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COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.
BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

RECORDS.

Records 1953/89

OPEN-CUT COAL SCOUT DRILLING.
STONY PINCH AND THORNTON AREA.

by

G. M. Burton

CANBERRA.

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STONY PINCH AND THORNTON AREA.

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SUMMARY

Six scout drill holes totalling 1020 feet of drilling were sunk by the Bureau in the Stony Pinch and Thornton Area, about 6 miles south-south-east of the City of Maitland in the Hunter Valley of N.S.W.

The bores penetrated the Four Mile Creek beds and the Buttai Sandstone of the Tomago "Stage" of the "Upper" Coal Measures. In the absence of reliable stratigraphical control, the seams cannot be correlated with much certainty.

Bore BMR4 Stony Pinch indicated that Donaldson's Seam(?) is thin and much banded; the coal, excluding bands, has an ash content of about 15% and calorific value of 12,300 B.Th.U/lb. This same bore showed that the basal 7 feet 3 inches of the Big Ben Seam has an ash content of about 25% and calorific value of 10,600 B.Th.U/lb. if 8 inches of non-coal bands are excluded.

The general results of the drilling were that the coal seams were heavily banded, variable and high in inherent ash. Accordingly the prospecting was halted after drilling six holes.

GENERAL

At the conclusion of the drilling programmes for possible open-cut sites along the outcrop of Donaldson's and the Big Ben Seams in the Buchanan Area (Bur.Miner.Res.Recs., 1952/49) and Bloomfield Area (Bur.Miner.Res.Recs., 1952/46) it was decided to explore these seams between Bloomfield and Thornton, to the east. Three sites were selected in Portions 47 and 92, Parish of Stockrington, Co. Northumberland, which lie in rough, heavily timbered country about 6 miles south-south-east of Maitland; access for the last two miles of this is by the rough bush tracks leading to the Hunter District Water Board's Stony Pinch Reservoir, at the south-western end of the area prospected.

The three drilling sites were selected mainly by using the Geological Map of the Newcastle Coalfield (L.J. Jones: N.S.W. Mines Dept.) and more recent work by J.C. Lloyd of the N.S.W. Geological Survey.

Low core recovery in two of the holes, BMR1 Thornton and BMR1 Stony Pinch, necessitated the drilling of offset holes close by. The core recovery in BMR 3 Stony Pinch was low also but it was decided to redrill this hole as BMR4 at some considerable distance for reasons of economy and structural control.

The seams intersected showed such variation from the sections obtained by the Bureau during the Bloomfield drilling to the west and by the Joint Coal Board during the Beresfield drilling to the east that it is impossible to correlate these broadly spaced scouts holes with any great degree of certainty.

The following notes and suggested correlation for each hole may be of assistance if used in conjunction with the results of the recent work by the N.S.W. Geological Survey when it is published.

The structure in the Stony Pinch and Thornton Area is a sub-meridional anticline pitching gently southward.

Stony Pinch BMR1 and 2. The sandstone commencing at 174 feet probably represents the Buttai Sandstone beds; in which case the following tentative correlation suggests itself:

Donaldson's Seam.....	either washed-out or stratigraphically above the base of the zone of weathering
Big Ben Seam.....	70'10" to 84'1"
Tomago Thin Seam.....	127'6" to 130'1"
Scotch Derry Seam.....	170' to 173'3"

Stony Pinch BMR3. The sandstone commencing at 170'6" and extending to the base of the hole at 250 ft. is probably the Buttai Sandstone; if this is so the overlying seams could be correlated with the Tomago type section as follows:

Donaldson's Seam.....	94'0"	to	98'1"
Big Ben Seam.....	123'6"	to	137'11"
Scotch Derry Seam.....	168'8"	to	170'

The plies forming the upper 7 ft. of the Big Ben Seam were heavily banded; the coal was sampled and after exclusion of bands was analyzed. The coal proved to be inferior having an ash content well in excess of 30% and calorific value of less than 10,000 B.Th.U/15.; however the slightly high moisture content of the coal may indicate weathering.

Stony Pinch BMR4. This hole was the distant offset of BMR3 and was drilled only to the base of the Big Ben Seam. Even after allowing for disparities due to logging errors caused by poor core recoveries there is still quite a difference in the seam sections between the two holes. If the seam correlation is correct, Donaldson's and Big Ben Seams are diverging fairly rapidly from BMR4 towards BMR3. The seams in BMR4 have been correlated with BMR3 as follows:

Donaldson's Seam.....	77'7"	to	82'8"
Big Ben Seam.....	89'	to	101'9"

The basal 7'3" of the Big Ben Seam would have an ash content of 25% and calorific value of about 10,600 B.Th.U/15. if 8 inches of non-coal bands were excluded.

Donaldson's Seam is thin and heavily banded; the band-free quality is good, being about 15% ash and having an ash content of 12,300 B.Th.U/15.

Thornton BMR1 and 2. It is considered that the unweathered section of these holes lies stratigraphically below the Big Ben Seam. The seam intersected between 67'9½" and 70'8½" may be the Scotch Derry and uppermost beds of the Buttai Sandstone may be at 73'4"

It was decided, after taking into consideration the general characteristics of the Tomago sediments as revealed in the Bloomfield drillings, that these results were not sufficiently good to justify further prospecting.

The difficulties of seam correlation using such widely spaced bore holes in such variable sediments as the Tomago "Stage" must be emphasized and it cannot be stressed too strongly that this identification of the seams is only tentative.

The bore holes were surveyed by officers of the N.S.W. section of the Dept. of Interior, Property and Survey Branch. In logging, the Petroleum Technologists measured all depths from the rotary table and a slight adjustment must be made to all logs to correct for this.

G.M. BURTON.

APPENDIX

- (a) Analyses;
- (b) Bore Logs.

All depths in this appendix are measured from the rotary table or spider of the drill; to obtain true depth below ground level it is necessary to subtract rotary table height as follows =

Bore	Height above ground
Stony Pinch 1 & 2	1'4"
" " 3	1'2"
" " 4	10"
Thornton 1	1'6"
" 2	1'8"

LIST OF ABBREVIATIONS USED IN BORE LOGS.

abundant - A.	ferruginous - ferr.	medium - m.
agglomerate - aggl.	fibrous - fib.	micaceous - mic.
aggregate - aggr.	fine - f.	mineral - min.
angular - ang.	fi ssile - fss.	mottled - mot.
arenaceous - aren.	flint - flt.	
argillaceous - argill.	formation - fm.	oolith - ool.
arkose (ic) - ark.	friable - fri.	pebble (s) - pbl.
anhydrite - anhyd.	foraminifera - forams.	pyrite - pyr.
	fossil(iferous) - foss.	pyritiferous -
band (s) - bd (s)	fracture - fract.	pyrf.
		purple - ppl.
bentonite - bent.	frosted - fstd.	
biotite - bio.		quartz - q.
bituminous - bit.	glauconite(ic) - glauc.	quartzite - qite.
black - bk.	grain - gr.	
blue - bl.	granite - grt.	
bottom - bot.	granular - grnl.	rare - R.
boulder - bldr.	grey - gy.	regular - reg.
brown - br.	greyish - grish.	residue - res.
breccia - brcc.	green - gn.	round (ed) - rd.
brecciated - brectd.	greenish - gnish.	salt and pepper - s & p.
	greywacke - gw.	sandstone - sst.
calcareous - calc.	gypsum - gyp.	sand - sd.
carbonaceous - carb.		sandy - sdy.
cement - cmt.	hard - hd.	shale - sh.
chert - cht.	heavy - hvy.	shaly - shy.
clay - cl.	heterogeneous - hetg.	siltstone - slst.
clayey - cly.		siderite - sid.
claystone - clst.	igneous - ign.	slightly - sl.
clayshale - clsh.	indurated - ind.	siliceous - sil.
coarse - c.	inferior - inf.	soft - s.
cobble - cbl.	interbedded - intb.	streak - strk.
colour - col.	intraformational - ifml.	
common - C.		tabular - tab.
compact - cpt.	jointing - jtnng.	thin-bedded -
composition - comp.		t.bdd.
concretion - conc.	kaolin - kaol.	tuffaceous - tuff.
conglomerate - cgl.		
contaminant (ated) -	laminated)	very - v.
contm.	laminae) lam.	variable - var.
crystal - xsl.	lamination)	
crystalline - xln.	light - l.	weathered - wd.
contorted - conttd.	limestone - lst.	white - wh.
dark - dk.		with - w.
dense - d.	massive - mass.	yellow - y.
distributed - dist.	marl - ml.	yellowish - yish.
distribution - distn.	material - mat.	
dolomite - dol.	matrix - mtx.	

The following interpretation is placed on the respective terms when applied to descriptions of cores recovered in coal:-

"broken" - fragments which can be put together to form cylinders, either approximate or actual, but which are not recognisably continuous with an unbroken portion of the same core.

COAL ANALYSIS

STONY PINCH - HORNBACH AREA.

Bore	Bur.Min.	Mines	Seam	Depth of Sample	Proximate Analysis						Calorific
	Res.	Dept.			H.Moisture	Volatile	Fixed	Ash	Coke	Ash	Value
	Sample No.	Analysis No.			%	Matter	Carbon	%	Nature	Colour	B.Th.U's/16.
		1952				%	%				
Stony Pinch BMR3.	1/BMR3	/944	Big Ben??	123'6"-124'6 $\frac{1}{2}$ "	2.4	22.5	39.9	35.2	Nc	Grey	-
	2 "	945	" "	125'3"-125'9 $\frac{1}{2}$ "	2.6	24.8	43.7	28.9	Aw	"	10,300
	3 "	946	" "	126' -127'8"	2.7	24.0	40.3	33.0	Aw	"	9,410
	4 "	947	" "	128'4"-130'2"	3.0	24.6	35.8	36.6	Aw	"	-
Stony Pinch BMR4.	1/BMR4	/921	Donaldsons??	77'7" -79'9"	2.4	30.3	51.7	15.6	Cw	Pink	12,250
	2 "	922	"	80'1 $\frac{1}{2}$ "-81'1"	2.3	31.6	52.1	14.0	Cw	"	12,510
	3 "	923	"	82'1 $\frac{1}{2}$ "-82'8 $\frac{1}{2}$ "	2.3	31.2	53.6	12.9	Cw	Buff	12,670
	4 "	924	Big Ben??	89'0 $\frac{1}{2}$ "-89'9 $\frac{1}{2}$ "	2.5	31.4	47.9	18.2	Cw	Pink	11,800
	5 "	925	" "	90'6" -92'1 $\frac{1}{2}$ "	2.1	27.7	46.5	23.7	Cw	"	11,030
	6 "	926	" "	92'6" -94'1"	2.5	28.5	45.4	23.6	Cw	Buff	10,950
	7 "	927	" "	94'6" -96'6 $\frac{1}{2}$ "	2.8	25.1	43.6	28.5	Nc	"	10,030
	8 "	928	" "	96'7" -99'7"	2.8	27.6	46.0	23.6	Cw	"	10,760
	9 "	929	" "	99'8" -101'9"	2.3	29.4	46.3	22.0	Cw	Pink	11,230

None of these samples was tested for sulphur content

* Aw = Weakly agglomerating
 Cw = Weak Coking
 Nc = Non-agglomerating, coherent

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Name and No. of Bore BMR 1 & 2 STONY PINCH

DISTRICT Newcastle COUNTY Northumberland PARISH Stockrington PORTION 47 LOCATION ^{Approx.} S.E. Cnr. Port. 47/
 Surveyed by A.N.Rochfort (D.Int.) Survey Method Theodolite Elevation 296 ft. Ref. Map 3380 52' / 2800 ft.
 Logged by N. Hoyling Cased Not Datum H.D.W.B. Stand. Ref. Report BMR Recs. 1953/89
 Sunk by BMR Type of Drill Failing 750 Depth BMR 1-234' 4"; BMR 2-85' Date Begun/Finished 19.3.52/1.4.52

[illegible]

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
62	10	4	9	Shale, pinkish-br. s.		2										
63	1		3	Shale, brish.bk. s.		3										
63	7		6	Shale, dk.gy. w. ib. m.gr. gy. sandstone		6										
64	2		7	Sandstone, dk.gy. c.gr.& m.gr. mic.		5										
64	11		9	Shale, dk.gy.		9										
65	1		2	Sandstone, br. c.gr. fri.		2										
67	6	2	5	Sandstone, dk.gy. m.gr. w. a c.gr. br. bd. near the top	2											
68	7	1	1	Sandstone dk.gr. shy. s. w. l.gy. patches of brecciation	1	1										
69			5	Claystone, dk.gy. w. l.gy. bds. (dip about 45°)		5										
69	6		6	Claystone y.		6										
70	5	11		" y. & wh. w. yish.& gyish.tinges		11										
70	7		2	Shale, bk. w. iridescent & limonitic stains		2										
70	10		3	" dk.br. to bk. s. ?wd. coal		3										
72	6	1	8	Coal, rather dull	1	6						<u>Big Ben ? Seam (G.M.B., Dec. 5°)</u>				
72	9		3	Coal, s. v.wd.		3										
73			3	Shale, bk. s.		3										
73	1		1	" l.brish.-gy. s.		1										
73	3		2	" bk. & br. s.		2										
73	3 1/2		1 1/2	" l.gy. s.		1 1/2										
73	7 1/2		4	COAL, bright		4										
73	8 1/2		1	Shale, gyish.-br.		1										
75	6	1	9 1/2	COAL, dull, s. wd. in part	1	5										
75	7		1	Shale, gy. s.		1										
75	10		3	" l.brish.-gy. v.s.		3										
75	11 1/2		1 1/2	Coal, s. wd.		1 1/2										
76	1 1/2		2	Shale, l.brish.-gy. v.s.		2										
76	6 1/2		5	COAL, bright		5										
76	8 1/2		2	Claystone, bk. v.s.		2										

Note:
No samples drawn for analysis as quality and thickness were insufficient. Cores retained in full by JCB's Newcastle office.

The formations from 69'6" are estimated from the cores recovered in BMR 1 and the adjacent BMR 2.

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
77		3 $\frac{1}{2}$		Siltstone, gy. s.	3 $\frac{1}{2}$											
77	11	11		Sandstone, gy. m.gr. s. w.dk.gy. carb. shale bds.	11											
78	6	7		Shale, gy. w. sdy. bds.	7											
79		6		Claystone, bk. v.s. w. thin bds. of bright coal	5 $\frac{1}{2}$											
79	1	1		Claystone wh. v.s.	1											
79	3	2		COAL, bright	2											
79	4	1		Claystone, buff. v.s.	1											
79	5	1		COAL, bright	1											
79	6	1		Claystone, bk.& wh.	1											
79	6 $\frac{1}{2}$	$\frac{1}{2}$		COAL, bright	$\frac{1}{2}$											
79	8 $\frac{1}{2}$	2		Claystone, wh. w. bk. bds.	2											
79	10	1 $\frac{1}{2}$		COAL, bright	1 $\frac{1}{2}$											
79	11	1		COAL, wd. v.s.	$\frac{1}{2}$											
80	2	3		Claystone, bk. v.s.	3											
80	8	6		" gy. s.	1 $\frac{1}{2}$											
81	11	1	3	COAL, bright	1											
82	3	4		Shale, bk.& brish.-bk. s.	4											
82	7	4		" l. brish.-gy. to wh. s.	4											
82	8	1		Shale, bk.	1											
83	9	1	1	COAL	9											
84	1	4		Dant (v. finely divided coal) bright	4											
89	7	5	6	Sandstone, gy. m.gr. s. fri.	1	2						Continued to 234'3" as BMR 1 only ,				
91	6	1	11	Sandstone, gy. m.gr. v.s. & cly.	7 $\frac{1}{2}$											
91	7	1		" " " " s.	1											
96	4	4	9	Sandstone, gy. f. to m.gr. s.	4	9										
96	7	3		" " m.gr. fri.	3											
97	2	7		Sandstone, m.gr. gy. fri.	6 $\frac{1}{2}$											
98	9	1	7	" " " " "	1	7										
101	7	2	10	Siltstone, yish.-gy. w. carb. lam.	2	10						Dip of sandstone-siltstone junction cs. 2°.				

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
104	7	3		Shale, brish.gy. s.		9										
105	10	1	3	Shale, brish.-gy. s.		3										
110	3	4	5	Shale, dk. gy.	2	7										
113	6	3	3	Sandstone, l.gy. ferr. v.c.gr. fri. resembles gw.-sst.	3	3										
114			6	Sandstone, l.yish.-gy.& br. c.gr.fri.		6										
116		2		" l.gy. c.gr. fri.		10										
117	6	1	6	Sandstone, l.gy. c.gr. fri. w. a vertical limonitic fissure	1	6										
117	9		3	COAL w. limonitic lam. ? decomposed pyrites		3										
118	5 $\frac{1}{2}$		8 $\frac{1}{2}$	Sandstone, dk.gy. m.gr. v.fri.		8 $\frac{1}{2}$										
119	2		8 $\frac{1}{2}$	Coal, shattered somewhat shy.		8 $\frac{1}{2}$										
120	3 $\frac{1}{2}$	1	1 $\frac{1}{2}$	Shale, l.gy. s.	1	1 $\frac{1}{2}$										
123		2	8 $\frac{1}{2}$	Shale, l.gy. s.	2	8 $\frac{1}{2}$										
125	2	2	2	Shale, l.gy. s. w. dk.gy. bds. to 1" thick	2	2										
125	2 $\frac{1}{2}$		$\frac{1}{2}$	Siltstone, gy.		$\frac{1}{2}$										
126	6 $\frac{1}{2}$	1	4	Shale, l.gy. s.	1	4										
126	8		1 $\frac{1}{2}$	Sandstone, l.gy. m.gr.		1 $\frac{1}{2}$										
127	3		7	Shale, bk.& brish.bk. w. thin bright bds.		7										
127	6 $\frac{1}{2}$	3 $\frac{1}{2}$		Sandstone, gy. m.gr. w. conttd. carb. bds.		3 $\frac{1}{2}$										
128	3		8 $\frac{1}{2}$	COAL		8 $\frac{1}{2}$										
128	3 $\frac{1}{2}$		$\frac{1}{2}$	Shale, gyish-bk.		$\frac{1}{2}$										
128	6 $\frac{1}{2}$	3		COAL		3										

Tomago Thin ? Seam (G.M.B.,
Dec., 53)

[illegible]

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
219	8	1	11	COAL, bright	1											
222		2	4	Sandstone, l.gy. f. to m.gr.	2	4										
223	11	1	11	Sandstone, l.gy. f. to m.gr.	1	11										
227	5	3	6	Sandstone, l.gy. m.gr.	3	6										
232	8	5	3	Sandstone, l.gy. f.gr. w. A. dk. gy. conttd. shy. carb. lam.	4	10										
234	4	1	8	Sandstone, gy. f.gr. s. w. dk.gy. shy. bds.	1	8						Abandoned because of heavy circulation loss, ? due to a fissure caused by blasting for the foundations of the nearby reservoir.				

BUREAU OF MINERAL RESOURCES

Name and No. of Bore BMR 3 STONY PINCH

DISTRICT Newcastle COUNTY Northumberland PARISH Stockrington PORTION 92 LOCATION S.E. Cnr. Port. 92/299⁰91/
1360 ft.
 Surveyed by A.N. Rochfort (D.Int.) Survey Method Theodolite Elevation 233 ft. Ref. Map BMR Plan N14 - 132
 Logged by N. Hoyling Cased Not Datum H.D.W.B. Stand. Ref. Report BMR Recs. 1953/89
 Sunk by BMR Type of Drill Failing 750 Depth 250 ft. Date Begun/Finished 2.4.52/8.4.52.

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
13		13		Sandstone, pink & pinkish-br. m.gr. fri.												
27		14		" br. v.c.gr. fri. w. some l.gy. shale & l.gy. chert lam.												
33		6		Sandstone br. m. to c. gr. fri												
44		11		" l. br. m.gr. fri.												
45		1		" l.gy. c.gr. w. some s. wd. coal												
53		8		" l.br. f. to m.gr. fri.												
55		2		" l. brish.-gy. c.gr. fri												
61		6		" brish.gy f. to m.gr.												
72	6	11	6	" " " c.gr.												
72	8		2	COAL, bright												
72	11		3	Shale, gy. w. sdy. bds.		21										
74		1	1	Sandstone, gy. m.gr.	1	1										
74	10		10	Shale, dk. gy.		8										
76	10	2		Sh. & sst. gy. (from cuttings)												
77	8		10	Shale, w. many thin gyish.-bk & l.gy.bds.		9										
78	2		6	Sandstone, l.gy. f.gr. w. thin dk.gy.bds.		5										
78	10		8	Shale, dk.gy.		4										
94		15	2	Sandstone, gy. f.gr. somewhat fri.												
94	3		3	COAL, bright												
95	6 1/2	1	3 1/2	COAL, bright		4										
95	8 1/2		2	Claystone, bk.& dk. gy. s.		2										
95	9 1/2		1	Shale, bk.		1										

Donaldson's Seam (G.M.B.)
Dec. 53

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
95	11 $\frac{1}{2}$		2	COAL, dull, shy.		2										
96	1 $\frac{1}{2}$		2	Claystone, buff, v.s.		1										
96	3 $\frac{1}{2}$		2	COAL		2										
96	5 $\frac{1}{2}$		1 $\frac{1}{2}$	Sandstone, gy. m.gr. sideritic, hard		1 $\frac{1}{2}$										
96	9		4	COAL, shy.		1										
97	1 $\frac{1}{2}$		3 $\frac{1}{2}$	COAL, dull		3										
97	4		3 $\frac{1}{2}$	Claystone, buff, v.s.		3 $\frac{1}{2}$										
98	1		9	COAL, gen. bright, fragmentary & shattered		7 $\frac{1}{2}$										
99	3	1	2	Sandstone, gy. m.gr. w. conttd. dk.gy. carb. bds.	1	2										
104		4	9	Sandstone, gy. m.gr.												
104	5		5	COAL												
104	7		2	Shale, bk. s.		2										
104	8		1	Claystone, l.gyish.-br. s.		1										
104	9		1	Claystone, bk. s.		1										
105	1 $\frac{1}{2}$		3 $\frac{1}{2}$	Shale, l.brish.-y. v.s.		3 $\frac{1}{2}$										
105	5 $\frac{1}{2}$		5	COAL, dull		3 $\frac{1}{2}$										
106	2 $\frac{1}{2}$		9	COAL, dull, v. shy.		9										
106	5		2 $\frac{1}{2}$	Shale, bk. silty		2 $\frac{1}{2}$										
106	6 $\frac{1}{2}$		1 $\frac{1}{2}$	Shale, bk. w. gy. clay lenses		1 $\frac{1}{2}$										
107	1 $\frac{1}{2}$		6	COAL, bright fragmentary		4 $\frac{1}{2}$										
107	2		1 $\frac{1}{2}$	Shale, bk.		1 $\frac{1}{2}$										
107	9		7	COAL, somewhat shy.		5 $\frac{1}{2}$										
107	11		2	Sandstone, gy. m.gr.		2										
107	11 $\frac{1}{2}$		1 $\frac{1}{2}$	Shale, bk.		1 $\frac{1}{2}$										
108	9 $\frac{1}{2}$	10		Sandstone, gy. m. to c. gr.	10											
109			2 $\frac{1}{2}$	Claystone, br. s.		2 $\frac{1}{2}$										
123	3	14	3	Sandstone, gy. m.gr. rather fri.												
123	6		3	COAL												
												Big Ben Seam (G.M.B.Dec.53)				

[illegible]

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
154	6		6	COAL, dull shy.		6										
154	7		1	Sandstone, l.gy. m.gr.		1										
155			5	Shale, dk.gy.		5										
160		5		Shale, gy.												
168	8	8	8	Shale, gy.												
169			4	COAL												
169	4		4	COAL, dull, shy.		4										
169	7		3	Siltstone, dk. gy.		3										
170			5	COAL, bright pyrfl.		5										
170	6		6	Shale, gy.		3										
175		4	6	Sandstone, gy. f.gr. w. dk.gy. carb. silty bds.												
180		5		Siltstone, dk.gy.												
185		5		Sandstone, l.gy. f.gr.												
191		6		" dk.gy. f.gr.												
193		2		Shale, gyish.-bk. w. carb. bds.												
212		19		Sandstone, dk.gy. f.gr. w. dk.gy. silty bds.												
218		6		Sandstone, l.gy. m.gr. ib. w. dk.gy. siltstone												
231		13		Siltstone, dk.gy.												
250		19		Sandstone, gy. f.gr. d. w. shy. carb. lam.												
												Scotch Derry ? Seam (G.M.B. 53)				
												Possible approximate commencement of Buttai Beds.				
												Completed.				

BUREAU OF MINERAL RESOURCES

Name and No. of Bore BMR 4 STONY PINCH

DISTRICT	Newcastle	COUNTY	Northumberland	PARISH	Stockrington	PORTION	92	Approx. LOCATION	S.E. Cnr. 92/273°8'/1502
Surveyed by	A.N.Rochfort (D.Int.)		Survey Method	Theodolite		Elevation	205'	Ref. Map	BMR N14 - 132
Logged by	N. Hoyling & M.Konecki		Cased	Not		Datum	H.D.W.B.	Ref. Report	BMR Recs. 1953/89.
Sunk by	BMR		Type of Drill	Failing 750		Depth	106' 7"	Date Begun/Finished	18.4.52/2.5.52

[illegible]

[illegible]

[illegible]

[illegible]

BUREAU OF MINERAL RESOURCES

Name and No. of Bore BMR 1 THORNTON

DISTRICT	Newcastle	COUNTY	Northumberland	PARISH	Stockrington	PORTION	92	LOCATION	Approx. S.E.Cnr. Port. 92/339°20' / 3771 ft.
Surveyed by	A. N. Rochfort (D.Int.)	Survey Method	Theodolite	Elevation	193.6 ft.	Ref. Map	BMR Plan N.14-132		
Logged by	N. Hoyling	Cased	Not	Datum	H.D.W.B. Stand.	Ref. Report	BMR Recs. 1953/89.		
Sunk by	BMR	Type of Drill	Failing 750	Depth	250 ft.	Date Begun/Finished	8/4/1952-15/4/52.		

[illegible]

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
160	6	1	6	COAL, dull, shy. probably w. many shale bds.												
190		29	6	Sandstone, gy. f.to m.gr. w. some coal as bds. @ 165' - 170'												
191	6	1	6	Shale, dk.gy. w. some bright cant bands	1	6										
200		8	6	Siltstone & shale, dark gy. w. some thin coal lam.												
211		11		Sandstone, l.gy. m.gr.												
215		4		Greywacke, dk.gy. m.gr. w. thin bright coal bds.												
221		6		Sandstone, l.gy. f.gr. & gy. & v.f.gr.												
222	8	1	8	Shale, brish.-bk. & bk. s. w. some dull coal												
228	8	6		Sandstone, gy. v.f.gr.												
229			4	Shale, br. v.s. w. some dull coal												
229	6		6	COAL, bright	1											
229	7½		1½	Shale, dk. gy. mic. pyrf.	1½											
231		1	4½	Shale, gyish.-bk. pyrf.	1½											
234		3		Siltstone, dk.gy.												
250		16		Sandstone, l.gy. m.gr. shy.												
					Completed.											
					This log should be supplemented by that of BMR 2 Thornton which was drilled 16' SE of BMR 1.											

BUREAU OF MINERAL RESOURCES

Name and No. of Bore BMR 2 THORNTON.

DISTRICT	Newcastle	COUNTY	Northumberland	PARISH	Stockrington	PORTION	92	Approx. LOCATION	S.E. Cnr. Port. 92/339020' / 3771 ft.
Surveyed by	A.N. Rochfort (D.Int.)	Survey Method	Theodolite	Elevation	192.5 ft.	Ref. Map	BMR Plan N.14/132		
Logged by	N. Hoyling	Cased	Not	Datum	H.D.W.B. Stand.	Ref. Report	BMR Recs. 1953/89.		
Sunk by	BMR	Type of Drill	Failing 750	Depth	101 ft.	Date Begun/Finished	15.4.52/18.4.52.		

[illegible]

Estimated Depth		Estimated Thickness		GEOLOGICAL DESCRIPTION OF STRATA	Core Measured		Coal Sample No.	Min. Bands Included		Min. Bands Excluded		PROXIMATE ANALYSIS				
Ft.	Ins.	Ft.	Ins.		Ft.	Ins.		Ft.	Ins.	Ft.	Ins.	H.M.	V.	F.C.	ASH	B. TH. U/LB
67	2		11½	Sandstone, l.gy. f.gr.		11½										
67	5½		3½	Shale, brish.-gy.		3½										
67	6½		1	Shale, dk.gy.		1										
67	8		1½	Shale, bk.		1½										
67	9½		1½	Sandstone, bk. m.gr.		1½										
70	8½	2	11	COAL, dull, shy.		11										
72	11½	1	4	Shale, gyish.-bk. s. ?wd.	1	4										
72	11½		11	Shale, dk.gy.		11										
73			½	Shale, bk. w. bright dant lam. & carb. leaves		½										
73	4		4	Shale, gy.		4										
74			8	Sandstone, gy. f.to m.gr. w. conttd. carb.		8										
75		1	7	Shale, gy. lam.	1											
77		1	5	Sandstone, l.gy. v.f.gr. sideritic & hd. in the last half	1	5										
81	7	4	7	Sandstone, l.gy. f.gr. w. conttd. carb. lam. & bds.	4	4										
81	10		3	Shale, dk. gy.		3										
84	3	2	5	Shale, dk. gy.	2	5										
85	5	1	2	Shale, gyish.-bk. v.s.	1	2										
86	9	1	4	Siltstone, dk. gy. brittle		7										
87	8		11	" gy.		11										
88	7		11	Sandstone, l.gy. v.f.gr.		11										
90	10	2	3	Siltstone, gy. w. darker shy.bds.& sdy.bds.	2	3										
91	11	1	1	Shale, gy. w.sdy. & silty bds.	1	1										
92	2		3	Sandstone, l.gy. v.f.gr.		3										
92	11		9	Shale, dk.gy. w.l.gy. sdy.bds.		9										
93	1		2	Sandstone, l.gy. m.gr.		2										
94			11	Shale, bk. hd. & coaly to dk.gy. & s.		4½										
95		1		Sandstone, l.gy. m.gr.	1											
101		6		Sandstone, l.gy. v.f.gr.(a 2" nodule of earthy carbonate (?calcite or siderite) occurs at the end of the core as recovered.	2											
												Scotch Derry Seam ? (G.M.B. Dec. '53).				
												Butt ai Sandstone ?				
												Completed. Not enough coal was penetrat to warrant sampling for analysis.				

12^(Ph.)