasts of mudstone and siltstone floating in the fine grained sandstone, basal contact erosional, stick.	0.85 DD57.00 1.73 1.19 DD60.05 2.17 DD63.09 0.32
		2.78		MUDSTONE - medium grey to dark grey, abundant carbonaceous material throughout unit, occasional coal spar, thin near base of unit, some areas of unit are slightly silty making the unit patchily calcareous, broken stick.	2.28
		0.25		MUDSTONE - black, highly carbonaceous, abundant coal spars in upper 15cm of unit.	0.25

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15

LOGGED BY

DARREN TOMECEKDATE 2 JULY 1981SHEET NO. 7 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.08		COAL - dull lustrous, appears to have abundant disseminated mudstone throughout, stick.	
		0.05		COAL - dull banded, lustrous, stick.	
		0.03		MUDSTONE - coaly, abundant thin bright bands of coal throughout, stick.	
		0.04		MUDSTONE - dark grey to black, highly listricated scattered carbonaceous material.	
		0.27		MUDSTONE - highly carbonaceous, black, highly listricated some coaly mudstone 20cm from top of unit and about 2cm of coal bright, blocky, in stick condition of core is broken to badly broken.	0.14 DD66.14 0.13
		1.47		MUDSTONE - dark grey to black, slightly silty at top of unit scattered carbonaceous debris with a 20cm section of unit being completely void of such material, very dense, several very thin calcite veins 50cm from base of unit orientated 90° to core axis, patchily calcareous, stick.	1.47
0-5°		1.63		SILTSTONE/SANDSTONE (60/40) - medium grey, siltstone interlaminated with a very fine grained light grey sandstone, slumped, some sporadic burrows, some carbonized plant fragments near base of unit, strongly calcareous, stick.	1.29 DD69.19 0.34
		1.26		SILTSTONE - medium grey, abundant vegetal matter first 10cm and then becomes barer with carbonaceous content increasing towards base of unit, some listric surfaces, silts become micaceous in basal 15 cm non-calcareous, massive stick.	1.26
15°		0.91		SANDSTONE - very fine to fine grained, light to medium grey abundant mica flecks, missing basal contact with probable core loss at this point non-calcareous, stick.	0.91

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COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY DARREN TOMECEK DATE 2 JULY 1981 SHEET NO. 8 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.15		COAL - dull, lustrous, badly broken and pulverized, adjoining stick of mudstone has ground top, possible loss.	0.15
		1.93		MUDSTONE - medium grey, scattered carbonized plant material, slightly silty at top becoming void of all vegetal matter 50cm from base of unit, slightly calcareous, basal contact with underlying silts, quite abrupt, massive.	1.93
		1.63		SILTSTONE - medium grey, lacking any carbonaceous material, massive texture, moderately calcareous, erosional basal contact.	0.87 DD75.29 0.76
20°		4.05		SANDSTONE - very fine grained, light to medium grey lamiated sands with abundant burrows, some slumping, microerosional features, scattered carbonized plant fragments, occasional coal spar near base of unit, strongly calcareous, basal contact erosional with underlying sandstones, stick.	2.30 DD78.33 1.75
		1.68		SANDSTONE - fine to medium grained at base, top 70cm are winnowed and cross-bedded light grey sands with silty mudstone angular interclasts (30cm zone 35cm from top of unit), silty and rippled unit to follow this section with a 1cm coal spar 35cm from base along with larger clast of angular dark grey silts and mudstones, in a medium grained sands, strongly calcareous, basal contact erosional abrupt, stick.	1.30 DD81.38 0.38
		0.36		SILTSTONE - dark grey to black, abundant carbonaceous matter, some slumping, slightly calcareous, basal contact erosional.	0.36
		0.56		SANDSTONE - medium grained, highly carbonaceous, several scattered thin coal spars, abundant thin coaly laminations, micaceous sandstone highly listricated along coaly laminae, slightly calcareous, erosional abrupt basal contact, broken stick.	0.56

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY DARREN TOMECEK DATE 2 JULY 1981 SHEET NO. 9 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.28		SILTSTONE - medium grey, highly slumped unit with some muddy dark grey interclasts floating in the silts, a calcite vein noted 60cm from top of unit orientated 70° to core axis the unit lacks plant fragments for the upper 1.60m, remainder of unit contains sporadic carbonaceous fragments and some plant impressions, slightly calcareous, stick.	0.60 1.13 DD84.43 0.55
20°		5.43		SILTSTONE/SANDSTONE (70/30) - interbedded very fine grained light grey sandstone and medium to dark grey siltstone rippled microerosional interbed contacts, some slumping but to a much lesser degree than the last unit with slump angles less than 20° to com B.C. axis, abundant grassy like carbonized plant fragments and impressions, several very thin calcite veins throughout unit orientated between 70 and 75° to core axis, pyrite and slickenside also associated with veins, slightly to strongly calcareous, slightly calcareous are the silts and reaction increases with content of sands, stick.	2.42 DD87.48 3.01 DD90.53
		1.27		MUDSTONE - dark grey to black, abundant carbonaceous and carbonized fragmented plant material, unit becomes slightly silty 50cm from base downwards towards base, scattered pyrite flecks, slightly calcareous, abrupt basal contact, stick.	1.27
		0.71		SANDSTONE - very fine grained light grey, slumping evident in basal 35cm of unit with above being almost massive with only 2 thin calcite veins both of which have core adjoining ground, 20cm from base interlaminated medium grey silts begin to appear, displaying some rippling and concentrated burrowing, occasional plant impressions also noted in this basal 20cm, erosional basal contact with underlying muds.	0.71
		3.90		MUDSTONE - black to dark grey, uppermost 0.92m of unit massive, dense featureless, remainder of unit contains abundant fragmented plant material, some coaly but dominantly carbonaceous, some listric surfaces scattered pyrite flecks, carbonaceous content drops off and silt content increases in final 30cm towards base, abrupt basal contact with underlying sands, non-calcareous, stick.	0.92 DD93.57 2.79 DD96.62 0.19

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15LOGGED BY W. P. LEEDATE 2 JULY 1981SHEET NO. 10 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.01m		SANDSTONE - light grey, fine grained, clean massive, tr. thin calcite veins perpendicular to core axis, tr coal spars parallel to core axis gradational lower contact, gradual upper contact, minor mica flecks, broken stick, non-calcareous.	
70		2.47m		SANDSTONE - light grey, fine to medium grain, massive with minor bands of thinly bedded low angle beds displaying minor low angle cross-bedding, clean, abrupt lower contact with gradational upper contact, tr. mica flecks, non-calcareous, stick to broken stick.	0.83m DD99.67 1.64m
		0.35m		MUDSTONE - medium grey to light brown, silty throughout, ferruginous, abundant carby plant fragments, abrupt upper contact, gradational lower contact, hard, heavy, non-calcareous, broken core.	
		4.71m		SILTSTONE - medium to dark grey, with scattered very fine to fine grained large grey siltstone lenses, muddy in places, tr very thin coal spars, scattered carby plant fragments, upper and lower contacts gradational, minor dark grey muddy clasts, broken core, slightly calcareous at top, remainder non-calcareous, scattered very fine mica flecks, tr semi-pyritized carby plant fragments.	1.02m DD102.72 3.12m DD105.77 0.57m
3-50		1.06m		SANDSTONE - light grey with minor medium grey, very fine to fine grain tr. thin coal spars, thinly bedded with abrupt small scale silty low angle cross-beds towards base, medium grey silty clasts scattered throughout, abrupt lower contact, stick core, scattered mica flecks throughout, fine carby plant fragments, non-calcareous.	
		0.24m		SILTSTONE - medium to dark grey, thin sand interbeds - light grey very fine to fine grained, abundant carby leaf impressions, (up to 3cm in length), abundant carby plant fragments, upper and lower contacts gradational, stick core, non-calcareous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY W. P. LEEDATE 2 JULY 1981SHEET NO. 11 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.15m		SANDSTONE - light to medium grey, very fine grain, massive, tr. thin coal spars, gradational contacts, scattered carby plant fragments, scattered mica flecks, slightly calcareous, broken stick.	
11-13 ⁰		2.50m		SANDSTONE - light to medium grey, fine grain, thinly bedded with abundant small scale cross laminations, minor dark grey silty interclasts up to 6cm across, upper contact gradational, lower contact erosional, abundant darker finer clasts at base, erosional band with abundant distortion and carby plant fragments, tr. mica flecks, stick to broken stick, slightly calcareous throughout.	0.08m DD108.81 2.42m
15-17 ⁰		1.13m		SANDSTONE - light to medium grey, fine grained, thinly bedded with basal part of unit containing abundant large (10cm dia.) darker and finer clasts, erosional zone as lower contact is erosional, tr. thin coal spars, broken stick, minor mica flecks, tr. carby plant debris, tr. listricated surfaces.	0.56m DD111.86 0.57m
		2.49m		SANDSTONE - light grey, medium grain, massive, minor darker finer clasts up to 7cm diameter, clean, abrupt contacts - lower listricated (core loss?) tr. small coal spars, slightly calcareous, stick to broken stick, minor mica flecks.	
15-17 ⁰		4.35m		SANDSTONE - light grey, fine to medium grain, with minor fine grained laminations, coarsening downwards, tr. small darker finer sandstone clasts, tr. thin coal spars, massive to thinly bedded, gradational lower contact, stick to broken stick, slightly calcareous at top to non calcareous at base.	1.86m DD117.04 2.49m
		1.19m		SANDSTONE - light to medium grey, very coarse grain to gritty with scattered small (1cm dia) pebbles, cherty, poorly sorted, very abrupt basal contact, 62cm from top is 4cm dark grey mudstone band with abrupt contacts, tr. coal spars, broken and ground in places, non-calcareous.	0.57m DD120.09 0.62m

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY W.P.LEE/B.CORMIER DATE 3 JULY 1981 SHEET NO. 12 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
9-11 ⁰	122.20	3.68m		SANDSTONE - light to medium grey, fine grained with interbedded darker grey, very fine grained sandstone/siltstone - ranging from 0.5cm up to 10cm; sandstone thinly bedded with abundant micro-erosional features, abrupt upper contact with gradational lower contact, scattered small very fine grained silty clasts, slightly calcareous in sandstone - non-calcareous in finer sequences, minor listricated surfaces, tr. carby plant debris, tr. mica flecks, broken core.	2.55m DD123.14 1.13m DD126.19
2-3 ⁰	123.56	1.36	1.36	SANDSTONE/MUDSTONE - silty, fine grained light grey sandstone and dark grey, silty mudstone, interlaminated and cyclical bedding, low angle cross-laminations prevalent minor small slumps, ripples and other disturbances, occasional erosional contacts, sharp basal contact slightly calcareous.	DD126.19 BOX 14
	125.17	1.61	1.61	MUDSTONE - black, occasional coal spar or streak, several silty dark grey and calcareous sections, unit generally non-calcareous.	
	125.47		(0.30)	CORE LOSS - ROCK	
	125.80	0.33	0.33	MUDSTONE - black, non-calcareous, as above, base contact gradational.	DD129.54
	126.89	1.09	1.09	SILTSTONE - medium grey, muddy lower half of unit contains root disturbed very fine grained sandstone laminations, contact at base gradational, non-calcareous throughout.	
	127.35	0.46	0.46	MUDSTONE - slightly silty, dark grey, non-calcareous, gradational basal contact.	
	127.46	0.11	0.11	SILTSTONE - muddy and sandy, very fine grained laminations, slightly disturbed and reworked, non-calcareous, gradational basal contact.	
	128.07	0.61	0.61	MUDSTONE - black to dark grey, slightly silty, calcareous laminations, non-calcareous, gradational lower contact.	
	128.17	0.10	0.10	SILTSTONE - with muddy and sandy very fine grained laminations and ripples dark grey to medium grey, calcareous, gradational basal contact.	

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COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY B. CORMIER DATE 2 JULY 1981 SHEET NO. 13 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	128.64	0.47	0.47	MUDSTONE - black to dark grey, silty at top, non-calcareous.	BOX 42
	128.76		(0.12)	CORE LOSS - ROCK	
	128.82	0.06	0.06	MUDSTONE - black to dark grey, silty base - gradational, non-calcareous	DD132.59
	128.97	0.15	0.15	SILTSTONE - medium grey, muddy, laminated, light grey.	
	129.17	0.20	0.20	MUDSTONE - dark grey to black, silty top, non-calcareous, listricated fracture surfaces, occasional coal streak.	
	129.35	0.18	0.18	CANNELOIDAL MUDSTONE - black, dull, occasional coaly streaks, non-calcareous.	BP15/1/1
	129.39	0.04	0.04	COAL - dull, black with 15-20% slightly brighter bands, submetallic.	BP15/1/2
	129.50	0.11	0.11	COAL - bright, metallic, black, blocky texture, friable.	
	129.92	0.42	0.42	COAL - dull, lustrous, black.	
	129.98	0.06	0.06	COAL - dull and bright, black, 20% bright bands.	
	130.04	0.06	0.06	COAL - bright, black, metallic, blocky, friable.	
	130.10	0.06	0.06	COAL - bright & dull, lustrous, 30% bright bands.	
	130.41	0.31	0.31	MUDSTONE/SILTSTONE - black to medium grey, gradational laminations, non-calcareous, gradational basal contact, sharp top contact with coal, occasional coal spar in upper 2cm.	
4-70	130.68	0.27	0.27	SANDSTONE/MUDSTONE - silty, dark grey to light grey, very fine grained inter-laminated sandstone, some small, low-angle, cross-laminations, gradational basal contact, non-calcareous. Mudstone, silty, dark grey occasional sandstone, fine grained to very fine grained lamination, non-calcareous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY B. CORMIER DATE 2 JULY 1981 SHEET NO. 14 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	131.24	0.56	0.56	MUDSTONE/SANDSTONE - gradational, interbeds of very fine grained, light grey sandstone to dark grey, mudstone, rooted zone near top, non-calcareous.	BOX 43
	132.01		(0.77)	CORE LOSS - ROCK	DD135.64
8-10 ⁰	133.76	1.75	1.75	MUDSTONE - with fine gradational interlaminations of sandstone, very fine grained and siltstone, medium grey with dark grey muddy matrix, slightly calcareous to non-calcareous.	
	133.81	0.05	0.05	CANNELOIDAL MUDSTONE - dull, black, with occasional thin bright coaly streaks.	
	133.86		(0.05)	CORE LOSS - COAL AND ROCK	
	133.92	0.06	0.06	COAL - dull, lustrous, black, occasional thin bright streak.	
	134.03	0.11	0.11	CANNELOIDAL MUDSTONE - dull black, numerous thin bright coaly streaks.	
	134.96	0.93	0.93	MUDSTONE - black, slightly carbonaceous, with many coaly streaks throughout, non-calcareous.	BOX 44
	135.15		(0.19)	CORE LOSS - ROCK	
	135.22		(0.07)	CORE LOSS - COAL AND ROCK	
	135.32	0.10	0.10	COAL AND CARBONACEOUS MUDSTONE - intermixed bright coal with dull black mudstone	DD138.99
	135.56	0.24	0.24	MUDSTONE - black, with occasional coaly streak, non-calcareous.	
		2.74		SILTSTONE - medium grey, with minor amounts of gradational interbeds and laminations of very fine grained, light grey sandstone and dark grey mudstone, top and bottom of unit particularly muddy, minor ripples and disturbed beds, non-calcareous top half while bottom half calcareous.	BOX 45
		0.34		SANDSTONE/SILTSTONE - light to medium grey interlaminated and cross-bedded, becoming siltier towards base, sharp upper contact and gradational basal contact, calcareous.	DD142.04

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15 LOGGED BY B. CORMIER/D. TOMECEK DATE 2 JULY 1981 SHEET NO. 15 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.53		SILTSTONE/MUDSTONE - dark grey to medium grey, occasional lamination of sandstone from very fine grained to medium grained or coal streak calcareous.	
				SANDSTONE/SILTSTONE - interbedded, muddy ripples, burrows and minor cross-laminations, light grey, fine grained to dark grey, carbonaceous and coaly debris near base, calcareous.	BOX 46
		1.48		SANDSTONE - fine to medium grained variable laminae with siltstone/mudstone, medium to dark grey, much carbonaceous and coaly irregular streaks, evidence of disturbed bedding and slumping, slightly calcareous.	
		0.55		SANDSTONE - light to medium grey, fine grain, laminae dark grey bands, cross-laminated, with coaly and carbonaceous streaks, lower half reworked or slumped, non-calcareous, gradational lower contact.	DD148.44
		1.54		MUDSTONE/SANDSTONE - banded, dark grey to light grey, sandstone fine to medium grained, mudstone silty, ripples, both gradational and sharp erosional contacts between bands, minor slumping, sandstone lenticular; non-calcareous to slightly calcareous.	
100		5.58		SANDSTONE - fine grained to medium grained, light to medium grey, upper most 50cm contain thin erosional beds of dark grey to medium grey silts and muds with concentrated zones of carbonaceous material near base, 51cm from top of unit is a 4cm zone of conglomerate with pebbles of light and dark grey quartz and brown silts all are subrounded in a matrix of non-calcareous coarse grained sands, 2.05m from top of unit is 30cm band of abundant thin coaly laminae, crinkled in the medium grained sands, 2.65m from top is a 2cm zone of pebble conglomerate containing rounded pebbles of chert and quartz in medium grained sands matrix. Throughout the unit are abundant mica flecks, non-calcareous sands with an erosional basal contact with underlying conglomerate.	1.04 DD151.48 2.65 0.39 DD154.54 1.50

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-15LOGGED BY DARREN TOMECEKDATE 3 JULY 1981SHEET NO. 16 OF 18

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.43		CONGLOMERATE - pebble conglomerate in a coarse grained, gritty sandstone siliceous matrix, predominantly well rounded chert and quartz pebbles largest 2cm in diameter, some with primary fracturing, poorly sorted pebbles, 8cm from base, population decreases and coarse grained clean sands are matrix constituents, basal contact erosionally abrupt.	0.43
130		0.12		SANDSTONE - coarse grained, light grey, clean, non-calcareous, stick, basal contact abrupt.	
		0.29		SANDSTONE - very coarse grained, light grey sandstone approaching gritstone in basal 5cm, appears massive basal contact contains several chert pebbles largest being 1.5cm in diameter rounded, basal contact erosional with underlying sands, non-calcareous, stick.	0.29
		0.17		SANDSTONE - coarse grained, light grey, several scattered small pebbles throughout unit, massive texture, non-calcareous, basal contact abrupt with underlying gritstone.	0.17
		0.14		SANDSTONE - very coarse grained to gritty, light grey with abundant small pebbles of angular cherts and quartz, massive, abrupt local contact, non-calcareous abrupt.	
		0.11		SANDSTONE - fine to medium grained, medium grey, abundant silty laminae in upper 7cm with scattered abundant mica flecks, non-calcareous, abrupt erosional basal contact with conglomerate.	
		0.25		CONGLOMERATE - pebble conglomerate in coarse grained sandstone matrix, poorly sorted, subrounded pebbles of predominantly smokey grey cherts and quartz, occasional light brown ferruginous siltstone clasts, well rounded, average diameter for all pebbles is 1.0cm, some gritstone matrix, lost for pebbles near base of unit, non-calcareous, basal contact erosional, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY CHOWDRY

DATE 4 JULY 1981

SHEET NO. 1 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
5-60		3.43		SANDSTONE - light to medium grey, very fine grained widely spaced thin-silty laminae, quartz/chert 60:40, sands fairly clean and sorted though some concentration of micaceous (quite common) and argillaceous matter along ripple laminae; unit ubiquitously rippled, and occasionally has small-scale cross-lamination, sporadic burrows (one 30mm deep and 8cm wide), 13cm thick siltstone at base, calcareous throughout, core broken and locally weathered.	CASING DD 3.3 1.55 DD 5.18 1.88
		0.05		SANDSTONE/SILTSTONE - medium grey, top half very fine grained with tiny carbonaceous fragments (some needle like), lower half micromicaceous, argillaceous siltstone, entire unit slightly weathered, fragmented core.	
		0.07		COAL - dull banded (dull and bright laminae widely spaced) broken stick.	BP81/16/1/1
		0.05		MUD/COAL - finely broken, and pulverized, sandy fragments.	BP81/16/1/2
		0.04		COAL - dull and bright, a thin band of needle coal in middle, broken stick.	
		0.025		COAL - bright, stick.	
		0.07		COAL - dull and bright, stick.	
		0.055		COAL - bright, part of the top stick.	BP81/16/1/3
		0.09		COAL - dull lustrous, clean, stick.	
		0.05		COAL - mostly bright, hard, some crusty stick.	
		0.11		COAL - dull lustrous, easily breakable, broken stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 4 JULY 1981 SHEET NO. 2 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.06		COAL - dull, lustrous, broken stick.	
		0.075		COAL - dull banded, clean, broken stick.	
		0.075		COAL - dull banded, broken stick.	
		0.16		COAL - dull, lustrous, clean, broken and fragmented core, listric surfaces.	BP81/6/1/3
		0.07		COAL - dull lustrous, broken stick.	
		0.06		COAL - dull lustrous, broken stick.	
		0.025		COAL - dull, minor bright laminae, broken stick.	
		0.025		COAL - dull and bright, broken stick	
		0.10		MUDSTONE - black, badly fragmented small pieces, appears very carbonaceous mudstone and/or coaly mudstone; abrupt at base.	DD 8.23 BP81/16/1/4
15°		1.82		SILTSTONE/MUDSTONE (75/25) - medium grey, silts very argillaceous, sparsely laminated plant fragments, rootlets, mudstone silty, locally very carbonaceous, gradual at base.	
		1.18		SILTSTONE - medium grey, locally argillaceous sequence characterized by much bioturbation and obliterations of laminae, locally slumped, strongly calcareous, broken core at base.	0.82 DD 11.2 0.99
		0.24		SILTSTONE/MUDSTONE - medium grey, dominance of silts, core fragmented, grind marks.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 8 JULY 1981SHEET NO. 3 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.69		SANDSTONE/SILTSTONE - medium grey to brownish grey, dominance sands - very fine grained, closely laminated and rippled, interlaminated and bedded with argillaceous siltstone, sparing carbonized plant fragments, calcareous, gradational at base.	
				SILTSTONE - dark grey, very argillaceous, locally needle-like carbonaceous debris, occasional vaguely discernible lamination; gradual.	
		0.18		MUDSTONE - dark grey/black, slightly carbonaceous but the basal 0.08m very carbonaceous with abundant finely broken and carbonized plant debris, most of interval badly fragmented.	0.06 DD 14.30 0.12
		1.91		SANDSTONE/SILTSTONE (60/40) - frequently interlaminated sequence of very fine-grained sands and silts, unit rippled and with small-scale cross-lamination, some slumped laminae, calcareous; interbedded below.	
150		0.77		SILTSTONE/MUDSTONE - top half medium grey, dominantly silty with rapidly interlaminated silty mudstone; remainder dark grey mudstone with frequent tiny ripples and lenses of silts (commonly erosional micro-contacts) bottom 13cm dense and carbonaceous, gradual at base.	
		0.05		COAL - dull, lustrous, mostly small fragments.	DD 17.37
		0.06		MUDSTONE - dark grey/black, carbonaceous, coaly 4cm thick mudstone at base heavily impregnated with pyrite.	
		0.28		SILTSTONE - medium grey, highly argillaceous, much finely macerated carbonaceous matter, rootlets, gradual at base.	
		0.35		MUDSTONE - dark grey/black, silty, slightly carbonaceous, devoid of lamination, gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 8 JULY 1981 SHEET NO. 4 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
15-18°		2.00		SILTSTONE - medium grey, argillaceous, locally sandy, laminated and rippled throughout, minor carbonaceous mudstone, sporadic slumps and isolated burrows, bottom 17cm has substantial very fine grained sands, slightly calcareous, abrupt at base.	1.88 DD 20.42 0.12
		0.73		SANDSTONE - light grey, fine to medium grained although clean there is abundant carbonized plant fragments throughout, current lamination, siliceous, abrupt below.	
18°		0.56		SANDSTONE - light to medium grey, fine to very fine grained, top 0.26m clean and fine grained, remainder very fine grained, cross-laminated with occasional thin silty laminae, strongly calcareous, core weathered at two horizons, interbedded below.	
15°		1.03		SANDSTONE/SILTSTONE (75/25) light to medium grey, top 0.53m very fine grained laminated sands with subordinate widely spaced silty laminae (invariable with sharp well defined contacts with sands) remainder rapidly interlaminated very fine grained sand and silts, minor rippled much micro-erosional contacts, at times graded with calcareous throughout, gradual at base.	
		0.77		MUDSTONE/SILTSTONE (90/10) - dark grey muds rapidly interlaminated with tiny ripples and laminae of siltstones, in variably sharp contacts, marine to near shore aspect, silty lenses, calcareous, abundant finely macerated/particulate carbonaceous matter along laminae, core broken.	0.42 DD 23.47 0.35
		0.10		MUDSTONE/COAL - black mudstone - very carbonaceous, pieces of coal, all badly fragmented grind marks, appears abrupt at base.	
14-16°		6.77		SANDSTONE - light grey, top 0.97m medium grey fine to medium grained with numerous silty layers (totalling 20% of sequence). Sand/silt contacts here invariably erosional; remainder of sequence uniformly fine to medium grained, well washed, well sorted occasionally tiny coal spars. vaguely cross bedded few rusty intraclasts, very slightly calcareous, abrupt at base.	2.25. DD 26.52 2.97 DD 29.56 1.55

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 9 JULY 1981 SHEET NO. 5 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.82		SILTSTONE/SANDSTONE (70/30) - silts medium grey, argillaceous, discontinuously laminated. Sandstone very fine grained, rippled and cross-laminated and broadly interlayered with silts, some slumped laminae, very slightly calcareous, abrupt at base.	
		0.46		MUDSTONE - dark grey/black, very silty, carbonaceous, core broken, abrupt at base.	0.37 DD 32.61
					0.09
		0.27		SILTSTONE - medium grey/dark grey, very argillaceous towards top and base, slumped laminae, slightly calcareous, abrupt.	
		0.19		MUDSTONE - dark grey/black, abundant carbonized plant debris, silty, abrupt below.	
		1.77		SILTSTONE - medium grey, argillaceous, cross-laminated and rippled throughout, locally thin zones bioturbated, local gradations from very fine grained sands to silts, carbonized plant fragments, strongly calcareous, abrupt below.	
		0.12		MUDSTONE - dark grey/black, abundant needle like leaf impressions and other carbonized plant fragments, listric fragments, gradual at base.	
		0.23		MUDSTONE - rusty, strongly ferruginous, top half very silty and highly calcareous, gradual at base.	
					0.16
		0.21		MUDSTONE - dark grey, very silty, calcareous.	DD 35.66
					0.05
		0.37		SILTSTONE - medium grey, argillaceous, laminated and rippled, wavy laminae, burrows, micro-graded units, strongly calcareous, passage downward by interbedding.	
					0.05
150		1.01		SANDSTONE - light/medium grey, very fine grained, top 0.55m with abundant small-scale, cross-lamination and small ripples, frequent silty laminae in top half, strongly calcareous, erosional at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 9 JULY 1981SHEET NO. 6 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
13-14 ⁰		1.57		MUDSTONE/SILTSTONE - light grey to dark grey, rapidly interlaminated and rippled, very fine grained sandstone and mudstone, sand ripples are very finely laminated and usually have sharp contacts with mudstone much burrowing, overall dominance of mudstone, basal 0.3m black and appear to incorporate higher muddy content (?also finely divided carbonaceous matter), silty laminae, strongly calcareous, core broken at base.	
		0.05		COAL - highly sheared, small fragments and powdery, mostly dull, lustrous.	DD 38.71
		0.86		SANDSTONE - light/medium grey, very fine grained, top 0.18m grey and argillaceous/carbonaceous remainder, with widely dispersed silty laminae, laminated and cross-laminated and strongly calcareous, gradual at base.	
		0.38		SILTSTONE/MUDSTONE - medium grey, frequently interlaminated, calcareous, gradual.	
		0.72		MUDSTONE - dark grey, silty, carbonaceous plant fragments, abundant nodules of pyrite and disseminated, totally lacking lamination, very gradational at base.	
10 ⁰		0.69		SANDSTONE - light/medium grey, very fine grained, frequently silty in lower half, regularly laminated, cross-laminated and rippled, many small burrows, micromicaceous, locally much carbonized plant leaves and fragments, calcareous, passage below by interbedding.	0.77 DD 41.76
		0.50		SILTSTONE/MUDSTONE (75/25) - medium/dark grey, rapidly interlaminated silts and silty mudstone, somewhat banded, much small burrowing, micro erosional features, intertidal aspect silty lenses and laminae calcareous, gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY CHOWDRY

DATE 10 JULY 1981

SHEET NO. 7 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.02		MUDSTONE/SILTSTONE (80/20) - dark grey dense mudstone interlaminated with silts (tiny ripples and lenses), thin slightly carbonaceous mudstone zone, non-calcareous throughout, gradual.	
		0.41		SILTSTONE - medium grey, interbeds of very fine-grained rippled sands, abundant burrowing, calcareous (sandy zones strongly calcareous) transitional at base.	
		0.14		MUDSTONE - dark grey/black, locally highly carbonaceous, silty at top and base.	
		0.75		SILTSTONE - medium grey, abundant cross-laminations and rippling but locally obliterated due to bioturbation, some slumping, carbonaceous plant fragments in top 0.2m of argillaceous siltstone, strongly calcareous, gradual at base.	0.12 DD 44.80 0.63
		0.45		SANDSTONE - light/medium grey, very fine-grained laminated, two silty zones each 8-10cm thick, slumped laminae, strongly calcareous, erosional at base.	
		0.35		MUDSTONE - top 0.18m brownish grey, highly silty and strongly calcareous remainder slightly carbonaceous, ferruginous, gradual at base.	
		0.27		SILTSTONE - medium grey, thin laminae of very fine grained, widely disturbed laminae due to ?slumping, some burrowing, strongly calcareous, slightly erosional at base.	
		0.17		MUDSTONE - medium grey, slightly silty, gradational.	
9-10 ⁰		3.65		SILTSTONE/SANDSTONE (75/25) - frequently interbedded and interlaminated medium grey silts and light/medium grey very fine grained sands - laminated and rippled with erosional contacts with siltstone, sequence abundantly burrowed and locally bioturbated, strongly calcareous throughout, very gradation at base.	0.48 DD 47.55 3.00 DD 50.60 0.17

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY

CHOWDRY

DATE 10 JULY 1981

SHEET NO. 8 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.17		MUDSTONE - dark grey/black, locally highly silty/carbonaceous (finely particulate), abundant plant fragments and disarticulated and broken pelecypod shells, calcareous throughout, interbedded at base.	
10°		0.58		SANDSTONE/MUDSTONE (70/30) - sandy, very fine grained, very finely cross-laminated and delicately rippled, these interlaminated with dark grey/black, silty/carbonaceous (macerated) mudstone, core fragmented and broken.	
		0.24		MUDSTONE - black, carbonaceous, fragmented pelecypod shells, calcareous abrupt at base.	
608°		0.70		SANDSTONE - light/medium grey, very fine grained, ubiquitous small-scale, cross-lamination and rippling, frequent very thin carbonaceous laminae, very weakly calcareous to siliceous, few isolated burrows, abrupt below.	
		2.02		MUDSTONE - dark grey, locally very silty, (especially in upper half), basal 0.40m black, canneloid mudstone, top half strongly calcareous, rest non-calcareous, abrupt at base.	0.22 DD 53.95 1.80
		1.14		SILTSTONE/MUDSTONE (80/20) - medium grey, lithologies in perceptibly blending, 13cm very fine grained sandstone bed in top half, slightly calcareous (patchily), interbedded at base.	0.68 DD 57.0 0.46
90°		0.40		SANDSTONE/SILTSTONE - sands light grey, salt and pepper, fine/medium grained, clean, slightly calcareous, structureless, these enclosing argillaceous siltstone, laminated and burrowed passage below by interbedding.	
		0.96		SANDSTONE - light/medium grey, dominantly very fine grained, small-scale cross-lamination, frequent thin silty laminae, few isolated burrows, strongly calcareous throughout, passage below by interbedding.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 10 JULY 1981SHEET NO. 9 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
12-15 ⁰		2.11		MUDSTONE/SILTSTONE/SANDSTONE - medium/dark grey sequence of basal half predominantly muddy with frequent but extremely thin silty ripples and lenses, remainder with increasing (upward) silty/sandy layers and lenses, invariably with microerosional boundaries, tiny sand-filled tubes and "pin-pricks", silty/sandy intervals calcareous, gradual.	1.20 DD 60.05 0.91
		0.52		SILTSTONE - medium grey, argillaceous, sandy, discontinuously laminated, few isolated burrows, calcareous, interbedded below.	
		1.59		SANDSTONE - light grey, dominantly fine to very fine grained, 0.32m interval fine/medium grained, cross-laminated throughout, generally well-washed, calcareous, basal 0.25m with frequent thin silty laminae and fragmented, interbedded below.	0.78 DD 62.18 0.81
		0.55		SANDSTONE/SILTSTONE (70/30) - frequently interbedded and interlaminated very fine grained sands and silts, much disruption of laminae by deep vertical burrows, micro erosional features throughout, strongly calcareous, passage below by interbedding.	
6-8 ⁰		1.26		MUDSTONE/SILTSTONE - dark grey, predominantly muddy, tiny silty/sandy ripples on lower half, these more frequent and thicker in top half, gradational to erosional contacts, small burrows, silty/sandy zones calcareous, gradual.	
		0.04		COAL - dull lustrous, fragmented, abrupt base.	
		2.08		SILTSTONE/MUDSTONE - broadly interlayered, argillaceous siltstone and silty mudstone, occasionally laminated and rippled. Several layers of very fine grained sandstone, entire sequence moderately calcareous, gradual.	0.33 DD 65.53 1.75
		0.67		MUDSTONE - dark grey, top 1/3 very silty, remainder locally dense, gradual at base.	

B P C A N A D A.

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY CHOWDRY

DATE 10 JULY 1981

SHEET NO. 10 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.27		SILTSTONE - medium grey, argillaceous, sparse carbonaceous plant debris gradual.	
		0.33		SANDSTONE - medium grey, very fine grained, locally argillaceous, silty, occasional vague lamination, calcareous, passage below imperceptible.	0.05 DD 68.88 0.28
		0.42		SILTSTONE/MUDSTONE - medium grey, broadly interbedded, mostly devoid of lamination, calcareous, very transitional at base.	
		0.19		MUDSTONE - dark grey/black, abundant carbonized plant debris, structureless, patchily calcareous, gradual at base.	
		0.66		SILTSTONE - medium grey, locally argillaceous, sparsely laminated and rippled, becoming sandy downward, calcareous, abrupt at base.	
		0.14		MUDSTONE - medium/dark grey, silty laminae, patchily calcareous, carbonaceous bottomward.	
		0.10		MUDSTONE - black, highly carbonaceous, slightly silty, abrupt basal contact, core broken.	
		1.35		SANDSTONE/SILTSTONE (60/40) - medium grey, broadly interlayered, very fine grained, laminated and rippled sandstone and siltstone, ubiquitous burrowing and locally bioturbated, calcareous throughout, erosional at base.	1.24 DD 72.24 0.11
		1.13		MUDSTONE - medium/dark grey, sporadically silty especially in lower 0.4m, patchily calcareous, occasionally laminated, gradual at base.	
6-80		4.85		SILTSTONE/MUDSTONE/SANDSTONE (60/30/10) - medium grey, broadly interbedded sequence of silts and muds, some very fine grained argillaceous sands, sequence generally impoverished of lamination, though 0.32m thick sandy/silty zone exhibits highly disturbed and	1.92 DD 75.28 2.93

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 10 JULY 1981SHEET NO. 11 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				slumped laminae, silt/mud boundaries generally imperceptible, some bioturbation and burrowing, basal 0.4m very muddy, strongly ferruginous, in one instance elongate needle like carbonized matter, non-calcareous, remainder sequence moderate to strongly calcareous, interbedded below.	
5-60		4.31		SANDSTONE - top 0.19m medium grey, fine to very fine grained, silty argillaceous, remainder of sequence light grey, fine/medium grained, cherty/quartzose, generally well-washed and well-sorted, 0.18m thick zone with abundant carbonaceous laminae, one large intraclast of ferruginous silty mudstone, most of sequence shows poor cross-bedding, very slightly calcareous - otherwise mostly siliceous, abrupt and clean basal contact.	0.11 DD 78.33 2.96 DD 81.38 1.24
		0.60		MUDSTONE - dark grey, middle 0.35m section very silty, slightly ferruginous, remainder at top and base dense and basal 5cm cannelloid mudstone, very gradual at base.	
		0.27		COAL - badly fragmented into small pieces, fragments of carbonaceous mudstone, coal fragments dominantly comprise dull variety, some dull lustrous. Abundant algal mats in some fragments.	DD 84.43
		0.21		SILTSTONE - dark grey, highly argillaceous, carbonized plant fragments, occasional lamination, gradual.	
		1.19		SILTSTONE/SANDSTONE (50/50) - light grey, lower half dominantly silty, remainder dominantly sandy - generally fine grained, sequence ubiquitously slumped, abundant muddy laminae in lower half, some burrowing, calcareous throughout, interbedded below.	
		2.15		SANDSTONE - light grey, dominantly (75%) very fine grained, remainder fine grained, sequence generally cross-laminated and ripples, muddy in basal 0.25m, much finely macerated carbonaceous plant debris confined to laminae in top 0.85m sequence, fine grained sands, well-washed and sorted, few isolated burrows, calcareous throughout, erosional base.	1.49 DD 87.48 0.66

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COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 11 JULY 1981SHEET NO. 12 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
10 ⁰		3.08		MUDSTONE/SANDSTONE (85/15) - predominantly dark grey, dense mudstone with tiny sandy ripples and lenses throughout, local concentrations of finely particulate carbonaceous matter, "pin-prick" and invertebrate burrows, articulated pelecypod shells, sandy/silty laminae, calcareous, otherwise non-calcareous, abrupt base.	2.25 DD90.52 0.83
		0.23		COAL - mostly fragments, some broken core, appears dominantly dull and some bright coal, essentially light and clean coal.	GSC sample at 91.36
		0.14		MUDSTONE - black, very carbonaceous, slightly silty towards base, gradational contact.	
8-10 ⁰		3.86		SANDSTONE - light/medium grey, predominantly very fine grained, laminated and cross-laminated throughout, but silty interbeds in lower half, but these silts imperceptibly blending with sands, Top 0.13m with argillaceous/carbonaceous laminae, 14cm zone (0.53m from top) with large invertebrate burrows disrupting laminae, calcareous throughout, interbedded.	1.79 DD 93.57 2.07
		0.92		MUDSTONE/SILTSTONE/SANDSTONE (50/30/20) - muds and silts dark grey, rapidly interlaminated and rippled, sands very fine grained with abrupt contacts with silts and muds, abundant isolated burrows, near shore aspect, patchily calcareous, erosional at base.	0.84 DD 96.62 0.08
5-7 ⁰		2.35		SANDSTONE - light/medium grey, very fine grained, laminated and cross-laminated, very few thin silty/argillaceous laminae, otherwise clean and sorted, several invertebrate burrows, strongly calcareous throughout, slightly erosional at base.	
		0.20		MUDSTONE - dark grey, very silty, gradational.	
		0.44		SANDSTONE/SILTSTONE - top half medium grey, remainder dark grey, broadly interlaminated, sands fine-grained vaguely laminated, muddy laminae (especially in basal section) strongly calcareous, pelecypod shells, passage below by interbedding	0.37 DD 99.67 0.12

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 11 JULY 1981SHEET NO. 13 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
60		0.85		MUDSTONE/SANDSTONE (90/10) - dominantly dark grey, tiny stringers and ripples of very fine sands and silts, locally ferruginous, sparse finely divided carbonaceous particles, strongly calcareous, basal 9cm very slightly calcareous, interbedded below.	
		0.15		SANDSTONE/SILTSTONE (85/15) - medium grey, very fine grained argillaceous sands, frequently interlaminated with dark grey siltstone, slightly calcareous, gradual at base.	
		0.29		SANDSTONE - light/medium grey, fine to very fine grained, very sparse thin coaly laminae, calcareous, very abrupt at base.	
		0.47		MUDSTONE - black, abundant carbonized plant fragments, carbonaceous, top 12cm dense, silty towards base, gradational.	
		0.54		SANDSTONE - medium grey, very fine grained, very silty, abundance of finely broken carbonized plant debris, poorly laminated, calcareous, erosional.	
		0.29		MUDSTONE - dark grey/black, very silty, plentiful carbonized vegetal matter, devoid of lamination, gradational at base.	0.02 DD102.72 0.27
		0.93		SANDSTONE - top 0.41m medium grey, very fine grained, some silty laminae, abundant burrows, remainder fine grained, cross-bedded, frequent concentration of finely macerated carbonaceous matter along sedimentary laminae, otherwise well sorted, strongly calcareous, erosional at base.	
70		2.08		SANDSTONE/SILTSTONE - dominantly medium grey, lower half dominantly very fine grained sands with substantial muddy/silty laminae and layers ripples and locally cross-laminated, local disruption of lamination by burrowers, sporadic concentration of finely particulate carbonaceous matter, remainder at top predominantly silty, argillaceous with scattered very fine grained sand lenses, calcareous throughout, abrupt at base.	1.04 DD105.46 1.04

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 11 JULY 1981SHEET NO. 14 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.07		MUDSTONE - top 3cm carbonaceous/coaly, remainder carbonaceous and very silty, very gradual at base.	
6-8 ⁰		0.94		SANDSTONE/SILTSTONE - medium grey, about equal amounts of interbedded fine-grained sands and argillaceous silts, sparsely laminated, some parallel to low-angle cross-lamination, strongly calcareous throughout, some muddy bands in top half of sequence, slightly erosional at base.	
		0.71		MUDSTONE - medium grey, very silty, few isolated laminae, strongly calcareous, abrupt below.	
		0.03		MUDSTONE - dark grey/black, coaly/carbonaceous, mostly small fragments abrupt.	DD108.05
		0.23		SILTSTONE - medium grey, very muddy, abundant carbonized plant fragments, some sedimentary lamination, strongly calcareous.	
6-8 ⁰		1.25		SILTSTONE/SANDSTONE (65/35) - basal 18cm light grey fine to very fine grained sands with some silty laminae, remainder broadly interbedded very fine grained argillaceous sands and silts, with much disturbed laminae, some of which is due to bioturbation, few muddy intraclasts, strongly calcareous throughout, sharp basal contact.	
		1.28		SILTSTONE/MUDSTONE - top 0.63m medium grey dominantly muddy with high silty content, remainder dominantly silty with large muddy intraclasts, overall slight dominance of mudstone, thin laminated zones, strongly calcareous throughout, basal 8cm calcareous, gradual at base.	
		0.05		COAL - mostly small pieces, dull lustrous.	GSC top 111.41
		0.11		MUDSTONE - black, very hard, appears highly silty/sandy, abundant carbonaceous plant debris and carbonaceous, some sedimentary laminae, broken stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY CHOWDRY

DATE 12 JULY 1981

SHEET NO. 15 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
10 ⁰		3.97		SANDSTONE - light/medium grey, top 0.95m fine-grained and with sparse carbonaceous laminae, remainder very fine grained cross-bedded, generally well-sorted in a given interval, basal 0.75m have numerous silty/muddy laminae, strongly calcareous throughout, erosional base.	DD111.56 3.02 DD114.60 0.95
		0.27		SILTSTONE - medium grey, highly argillaceous, thin ripples of very fine sands, slightly calcareous, erosional at base.	
		0.26		SANDSTONE - light/medium grey, fine grained, 5cm thick siltstone in middle, calcareous. passage below by interbedding.	
		0.25		SILTSTONE - medium grey, lower half dark grey very argillaceous, slightly calcareous, gradual.	
8-10 ⁰		1.47		SANDSTONE - light grey, dominantly fine-grained, generally clean and well-sorted, top 13cm and basal 9cm with small ripples, very fine grained with fine concentration of carbonaceous laminae, remainder devoid of laminations, strongly calcareous throughout, gradual base.	
		0.42		SANDSTONE/SILTSTONE (90/10) - medium grey, dominantly very fine grained, parallel lamination (might be low-angle cross-lamination), frequent silty, muddy laminae, calcareous throughout, erosional.	
		0.24		SANDSTONE - light grey, fine grained, generally clean and well-sorted, laminated at top, strongly calcareous, erosional at base.	
		0.28		SANDSTONE/SILTSTONE (65/35) - sands very fine grained, light/medium grey well laminated, interbedded with argillaceous medium grey siltstone, strongly calcareous, interbedded below.	
		0.67		SILTSTONE/SANDSTONE (80/20) - light grey to medium grey argillaceous siltstone/very fine grained laminated and sandstone, some muddy bands microerosional boundaries, calcareous, gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 12 JULY 1981SHEET NO. 16 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.83		SILTSTONE/MUDSTONE (80/20) - medium/dark grey, frequently laminated and rippled, slightly ferruginous, patchily calcareous, gradual.	
		0.70		MUDSTONE - dark grey/black, abundant carbonized plant fragments, thin carbonaceous/canneloid mudstone zone at 121m, ferruginous and very silty downward, gradual.	0.37 DD121 0.33
		0.52		SILTSTONE - dark grey, highly muddy, carbonaceous debris, structureless strongly calcareous, abrupt.	
		0.32		MUDSTONE - black, very carbonaceous, uniformly disseminated silts, abrupt at base.	
		0.41		SANDSTONE - light/medium grey, fine-grained, abundant argillaceous/silty laminae, poorly washed and sorted, siliceous, highly erosional and scoured basal contact.	
		0.38		MUDSTONE - dark grey, uniformly silty, (no lamination), non-calcareous, gradual at base.	
		0.10		COAL - dominantly dull lustrous, fragmented.	DD124 GSC Top@
		0.05		COAL - highly sheared and lustrous, appears dull lustrous coal, abrupt at base.	123.95
		0.80		SILTSTONE - medium grey, frequent thin, very fine grained layers (imperceptibly blending), generally lacking lamination, siliceous, few burrows, irregular passage at base.	
		1.82		SANDSTONE/SILTSTONE - medium grey, dominantly sandy, very fine grained, silty sands broadly interlayered with sandy siltstone, much disrupted laminae (some due to slumping but majority due to bioturbation) also much isolated worm burrowing, overall increase in sandy component downward strongly calcareous throughout, interbedded at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 12 JULY 1981 SHEET NO. 17 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
80		2.20		SANDSTONE - top 0.69 buff grey, fine to very fine grained with small scale cross-lamination, few thin silty/muddy laminae, remainder fine/medium grained, clean, well-sorted, cross-bedded, tiny coal spars in basal 0.5m, slightly calcareous, abrupt base.	0.18 DD127.10 2.02
		0.28		SANDSTONE - light/medium grey, very fine grained isolated laminae and ripples, slightly calcareous, abrupt base.	
		4.37		SANDSTONE - light grey, fine/medium grained, generally well-sorted and clean, cross-bedded periodically, slightly calcareous, abrupt at base.	0.67 DD130.15 2.4 DD132.89 1.30
		0.92		MUDSTONE/SANDSTONE (90/10) - dark grey highly silty, (very fine grained), mudstone with tiny ripples and lenses of very fine grained finely laminated sands, one fragmented pelecypod shell, strongly calcareous throughout, interbedding.	
		0.46		MUDSTONE - medium/dark grey, ferruginous, calcareous, silty, top 3cm small pieces and very carbonaceous, gradual at base.	0.15 DD135.63 0.31
		0.95		MUDSTONE - dominantly black, much of the sequence comprises canneloid mudstone, non-calcareous and totally lacking lamination, core fragmented in top 20cm and basal 6cm.	0.15 DD136.24 0.80
		0.39		SILTSTONE/MUDSTONE (50/50) dark grey to black, broadly interlayered, silts very argillaceous and mudstone very carbonaceous, sequence lacking lamination, very gradual at base, core fragmented.	
		0.37		MUDSTONE - black, carbonaceous, slightly lower half, devoid of lamination, gradual at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 12 JULY 1981SHEET NO. 18 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO.
		MEASURED	APPARENT		
		0.72		SILTSTONE - medium grey, highly argillaceous, sparing carbonaceous plant fragments, basal 20cm very muddy and have emaciated pelecypod shells and fragments, strongly calcareous throughout, gradual at base.	
		0.42		SILTSTONE - medium grey, top 9cm very fine grained and highly argillaceous remainder sandy silts, poorly laminated, strongly calcareous, abrupt at base.	
		0.04		COAL - dull lustrous, all small pieces, abrupt.	DD139.29
		0.07		MUDSTONE - dark grey, carbonaceous towards base, top half slightly silty, broken stick.	
		0.03		MUDSTONE - black, highly carbonaceous, broken core.	
		0.05		MUDSTONE - black, coaly carbonaceous top half, remainder at base dull hard coal with some bright bands, broken core.	
		0.20		MUDSTONE - black, very carbonaceous, much silty content (uniformly dispersed), gradual at base.	
		0.38		SILTSTONE - medium grey, top half very argillaceous, remainder clean, siliceous, abrupt at base.	
50		1.08		SANDSTONE/SILTSTONE (60/40) light/medium grey, broadly interbedded (blending imperceptible) sands very fine grained with poorly-defined small-scale cross-lamination, much isolated burrowing, basal 0.4m dominantly silty, with frequent but very thin argillaceous laminae, calcareous throughout, very gradual at base...	
		0.05		MUDSTONE - dark grey, abundant carbonized plant fragments, core broken.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 12 JULY 1981 SHEET NO. 19 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.05		COAL - fragmented, appears dull lustrous.	GSC Top @ 141.87
		0.48		MUDSTONE - black, most of unit highly carbonaceous, hard mudstone, broken stick.	
4-5 ⁰		1.52		SILTSTONE - dominantly medium grey, top 0.31m with sparse rootlets, remainder with abundant argillaceous/sandy laminae, frequent disruption due both to bioturbation and slumping, calcareous throughout, decreasing silts downward.	DD142.34
		0.91		MUDSTONE - medium grey, homogenously silty (very fine grained), no discernible lamination, slight colour banding, calcareous throughout, silty content increasing downward.	
		1.60		SILTSTONE/SANDSTONE/MUDSTONE (50/30/20) - silts and muds dark grey, these rapidly interlaminated by tiny ripples and lenses of very fine grained light/medium grey sands with erosional to abrupt microcontacts with silts and muddy laminae, moderate to strongly calcareous throughout, few emaciated pelecypod shells, increasingly muddy downward.	0.42 DD145.39 1.18
		0.05		MUDSTONE - black, homogenously carbonaceous, tiny (barely discernible with unaided eye) silty discontinuous laminae, gradual at base, stick.	
		0.04		COAL - mostly fragmented, dull lustrous.	GSC Top @ 146.61
		0.12		MUDSTONE - dark grey/black, very carbonaceous at top, gradual at base.	
		0.19		SILTSTONE - medium grey, argillaceous at top, vague sporadic lamination, calcareous, interbedded.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY CHOWDRY

DATE 12 JULY 1981

SHEET NO. 20 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
6 ⁰		0.48		SANDSTONE - light/medium grey, top 18cm with 30% silty/muddy laminae, (these have erosional contacts with sands) incorporating occasional "pin-prick" burrows, remainder very fine grained laminated sands with occasional silty laminae, strongly calcareous throughout, highly erosional at base.	
		0.78		SILTSTONE - dark grey, very highly argillaceous, sedimentary lamination disturbed due to slumping (much of originally discrete muddy bands now intimately intermixed with sands and silts in a chaotic fashion) 3cm thick carbonaceous mudstone band, mostly siliceous, very gradual at base.	
		0.64		MUDSTONE - mostly black, carbonaceous, top half distinctly silty, non-calcareous, broken stick.	
		0.24		MUDSTONE - black, very mostly boney canneloid mudstone, badly fragmented into small pieces.	DD148.44
		0.56		MUDSTONE/SILTSTONE (50/50) - medium grey, top half dominantly mudstone, remainder argillaceous siltstone lacking lamination, strongly calcareous, interbedding below.	
6-8 ⁰		1.64		MUDSTONE/SILTSTONE/SANDSTONE (45/35/20) - generally dark grey rapidly intercalated very fine grained silts and mudstone regularly punctuated by tiny ripples of very fine grained sands, irregular to erosional contacts, some burrowing by invertebrates, tiny dark pelecypod shells, strongly calcareous in upper half (where silts and sands predominate) and least calcareous in basal 30cm (increasingly muddy and dense), interbedded below.	1.14 DD151.48 0.50
		0.18		SILTSTONE - medium grey, top 2/3 siltstone, remainder contains considerable sands - very fine grained and laminated, few burrows, strongly calcareous, passage below by interbedding.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 12 JULY 1981SHEET NO. 21 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.32		SANDSTONE - light/medium grey, very fine grained, top 60% frequently interlaminated by silts, remainder clean, strongly calcareous throughout, erosional at base.	
		0.14		SILTSTONE - medium grey, highly argillaceous, vague lamination, strongly calcareous, erosional.	
		0.44		MUDSTONE - dark grey, homogenously silty with lamination increasing downward, strongly calcareous, interbedded at base.	
5-6 ⁰		0.53		SILTSTONE/MUDSTONE - medium/dark grey, predominantly very fine-grained silts intricately interlaminated with muds, lamination generally accentuated by slight slumping and compaction, calcareous, gradual at base.	
		0.25		MUDSTONE - medium grey, slightly silty, few silty laminae, erosional below.	
		0.57		SANDSTONE - light/medium grey, fine to very fine grained, top half with abundant carbonaceous (particulate) matter along laminae, lower half sparsely so, strongly calcareous throughout, gradual at base.	
8-10 ⁰		0.61		SILTSTONE/MUDSTONE - medium/dark grey, medium to coarse grained, well-laminated silts, interlaminated and bedded with silty mudstone, much erosional contacts, large? pelecypod sand filled burrow in muddy band, silts predominant in top 2/3 sequence, remainder mostly muddy, calcareous throughout, gradual.	0.02 DD154.53 0.59
		0.84		MUDSTONE - mostly dark grey/black, sporadically silty and slightly ferruginous, middle 16cm with abundant tiny lenses and ripples of very fine sands (patchily calcareous section), basal 0.15m very strongly calcareous and brownish grey, abrupt basal contact.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 12 JULY 1981SHEET NO. 22 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.07		COAL - dominantly dull lustrous, mostly small pieces, some hard muddy fragments.	GSC Top @ 156.01
		0.22		MUDSTONE - dark grey silty, slightly carbonaceous, lacking lamination, gradual, broken stick.	
		0.08		COAL - dull lustrous, top half hard, broken core.	
		0.08		MUDSTONE - dark grey, slightly ferruginous, carbonaceous, broken stick.	
		0.12		MUDSTONE - black, hard, carbonaceous, coal fragments, core fragmented and broken.	
		0.05		COAL - large piece, dull lustrous, abrupt below.	GSC Top @ 156.6
		0.07		MUDSTONE - black, highly carbonaceous, coaly, boney coal, broken stick abrupt at base.	
		0.45		MUDSTONE - medium grey, very highly silty, abundant finely comminuted carbonized plant debris, some differentiated silty laminae, abrupt.	0.36 DD157.58 0.09
		1.22		SILTSTONE/SANDSTONE/MUDSTONE (40/35/25) - medium grey, broadly interbedded, sands very fine-grained, silty, lacking lamination, silts argillaceous, lithologies blending imperceptibly, gradual base.	
		1.46		MUDSTONE - medium grey, homogenously silty, sparse, carbonized plant debris, silty content progressively bottomward, slightly ferruginous, very gradual at base.	
		0.35		SILTSTONE - top 1/3 medium grey highly argillaceous, remainder sporadically argillaceous, and vaguely laminated, very gradual base.	0.22 DD 160.63 0.13

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 13 JULY 1981 SHEET NO. 23 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
10 ⁰		3.53		SANDSTONE - light grey, top 8cm very fine grained, argillaceous/silty, ripples and laminated, remainder fine/medium grained, generally well-washed and sorted, vaguely cross-bedded, very slightly calcareous, abrupt below.	2.83 DD163.67 0.70
8-10 ⁰		1.84		SILTSTONE/MUSTONE - medium/dark grey, broadly interbedded argillaceous siltstone and silty mudstone - mutual boundaries by transitional 18cm very fine grained sandstone in basal 1/3 sequence, sparse lamination and burrows, non-calcareous, gradual.	
		0.02		MUDSTONE - black, abundant carbonaceous plant debris, hairline quartz veining, broken stick.	DD166.72
		0.13		COAL - mostly fragments, a mixture of dull and dull lustrous coal, clean light coal.	GSC Top @ 166.68
		0.38		MUDSTONE/SILTSTONE - top 15cm black, highly carbonaceous, grading below to silty mudstone and argillaceous siltstone - generally lacking lamination, very gradational at base.	
		0.24		SANDSTONE - medium grey, very fine grained, silty, structureless, slightly erosional at base.	
		0.45		SANDSTONE - light/medium grey, fine-grained, fairly clean, sorted, few burrows, generally lacking lamination, siliceous, erosional at base.	
9-11 ⁰		0.68		SANDSTONE - light/medium grey, very fine grained, small-scale cross-lamination and isolated ripples, very thin carbonaceous/silty laminae towards base, slightly calcareous, very transitional at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY DARREN TOMECEK DATE 4 JULY 1981 SHEET NO. 25 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				START AT BOX 59	
		0.49		SANDSTONE - medium grained, light grey, abundant mica flecks, massive, some coarse grains scattered throughout, some carbonaceous debris in basal 10cm, non-calcareous, stick.	0.49
		0.77		SANDSTONE - fine grained to gritty with some scattered conglomerate light grey, sands coarsen downwards from fine grained at top to conglomerate at bottom, top 7cm of unit contain abundant carbonaceous laminae, slightly crinkled orientated 53° to core axis, some lustrated, remainder of unit gritstone and coarse grained sandstone becoming conglomerate 10cm from base, conglomerate contains rounded pebbles of chert and quartz no larger than 1cm in diameter, poorly sorted, non-calcareous, stick.	0.77
		1.44		SANDSTONE - fine grained at top to conglomerate at base, light grey, abundant carbonaceous laminae 28cm from top making up a 15cm zone followed closely by a 10cm band of coarse grained sand with several well rounded pebbles, remainder of unit displays some cross-bedding with some coarse grained sandstone, 30cm from base of unit pebble conglomerate occurs with rounded pebbles of chert and quartz with largest pebble being 2cm in diameter for an average size of 0.5cm in diameter, poorly sorted, non-calcareous, stick.	0.76 DD175.8 0.68
		0.50		SANDSTONE - fine grained to coarse grained conglomerate light grey, fine grained at top 12cm passing abruptly to coarse grained conglomerate for 18cm and abruptly returning to medium grey massive sandstone with basal 4cm becoming conglomerate again, poorly sorted, non-calcareous, basal contact abrupt, stick.	0.50
		0.80		SANDSTONE - fine to coarse grained, light grey, scattered very thin carbonaceous laminae sporadic occurrence of pebbles, quite small, overall coarsening downwards sequence, non-calcareous, stick.	0.80

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY DARREN TOMECEKDATE 4 JULY 1981SHEET NO. 26 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
30		1.06		SANDSTONE - fine grained to coarse grained at base, light grey, predominantly fine grained with a coarsening downwards sequence 25cm from base, scattered flecks of mica throughout upper sequence, basal 2cm hold an angular clast of silty mudstone (1cm in length) in the hosting gritstone, basal contact appears erosionally abrupt with underlying sandstone, non-calcareous, stick.	1.01 DD178.9 0.05
		0.79		SANDSTONE - medium to coarse grained, light grey coarsening downwards, 47cm from top of unit is a singular quartzite pebble well rounded and longer than its diameter of 1.5cm, lower in the unit are carbonaceous, coaly pebbles well rounded, also abundant mica flecks, non-calcareous sands with an erosionally abrupt basal contact, stick.	0.79
50		2.23		SANDSTONE - fine grained, light grey, laminated sands with parallel and cross-laminations some rippling, abundant very thin carbonaceous laminae in basal 10cm, immediately above base are several pebbles of smokey grey chert and white quartzite, these pebbles average 2cm in diameter and are hosted in a fine grained sandstone matrix, basal contact abrupt, stick.	2.15 DD181.9 0.08
		0.27		SANDSTONE - medium grained, light grey, appears massive with abundant mica flecks, non-calcareous, basal contact appears to be abrupt but adjoining stick ground, possible core loss at end of unit.	0.27
		0.65		SILTSTONE - medium grey, abundant mica flecks, scattered carbonaceous and coaly fragmented plant debris, some sand units laminated and slumped within the siltstone, non-calcareous, basal contact abrupt and possible missing as it appears to be underlying coal looks to be ground.	0.65
		0.03		COAL - dull, lustrous, needle coal, brittle, stick.	
		0.02		COAL - bright, stick, adjoining core ground probable core loss in coal.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY DARREN TOMECEK DATE 5 JULY 1981 SHEET NO. 27 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.81		SILTSTONE - medium to dark grey, becoming very muddy in locations, contains abundant carbonaceous material with some thin bright laminae	0.94 DD185.01
				45cm from top, some of the silty muds associated with the lower half of the unit containing several observable mats of orientated needles, several zones display listrication and highly polished surfaces, non calcareous, core is badly broken and ground in upper 70cm, basal contact with underlying coal also appears to be missing, probable core loss.	0.87
		0.02		COAL - dull, lustrous, stick.	
		0.03		COAL - dull, lustrous, stick.	
		0.03		COAL - dull, lustrous, badly broken.	
		0.02		COAL - dull lustrous.	
		0.01		MUDSTONE - cannaloid, stick.	
130		1.82		SANDSTONE - light to medium grey, very fine to fine grained, top of core ground, silty in upper 15cm with scattered carbonaceous, fragmented plant debris throughout upper 35cm, sands are inter-laminated with carbonaceous, coaly material, crossbedded and some minor slumping, 1.28m from top of unit is a 2cm calcite vein orientated 77° to core axis or parallel to bedding, scattered abundant mica flecks throughout unit, core is stick.	1.82 DD188.06
		1.21		SANDSTONE/SILTSTONE (50/50) - light to medium grey, sands fine grained light grey, silts medium grey, interbedded, some rippled features, slumped with some slumping in unit ending in displaced clasts of silts in sand, scattered abundant carbonaceous, fragmented plant material, scattered small mica flecks, non-calcareous, broken stick, core ground in places, basal contact appears abrupt with underlying silts.	1.21 DD189.89

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY: DARREN TOMECEK

DATE 6/9 JULY 1981

SHEET NO. 28 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.67		SILTSTONE - medium to dark grey, abundant mica flecks scattered carbonaceous fragmented plant material with a greater concentration 15cm from top of unit, core is badly broken and squeezed probable loss in this unit.	0.67
		3.43		SILTSTONE/SANDSTONE (65/35) - sandstone very fine grained, light grey, silts are light to dark grey in colour, thinly laminated in upper section abundant crossbedding, some slumping, scattered carbonaceous and coaly laminae, some rippling, some large scattered burrows in the thinly bedded lower section, located one small fossil unidentifiable, non-calcareous, erosional sharp basal contact, upper 50cm of unit badly broken, remainder stick.	2.25 DD193.25 1.18
		0.33		MUDSTONE - medium to dark grey, silty, abundantly scattered fragmented carbonaceous material throughout unit some coaly, basal contact erosional abrupt, non-calcareous stick.	0.33
		1.66		SILTSTONE - light grey to medium grey, thinly interbedded silts and sandy silts, slumped, abundantly burrowed, scattered fragmented carbonaceous matter, sporadic mica flecks becoming transitionally more sandy towards base with basal 60cm strongly calcareous, remainder of unit non-calcareous, stick.	1.62 DD196.60 0.04
14 ⁰		0.64		SANDSTONE - fine grained, light grey, interlaminated sands with scattered fragmented carbonaceous plant material, large scattered mica flecks, some slumping in basal 10cm of unit, non-calcareous, gradational basal contact, stick.	0.64
		8.95		SANDSTONE - medium to coarse grained, light grey, salt and pepper 77cm from top of unit are several clasts of silts and ferruginous muds with the largest being 5cm in diameter and occur locally over a 10cm zone - remainder of unit a series of large scale medium angle crossbedded sands with a 1.80m zone 2.36m from top of unit being badly broken and rotationally twisted and ground, scattered mica flecks small, basal 2m	2.36-stick DD199.65 1.80Broken 1.11-stick DD202.69 2.87-stick

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY DARREN TOMECEKDATE 9 JULY 1981SHEET NO. 29 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				of unit contains scattered carbonaceous fragmented plant material with abundance increasing with depth, basal contact erosionally abrupt with some scouring, non-calcareous, stick to badly broken.	DD205.74 0.81Broken stick
		1.05		SILTSTONE - medium to dark grey, interlaminated silts and carbonaceous material, rippled, non-calcareous, possibly some burrowing, basal contact would appear to be abrupt, but underlying coal is broken and this may be a false contact.	1.05
		0.08		COAL - dull lustrous, stick.	0.08
		0.04		COAL - bright, stick.	0.04
		0.03		COAL - dull, lustrous, stick, core ground at base.	0.03
		0.60		MUDSTONE - dark grey to black, abundant fragmented carbonaceous and coaly material scattered throughout, occasional coal spar, listricated surfaces near base of unit, non-calcareous, basal contact probably missing as end of mudstone stick is ground.	0.60
		0.11		COAL dull lustrous, small badly broken fragments.	0.11
		0.05		MUDSTONE - dark grey to black highly carbonaceous, some minor bright coal laminations.	0.05 DD208.7
		3.01		SILTSTONE/SANDSTONE (70/30) - medium grey silts and light grey very fine grained sandstone, thinly bedded, highly burrowed and bioturbated throughout this unit, no invertebrate burrows in this unit, basal contact erosionally scoured and sharp, non-calcareous, stick.	3.01

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY W. P. LEEDATE 4 JULY 1981SHEET NO. 30 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				STARTING BOX 72	
		0.43m		SANDSTONE - light-medium grey, fine-very fine grained, thinly bedded with light fine grained laminae interbedded with medium grey very fine grained laminae, worm burrows, minor ripple drifted, minor mica flecks, upper contact abrupt and erosional, lower contact gradual, unit fining downwards, non-calcareous, becoming massive at base, broken core.	0.05m DD211.84 0.38m
		0.28m		SILTSTONE - medium grey, massive with scattered dark grey muddy clasts (max. 5cm dia.), gradational contacts, becoming sandy towards base, broken core, non-calcareous, scattered mica flecks, tr. coal spars - very small.	
		1.17m		SANDSTONE - light grey, very fine-fine grained, massive, minor bioturbation in top 12cm with small slumping at base, gradational contacts, core broken and fractured, slightly calcareous at top - remainder strongly calcareous, scattered mica flecks, 4cm long worm burrow at base.	
		0.59m		SANDSTONE - light grey, fine grained, thinly bedded, upper 1/2 of unit abundant slumping with minor worm burrows, lower 1/2 regular thin bedding with worm burrows throughout, gradual contacts, minor calcite lined listricated surfaces, scattered mica flecks, broken stick, calcareous.	0.35m DD214.27 0.24m
		0.47		SANDSTONE - medium grey, very fine-fine grained, bioturbated, complete deformation of bedding throughout, worm burrows, slumping, upper contact gradual, lower contact abrupt, core broken stick, listricated at base tr. carby plant fragments, slightly calcareous.	
		0.16m		SILTSTONE/MUDSTONE - medium grey, massive, minor coal spars - very thin, abundant listricated surfaces, top of unit - core ground, remainder broken, gradational contacts, scattered carby plant fragments non-calcareous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY W. P. LEE DATE 4 JULY 1981 SHEET NO. 31 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.94m		SANDSTONE - medium grey, very fine-fine grained, scattered carby plant fragments throughout, thinly banded based on grain size differential as well as the finer bands are slightly darker, tr thin coal spars, perpendicular to bedding, 46cm up from base is 17cm displaced slumped unit, gradational contacts, broken stick, minor mica flecks, non-calcareous.	
		2.84m		SANDSTONE - light-medium grey, fine-medium grain, thinly banded (light/grey-medium/finegrained), abundant worm burrows, (burrows up to 1cm wide and 6cm long), minor ripple bedding, upper contact gradational, lower contact sharp erosional, sharp very fine grain darker clasts scattered throughout, minor small scale low angle crossbedding, invertebrae impressions - minor, broken stick, broken core.	0.69m DD217.02 2.15m
		0.60m		SILTSTONE -medium grey, homogeneous, becoming sandy towards base, gradual basal contact, minor thin very fine grain light sandstone laminae, minor small mica flecks, carby plant debris near and at base, non-calcareous, broken core.	
		0.68		SANDSTONE - light to medium grey, very fine to fine grain, thinly banded, tr small worm burrows, tr. thin coal spars, core listricated and ground in places, basal contact listricated, abundant carby debris near and at base, scattered small mica flecks.	
		0.03m		MUDSTONE - dark grey/black listricated, very carbonaceous, broken.	
		0.02m		COAL - dull lustrous, dirty, crumbled.	BP81/16/2/1
		0.05m		COAL - dull lustrous, listricated fracture in centre @ 42°, stick.	
		0.05m		COAL - dull banded, lustrous stick.	
		0.10m		COAL - dull, lustrous, stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY W. P. LEEDATE 6 JULY 1981SHEET NO. 32 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.05m		COAL - dull, banded, stick	
		0.03m		COAL - bright, friable, stick.	
		0.02m		COAL - dull, lustrous, lustricated; stick.	
		0.04m		COAL - dull, abundant agale material (needles), stick.	
		0.05m		COAL - dull, lustrous, minor agale material (needle), stick.	
		0.01m		COAL - bright stick.	
		0.07m		COAL - bright banded, broken.	
		0.08m		COAL - dull, sub-lustrous, crumbled	BP81/16/2/1
		0.06m		SANDSTONE - dark grey, very fine to fine grained, massive, abundant very thin coal spars, upper and lower contacts lustricated, abundant carby plant debris, non-calcareous stick core.	
		0.03m		COAL - dull, dirty, hard, crumbled.	
		0.73m		SANDSTONE - light to medium grey, fine grained, bioturbated, burrows up to 1cm thick and 1cm long, scattered coal spars, bedding distorted, upper contact lustricated, lower contact gradual, stick core, tr. very fine mica flecks, tr. carby plant fragments, non-calcareous.	0.33m DD221.28 0.40
17-20 ^u		2.70m		SANDSTONE - light grey, fine to medium grained, thin bedded, abundant small scale low angle crossbedding, minor small scale slumping, gradual contacts, tr. large invertebrae impressions (up to 6.5cm long), scattered massive sandstone bands (20cm), minor very fine mica flecks scattered bands of carby plant fragments, broken stick, non-calcareous.	2.70m DD224.33

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY CHOWDRY

DATE 14 JULY 1981

SHEET NO. 34 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
8-10 ⁰		0.19		SANDSTONE/SILTSTONE (75/25) - rapidly interlaminated sequence of dark grey argillaceous finely laminated siltstone and light grey, very fine grained sandstone, basal 6cm essentially clean sand; isolated burrows in the upper half; sand/silt boundaries being invariably abrupt to erosional, erosional and broken contact with coal below.	
		0.02		COAL - dull, lustrous, easily breakable, broken stick	BP81/16/3/1
		0.01		MUDSTONE - rusty grey, very hard, very carbonaceous (homogenously), attached to coal above.	
		0.10		COAL - small pieces and fragmented core; dull lustrous and bright coal some peacock variety; all clean and readily breakable.	
		0.03		COAL - dull lustrous, soft, some needle-like, fragmented core.	
		0.25		COAL - dull lustrous and bright banded, small fragments, peacock coal, suggestion of needle like fabrics, abrupt below.	
		0.38		SILTSTONE - medium grey, top 9cm very argillaceous/carbonaceous, remainder clean and with frequent fine grained sandstone laminae downward, siliceous, interbedded below.	
		0.40		SANDSTONE/SILTSTONE - light to medium grey, very fine grained sands (60%) rapidly interlaminated with dark grey argillaceous and carbonaceous (finely macerated carbonaceous matter along some laminae) siltstone, siliceous, interbedded at base.	
9-11 ⁰		2.61		SANDSTONE - light to medium grey, very fine grained, low angle cross-lamination throughout, abundant dark grey siltstone bands, invariable with abrupt to scoured contacts with sands, much invertebrate burrowing (funneling of silty/muddy laminae into sandstone intervals), silty/muddy laminae becoming thinner but more numerous downwards. Most of sands have clean shelf aspect, slightly calcareous, interbedded below.	0.87 DD233.78 1.74

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 14 JULY 1981SHEET NO. 35 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
6-8 ⁰		1.50		SILTSTONE/MUDSTONE/SANDSTONE (60/30/10) - rapidly interlaminated sequence of dark grey silts and muds and light to medium grey very fine grained essentially rippled (tiny) sandstone, much microerosional features, tiny "pin-prick" burrows, some larger burrows, marine to nearshore aspect. Muddy content increases downward, bottom 16cm black with abundant finely macerated carbonaceous matter. Top half slightly calcareous (essentially along sandy laminae), remainder non-calcareous, contact with coal below listricated.	1.22 DD236.83 0.28
		0.05		COAL - dominantly bright, all fragments.	G.S.C. TOP 237.09
		2.86		SILTSTONE/MUDSTONE (80/20) - uniformly medium grey, siltstone generally very argillaceous, top 14cm very carbonaceous, followed by 30cm rootlet bearing argillaceous silts, elsewhere also sporadically disturbed by rootlets, generally lacking lamination, siliceous, abrupt base.	2.47 DD239.88 0.39
		0.28		SANDSTONE - light to medium grey, fine-grained, ubiquitously slumped and distorted laminae, suggestion slumped silty laminae, few isolated burrows, slightly calcareous, abrupt base.	
		0.29		SILTSTONE - uniformly medium grey, top half abundantly argillaceous, remainder with sporadic and tiny sandy lenses and ripples, some burrowing in lower half, slightly calcareous, passage below by interbedding.	
7-8 ⁰		3.29		SANDSTONE/SILTSTONE (75/25) - Top 1.43m sequence rapidly interbedded medium grey siltstone and very fine grained light to medium grey silty sandstone, laminated and rippled throughout with local slumping and distortion of laminae due to compaction; abundant erosional bed boundaries, remainder of sequence fine grained laminated and rippled sands with widely dispersed but substantial silty/muddy layers, locally burrowed throughout, calcareous throughout, erosional with coal below.	1.99 DD242.92 1.30

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 14 JULY 1981 SHEET NO. 36 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.12		COAL - dominantly dull lustrous, broken stick.	G.S.C. Top 244.27
		0.14		MUDSTONE - black, very carbonaceous, lustrated, imperceptible passage below.	
		1.08		SILTSTONE - uniformly medium grey, very argillaceous, generally devoid of lamination, siliceous, very gradual toward base.	
		0.29		SILTSTONE/SANDSTONE - medium grey, top half dominantly silty, remainder siltstone/sandstone (very fine grained) distorted laminae due to slumping, siliceous, interbedded below.	0.26 DD245.97 0.03
8-10 ⁰		1.36		SANDSTONE - light to medium grey, dominantly fine-grained, much silty laminae where concentration of finely particulate carbonaceous exists, much cross-lamination, one deep invertebrae burrow, calcareous throughout, interbedded below.	
		1.05		SANDSTONE/SILTSTONE - medium grey, about equal proportion of sandy/ silty sequence top half of which is dominantly sandy (very fine grained) with silty interbeds, remainder dominantly silty with subordinate argillaceous and rippled sandstone, overall generally fining sequence downward; calcareous at top and progressively less-to non-clacareous at base, very gradual.	
		0.52		MUDSTONE/SILTSTONE - predominantly muddy unit with frequent but very thin silty laminae and ripples - they gradually diminish downward and mudstone becomes distinctly dense and canneloid.	
		0.04		COAL - dominantly dull lustrous, broken stick.	DD249.02
		0.03		COAL - mostly dull with some muddy lithology, all small pieces.	
		0.14		MUDSTONE - dark grey to black, carbonaceous, abrupt.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 15 JULY 1981SHEET NO. 37 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.64		SANDSTONE/SILTSTONE - uniformly medium grey, dominance of silts, sequence thoroughly bioturbated and sand/silt component intimately mixed, few remnants of lamination, sands very fine grained siliceous, gradual transition to laminated sandstone below.	
8 ⁰		0.87		SANDSTONE - light grey, fine grained, generally clean and sorted in a given interval, cross-laminated and some thin silty/very fine grained sandy laminae, very slightly calcareous, abrupt base.	
		0.26		SANDSTONE - light grey, very fine grained, clean cross-laminated, calcareous, top 8cm dark grey siltstone, abrupt at base.	
		1.57		SANDSTONE - light grey, medium grained, very clean, well-sorted, vaguely discernible cross-bedding, some silty laminae in basal 0.18m, very slightly calcareous, abrupt at base.	0.82 DD252.07 0.75
		0.67		SILTSTONE/SANDSTONE (85/15) - medium to dark grey, silts mainly argillaceous and lacking lamination due to bioturbation; widely dispersed very fine grained sands imperceptibly passing to silts, well-defined wavy lamination in basal 8cm, siliceous, interbedded below.	
8-9 ⁰		1.37		SANDSTONE - light grey, fine to medium grained, mostly clean and well-sorted, cross-bedded, slightly calcareous; basal 0.27m black, highly carbonaceous (homogenously admixed due to slumping) and silty; interbedded below.	
		0.45		SILTSTONE/SANDSTONE/MUDSTONE (60/30/10) - silts and muds dark grey and rapidly interlaminated with very fine grained laminated and rippled sandstone; locally somewhat graded laminae, much slumping in top half, some compaction dislocation in lower half, finely particulate carbonaceous matter plus carbonized leaves, abrupt.	0.15 DD255.12 0.30

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY CHOWDRY

DATE 15 JULY 1981

SHEET NO. 38 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.31		MUDSTONE - dark grey/black, much carbonized plant fragments and leaf impressions, silty downward.	
5-7 ⁰		0.50		SILTSTONE/MUDSTONE/SANDSTONE (40/40/20) - rapidly interlaminated lithologies; silts and muds dark grey, sands very fine grained essentially lenticles and ripples, microerosional contacts, isolated burrows (some "pin-pricks"), dominantly muddy downward	
		0.16		MUDSTONE - dark grey, sporadic silty laminae, slightly carbonaceous at base, lustric at base.	
		0.05		COAL - top 2cm band muddy coal, remainder dull lustrous coal, broken core, grind marks on basal part of coal piece.	
		0.26		MUDSTONE - dark grey to black, top 1/3 highly carbonaceous, slightly silty downward, broken core.	
5 ⁰		0.97		SANDSTONE/SILTSTONE (70/30) - medium grey, sands very fine grained, slightly silty and sparsely laminated (mostly parallel wavy lamination), broadly interbedded with argillaceous siltstone, locally abundantly burrowed, strongly calcareous throughout, gradual at base.	
		0.40		MUDSTONE - dark grey, abundant carbonized plant debris, homogenously silty, lacking lamination, strongly calcareous, very gradual at base.	0.37 DD258.1 0.03
		0.72		SILTSTONE - medium grey, argillaceous, top 0.3m mostly structureless, remainder with abundant parallel to ripple lamination but much of it partially disturbed by slumping and/or bioturbation; very fine sands frequently interlaminated, calcareous, interbedding at base.	
6-8 ⁰		0.54		SILTSTONE/SANDSTONE (55/45) - light to medium grey, rapidly interlaminated very fine sands and silts, small-scale cross-lamination and rippling, minor slumping, fairly gradational interchange of lithologic boundaries, isolated burrows, strongly calcareous, gradual at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY DARREN TOMECEK DATE 4 JULY 1981 SHEET NO. 39 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.54		SILTSTONE - medium to dark grey, locally very argillaceous, remnants of very fine laminae discernible (possible bioturbation), very muddy basal 15cm, slightly calcareous, burrowed at base.	
		0.65		SANDSTONE/SILTSTONE (60/40) - medium grey, ubiquitously slumped, regularly interlaminated, much burrowing and bioturbation especially in basal 0.35m (some invertebrate burrows) calcareous throughout, interlaminated at base.	
		0.47		SILTSTONE - medium to dark grey, very argillaceous, relics of lamination within an otherwise bioturbated fabric, very slightly calcareous to siliceous, burrowed at base.	
		0.72		SILTSTONE/SANDSTONE (85/15) - medium to dark grey, thoroughly burrowed and bioturbated silts and very fine sands now in intimation association, siliceous, abrupt at base.	0.08 DD261.2 0.64
7-8 ⁰		2.51		SANDSTONE - light grey, dominantly fine grained, (16cm fine to medium grained within top 1m) generally well-washed, sorted, cross-bedded throughout, 14cm zone (0.66m from base) has abundant coal spars, basal 5cm with dark grey mudstone laminae, slightly calcareous; interbedded base.	2.27 DD264.26 0.24
8 ⁰		0.91		SANDSTONE/SILTSTONE (70/30) - light grey, very fine grained laminated sandstone, interlaminated with dark grey, argillaceous silts, sharp silty/sandy boundaries, much finely particulate carbonaceous matter, few isolated burrows at top, basal 0.12m dominantly muddy; listricated at base.	
		0.22		COAL - broken into small pieces and mostly pulverized; apparently bright coal.	G.S.C. TOP 265.42

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 15 JULY 1981 SHEET NO. 40 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO.
		MEASURED	APPARENT		
		1.55		MUDSTONE - dark grey to black, top 12cm highly carbonaceous, remainder slightly silty but locally highly silty (no laminations), ferruginous zone near base, broken contact.	
		0.07		COAL - mostly fragmented into small pieces, appears dull, lustrous coal, abrupt base.	DD267.31
		0.12		MUDSTONE - black, hard, coaly mudstone, listricated surfaces, very gradual base.	G.S.C. TOP 267.31
		0.48		SILTSTONE - medium to dark grey, very highly argillaceous, vague laminations, siliceous, gradual	
		0.05		COAL - top 2cm coaly mudstone/coal, remainder dull and bright coal, heavily cleated, abrupt base.	
		0.09		SANDSTONE - medium to dark grey, very fine grained, frequently laminated with abundant silts and muds (some finely carbonaceous) listricated.	
		0.03		COAL - large piece 1/2 sublustrous, remainder lustrous coal, listricated at base.	
6-8 ⁰		0.75		SANDSTONE/SILTSTONE (80/20) medium grey, very fine-grained silty sands, interlaminated and bedded with argillaceous well-laminated silts, isolated burrowing, slightly calcareous, erosional at base.	
		0.06		MUDSTONE - black, slightly carbonaceous.	
		0.01		COAL - one piece, dull hard coal.	
		0.15		SILTSTONE - medium to dark grey, very argillaceous, siliceous, devoid of lamination, very gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 15 JULY 1981SHEET NO. 41 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.43		SANDSTONE - light to medium grey to brownish grey, very fine grained, top 0.11m and basal 0.12m thoroughly bioturbated, middle section partially bioturbated and exhibits cross-lamination and rippling, strongly calcareous throughout, gradual.	
8-90		1.84		SILTSTONE/MUDSTONE (70/30) - medium to dark grey, broadly interbedded argillaceous siltstone and silty mudstone imperceptibly blending into each other, generally lacking lamination (only 16cm laminated zone towards base), basal 0.12m very highly carbonaceous, top 0.45 slightly ferruginous and sparingly calcareous, broken contact with coal below.	0.47 DD270.36 1.37
		0.11		COAL - dull lustrous, light clean coal, broken stick.	G.S.C. TOP 271.74
		0.10		MUDSTONE - dark grey to black, very carbonaceous at top, very silty downward; gradual at base.	
		0.20		SILTSTONE/SANDSTONE (65/35) - medium grey, sands very fine grained, finely laminated, silty, calcareous, occupying middle section, silts argillaceous, slightly calcareous, gradual at base.	
		0.32		MUDSTONE/SILTSTONE - dark grey, dominantly muddy, carbonized plant fragments, hairline calcite veins, strongly calcareous, very gradual at base.	
		0.55		MUDSTONE - dark grey, abundant carbonaceous plant debris, highly silty, occasional vague lamination, slightly ferruginous, gradual base.	
80		0.89		SILTSTONE/SANDSTONE (70/30) - medium brownish grey, very fine grained, silty laminated and rippled sands (essentially confined to upper half of unit) silts becoming progressively more argillaceous and less calcareous downward, very transitional base.	0.07 DD273.40 0.82

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16 LOGGED BY CHOWDRY DATE 16 JULY 1981 SHEET NO. 42 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO.
		MEASURED	APPARENT		
		1.13		MUDSTONE - dark grey to black, ubiquitous carbonaceous plant debris, locally highly silty and sporadic vaguely discernible silty laminae; basal 0.35 black and very carbonaceous, gradual base.	
		0.34		MUDSTONE - black, very hard, carbonaceous and locally coaly mudstone entire interval broken and with listric surfaces, very transitional downward.	
		3.83		SILTSTONE - uniformly medium grey, top 0.25m coarse grained silts with some distorted laminae, remainder of homogenous appearance with sparsely dispersed finely divided carbonaceous debris, locally very argillaceous, slightly calcareous throughout, unit characterized by general lack of lamination, transitional at base.	0.25 DD276.45 3.00 DD279.50 0.58
		0.57		SANDSTONE - light to medium grey, very fine grained, frequently interlaminated with silts, entire unit exhibits ripple/wavy lamination but locally obliterated due to bioturbation, calcareous throughout.	
		0.42		MUDSTONE - medium to dark grey, carbonaceous in top 0.15m, rest sporadically ferruginous with increasing silty content downward, very gradational contact at base.	
		0.37		SILTSTONE - top half brownish grey, broadly laminated, strongly calcareous, remainder highly argillaceous, calcareous, becoming darker towards base.	
		0.39		MUDSTONE - dark grey to black, carbonaceous lower half, lacking lamination, gradual change at base.	
					0.41
6°		1.17		SANDSTONE - light to medium grey, very fine grained, frequent thin silty laminae throughout, ubiquitously rippling, wavy lamination, top 0.2m riddled with burrows, calcareous throughout, gradual base.	DD282.55 0.76

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16LOGGED BY CHOWDRYDATE 16 JULY 1981SHEET NO. 43 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
5-6 ⁰		0.44		SILTSTONE - medium grey, few sandy laminae within top 0.27m, substantial sandy content in basal 0.18m but here unit with slumped laminae; siliceous throughout, abrupt at base.	
		0.22		SANDSTONE - light to medium grey, very fine grained much silty laminae in lower half, abundantly bioturbated, chaotic lamination, slightly calcareous at top, remainder siliceous, gradual.	
		0.11		SILTSTONE - medium grey, vague remnants of lamination, otherwise bioturbated, gradual base.	
6-8 ⁰		0.58		SANDSTONE - light grey, top 0.23m very fine grained, with small-scale cross-lamination and ripples, sporadic burrows, remainder fine grained clean, well-washed, sorted and vaguely cross-bedded, calcareous throughout, abrupt base.	
		0.85		SANDSTONE - light to medium grey, top 0.4m with substantial silty laminae and layers and very fine grained, occasional burrows and some slumping, remainder fine grained but with lesser amount of silty content. Basal 0.16m is clean sandstone, fine grained with abundant silty, elongate intraclasts "floating" in it - this clearly is a deep (16cm) channel, as evidenced by the juxtaposition of sandstone and siltstone lithologies along the core axis, and highly indented contact. The lamination in basal sediments of channel are nearly flat lying and have discordant relationships with the 'host' sediments. A few calcite filled fractures, strongly calcareous throughout.	0.60 DD285.6 0.25
6-7 ⁰		0.36		SILTSTONE/MUDSTONE - top half medium grey, highly argillaceous siltstone with occasional lamination, remainder dark grey silty mudstone, gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY

CHOWDRYDATE 16 JULY 1981

SHEET NO.

44 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.71		SILTSTONE - medium grey, slightly argillaceous, sequence generally laminated but these periodically obliterated due to bioturbation, local slumping, strongly calcareous (basal 0.25m only slightly so), gradual.	
8-9 ⁰		1.47		SANDSTONE - light to medium grey, very fine grained, ubiquitous small scale cross-lamination, some local micro slumping and bioturbation, frequent thin silty laminae and few layers, few brittle fractures strongly calcareous throughout, gradual base.	
8 ⁰		2.15		SANDSTONE - light grey, fine to medium grained, top 0.9m with variable grain size (between fine and medium) with numerous dark grey silty laminae (appear to 'float') abundant tiny silty clasts, vaguely cross-bedded, remainder uniformly fine to medium grained, vaguely discernible cross-bedding, basal 0.20m with silty intraclasts, upper half calcareous, remainder slightly so, abrupt.	0.19 DD288.64 1.96
		0.05		COAL - mostly as small fragments, dull lustrous, abrupt.	G.S.C.TOP 291.02
		0.19		MUDSTONE - top half black, highly carbonaceous, remainder dark grey, slightly ferruginous, calcareous, highly silty with vaguely discernible lamination, very gradual transitional at base.	
		0.36		SILTSTONE/SANDSTONE (70/30) - medium grey, middle section essentially very fine grained silty, laminated sandstone, followed on either side by highly argillaceous siltstone, strongly calcareous throughout, becoming steadily more muddy downward.	
		0.73		MUDSTONE - top 0.10m highly silty and ferruginous, remainder very carbonaceous and abundant carbonized plant leaves, gradual at base.	0.10 DD291.69 0.63
		0.71		SILTSTONE - medium grey, top 8cm very argillaceous, remainder locally slumped as well as bioturbated, some very fine-grained sands within the central slumped segment, strongly calcareous, slightly ferruginous in basal 15cm, gradual base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY

CHOWDRYDATE 16 JULY 1981

SHEET NO.

45 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.10		MUDSTONE - dark grey, very silty, vague lamination strongly calcareous, gradual base.	
		0.30		MUDSTONE/SANDSTONE/SILTSTONE (40/30/30) - basal 10cm dominantly very fine grained laminated sands with thin silty laminae, remainder frequently interlaminated silts and muds with tiny sandy ripples and lenses, sporadic burrows, strongly calcareous, erosional base.	
		0.32		MUDSTONE - top half medium grey with abundant silty ripples and calcareous, remainder dark grey less silty and slightly calcareous, broken contact.	
		0.15		COAL - dominantly dull lustrous coal, some bright, broken core plus large stick.	G.S.C. TOP 293.70
		1.38		SILTSTONE/MUDSTONE - top 0.75m dark grey, fine grained and highly argillaceous siltstone totally lacking lamination; remainder black sparingly silty (homogeneously) abundant carbonized plant debris and leaves, basal 0.12m dark grey siltstone, entire unit non-calcareous, slightly erosional at base.	0.55 DD294.74 0.83
8-9 ⁰		0.86		SANDSTONE/SILTSTONE (60/40) - medium grey, very fine grained sands and silts, extremely rapidly interlaminated (on scale of mm) microerosional contacts, much slumping and tiny intraclasts in basal 0.25m burrowing, top 0.51m non-calcareous, remainder slightly calcareous, passage below by interbedding.	
		0.67		SILTSTONE - dark grey, highly argillaceous, frequent very fine grained sand laminae, and ripples especially in basal 0.23m (this interval strongly slumped), gradual diminution of silty content downward.	
5 ⁰		0.37		MUDSTONE - dark grey to black, carbonaceous, devoid of sedimentary laminations, listricated at base.	0.18 DD297.48 0.19

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-16

LOGGED BY

CHOWDRYDATE 16 JULY 1981SHEET NO. 46 OF 47

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.04		COAL - small pieces and fragmented, dull lustrous coal.	G.S.C. TOP 297.66
		0.13		MUDSTONE - black, hard, slightly carbonaceous and ferruginous, imperceptible below.	
6-7 ⁰		0.52		SILTSTONE/SANDSTONE (75/25) - medium grey broadly laminated silts, interbedded with very fine grained sands (essentially restricted to top half), silts increasingly argillaceous in basal 0.15m, calcareous throughout, slightly erosional at base.	
		1.99		MUDSTONE - medium/dark grey, locally very highly silty, sporadically ferruginous, non-calcareous throughout, devoid of laminations, sparsely carbonized plant remains, fragmented base.	DD300.84
		0.15		COAL - highly pulverized and small pieces, type indeterminate, abrupt base.	G.S.C.TOP 300.84
		0.23		MUDSTONE - black, hard, highly carbonaceous, grind marks on one piece, abrupt below.	
		0.54		SILTSTONE/MUDSTONE - dark grey, dominantly silty, muddy content evenly dispersed, occasional vague lamination, gradual base.	
		0.64		SILTSTONE - medium grey, slightly argillaceous, mostly lacking lamination, finely broken carbonaceous matter evenly dispersed, abrupt at base.	
5-7 ⁰		2.58		SILTSTONE/SANDSTONE (60/40) - sands very fine grained, light grey, frequently interlaminated and interbedded with medium grey siltstone, locally argillaceous and with uniformly dispersed finely broken carbonaceous debris, abundant slumping and burrowing (one tube 9cm deep and 1cm wide), calcareous, erosional.	1.46 DD308.88 1.12

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 19 JULY 1981 SHEET NO. 1 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0		CASING	DD 3.96
2-3 ⁰		2.12		SANDSTONE - light grey, core locally weathered rusty, top 0.37m fine-grained, cross-laminated, remainder fine/medium grained, well-sorted, clean, mostly cross-bedded, occasional thin isolated carbonaceous laminae, strongly calcareous throughout, abrupt below.	1.07m DD 5.18 1.05m
5 ⁰		0.60		MUDSTONE/SILTSTONE (60/40) - medium grey, top half dominantly silty with substantial argillaceous laminae, parallel lamination and isolated ripples of very fine grained sandstone, remainder silty mudstone, abundantly micromicaceous, locally burrowed. 4cm thick fine grained light grey sandstone with minor silty clast at 20cm from top, upper 25cm calcareous. Entire unit fragmented and broken core and weathered throughout. Abrupt at base.	DD 7.62
		0.15		COAL - mostly as 2-3cm (across) fragments, a mixture of dull lustrous and bright coal, some pieces of very hard bony coal-considerable core loss here.	
		0.44		SILTSTONE - ash grey to medium grey, argillaceous finely broken core and sparsely dispersed carbonized plant fragments, lacking lamination, basal 0.17m coarse grained and with sandy layers, and frequently burrowed; siliceous throughout, fragmented at base but appears abrupt.	
		0.43		SANDSTONE - top 17cm light grey, fine grained, fairly clean and sorted, remainder medium grey, dominantly very fine grained and silty, very slightly calcareous, core broken throughout.	
		0.36		MUDSTONE - medium grey, highly silty, (homogenously) very ferruginous, core loss indicated by few grind marks, appears gradual at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 19 JULY 1981 SHEET NO. 2 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.49		SANDSTONE/SILTSTONE (55/45) - medium grey, silts confined to upper segment of sequence and are distinctly muddy, remainder very fine grained, silty, laminated sandstonr, siliceous, isolated burrows, core broken and some grind marks abrupt below.	
		0.29		SILTSTONE/MUDSTONE - medium grey, about equal, interlaminated, core badly fragmented, core loss.	0.06 DD 11.28
5-6 ⁰		1.27		SILTSTONE - top 0.54m light/medium grey with frequent sandstone laminae and thin layers, abundantly burrowed and (some bioturbated); remainder medium grey very muddy with finely broken carbonaceous plant debris; siliceous throughout, core broken and fragmented, appears abrupt.	0.23
		2.79		SANDSTONE - light grey, fine/medium grained generally well-sorted and clean, two thin bands of very fine grained sandstone, few tiny coal spars and some silty intraclasts, vaguely cross-bedded, slightly calcareous, locally substantial amount of cherts, fragmented at base.	1.32 DD14.32 1.47
8-9 ⁰		1.05		SANDSTONE/SILTSTONE (60/40) - broadly interlayered and interlaminated very fine grained silty sands and argillaceous mudstone; much rippling and burrowing, siliceous, interbedded at base.	0.82m DD 16.76 0.23m
		0.59		SANDSTONE - light grey, fine/medium grained, fairly clean, 4cm thick very fine grained sandstone, cross-laminated, thin and sparse silty intraclasts, core broken, abrupt (but not erosional) base.	
		0.32		MUDSTONE - medium grey, very silty, (some thin silty laminae), basal 0.04m argillaceous siltstone, very gradational at base.	
8 ⁰		2.14		SANDSTONE - light grey, fine/medium grained, well sorted, clean, cross-bedded, basal 0.3m with abundant tiny silty intraclasts; top 0.50m calcareous, remainder slightly calcareous, abrupt base.	1.66 DD 19.81 0.48

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

CHOWDRY

DATE

19 JULY 1981

SHEET NO.

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COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
70		0.42		SILTSTONE - medium grey, highly argillaceous, fine ripples and lamination of very fine grained sands, core fragmented and locally weathered.	
		0.72		MUDSTONE - black/dark grey, slightly ferruginous locally, abundant plant fragments, carbonaceous, silty and 10cm differentiated band, patchily calcareous, grind marks, gradational.	
		0.29		SANDSTONE - medium grey/light grey, very fine grained, frequent silty laminae, siliceous, gradational at base, core broken.	
		0.57		MUDSTONE - dark grey/black, top 4cm siltstone, remainder highly carbonaceous and locally coaly mudstone, few dull lustrous coal fragments, entire unit badly fragmented into small pieces, core loss indicated.	0.17 DD 22.55 0.40
		1.55		MUDSTONE - dark grey/black, carbonaceous, silty lacking lamination, core broken and some fragmented.	
		1.67		SILTSTONE - uniformly medium grey, very fine grained, highly argillaceous, locally silty mudstone, basal 5cm with some vague lamination.	
50		3.86		SILTSTONE - medium grey, generally very fine-grained (60%) and highly argillaceous, locally coarse silts with thin layers and laminae of very fine grained sands (these have abundant burrows and strongly calcareous), remainder calcareous, basal 8cm silty mudstone, interbedded base.	2.16 DD 28.65 1.70
		1.08		SILTSTONE/SANDSTONE (85/15) - rapidly interlaminated medium grey argillaceous siltstone and very fine grained sandstone, mostly erosional boundaries, sporadic burrows, calcareous throughout, gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

CHOWDRY

DATE

20 JULY 1981

SHEET NO.

4 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.39		MUDSTONE - medium grey, highly silty, vague lamination, calcareous, gradual base.	0.20 DD 31.70 0.19
5 ⁰		1.25		SILTSTONE/MUDSTONE - medium grey, slight dominance of silts (mostly in top half), irregularly laminated and with few burrows, strongly calcareous, remainder highly silty mudstone with occasional faint lamination, calcareous only along silty content, fragmented at base.	
		0.10		COAL - predominantly dull lustrous, minor thin bright laminae, locally needle fabric discernible, core broken.	
		0.03		COAL - dominantly bright coal, one piece.	DD. 34.75
		0.30		MUDSTONE - black, highly carbonaceous, entire interval fragmented into small pieces.	
		0.52		SILTSTONE - medium grey, fine-grained, argillaceous, isolated, structureless, siliceous, erosional base.	
		0.18		SANDSTONE - light/medium grey, very fine grained, fine wavy lamination, substantial silty laminae in lower half, calcite fracture, sporadically burrowed, slightly calcareous, gradual at base.	
		0.72		SILTSTONE - medium/dark grey, very fine grained, highly argillaceous, devoid of lamination, siliceous, gradual at base.	
3-4 ⁰		0.31		SILTSTONE/SANDSTONE (50/50) - sands light/medium grey, fine to very fine grained (some with tiny coal spars and silty intraclasts), interlayered with argillaceous, structureless siltstone, basal 8cm (sands) slightly calcareous, erosional.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 20 JULY 1981 SHEET NO. 5 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.51		SILTSTONE - top 0.70m medium grey, very fine grained, highly argillaceous mostly structureless, remainder with medium/coarse grained silty with some sandy laminae, abrupt base	1.01 DD 37.79 0.50
		0.07		MUDSTONE - black, highly carbonaceous, hard, fragmented into two pieces.	
		0.05		COAL - mostly dull lustrous, some muddy fragments towards base, large pieces, abrupt.	
		3.10		SILTSTONE/SANDSTONE (85/15) - medium grey, locally highly argillaceous, rippled and cross-laminated, laminae and thin layers of very fine grained throughout, mostly siliceous, core broken and locally fragmented, core loss indicated, gradual.	1.37 DD 40.53 0.87 DD 41.76 0.86
6-7 ⁰		1.42		SILTSTONE/SANDSTONE (70/30) - light/medium grey, broadly interbedded laminated silts and very fine grained sands, some wavy crinkly lamination, locally slumped and burrowed, siliceous, core locally fragmented, gradual base.	1.35 DD 45.41 0.07
		0.30		SANDSTONE - light grey, very fine grained, distinctly wavy lamination, silty laminae, siliceous, very transitional at base.	
		0.82		MUDSTONE - dark grey, silty, (very fine grained) structureless, basal 0.25 highly silty, core broken and one calcite fracture.	
		2.56		SILTSTONE/MUDSTONE (80/20) - medium grey, intermingling lithologies or argillaceous siltstone and silty mudstone, occasional lamination, locally with large number of vertical worm burrows (and partially bioturbated) core fragmented and one calcite fracture (along bedding) in upper half of unit, locally calcareous, basal 0.25 black and carbonaceous.	0.62 DD 47.85 1.94

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

CHOWDRYDATE 20 JULY 1981SHEET NO. 6 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.09		COAL - dominantly dull and rand coal, some dull lustrous coal with thin vitrinite, fragmented core.	
		0.19		MUDSTONE - dark grey/black, highly silty and carbonaceous, structureless, slightly ferruginous very transitional at base.	
6-70		6.19		SANDSTONE - light/medium grey, predominantly very fine grained, laminated and cross-laminated throughout, frequent isolated dark carbonaceous/silty laminae (also micromicaceous), otherwise clean and uniform texture, few invertebrate burrows, very slightly calcareous, silty bands and laminae more numerous bottomward, unit characterized by well-defined laminae.	0.77 DD 50.6 3.05 DD 53.64 2.37
50		1.39		SANDSTONE/SILTSTONE (90/10) - light/medium grey, very fine grained, frequent argillaceous/silty laminae (erosional microcontacts) where finely particulate matter abound, some slumping, abrupt base.	0.64 DD 56.69 0.75
		0.06		COAL - top 4cm bright banded with a thin carbonaceous mudstone, remainder at base dull lustrous, broken core.	
		0.10		MUDSTONE - black, highly carbonaceous, silty, core broken, appears very transitional at base.	
60		1.16		SANDSTONE - light/medium grey, top 0.30m very fine-grained, abundantly argillaceous and burrowed, followed by fine to very fine grained sparsely laminated sands with two silty layers (each 5cm thick) sporadic burrows and slightly calcareous, remainder at base very fine grained, highly argillaceous/silty sands, passage below by interbedding.	
		0.28		MUDSTONE - medium grey, top 1/3 very silty, remainder slightly calcareous, gradual.	DD 59.75
		0.06		COAL - mostly dull and bright, broken core.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

CHOWDRYDATE 20 JULY 1981SHEET NO. 7 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.06		MUDSTONE - black, coaly mudstone with abundant bright and discontinuous laminae, broken stick.	
		0.13		MUDSTONE - dark grey, carbonaceous, thin calcite fracture along bedding abrupt below.	
3-5 ⁰		0.27		SILTSTONE - medium/dark grey, highly argillaceous at top and base, abundant carbonaceous debris, minor laminae of very fine grained sands, sporadically calcareous, very gradual base.	
		0.71		MUDSTONE - dark grey/black, abundant carbonaceous debris, locally passing to coaly mudstone, slightly ferruginous, core fragmented, grind marks, devoid of lamination, very transitional at base.	
		0.83		SILTSTONE - medium grey, fine grained, highly argillaceous, sparse vague lamination, brief passages to silty mudstone, some carbonized plant detritus, suggestion of slumping in basal 20cm, calcareous, gradual base.	
		0.45		MUDSTONE - dark grey/black, abundant carbonaceous matter, homogenously silty, ferruginous lenses, gradual at base.	
5-6 ⁰		2.39		SILTSTONE - medium grey, fine to coarse grained silts, frequently interlaminated and rippled, gradational to erosional lamellar contents, much penecontemporaneous erosional and slumping, locally burrowed and bioturbated, substantial sandy laminae toward base, sporadically calcareous.	0.14 DD 63.10 2.25
		0.53		SANDSTONE - light/medium grey, very fine grained frequent thin silty laminae, abundant fine carbonaceous plant debris, slumping in upper half and strongly calcareous, remainder with increasingly silty content, slightly calcareous, gradual.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 21 JULY 1981 SHEET NO. 8 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.57		SILTSTONE - medium grey, top 0.18m entirely slumped, with significant fine sand laminae, remainder highly argillaceous and sparse carbonaceous matter, fragmented base.	0.18 DD 66.14 0.39
		0.09		COAL - dull lustrous and dull coal, all coal fragmented into small pieces, some of these abundant needle fabrics, appears gradational at base.	
		0.26		MUDSTONE - dark grey/black, abundantly carbonaceous, homogenously silty top 3cm coaly mudstone, increasing silts downwards.	
60		1.09		SILTSTONE/SANDSTONE (90/10) - medium grey, silts locally very argillaceous, ripple laminated but periodically bioturbated, carbonaceous plant fragmented, sands essentially very fine grained and silty, carbonaceous, interbedded at base.	
50		1.73		SANDSTONE - light/medium grey, very fine grained, frequent silty laminae, mostly rippled and small-scale cross-lamination, periodically burrowed (?invertebrate) and tiny intraclasts, strongly calcareous, base of unit arbitrary and depicts a point where there is a frequent interlaminated silts.	0.87 DD69.19 0.86
50		1.67		SANDSTONE/SILTSTONE (80/20) - rapidly interlaminated very fine grain light grey sands and dark grey argillaceous laminated somewhat graded silts, invariably with erosional tops with sands, tiny burrows plus invertebrate trace fossils, calcareous, interlaminated base.	
3-50		3.39		MUDSTONE/SANDSTONE (80/20) - dark grey silty mudstone, rapidly interlaminated and rippled (tiny) very fine grained sands, abrupt to erosional boundaries, much small burrowing and invertebrate structures, abundant finely particulate carbonaceous matter and pyrite modules and disseminated, pelecypod shells (some pyritic), calcareous (mostly sandy laminae), cessation of laminae below.	0.46 DD 72.24 2.93

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 23 JULY 1981 SHEET NO. 9 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.39		MUDSTONE - dark grey/black, highly silty (disseminated) and abundant carbonaceous plant fragments, structureless slightly ferruginous, very gradational at base.	DD 75.28
		0.80		SILTSTONE - medium grey, abundantly argillaceous, infrequent sandy laminae, (substantial in basal 0.28m), slumping, burrowed/bioturbated siliceous, abrupt basal contact.	
50		0.56		SANDSTONE/SILTSTONE (75/25) - sandstone light grey, fine grained, clean but with frequent intercatations of dark grey silts, well laminated with erosional contacts with sands, silts largely confined to basal 1/3 sequence, much burrowing, abrupt below.	
		0.72		MUDSTONE - dark grey, highly silty, but lacking lamination, abundant finely broken and large sized carbonaceous debris, abrupt below.	
		0.10		COAL - dull, lustrous, some needles, broken stick, and fragmented, abrupt base.	GSC Top DD 78.33
		0.16		SANDSTONE - light grey, fine grained, laminated, silty laminae, few burrows, slightly calcareous, abrupt base.	
		0.13		MUDSTONE - black, carbonaceous, silty downward, slightly erosional base.	
		3.32		SANDSTONE - medium grey, very fine grained, small scale cross-lamination and rippling throughout, frequent laminae and layers of very coarse grained sands, much invertebrate burrowing, top 1.1m has widely spaced dark carbonaceous laminae, few silty mudstone bands downward, calcareous throughout, interbedded below.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17LOGGED BY CHOWDRYDATE 23 JULY 1981SHEET NO. 10 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
5-6 ⁰		1.08		SANDSTONE/SILTSTONE (55/45) - light brownish grey, very fine grained laminated and rippled sands (dominating top 1/2 unit) interlaminated with dark grey siltstone (sometimes argillaceous), gradational to erosional contacts, sporadic burrowing, moderately calcareous, interbedded below.	0.16 DD 81.38 0.92
		0.60		SILTSTONE/MUDSTONE/SANDSTONE (55/30/15) - dark grey silts and muds interlaminated and rippled (tiny) with very fine grained sands, erosional boundaries, pelecypod shells, calcareous (where sandy) cessation of lamination below.	
		0.51		MUDSTONE - dark grey, slightly carbonaceous, slightly silty, silty laminae in basal 20cm, gradual base.	
		1.04		SILTSTONE/MUDSTONE - medium grey, broadly interbedded, imperceptibly blending, 10cm very fine grained argillaceous sandstone with abundant trace fossils, calcareous throughout, gradual base.	0.93 DD 84.43 0.11
		0.69		SILTSTONE - medium grey dominantly very coarse grained, frequent lenses and ripples of very fine grained sands, siliceous, gradual base.	
6 ⁰		2.53		SANDSTONE - light grey, fine grained, top 0.37m with substantial silty layers (floating) remainder, generally clean, well-sorted 0.32m middle zone with abundant closely spaced carbonaceous laminae, cross-laminated pne bottle fracture, slightly calcareous, basal 5cm riddled with small angular dark grey silty intraclasts, abrupt at base.	2.05 DD 87.48 0.48
		0.05		MUDSTONE - dark grey/black, carbonaceous, mostly as small fragments.	
		0.09		COAL - mostly dull lustrous, some bright bands, easily breakable, some needle fabrics, mostly large fragments, appears abrupt base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 23 JULY 1981 SHEET NO. 11 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.92		SILTSOTNE/MUDSTONE (80/20) - medium grey, silts argillaceous and gradually passing to silty mudstone, middle 15cm with some sandy laminae, slumped and burrowed, remainder structureless, siliceous, gradual base.	
6-7 ⁰		1.39		SANDSTONE/SILTSTONE (65/35) - sandstone light/medium grey, fine to very fine grained, interbedded with dark grey, sandy siltstone (one interval with very large highly irregular and pointed laminated silts "floating" in sandstone matrix - (this zone appears to be ripped up substratum), sporadically calcareous, erosional base.	1.31 DD 90.52 0.08
		1.09		SANDSTONE - light grey, fine/medium grained, mostly clean and sorted, top 1/3 with sparse thin carbonaceous laminae, vaguely discernible cross-lamination, 9cm zone with abundant tiny rounded elongate silt clasts, very slightly calcareous, abrupt at base.	
4-5 ⁰		0.65		SANDSTONE/SILTSTONE (75/25) rapidly interlaminated and interlayered very fine grained silty, light grey sands and dark grey argillaceous siltstone, appears with dominantly parallel lamination, gradational to abrupt mutual contacts, calcareous, few small burrows, gradual base.	
		0.94		MUDSTONE - medium grey, locally silty laminae, 13cm zone with ripples and laminae of very fine grained sands, few burrows, mostly non-calcareous gradual base.	0.67 DD 93.57 0.27
		0.54		SILTSTONE/SANDSTONE - medium grey, top half dominantly silty, remainder dominantly sandy, abundantly burrowed/bioturbated, interbedded base.	
		1.13		SANDSTONE - medium grey, fine-very fine grained, mostly rippled with some small-scale cross-lamination, much slumping and bioturbation, basal 0.42m with abundant silty layers, slightly calcareous, remainder moderately calcareous, slumped base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 24 JULY 1981 SHEET NO. 12 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.65		MUDSTONE - medium grey, highly silty, slumped laminae in top 20cm and calcareous, remainder devoid of lamination, imperceptible below.	
		0.59		SANDSTONE/SILTSTONE (65/35) - medium grey, sands very fine grained silty, poorly laminated, some slumping, silts, essentially confined to top and basal part of unit, burrowed, entire sequence strongly calcareous, gradual at base.	0.37 DD 96.62 0.22
		0.08		MUDSTONE - black, abundant carbonized plant fragments, core fragmented.	
		0.05		MUDSTONE/COAL - badly fragmented interval, pieces of coaly mudstone and hard dull coal.	
		0.35		MUDSTONE - dark grey, very highly silty, vaguely laminated, transitional base.	
3-40		0.75		SILTSTONE/SANDSTONE (85/15) - medium grey, highly argillaceous irregularly laminated silts with frequent thin laminae of very fine grained rippled sandstone (sands sensibly increasing downward) with numerous burrows, all lithologic changes very gradational, siliceous, abrupt at base.	
		0.64		SANDSTONE - light/medium grey, top half very fine grained, frequent silty layers, laminated, remainder fine grained relatively clean, few silty laminae and tiny silty intraclasts locally, slightly calcareous, abrupt at base.	
		0.89		SILTSTONE/SANDSTONE (70/30) - medium grey, parallel laminated, rippled, argillaceous siltstone, and very fine grained sands, (confined to lower 1/3 sequence) with one large invertebrate burrow, strongly calcareous, gradual at base.	0.53 DD 99.67 0.36

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 24 JULY 1981 SHEET NO. 13 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
4-5 ⁰		5.57		SANDSTONE - light grey, gradually fining upward unit, basal 3.10m medium grained remainder at top generally fine/medium grained (with few local exceptions where grain size may reach fine fraction), entire unit cross-bedded, generally clean and fairly well-sorted, sporadic rusty weathering silty inclusions, tiny sparse coal spars, top 1.5m locally has carbonaceous laminae, weakly calcareous, abrupt basal contact.	2.52 DD102.72 3.05
		0.56		MUDSTONE - black, mostly canneloid mudstone, middle 0.15m with tiny lenses and ripples of very fine grained light grey sands, basal 0.12m with some dull coal and coaly mudstone, core mostly fragmented, core loss indicated.	
		0.49		SILTSTONE - medium grey, top 0.2m very muddy and with finely disseminated carbonaceous matter, remainder slightly argillaceous, rooty, vaguely discernible lamination, siliceous, very gradual base.	
		0.30		SANDSTONE - medium grey, very fine grained, frequent silty laminae, many rootlets and few small burrows, small-scale cross-lamination and ripples, siliceous, abrupt at base.	
5 ⁰		10.12		SANDSTONE - light grey, medium grained, very clean, unimodal, cross-bedded throughout, basal 3.5m with sparse coal spars - one 3cm silty band, few rusty silty intraclasts, slightly calcareous; abrupt at base.	1.61 DD108.81 2.97 DD111.86 3.0 DD114.91 2.54
4-5 ⁰		1.60		SANDSTONE - light/medium grey, dominantly fine grained, few sparse argillaceous/silty laminae, low-angle, small-scale cross-lamination, basal 0.6m with abundant carbonaceous laminae, top 0.67 siliceous and locally fragmented core, remainder strongly calcareous, abrupt cessation of laminae at base, some core loss indicated.	0.28 DD117.96 1.32

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

CHOWDRY

DATE

24 JULY 1981

SHEET NO.

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COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
5 ⁰		6.34		SANDSTONE - light grey, dominantly fine/medium grained, cross-bedded throughout, middle 0.65m with frequent isolated carbonaceous laminae, basal 0.88m uniformly medium grained, otherwise unit well-washed, sorted, strongly calcareous, gradual at base.	1.72 DD121.10 3.01 DD124.05 1.61
4-6 ⁰		1.59		SANDSTONE - light grey, fine grained, small-scale cross-lamination, sparse isolated carbonaceous laminae in basal 0.8m, strongly calcareous throughout, gradual base.	1.37 DD127.10 0.22
		0.52		SANDSTONE - light grey, dominantly fine/medium grained, middle 0.15m with silty laminae, mostly structureless, poorly sorted, strongly calcareous, abrupt at base.	
5 ⁰		0.40		SANDSTONE - light grey, fine grained, very clean, sorted, regularly laminated (either parallel lamination or low angle cross-beds), strongly calcareous, abrupt base.	
		1.06		SANDSTONE - light grey, fine/medium grained vaguely cross-bedded, 14cm interval fine grained remainder clean, fairly well sorted, calcareous throughout, interbedded below.	
5-7 ⁰		1.0		SANDSTONE - light grey, fine grained, clean well-sorted, low-angle cross-bedding, strongly calcareous, basal 24cm fine/medium grained and slightly calcareous.	0.76 DD130.15 0.24
		0.21		CONGLOMERATE/GRITSTONE - ill-sorted assemblage of quartz/chert granules (few pebbles 2cm across), dark grey angular silty intraclasts some rusty pebbles, abundant coal spars, abrupt at base (not erosional).	0.07 DD131.06 0.14

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17LOGGED BY CHOWDRYDATE 24 JULY 1981SHEET NO. 15 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
60		5.80		SANDSTONE - light grey, dominantly medium-grained, poorly cross-bedded, clean, well-sorted, some intervals structureless, two thin (4cm) muddy bands, slightly calcareous, passage below by interbedding.	1.79 DD133.20 3.04 DD136.24 0.97
		0.21		SANDSTONE - light grey, unit rapidly passing from fine to very fine grained sands, characterised by closely spaced carbonaceous laminae, very slightly calcareous, abrupt base.	
		0.94		SANDSTONE - light grey, top 0.44m very clean, homogenously fine/medium grained, strongly calcareous, remainder poorly sorted and varying between fine and medium grained, abundant coal spars, lacking lamination slightly calcareous, abrupt at base.	
		0.11		MUDSTONE - black, slightly carbonaceous, highly listricated surfaces, erosional contact.	
		0.45		SANDSTONE - light grey, fine/medium-grained, generally clean, vaguely laminated, slightly calcareous, steep listricated basal contact.	
		2.01		MUDSTONE - top 0.34 brownish grey, highly silty, (some discernible lamination) slightly ferruginous, remainder distinctly dark grey, brittle, dense with little or no silts, totally devoid of lamination. Basal 0.55m black with carbonized plant debris progressively increasing downward and locally slightly ferruginous, very gradual base.	0.36 DD139.29 1.65
		0.06		COAL - mostly small pieces, dull and bright fragments, some needle fabrics.	
		0.05		MUDSTONE - black, carbonaceous, coaly, abundant vitrinite streaks, broken core	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

CHOWDRY

DATE

25 JULY 1981

SHEET NO.

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COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.23		MUDSTONE - dark grey, middle 0.36m carbonaceous, non-calcareous, totally lacking lamination, basal 0.21 slightly ferruginous, strongly calcareous, silty content toward base.	1.02 DD142.34 0.21
		0.17		SILTSTONE - dark grey, highly argillaceous, vaguely laminated, strongly calcareous, interbedded below.	
5-6 ⁰		1.74		SANDSTONE - light/medium grey, very fine grained, frequent thin silty laminae, ubiquitous small-scale cross-lamination, few widely dispersed burrows, basal 0.30m rippled with abundant finely fragmented carbonaceous debris, 0.08m siltstone bed with highly scoured top with sands; strongly calcareous throughout, abrupt base.	
3-4 ⁰		3.73		MUDSTONE/SILTSTONE - dark grey, predominantly muddy, disseminated silts abundant tiny ripples of very fine sands, abundant slumping, dispersed finely macerated carbonaceous matter, sporadic burrows, slight to moderately calcareous, gradual at base.	0.86 DD145.39 2.87 DD148.44
		0.03		COAL - dull lustrous some needle structures, mostly as small pieces, core loss indicated.	
		0.72		MUDSTONE - dark grey/black, abundant finely broken carbonaceous matter, middle section very silty but lacking lamination, top 8cm coaly mudstone, gradual at base.	
		0.16		SILTSTONE - dark grey, highly argillaceous, structureless, siliceous, basal 2cm cleaner and with tiny sandy ripples, interbedded below.	
5 ⁰		0.73		SANDSTONE - light grey, fine to very fine grained, top 0.31m very silty (as thin laminae and layers) highly erosional contacts, abundantly burrowed, remainder cleaner, rippled and small-scale cross-lamination, calcareous throughout, abrupt.	
		0.05		MUDSTONE - black, carbonaceous, broken core.	

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 25 JULY 1981 SHEET NO. 17 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.13		COAL - dull lustrous, broken stick, gradual base.	GSC TOP 150.47
		0.20		MUDSTONE - black, carbonaceous, hard, grind marks.	
		0.75		MUDSTONE - medium grey, highly silty, structureless, increasing silty content downwards.	0.72 DD151.48
50		0.32		SILTSTONE - medium grey, very argillaceous, arenaceous laminae, calcareous, gradual base.	0.03
		0.41		SANDSTONE - light/medium grey, predominantly very fine-grained, abundant closely spaced argillaceous/silty laminae (erosional contacts) sporadic burrowing, strongly calcareous, erosional base.	
		0.56		MUDSTONE/SILTSTONE - dark grey, predominantly muddy, silts as widely spaced laminae and layers, slumping, strongly calcareous, gradual..	
		1.46		MUDSTONE - dark grey, locally black, and very carbonaceous, coaly mudstone, large coal spar, very silty downward, top 0.32m strongly calcareous, very gradual toward base.	
50		5.01		SILTSTONE/MUDSTONE/SANDSTONE (60/30/10) - medium/dark grey, rapidly interlayered argillaceous siltstone, silty mudstone and silty sandstone (very fine grained), lithologies imperceptibly blending, much variously broken carbonaceous debris, slumping, burrowing, mostly slightly calcareous (0.75m strongly) abrupt below.	0.12 DD154.53 2.81 DD157.58 2.08
		0.12		COAL - dominantly dull lustrous, large bright band toward base, stick, base broken.	
		0.08		MUDSTONE - black, hard, very carbonaceous, coaly mudstone, broken stick, broken base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 25 JULY 1981 SHEET NO. 18 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.09		COAL - mostly dull lustrous, broken stick.	
		0.14		COAL - dull lustrous and dull and bright, all as small pieces and some broken stick.	
		0.15		MUDSTONE - black, very carbonaceous, fragmented.	
		0.92		SILTSTONE - medium grey, very argillaceous middle 0.20m structureless, slightly sandy in basal 10cm, siliceous.	0.34 DD160.63 0.58
2-3 ⁰		0.40		SANDSTONE/SILTSTONE (79/25) - medium grey, very fine grained silty sandstone, interlaminated with silts, abundant vertical burrowing tubes, siliceous, very gradual at base.	
		0.32		MUDSTONE - dark grey, highly silty, (homogenous) finely broken carbonized plant fragments, irregular basal contact.	
		0.43		SANDSTONE/SILTSTONE (60/40) medium grey, sands very fine grained, very silty and mostly confined to upper 2/3 sequence, irregularly laminated, siliceous, gradual base.	
		0.17		MUDSTONE - black/dark grey, very silty, slightly carbonaceous, gradual base.	
		2.75		SILTSTONE/SANDSTONE (60/40) - top 0.24m highly silty, essentially structureless and interbedded very fine grained sands and argillaceous siltstone, mostly imperceptible passaged, locally disturbed and burrowed, sparingly calcareous, interbedded at base.	1.10 DD163.68 1.65
		1.42		SANDSTONE - light/medium grey, very fine grained, top 0.45m has frequent silty argillaceous laminae, remainder relatively clean with ripple-drift cross-lamination, with occasional extremely tiny silty clasts, strongly calcareous, erosional base.	1.27 DD166.72 0.15

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 25 JULY 1981 SHEET NO. 19 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
3-4 ⁰		1.05		SILTSTONE/MUDSTONE - top half dark grey, dominantly muddy with abundant stringers of very fine grained sands, much deformation and burrowing finely macerated carbonaceous debris, remainder dominantly argillaceous siltstone, sandy laminae sporadic bioturbation, calcareous, abrupt cessation of lamination at base.	
		0.18		MUDSTONE - black, highly carbonaceous, lenses of coal (ankerite impregnation), fragmented.	
		1.08		SILTSTONE/SANDSTONE (60/40) - sands light/medium grey, very fine grained, silts dark grey, highly argillaceous, imperceptible passaged, much slumping and bioturbation, calcareous throughout, abrupt below.	
3-4 ⁰		0.27		SANDSTONE/SILTSTONE - medium/dark grey, about equal proportion of very fine grained finely laminated sands and argillaceous siltstones, frequently interlaminated, mostly rippled gradational to erosional microcontacts abundantly burrowed (sand/silt filled tubes) broken stick.	DD169.77
		0.35		MUDSTONE - medium grey, highly silty, lacking lamination, top 1/3 badly fragmented and with grind marks, core loss indicated.	
		0.79		MUDSTONE/SANDSTONE - medium grey, predominantly muddy (90%), highly silty (mostly as disseminated but occasionally differentiated silty laminae) widely spaced layers of well-laminated very fine-grained sandstone, silty, calcareous, entire sequence sporadically burrowed and slight local disturbance of laminae, muds very slightly calcareous, irregular at base.	
		0.13		MUDSTONE - top 5cm medium grey, non-calcareous, bottom 8cm brownish grey, extremely hard, very ferruginous, fine carbonaceous debris, very strongly calcareous (almost limy), locally dense, fragmented at base.	

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 26 JULY 1981 SHEET NO. 21 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
4-5 ⁰		0.84		MUDSTONE/SANDSTONE - broadly interbedded medium grey highly silty mudstone (sometimes passing to argillaceous siltstone) and very fine grained sands, silty, argillaceous, irregularly laminated and rippled, minor slumping, very slightly calcareous, gradual basal contact.	
		1.23		SANDSTONE - light grey, very fine grained, regular ripple-drift, cross-lamination, 5cm siltstone layer, one large burrow, slightly calcareous basal 10cm with abundant silts, abrupt base.	0.78 DD178.92 0.45
		0.08		COAL - top 2cm bright followed by 4cm dull high ash coal with abundant thin vitrinite laminae, basal 2cm dull and bright coal, broken stick, basal contact broken.	
		1.29		MUDSTONE - dominantly dark grey, 12cm calcareous and ferruginous, remainder non-calcareous, basal 0.20m very carbonaceous and locally passes to coaly mudstone, gradual base.	
		1.17		MUDSTONE - medium grey, homogenously silty, (vague suggestion of lamination downward) mostly strongly calcareous, very silty toward base, grind marks in basal 15cm core, fragmented.	
		0.74		SILTSTONE/SANDSTONE (85/15) - medium grey sequence of silts with sparse lamination of very fine grained silty sands, moderately deformed laminae, occasionally burrowed intervals, calcareous throughout, abrupt basal contact.	
		0.12		MUDSTONE - dark grey, highly silty, vaguely laminated, carbonaceous at base.	
		0.16		MUDSTONE/SILTSTONE - about equal, medium grey, sandy laminae, slightly calcareous, abrupt base.	
		0.07		MUDSTONE/COAL - top half highly carbonaceous mudstone to coaly mudstone remainder dull lustrous coal, all fragmented, gradual base.	

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 26 JULY 1981 SHEET NO. 22 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.22		MUDSTONE - black, abundant carbonaceous plant debris, silty increasing downwards, clean basal contact, stick.	
		0.76		SILTSTONE - medium grey, abundantly arenaceous finely broken, carbonaceous plant debris, disturbed laminae, siliceous, gradual at base.	
		0.17		MUDSTONE - medium grey, highly silty, carbonized plant debris, disturbed laminae, gradual base.	
4-5 ⁰		3.61		SANDSTONE - light/medium grey, predominantly very fine grained, ubiquitously rippled, locally cross-laminated, some undulose/wavy lamination, frequent fine carbonaceous laminae, compaction features and slight deformation of lamination (locally), top 0.46m highly silty and almost bioturbated, basal 0.54m frequently silty, basal 1.54m strongly calcareous, rest moderately calcareous, interbedded at base.	0.61 DD185.01 3.0
		0.45		SANDSTONE/SILTSTONE (80/20) - medium grey, very fine grained, blending with argillaceous silts, middle 0.15m has abundant whole pelecypod shells ranging from 1/2 to 1cm across, very slightly calcareous to siliceous, erosional at base.	DD188.06
4 ⁰		1.11		MUDSTONE/SANDSTONE (75/25) - dark grey sequence of silty mudstone, sporadically finely particulate carbonaceous matter, sands extremely fine grained (or most of this coarse grained silts) occurring as thin laminae and tiny ripples, mostly having sharp to erosional contacts with muds, unit has many pelecypod shells (displaying wide variation in size from few mm to 1cm), totally non-calcareous. basal 7cm dominantly sandy (rippled), very fine grained and interlaced with muddy laminae, coaly stringer at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

CHOWDRY

DATE

26 JULY 1981

SHEET NO.

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COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.37		MUDSTONE - top 0.15m with abundant carbonized plant debris, remainder highly silty, (rapidly increasing bottomward), totally devoid of sedimentary lamination, very gradational basal contact.	
		0.97		MUDSTONE - brownish grey, locally very silty and imperceptibly passing to argillaceous siltstone, structureless, a lens of very fine sand, strongly calcareous throughout.	
		0.18		MUDSTONE - black, dense carbonaceous (finely dispersed), top half calcareous, broken core.	
		0.07		COAL - dull lustrous, large piece, listric base.	
		0.45		COAL - a mixture of dull and dull lustrous coal, badly fragmented throughout.	
		0.40		MUDSTONE - medium/dark grey, 10cm burrowed argillaceous band, remainder generally silty, structureless, some carbonaceous plant debris, basal 0.18m calcareous, gradual base.	
		0.34		SILTSTONE - medium grey, highly argillaceous, vague lamination, strongly calcareous, very gradual at base.	
		0.43		MUDSTONE - medium grey, very silty, silty content rapidly increasing downward, basal 0.15m strongly calcareous with sporadic lamination and burrowing, imperceptible passage below.	
		0.36		MUDSTONE/SILTSTONE - medium grey, top half dominantly muddy with substantial silty content, mostly burrowed/bioturbated, remainder dominantly silty, some sandy laminae, unit strongly calcareous throughout, indistinct base.	

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COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

CHOWDRY

DATE

26 JULY 1981

SHEET NO.

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COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
4-50		3.71		SANDSTONE - light/medium grey, top 1.5m very fine grained, remainder fine grained, strongly calcareous throughout, ubiquitous rippling and small scale cross-lamination, sparse thin intraclastic zones (pointed to subrounded silty clasts), occasional thin silty laminae (some times associated with particulate carbonaceous content), basal 15cm riddled with silty intraclasts (generally larger at base), erosional basal contact. Broken core and grind marks in some basal 1/3 unit.	0.51 DD194.16 2.97 DD197.20 0.23
		0.73		MUDSTONE/SANDSTONE (75/25) - very rapidly interlaminated sequence of dark grey silty mudstone (abundantly listricated) and very fine grained laminated silty sands, tiny ripples and lenses, sparsely burrowed, patchily calcareous, dense at base.	
		0.18		COAL - dominantly dull, some dull lustrous, broken stick, basal contact broken.	GSC TOP 198.18
		2.48		MUDSTONE - top 0.29m dark grey/black, abundant carbonized plant debris remainder dark grey, sporadically carbonaceous (save basal carbonaceous mudstone).	1.29 DD200.25 1.19
		0.02		COAL - dull, lustrous, small pieces.	
		0.10		COAL - top half dull lustrous with tiny vitrinite laminae, remainder dull with some high ash coal, broken stick, listricated at base.	
		0.08		COAL - predominantly dull, some dull lustrous easily breakable, mostly as small fragments.	
		0.07		MUDSTONE - black, carbonaceous, hard, large piece.	
		0.05		COAL - mostly small pieces and pulverized.	

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COAL DIVISION

BOREHOLE NO. BP81-17LOGGED BY CHOWDRYDATE 26 JULY 1981SHEET NO. 25 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.95		MUDSTONE - dark grey/black, locally abundant carbonized plant fragments, homogenously silty, totally devoid of lamination, gradual.	
		0.44		SILTSTONE - medium grey, very highly argillaceous, finely broken carbonaceous matter, sporadically laminated (some suggestion of deformation) very slightly calcareous, slumped base.	
		0.98		SANDSTONE/SILTSTONE (60/40) - medium grey, top 0.45m dominantly silty, remainder mostly sandy (very fine grained) with frequent silty laminae, abundant burrowing and wavy lamination partially obliterated by bioturbation, some deformed lamination, bioturbated base.	0.11 DD203.30 0.87
		0.16		MUDSTONE - medium grey/black, abundant carbonized plant debris, bioturbated, slightly calcareous, very gradual at base.	
3-5 ⁰		0.51		SANDSTONE - light/medium grey, very fine grained, rippled and cross- laminated throughout, frequent very thin silty/carbonaceous laminae, tiny silty intraclasts at top, calcareous, erosional basal contact.	
		1.20		SILTSTONE/SANDSTONE (60/40) - medium grey, rapidly interbedded and interlaminated very fine grained, silty sands and argillaceous siltstone, abundant burrowing and sediments partially bioturbated, calcareous throughout, carbonaceous matter (finely divided) gradual diminution of sands and increasing muddy content downward, broadly interbedding at base, broken stick.	
		0.32		MUDSTONE/SANDSTONE (85/15) - medium grey, silty mudstone grading into and/or with abrupt contacts with very fine grained sands, sporadic tiny sandstone dykes burrows, gradual disappearance of sandy laminae downward.	DD206.35

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COAL DIVISION

BOREHOLE NO. BP81-17LOGGED BY CHOWDRYDATE 27 JULY 1981SHEET NO. 26 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.42		MUDSTONE - top 8cm grey with occasional tiny sandy ripples and discontinuous laminae, remainder variable sequence of black mudstone with abundant finely broken carbonaceous debris, and black cannelloid mudstone, some intervals slightly ferruginous much listrication, core fragmented, gradual.	
4-5 ⁰		1.77		SANDSTONE/SILTSTONE - top 0.43m predominantly medium grey, slightly argillaceous siltstone with severely slumped laminae (some postlittification dislocation), sandy laminae, followed by 0.73m very fine grained sands, rippled and cross-laminated silty bands with erosional contacts, strongly calcareous, abundant burrowing, remainder light/medium grey sandstone characterized by abundant carbonized plant fragments (larger ones appearing as coal spars) cross-laminated, few burrows, silty laminae at top and base, abrupt contact with coal below.	
		0.16		COAL - dominantly dull lustrous, broken stick, base of coal with grind marks.	
		0.07		MUDSTONE - black highly carbonaceous/coaly mudstone, gradual toward base.	
		0.57		SILTSTONE - medium grey, argillaceous/silty sparsely laminated, some plant fragments, siliceous very transitional base.	0.44 DD209.40 0.13
5 ⁰		2.77		SANDSTONE/SILTSTONE (95/5) - light/medium grey, very fine grained, abundantly micaceous, cross-laminated throughout, silts widely spaced thin layers, tiny muddy intraclasts in basal 10cm, strongly calcareous throughout, abrupt base.	
5-6 ⁰		3.75		MUDSTONE - medium grey, silty, locally grading into argillaceous siltstone (total aggregate thickness of these silty units does not exceed 0.25m), 5cm very fine grained burrowed sandstone, sequence generally devoid of lamination, very strongly calcareous throughout, gradual base.	DD212.44 3.04 DD215.49 0.71

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17LOGGED BY CHOWDRYDATE 27 JULY 1981SHEET NO. 27 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.48		SANDSTONE/SILTSTONE (65/35) - rapidly interlaminated very fine grained sands (light grey) and dark grey argillaceous siltstone, mutual contacts invariably abrupt to erosional, severe slumping throughout, some burrowing, calcareous, abrupt basal contact.	
50°		1.49		SANDSTONE - light grey, very fine grained, generally clean, 5cm silty band near top, basal 0.45m with frequent silty laminae (floating in sands), cross-laminated, sporadic burrows, strongly calcareous.	
		0.34		SILTSTONE - medium grey, highly argillaceous, arenaceous, abundantly burrowed, slumping, very slightly calcareous, slickensided base.	0.24 DD218.54 0.10
50° Top .82m		2.22		SANDSTONE - light/medium grey, very fine grained, generally clean, cross laminated, basal 0.17m very silty, large invertebrate burrow. Top 15cm slickensided with numerous fine calcite veins, also there are hairline calcite veins at numerous levels. Steep dip (50°) in top 0.82m remainder flat (50°). Basal 0.3m slightly calcareous, remainder strongly so, interbedded at base.	
		0.68		SILTSTONE/SANDSTONE (50/50) highly slumped and bioturbated, frequently interlaminated dark grey argillaceous silts and very fine sands, 2cm coaly mudstone, 10cm from base, slightly calcareous, core broken throughout.	0.58 DD221.59 0.10
		0.94		MUDSTONE - top 0.23m black and locally carbonaceous/coaly mudstone, remainder medium grey, silty (increasingly siltier downward and calcareous), totally devoid of lamination, darker at base.	
		0.47		MUDSTONE - black, carbonaceous 4cm thick coaly mudstone, locally slightly ferruginous, core broken throughout, gradual base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 27 JULY 1981 SHEET NO. 28 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.12		MUDSTONE/SILTSTONE (70/30) - top 0.26m dark grey to black, with abundant carbonized plant debris, silts highly argillaceous and essentially confined to middle section, sporadic burrows and slightly calcareous, remainder non-calcareous, indistinct at base.	0.97 DD224.64 0.15
3-5 ⁰		0.63		SANDSTONE/SILTSTONE (85/15) - broadly interlaminated and interbedded very fine grained light grey, sands and finely laminated silts, some slumping in basal 1/3 and slightly calcareous, remainder strongly calcareous, few burrows, erosional base.	
		0.27		MUDSTONE - dark grey, silty, sparse plant fragments, lacking lamination very silty at base.	
		0.28		SANDSTONE/SILTSTONE - top half medium grey, dominantly very fine-grained argillaceous/silty sandstone, sparsely laminated and strongly calcareous, remainder siltstone, highly argillaceous, lacking lamination and very slightly calcareous, indistinct passage below.	
		0.69		MUDSTONE - medium grey, locally very silty, structureless, vaguely laminated (occasionally) very gradual passage at base.	
		0.16		SILTSTONE - medium grey, bioturbated (especially toward base where sandy laminae have whorled fabrics), slightly calcareous, gradual.	
		0.39		MUDSTONE - top 2/3 dark grey with 3cm carbonaceous mudstone, listricated with numerous calcite veins, remainder silty, structureless, gradual at base.	
		0.73		SILTSTONE - uniformly medium grey, highly argillaceous at top and mostly structureless, basal 0.2m with abundant lenses of very fine grained sands, suggestion of slumping and/or bioturbation, increasingly calcareous toward base, interbedded contact.	0.36 DD227.68 0.37

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COAL DIVISION

BOREHOLE NO. BP81-17

LOGGED BY

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SHEET NO.

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COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
4-50		1.57		SANDSTONE - light/medium grey, predominantly very fine grained, small scale cross-lamination and rippling throughout, frequent thin dark silty/argillaceous laminae, two dark grey siltstone bands each 7cm thick and with highly erosional top contacts with sands, local burrowing and slightly deformed laminae, strongly calcareous throughout, erosional base.	
		0.11		MUDSTONE - black, highly carbonaceous/canneloid broken core, broken basal contact.	
		0.09		COAL - dull lustrous, top with grind marks, broken stick, appears gradual at base.	
		0.08		MUDSTONE - black, top 5cm coaly mudstone remainder very carbonaceous, ferruginous, very hard, silty/sandy toward base.	
		0.35		SILTSTONE/SANDSTONE (70/30) - dark grey silts, argillaceous and with carbonized plant debris, sand (confined to basal section) very fine grained and interlaminated with silty laminae and ripples, siliceous gradual base.	0.18 DD230.73 0.17
		1.20		MUDSTONE - medium grey, locally differentiated into silty bands, calcareous structureless, gradual.	
		0.56		SILTSTONE/MUDSTONE (70/30) - medium grey, broadly interlayered very argillaceous siltstone, and silty mudstone, numerous very thin very fine sand laminae (erosional contacts) strongly calcareous throughout, gradual.	
		0.34		MUDSTONE - top 0.14m dark grey, remainder very silty, medium grey, suggestion of lamination, imperceptible change below.	

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 27 JULY 1981 SHEET NO. 30 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.41		SANDSTONE - light/medium grey, very fine grained vague relicts of lamination, otherwise bioturbated (discrete large worm tubes), strongly calcareous, erosional at base.	
		0.18		MUDSTONE - medium grey, structureless, distinct and slightly irregular basal contact.	
5 ⁰		0.54		SANDSTONE/SILTSTONE/MUDSTONE (40/40/20) - very fine grained argillaceous/silty sands interlaminated with silts and muds, calcareous erosional.	0.14 DD233.78 0.40
		0.33		MUDSTONE - medium grey, very silty, strongly calcareous, indistinguishable below.	
		0.39		SILTSTONE/SANDSTONE - top 2/3 highly argillaceous silts, with thin sandy laminae, moderately slumped, remainder very fine sands, entire sequence strongly calcareous, erosional base.	
		0.70		MUDSTONE - medium grey, abundant uniformly dispersed silts, totally lacking laminations, calcareous, gradual at base.	
		0.26		MUDSTONE - dark grey/black, finely broken carbonaceous plant fragments, basal 8cm distinctly silty, slightly erosional base.	
5-6 ⁰		2.01		SANDSTONE - top 0.50m very fine grained with frequent silty laminae, remainder light grey, fine grained, mostly clean, basal 0.2m with abundant finely broken carbonaceous fragments (emphasize lamination), sporadic burrows, much of section with small scale, cross-lamination few tiny silty intraclasts, strongly calcareous throughout, abrupt and slightly irregular base.	0.94 DD236.83 1.07

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 27 JULY 1981 SHEET NO. 31 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.18		MUDSTONE/SILTSTONE (80/20) - rapidly interlaminated dark grey mudstone and medium grey laminated rippled siltstone, sharp to erosional contacts, thin lenses of very fine sands, abundant finely particulate carbonaceous matter, tiny sand filled burrows and larger tubes, patchily calcareous, two calcite filled fractures, basal 7cm with numerous hairline calcite veins, grind marks at base.	
		0.26		MUDSTONE - black, hard, top 8cm with few very thin silty laminae, and ferruginous remainder dense, canneloid and carbonaceous, core broken, listricated.	
		0.04		MUDSTONE - black, distinctly canneloid, broken stick.	
		0.25		COAL - dominantly dull lustrous, broken stick.	GSC TOP 239.63
		0.02		COAL - dull submetallic lustre, fragmented.	DD239.88
		1.41		MUDSTONE - top 0.62m dark grey/black, locally very carbonaceous, silty and ferruginous, remainder medium grey, uniformly silty, lacking lamination, basal 0.22m highly argillaceous siltstone and strongly calcareous, slightly irregular basal contact.	
4-60		2.42		SANDSTONE - light grey, basal 0.85m fine grained, cross-laminated with tiny dark silty laminae, remainder very fine grained, vaguely laminated, top 0.45m has substantial silts, burrowed and largely devoid of lamination, strongly calcareous throughout, some calcite filled fracture, abrupt base.	1.18 DD242.92 1.24
		0.39		MUDSTONE - dark grey, top 0.18m with sporadic silty laminae, calcareous, remainder slightly carbonaceous, gradual base.	
		0.05		MUDSTONE - black, dense canneloid, fragmented.	

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COAL DIVISION

BOREHOLE NO. BP81-17

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COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.17		COAL - dull lustrous, entire section broken into tiny pieces and pulverized.	
		0.62		MUDSTONE - top 2cm black and highly carbonaceous, remainder medium grey, highly silty in basal 0.2m very gradational base.	
5-6 ⁰		2.40		SILTSTONE/SANDSTONE (80/20) - medium grey silts, well-laminated, wavy, locally slumped, frequent layers of very fine light grey sands, abundant erosion features, burrowed, variously broken carbonized plant matter throughout, calcareous, interbedded at base.	0.55 DD245.97 1.85
		0.66		SANDSTONE/SILTSTONE (85/15) - broadly interbedded very fine grained, medium grey, laminated sands and argillaceous silts with erosional to gradual contacts, erosional base.	
		0.50		MUDSTONE/SANDSTONE - dark grey/black muds intimately associated with finely particulate carbonaceous matter, ripples and very thin laminae of very fine grained sands occur throughout, listricated at base.	DD249.02
		0.92		MUDSTONE - black, mostly dense, locally slightly ferruginous, occasional very fine carbonized plant fragments, totally lacking lamination, broken core throughout.	
		0.94		MUDSTONE - black, locally carbonaceous, 3cm bright coal within top 30cm, core fragmented.	
		0.20		COAL - mostly tiny pieces and pulverized muddy fragments in coal, type indeterminate.	
		1.96		MUDSTONE - uniformly medium grey, middle 0.3m highly silty and slightly calcareous, entire sequence lacking lamination, gradual base.	0.88 DD252.07 1.08
		0.16		SILTSTONE/SANDSTONE (50/50) - medium grey, very tiny sands laminated, silts very argillaceous, gradual.	

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 27 JULY 1981 SHEET NO. 33 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.60		SILTSTONE - medium grey, occasional very vague lamination, siliceous, erosional base.	
3-4 ^o		2.22		SANDSTONE - light/medium grey, very fine grained, top 1/3 has frequent silty laminae, cross-laminated throughout, sporadic burrowing, basal 0.12m very silty, calcareous entire unit, erosional base.	1.23 DD255.12 0.99
		1.52		MUDSTONE/SANDSTONE (85/15) - dark grey muds with abundant finely macerated carbonaceous matter, interlaminated frequently with tiny rippled and very thin laminae of very fine grained sands, sharp to erosional contacts, sporadic burrows, basal 0.20m black and very carbonaceous, indistinct.	
		0.44		SILTSTONE - medium grey, very muddy, burrowed, irregularly laminated, very strongly calcareous, interbedded base.	0.34 DD258.16 0.10
		0.79		SANDSTONE/SILTSTONE (60/40) - broadly interlayered very fine grained sands and highly argillaceous dark grey siltstone, calcareous throughout, very gradational base.	
		0.62		SANDSTONE - light grey, fine grained, generally clean, cross-laminated, basal 0.17m has two silty bands (totalling 9cm thick), calcareous throughout, erosional base.	
		0.29		MUDSTONE - medium/dark grey, devoid of lamination, indistinct at base.	
5 ^o		1.46		SANDSTONE - light/medium grey, very fine grained, substantial silty laminae in middle, broadly laminated, erosional features, calcareous, passage below by interbedding.	1.08 DD261.21 0.38
		0.26		SANDSTONE/SILTSTONE (85/15) - rapidly interlaminated very fine sands and argillaceous silts, strongly calcareous, interlaminated at base.	

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COAL DIVISION

BOREHOLE NO. BP81-17 LOGGED BY CHOWDRY DATE 27 JULY 1981 SHEET NO. 34 OF 35

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
2-3 ⁰		1.14		MUDSTONE/SANDSTONE (80/20) - dark grey, highly silty (muds and silts imperceptibly grade into each other and together constitute 80%) mudstone with tiny ripples and lenses of very fine sands, sharp to erosional contacts, pelecypod, calcareous, locally burrowed, abrupt base.	
		0.19		SANDSTONE - light/medium grey, very fine grained, frequent argillaceous silty laminae, few burrows, very slightly calcareous, abrupt.	
		0.12		COAL/MUDSTONE - badly fragmented coal and carbonaceous mudstone, gradual base.	
		0.98		MUDSTONE - black, carbonaceous, listricated throughout (revealed on breaking), coal spars, core broken periodically.	
		1.02		MUDSTONE - medium grey, silty (lower half highly silty) structureless, 10cm carbonaceous in middle, top 0.22m calcareous, gradual base.	DD264.26
		0.52		SANDSTONE - top 10cm argillaceous, silts grading below to very fine grained argillaceous sands, sparsely laminated, very slightly calcareous, basal 0.2m unit fragmented, grind marks at base, core loss indicated.	0.42 DD267.31 0.10
		0.11		MUDSTONE - medium grey, very hard, slightly ferruginous, silty laminae, slightly calcareous.	
		0.18		SANDSTONE - light/medium grey, very fine grained, small-scale cross-lamination, slightly calcareous, grind marks on broken core.	
		0.72		MUDSTONE/SILTSTONE (70/30) - dark grey silts and muds blending into each other, sporadic lamination, calcareous, fragmented, grind marks, very transitional at base.	0.42 DD270.36 0.30

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY CHOWDRY DATE 28 JULY 1981 SHEET NO. 1 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.12		SANDSTONE - medium grained, ground fragments, badly weathered, probably overburden.	
4-50		0.52		SILTSTONE - medium grey, slightly argillaceous, sparsely laminated, two 2-4cm thick very fine grained sandstone, well laminated, many small burrows, strongly calcareous throughout, fragmented and broken core, partly weathered, gradual base.	
		0.36		SANDSTONE - dominantly very fine grain, mostly weathered (top half) rusty below, small scale, cross-lamination, abundantly burrowed, large siltstone band, medium grey, entire sequence very strongly calcareous, slightly erosional at base, few hairline fractures in top half, fragmented interval.	
50		0.41		SILTSTONE - buff/grey, laminated, very fine grained sand ripples, locally burrowed, very strongly calcareous, erosional base, core locally weathered and fragmented.	
		0.52		SANDSTONE - light/medium grey, dominantly very fine grained, ubiquitous small-scale cross-lamination, silty laminae, few burrows, very strongly calcareous, broken core.	
		0.27		SILTSTONE - weathering deeply rusty, freshly broken dark grey, strongly calcareous, entire unit badly fragmented, core loss indicated.	
		0.45		MUDSTONE - medium/dark grey, locally dense, carbonized plant fragments, ferruginous, very strongly calcareous, unit badly weathered, grind marks, core loss indicated.	DD 5.18
		1.47		SANDSTONE - light/medium grey, fine grained, clean, strongly calcareous, sandstone, alternating with brownish grey, silty non-calcareous sands, absent to poor lamination, core slightly weathered, steep fractures, abrupt at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY CHOWDRY DATE 28 JULY 1981 SHEET NO. 2 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
50		0.84		SANDSTONE - buff/grey, very fine grained, regular bands of very argillaceous silts, irregular rippled and laminated, isolated burrows, very strongly calcareous, core fragmented and locally weathered, abrupt base.	
		0.66		SANDSTONE - top 0.12m medium grey, very fine grained, clean, siliceous, followed by 0.25m light grey, fine grained very strongly calcareous sandstone, sparsely laminated and burrowed, remainder at base, very fine grained, clean, dominantly cherty, siliceous, grind marks on last segment of core, appears abrupt.	0.37 DD 8.23 0.29
		0.58		SANDSTONE - brownish grey, dominantly very fine grained, silty, poorly laminated, dominance of cherts, siliceous; 8cm thick fine grained strongly calcareous sandstone in lower 1/3, slightly erosional at base, grind marks on top.	
3-50		0.25		SILTSTONE - dark grey, slightly argillaceous, burrowed, vaguely discernible lamination, strongly calcareous, abrupt at base.	
		0.55		SANDSTONE - light medium grey, very fine grained, frequent silty layers, isolated ripples, laminated, few burrows, very strongly calcareous.	
40		1.52		SILTSTONE/SANDSTONE/MUDSTONE (70/20/10) - variable sequence of dark grey silts, very fine grained laminated and rippled sandstone, silty, with large silty/muddy intraclasts and dark grey highly silty mudstone, often mutual boundaries are sharp to highly erosional, sporadic burrows, most of unit strongly calcareous, erosional at base.	1.30 DD11.28 0.22
		0.47		SANDSTONE - light grey, dominantly very fine grained, ubiquitous small-scale, cross-lamination, top half with sparse dark carbonaceous laminae, remainder with tiny intraclasts and tiny carbonaceous matter and 15mm chunk of coal, entire sequence very strongly calcareous, basal contact very erosional.	

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COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY CHOWDRY DATE 28 JULY 1981 SHEET NO. 3 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.25		MUDSTONE - medium grey, middle 8cm laminated and very silty, strongly calcareous throughout, irregular basal contact.	
		0.26		SANDSTONE - light/medium grey, top 9cm very silty, closely laminated very fine grained sandstone passing below to cleaner broadly rippled sandstone. Much burrowing at top strongly calcareous throughout, sharp at base.	
		0.79		SANDSTONE - light/medium grey, very fine grained, top 0.40m cross-laminated and have abundant fine coal spars and carbonaceous laminae, much hairline calcite veining, remainder with frequent silty laminae, very strongly calcareous throughout, abrupt basal contact.	
		0.24		MUDSTONE/SILTSTONE - top 1/3 medium grey argillaceous siltstone, remainder at base medium/dark grey mudstone, slightly silty, devoid of lamination, calcareous throughout, gradual.	
		0.89		SANDSTONE - light/medium grey, dominantly very fine grained, 8cm thick muddy band 0.22m from base, sands well laminated, locally clean, strongly calcareous throughout erosional base, core broken.	0.62 DD14.32 0.27
50		0.32		MUDSTONE - dark grey, very silty in middle 5cm zone, strongly calcareous 15mm carbonaceous mudstone, gradual at base.	
		0.26		SANDSTONE - medium grey, very fine grained, frequent silty laminae, very muddy in basal 10cm, strongly calcareous, transitional base.	
		0.23		MUDSTONE - medium/dark grey, frequent thin silty laminae, calcareous, sharp base.	
		0.38		SANDSTONE - dominantly very fine grained, light/medium grey, top 1/2 clean, well laminated, remainder darker silty, and with poorly defined lamination, strongly calcareous, gradual basal contact.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY CHOWDRY DATE 28 JULY 1981 SHEET NO. 4 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		2.49		MUDSTONE - dark grey/black, carbonaceous in most part, locally ferruginous and silty, devoid of lamination, top 0.47m strongly calcareous, middle 1/3 broken and fragmented core, very gradual at base.	0.86 DD16.76 1.63
		0.63		MUDSTONE - brownish grey, highly silty, lacking lamination, core slickensided and fractured (calcite-filled) at numerous points, (no significant structure envisioned), gradual.	
		0.97		SILTSTONE - buff/grey, highly argillaceous, occasional rootlets in top half, siliceous, singular lack of lamination, calcite vein, increasingly muddy downward.	0.64 DD19.81 0.33
		0.37		MUDSTONE - medium grey, very silty, structureless, grindmarks on base of last core interval.	
		0.63		MUDSTONE - dominantly black, mostly dense, canneloid, carbonized plant fragments, variously broken, lacking lamination, slightly locally ferruginous, abrupt at base.	
		0.12		SILTSTONE - grey, lower half highly argillaceous, structureless, minor plant fragments, gradual.	
		0.61		MUDSTONE - dark grey/black, sparse carbonized plant debris, structureless, fragmented base.	
		0.51		MUDSTONE - brownish/grey, highly ferruginous, strongly calcareous, gradual at base.	
		1.17		MUDSTONE - mostly black, locally very carbonaceous/coaly mudstone, core locally fragmented, core loss.	0.45 DD22.86 0.72

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18

LOGGED BY

CHOWDRY

DATE

30 JULY 1981

SHEET NO.

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COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.42		MUDSTONE - dark grey, abundant, carbonaceous matter, highly silty, scattered rootlets, ferruginous, devoid of lamination, gradual.	
		2.17		MUDSTONE - medium grey, highly silty, strongly calcareous, very vague sporadic lamination, rapid increase of silts downward.	1.73 DD25.91 0.44
		1.59		MUDSTONE/SILTSTONE (85/15) - grey/medium grey, mudstone with widely spaced argillaceous siltstone, locally argillaceous siltstone, locally vaguely laminated, few burrows, very strongly calcareous, interbedded base.	
		0.47		SILTSTONE - medium grey, very fine grained, highly argillaceous, burrowed, strongly calcareous, gradual.	
6-80		4.85		SANDSTONE - predominantly light grey, fine grained (topmost 1-2m very fine grained) very silty and locally burrowed/bioturbated, cross-bedded cross-laminated throughout, mostly clean, sorted, basal 0.39m poorly sorted, tiny silty clasts and spars, very strongly calcareous, sporadic hairline fractures in middle section, very abrupt basal contact.	0.12 DD29.26 3.04 DD32.61 1.69
		0.58		COAL/MUDSTONE - most of unit comprises dull, muddy coal, with substantial zones of carbonaceous/coal mudstone, core broken and periodically fragmented, gradual at base.	
		0.25		MUDSTONE - top half dark grey/black, very carbonaceous, remainder slightly silty and badly fragmented gradual base.	
		0.14		SANDSTONE - very fine grained sands with very small ripples and embodying frequent dark grey argillaceous/silty laminae, abundant burrows, strongly calcareous, abrupt base.	DD35.66

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY CHOWDRY DATE 30 JULY 1981 SHEET NO. 6 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.46		MUDSTONE - medium grey, sporadically silty, calcareous, abrupt at base.	
30		0.29		SANDSTONE - light/medium grey, very fine-grained, clean, parallel laminations, occasional isolated fine carbonaceous laminae, very strongly calcareous, core broken, abrupt base.	
		1.80		MUDSTONE - medium/dark grey, locally highly silty, carbonaceous plant fragments, lacking lamination, top 0.15m calcareous, bottom 0.16m black, carbonaceous/coaly mudstone, broken base.	
		0.03		MUDSTONE/COAL - small fragments of mudstone and coal, core loss indicated.	
		0.63		MUDSTONE - medium grey, spontery, dense, sparse carbonaceous matter, core fragmented.	0.07 DD38.71 0.56
		0.78		SILTSTONE - medium grey, very highly argillaceous, variable amount of carbonized plant fragments, slightly ferruginous, locally, gradual at base.	
		1.32		MUDSTONE - medium grey, very silty, slightly carbonaceous in basal 20cm gradual.	
		1.57		MUDSTONE - dominantly black, and mostly very carbonaceous, structureless gradual	0.27 DD41.76 1.30
		0.09		COAL - dull hard, and somewhat canneloid, imperceptible passage below, stick.	
		0.58		MUDSTONE - black, hard, canneloid, abundant tiny laminae of bright coal, broken stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY CHOWDRY DATE 30 JULY 1981 SHEET NO. 7 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.15		COAL - mostly dull, some dull lustrous with bright bands, broken stick, grind marks at base.	
		0.10		MUDSTONE - top 1/3 black, highly carbonaceous, remainder slightly ferruginous, grind marks at base.	
		0.69		SANDSTONE - light grey, fine to very fine grained, cross-bedded, abundant coal spars, generally clean, poorly sorted, top 8cm very argillaceous/silty siliceous throughout, erosional base.	0.58 DD44.80 0.11
		0.29		MUDSTONE - medium/dark grey, very silty in middle 5cm and ferruginous, very gradual.	
4-50		0.48		SILTSTONE - medium grey, very sandy and locally highly argillaceous, basal 0.16m sparsely laminated and with few burrows, entire unit siliceous, gradual base.	
		0.07		MUDSTONE - black, very carbonaceous, silty/sandy toward base, broken core.	
		0.22		SANDSTONE - light/medium grey, very fine grained, very silty, frequent laminae, much burrowing, calcareous, gradual base.	
		2.02		MUDSTONE - medium to dark grey, 14cm thick very carbonaceous zone, 12cm siltstone layer, locally very ferruginous; silty and ferruginous intervals calcareous, generally lacking laminations, slightly irregular base.	1.73 DD47.85 0.29
		0.46		SANDSTONE - light/medium grey, very fine grained, frequent silty/ argillaceous layers, vaguely laminated, strongly calcareous, gradual at base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY CHOWDRY DATE 30 JULY 1981 SHEET NO. 8 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.98		SILTSTONE - medium grey, fine-grained, broadly imperceptibly passing to silty mudstone; sparse vague lamination, sporadically ferruginous, strongly calcareous, gradual.	
		1.88		MUDSTONE/SILTSTONE (85/15) - medium grey, locally grading into silts (essentially in upper half of unit, strongly calcareous) one, 2cm thick coal zone (appears detrital), basal 15cm vaguely laminated and slightly calcareous, abrupt at base.	1.08 DD50.90 0.80
		0.22		SANDSTONE - medium grey, top 4cm with small scale, cross-lamination, remainder very fine grained, highly silty/argillaceous, rippled and laminated, few burrows, strongly calcareous, gradual.	
		1.85		MUDSTONE - medium grey, very silty, strongly calcareous, slightly ferruginous, darker at base.	
		1.97		MUDSTONE - dark grey/black, abundantly silty with occasional vague lamination, patchily ferruginous/calcareous, 0.24m thick mudstone, pale brown perhaps paleosol and/or bentonitic (reworked) at 55.07m, some intervals very carbonaceous and coaly mudstone, core locally fragmented.	0.10 DD53.95 1.87
		0.60		MUDSTONE - black, dominantly carbonaceous/coaly mudstone, badly fragmented core, core loss.	0.13 DD56.99 0.47
		0.78		MUDSTONE - dark grey/black, carbonaceous, 4cm pulverized coal, 9cm from top, core broken	
		0.22		MUDSTONE/COAL - entire interval badly fragmented, mostly very carbonaceous/coal mudstone, some coal fragments, grind marks, core loss.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18

LOGGED BY

CHOWDRYDATE 31 JULY 1981SHEET NO. 9 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
50		0.77		MUDSTONE - dark grey/black, very carbonaceous, 15cm thick argillaceous arenaceous siltstone in lower 1/3, calcareous, laminated, remainder structureless, broken stick.	
		0.76		MUDSTONE - medium to dark grey, locally very carbonaceous, abundantly silty with sparse lamination, patchily calcareous, broken core.	0.59 DD60.35 0.17
		0.51		MUDSTONE - medium grey, slightly carbonaceous, regular silty layers, strongly calcareous, sparsely laminated, very gradual base.	
		0.22		MUDSTONE - black, very carbonaceous, grading downward to coaly mudstone, broken stick.	
		0.13		COAL - dominantly dull, hard, appears high ash, minor vitrinite laminae, broken core.	
		0.89		MUDSTONE - top 1/3 dark grey/black, locally very carbonaceous, slightly ferruginous, lacking lamination, fragmented at top.	
		0.75		MUDSTONE - top 0.16m very hard, rusty, highly ferruginous with hairline calcite veins, remainder medium grey, very silty, strongly calcareous bottom 13cm has some lamination, gradual base.	0.58 DD64.00 0.17
		0.22		MUDSTONE - medium grey, little or no silt, sparse carbonized plant debris, top half strongly calcareous, core broken.	
		0.35		COAL/MUDSTONE - top 0.17m very hard dull coal with muddy layers, broken stick; remainder badly fragmented dull coal and very carbonaceous/coaly mudstone.	
		0.72		MUDSTONE - dark grey/black, highly listricated sparse carbonaceous matter, pancity of silts and lamination, broken stick.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18

LOGGED BY

CHOWDRY

DATE

31 JULY 1981

SHEET NO.

10 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.12		MUDSTONE - black, dominantly very carbonaceous, thin coaly bands, core fragmented and broken.	
5-6 ⁰		0.78		SILTSTONE/MUDSTONE - medium grey, dominantly some very fine grained laminated sands, muds dark grey, silty, structureless, entire unit patchily calcareous, gradual base.	0.34 DD67.06 0.44
		0.37		MUDSTONE - dark grey/black, carbonaceous, basal 8cm silty, gradual base.	
		1.08		MUDSTONE/SILTSTONE (70/30) - broadly interbedded dark grey, structureless, silty mudstone, imperceptible passing to argillaceous sandy (briefly) siltstone with vague lamination, gradual at base.	
		1.31		MUDSTONE - dark grey/black, top 2/3 sporadically silty, slightly ferruginous, remainder black, slightly carbonaceous; few oblique fractures (siliceous) grind marks at top.	0.87 DD70.10 0.44
		0.50		MUDSTONE - black very carbonaceous coaly mudstone, fragments of hard dull coal, fragmented core.	
6-7 ⁰		3.32		SILTSTONE/MUDSTONE - top half dominantly argillaceous, sparsely laminated siltstone with very thin sandy laminae, remainder silty mudstone with very occasional laminae, coal spars, siliceous throughout, abrupt base, core broken, grind marks.	1.94 DD73.46 0.88 DD74.67 0.50
		0.28		SANDSTONE - light grey, fine grained, cross-lamination, siliceous, clean, burrows, fragmented core, siliceous fracture (coating), ground at base.	
		0.24		MUDSTONE - dark grey, homogenously silty, grind marks on top, erosional base.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY CHOWDRY DATE 31 JULY 1981 SHEET NO. 11 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	78.80	0.43	0.43	SANDSTONE - medium grey, medium grained, abundant silty layers, coal spars, poorly sorted, carbonaceous laminae, siliceous throughout, scoured base.	
	79.65	0.85	0.85	MUDSTONE - medium grey, highly silty, sparse lamination, few thin sandy ripples, locally very carbonaceous, core broken.	
	80.71	1.06	1.06	MUDSTONE - black, dominantly very carbonaceous, core locally badly fragmented and broken.	0.24 DD77.72 0.81
	82.49	1.78	1.78	MUDSTONE - top 0.75m medium grey, highly silty with occasional lamination (calcareous), followed by 0.35m highly fragmented carbonaceous mudstone - remainder at base medium/dark muds with silty bands slightly ferruginous and patchily calcareous, broken, listricated core.	1.02 DD79.86 0.76
	84.90	2.11	2.41	SILTSTONE/MUDSTONE - slight dominance of brown/grey siltstone, argillaceous, poorly laminated, mudstone dark grey, silty, locally very slightly carbonaceous, chunks of derived coal, strongly calcareous in most part, broken stick, some fragmented. (Core loss 0.30m).	2.06 DD82.90 0.05
	85.99	1.09	1.09	MUDSTONE - dark grey/black, sporadically silty, slightly carbonaceous calcareous in most part, stick and broken core.	
	86.19	0.20	0.20	-----TOP OF GRIZZLY ZONE ----- MUDSTONE - black, very carbonaceous, core badly fragmented, listricated	
	86.49	0.30	0.30	MUDSTONE - black, very carbonaceous, broken core.	
	88.24	1.58	1.75	MUDSTONE - black, predominantly very carbonaceous, appears to embody brief coaly intervals, entire unit badly fragmented and listricated, (Core loss in this unit 0.17m).	0.48 DD86.56 1.10

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-18 LOGGED BY: CHOWDRY DATE 31 JULY 1981 SHEET NO. 12 OF 13

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
	88.89	0.65	0.65	SILTSTONE - pale grey, highly argillaceous, locally arenaceous, 10cm zone in middle riddled with rootlets, entire unit has 'bleached' look, abundant carbonized leaves (commonly intact), abrupt base.	
	96.50	6.70	7.61	MUDSTONE - predominantly dark grey, locally slightly carbonaceous (few thin coal bands, silty, totally devoid of lamination, core locally fragmented. (Core loss in this unit 0.91m).	DD90.90 2.90 DD93.27 2.82 DD96.32 0.08
	96.96	0.46	0.46	-----BASE OF GRIZZLY ZONE ----- SANDSTONE/SILTSTONE - medium grey, top 12cm very fine grained, highly argillaceous silts, grading below to very fine grained siltstone, argillaceous/silty, disturbed laminae, siliceous throughout, erosional base.	
	97.15	0.19	0.19	MUDSTONE - medium grey, slightly silty, sparse carbonaceous matter, very gradual at base.	
	97.77	0.62	0.62	MUDSTONE - very hard almost entire unit strongly ferruginous, few siliceous fractures.	
	99.57	1.80	1.80	MUDSTONE - dark grey/black, top 2/3 locally silty, slightly ferruginous (locally) remainder black, locally carbonaceous/coally mudstone and fragmented, very indistinct at base.	0.12 DD98.14 1.68
	99.71	0.14	0.14	MUDSTONE - very hard, strongly ferruginous, abrupt.	
6-70		0.41		SANDSTONE - light grey, very fine grained, small ripples and wavy lamination, abundant carbonaceous laminae, bottom 11cm with silty laminae, fractured in top one third sequence, strongly calcareous throughout, abrupt basal contact.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-19 LOGGED BY W. P. LEE DATE 25 JULY 1981 SHEET NO. 1 OF 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
				CASING @ 3.05m	
34°		0.91m		SANDSTONE - light to medium grey, fine grained, thinly bedded, fining downwards, minor small scale cross beds, trace coal spars, upper 70cm broken stick, lower 21cm badly broken, strongly calcareous, gradational contact.	
		1.09m		SANDSTONE - light grey, very fine to fine grained, strongly calcareous, massive, tr. fine mica flecks, coarsening downwards, lower 1/2 of unit displays minor bioturbation, thinly bedded at base 2-3mm beds, gradual basal contact, broken.	0.36m DD 5.18 0.73m
5-8°		1.54		SANDSTONE - light grey, fine grained, thinly bedded, winnowed, abundant very thin medium grey finer bands throughout, coarsening downwards, tr. very fine/silty clasts-angular, tr. small scale low angle cross-bedding, strongly calcareous, broken-badly broken, tr. carby debris.	
		0.58m		SANDSTONE - light grey, fine to medium fine grain, minor thin coal spars, scattered medium grey coarse grains, abrupt basal contact, listricated surfaces, unit appears to have been reworked very irregular and distorted bedding, minor darker finer grain intraclasts throughout, broken, calcareous.	0.48m DD 8.23 0.10m
		5.73m		SANDSTONE - light grey, very fine grained, massive, badly broken to crumbled, fining downward 50% silty at base, gradational lower contact, minor medium grey bands, tr. thin coal spars, calcareous, tr. listrication.	2.25m DD 11.28 2.87m DD 14.33 0.61
		0.47m		SILTSTONE - medium to dark grey, abundant carby debris throughout upper and lower contacts gradational, non-calcareous, badly broken, minor listricated surfaces.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-19 LOGGED BY W. P. LEE DATE 28 JULY 1981 SHEET NO. 2 OF 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.82m		MUDSTONE - dark grey to black, carbonaceous, abundant carby plant fragments, trace thin bright coal spars, silty in part, gradual upper and lower contacts, broken core, non-calcareous.	
0-30		0.31m		SANDSTONE - medium grey, very fine grain, abundant silty, very thin bedding, tr. very thin bright coal spars, tr. carby rootlets, tr. carby plant fragments, scattered very fine mica flecks, strongly calcareous, broken core.	
		1.38m		SILTSTONE/MUDSTONE - dark grey, scattered thin bright coal spars, tr. light grey, very fine grain sandstone bands (5mm), abundant carby plant fragments, calcareous, tr. very fine mica flecks badly broken.	0.15m DD 17.37 1.23m
		0.48m		COALY MUD ZONE - badly crumbled and pulverized, 2cm of hard bright coal at top, then approximately 15cm of soft, weathered light brown mud, next approximately 15-20cm of black carbonaceous muds and coal, at base of unit 8cm of dirty coal, to hard blocky, dull lustrous, with tr. thin bright coal bands, total unit thickness approximate only, core loss.	DD 20.42 -
		0.69m		MUDSTONE - dark grey-black, scattered carby plant impressions, tr thin bright coal bands, minor listricated surfaces, becoming silty towards base, core badly broken to crumbled, non-calcareous.	
		1.80m		SILTSTONE - light-medium grey, scattered very thin bright coal bands, scattered very fine grained, light grey sandstone bands, minor micro-erosional features, slightly calcareous, gradual lower contact, broken core.	1.62m DD 23.47 0.18m
		0.96m		MUDSTONE - dark grey-black, listricated, scattered bright coaly debris, becoming silty at base, core badly broken, non-calcareous.	
		0.29m		SILTSTONE - medium grey, abundant bright coal plant fragments throughout, lower contact gradual, muddy in part, calcareous, badly broken core.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-19 LOGGED BY W. P. LEE DATE 28 JULY 1981 SHEET NO. 3 OF 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.36m		MUDSTONE - black, very carbonaceous, abundant thin bright coal bands, blocky, hard, tr. very fine grained light grey sandstone bands (5mm), abrupt lower contact, non-calcareous, broken core.	
3-5 ⁰		0.48m		SANDSTONE - light grey, very fine-fine grained, thinly bedded to featureless, upper contact listricated, tr. rootlets, abundant thin bright coal spars in upper 14cm of unit, lower contact gradual, broken core, strongly calcareous.	DD 26.52
		2.18m		SILTSTONE - light-medium grey, featureless, abundant very fine grain sandstone bands throughout, tr very thin coal spars, minor listrication with associated thin calcite veining, broken core, calcareous.	
5-7 ⁰		1.49m		SANDSTONE - light-medium grey, very fine-fine grain, with abundant silty laminae throughout, 46cm up from base is 21cm ferruginous band, scattered very thin coal spars, gradual lower contact, tr rootlets broken stick, strongly calcareous, abundant carby plant fragments at base-slightly pyritic.	0.68m DD 29.57 0.81m
		1.33m		SILTSTONE - medium-dark grey, minor very fine grain, light medium grey sandstone bands, tr. thin bright coal spars, listricated, scattered carby plant fragments, muddy at base, broken and crumbly in places, gradational lower contact, non-calcareous.	
		1.98m		SANDSTONE/SILTSTONE - light-medium grey, massive/featureless, clean, two 5cm ferruginous bands in middle of unit, lower contact gradational, 50/50 sand/silt throughout unit, lower % siltstone at base, broken-broken stick core, strongly calcareous.	0.68m DD 32.61 1.30m
		1.63m		SANDSTONE - light grey, very fine grain, massive, upper and lower contacts gradational, tr. very fine mica-flecks, clean, tr. carby plant fragments, broken stick, strongly calcareous.	

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-19

LOGGED BY

W. P. LEE

DATE 30 JULY 1981

SHEET NO.

4 OF 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		1.32m		SANDSTONE - light-medium grey, very fine - fine grain, well sorted, thinly cross-laminated, abrupt lower contact, strongly calcareous, broken core, well worked, tr. carby plant debris, tr. very fine mica flecks, silty in parts.	0.11m DD 35.66 1.21m
		2.18m		SANDSTONE - light grey, fine-medium grain, poorly sorted, minor coarse grained, abundant thin coal spars, ripple drifted, scattered bands of fine grain sandstone, broken to crumbled, calcareous, unit represents basal section of a channel lag deposit.	1.49m DD 38.71 0.69
		0.46m		SILTSTONE - medium grey, featureless, minor thin very fine grain, light grey, sandstone bands, gradual lower contact, broken stick core, strongly calcareous, scattered very fine mica flecks, clean.	
6-90		4.16m		SANDSTONE - light-medium grey, fine-medium grain, coarsening downward, predominantly thinly cross-laminated, trace thin bright coal spars, well sorted, abrupt lower contact, scattered medium grey finer clasts throughout, broken stick, strongly calcareous.	1.92m DD 41.76 2.24m
		0.84m		SANDSTONE - light-medium grey, fine-medium grain with minor coarse grains, poorly sorted, ripple drifted, abundant bright coal spars, abundant medium grey finer grey clasts throughout, basal contact abrupt, listricated in part, broken core, calcareous, unit represents basal section of channel lag deposit.	0.10m DD 44.81 0.7m
		0.13m		SILTSTONE - medium grey, massive, clean, stick core, strongly calcareous, tr. carby plant debris, gradual lower contact.	
		5.73m		SANDSTONE - light to predominantly medium grey, fine-medium grain coarsening downwards, upper 1/2 silty with minor bioturbation evident, worm burrows, tr. thin dull coal spars, strongly calcareous, lower 1/2 thinly laminated with minor small scale cross-beds, minor ripple bedding, broken stick-broken, listricated, abrupt lower contact.	2.10m DD 47.85 2.92m DD 50.90 0.71m

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-19 LOGGED BY W. P. LEE DATE 30 JULY 1981 SHEET NO. 5 OF 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.54m		SANDSTONE - light-medium grey, fine-coarse grain, poorly sorted, ripple drifted, abundant thin bright coal spars, abrupt basal contact, listricated, non-calcareous, broken core, unit represents basal section of channel lag deposit.	
		0.66m		MUDSTONE - dark grey-black, very carbonaceous, abundant thin bright coal spars, listricated, scattered carby plant debris, tr. pyritization, gradational basal contact, broken-badly broken core, non-calcareous.	
		0.57m		SILTSTONE - medium-dark grey, muddy, massive, broken stick, strongly calcareous, tr. carby plant debris throughout, lower contact broken and abrupt.	
		0.07m		COAL - dull lustrous, blocky, friable, dirty with 2 very thin muddy bands (2-3mm)	DD 53.95m
		0.05m		COAL - dull bright banded, blocky, friable.	
		0.09m		COAL - dull lustrous with tr. bright bands blocky.	
		0.33m		MUDSTONE - black, very carbonaceous, scattered thin bright coal bands, scattered carby plant fragments, minor pyritization, core ground in places, otherwise broken, non-calcareous.	
		0.62m		SILTSTONE - medium-dark grey, massive, scattered carbonaceous plant fragments, listricated in part, core broken to crumbled, non-calcareous.	
		1.20m		SANDSTONE - very fine- fine grain, medium grey, thinly laminated, clean non-calcareous, broken stick, well sorted, tr. fine mica-flecks, argillaceous, gradual lower contact.	
		0.11m		SILTSTONE - medium grey, massive, abundant carbonaceous plant fragments non-calcareous, core ground at base-otherwise broken.	DD 56.99m

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-19 LOGGED BY W. P. LEE DATE 30 JULY 1981 SHEET NO. 6 OF 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		0.02m		COAL - dull bright banded, crumbled, definite core loss, pulverized.	
		1.03m		MUDSTONE - dark grey, carbonaceous, abundant carby plant debris, listricated in part, becoming silty towards base, friable and blocky broken core, non-calcareous, gradational lower contact.	
		1.41m		SILTSTONE - medium-dark grey, massive/featureless, carbonaceous in part, listricated, scattered carby plant remains, core ground in places, scattered bright coal spars, broken-badly broken, non-calcareous, gradational lower contact.	1.20m DD 60.05 0.21m
		7.31m		SANDSTONE - light to medium grey, very fine-medium grain, medium grain represented by thin bands (<10cm) throughout the unit, thinly laminated with minor low angle small-scale cross-bedding, tr. thin calcite veins with well developed calcite crystals, calcareous throughout, tr. thin bright coal spars, tr. micro erosional features, 1.26m from top - 15cm long and 1cm wide coal spar parallel to core axis, lower contact erosional/scoured, core broken and ground in places.	2.68m DD 63.09 3.03m DD 66.14 1.60m
		3.51m		SILTSTONE - medium-dark grey, massive/featureless, entire unit consistent, ferruginous in places, tr. shell fossils, scattered carby plant fragments, basal contact gradual, slightly calcareous, muddy in part, unit represents lagoonal facies, core broken-badly broken, ground in places as well.	1.46m DD 69.19 2.05m
		2.84m		SANDSTONE - light-medium grey, very fine-fine grain, thinly laminated, silty throughout, clean, tr. coal spars, non-calcareous, broken stick-broken core, listricated in part, core ground in places, lower contact gradual.	0.69m DD 72.24 2.15m

B P C A N A D A

COAL DIVISION

BOREHOLE NO. BP81-19

LOGGED BY

W. P. LEEDATE 31 JULY 1981SHEET NO. 7 OF 7

COM BCA*	DEPTH m (GEOPH.)	THICKNESS m		DESCRIPTION	DRILLERS DP & SAMPLE NO
		MEASURED	APPARENT		
		6.05m		SILTSTONE - medium to dark grey, scattered thin grey very fine grain sandstone laminations throughout, listricated in part, scattered carbonaceous plant fragments, muddy in part, non-calcareous, broken core.	0.90m DD 75.29 2.95m DD 78.33 2.20m
7-10 ⁰		10.05m		SANDSTONE - light grey, fine-medium grain, well-sorted, clean, trace finer grain, medium grey, sub-round clasts, listricated in part, bedding regular and undisturbed, abrupt lower contact, broken stick core, slightly calcareous, minor small scale low angle cross-beds, core ground in places, trace very thin coal spars, scattered mica-flecks.	0.86m DD 81.38 3.03m DD 84.43 3.02m DD 87.48 2.97m DD 90.53 0.17m
		3.61m		SILTSTONE - medium-dark grey, massive/featureless, minor ferruginous band (max 7cm) listricated in part, calcite veining along listricated surfaces, basal contact erosional with abundant clasts mixed in with sand-chewed up (lower 14cm), broken core, ground in places, tr. shell fragments, tr. carby plant fragments, calcareous.	2.79m DD 93.57 0.82m
		3.30m		SANDSTONE - light grey, medium to coarse grain, thinly laminated to massive, scattered thin bright coal spars, listricated in part, tr. calcite veins, core broken to badly broken, definite core loss, tr. darker finer angular clasts, grain size coarsening downwards, minor very coarse grains, slightly calcareous.	0.72m DD 95.10 1.11m DD 96.32 1.47m DD 98.15
				END OF HOLE	

B.P. CANADA LTD. COAL GROUP

Page 1 of 2

TRENCH NUMBER: SNTR 23 GRIZZLY SEAM

SCALE: 1:20

PROJECT: Rocky Creek

DATE: 10 July, 1981

LOCATION: Hill 1522

ELEVATION: Roof elev. 1,520 m

GEOLOGIST: C. Bickford

Thick(m)	Depth (m)	Lithology	(Sample No.)
0.21+	0.00	ROOF: MUDSTONE - carbonaceous, black, fissile, abundant thin bright coaly bands.	(SNTR 23/7)
0.10	0.10	COAL - dull and bright, blocky, weathered.	(SNTR 23/6)
0.12	0.22	MUDSTONE - carbonaceous, black, abundant thin bright coal bands.	(SNTR 23/5)
0.87	1.09	COAL - dull banded, lustrous, blocky, weathered	(SNTR 23/4)
0.06	1.15	MUDSTONE - black, canneloid, weathered; abundant thin bright coal bands, in places approaching coal.	(SNTR 23/3)
0.11	1.26	COAL - dull lustrous	
0.09	1.35	COAL - dull and bright	
0.03	1.38	COAL - bright	
0.12	1.50	COAL - dull banded, lustrous.	
0.01	1.51	MUDSTONE - black, carbonaceous	(SNTR 23/2)
0.05	1.56	COAL - bright.	
0.02	1.58	MUDSTONE - black, carbonaceous, abundant very thin bright coal bands.	
0.02	1.60	COAL - bright.	
0.19	1.79	MUDSTONE - dark brown to black, carbonaceous, scattered thin bright coal bands; listricated at top.	
0.01	1.80	COAL - bright, blocky.	
0.05	1.85	MUDSTONE - dark brown to black, carbonaceous, scattered thin bright coal bands	(SNTR 23/1)
0.07	1.92	MUDSTONE - brown, listricated	
0.34	2.26	MUDSTONE - dark brown to black, carbonaceous, abundant thin bright coal bands, occasional bright coal lenses to 0.01 m m thick.	

B.P. CANADA LTD. COAL GROUP

TRENCH NUMBER: SNTR 25 GRIZZLY SEAM

SCALE: 1:20

PROJECT: Rocky Creek

DATE: July 10, 1981

LOCATION:

ELEVATION: 1,418 m at base of section.

GEOLOGIST: C. Bickford

Thick(m)	Depth (m)	Lithology	(Sample No.)
1.50+		SANDSTONE - very fine-grained, thin-bedded.	
4.50		MUDSTONE/SILTSTONE (70:30) - dark grey, very thin bedded, rubbly mudstone with interbeds, 0.10 to 0.20 m thick, of blocky, dark olive-grey siltstone.	
0.42	0.00	ROOF: MUDSTONE - dark grey.	
0.08	0.08	COAL - dull	(SNTR 25/1)
0.31	0.39	MUDSTONE - dark grey, carbonaceous	(SNTR 25/2)
0.20	0.59	MUDSTONE - black, canneloid, hard, blocky, abundant very thin bright coal bands; gradational	(SNTR 25/3)
0.30	0.89	MUDSTONE - black, carbonaceous, abundant thin bright coal bands	
0.10	0.99	MUDSTONE - dark grey, locally orange - weathering	(SNTR 25/4)
0.22	1.21	MUDSTONE - dark grey to black, carbonaceous, abundant thick bright coal bands.	
0.06	1.27	COAL - bright banded, blocky	(SNTR 25/5)
0.14	1.41	MUDSTONE - dark brown, carbonaceous	(SNTR 25/6)
0.03	1.44	COAL - sheared, pulverised	(SNTR 25/7)
0.07	1.51	COAL - bright banded, blocky	
0.12	1.63	MUDSTONE - dark brown, carbonaceous, occasional thick bright coal bands.	(SNTR 25/8)
0.01	1.64	COAL - bright	
0.02	1.66	MUDSTONE - black, canneloid.	(SNTR 25/9)
0.50	2.16	COAL - dull lustrous, blocky, very hard. Attitude: 165/5° E	

B.P. CANADA LTD. COAL GROUP

TRENCH NUMBER: SNTR 29

SCALE: 1:20

PROJECT: Rocky Creek

DATE: July, 1981

LOCATION: In CWM between BP-1 and BP-7

ELEVATION: _____

GEOLOGIST: B. Cormier, C. Bickford, P. Lee

Thick(m)	Depth (m)	Lithology	(Sample No.)
0.48		SOIL - beige, and TILL	
0.10 to 0.15		TILL - brown	
0.51		MUDSTONE - with carbonaceous, mudstone near base; brownish - black to grey-black	(SNTR 29/1)
0.35		COAL - dirty, dull, soft, black	(SNTR 29/2)
0.25		COAL - bright, blocky	(SNTR 29/3)
0.33		MUDSTONE - dark brown to black, carbonaceous, very thin bright coal bands	(SNTR 29/4)
0.46		SANDSTONE - very fine-grained, silty, light grey to light brown; carbonaceous with scattered rooflets. Massive; well-cemented.	
0.65		MUDSTONE - dark brown to black, very carbonaceous, soft, friable, badly weathered.	(SNTR 29/5)
0.39		SANDSTONE - very fine-grained, silty, carbonaceous, scattered carbonaceous, rooflets, non-calcerous, well-cemented thin-bedded.	
0.64		COAL - dirty, soft, pulverised	(SNTR 29/6)
0.64		COAL - bright banded, dirty, soft, pulverised	(SNTR 29/7)
0.49		MUDSTONE - dark brown, carbonaceous, rubbly, with scattered pulverised plant fragments	(SNTR 29/8)
0.51		COAL - dull lustrous, bright banded, blocky	(SNTR 29/9)
0.24		MUDSTONE - black, cameloid, very carbonaceous very thin bright coal bands, abundant carbonised plant material, hard.	(SNTR 29/10)
0.18+		MUDSTONE - very carbonaceous, hard	(SNTR 29/11)

GEOLOGICAL

TRAVERSE NOTES.

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 10 JUNE 1981SHEET NO. 1 OF 20

STATION	UNIT	DESCRIPTION
SN1		SANDSTONE - very coarse to gritty, black cherts predominant, minor quartz grains, light grey, grey to light brown weathering, medium bedded, non-calcareous, finer sequences (lenses) throughout outcrop, scattered impressions, some carbonaceous debris. Outcrop exhibits small scale rolls within itself. 274/32°N
SN2		SANDSTONE - very coarse to gritty, again predominantly black cherts, minor quartz grains, light grey, light grey to buff weathering, thick bedded, non-calcareous, carbonaceous debris, outcrop also contains finer bands of some material. 0.41/13°N.W.
SN3		SANDSTONE very fine to fine grained, creamy to very light grey, buff to grey weathering, thin bedded, very calcareous, underlain by: SANDSTONE - coarse to gritty, light grey, light grey weathering, mudstone interclasts, thick bedded, non-calcareous. 180/6°E
SN4		Coal - exposed by creek erosion, possibly 30cm exposed in bank and creek bed, no floor visible. Coal is very clean, lustrous, hard, blocky with no visible partings. MUDSTONE - silty, nodular dark grey, brown weathering, very calcareous, 50cm exposed no definite strike and dip available, possibly dipping northward. This rock makes up the visible roof.
SN5		SANDSTONE - fine to medium grained, grey to light brown, buff weathering, thin bedded, abundant large scale cross-beds, very calcareous, well cemented. 095/6°N
SN6		SANDSTONE - silty, very fine, dark grey, brown weathering, medium bedded, strongly calcareous, well cemented.
SN7		SANDSTONE - silty, very fine, dark grey, light brown weathering, appears to be thin to medium bedded, very calcareous, outcrop badly weathered.

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 14 JUNE 1981SHEET NO. 2 OF 20

STATION	UNIT	DESCRIPTION
SN8		SANDSTONE - fine to medium grained, light grey, dark grey weathering, fine to thin bedded, small scale cross-bedding, non-calcareous, moderately cemented. 260/26°N
SN9		SANDSTONE - medium grained, brown, dark grey weathering, thin bedded, non-calcareous, moderately cemented, pebbly conglomerate lenses throughout, clasts up to 1cm in diameter. 285/22°N
SN10		SANDSTONE - medium grained, light brown, dark grey weathering, thin to medium bedded, non-calcareous, abundant orange flecks throughout. 306/11°N.E.
SN11		SANDSTONE - fine grained, brown, dark brown weathering, thin to medium bedded, irregular, strongly calcareous. 025/13°S.E.
SN12		SANDSTONE - very fine to fine grained, dark grey, dark grey weathering, thin to medium bedded, moderately calcareous, very disturbed, calcite filled fractures, many large joints throughout; outcrop forms part of the South limb of an anticlinal structure. 0.77/37°S.W.
SN13		Large outcrop, 15m+ containing the axis of above mentioned anticline, axis bears 128°.
		SANDSTONE - very fine grained, dark grey, buff to light brown weathering, thin to medium bedded, abundant muddy laminae, rich in very fine quartz grains, strongly calcareous. 151/22°N.E.
		The sandstone are interbedded with carbonaceous shales and coaly bands up to 10cm thick (coaly bands only).
		Sandstones also contain many plant, leaf, fern, and grass impressions, as well as silicified logs, and carbonized log impressions.

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 15 JUNE 1981SHEET NO. 3 OF 20

STATION	UNIT	DESCRIPTION
SN13cont..		Again all rocks within this outcrop are severely disturbed, exhibiting fractures, joints and abundant large scale slickensides.
SN14		SANDSTONE - very fine, dark grey, light brown weathering, medium bedded, strongly calcareous, very disturbed as in SN13. 136/10°N.E.
SN15		SANDSTONE - very fine grained, dark grey, dark grey weathering, thin bedded, interbedded with: SILTSTONE - dark grey, dark grey weathering, both are non-calcareous, again severelyly disturbed. 125/32°S.W.
SN16		SANDSTONE - very fine grained, dark grey, brown weathering, medium bedded, non-calcareous, interbedded with: Carbonaceous shales, dark grey to black, dark grey weathering, rubbly, non-calcareous. 125/62°S.W.
SN17		SANDSTONE - medium grained, light grey, light grey weathering, medium bedded, non-calcareous, contains some scattered chert pebbles approx. 1cm in diameter, abundant quartz grains. 295/9°S.W.
SN18		SANDSTONE - medium grained, light grey, grey weathering, thin to medium bedded, non-calcareous, moderately cemented, some low angle, cross-bedding. 028/14°S.E.
SN19		CONGLOMERATE - (not in place), medium grained, sandstone matrix, light grey, grey weathering, non-calcareous, conglomerate is poorly sorted with clasts of light and dark chert pebbles up to 3cm sub-angular to sub-rounded, very well cemented.
SN20		SANDSTONE - medium grained, light grey, grey weathering, (brown when wet), thin bedded, appears to contain low angle cross-bedding, non-calcareous. 147/9°N.E.

GEOLOGICAL
TRAVERSE NOTES

PROPERTY ROCKY CREEK GEOLOGIST DAVID J. STANDRING DATE 20 JUNE 1981 SHEET NO. 4 OF 20

STATION	UNIT	DESCRIPTION
SN21		SANDSTONE - fine grained, brown, dark brown weathering, thin bedded, non-calcareous, moderately cemented. 335/6°N.E.
SN22		SANDSTONE - very fine to fine grained, dark grey to brown, dark brown weathering, rubbly, thin bedded, slightly calcareous. 107/15°N
SN23		SANDSTONE - very fine grained, light brown, light grey weathering, thin to medium bedded, non-calcareous, well cemented. Underlain by: MUDSTONE - dark grey, brown weathering, rubbly, non-calcareous, areous. 205/25°N.W.
SN24		SANDSTONE - very fine to fine grained, light brown, grey weathering, thin to medium bedded, non-calcareous, minor scattered rootlets throughout. Underlain by: MUDSTONE - dark grey, grey to dark grey weathering, rubbly, non-calcareous. 252/14°N.W.
SN25		SANDSTONE - very fine grained, light brown, dark brown weathering, medium irregular bedded, moderately calcareous, abundant carbonaceous debris. 137/14°N.E.
SN26		COAL - 15 to 20cm of "bony" coal, hard, blocky, dull lustrous. Mudstone roof, brown grey, dark grey weathering, rubbly, slightly calcareous. Mudstone floor, light brown, dark grey weathering, rubbly, non-calcareous.
SN27		SANDSTONE - very fine grained, silty, grey, light brown weathering, thin to medium bedded, moderately calcareous, very well cemented, bedding is shattered and extremely jointed. 137/51°S.W.

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 21 JUNE 1981SHEET NO. 5 OF 20

STATION	UNIT	DESCRIPTION
SN28		MUDSTONE - very carbonaceous, dark grey, dark grey weathering, rubbly, non-calcareous. 149/36°S.W.
SN29		SANDSTONE - very fine grained, grey, light brown to buff weathering, medium to thick bedded, blocky, non-calcareous, very well cemented, numerous carbonaceous rootlets, overlain by: SILTSTONE - dark grey, grey weathering, rubbly, non-calcareous, nodular in places. 135/46°S.W.
SN30		SANDSTONE - fine grained, grey to grey brown, light brown weathering, thin to medium bedded, slightly calcareous, well cemented, numerous large carbonaceous rootlets, abundant mica flecks along bedding planes. 103/46°S.W.
SN31		Numerous large blocks of a chert pebble, (up to 4cm), conglomerate non-calcareous, grey weathering, poorly sorted.
SN32		SANDSTONE - fine to medium grained, grey, brown to brown grey weathering, medium to thick bedded, slightly calcareous, moderately cemented, but very resistant. 133/21°S.W.
SN33		CONGLOMERATE - grey to green grey, pebbles of light and dark cherts with occasional quartzites up to 4cm in diameter, poorly sorted, clasts are sub-angular to sub-rounded, conglomerate is non-calcareous, extremely well cemented.
SN34		SILTSTONE and carbonaceous MUDSTONES - dark grey, dark brown weathering, rubbly to blocky, strongly calcareous, abundant carbonaceous roots and fragments.
SN35		SANDSTONE - very fine to fine grained, grey, reddish brown weathering. medium bedded, strongly calcareous, very well cemented. 282/90°S

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 21 JUNE 1981SHEET NO. 6 OF 20

STATION	UNIT	DESCRIPTION
SN36		SILTSTONE - sandy, dark grey, light brown to buff weathering, thin to medium bedded, strongly calcareous, well cemented, outcrop contains one thin band (5cm) of "peacock" coal, the rest of outcrop contains very abundant carbonaceous roots, fragments and impressions. 295/31°S.W.
SN37		SANDSTONE - medium grained, dark grey, grey weathering, thick bedded, strongly calcareous, extremely well cemented. 121/31°N.E.
NOTE:		*SN36 and SN37 are less than 50m distance apart, SN36 is part of the S. limb of an anticline while SN37 is part of the N. limb. The axis of the above anticline bears 298°.
SN38		SANDSTONE - fine grained, dark brown, grey to dark brown weathering, medium to thick bedded, non-calcareous, well cemented, outcrop is severely disturbed exhibiting numerous joints and fractures. Underlain by: CONGLOMERATE - light grey, light grey weathering, non-calcareous, well cemented, the conglomerate is clean, with clasts of light and dark cherts up to 5cm, all well rounded, poorly sorted. 808/13°S
SN39		Numerous large blocks of conglomerate, very well cemented, non-calcareous, matrix of coarse grained grey sandstone, pebbles are predominantly cherts with scattered quartz, clasts are sub-rounded up to 5cm in diameter.
SN40		SANDSTONE - coarse grained, cherts and quartz, dark grey, grey to brown weathering, medium bedded to massive large scale low-angle cross-beds, slightly calcareous, well cemented. 172/25°E
SN41		SANDSTONE - medium to coarse grained, dark grey, grey to light brown weathering, thick bedded, cross laminated, moderately calcareous, moderately cemented, scattered carbonaceous fragments. 138/13°N.E.

GEOLOGICAL

TRAVERSE NOTES.

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 22 JUNE 1981SHEET NO. 7 OF 20

STATION	UNIT	DESCRIPTION
SN42		CONGLOMERATE - (not in place), light grey, grey to bluish grey weathering, clasts of cherts, poorly sorted, angular, grit size to 1cm, clean coarse grained sandstone matrix, non-calcareous.
SN43		SANDSTONE - very coarse sand to grit, brown grey, grey weathering, poorly sorted chert pebbles, angular, non-calcareous, well cemented.
		SANDSTONE - medium grained, grey, brown weathering, medium to thick bedded, large scale low angle cross-beds, slightly calcareous, well cemented. 155/21°S.W.
SN45		SANDSTONE - very fine to fine grained, dark brown, buff to brown weathering, medium to thick bedded, moderately calcareous, extremely well cemented, outcrop is severely disturbed exhibiting abundant jointing and large scale slickensides. 024/22°N.W.
SN46		SANDSTONE - fine grained, light brown to grey, buff to brown weathering, thin to medium bedded, blocky, moderately calcareous, abundant mica flecks on bedding planes. 139/47°N.E.
SN47		Large outcrop 10m+ SANDSTONE - medium grained, brown to grey, buff weathering, medium bedded to thick bedded, slightly calcareous, well cemented, contains abundant mudstone interclasts. Underlain by: MUDSTONE - silty, dark grey, dark grey weathering, rubbly, non-calcareous, contains numerous ironstone concretions and exhibits load casting due to sediments mentioned above. 080/22°N
SN48		SANDSTONE - very fine grained, dark brown, dark brown weathering, appears to be thin bedded, irregular, strongly calcareous, moderately cemented.
SN49		SANDSTONE - very fine grained, grey, grey to blue grey weathering, appears to be thin bedded, non-calcareous, very well cemented.

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 23 JUNE 1981SHEET NO. 8 OF 20

STATION	UNIT	DESCRIPTION	
SN50		CONGLOMERATE - green grey, green grey to grey weathering, non-calcareous, very well cemented, clast of light and dark cherts from grit size to 5cm, poorly sorted, sub-rounded, many exhibit shearing. Conglomerate is associated with lenses and beds of:	
		SANDSTONE - coarse grained, grey brown, grey to blue grey weathering, medium bedded, non-calcareous, well cemented, sandstone contains chert pebbles (up to 1cm) throughout. 112/41°S.W.	
SN51		SANDSTONE - medium to coarse grained, brown to brown grey, grey to blue grey weathering, medium bedded, non-calcareous, well cemented, primarily quartz composition with cherts making up the other component. 80%-20% respectively. 021/17°N.W. (may not be in place)	
SN52		SANDSTONE - very coarse grained, chert composition, minor quartz throughout, grey, grey to blue grey weathering, thick bedded, non-calcareous, well cemented. Outcrop contains lenses of conglomerate, well sorted, well rounded chert pebbles, less than 1cm in diameter, grey, blue grey weathering, non-calcareous, very well cemented.	
		This deposit appears to be a channel log due to the abundance of log impressions, coaly logs and fragments and scattered silicified wood.	
		Entire outcrop is badly jointed, exhibits localized rolls and numerous slickensides.	
SN53		SANDSTONE - very fine grained, light brown, buff to reddish brown weathering, flaggy, fine to thin bedded, strongly calcareous, well cemented, minor low-angle cross-beds. 144/20°S.W.	
SN54		SANDSTONE - fine to medium grained, brown to grey, dark brown to reddish brown, fine to thin bedded, finer sequence is strongly calcareous while the coarser sequence is non-calcareous. 148/18°S.W.	

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 23 JUNE 1981SHEET NO. 9 OF 20

STATION	UNIT	DESCRIPTION
SN55		SANDSTONE - medium grained, light brown, grey weathering, medium bedded, non-calcareous, well cemented.
SN56		SANDSTONE - fine grained, red brown to grey, dark grey to red brown weathering, medium bedded to massive, strongly calcareous, very well cemented. Massive beds contain troughs of sandy conglomerate, matrix of above sand with clasts of light and dark cherts up to 20mm, all sub rounded to rounded. Outcrop also contains numerous log impressions and the carbonaceous remains of logs. This particular outcrop is continuous for at least 500m on a 058 bearing, 5m+ exposed at this point. 107/11 ⁰ N.E.
SN57		SANDSTONE - fine to medium grained, grey, buff to reddish brown weathering, medium bedded to massive, moderately calcareous, well cemented, again has conglomerate described in SN56, due to trough and cross-bedding no strike and dip possible.
SN58		CONGLOMERATE - grey to grey brown, grey weathering, light and dark chert clasts up to 1cm, sub-rounded, moderately sorted, non-calcareous, well cemented, small medium to coarse grained sandstone lenses throughout, numerous impressions throughout entire outcrop. 094/22 ⁰ N
SN59		SANDSTONE - fine grained, grey brown, grey weathering, fine to thick bedded, non-calcareous, small conglomerate lenses (as in SN58) throughout, minor log impressions. 169/9 ⁰ N.E.
SN60		SANDSTONE - fine grained, grey brown, grey weathering, thick bedded, cross-laminated, non-calcareous, small troughs of conglomerate (as in SN58). 079/24 ⁰ N
SN61		SANDSTONE - very fine grained, dark brown to dark grey, light grey weathering, fine to thin bedded, flaggy to rubbly, strongly calcareous, scattered rootlets. 085/22 ⁰ N

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 26 JUNE 1981SHEET NO. 10 OF 20

STATION	UNIT	DESCRIPTION
SN62		SANDSTONE - medium grained, light brown, light grey to buff weathering, appears to be medium bedded, slightly calcareous.
SN63		SANDSTONE - fine grained, light grey to brown, light grey weathering, medium bedded, strongly calcareous, well cemented. 033/11°N.W.
SN64		SANDSTONE - very fine grained, light grey, light grey weathering, medium bedded, non-calcareous very well cemented, outcrop displays numerous joints and slickensides. 091/23°N
SN65		SANDSTONE - very fine grained, brown, dark grey weathering, fine to thin bedded, flaggy to blocky, very strongly calcareous, small scale low-angle cross-beds, abundant carbonaceous debris along bedding planes.
SN66		SANDSTONE - very fine grained, dark grey to orange brown, buff weathering, thin to medium bedded, strongly calcareous, small scale cross-bedding. 029/6°N.W.
SN67		CONGLOMERATE - grey, grey to grey green weathering, clasts of light and dark cherts up to 5cm predominantly smaller, less than 3cm, sub-angular to sub-rounded, non-calcareous, well cemented. 060/21°N.W. Outcrop extends continuously for at least 400m in a westerly direction.
SN68		SANDSTONE - coarse grained, grey to brown grey, light grey to buff weathering, fine to thin bedded, cross-laminated, moderately calcareous, small-scale low-angle cross-beds. 179/24°W
SN69		SANDSTONE - as above, however medium bedded. 160/36°W

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 26 JUNE 1981SHEET NO. 11 OF 20

STATION	UNIT	DESCRIPTION
SN70		SANDSTONE - very fine grained, red brown, light brown to buff weathering, medium bedded, slightly calcareous, small-scale cross-beds, jointing evident throughout. 160/26 ⁰ W
Sn71		SANDSTONE - very fine grained, dark grey, red brown to buff weathering, medium bedded, very strongly calcareous, ferruginous concretions evident. 175/45 ⁰ W
SN72		SANDSTONE - very fine grained, dark grey, red brown to buff weathering, medium bedded, strongly calcareous. 150/31 ⁰ S.W
SN73		SANDSTONE - fine grained, brown to grey brown, dark brown weathering, medium bedded, non-calcareous, well cemented, small-scale low-angle cross-beds. 146/3 ⁰ S.W.
SN74		SANDSTONE - very fine grained, silty, dark grey to orange brown, dark grey weathering, thin bedded, moderately calcareous, silty laminae, some scattered carbonaceous debris. 110/13 ⁰ N.E
SN75		SANDSTONE - very fine grained, dark grey, brown to dark brown weathering, thin to medium bedded, moderately calcareous, well cemented, small-scale, channelling throughout.
SN76		SANDSTONE - very fine grained, brown, grey weathering, medium bedded, blocky, moderately calcareous, well cemented, very resistant. 160/29 ⁰ N.E
SN77		SANDSTONE - very fine grained, dark grey, light grey weathering, medium to thick bedded, irregular, non-calcareous, well cemented. 178/8 ⁰ W

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 27 JUNE 1981SHEET NO. 12 OF 20

STATION	UNIT	DESCRIPTION
SN78		SANDSTONE - coarse to medium grained, dark brown to dark grey, light brown weathering, thick bedded, very calcareous, abundant carbonaceous debris and impressions.
SN79		SANDSTONE - very fine grained, dark grey to dark brown, dark brown weathering, medium irregular bedded, strongly calcareous, very well cemented.
SN80		SANDSTONE - very fine grained, red brown to brown, red brown weathering, thin bedded, strongly calcareous, cross-laminated, small-scale low-angle cross-beds.
SN81		CONGLOMERATE - medium grained, light brown, sandstone matrix, grey weathering, light and dark chert clasts up to 2cm, poorly sorted, sub-angular, non-calcareous, very well cemented. 114/31°N.E
SN82		SANDSTONE - very coarse grained to gritty, orange brown, grey weathering, predominantly chert composition, non-calcareous.
SN83		MUDSTONE - silty, very carbonaceous, dark grey, dark grey to grey weathering, rubbly, non-calcareous, small scattered coal spars. 180/9°E
SN84		SANDSTONE - very fine to fine grained, light grey, grey weathering, appears to be medium bedded, non-calcareous.
SN85		SANDSTONE - very fine grained, dark grey, light grey to grey weathering, medium irregular bedded, non-calcareous, well cemented. 176/14°E
SN86		Coal bearing sequence 10m+; possibly 3m of very hard, blocky, lustrous, coal, possibly 1m of flaky dirty dull lustrous coal, one parting of silty mudstone 1' thick. Roof material is sandstone described in SN85. No visible floors. 142/5°N.e.

GEOLOGICAL
TRAVERSE NOTES

PROPERTY ROCKY CREEK GEOLOGIST DAVID J. STANDRING DATE 30 JUNE 1981 SHEET NO. 13 OF 20

STATION	UNIT	DESCRIPTION
SN87		SANDSTONE - very fine grained, orange brown to dark brown, dark brown weathering, thin irregular bedded, strongly calcareous, muddy laminae, abundant coal spars throughout.
SN88		COAL - 3' plus of hard, dirty, dull, lustrous, blocky to flaky coal. Floor grades from a coaly mud to a siltstone, dark brown, buff weathering, thin bedded, non-calcareous. No visible roof. 164/90N.e Large outcrop 10m+ at this point beds suddenly plung into an overturned anclinal structure.
SN89		SANDSTONES are (1) coarse grained, light grey, light grey weathering, medium bedded, non-calcareous. (2) very fine grained, dark grey, orange brown weathering, thin to medium bedded, non-calcareous. *both are partially metamorphozed. 169/350N.E. to 145/780N.E to post vertical within 20 metres
SN90		SANDSTONE - very coarse to gritty, conglomerate in places, light and dark chert pebbles, grey to blue grey weathering, medium to thick bedded, non-calcareous, well-cemented. 148/180N.E.
SN91		SANDSTONE - medium grained, grey, light brown weathering, thin bedded, slightly calcareous. 235/170N.W.
SN92		TOP
(TRENCH SNTR22)		0.23m SILTSTONE - muddy, buff to light brown weathering 0.46m SILTSTONE - thinly laminated, non-calcareous, abrupt contact with underlying coal. 0.20m weathered coal. 0.23M COAL, hard, bright, strongly cleated. 0.16m COAL, weathered, pulverized, type indeterminate. 0.23m COAL, bright, strongly cleated. 0.20m MUDSTONE, bright coal bands. 1.5m MUDSTONE, carbonaceous, occasional coaly bands.

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 6 JULY 1981SHEET NO. 14 OF 20

STATION	UNIT	DESCRIPTION
SN92cont..		0.15m SANDSTONE, silty, ferruginous. 072/16 ⁰ N.W
		BASE
SN93		SANDSTONE - fine grained, light brown, grey weathering, medium bedded, moderately calcareous, well cemented. 125/35 ⁰ N.E
SN94		SANDSTONE - fine grained, dark brown, light grey to buff weathering, thin irregular bedded, flaggy, strongly calcareous, well cemented. 124/28 ⁰ N.e
SN95		SANDSTONE - fine grained, light brown, grey weathering, thin to medium bedded, strongly calcareous, well cemented. 150/21 ⁰ N.E
SN96		COAL BLOOM: 2m+ coal bearing sequence, bands of hard bright block coal with carbonaceous mudstone and dull lustrous dirty coal. Roof: SANDSTONE - very fine grained, silty, dark grey, orange to light brown weathering, fine to thin bedded, non-calcareous, moderately cemented. Floor: SANDSTONE - fine to medium grained, light grey, brown to buff weathering, thin bedded, strongly calcareous, grading into; SILTSTONE - rubbly, light grey, light grey weathering, non-calcareous, siltstone contains one (1) 20cm ferruginous band, bright orange, nodular, non-calcareous. 145/25 ⁰ N.E
SN97		SANDSTONE - very fine to fine grained, grey, light grey to brown, grey weathering, thin bedded, strongly calcareous. 129/12 ⁰ N.E

GEOLOGICAL
TRAVERSE NOTES

PROPERTY ROCKY CREEK

GEOLOGIST DAVID J. STANDRING

DATE 8 JULY 1981

SHEET NO. 15 OF 20

STATION	UNIT	DESCRIPTION
SN98		SANDSTONE - medium grained, dark brown (when wet) dark brown weathering, medium to thick bedded, small scale, cross-lamination, slightly calcareous, well cemented. 069/11°N.W
SN99		SANDSTONE - fine grained, light grey, light grey weathering, thin bedded, non-calcareous, moderately cemented, abundant rootlets. 024/10°S.E
SN100		SANDSTONE - very fine grained, dark brown, dark brown to orange brown weathering, fine to thin irregular bedded, strongly calcareous, abundant impressions and carbonaceous fragments along bedding planes. 185/8°W
SN101		SILTSTONE - dark grey, orange brown to buff weathering, fine to thin bedded, rubbly, strongly calcareous. Underlain by: MUDSTONE - carbonaceous, grey, dark grey weathering, rubbly, non-calcareous. 120/6°N.E.
SN102		SANDSTONE - medium to coarse grained, grey, light grey to grey weathering, thin to medium bedded, non-calcareous, strongly jointed. 122/12°N.E
SN103		SANDSTONE - very fine grained, light grey, grey to grey brown weathering, medium irregular bedded, strongly calcareous, well cemented, scattered carbonaceous debris. 140/10°N.E
SN104		SANDSTONE - coarse grained, grey brown, light grey weathering, medium to thick bedded, small scale, cross-laminations, channelling evident, non-calcareous, well cemented. 124/7°N.E

GEOLOGICAL
TRAVERSE NOTES

PROPERTY ROCKY CREEK

GEOLOGIST DAVID J. STANDRING

DATE 8 JULY 1981

SHEET NO. 16 OF 20

STATION	UNIT	DESCRIPTION
SN105		<p>Large Outcrop 9-10m</p> <p>SANDSTONE - medium to coarse grained, grey, light grey to grey weathering, medium to thick bedded, strongly calcareous, well cemented.</p> <p>Underlain by:</p> <p>SILTSTONE - dark grey, light brown to orange brown weathering, occasional bands of dark grey weathering rock, blocky, very strongly calcareous, well cemented.</p> <p>*this outcrop forms a waterfall at the major turn in creek (above HP8).</p> <p style="text-align: center;">135/14°N.E</p>
SN106		<p>SANDSTONE - fine grained, reddish brown, light brown weathering, thin to medium bedded, troughing (channelling) evident, very strongly calcareous, very well cemented.</p> <p style="text-align: center;">086/15°N</p>
SN107		<p>SANDSTONE - very fine to fine grained, grey brown, dark brown weathering, thin bedded, slightly calcareous.</p> <p style="text-align: center;">136/11°N.E.</p>
SN108		<p>SANDSTONE - as in SN107.</p> <p style="text-align: center;">085/9°N</p>
SN109		<p>SILTSTONE - dark grey, dark grey to light brown to buff weathering, thin bedded, rubbly to blocky, strongly calcareous, well cemented.</p> <p style="text-align: center;">070/11°N.W</p>
SN110		<p>SANDSTONE - very fine grained, grey brown, dark grey to dark brown weathering, thin bedded, slightly calcareous, moderately cemented, strongly jointed.</p> <p style="text-align: center;">147/18°N.E</p>
SN111		<p>CONGLOMERATE - poorly sorted, clasts of light and dark cherts up to 4cm, sub-angular to sub-rounded, very well cemented, non-calcareous.</p>

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 8 JULY 1981SHEET NO. 17 OF 20

STATION	UNIT	DESCRIPTION
SN112		40m vertical drop from SN111 passing through conglomerate in SN111 into: CONGLOMERATE - very poorly sorted, green grey weathering, clasts of light and dark cherts, upto 10cm in diameter, sub-angular, very well cemented, non-calcareous. *20m exposure. Underlain by: SANDSTONE - fine grained, light brown, buff weathering, medium bedded, slightly calcareous.
SN113		SANDSTONE - very fine grained, light brown, dark brown weathering, medium to thick bedded, blocky, moderately calcareous, well cemented, strongly jointed. 114/8°N.E
SN114		SANDSTONE - coarse grained, dark grey to brown, grey brown weathering, thin to medium bedded, non-calcareous, abundant rusty weathering grains.
SN115		SANDSTONE - coarse grained, light grey, buff to light reddish brown weathering, thin to medium bedded, blocky to flaggy, small scale low-angle cross-beds, moderately calcareous, moderately cemented. 172/26°E
SN116		SANDSTONE - very fine grained, light grey to light brown, buff to brown weathering, fine to thin ripple bedded, flaggy, strongly calcareous. Underlain by: SANDSTONE - medium to coarse grained, light grey, grey weathering, thin to thick bedded, blocky, low-angle cross-laminations in thick beds, slightly calcareous, well-cemented - lower section of this outcrop contains conglomerate lenses: pebbly conglomerate, poorly sorted, angular to sub rounded clasts, non-calcareous, clasts all less than 1cm. 232/8°S.E
SN117		SANDSTONE - medium to coarse grained with conglomerate lenses, both lithologies as in SN116. *glacially eroded no strike and dip possible.

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 25 JULY 1981SHEET NO. 18 OF 20

STATION	UNIT	DESCRIPTION
SN118		CONGLOMERATE with SANDSTONE lenses: CONGLOMERATE - coarse grained sandstone matrix, poorly sorted, clasts of light and dark cherts, angular to sub-rounded, up to 5cm, generally less than 2-3cm non-calcareous, well cemented.
		SANDSTONE - coarse grained to gritty, light grey, light grey to grey weathering, thick bedded to massive, non-calcareous, abundant chert pebbles throughout. 320/15°S.W.
SN119		SANDSTONE - fine grained, grey, light brown weathering, thin to thick bedded, non-calcareous, well cemented, scattered carbonaceous debris, scattered mudstone interclasts. 277/9°S
SN120		SANDSTONE - fine grained, salt and pepper colouration, dark grey weathering, thin bedded, non-calcareous. 180/9°W
SN121		SANDSTONE - very fine grained, light grey, light grey to buff weathering, appears to be thin bedded, non-calcareous, scattered very fine carbonaceous debris.
SN122		SANDSTONE - medium grained, light brown, grey to brown weathering, thin bedded, non-calcareous, moderately cemented. 345/20°S.W
SN123		SANDSTONE - medium grained, salt and pepper colouration, red brown to grey weathering, thin bedded, non-calcareous, moderately cemented, scattered siltstone interclasts - outcrop contains a pebbly conglomerate lense 1m long x 20cm thick, poorly sorted, clasts of light and dark cherts, sub-rounded, non-calcareous, well cemented. 340/21°S.W

GEOLOGICAL
TRAVERSE NOTES

PROPERTY ROCKY CREEK GEOLOGIST DAVID J. STANDRING DATE 28 JULY 1981 SHEET NO. 19 OF 20

STATION	UNIT	DESCRIPTION
SN124		SANDSTONE - fine grained, light brown, light brown to grey weathering, fine to medium bedded, strongly calcareous, well cemented; small scale low-angle cross-beds in finer beds. 012/14°S
SN125		SANDSTONE - very fine grained, silty, dark grey, buff to orange brown weathering, thin to medium bedded, flaggy to blocky, strongly calcareous, small scale, low angle, cross-beds. 116/22°N.E
SN126		SANDSTONE - very coarse grained to fine conglomerate, dark grey, grey to reddish brown, thick bedded, non-calcareous, well cemented, numerous impressions, (log impressions) and carby to coaly spars, appears to be a channel log. 152/22°N.E
SN127		SANDSTONE - very coarse grained to gritty, grey, grey weathering, thick bedded to massive, non-calcareous. 118/36°N.E
SN128		SANDSTONE - medium grained, light brown, buff to dark grey weathering, thin to medium unevenly bedded, blocky, slightly calcareous, moderately cemented. 166/12°N.E
SN129		SANDSTONE - fine grained, light grey to light brown, grey to light red brown weathering, thick bedded, strongly calcareous, well cemented. 044/24°N.W
SN130		SANDSTONE - medium to coarse grained, grey to brown, reddish brown weathering, fine to thin bedded, blocky to flaggy, non-calcareous, abundant rusty weathering grains. 172/8°W
SN131		SANDSTONE - very coarse grained to gritty, occasional small fine conglomerate lenses, chert composition, light grey, grey to dark grey weathering, massive, thinly laminated, non-calcareous, well-cemented. 163/7°S.W

GEOLOGICAL
TRAVERSE NOTES

PROPERTY ROCKY CREEK GEOLOGIST DAVID J. STANDRING DATE 28 JULY 1981 SHEET NO. 20 OF 20

STATION	UNIT	DESCRIPTION	
SN132		SANDSTONE - fine to medium grained, light brown to grey, light brown to reddish brown weathering, thin bedded, large scale low-angle, cross-beds, slightly calcareous, well cemented.	
		142/28°S.W	
SN133		SANDSTONE - fine grained, brown, dark brown weathering, appears to be thick bedded, non-calcareous, appears to be S.W. dipping.	
SN134		CONGLOMERATE - sandy, fine sand matrix, light and dark chert clasts, poorly sorted, sub-angular to sub-rounded pebbles up to 1cm, non-calcareous, well cemented.	
SN135		SANDSTONE - fine to very coarse grained, grey to light brown, grey to buff weathering, thin bedded to massive (massive beds are vcg) non-calcareous, well cemented.	
		148/19°N.E	
SN136		SANDSTONE - very fine to fine grained, light brown, brown to grey, thin bedded to massive, non-calcareous, very fine carbonaceous laminae.	
		130/10°N.E	
SN137		SANDSTONE - course grained, grey, dark grey, weathering, thick bedded, non-calcareous, well cemented, numerous impressions.	
		114/14°N.E	
SN138		SANDSTONE - very fine grained, silty, dark grey, light brown weathering, fine bedded, strongly calcareous, well cemented, very fine silty laminae.	
		230/12°N.W	
SN138		SANDSTONE - as in SN138	
		260/12°N	

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST C. BICKFORDDATE 29 MAY 1981SHEET NO. 1 OF 2

STATION	UNIT	DESCRIPTION
JA-1	GEL	Here along ridge is exposed the following section: TOP
		SANDSTONE - fine grained, light grey, conglomeratic. Forms top of ridge. Attitude 133/16NE.
		CONGLOMERATE - granule to pebble. At least 6m thick.
JA-2	GEL	CONGLOMERATE - granules (a few small pebbles) in a coarse sand matrix; thick bedded and blocky, with some interbedded SANDSTONE - coarse grained, light grey, clean. Attitude 127/15NE.
JA-3	GEL	Here by drill site "0" is SANDSTONE - medium grained, medium grey; medium, irregular bedded, dirty with log impressions. Attitude 040/5SE
JA-4	GEL	Here by lake is SANDSTONE - very fine to fine grained, thin platy beds, buff weathering; small-scale low-angle cross-laminated. Attitude 107/37NE; about 6m above Gething/Cadomin contact.
JA-5	GEL	SANDSTONE - very fine grained, silty, forms line of bluffs above Grizzly zone. Very thin, platy beds; Attitude 090/4N.
JA-6	GEL	Here a top hill near BP12 is SANDSTONE - medium to very coarse grained, light grey, siliceous, thin bedded. Trough and low-angle cross-bedded, locally gritty, some roots and plant stem impressions. Attitude 129/24S.W.
JA-7	GEL	SLP walked out sandstone outcrop. Here attitude is 141/29S.W, in coarse grained to very coarse grained, siliceous, channel cross-bedded sandstone. Some slickensides on bedding.
JA-8	GEL	Here is a low rounded ledge of SANDSTONE - fine grained, clean, brown weathering, some intraclasts and coal spars; large scale trough cross-bedded, thin-bedded, platy. Attitude 055/14SE. Thickness 1.5m+

GEOLOGICAL

TRAVERSE NOTES

PROPERTY ROCKY CREEKGEOLOGIST DAVID J. STANDRINGDATE 31 JULY 1981SHEET NO. 1 OF 1

STATION	UNIT	DESCRIPTION
M556		SANDSTONE - fine to medium grained, light brown to grey, light brown to orange brown weathering, thin irregular bedded, slightly calcareous, moderately cemented, abundant rusty weathering grains. 092/38 ⁰ N
M557		SANDSTONE - as above, abundant low angle, cross-beds. 121/78 ⁰ N.E
M558		SANDSTONE, as in M556 149/26 ⁰ N.E
M559		SANDSTONE - very fine grained, grey, light grey weathering, fine to thin bedded, non-calcareous, well cemented, strongly jointed, shattered bedding, has a somewhat 'baked' appearance. 154/58 ⁰ N.E
M560		SANDSTONE - fine to medium grained, light grey to light brown, brown to reddish brown, fine to thin bedded, non-calcareous, abundant rusty weathering grains. 171/17 ⁰ E
M561		SANDSTONE - as above (M560) 131 ⁰ /21 ⁰ N.E
M562		SANDSTONE - fine to medium grained, light brown, brown to dark brown, weathering, thin bedded, strongly calcareous, moderately cemented, abundant orange weathering grains. 154/20 ⁰ S.W
M563		SANDSTONE - as in M562 136/19 ⁰ S.W

PR-Rocky Creek 81(3)A
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BP 81-06 - BP 81-19 inc. Book 2

620



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B.P. Canada



CONFIDENTIAL

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

00 620

COMPOSITE SAMPLES FOR PETROGRAPHIC ANALYSIS

BP SAMPLES

BIRTLEY LAB SAMPLES

CASCADE SAMPLE NO.

SN-80 1/1/1
SN-80 1/1/3
SN-80 1/1/4

5548
5550
5551

SN-80-1/1-PG1

SN-80 1/2/1
SN-80 1/2/3
SN-80 1/2/6

5555 & 5556
5558
5560

SN-80-1/2-PG2

SNTR 18/13
SNTR 18/14
SNTR 18/15
SNTR 18/16
SNTR 18/17
SNTR 18/18
SNTR 18/20

6381
6382
6383
6384
6385
6386
6388

SNT-18-PG4

SNTR 19/2
SNTR 19/4
SNTR 19/6
SNTR 19/7
SNTR 19/9

5849
5851
5853
5854
5856

SNT-19-PG5

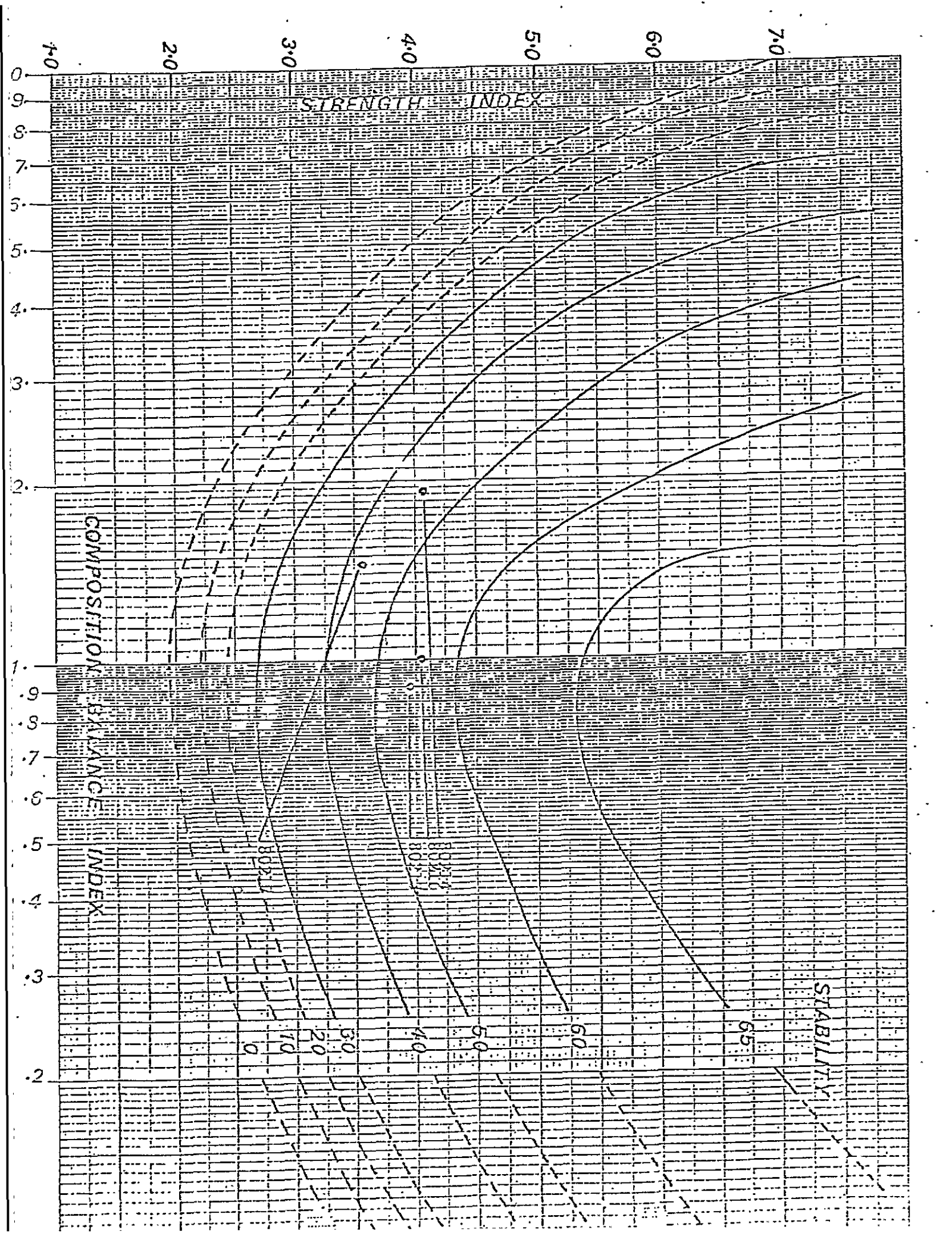
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REFLECTANCE DATA

SAMPLE No CCP No	MEAN MAX. REFLECTANCE.	V - TYPES													VM%	ASH	SUL.		
		V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15	V-16	V-17	V-18	V-19					
6614-SN-80-1/1#1 80213	1.024			23	17	8	2											10.7	0.4
6615-SN-80-1/2#2 80214	1.154				13	22	12	3										10.8	0.3
6617-SNT-18-PG#4 80216	1.103			6	18	17	9				OXIDIZED/WEATHERED						15.0	0.3	
6618-SNT-19-PG#5 80217	0.986			30	20						OXIDIZED/WEATHERED						13.2	0.4	

MACERAL DATA.

SAMPLE No CCP No	VITRINITE	EXINITE	SEMIFUSINITE	MACRINITE	MICRINITE	FUSINITE	MINERAL MATTER	REACTIVES %	INERTS %	COMPOSITIONAL BALANCE INDEX	STRENGTH INDEX	PREDICTED COKE STABILITY	APPROX. JIS DRUM INDEX
6614-SN-80-1/1-PG#1 80213	62.62	3.79	22.72	0.75	1.26	3.03	5.81	73.90	26.10	0.90	3.90	54	92
6615-SN-80-1/2-PG#2 80214	45.33	3.20	41.06	0	2.40	2.66	5.33	59.08	40.92	1.91	4.18	46	91
6617-SNT-18-PG#4 80216	58.65	0.58	29.32	0	0.29	0.87	10.26	70.53	29.47	1.10	4.18	57	92
6618-SNT-19-PG#5 80217	48.64	3.40	34.01	0	5.10	2.04	6.80	63.05	36.95	1.47	3.60	42	91



PETROGRAPHY OF
COAL SAMPLES 702-709
FOR
B.P. EXPLORATION CANADA LTD.
CALGARY

NOVEMBER 1981

David E. Pearson & Associates Ltd.,
Consulting Coal Geologists & Petrographers,
804 Leota Place,
Victoria,
British Columbia
V8Y 1H2

INTRODUCTION

Eight crushed, raw-coal samples were received at the Coal Laboratory on October 29, 1981. The samples were identified as follows:-

702	GRIZZLY
703	GRIZZLY
704	B SEAM
705	B LOWER SEAM
706	C SEAM
707	C LOWER SEAM
708	GRIZZLY
709	GRIZZLY

SAMPLE PREPARATION

The crushed coal was coned and quartered and reduced to ten grams to provide material for one pellet. This coal was then placed in a pre-greased, reuseable METSERV 25 mm plastic mould. Cold-set epoxy resin, to which had been added a portion of hardener, was then mixed with the coal and allowed to set. This is the preferred method of sample preparation for all ranks of coal, as it does not affect the reflectance of vitrinites. The alternative method, using Beuhler TRANSOPTIC powder has been shown to increase vitrinite reflectance in low-rank coals (Marchioni, 1978, -see Appendix E).

Pellets were polished for examination on Beuhler polishing equipment.

PETROGRAPHIC EXAMINATION

The polished samples were examined using a Leitz Orthoplan Compact microscope-photometer. The control panel of the microscope is interfaced to a Hewlett Packard 85 minicomputer, HP 82905A printer and HP 7225A plotter for automatic computation, tabulation and draughting of results.

One hundred individual vitrinite 'A' grains were measured for reflectance in the rank analysis. Standardization of photometer-readout was performed prior to and subsequent to these analyses and after every twenty-five readings. Maximum reflectance values were retained by the computer.

One thousand grains were counted during the maceral analysis, at traverse steps of 0.5 mm. The maceral semifusinite deserves special mention because of its peculiar thermorheological behavior. Dr. Winfried Koensler of RHURKOHLE, Essen, West Germany, completed a thesis in 1980 on Elco property and Saxon property coals from British Columbia (Das Verhalten des Inertinitis Westkanadischer Kreidekohlen bei der Verkokung, Koensler, March 1980, 118p.). The results of this study show that semifusinite with a maximum reflectance 0.2% greater than the mean maximum reflectance of the associated vitrinite 'A' will not melt during carbonization. Whereas, those semifusinites with reflectances up to the vitrinite 'A' \bar{R}_0 max + 0.2% do melt.

This conclusion, which was based on a rigorous petrographic study, combined with melting experiments, on whole polished slabs of coal from Western Canada, removes the willy-nilly apportioning of 1/3 and 2/3 semifusinite to the reactive and inert categories respectively, and allows the assignment of inert or reactive character of macerals, whether or not in coking coal, to be made on a more scientific basis.

The reflectance of each semifusinite maceral encountered in the maceral analysis was measured and depending upon the result was assigned to the inert or reactive category.

To obtain information on the percentage mineral-matter in the coal fragments, a separate point count analysis was performed. A distinction was made between coal particles devoid of any mineral matter, the microlithotype vitrain with mineral matter, the microlithotype trimacerite with mineral matter and grains wholly composed of mineral matter.

The results of the petrographic analyses and the mineral-matter/coal analyses are contained in table form in Appendix A. The individual readings made in the reflectance analysis are listed together with the Basic Statistics in Appendix B. Computer-generated histograms of the samples are located in Appendix C, and pie-diagrams showing the maceral distribution of the samples are contained in Appendix D.

STATISTICAL ANALYSIS

The standard error of the mean of the \bar{R}_{omax} readings is given for each sample in the computer listings in Appendix B, and is tabulated below.

<u>Standard error of the mean</u>	<u>0.0</u>	<u>0.1</u>
Number of samples	7	1

It is worth noting that a standard error of the mean of 0.02% is reported as acceptable by M.T. Mackowsky in Stach's Textbook of Coal Petrology.

Similarly, the spread of the readings is given by the standard deviation, which is a measure of frequency of readings about the mean. One standard deviation contains 68% of all readings. For the data presented in the report, the following apply:-

<u>One standard deviation</u>	<u>±0.03</u>	<u>±0.04</u>	<u>±0.05</u>	<u>±0.06</u>
Number of samples	-	4	4	-

Stach's Textbook of Coal Petrology, and the Handbook of the International Committee for Coal Petrology both show histograms with \bar{R}_{omax} standard deviations of ± 0.06 . Nevertheless, these standard deviations, in our opinion, are higher than many coals we have examined from Western Canada.

The individual maceral data has a standard deviation of about $\pm 5\%$.

The coals examined have vitrinite reflectances that indicate them to be of either high volatile bituminous rank ($<1.12\% \bar{R}_o$) or medium volatile bituminous rank ($>1.12 < 1.51\% \bar{R}_o$). The actual range in reflectance is 0.98% - 1.22%.

Despite the fact that the coals examined were unwashed, and that they possess considerable amounts of mineral-matter, the total inert content of most of them is high, ranging from 29.5% to 60.4%. Six of the samples have total-reactive contents of less than 55%. Exinite is present in all samples.

Sample B.P. 709 is deeply weathered; many vitrinite grains have both oxidation rims and cracked margins.

The mineral-matter/coal analysis shows, to a certain degree, the relative ease of cleaning of the coals. B.P. 706, for example, has 85% mineral-matter-free coal fragments, few grains enclosing mineral matter, and little free mineral matter. It should clean easily. By contrast, B.P. 709 has the fewest clean coal fragments of all samples, and although it has much free mineral-matter (26%), over 30% of the coal grains contain mineral-matter of some description. Not surprisingly, it appears to be a poor coal to wash.

APPENDIX A

PETROGRAPHIC ANALYSIS

IDENTIFICATION

Description	B.P. 702	B.P. 703	B.P. 704	B.P. 705	B.P. 706	B.P. 707	B.P. 708	B.P. 709
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DISTRIBUTION OF VITRINITE TYPES

V-6								
V-7								
V-8								
V-9			1					57
V-10	23	12	49			2	16	43
V-11	73	77	46	26	35	55	82	
V-12	4	11	4	71	60	42	2	
V-13				3	5	1		
V-14								
V-15								
V-16								
V-17								
V-18								

REACTIVE COMPONENTS

Total Vitrinite	45.7	34.2	43.7	39.9	40.9	30.0	34.9	66.9
Reactive Semi-fusinite	2.3	4.5	5.6	7.6	9.6	6.2	6.8	2.0
Exinite	2.1	2.7	7.1	1.9	2.3	3.4	2.4	1.6
Total	50.1	41.4	56.4	49.4	52.8	39.6	44.1	70.5

INERT COMPONENTS

Inert Semi-fusinite	20.3	41.3	29.4	33.7	37.2	45.2	34.9	8.5
Macrinite	0.7	0.9	0.8	0.7	0.8	1.0	0.9	1.2
Fusinite	1.2	1.2	1.1	1.0	2.1	1.4	1.4	0.4
Inertodetrinite	0.7	0.9	0.5	1.2	0.9	1.3	1.9	0.4
Mineral Matter	27.0	14.3	11.8	14.0	6.2	11.5	16.8	19.0
Total	49.9	58.6	43.6	50.6	47.2	60.4	55.9	29.5

PETROGRAPHIC INDICES

Mean Reflectance	1.12	1.14	1.10	1.22	1.21	1.19	1.13	0.98
Standard Deviation	±0.04	±0.05	±0.05	±0.04	±0.05	±0.05	±0.04	±0.04

* Deeply oxidized sample

MINERAL-MATTER/COAL ANALYSIS

Values Rounded to Whole Numbers

		B.P. 702	B.P. 703	B.P. 704	B.P. 705	B.P. 706	B.P. 707	B.P. 708	B.P. 709*
Fragments Wholly of Coal	%	34	65	46	53	85	61	56	43
Fragments of Vitrain and Mineral-Matter	%	30	25	8	12	1	3	14	19
Fragments of Trimacerite and Mineral-Matter	%	11	5	2	23	5	21	12	12
Fragments Wholly of Mineral-Matter	%	25	5	44	12	9	15	18	26

* Deeply oxidized coal sample

APPENDIX B

VITRINITE REFLECTANCE DATA FOR
 B.F. EXPLORATION SAMPLE #702 GRIZZLY

I	X(I)	X(I+1)
1	1.1100	1.1500
3	1.0800	1.1000
5	1.1800	1.0600
7	1.1000	1.1500
9	1.1500	1.0500
11	1.0700	1.1200
13	1.1500	1.1400
15	1.0700	1.0700
17	1.1600	1.1400
19	1.0800	1.0700
21	1.0500	1.1600
23	1.1400	1.1900
25	1.1500	1.1100
27	1.0700	1.1700
29	1.1100	1.1900
31	1.1200	1.0700
33	1.1400	1.1300
35	1.0900	1.1400
37	1.1900	1.1700
39	1.1100	1.0900
41	1.1000	1.1100
43	1.0600	1.1800
45	1.1500	1.1900
47	1.2000	1.1200
49	1.1100	1.0900
51	1.1500	1.1100
53	1.1000	1.1200
55	1.0900	1.1300
57	1.1500	1.1500
59	1.2000	1.1700
61	1.1100	1.1100
63	1.0600	1.1400
65	1.1000	1.1000
67	1.1300	1.1400
69	1.1100	1.1600
71	1.1000	1.1000
73	1.1300	1.1100
75	1.0900	1.1100
77	1.2100	1.1100
79	1.0600	1.0700
81	1.1800	1.1000
83	1.1600	1.1200
85	1.0900	1.1300
87	1.1500	1.2000
89	1.1600	1.1100
91	1.1600	1.1100
93	1.1600	1.0800
95	1.0800	1.1200
97	1.1000	1.1000
99	1.1700	1.1100

B. P. EXPLORATION SAMPLE #702 GRIZZLY

BASIC STATISTICS

N = 100

STD ERROR OF THE MEAN= .00

MEAN = 1.1231

COEF OF VARIATION = 3.46%

VARIANCE = .0015

STANDARD DEVIATION = .0389

SKEWNESS = .2108

KURTOSIS = 2.2855

95.00% C.I. FOR MEAN:

(1.1154, 1.1308)

ONE-TAIL t(99 , .025)=

1.98466175739

VITRINITE REFLECTANCE DATA FOR
 B.F. EXPLORATION SAMPLE #703 GRIZZLY

I	X(I)	X(I+1)
1	1.1500	1.0500
3	1.0900	1.2100
5	1.1500	1.1400
7	1.1500	1.0800
9	1.2200	1.1600
11	1.1300	1.1500
13	1.1700	1.1500
15	1.0500	1.1000
17	1.2300	1.1300
19	1.2400	1.1100
21	1.1400	1.1600
23	1.2000	1.1600
25	1.1300	1.1000
27	1.1200	1.1800
29	1.1900	1.2300
31	1.1100	1.1500
33	1.1100	1.1900
35	1.1100	1.1800
37	1.1200	1.1400
39	1.1200	1.1700
41	1.2500	1.1800
43	1.1800	1.1500
45	1.1300	1.1800
47	1.1600	1.1000
49	1.1000	1.0700
51	1.1600	1.1200
53	1.1400	1.1000
55	1.1700	1.1700
57	1.1600	1.1600
59	1.1400	1.0900
61	1.1000	1.1900
63	1.1700	1.1900
65	1.1000	1.0200
67	1.0900	1.2400
69	1.1800	1.1700
71	1.1300	1.1300
73	1.1200	1.1700
75	1.1400	1.0700
77	1.1700	1.1600
79	1.1300	1.1300
81	1.1000	1.1600
83	1.1900	1.2000
85	1.2300	1.0900
87	1.1200	1.1100
89	1.1600	1.1000
91	1.0700	1.0700
93	1.1200	1.1000
95	1.1400	1.1600
97	1.2200	1.1800
99	1.1700	1.1500

S. P. EXPLORATION SAMPLE #703 GRIZZLY

BASIC STATISTICS

N = 100
STD ERROR OF THE MEAN = .00
MEAN = 1.1442
COEF OF VARIATION = 3.97%
VARIANCE = .0021
STANDARD DEVIATION = .0454
SKEWNESS = .0035
KURTOSIS = 2.9062

95.00% C.I. FOR MEAN:

1.1352, 1.1532)

ONE-TAIL t(99 , .025)= 1.98466175739

VITRINITE REFLECTANCE DATA FOR
 B.F. EXPLORATION SAMPLE #704 B SEAM

I	X(I)	X(I+1)
1	1.1000	1.0700
3	1.0800	1.1700
5	1.0900	1.0800
7	1.1800	1.2000
9	1.0700	1.1400
11	1.0600	1.2000
13	1.0800	1.0800
15	1.1800	1.0800
17	1.1800	1.0600
19	1.1800	1.2000
21	1.1400	1.0500
23	1.0900	1.0800
25	1.1800	1.1500
27	1.0700	1.0900
29	1.0600	1.1000
31	1.1500	1.1400
33	1.0900	1.0500
35	1.0600	1.1300
37	1.0200	1.1200
39	1.1400	1.1000
41	1.0400	1.1200
43	1.1200	1.1500
45	1.1600	1.1500
47	1.1600	1.1000
49	1.1500	1.0800
51	1.1700	1.1200
53	1.1500	1.1200
55	1.0800	1.1300
57	1.1400	1.2000
59	1.1300	1.0600
61	1.0100	1.1100
63	1.0200	1.1300
65	1.0200	1.1500
67	1.1300	1.1300
69	1.1000	1.0800
71	1.0300	1.0800
73	1.0400	1.1300
75	1.0300	1.1000
77	1.1800	0.9900
79	1.0600	1.1600
81	1.0700	1.0400
83	1.0900	1.0600
85	1.0300	1.0800
87	1.0800	1.0000
89	1.0500	1.1200
91	1.0700	1.0800
93	1.1700	1.0400
95	1.1300	1.1300
97	1.0700	1.0300
99	1.0600	1.0500

B.F. EXPLORATION SAMPLE #704 B SEAM

BASIC STATISTICS

N = 100

STD ERROR OF THE MEAN= .01

MEAN = 1.1015

COEF OF VARIATION = 4.63%

VARIANCE = .0026

STANDARD DEVIATION = .0510

SKEWNESS = .0739

KURTOSIS = 2.1902

95.00% C.I. FOR MEAN:

(1.0914, 1.1116)

ONE-TAIL t(99 , .025)=

1.98466175739

VITRINITE REFLECTANCE DATA FOR
 B.P. EXPLORATION SAMPLE #705 B LOWER SEAM

I	X(I)	X(I+1)
1	1.2000	1.2800
3	1.2200	1.2400
5	1.1300	1.2100
7	1.2300	1.2500
9	1.2700	1.1900
11	1.2400	1.2200
13	1.2600	1.2700
15	1.1700	1.1600
17	1.2400	1.2600
19	1.1700	1.2600
21	1.2200	1.1500
23	1.2300	1.2700
25	1.3100	1.2400
27	1.2500	1.2100
29	1.2500	1.2700
31	1.2600	1.1600
33	1.1500	1.1300
35	1.2100	1.1900
37	1.2100	1.2700
39	1.1800	1.2600
41	1.2600	1.2700
43	1.2000	1.1900
45	1.2500	1.3100
47	1.2400	1.2100
49	1.2600	1.3000
51	1.2500	1.2400
53	1.2500	1.2000
55	1.2400	1.1900
57	1.2200	1.2300
59	1.2100	1.2500
61	1.2400	1.2000
63	1.1800	1.2400
65	1.1700	1.2000
67	1.2200	1.2700
69	1.2300	1.1500
71	1.2000	1.2400
73	1.2700	1.1800
75	1.1400	1.1300
77	1.1800	1.1400
79	1.1200	1.2600
81	1.2400	1.2900
83	1.2500	1.2200
85	1.2500	1.2000
87	1.2400	1.1700
89	1.2400	1.2400
91	1.2200	1.2600
93	1.1200	1.2100
95	1.2000	1.2700
97	1.2300	1.1900
99	1.1600	1.2800

B.P. EXPLORATION SAMPLE #705 B LOWER SEAM

BASIC STATISTICS

N = 100
STD ERROR OF THE MEAN = .00
MEAN = 1.2210
COEF OF VARIATION = 3.62%
VARIANCE = .0020
STANDARD DEVIATION = .0442
SKEWNESS = -.4270
KURTOSIS = 2.5601

95.00% C.I. FOR MEAN:
(1.2122, 1.2298)
ONE-TAIL t(99 , .025) = 1.98466175739

VITRINITE REFLECTANCE DATA FOR
 B.F. EXPLORATION SAMPLE #706 C SEAM

I	X(I)	X(I+1)
1	1.2000	1.2600
3	1.2400	1.3000
5	1.2400	1.1800
7	1.2200	1.2600
9	1.1300	1.1600
11	1.3000	1.2700
13	1.2300	1.2300
15	1.2300	1.2400
17	1.1900	1.1300
19	1.2500	1.2100
21	1.2300	1.2300
23	1.2100	1.2400
25	1.2100	1.2300
27	1.2800	1.1700
29	1.1900	1.1400
31	1.2100	1.2300
33	1.2600	1.2100
35	1.2200	1.1500
37	1.2700	1.2700
39	1.2200	1.1600
41	1.1800	1.1800
43	1.2700	1.3200
45	1.2000	1.1300
47	1.1700	1.1800
49	1.1700	1.2600
51	1.1900	1.2600
53	1.2000	1.2400
55	1.1700	1.1600
57	1.2600	1.2900
59	1.2100	1.1600
61	1.1700	1.1000
63	1.2100	1.1700
65	1.1500	1.2600
67	1.1700	1.2100
69	1.2200	1.2100
71	1.1700	1.2600
73	1.2200	1.2600
75	1.2100	1.2100
77	1.1800	1.2800
79	1.2600	1.3000
81	1.2700	1.2100
83	1.2300	1.2100
85	1.1400	1.1400
87	1.1600	1.2700
89	1.1400	1.2000
91	1.1100	1.2200
93	1.1700	1.2500
95	1.2500	1.2500
97	1.3000	1.2600
99	1.1600	1.1500

B.F. EXPLORATION SAMPLE #706 C SEAM

BASIC STATISTICS

N = 100
STD ERROR OF THE MEAN = .00
MEAN = 1.2131
COEF OF VARIATION = 3.98%
VARIANCE = .0023
STANDARD DEVIATION = .0483
SKEWNESS = -.0855
KURTOSIS = 2.3060

95.00% C.I. FOR MEAN:
1.2035, 1.2227)
ONE-TAIL t(99 , .025) = 1.98466175739

VITRINITE REFLECTANCE DATA FOR
 B.F. EXPLORATION SAMPLE #707 C LOWER SEAM

I	X(I)	X(I+1)
1	1.2100	1.2100
3	1.1900	1.2300
5	1.2500	1.2400
7	1.1700	1.1800
9	1.1600	1.1900
11	1.1600	1.1700
13	1.1800	1.2200
15	1.1700	1.1700
17	1.2300	1.2300
19	1.1800	1.1500
21	1.1700	1.1800
23	1.3100	1.1800
25	1.2200	1.2000
27	1.2600	1.2500
29	1.1500	1.2200
31	1.1800	1.1600
33	1.2000	1.2400
35	1.1900	1.1500
37	1.1500	1.2200
39	1.0800	1.2400
41	1.2200	1.1100
43	1.1500	1.2300
45	1.1800	1.1200
47	1.1100	1.2200
49	1.2200	1.1700
51	1.2200	1.1500
53	1.2500	1.2200
55	1.1800	1.1200
57	1.1600	1.2000
59	1.2200	1.1400
61	1.2500	1.2900
63	1.1500	1.1400
65	1.1700	1.2100
67	1.1600	1.1400
69	1.1700	1.1900
71	1.1400	1.2300
73	1.2100	1.2700
75	1.2700	1.1200
77	1.2100	1.1400
79	1.2400	1.0700
81	1.2100	1.2900
83	1.2600	1.1400
85	1.1900	1.1000
87	1.1500	1.1600
89	1.1400	1.1300
91	1.1200	1.1700
93	1.2400	1.1100
95	1.1700	1.2300
97	1.1600	1.2200
99	1.2700	1.1800

B.P. EXPLORATION SAMPLE #707 C LOWER SEAM

BASIC STATISTICS

N = 100
STD ERROR OF THE MEAN = .00
MEAN = 1.1884
COEF OF VARIATION = 4.06%
VARIANCE = .0023
STANDARD DEVIATION = .0483
SKEWNESS = .0633
KURTOSIS = 2.6490

95.00% C.I. FOR MEAN:

(1.1788, 1.1980)

ONE-TAIL t(99 , .025) = 1.98466175739

VITRINITE REFLECTANCE DATA FOR
 B.P. EXPLORATION SAMPLE #708 GRIZZLY

I	X(I)	X(I+1)
1	1.1200	1.1700
3	1.0800	1.0700
5	1.0500	1.0900
7	1.1600	1.1200
9	1.0700	1.1000
11	1.1200	1.1700
13	1.1400	1.1800
15	1.0900	1.0900
17	1.0900	1.1300
19	1.1100	1.1600
21	1.2100	1.1400
23	1.1000	1.1700
25	1.1800	1.1500
27	1.0800	1.1100
29	1.0800	1.1100
31	1.1900	1.1500
33	1.1100	1.1500
35	1.1700	1.1500
37	1.1200	1.1300
39	1.1400	1.1400
41	1.1900	1.1500
43	1.1100	1.1300
45	1.1300	1.1200
47	1.1600	1.1100
49	1.1200	1.1300
51	1.1400	1.1500
53	1.1500	1.1000
55	1.1600	1.1200
57	1.1300	1.1400
59	1.1200	1.1800
61	1.1300	1.1600
63	1.1400	1.0800
65	1.1500	1.1300
67	1.1400	1.1100
69	1.1500	1.1700
71	1.1600	1.1100
73	1.1800	1.1200
75	1.1600	1.1400
77	1.1600	1.0600
79	1.1200	1.1700
81	1.1100	1.1800
83	1.1700	1.1500
85	1.0800	1.1400
87	1.1400	1.1500
89	1.1800	1.2100
91	1.1800	1.1700
93	1.1500	1.0900
95	1.0700	1.1900
97	1.1000	1.1600
99	1.0600	1.1100

B.F. EXPLORATION SAMPLE #708 GRIZZLY

BASIC STATISTICS

N = 100

STD ERROR OF THE MEAN= .00

MEAN = 1.1336

COEF OF VARIATION = 3.11%

VARIANCE = .0012

STANDARD DEVIATION = .0352

SKEWNESS = -.2117

KURTOSIS = 2.4889

95.00% C.I. FOR MEAN:

(1.1266, 1.1406)

ONE-TAIL t(99 , .025)= 1.98466175739

VITRINITE REFLECTANCE DATA FOR
 B.P. EXPLORATION SAMPLE #709 GRIZZLY

I	X(I)	X(I+1)
1	1.0000	0.9500
3	0.9800	1.0000
5	0.9900	0.9800
7	0.9600	0.9700
9	1.0300	0.9200
11	0.9800	1.0300
13	0.9500	1.0300
15	1.0500	1.0200
17	0.9900	1.0500
19	1.0300	0.9800
21	1.0100	0.9900
23	0.9600	0.9600
25	0.9300	1.0700
27	1.0000	0.9800
29	0.9200	0.9400
31	0.9600	0.9300
33	1.0300	0.9400
35	0.9900	1.0000
37	0.9800	1.0100
39	0.9400	1.0100
41	1.0300	0.9400
43	1.0300	1.0200
45	1.0100	0.9500
47	1.0000	1.0100
49	0.9600	0.9900
51	0.9700	0.9700
53	0.9400	0.9900
55	1.0300	1.0100
57	1.0400	1.0000
59	1.0100	1.0100
61	1.0400	0.9500
63	0.9600	0.9800
65	1.0100	1.0100
67	1.0100	0.9500
69	0.9500	1.0200
71	0.9300	0.9800
73	0.9800	1.0000
75	1.0200	0.9800
77	0.9500	0.9700
79	1.0400	0.9400
81	1.0000	1.0300
83	1.0400	0.9500
85	1.0000	0.9400
87	0.9500	0.9500
89	0.9100	0.9700
91	0.9300	1.0000
93	1.0400	0.9700
95	0.9200	1.0400
97	0.9600	0.9300
99	0.9400	0.9900

B.P. EXPLORATION SAMPLE #709 GRIZZLY

BASIC STATISTICS

N = 100

STD ERROR OF THE MEAN = .00

MEAN = .9848

COEF OF VARIATION = 3.74%

VARIANCE = .0014

STANDARD DEVIATION = .0368

SKEWNESS = .0151

KURTOSIS = 2.0707

95.00% C.I. FOR MEAN:

(.9775, .9921)

ONE-TAIL t(99 , .025) = 1.98466175739

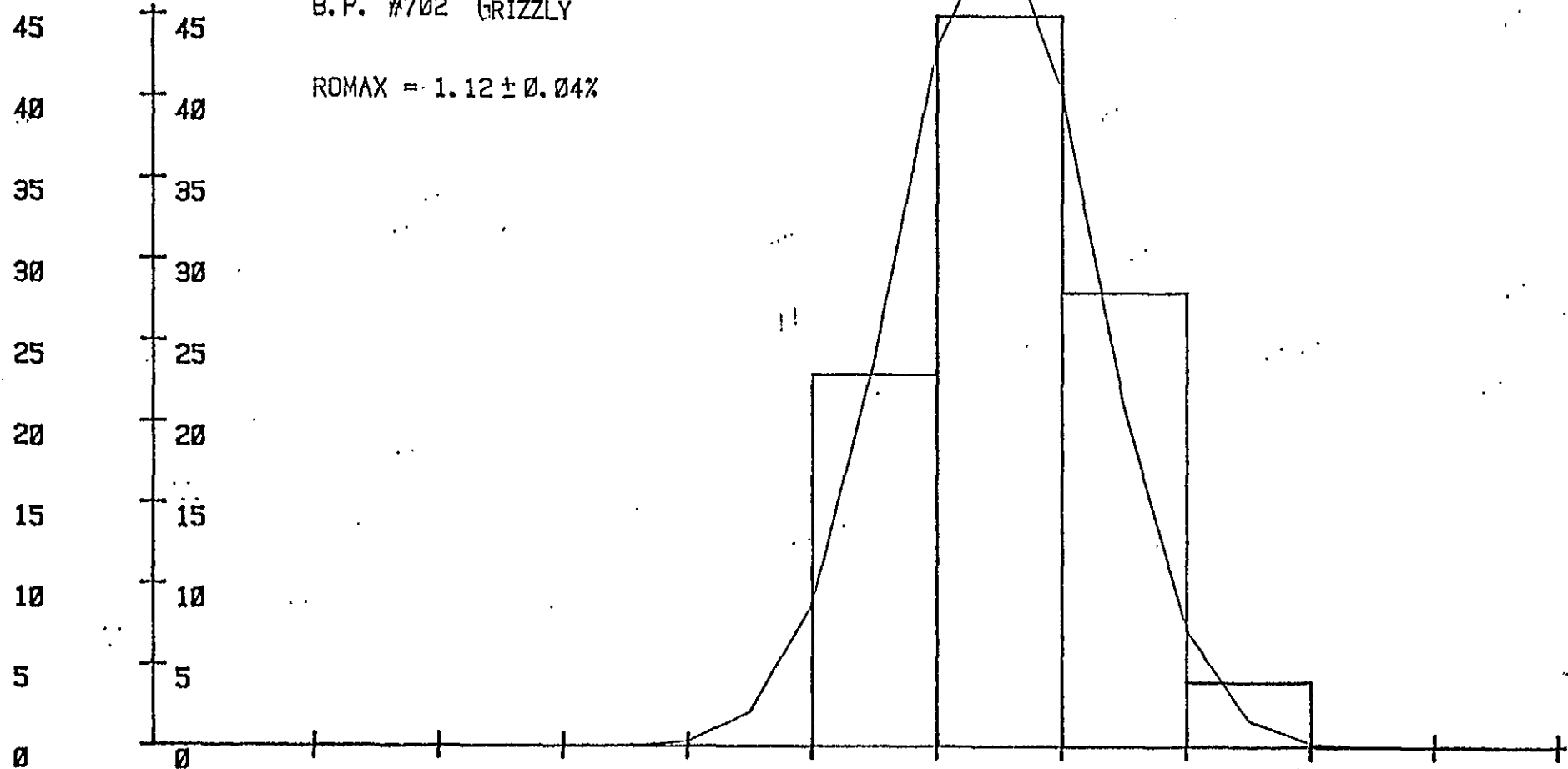
APPENDIX C

VITRINITE FREQUENCY DISTRIBUTION

NO %

B.P. #702 GRIZZLY

RDMAX = $1.12 \pm 0.04\%$



VITRINITE TYPE (V-STEP)

LIM:

0.05

0.1

0.15

0.2

0.25

0.3

0.35

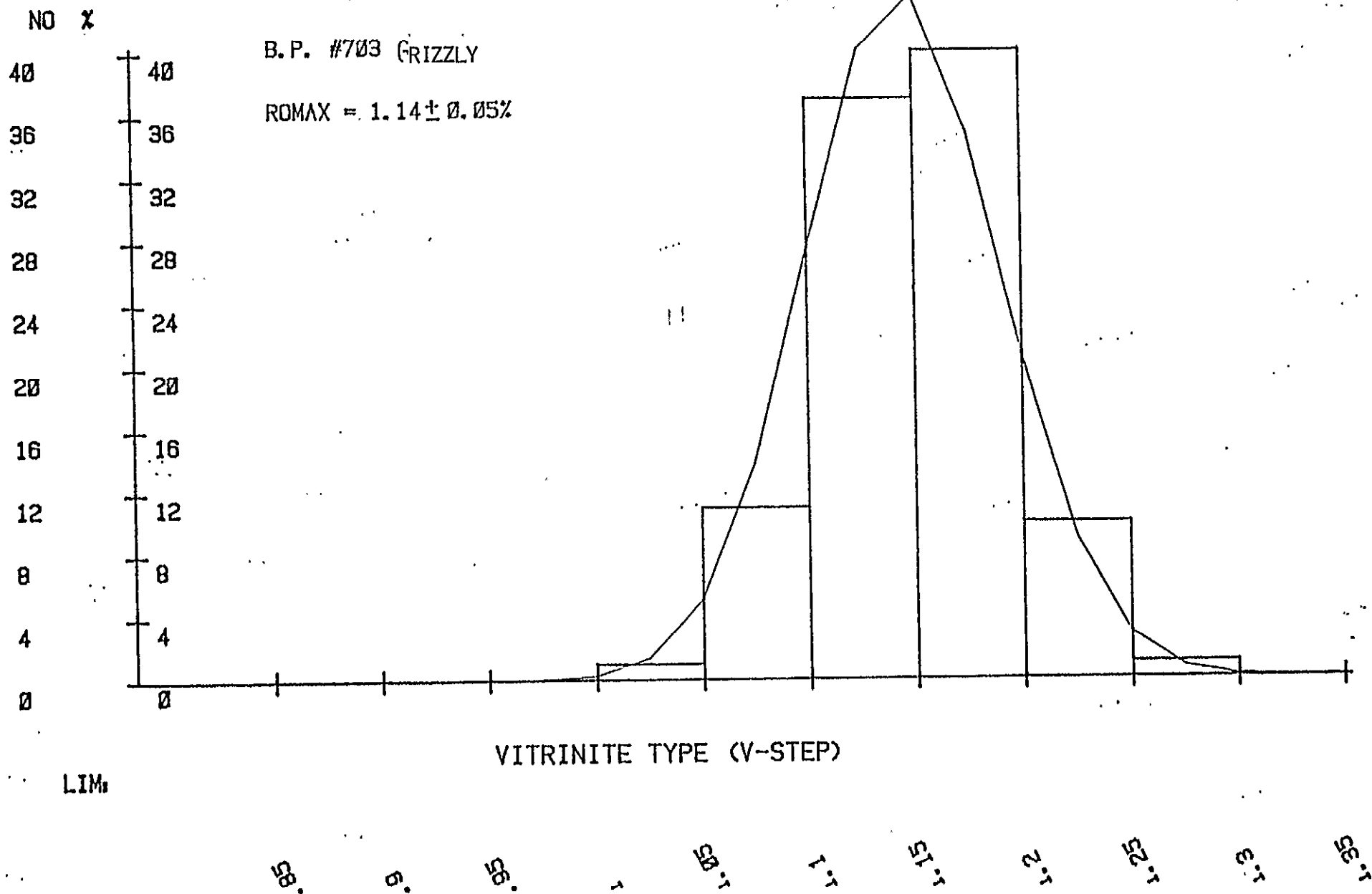
0.4

0.45

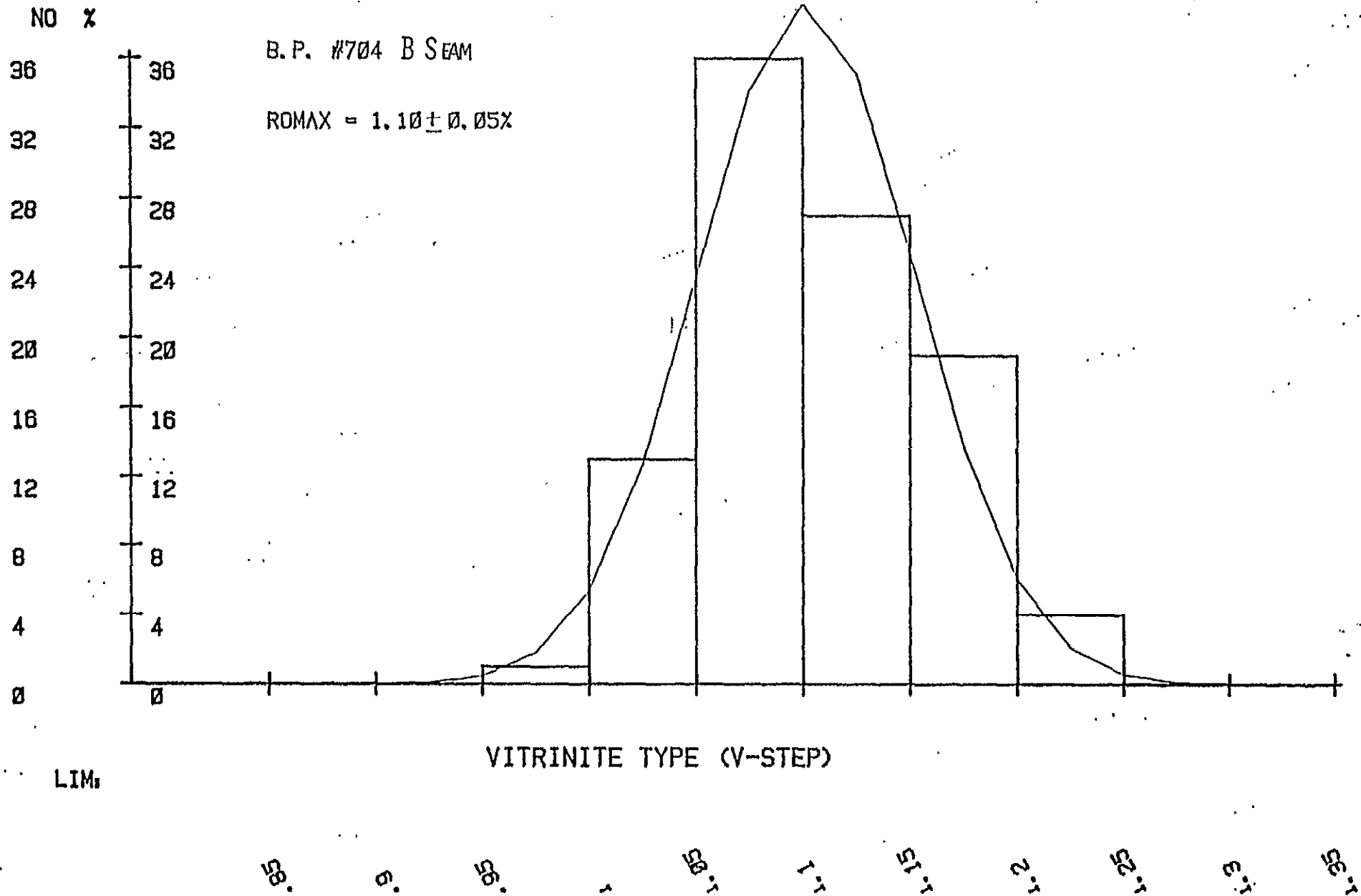
0.5

0.55

VITRINITE FREQUENCY DISTRIBUTION



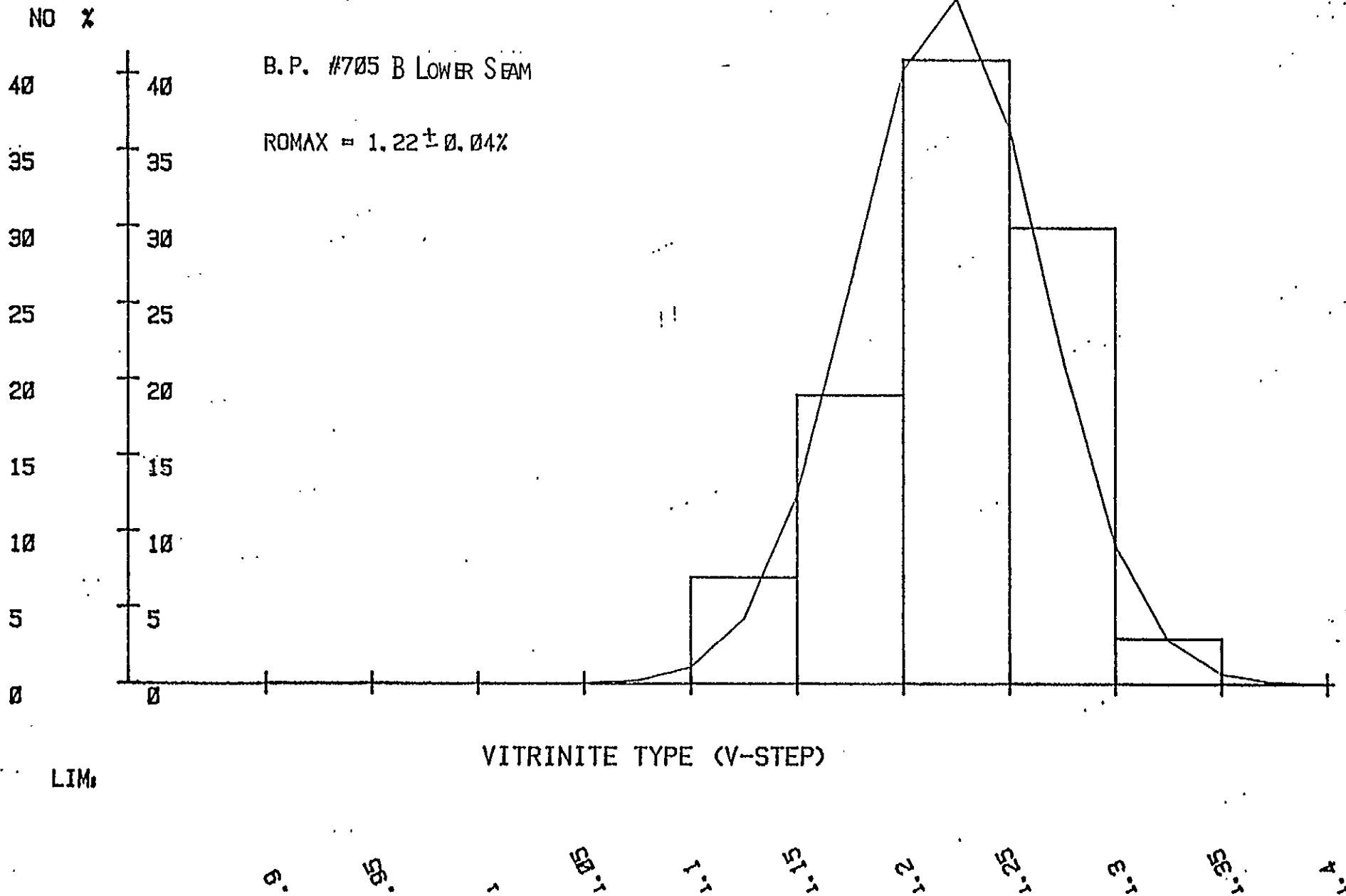
VITRINITE FREQUENCY DISTRIBUTION



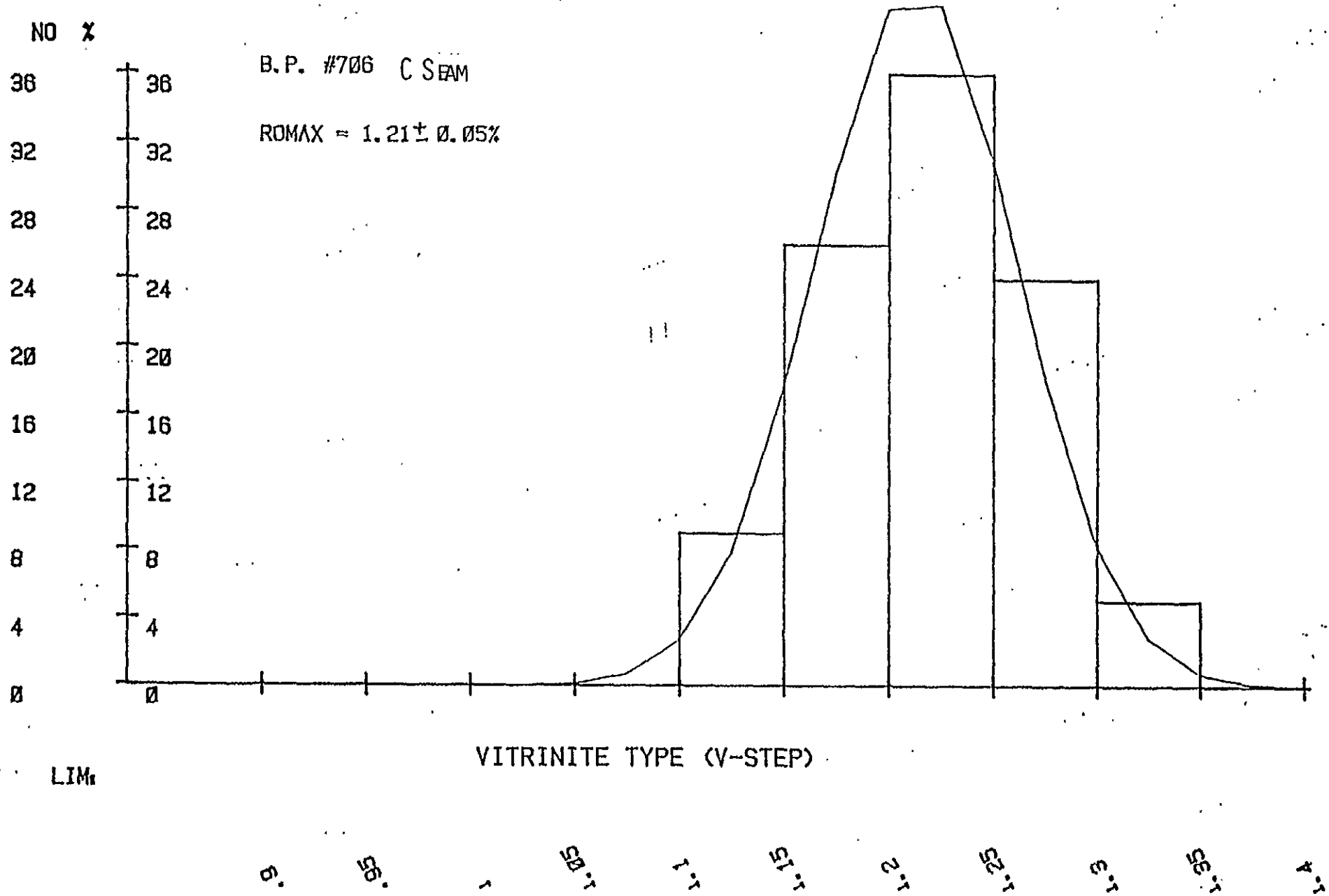
VITRINITE FREQUENCY DISTRIBUTION

B.P. #705 B LOWER SEAM

ROMAX = $1.22 \pm 0.04\%$



VITRINITE FREQUENCY DISTRIBUTION

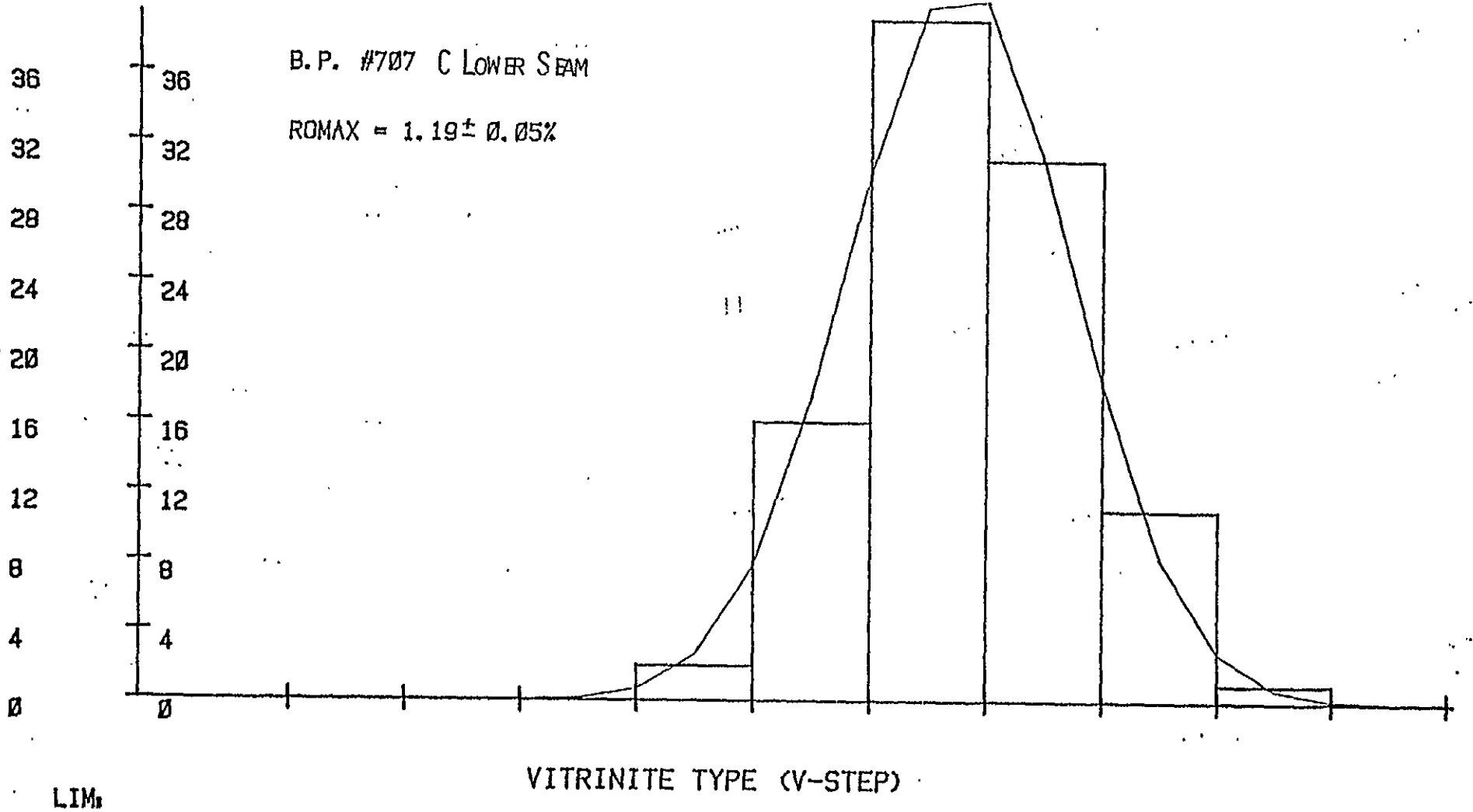


VITRINITE FREQUENCY DISTRIBUTION

NO %

B.P. #707 C LOWER SEAM

ROMAX = $1.19 \pm 0.05\%$

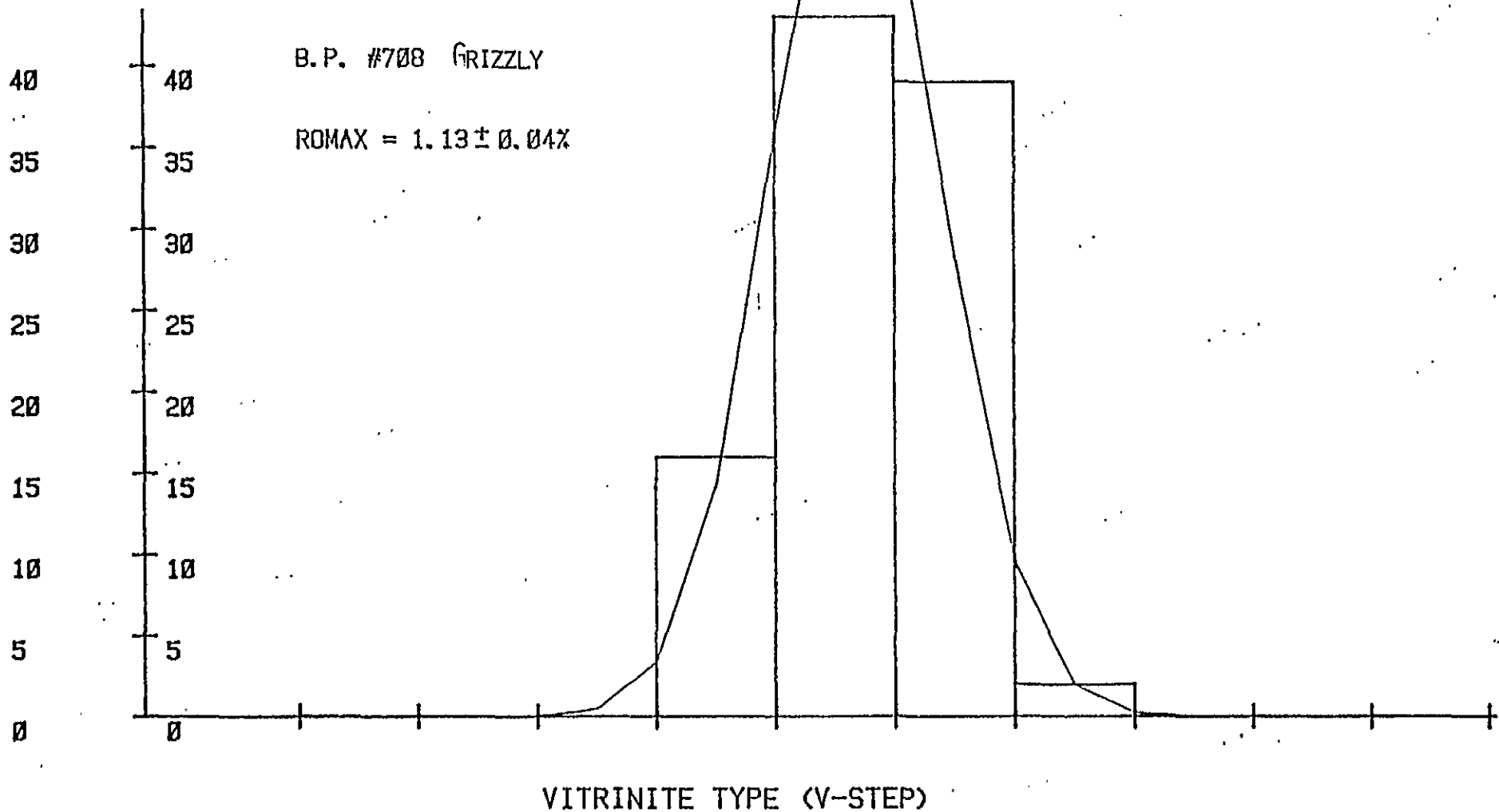


LIM₃

0. 0.5 1 1.5 2 2.5 3 3.5 4

VITRINITE FREQUENCY DISTRIBUTION

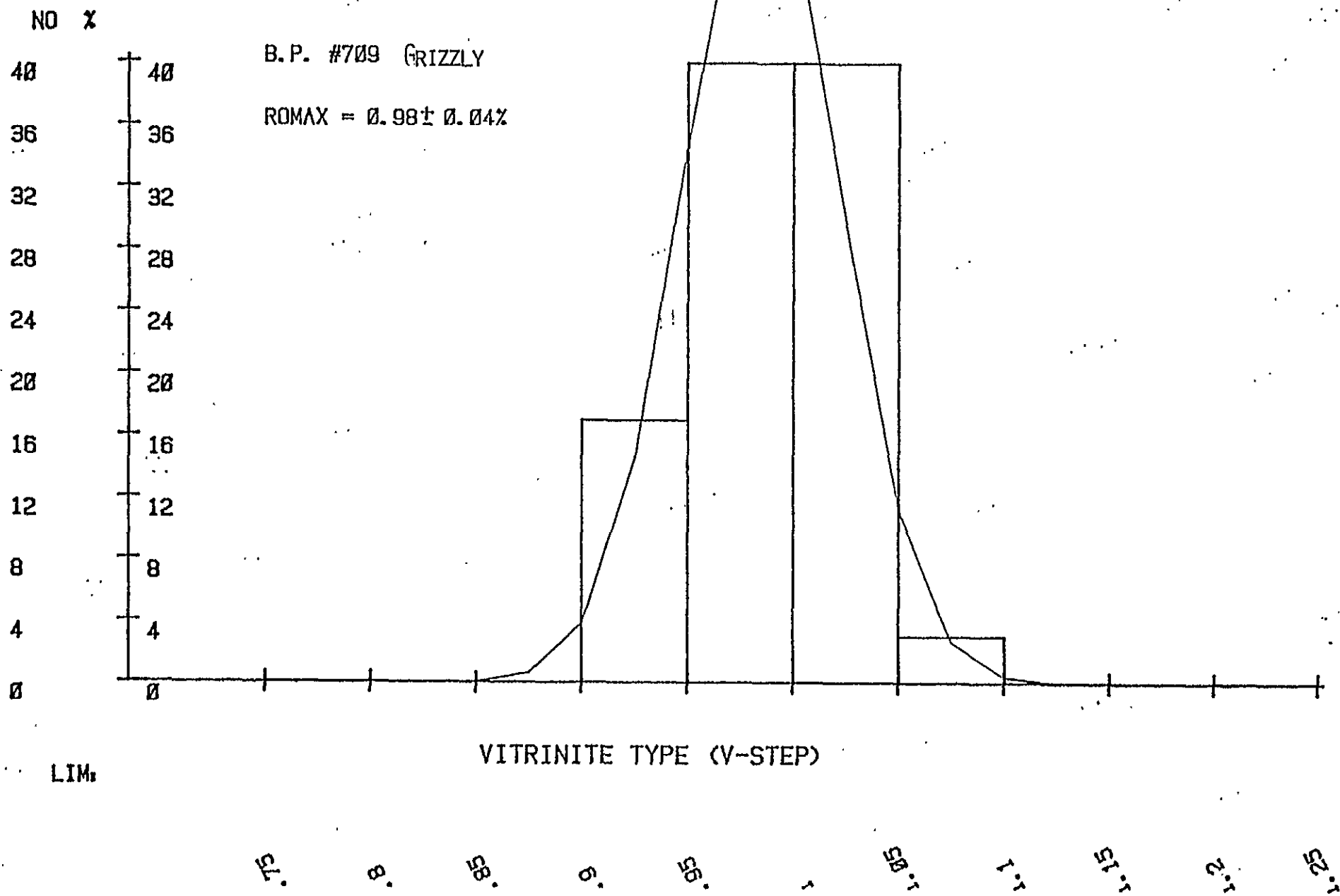
NO %



LIM₁

0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1

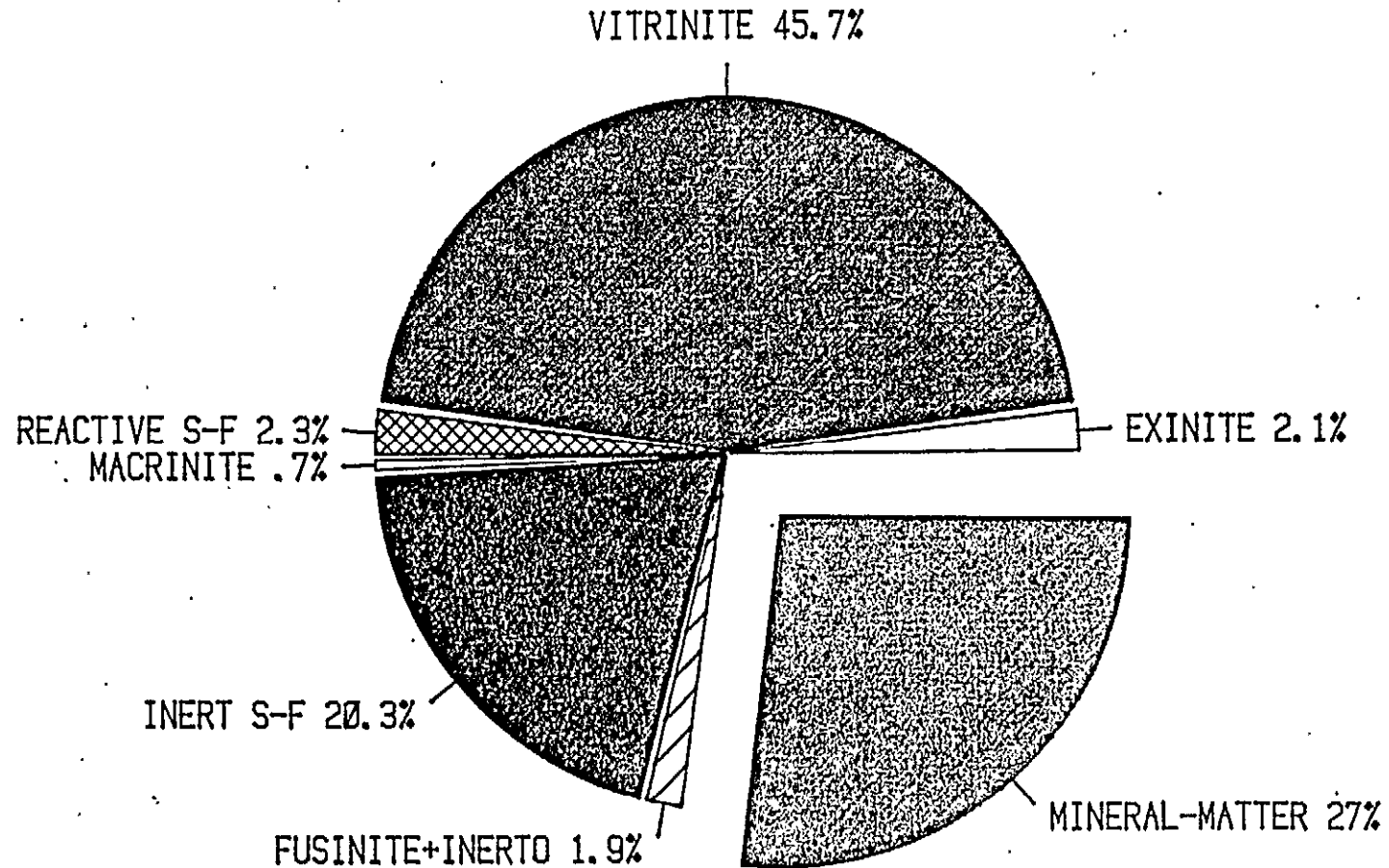
VITRINITE FREQUENCY DISTRIBUTION



APPENDIX D

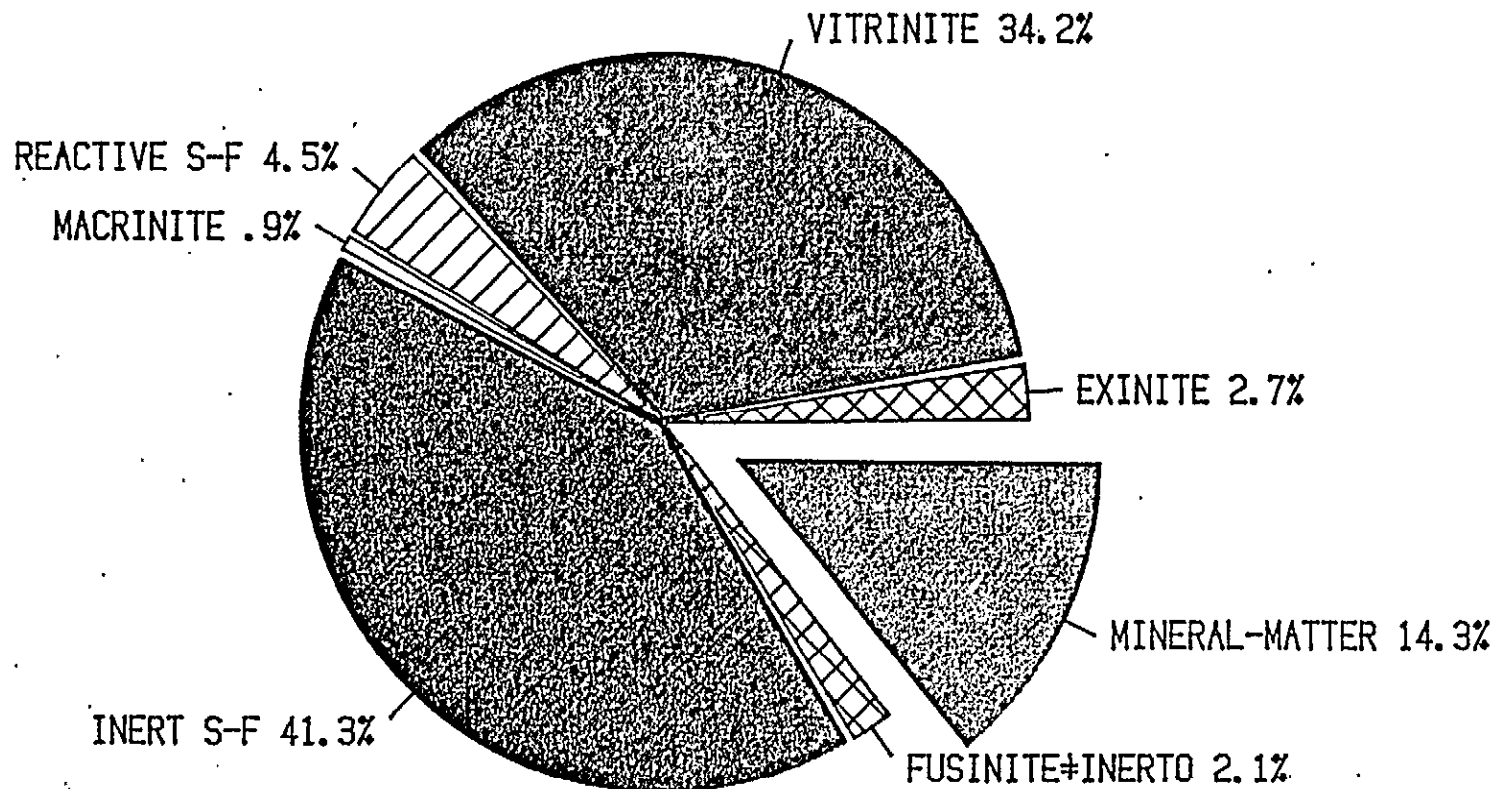
MACERAL DISTRIBUTION

B. P. EXPLORATION SAMPLE #702 GPIZZLY



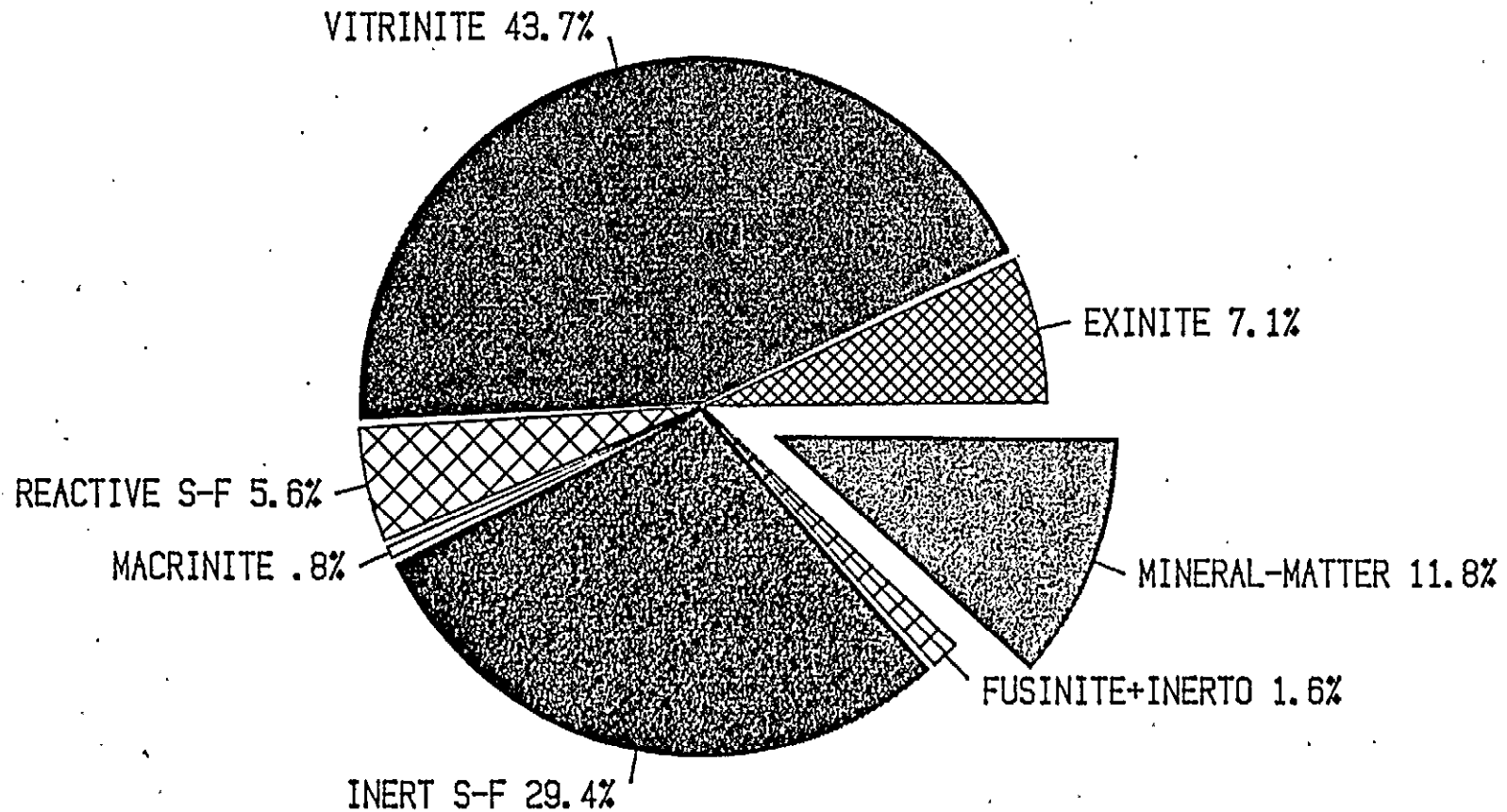
MACERAL DISTRIBUTION

B.P. EXPLORATION SAMPLE #703 GRIZZLY



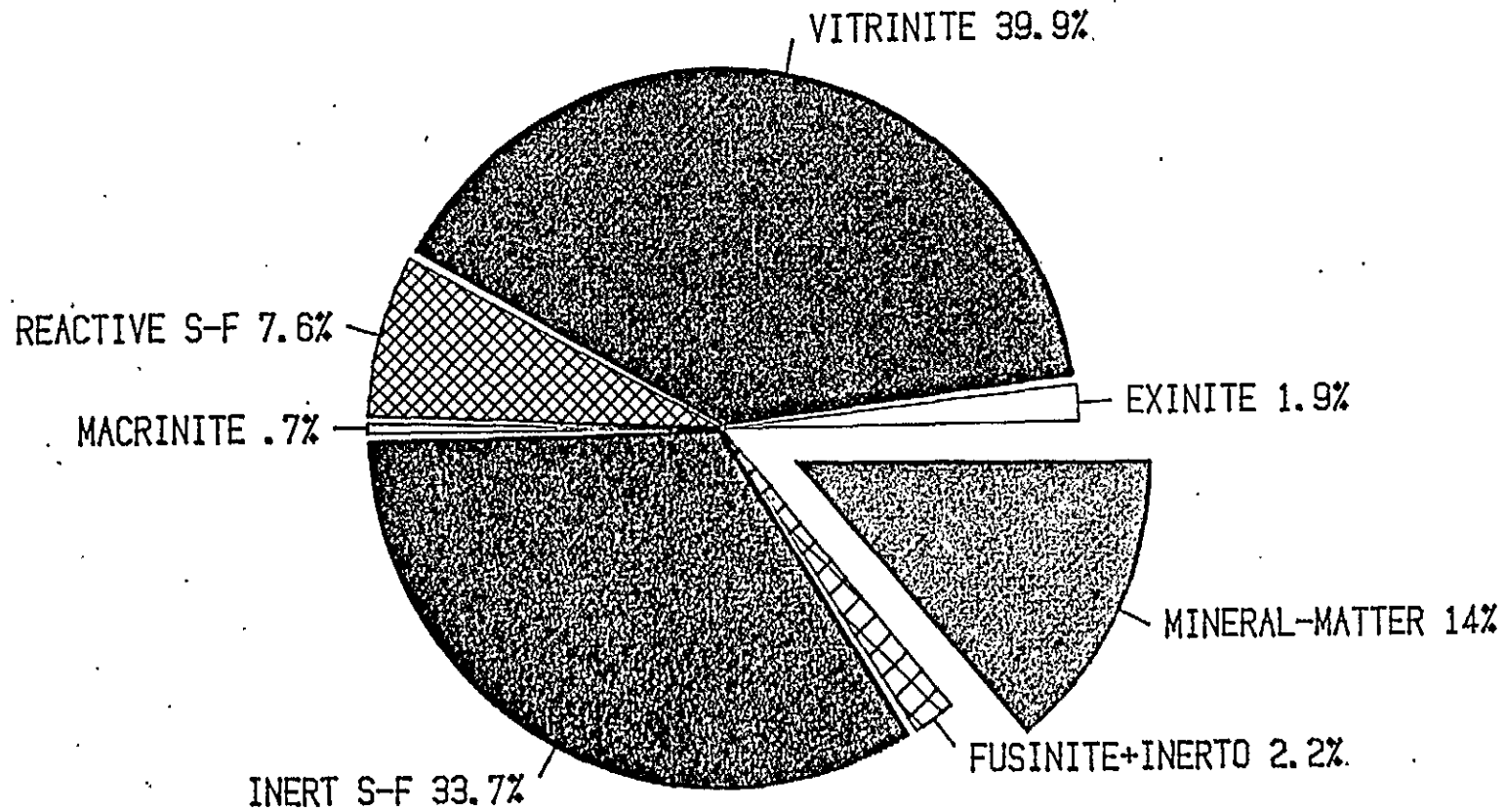
MACERAL DISTRIBUTION

B. P. EXPLORATION SAMPLE #704 B SEAM



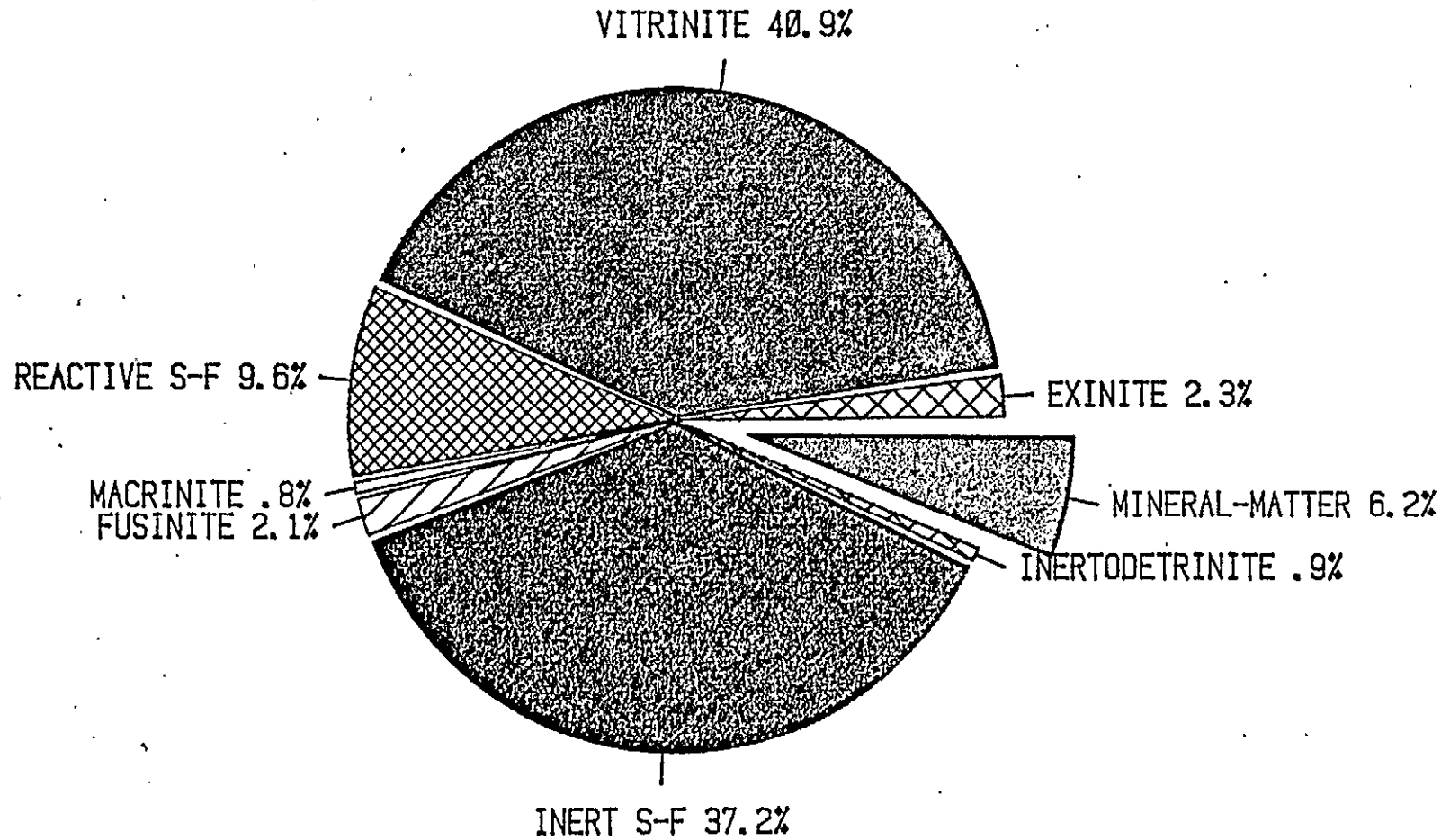
MACERAL DISTRIBUTION

B. P. EXPLORATION SAMPLE #705 B LOWER SEAM



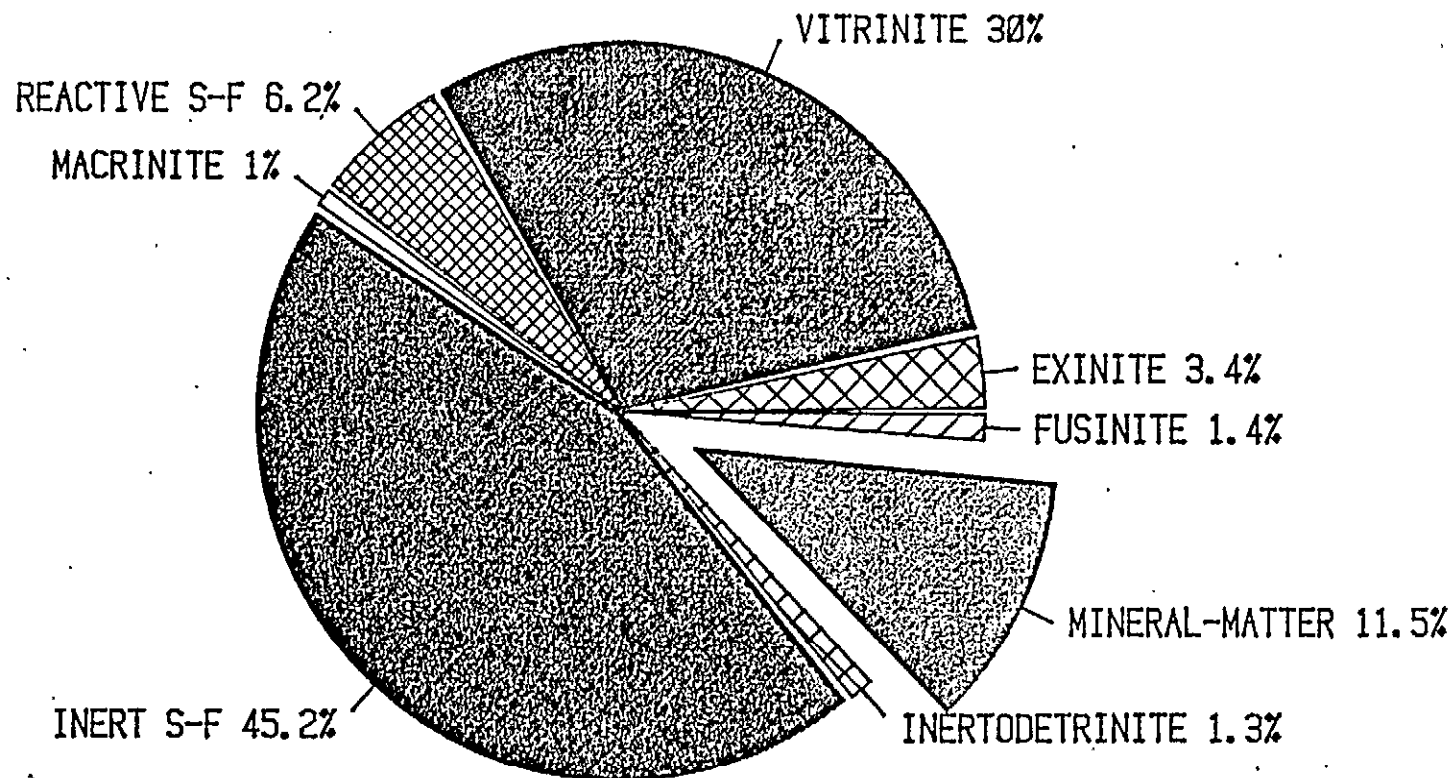
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B.P. EXPLORATION SAMPLE #706 C. SEAM



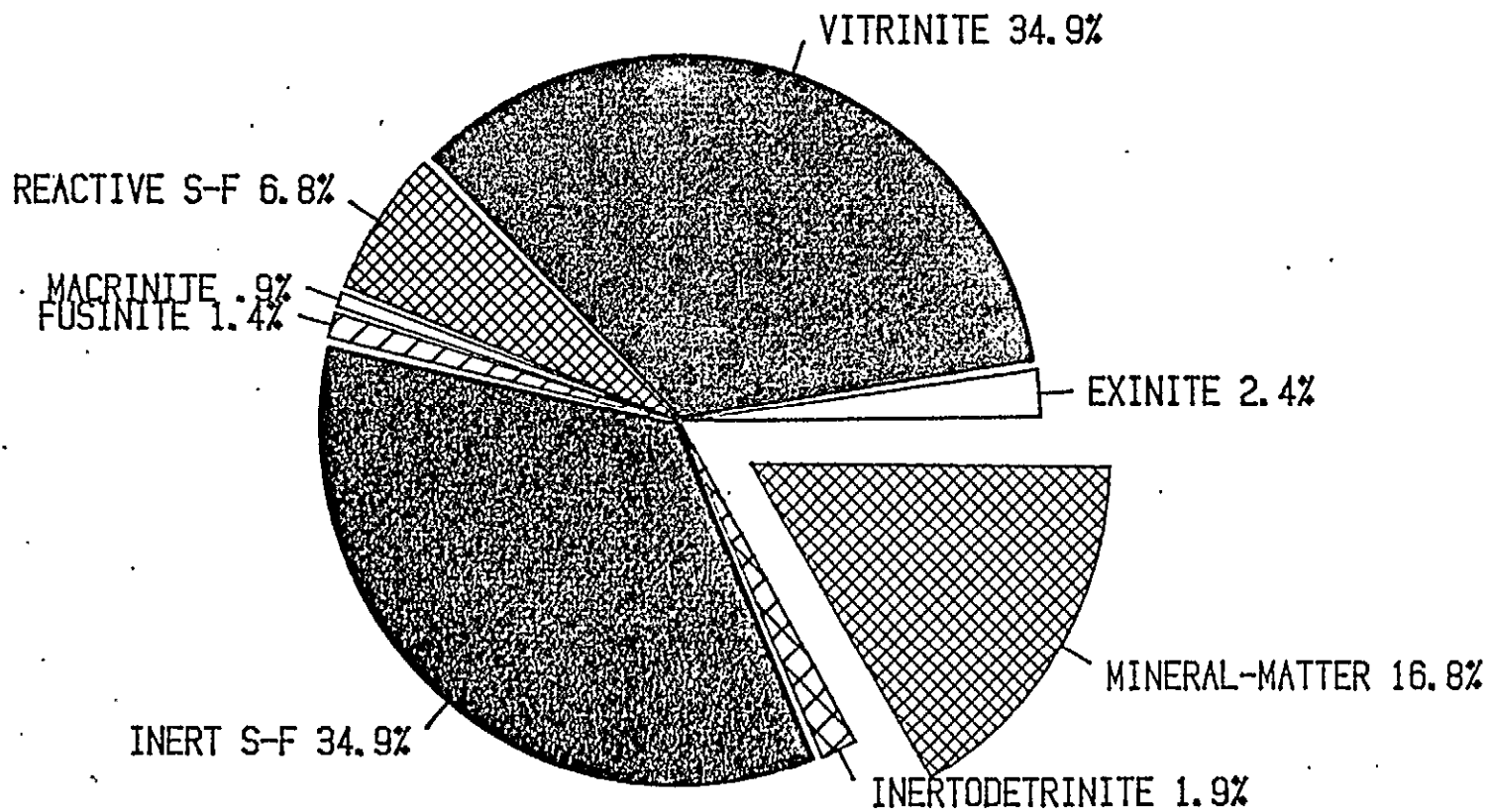
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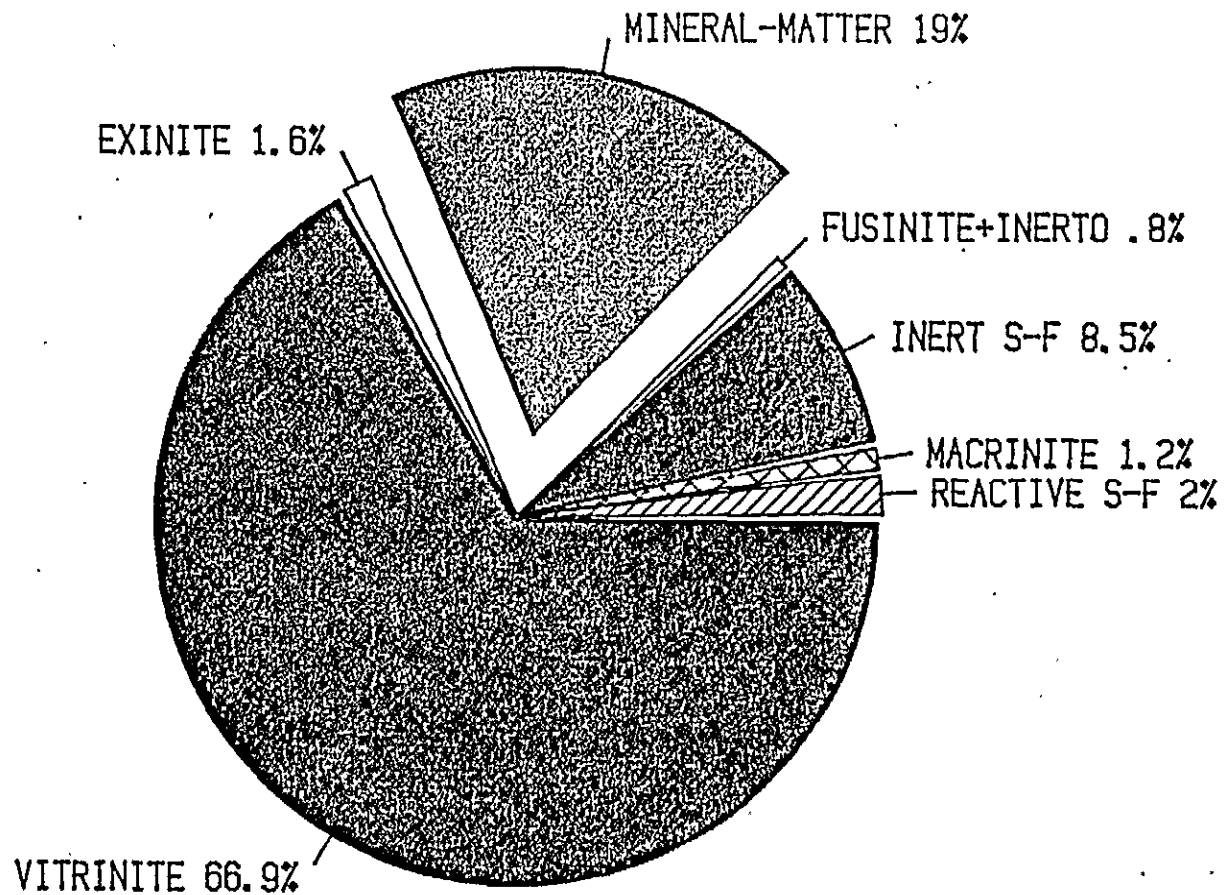
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APPENDIX E

THE EFFECT ON VITRINITE REFLECTANCE OF ELEVATED TEMPERATURES DURING SAMPLE PREPARATION

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Introduction

An investigation of vertical and lateral rank variation as expressed by mean maximum vitrinite reflectance is in progress as the initial part of a study of the petrography of the lignite deposit at Hat Creek, south-central British Columbia. Preliminary determinations indicated an increase from 0.25% to 0.53% for this parameter over the thickness of the deposit (300 m). To provide meaningful results for a comparative rank study involving coals of such low rank, within a deposit in which vertical changes are relatively small, it is clear that all sources of error, however small, needed to be investigated and either eradicated or at least quantified.

The usual method of preparing particulate coal samples for microscopic analyses at the Institute of Sedimentary and Petroleum Geology (and at other laboratories) is by mixing the coal and a thermoplastic powder into a mould and forming a pellet by subjecting the mixture to heat and pressure. The equipment used at the Institute generates temperatures up to 110°C for a period of approximately 20 minutes. An alternative method, common to many laboratories, is to use liquid epoxy or polyester resins as the mounting medium. Some of these compounds also generate heat when hardening after the addition of a catalyst but in most cases temperature increase can be held to low levels by the selection of a suitable resin. This latter method is used in response to the known behaviour of coal to extraneous heating and to the frequent warnings in the literature concerning 'overheating' of samples during drying and pellet preparation (e.g. International Commission for Coal Petrology, 1971, 1973;

A.S.T.M. Standards, 1977). There are few quantitative data available on the effects of the laboratory heating of coal samples on their vitrinite reflectance and the temperatures considered excessive vary from 50°C to 100°C.

Based on the methods of paleotemperature determination of Huck and Karweil (1955), it appears that the Hat Creek lignites have never been subjected to temperatures in excess of 70°C. Although the heating produced during the 'thermoplastic' mounting procedure is of short duration, it was considered possible, especially in view of the significantly lower paleotemperatures involved, that anomalous vitrinite reflectance values may result. The aim of this investigation was to determine if there was an increase in vitrinite reflectance in samples prepared by the 'thermoplastic' method over those prepared in cold-setting resins, to quantify such variations, and to determine if they warranted changes in sample preparation technique.

Method and Results

Seven samples of Hat Creek lignite and six other western Canadian coals were selected to provide a range of rank between mean maximum vitrinite reflectances (R_o max.) of 0.25% and 1.0%. All of these coals had maximum paleotemperatures of 60°C to 95°C. In each case, samples were crushed to pass a 20 mesh sieve and then two splits of a volume suitable for the preparation of a particulate pellet were obtained by riffing. One split was then mounted by the 'thermoplastic' process and the other in a cold-setting resin. The resin used was found to increase in temperature by only 3°C above room temperature during hardening. Both pellets were then polished by the same procedure and then stored in a desiccator.

Thirty determinations were made of maximum vitrinite reflectance on each pellet, according to a standard procedure. In all cases, the pellets which had been heated revealed mean reflectance values higher than those set without heating. Figure 1 shows the R_o max. of all pairs of pellets, plotted against the R_o max. of the cold-set sample in each case (horizontal axis). The graph shows disparities ranging from 0.015% to 0.05% between the same coal mounted by the two different processes. Harrison (1965) and Thomas and Damberger (1976) found that reflectance increased as samples of the same coal were subjected to progressive drying. It is possible that the higher reflectances recorded here may be due to the loss of pore moisture by the imposition of high temperatures during moulding. Reflectance discrepancies are highest in the 0.25% to 0.50% range of R_o max. where natural moisture content would also be highest. Alternatively, the variation may be due to more fundamental changes in the chemical-physical nature of vitrinite, as in the normal processes of coalification, primarily in response to heating.

Over the range of R_o max. from 0.25% to 1.0%, the relationship between the two sets of samples is expressed by the equation:

$$y = 0.9759x + 0.0444 \text{ (correlation coefficient = 0.9918);}$$

where $y = R_o$ max. of a sample prepared by the 'thermoplastic' process

and $x = R_o$ max. of the same coal mounted in a cold-setting resin.

Vitrinite reflectance determinations were repeated on three pairs of pellets by members of the Coal Technology Section and, while the absolute value of R_o max. varied by $\pm 0.01\%$, the discrepancy between samples of the same coal was identical for each operator.

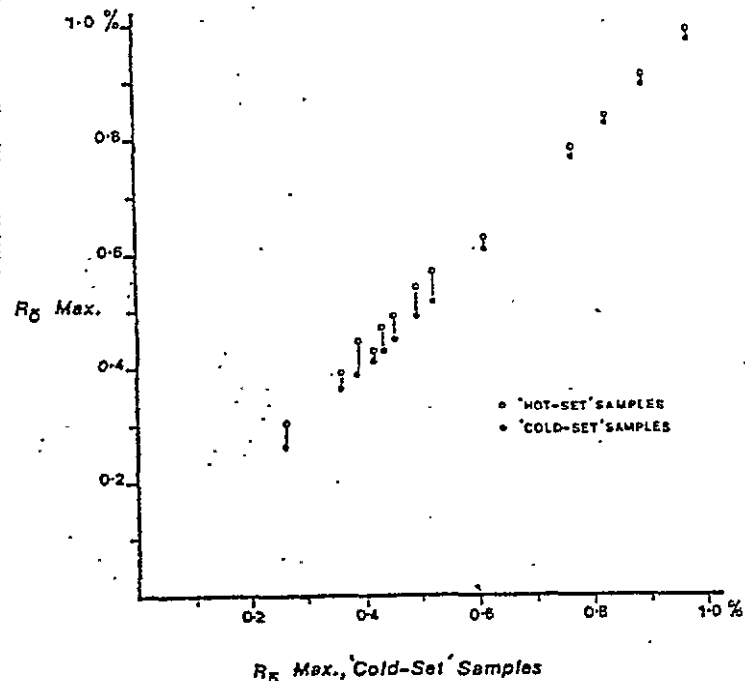


Figure 1. Plot of R_o max. of paired 'cold-set' and 'hot-set' pellets. The R_o max. of the 'cold-set' samples has been used as the basis for comparison and is plotted on the abscissa.

The above relationship indicates an increase in R_o max. of relatively low rank coals (high volatile bituminous and lower) by approximately 0.03% by heating to 110°C during sample preparation. While this appears to be quite a small error, it should be noted that the range of reflectance values determined on individual pellets of Hat Creek coal is generally less than 0.13% and R_o max. is repeatable to $\pm 0.01\%$. At this level of accuracy and in view of the small range of reflectance within the deposit (0.30%), this source of error is considered significant. In terms of a comparative rank study, it is particularly significant that the discrepancy is not constant. It was decided that all samples of Hat Creek lignite prepared for reflectance analyses would be mounted in cold-setting resin as would other coals used in detailed rank studies. For most industrial applications, this error is not significant and would have little effect on calculations of other chemical and physio-chemical parameters of the coal or on any decisions likely to be made during exploration or assessment of potential.

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