COMMONWEALTH OF AUSTRALIA.

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

RECORDS. 1953/88



KILLINGWORTH AREA

DRILLING RESULTS

By T.H. Rodger

Bureau of Mineral Resources, Geology and Geophysics OPEN CUT COAL INVESTIGATIONS IN NEW SOUTH WALES NEWCASTLE REGION

KILLINGWORTH AREA

DRILLING RESULTS
By T.H. Rodger

RECORDS 1953/88

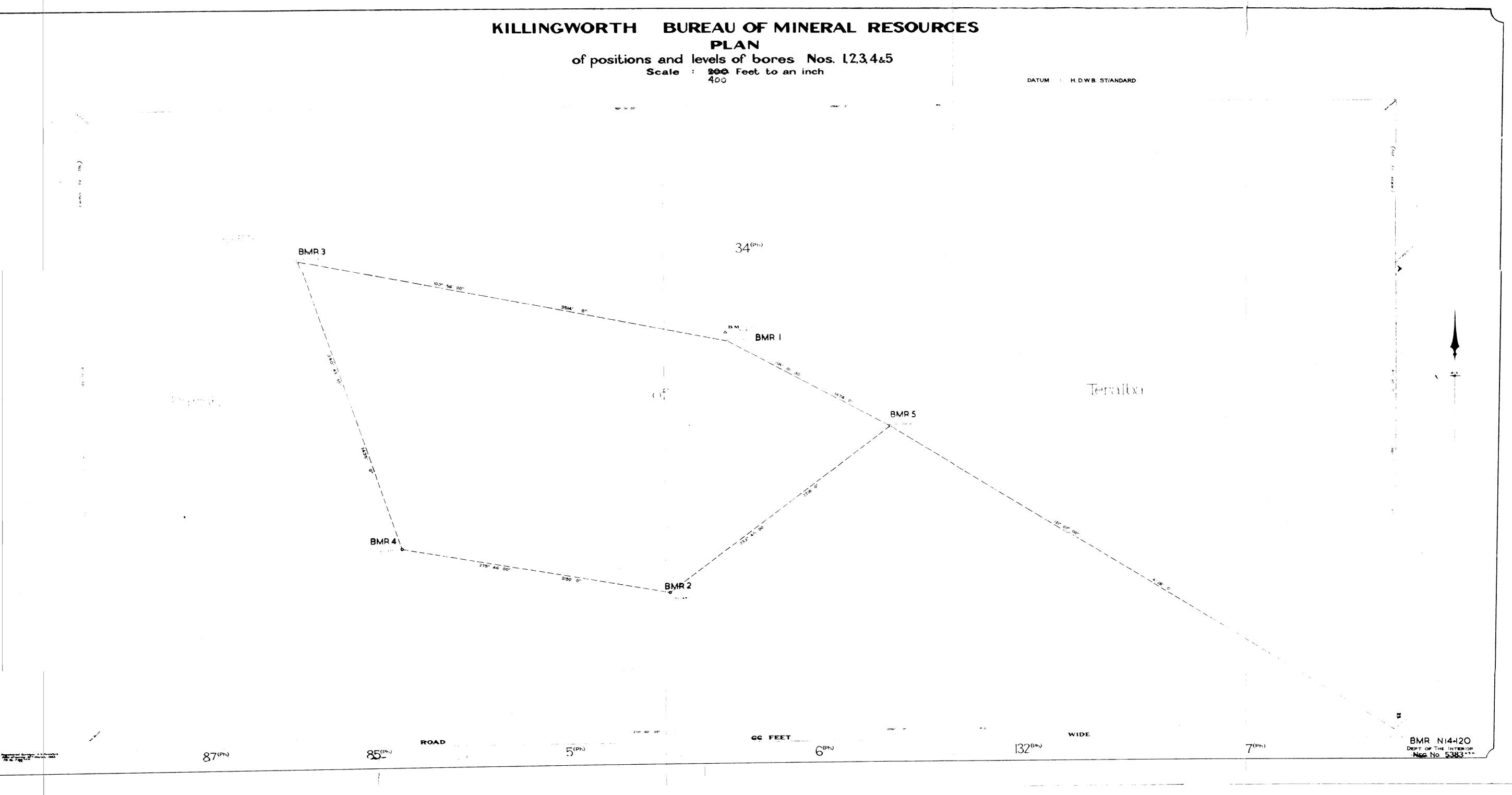
CONTENTS.
Text; Bore Logs; Map N14/120

The area investigated is to the south west of the West Wallsend Extended Colliery near the township of Killingworth within Portion 34, Parish of Teralba, County Northumberland.

Drilling was carried out for the Joint C_{O} al Board as part of the programme of the proposed Barnsley Australasian Open Cut, to locate the Great Northern and Fassifern Seams which outcrop at the base of the hills. Five bores were sunk (see EMR Map N14/12%) Bores BMR 1 to 4 penetrated the Fassifern Seam.

The coal in the seams was found to be of extremely poor quality and the seams very banded. Therefore drilling was discontinued. There are dykes shown on the Caledonian Collieries Ltd. "Plan Showing Outcrep of the Great Northern and Fassifern Seams" (Plan W.W.E. 184C.) One of these is visible near BMR 5, but the others near BMR 3 cannot be seen on the surface. Cindered coal was not encountered during drilling operations.

The seams dip to the north west.



KILLINGWORTH AREA.

List of Approximate Locations from Point of Origin, SE Cnr. Portion 34, Parish of Teralba. (Map N14-120.)

BMR 1 310°50' 6190' BMR 3 304°30' 9580' BMR 2 291 50' 5935' BMR 4 291 00' 7125' BMR 5 311°30' 4725'

APPROX. SE Enr. of port. 34 PARISH Teralba 310 501/61901 eralba PORTION LOCATION N14-120 Newcastle Northumberland DISTRICT COUNTY Theodolite Trav. 191.6 Dept. Interior Elevation H.W.B. Survey Method Surveyed by Ref. Map 3516" BMR Records 1953/88 W.A.McKinnon Datum 106'10" Cased Ref. Report Logged by Date Begun/Finished 1.7.52/8.7.52 Sullivan 22HD Sunk by Type of Drill Depth Coal Min. Bands Min. Bands PROXIMATE ANALYSIS Estimated Estimated Core Included Excluded Depth Thickness GEOLOGICAL DESCRIPTION OF STRATA Measured Sample H.M. F.C. B. TH. U/LB No. ASH Ft. Ins. Ft. Ins. Ft. Ins. Ins. Ins. Sand, soft, clayey, formed by weathering of sandstone & clayshalo 10 0 Clayshale, off-white, soft GT. NORTHERN SEAM (THR) 10 COAL. smut 5 Greywacke, pink soft, weathered 10 10 Clayshale, dark brown, soft 11 COAL. smut Clayshale, light grey weathered 11 2 Clayshale, light grey w. orange & brown inclusions-white mineral, filling cracks 17 3 Clayshale, light grey soft sandy in patches w. thin bands ferruginous mat. 3 20 3 Clayshale, light grey to a ferruginous yellow silty in places white material filling cracks 25 Clayshale as above 11 8 10 Greywacke, light yellow fine to medium grained soft and weathered 36 3 Greywacke, light yellow, fine medium & 10 & coarse grained, weathered 2 39 Greywacke, as above 3 Greywacke, l.yellow to buff, soft fine 0 to medium Clayshale, soft, grey with plant remains Greywacke, grey to limonite yellow fine & medium Clayshale, light grey w. some linonite Greywacke, linonitic yellow fine to medium 11 45 Clayshale, light grey, soft 1 9 Greywacke, light grey to light yellow fine 46 to medium grained

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BMR 1 KILLINGWORTH

Name and No. of Bore

Page Z

Name and No. of Bore BMR 1 KILLINGWORTH

			_					•				
Estimated Depth	Estimated Thickness		Core Measured	Coal Sample	Min. Bands Included	Min. Bands Excluded	PROXIMATE ANALYSIS					
Ft. Ins.		GEOLOGICAL DESCRIPTION OF STRATA	Ft. Ins.	No.	Ft. Ins.	Ft. Ins.	H.M. V	. F.C. ASH	B. TH. U/LB			
47 3 48 7 49 11	1 4	Siltstone, light grey, clayey Greywacke, light yellow fine grained Greywacke, light yellow to grey medium w. current bedding	1 0	-								
54 11 60 7 70 7	5 8	Greywacke, as above Greywacke, as above Greywacke, deep yellow medium to very coarse	1 0 1 0 5 0			·		-				
72 8 74 6		Greywacke, light yellow medium to coarse	7			1						
80 0		Greywacke, light grey & black banded fine to medium Siltstone, light grey w. some sandy &	10	-								
83 2 83 11 87 1	3 2 9	clayey patches irregularly bedded Siltstone, grey sandy & clayey in patches Clayshale, light grey soft	4 3 9 7					·				
87 4 88 6 90 0	1 2	Siltstone, grey sandy in patches COAL, dull Shale, black, carbonaceous	2 0				F	ASSIFERN SE	AM (T.H.R.)			
90 3 90 4 90 7 90 11 91 1 94 4	3 1 3 4 2 3 3 3	COAL, dull, shaly COAL, thin bright bands Siltstone, black, carbonaceous COAL, mainly bright Claystone, grey soft shattered Shale, coaly COAL, dull w. bright bands	4 2 1 3 4 2 5									
95 5 96 1 96 5 96 10 97 5 98 4 98 11 99 8 103 10 104 1 106 10	8 4 5 7 11 7 9 4 2	Shale, black, coaly w. thin bright bands Claystone, yellow, soft COAL, mainly bright COAL, dull Greywacke, light grey, fine to medium Greywacke, as above Clayshale, grey, soft Greywacke, light grey, fine to medium Siltstone, grey, carbonaceous COAL, bright Siltstone, grey, carb. sandy in places	3 6 2 7 11 3 9 2 4 1									
		Hole completed					t	yped 26.10.	53			

BMR 2 KILLINGWORTH Name and No. of Bore Newcastle DISTRICT Dept. Interior Survey Method Theodolite Thev. Elevation 269.51 Ref. Map N14-120 Surveyed by N. Hoyling Cased Failing 750 H.W.B. BMR Records 1953/88 Datum H.W.B. Ref. Report Logged by Type of Drill Failing 750/262 158'10" Date Begun/Finished 8.7.52/18.7.52 Depth Sunk by Estimated Estimated Coal Min. Bands Min. Bands Core PROXIMATE ANALYSIS GEOLOGICAL DESCRIPTION OF STRATA Depth Thickness Measured Sample Included Excluded H.M. F.C. B. TH. U/LB No. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Greywacke, light brown, originally greyish white ferruginous, medium grained to finely conglomerate rather friable 16 33 Sandstone greyish white to light brown fine 79 0 to medium grained, soft & friable 82 0 3 0 Shale, grey, medium, soft 97 15 Sandstone, brown, medium grained somewhat friable 97 Shale, greyish, black, medium, soft 129 32 Shale, dark grey, medium soft, with rare black bands in the top 51 137 Shale, black, medium hard 130 Claystone, greyish yellow & black soft 131 GT. NORTHERN SEAM (T.H.R.) COAL 11늵 COAL, with bright bands 131 132 Shale, brownish-yellow, soft 132 COAL, rather shaly with bright bands 134 COAL, dull, rather shaly 134 Shale, brownish, yellow, medium soft 134 COAL. dull 135 COAL, dull with bright bands 135 Shale, ywllow, medium soft Shale, yellow, medium soft 136 COAL, dull with bright bands fragmentary 136 137 Shale, yellow, soft 137 COAL, dull shaly COAL, mostly bright 138 138 Shale, grey, soft 138 COAL, dull with bright bands 140 0 COAL, with bright bands broken to frag. ٦٦ COAL ? 141 0 142 COAL ?

Page

Name and No. of Bore

Estimated Estimated Core Coal Min. Bands Min. Bands PROXIMATE ANALYSIS Depth Thickness GEOLOGICAL DESCRIPTION OF STRATA Measured Sample Included Excluded F.C. H.M. V. ASH B. TH. U/LB No. Ft. Ft. Ins. Ft. Ins: Ft. Ins. Ft. Ins. Ins. Shale, yellow & reddish brown soft COAL, with bright bands COAL 5½ 2 2 143 143 143 145 1 9½ 1 9½ Sandstone, light grey medium grained & medium hard 3 Shale, grey, silty.
Shale, grey sandy with black bands 145 4 158 10 13 typed 26.10.53 Hole completed

Welverburger of the the state of the second of the second

BMR 3 KILLINGWORTH

_ DUKE	AU UF	MINERAL RESOURCES			o. of Bore	ATOTA		OTF C		- T)		
DISTRICT	Newca	COUNTY	Teralba	P	ORTION	34 LOCATI	ON	304	301/9	580	54.	
		. Interior Theodolite Trav. Survey Method Not	Elevation	271.	Q.	Ref	. Man		N14 -1	20		
Logged by	by Dept N. H	oyling Not	Dotum	H.W.	В.	Dof	Donor	_ E	BMR Re	c ords	1953/88	
	ogged by BMR. Cased Failing 750/262							18.7.52/1.8 in/Finished				
Sunk by.		Type of Drill		200			e Begui					
Estimated Depth	Estimated Thickness	GEOLOGICAL DESCRIPTION OF STRATA	Core Measured	Coal Sample	Min. Bands Included	Min. Bands Excluded	TT 35	1	XIMATE		·	
Ft. Ins.	Ft. Ins.	Sandstone, light grey, fine to medium gra	Ft. Ins.	No.	Ft. Ins.	Ft. Ins.	H.M.	<u>v.</u>	F.C.	ASH	B. TH. U/LB	
		friable					-					
14 0	4 0	Sandstone, light yellowish-brown fine					[
1 9 0	5 0	grained, soft & clayey Shale, light brownish-grey										
3 9 0	-	Sandstone, light grey, fine to medium						•				
68 6	29 6	grained, conglomerate in bands friable	e									
68 10		Shale, greyish, white medium hard COAL, dull soft					GT.	NORT	HERN	SEAM	T.H.R.)	
69 9		COAL, dull, rather shaly	63	1/BMR	 3							
70 9 71 7	1	COAL, dull	62	1/BMR						-	·	
11 1	10	COAL, dull	85									
71 9		Shale, grey, hard	1월									
73 9 74 9		COAL, dull										
75 9		COAL, dull with bright bands COAL, dull with bright bands	8 8	2/BMR:	3 							
75 10	1	Shale, brown	1		1	•						
76 9	11	COAL, dull with bright bands	7									
77 7	10	COAL, dull with bright bands	5 ½	3/BMR :	 					•	•	
$77 7\frac{1}{5}$		Shale, brownish-grey	3½	O/ Dillic	<u> </u>							
78 3 79 9	1 6	COAL, dull with bright bands COAL, dull very shaly in bands		- :								
	" "	JOAN, dail very shary in bands	1 0		•						•	
81 2	1 5	Shale, black	_		}		,					
81 8 81 11	5 3	Shale, black with rare bright coal bands Claystone, light brown soft	์5 ±ี่ฐ 3 1 ±ี่ฐ 2 3 ±ี่ฐ									
82 야		Shale, black	ુ 1 ક ે						l I			
$83 2\frac{1}{2}$	2	Claystone, light brown, soft	ِّ	!]			
82 6 [~] 83 7		Shale, black with bright coal bands	3½ 4						,			
- - •		orace wron origin coar dands	1 #									
	1	,	I		1	l i	İ	l	I	I		

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Name and No. of Bore MR 3 KITLLINGWORDER

	mated		nated		Cor		Coal	Min. Bands		Bands		PRO	XIMATE	ANALY	SIS
Ft.	epth Ins.	1	kness Ins.	GEOLOGICAL DESCRIPTION OF STRATA	Measu Ft.	1	Sample No.	Included Ft. Ins.	Į.	uded Ins.	H.M.	v.	F.C.	ASH	B. TH. U/LB
83 84 84	8 0 4		1 4 4	Shale, greyish brown, medium soft Shale, black Shale, greyish brown, medium-soft silty		1 3½ 4		10. 113.		<u> </u>					
85 85	3		11 3	Shale, black Shale, black		1				,		· -	-		
86 87	5		11 8	Shale, light yellowish-grey-brown, soft Shale, black		10 4 경					_				•
89	1	2	0	Shale, light grey, tuffaceous, dark brown to light brown in the top ½ medium, hard with soft bands	2	0				ļ	-				٠,,
,91 ,91	3 1 . 9	1	2 10 8	Shale, light grey medium soft COAL, dull very shaly Shale, black with bright coal bands hard		2 6 8			4			·			·
92 93 94	5 1 1	1	8 8 0 2	COAL, dull Shale, light grey medium soft tuffaceous Shale, black, hard		7 62 3				-			ŕ		
.95	9	1	7	Sandstone, dark grey to grey very fine grained, medium hard Shale, black, hard		7							-		
96 98 99	9 10 6	2	0 1 8	Shale, dark grey to black, hard Shale, black, hard COAL, dull very shaly		8 9 3			-						
99 99 100 101	7 8 9 0 0		1 1 1 1 2 2 3 0 0	Shale, light grey, soft Shale, dark grey, medium hard COAL, dull very shaly Shale, black		1 2 5 1 C									
101 104	9	3	9	Shale, light brown soft Shale, light greenish-grey, sandy medium soft	3	9				-					·
107	9 4	3 2	0 7	Shale, light to dark grey medium hard Shale, dark grey, medium hard with silty & sandy bands	2	0						-			•
110 118	9 1	7	5 4	Sandstone, light grey, fine grained hard Sandstone, light grey fine to medium grained hard		ž		-		,		-			
118 119 119	11 2 5		10 3 3	COAL, dull COAL, dull Sandstone, light grey, fine grained shaly		1									
119	10		5	medium soft Shale, black, hard with some bright coal		3 5									

	mated		mated kness	GEOLOGICAL DESCRIPTION OF STRATA		ore	Coal		Bands		Bands		PRO	XIMATE	ANALY	SIS
	epth Ins.	Ft.	Ins.	• GEOLOGICAL DESCRIPTION OF STRATA	j	sured I <u>n</u> s.	Sample No.	i	uded Ins.	1	luded Ins.	H.M.	v.	F.C.	ASH	B. TH. U/LB
120	1½	1.0.	3 2	COAL, mostly dull		3 1			1115.	Ft.	1118.					
120	9		7 1	Shale, dark grey, hard		7~				ĺ						
125	4	4	7 ²	Shale, dark, silaceous, hard		•										
	8	-	4	COAL, dull												
125			מ	COAL, mostly dull		7 নুহা 4										
126	3	Ì	1	Shale greyish brown soft		크						.				
126	$3\frac{1}{2}$		1 4분	COAL, mostly dull		4특									İ	
126	8		42			- 2										
127	3	_	7	Shale greyish black, hard	1	0										
128	3	1	0	Shale greyish black hard	-											
150		21	9	Shale greyish black hard												
182	0	32	0	Sandstone, light brown, grey fine to												
		ŀ		medium grained dense medium hard												
182	6		6	Shale, grey & soft coal		0										
183	3		9	Shale, black, hard		9 3									1	
183	6	1	3	Siltstone, greyish black hard		o										
184	6	1	0	Sand stone grey to light grey fine to												
•		ľ		medium grained hard		11									1	
200	0	15	6	Sandstone, grey fine to medium graihed												
				with some grey shale bands		-				\ \						
201	2	1	2	Shale, black hard		_						·			1	•
201	5		3	Shale light grey soft tuffaceous		3										
202	2	1	9	Shale black hard		9										
210	5	8	3	Shale dark grey to black hard									C = ==	NT CIT? 4	· / ·	T D \
211	2	ĺ	9	COAL, mostly dull, fragmentary		7						F'AS	SIFER	N SEA	(T. 1	leRe)
211	5	ļ.	3	Siltstone, grey medium hard	1.	3]	
211	8	1	3	COAL, dulí		2								ļ	1	
211	10		2	Shale, black		2									j	•
212	iŏ	1	0	Shale, light grey, medium soft, silty	1	0				ŀ						
213		-	7	COAL, dull very shaly		4						e .				
214	i		8	COAL, dull shaly		8										
214	10		9	Shale, light grey soft		9										
214	11		ì	COAK, dull very shaly		1										
215	2		3	COAL, dull with bright bands		3										
215	31	}	ਹੈ 1 <u>ਵੈ</u>	Siltstone, light brown, medium soft		그 글				1						
215	oi Oi	1	6 6	COAL, dull shaly		6~										
216	31	1	6	Shale, light grey, very soft		6										
217	31	1	0	COAL, dull with bright bands	1	0		İ					l			
OTTO OTTO	2393340	1	1	Shale, greyish brown, medium soft		1									1	
217	72		77	COAL, bright		킂										
217	9		4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Shale, black, hard		1 2 2		1								
217	113	ļ	42	DIEG 192 * PEG OFF TEG I C		6								-		•
		-			4.	15		F		:	17	t^{\prime}	15,	15	15	

Name and No. of Bore BMR 3 KILLINGWORTH

Estimated Depth	Estimated Thickness	GEOLOGICAL DESCRIPTION OF STRATA	Core Measured	Coal Sample	Min. Bands Included	Min. Bands Excluded		PRO	XIMATE	ANALY	SIS
Ft. Ins.	Ft. Ins.	GEOLOGICAL DESCRIPTION OF STRATA	Ft. Ins		Ft. Ins.	Ft. Ins.	H.M.	v.	F.C.	ASH	B. TH. U/LB
218 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 1 7 5 2 1 2 1 0 1 0	COAL, bright Shale, black Sandstone, l.gy. carb.f.grained Shale, black silty Shale brown COAL dull shale COAL, dull with rare bright bands COAL, dull with bright bands pyritiferous brownish grey shale lenses	1 7 5 5 11 1 0		,						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10½ 8 3 1 4 5 8½ 1 5 7½	Sandstone, light grey carbonaceous fine grained Shale, black to dark grey Shale, dark grey, medium soft Siltstone, dark grey, medium soft Shale, greyish-black, medium soft Shale, greyish-black medium soft Sandstone, light grey fine grained Claystone, light brownish-grey hard Dip of shale-sandstone & sandstone claystone junctions is only about 20.	103 8 3 1 4 5 8 1 5	3							
		Hole completed				t	yped	27. 10	.53	v.	·
							79				
							·				

B	UKE	AU	UF	MINERAL RESOURCES	•	Na	ame and N	o. of Bore	APPRO	X S	E. Cnr	of	Port.	34		
DI	STRICT	, Nev	vcast	le COUNTY Northumberland PARISH.	${ m Ter}$	al ba		34	1	. 2	91 - An ,	17725	ο.			
Su	rveyed	by	Dept.	Interior Survey Method Theodolite Trave	Ele	evation										
Lo	gged by	v	V. Ho	yling Cased Not	Da	tum	H.W.B.	,	Ref	f. Repor	Τ.					
Sunk by BMR Type of Drill Failing 1500							176'		Dat	te Begu	n/Finish	22.7.52/28.8.52 nished				
	mated epth		mated kness	GEOLOGICAL DESCRIPTION OF STRATA	Co	ore sured	Coal Sample	Min. Bands Included	Min. Bands Excluded		PRO	XIMATE	ANALY	SIS		
Ft.	_		Ins.			Ins.	No.	Ft. Ins.	Ft. Ins.	H.M.	v.	F.C.	ASH.	B. TH. U/LB		
65	6	65	6	Sandstone, brown, medium to very coards												
			_	grained w. thin fine complomerate bds.												
66	O,		6	COAL, dull w. white claystone		. 4		,				,				
66	4		4	Claystone white very soft		. 4								`		
67	0	-	8	Claystone, dk. grey very soft Claystone, black, soft probably weathered		0				1						
70	O	3	0	Coal	ı	3								•		
71	0	1	0	Shale, grey soft	_											
73	6	2	6	Sandstone, grey soft shaly in the bottom												
, 0	O	~		quarter	2	6										
144	6	71	Ō	Sandstone, grey very soft, shaly									<u> </u>			
145	Ō	-	6	COAL, duli						GT.	NORTH	ERN S	CAM (T	.H.R.)		
147	Ö	2	0	COAL, dull shaly w. bright bands	1	11										
147	2		2	Siltstone, grey		2]			
149	0	1	10	COAL, soft & bright ?weathered	1	10								•		
149	6		6	Shale, black, medium soft		5							!			
149	ô		3	Shale, black, hard		3										
152	0	2	3	Shale, black, soft to medium soft ?wd coal		11										
153	0	1	0	COAL, dull shaly		8							.			
153	1		1	Shale, greyish-brown medium soft		1 9		-								
153	10,	1	9	COAL, dull with bright bams		9										
154	0늹		2 1	Shale, brown, soft		2 1					,					
155	0	1	미분	COAL, dull with bright bands .		5					•		- 1			
155	9	-	9	Shale, black, medium hard		6		,			}					
156	3	[6	Shale, brown, medium soft sandy	{	6										
157	0		9	Shale, black, hard		2 11										
157	11		11	Shale, light grey. soft		7							. !			
158	6		7	COAL, mostly duli		រ <u>ុំ</u>										
159	0		6	Shale, dk.brownish-grey		72					1	1				
1 5 9 162	7	77	7 71	~Shale, light brownish-grey	1	5					-	-		,		
102	10분	3	3 <u>1</u>	COAL. dull with bright bands	-	•										

BMR 4 KILLINGWORTH

Name and No. of Bore BMR 4 KILLINGWORTH

_	age :	<u> </u>	••••••			7.4	ame anu 1	10. 01	Dore 'E	MEE	···· Probability	T-1/10-34-0-	FC1F1	••••••	•••••	••••••
Estima Dept	ated		mated kness	GEOLOGICAL DESCRIPTION OF STRATA		ore sured	Coal Sample		Bands		Bands uded		PRO	XIMATE	ANALY	SIS
Ft.			Ins.	• • •	1	Ins.	No.	í	Ins.	1	Ins.	H.M.	v.	F.C.	ASH	B. TH. U/LB
163 104 164 165	0 3 10 10	1 1 3	1½ 3 2 0	Shale, l.brown, medium soft CCAL, meatly dull Sandstone, yellowish-brown f.grd.soft Sandstone, greyish-white fine grained hd. COAL, dull & soft w. bright parts gener- ally weathered		1½2 2 2 0	S. S. S. S. S. S. S. S. S. S. S. S. S. S						-			
171 172 172 173 173 173 174	168100548928	1	252310514153	Shale, grey silty hard Shale, dk.grey Claystone, grey dense sideritic Shale, black hard Shale, brownish-yellow soft COAL, shlay w. some bright bands Shale, greyish-black hard COAL, dull w. bright bands Shale, black medium hard-brittle Shale, light grey, carb. soft Shale, black, medium hard	.	125250 18325 152	2								•	
174 176	0	1	១ ភ្ន 6	Shale, grey soft Shale. light brownish-grey very dense medium hard	1		. A 6				. :					
				Hole completed									t ype	d 27.	10.53	
				-										<u>;</u> ;;		Marian.
`											•	,				٠ -,
									,			:		·		

BMR 5 KILLINGWORTH Name and No. of Bore APPROX. SE. Cnr. of Port. 311 301/47251 COUNTY Northumberland Teralba DISTRICT Newcastle PORTION LOCATION N14-120 Survey Method TheodoliteTrav. 205.01 Surveyed by Dept. Interior Elevation Ref. Map Ref. Report BMR Records 1953/88 H.W.B. Not N. Hoyling Logged by ... Cased Datum ... Date Begun/Finished 4.8.52/4.8.52 Failing 750/262 441411 BMR Type of Drill Depth ... Sunk by Estimated Estimated Core Coal Min. Bands Min. Bands PROXIMATE ANALYSIS Thickness GEOLOGICAL DESCRIPTION OF STRATA Measured Sample Included Excluded Depth H.M. V. F.C. B. TH. U/LB No. ASH Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Shale light brownish-grey medium soft - 5 Shale, dark brown medium soft Shale, pinkish buff 0 Sandstone, light brown, medium grained friable & shaly 5 Shale, dark brown & black medium hard with some white claystone bands 44 15 Sandstone, brown coarse grained rather fria ble Hole abandoned. typed 27,10.53