COMMERCIAL IN CONFIDENCE

Section of: Markham No. 18 Underground Borehole (A. & B.)

1 - MAY 1982

Purpose: Coal exploration

	(Nat. Grid, Sheet & Qtr.)	B/H REGD. NO.
Exact Site: E 446372) L.101's N 367645) Main Gate	SK 46 NE	47A(1st Hole) 47B(Redrill)

SK 46 NE/51

Level at which bore commenced relative to O.D:- 386.80 m below O.D. (in the Clay Cross Soft seam)

Date of Boring: August to November 1981

Borer: North Derbyshire Area Boring Team, N.C.B.
Cores examined by D.J. Green and J.H. Rippon

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS m	THICKNESS cm	DEPTH m	DEPTH cm
	Top of hole.			131	44
Sandstone	with siltstone, 80:20; abundant sandstone laminae, micro lenses and a few larger sandstone ripples with erosional bases; abundant micaceous planty planes	0	99		
	passage			130	45
Siltstone	fine, poorly laminated in part; a few levels with plant debris; occasional larger plants including Lepidostrobus and 'strap' plants				
	passage	1	25		
				129	20
Sandstone	with siltstone 70:30 decreasing upwards; abundant irregular sandstone ripples with erosional bases; crumpled bedding in parts; rare rootlets near top.				
	sharp	1	78		
				127	42
Sandstone	with occasional discontinuous siltstone laminae; ripple sets				
	passage	0	47		
				126	95

SK /46 /NE/51

COMMERCIAL IN CONFIDENCE

2nd - MAY 1982

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS m	THICKNESS cm	DEPTH m	DEPTH cm
Sandstone	with siltstone 80:20, abundant irregular and linguoid sandstone ripples with erosional bases, with discontinuous siltstone laminae and layers; micaceous planty planes; local ripple drift passage	1	30	125	65
Siltstone	fine and sandstone, 50:50; abundant sandstone laminae and irregular lenses, with local ripple drift. Abundant micaceous planty planes. rapid passage	0	85	124	80
Siltstone	fine, locally medium, laminated; occasional sandstone laminae; slurried in parts passage	2	25	122	55
Mudstone	silty in parts, laminated; occasional ironstone lenses upto 0.06	0	70	121	85
	(From 121.85 to 117.14 the log is a composite of the original core and the re-drill, incorporating depths derived from penetration recorder charts)				
CORE LOST	or fragmented; assumed all mudstones	1	26	120	59
	Boxed core 120.59 - 117.54				
	Mudstone (cylinders)	0	43	120	16
	Mudstone dark (cylinders) attached	0	20	119	96
	(Coal (cylinders, broken cylinders				
	(and fragments)	0	80		
	(Mudstone (cylinders)	0	52		
	(Mudstone, canneloid to base (cylinders)	0	24		
	(Inferior cannel (cylinders)	0	18		
	(Coal (fragments)	(0	14)		
	(Dirty coal	(0	07)		
2ND WATERLOO	(LOST CORE interpreted as coal	(0	08)		
	(Mudstone and coal	0	07		
	(Mudstone silty, with mussels	0	32	117	54
	(LOST CORE interpreted as mudstone	0	16	117	38
	(Mudstone canneloid; rare phosphatic (nodules	0	14	117	24
	(CANNEL; inferior above with plant (remains, clean in basal 0.02	0	08		
	Recovery c. 83%; dip 4o	2	80	117	16

SK /46 /NE/ 51

COMMERCIAL IN CONFIDENCE 3 - MAY 1982

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS m	THICKNESS cm	DEPTH m	DEPTH cm
Mudstone	carbonaceous with coalified plant remains; fragmented.	0	02	117	14
Siltstone	fine, laminated; common sandstone laminae; common plant debris on some bedding planes; common micaceous planty planes; less sandstone towards the top	1	14	116	00
	passage				
Siltstone	fine, laminated	0	65	115	35
	passage				
Siltstone	fine with common sandstone laminae and occasional horizons of micro lenses; occasional sand-filled burrows	1	10	114	25
	passage				
Mudstone	silty in parts, poorly laminated; wormy in parts; rare Anthraconaia	0	62	113	63
	unattached				
COAL	and mudstone, interleaved; cylinders	0	01	113	62
	unattached				
Siltstone	fine laminated; common sandstone laminae; rootlets	0	22	113	40
	passage				
Siltstone	fine to medium-grained; abundant sandstone laminae and ripple drift, occasional faultlets; local crumpled bedding; locally canky; common small micaceous planty planes; rootlets near the top	1	35	112	05
Siltstone	fine with abundant sandstone laminae and common micro lenses; frequent small sand filled burrows; micaceous planty planes; crumpled bedding in top 0.13; canky near base	0	73	111	32
Sandstone	fine; irregular ripples with micaceous planty planes and discontinuous siltstone laminae	0	27	111	05

SK/46/NE/51

COMMERCIAL IN CONFIDENCE

MAY 1982

Sandstone	fine; dune sets; a few micaceous planty planes; sub-vertical mineralised joint.	0	89		
				110	16
Sandstone	fine; linguoid ripple sets; occasional irregular ripples with discontinuous siltstone laminae near the base; small micaceous planty planes				
	sharp	1	14		
				109	02
Siltstone	fine, laminated; common sandstone laminae and unconnected ripples; micaceous planty planes in part	0	38		
				108	64
Siltstone	fine, poorly laminated; rare discontinuous sandstone fine wisps; local iron-rich layers				
	passage	1	34		
				107	30
Siltstone	fine, muddy, poorly laminated				
	passage	0	30		
				107	00
Mudstone	laminated; rare thin ironstone bands near base. Common worm tracks; Cochlichnus at 06.53. Rare non-marine lamellibranchs between 06.00 and 06.10.				
		1	25		
				105	75
Mudstone	highly carbonaceous, locally slightly silty, shaley. Locally common fish scales.	0	15		
				105	60
Mudstone	laminated; weak listric. Common ironstone bands up to 0.08				
		1	55		
	detached			104	05
COAL and DIRT	Mudstone carbonaceous coaly laminae 3) Coal bright 16) Dirt 34) Coal dirty and dirt 6) cylinders Dirt 4) Coal 3) Dirt 1) Coal dirty 2) 69				
	detached	0	69		
SEATEARTH				103	36

SK/46/NE/51

-- MAY 1987

Siltstone	fine, unlaminated, grey; common roots	0	12		
				103	24
Siltstone	medium with common, diffuse, root-disturbed sandstone fine laminae and thin layers 70:30. Common micaceous planty planes. Common roots	0	84		
	passage			102	40
Siltstone	medium, grey, unlaminated; occasional roots	0	57		
				101	83
Mudstone	silty, grey, unlaminated; common roots	0	16		
				101	67
Mudstone	slightly silty, poorly laminated; abundant plant remains including Lepidostrobus; occasional roots	0	23		
				101	44
	detached				
COAL	and dirt; broken cylinders				
	detached	0	05		
				101	39
SEATEARTH					
Sandstone	fine, ganisteroid, very strong; rare sub-vertical mineralised joints; rare root traces	0	34		
				101	05
Siltstone	fine and sandstone fine, interlaminated and interlayered; common micaceous planty planes; rare small ironstone nodules near top; occasional roots	0	55		
				100	50
Siltstone	fine and sandstone fine, interlaminated and interlensed; common ripples throughout; common micaceous planty planes; slurried texture in basal 0.08; common comminuted plant debris	0	48		
				100	02
Sandstone	fine; common micaceous planty planes; ripple bedded, occasional diastems; common iron rich patches; large load and pouch structure in top 0.12	0	64		
				99	38

SK/46/NE/51

Siltstone	fine and sandstone fine interlaminated and interlayered; ripple bedded; occasional diastems; locally developed 'train' drift; common micaceous planty planes; occasional iron-rich patches	0	21	99	17
Siltstone	fine with occasional sandstone fine laminae 80:20; occasional micaceous planty planes; occasional rippled layers near top; rare plant remains including Calamites sharp	1	77	97	40
Sandstone	fine to medium with rare siltstone fine laminae and layers up to 0.03 in basal 0.30; common micaceous planty planes; locally ripple-bedded with locally developed ripple drift near base; rare ironstone clasts between 96.40 and 96.55; occasional iron-rich patches sharp	2	04	95	36
Siltstone	fine with occasional sandstone fine laminae 90:10; locally common microlenses; poorly developed ripples near top; rare micaceous planes near top; rare comminuted plant debris	1	02	94	34
Mudstone	slightly silty, laminated; occasional ironstone bands	0	54	93	80
Mudstone	laminated, core fragmented	0	24		
	detached			93	56
COAL	bright fragments	0	07		
	detached			93	49
Mudstone	core fragmented	0	37		
	detached			93	12
COAL	mainly bright fragments				
	detached	0	26		
				92	86

SEATEARTH					
Mudstone	listric, core completely fragmented	0	42	92	44
Siltstone	fine to medium, rare wispy sandstone fine laminae; common roots and root nodules	0	19	92	25
Siltstone	fine with occasional sandstone fine laminae and micro lenses 80:20; 0.05 ironstone at base; common roots becoming rare towards base	0	32	91	93
Mudstone	silty, poorly laminated; occasional small burrows; rare plant remains	0	23	91	70
Mudstone	poorly laminated; occasional irregular listric surfaces near base; very weak	0	76	90	94
Siltstone	medium, dark unlaminated, strong; common faultlets; occasional 30 degree hade irregular breaks; common ironstone nodules; common wormy ironstone bands; occasional Neuropteris leaves	4	44	86	50
Siltstone	fine, poorly laminated; locally dark; common plant remains including Neuropteris and Alethopteris	1	05	85	45
SEATEARTH					
Siltstone	medium to fine, unlaminated; occasional root nodules; common roots	0	67	84	78
Siltstone	fine, poorly laminated, dark; common faultlets; occasional ironstone patches and small nodules; locally common plant remains including Neuropteris	1	98	82	80
Siltstone	medium to coarse, unlaminated; common faultlets; rare ironstone patches near top	0	50	82	30

SK/46/NE/51

MAY 1982

Siltstone	fine, muddy, poorly laminated, dark	0	24	82	06
Siltstone	fine with occasional sandstone fine laminae 80:20; 30 degree hade unmineralised joint; colonial burrows	0	47	81	59
Siltstone	fine and sandstone irregularly interlaminated and interlayered; common micaceous planty planes; locally-developed ripples	0	20	81	39
Siltstone	fine to medium, poorly laminated, dark; common 45 degree listric breaks; occasional non-listric breaks to 76:50; common and locally abundant faultlets; abundant small irregular ironstone nodules between 80:50 and 81:00; colonial burrows between 77.25 and 77.30	7	24	74	15
Siltstone	fine, locally muddy, poorly laminated; occasional ironstone patches, locally common small burrows	1	23	72	92
Mudstone	highly carbonaceous, shaley, sub-canneloid)	0	18	72	74

SEATEARTH

Mudstone	silty; abundant irregular listric surfaces	0	54	72	20
Sandstone	fine with occasional irregular siltstone fine laminae 80:20; common micaceous planty planes; occasional ironstone patches; common roots	0	26	71	94
Siltstone	fine with common sandstone fine laminae 70:30; occasional ironstone nodules; occasional roots	0	40	71	54
Sandstone	fine with occasional siltstone fine laminae; common micaceous planty planes; ripple bedded with occasional ripple drift; large load structure near top; common sand-filled burrows between 71.00 and 71.06	0	90	70	64

SK/46/NE/51

Siltstone	fine and sandstone; abundant sandstone lenses and laminae; common micaceous planty planes; local faultlets				
	passage	1	59		
				69	05
Siltstone	fine grained with common sandstone laminae and occasional small ripples; common micaceous planes with plant debris; local faultlets				
	passage	1	00		
				68	05
Siltstone	fine, laminated; occasional small anthracosids	0	15		
				67	90
Mudstone	shaley; occasional thin ironstones; occasional small non-marine lamellibranchs; wormy in parts				
		3	00		
	* core fragmented from 67.60 to 64.56			64	90
Siltstone	fine grained, unlaminated; local faultlets; common plant remains including Neuropteris, Mariopteris and 'strap' plants; local Pinnularia	3	40		
				61	50
Siltstone	fine with sandstone laminae and ripples	0	19		
	sharp			61	31
Sandstone	with minor discontinuous siltstone laminae; abundant irregular ripples with erosional bases	0	16		
				61	15
Siltstone	fine grained, laminated; common sandstone laminae and occasional larger lenses; micaceous planes with plant debris including Cyclopteris; small anthracosids near the base				
	passage	1	20		
				59	95
Mudstone	silty; abundant small Anthracosia and Naiadites; ironstones up to 0.04				
	passage	1	35		
				58	60
Mudstone	shaley; carbonaceous; abundant Naiadites with Spirorbis near the base; abundant Anthraconaia and Anthracosia towards the top; occasional ostracods; wormy in parts	1	10		
				57	50
	Core boxed from 57.50 to 56.02				
	Mudstone (fragments)	0	25		
				57	25

SK/46/NE/51

	Mudstone (cylinders and broken cylinders)	0	29		
	detached			56	96
SECOND ELL	Coal (fragments)	0	75		
	Recovery c. 55%				
	detached			56	21
SEATEARTH					
Mudstone	(cylinders and broken cylinders)	0	10		
				56	11
Siltstone	fine (cylinders)	0	18		
				55	93
Siltstone	medium-grained with abundant sandstone laminae and ripples; common ripple drift and 'train' drift; occasional small scours; ironstone nodules becoming common towards the top	1	43		
				54	50
Siltstone	fine grained; common sandstone ripples in parts; occasional ironstones; frequent micaceous planty planes and larger plant fragments	1	90		
				52	60
Siltstone	fine grained; occasional sandstone laminae; large sandstone load structure at the top	1	10		
				51	50
Siltstone	fine to medium-grained, slurried texture	0	65		
				50	85
Siltstone	fine grained with common sandstone laminae and thin lenses; micaceous planty planes; ironstones up to 0.06	0	85+		
				50	00
	Start of coring at 50.00 m above origin in Clay Cross Soft seam.				

JR/90408/DL.XI

SK/46/NE/51

NORTH DERBYSHIRE AREA
NATIONAL COAL BOARD

- - MAY 1982

COMMERCIAL IN CONFIDENCE

SURVEY DEPARTMENT

BOREHOLE DATA AND HISTORY

BOREHOLE NAME: MARKHAM N°18 UNDERGROUND BORE HOLES (A & B)

Approximate Location: 4,390 METRES S 7° E MARKHAM SHAFTS.

National Grid Reference: E 446372·4 N 367645·4

6 inch sheet: SK 46 N.E.

Level of Origin: 386·8 METRES BELOW O.D.

Date of Drilling: 'A' HOLE 'B' HOLE
Commenced 17/8/81 6/10/81
Finished 1/10/81 5/11/81

Contractor's Name: N.C.B.

Name of Boremaster: B. WARD, DRILLER IN CHARGE

Depth (m)	Diameter of Core (mm)	Diameter of Hole (mm)	
0 to 50 m	OPEN HOLE	73·025 mm	'A' UP BORE
50m to 131·44	NQ · CORE BARREL · 47·6 mm	75·8 mm	
0 to 94m	OPEN HOLE	73·025 mm	'B' UP BORE
94m to 123 m	5'0" (1·52m) NQ CORE BARREL 47·6 mm	75·8 mm	

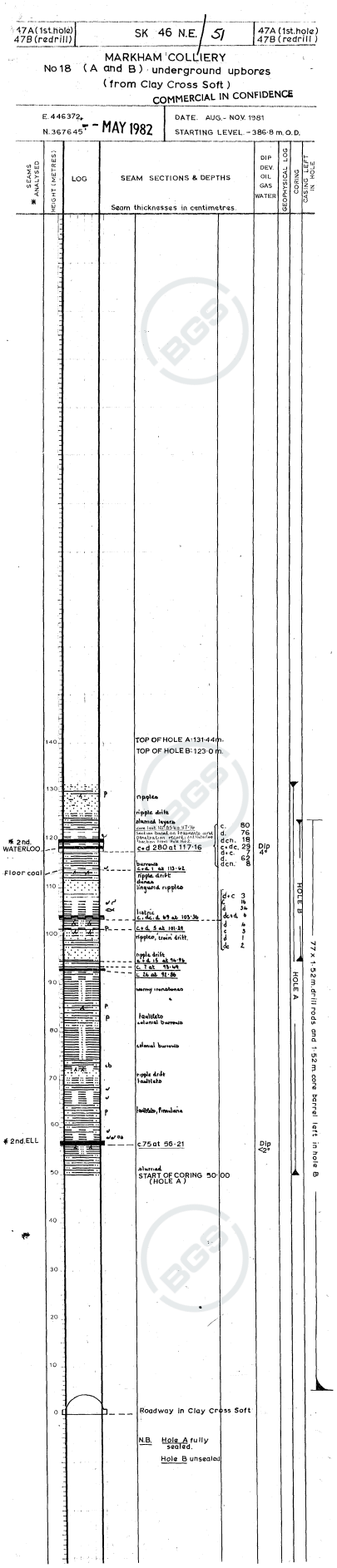
Drilling Difficulties: HAD CONSIDERABLE TROUBLE WITH CAVINGS BELOW 2ND WATERLOO SEAM, ALSO RECOVERY WAS POOR, SO DECIDED TO RE-DRILL 2ND WATERLOO BY CEMENTING UP FIRST HOLE (A) & MOVE OVER AND RE-DRILL.

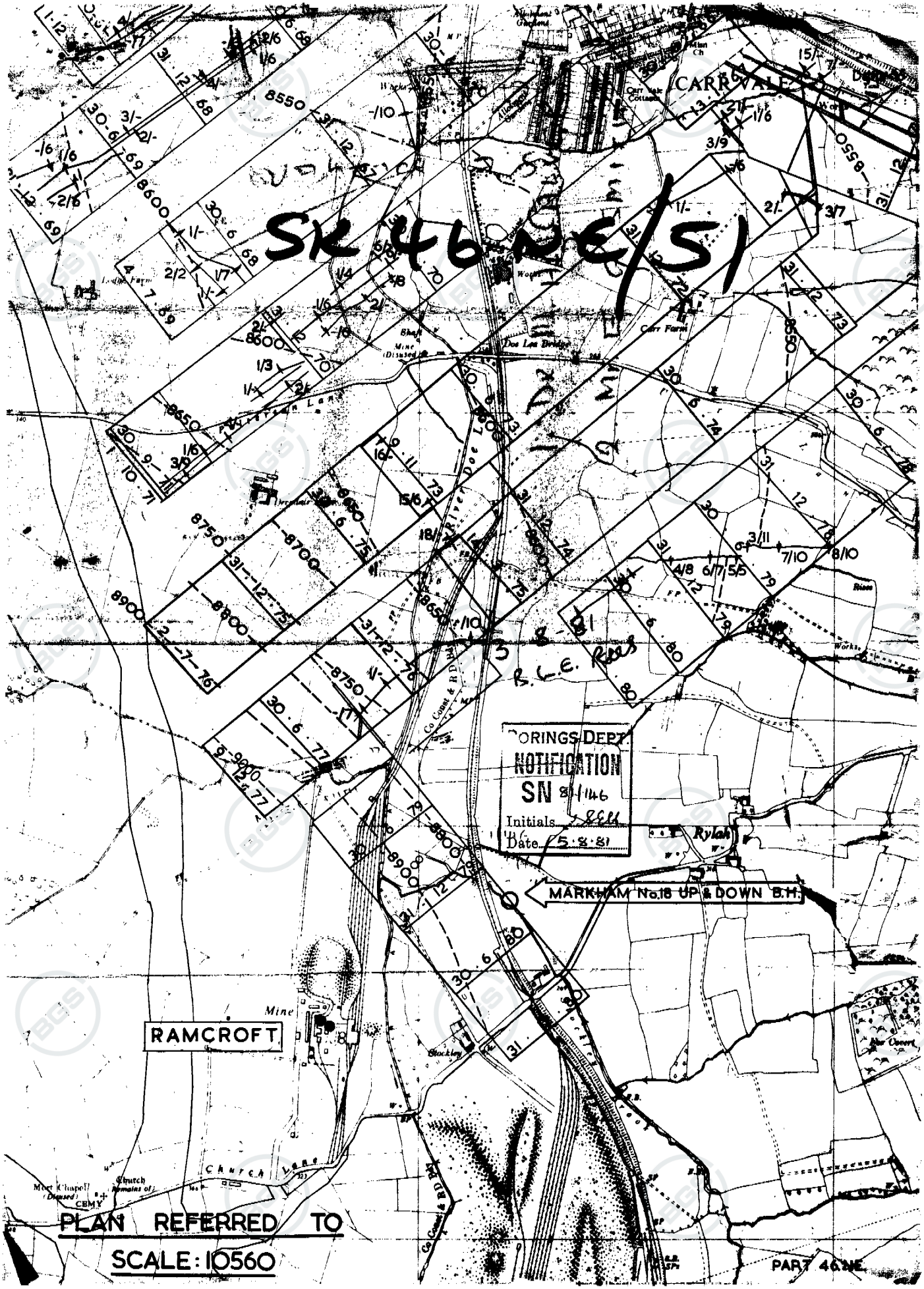
Method of Sealing Off Borehole: 'A' BOREHOLE INJECTED 850 KG SHALLOW OIL WELL CEMENT, MIXED WITH 454·6 LITRES FIRE MAIN WATER UP THE STAND PIPE UNTIL PRESSURE BUILT UP TO 450 lbs/□". 'B' BORE HOLE WAS NOT SEALED STILL 77 x 1·52m DRILL RODS & 1·52m CORE BARREL LEFT IN THE B/H DUE TO VENTILATION DIFFICULTIES, ALL DRILLING EQUIPMENT LEFT ON SITE WHEN SEALS PUT ON

Purpose fulfilled by Borehole:
OBTAINED CORE OF 2ND WATERLOO SEAM ALSO QUALITY & THICKNESS OF STRATA OVERLYING COAL SEAM UP TO MARKER BAND

Official Responsible for above Report:

A.F. BOIVMER




SK 46 NE/51
CARRVALE
RAMCROFT
MARKHAM No.18 UP & DOWN B.H.
BORINGS DEPT
NOTIFICATION
SN 81/1146
Initials SEH
Date 5.8.81
PLAN REFERRED TO
SCALE: 1:2500
PART 46 NE.