Eastwood & Partners
CONSULTING ENGINEERS

GEOTECHNICAL AND GEO-ENVIRONMENTAL SITE APPRAISAL COMMENTARY

BARNSLEY WEST

FOR

STRATA

36284-001

4 October 2013

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Job No.	:	36284
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Approved	:	[redacted]

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GEOTECHNICAL AND GEO-ENVIRONMENTAL SITE APPRAISAL SUMMARY

Introduction

This appraisal considered the likely significant effects that the ground conditions at the application site could have on the proposed development.

Site Description

The site is located to the West of Barnsley and comprises mainly agricultural land with two farms. Several streams cross the site and there are several areas of woodland as well as field boundaries.

Site History

The following table summarises the pertinent features shown on the historical Ordnance Survey maps.

Date of map	On site	Off site
1855	Agricultural fields with four woodland areas Hermit Lane present	Barugh Green Road and Higham Common Road present with small villages of Barugh Green, Higham and Gawber centred around road crossings.
1891	No changes	
1938	Footpath shown to cross centre of site north of Hermit Lane.	Residential development. Gawber and Barugh Green up to boundaries.
1955	Hermit and Drury Spring Woods not shown – fields instead.	Individual properties built along Barugh Green Road.
1965	North of Hermit Lane opencast. Drains shown crossing the site (Craven Wood shown just along the stream) One field to the east of the site shown as opencast.	No changes
1973	No opencast workings shown. Land in north shown as fields.	M1 constructed Additional residential development to north-west.
1983	No changes	Additional residential development to the east.

In summary, with the exception of opencast workings, the site has remained predominantly agricultural. The surrounding area has also been predominantly agricultural or residential.

Geology

The geological map, Sheet SE30NW (1:10,000), shows the site to overlie Carboniferous Coal Measures. These are expected to comprise bands of mudstone, sandstone and coal seams. A

number of fault lines are present on the site, mostly trending north-west to south-east. The overall dip of the strata is shown to be approximately 5° to the north-east.

Coal seams are shown to outcrop across the site, including the Barnsley Coal (2.29 m to 3.1 m thick), the Dunsil Coal (0.46 m to 0.81 m thick), the Gawber Coal (0.72 m thick) and the Swallow Wood Coal (0.3 to 1.15 m thick). There is also a thin coal recorded between each of these.

The bedrock is shown to be predominantly mudstone, with a thin band of the Haigh Moor Rock in the north and a thin band of sandstone in the east.

Opencast Workings

Four areas of opencast workings are shown. We have obtained copies of the abandonment plans from the Coal Authority and a copy of these is appended, along with our drawings 36284/001 to 005 which extract the pertinent information from these. Eastwood & Partners also arranged for six cable percussion boreholes to be completed to investigate the depth and nature of the backfill within the four areas of opencast workings. A copy of the logs for these is also appended and their approximate positions are shown on drawings 36284/001 to 005.

The following is summarised for each of these areas:

Craven I - *Reference should be made to Eastwood & Partners' drawings 001 and 002 and the Coal Authority plan Craven I & II 0E/COMP/03/311 Sheet 1 of 2*

These are the northernmost of the workings. The Swallow Wood seam and overlying Thin seam are shown to have been worked and these workings are indicated to have been up to 12.5 m deep, although generally much shallower than this.

Borehole 3 was undertaken within the north-eastern end of this area. At this position the ground level is expected to be around 85 m above Ordnance Datum (AOD) and the base of the Swallow Wood Seam and workings at 75 m AOD. Of the order of 10 m of made ground was therefore expected. Made ground, comprising clay, mudstone/siltstone gravels and coal, was recorded to 2.5 m below ground level (bgl) at which point, a 100 mm thick coal band was recorded before natural ground, of mudstone, was recorded from 2.6 m to the base of the hole at 3.7 m bgl.

The Swallow Wood seam was recorded as being 0.6 m thick, with a 0.3 m thick parting, and the Thin coal 0.34 m thick, with a 0.6 m thick fireclay below.

We would recommend that an allowance for an average of 6 m pile lengths is made for the residential units proposed in this area.

Craven II - *Reference should be made to Eastwood & Partners' drawings 001 and 003 and the Coal Authority plans Craven I & II 0E/COMP/03/311 Sheet 1 of 2 and 2 of 2*

These are the workings south of Craven I, where the Gawber, Swallow Wood, Top Haigh Moor and Low Haigh Moor are all shown to have been worked. The depth of these workings from original ground level is shown to be up to 44.2 m deep. A pump shaft is also indicated at the north-eastern end of the workings (up to 46.3 m deep). This is shown to be 0.9 m in diameter and the top of the pumping shaft is recorded to be at 87.9 m above Ordnance Datum. The former shaft is also noted to be buried around 1.5 m below the restored ground level at grid reference 432004 407548. This shaft may well need to be located, capped and not built over.

Boreholes 1, 6 and 2 were undertaken within this area. The table below summarises the findings:

Borehole	Current Ground Level (mAOD)	Base of Coal/Excavation Level (mAOD)	Expected Made Ground Depth (m)	Made Ground Depth in Borehole (m)
1	96	51	45	21.8
6	117	74	43	8.7
2	130	85.3	44.7	9.9

The made ground was recorded as similar to that in Craven I. Some boulders were also encountered but the drilling rig managed to progress past these. The natural ground recorded at the base of the boreholes was siltstone. There is clearly an anomaly between the Coal Authority plans and intrusive investigation. It is possible that the lower part of the opencast was backfilled with larger pieces of solid rock and it is these that we encountered at the base of each hole, however it is considered unusual to find this in all three holes. We therefore, consider that it would be prudent to undertake some rotary drilling to confirm whether the recorded natural ground depth is actually large obstructions.

At this stage, we have allowed for an average pile length of 15 m for the residential units proposed in this area. Due to the depth of the made ground and the presence of obstructions, it is considered that driven steel tube piles will probably need to be adopted.

The Gawber is recorded as being 0.5 m thick, the Top Haigh Moor 0.8 m thick and the Low Haigh Moor 0.65 m thick. There is a 0.4 m thick parting within the Gawber (0.9 m total thickness), two partings in the Top Haigh Moor totalling 0.3 m and a fireclay of 0.3 m thickness beneath (1.4 m total thickness) and one parting in the Low Haigh Moor of 0.25 m (0.9 m total thickness). The Swallow Wood seam was the same as for Craven I.

The current ground level appears to be similar to the ground levels from which the depths on the abandonment plans are measured and in the majority of cases the current ground levels are slightly higher than previously.

No old mine workings were recorded in either the Craven I or Craven II areas indicating that these seams have probably not been worked by underground methods beyond the extent of the opencast workings. The ground for these two areas is recorded as having been fully restored by July 1952. The made ground has therefore been in place at least 60 years.

Hunters Cottage & Extension - *Reference should be made to Eastwood & Partners' drawings 001 and 004 and the Coal Authority plan Hunters Cottage & Extension 0E/COMP/03/121*

These are the southernmost of the workings and extracted the Gawber, Thin, Swallow Wood Top and Swallow Wood Bottom seams. The workings are shown to be up to nearly 20 m deep. Old workings were noted to be present in a few areas, although would be expected to be bell pits or smaller opencast workings as opposed to underground workings from shafts. This area was fully restored by June 1956 and the made ground has therefore been in place for at least 56 years.

The original ground levels appear to generally have been significantly higher than the current ground levels. This could be partly due to the difficulty in accurately locating the former workings on the current site boundaries and the discrepancy between their location and size shown on the Coal Authority abandonment plan and geological map.

Borehole 4 was completed in this area. At this position, according to the drawings, the ground level is expected to be around 133 m AOD, compared to an original ground level of 146.5 m AOD. The Swallow Wood Bottom coal was recorded as being around 15.5 m deep and therefore the base of the made ground would be expected to be around 131 m AOD and consequently 2 m below current ground level. Made ground was recorded to a depth of 13.4 m in BH4. This apparent discrepancy is considered to be due to the difficulties in locating of the former workings on the current site plan. For example, if the opencast workings shown on the Coal Authority plan were lined up with the western edge of the workings shown on the geological map, the levels and depth of made ground would be much closer.

The workings in this area are expected beneath the employment units.

The Swallow Wood Top seam was recorded as being 0.36 m thick and the Swallow Wood Bottom seam as 0.9 m thick. The Gawber seam was recorded as being 0.5 m thick, with a shale parting of 0.25 between the two leaves. The Thin seam is recorded as 0.38 m thick.

Farm House Lane - *Reference should be made to Eastwood & Partners' drawings 001 and 005 and the Coal Authority plan Farm House Lane NE415*

These are the easternmost of the workings and extracted the Barnsley seam. The workings are shown to be up to 15 m deep. Old workings were noted to be present, with approximately 80% previously worked. This area is recorded as having been abandoned in 1960. The made ground is therefore expected to have been in place for at least 50 years.

Borehole 5 was completed in this area. The current ground level is expected to be around 135 m AOD and the base of the coal at 125 m AOD and therefore around 10 m deep. Made ground was recorded to a depth of 8.3 m bgl in this hole, which is reasonably consistent.

We would recommend that an allowance for an average of 6 m pile lengths is made for the residential units proposed in this area.

Underground Workings

In some areas of the site, where the coal has not been worked by opencast methods, the depth and thickness of the coal seams could be such that any underground workings could influence development at the surface, such as the areas to the north-west, north-east and south-west of the Hunters Cottage & Extension workings. Significant underground workings are considered unlikely for a number of reasons including:

- No shafts are recorded on the geological or historical maps;
- There are a number of faults in the area; and
- Former workings were generally not found in the opencast areas.

Some rotary holes are recommended to give confidence in this regard.

Hydrogeology

The site overlies a Secondary A aquifer and is not within a groundwater Source Protection Zone. Springs are understood to be present, mainly in the southern employment areas (although none were apparent when we walked over the site).

Contamination

Ground Gas

The Environment Agency website indicates that there are several landfills to the north-east of the

site (within 250 m) as well as Land at Nudge Hill Farm on the western site boundary (central). These landfills, and the significant thickness of made ground in the areas of former opencast workings, are potential sources of ground gas, which will require investigation. At this stage, it is recommended that Amber 1 gas protective measures are allowed for. These will require a ventilated void or granular blanket below the ground floor construction and a fully lapped and sealed gas membrane system.

BRE211 *'Radon: Guidance on protective measures for new buildings'* indicates that basic radon protective measures are required for at least some areas of the site.

Soils

The ground would not be expected to be significantly contaminated, although elevated concentrations of metals/metalloids, polycyclic aromatic hydrocarbons and sulphates may be recorded.

Abnormals

The area has been extensively mined by opencast methods. We have reviewed abandonment plans supplied by the Coal Authority and undertaken an initial (but not extensive) borehole investigation to establish the depth of the opencast. The extent has been based on the mining abandonment plans.

Residential Areas

The current layout shows the residential areas set over two areas of opencast (Craven I and Craven II) and the smaller residential area to the south-east over the Farm House Lane workings.

At this stage, we would recommend that foundations for all the residential properties are PILED.

We would suggest an allowance of say 6 m pile lengths in the Craven I zone, 15 m average in Craven II and 10 m in Farm House Lane. Due to the depth of the made ground and the presence of obstructions, it is considered that driven steel tube piles will probably need to be adopted in Craven II. Additional investigation is however, recommended to confirm the made ground depths, particularly in Craven II where they were significantly shallower in the boreholes than expected from the plans.

REINFORCED CONCRETE GROUND BEAMS will be required for the piled foundations. Ground floors will need to be pre-cast beam and block with a void under.

Heave precautions may be required for plots close to existing hedgerows.

The backfill in the workings was found to be fairly compact, so it may be possible to use raft foundations instead of piles. Our recent experience is that NHBC are reluctant to accept rafts on backfilled opencast without extensive testing. It may be that rafts could be explored further and we have taken some samples from the boreholes and also installed groundwater monitoring wells in these to enable us to progress this.

Because of the gradients of the site, there is likely to be significant cut and fill. Allowance should be made for retaining structures to terrace development plateaus and access roads.

At this stage, AMBER 1 Gas protection measures should be allowed for.

Access roads will need to be planned to minimise cut and fill and retaining structures.

Employment Areas

It is assumed that the employment units will be lightweight framed structures. The majority are located over opencast areas.

For lightweight framed units, it is possible that reinforced ring beams will be suitable foundations. If heavier structures are envisaged, piled foundations may be necessary.

For units outside the opencast areas, traditional pad/strip foundations will be suitable.

Again, note should be taken of the cut/fill regarding exercise that will be necessary.

Indicative Costs for Abnormals

It is difficult to give definitive costs at this stage. Much will depend upon the developed layouts. However, below is a “finger in the air”.

Residential Areas

For piled foundations, we would expect the piling costs to range between the following:

- 6 m piles - £5000 per plot.
- 10 m piles - £7000 per plot
- 15 m piles - £8000 per plot

Reinforced concrete ground beams £5000 per plot.

(Note, the cost of standard strip footings will need deducting from the above, say, £2500 per plot)

Gas membranes £2000 per plot.

Obviously these costs will be dependent upon plot sizes and complexity.

Strata may have some more reliable figures from recent tenders.

There is likely to be a significant cut and fill exercise, but it should be possible to engineer a balance to avoid taking material off site.

Retaining structures should be kept to a minimum, but it is very likely that some will be required.

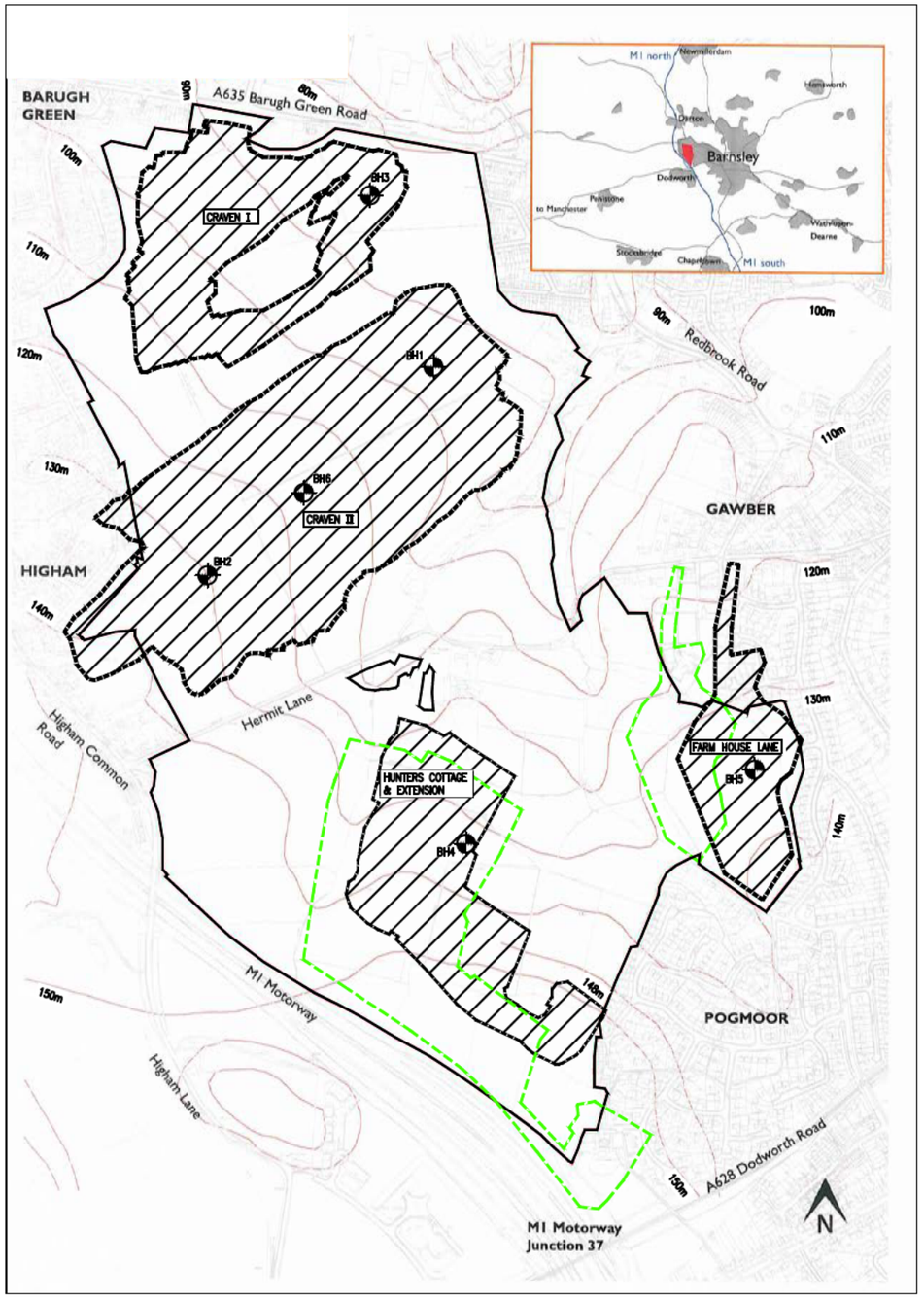
A rough cost would be in the order of, say, £500 per linear metre of wall in the range of 1.5 m to 2 m high.

Employment Units

It is very difficult to put an extra over cost without details of the units. A guess would be in the region of £50/m^2.

Further Works

Before more definite information regarding the properties of the ground and any contamination present can be given, an intrusive ground investigation would be required. Excavation of trial pits using a mechanical excavator is considered to be the most suitable method as it will enable a thorough investigation of the nature of the ground. Rotary boreholes are also proposed to consider the made ground depths and any other underground coal workings further. Gas and groundwater should also be undertaken. We recommend talking to the NHBC about the foundation options and have samples which could be tested to consider the potential for using raft foundations further.



Information within this drawing is not necessarily produced to scale.
Always use figured dimensions and co-ordinates – if in doubt, ask.

This drawing has been produced using the following record drawings:–

Master Plan from link downloaded 12.08.2013

The Coal Authority

Hunters Cottage & Extension – Drawing No. OE/COMP/03/121
Craven I & II – Drawing No. OE/COMP/03/311 Sheet 1 of 2.
Craven I & II – Drawing No. OE/COMP/03/311 Sheet 2 of 2.
Farm House Lane – Catalogue No NE415 Sheet Info:

KEY

Site Boundary

Approximate Extent of Opencast Workings taken from the above Coal Authority drawings.

Approximate Extent of Opencast Workings taken from Geological Map (SE30NW).

Approximate position of Cable Percussion Borehole completed for Eastwood & Partners in September 2013.

REV	DESCRIPTION	SIG	CHK	DATE
A	First Issue.			

STRATA

BARNSLEY WEST

EXTENT OF OPENCAST WORKINGS

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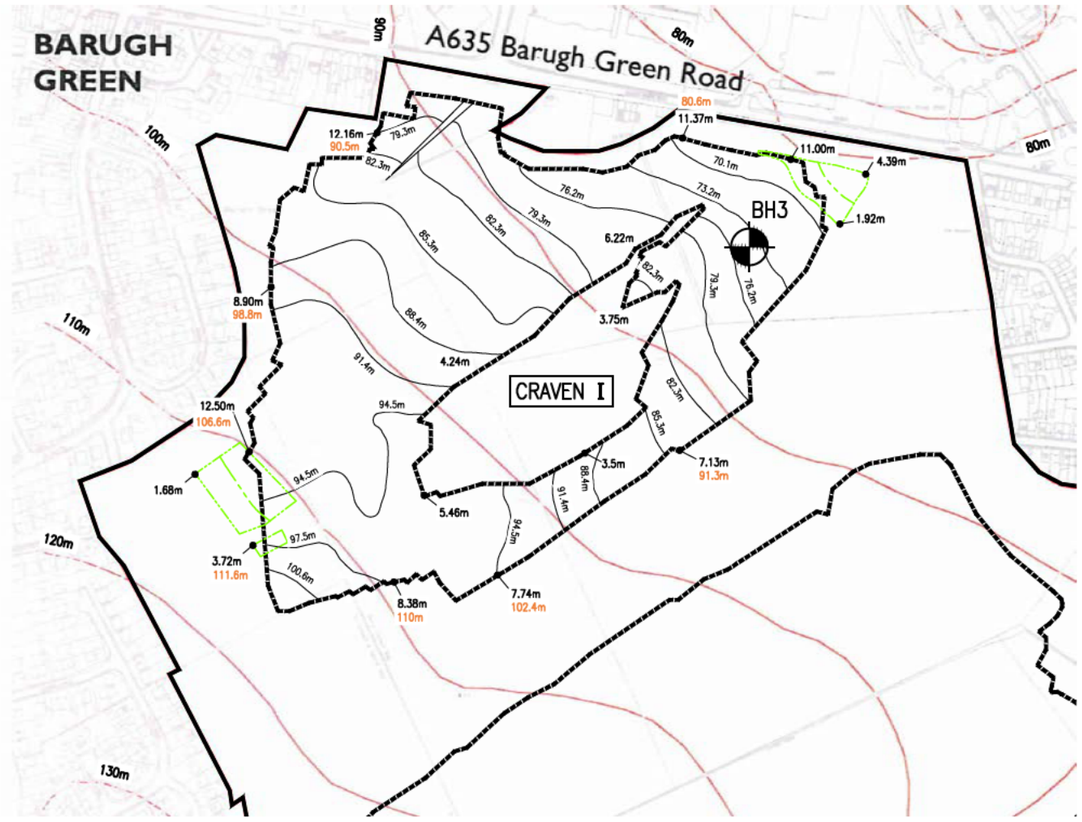
SCALE WHEN PLOTTED AT A3	DRAWING STATUS
Approx 1:10000	INFORMATION

DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
JAB	CAT	02.10.13	36284/001	A



Information within this drawing is not necessarily produced to scale.
Always use figured dimensions and co-ordinates – if in doubt, ask.

This drawing has been produced using the following record drawings:–
Master Plan from link downloaded 12.08.2013

The Coal Authority

Craven I & II – Drawing No. OE/COMP/03/311 Sheet 1 of 2.

1. This drawing to be read in conjunction with Eastwood & Partners drawing 36284/001.

KEY

- Site Boundary
- Approximate Extent of Previous Opencast Mining
- Approximate Extent of Thin Seam
- 91.4m — Approximate Opencast Contours (mAOD)
- 12.5m — Depth from Original Ground Level to Base of Coal or Excavation
- 90m — Current Ground Level (mAOD)
- 102.5m — Original Ground Level (mAOD)
- Approximate position of Cable Percussion Borehole completed for Eastwood & Partners in September 2013.

REV	DESCRIPTION	SIG	CHK	DATE
A	First Issue.			

STRATA

BARNSLEY WEST

CRAVEN I OPENCAST WORKINGS

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SCALE WHEN PLOTTED AT A3	DRAWING STATUS
Approx 1:5000	INFORMATION

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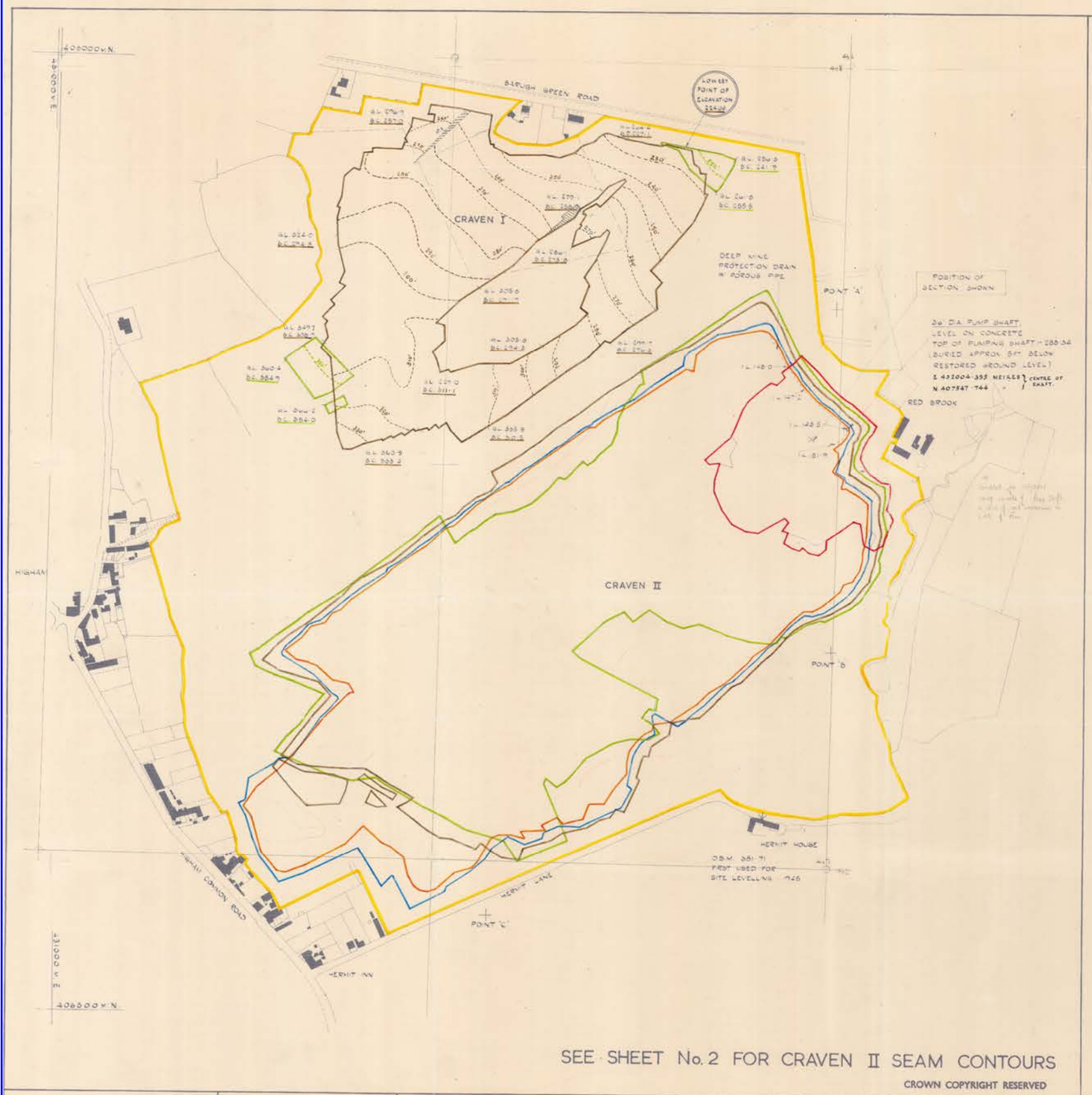

SEE SHEET No. 2 FOR CRAVEN II SEAM CONTOURS

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N.E. 498

LEGEND

LOCATION

1:2500 SCALE ORDNANCE SHEET REFERENCE 274-E 274-G
DATE OF ORDNANCE SHEET 1951
NAME OF SITE CRAVEN I & II
LOCATION OF SITE 2 MILS NW OF BARNSLEY
COUNTY YORKSHIRE WEST RIDING
PARISH DARTON

QUANTITIES WORKED

TOTAL AREA REQUISITIONED 186.57 ACRES, SHEWN
TOTAL AREA WORKED EXCLUDING BATTERS 111.29 ACRES
TOTAL COAL RECOVERED FROM ABOVE 556,020 TONS

	GAWBER	TWIN	SWALLOW WOOD	TOP HAIGH MOOR	LOW HAIGH MOOR	
NAMES OF SEAMS WORKED FOR ABOVE TONNAGE (SEAMS NAMED FROM LEFT TO RIGHT IN GEOLOGICAL DESCENDING ORDER)						
AREA OF COAL SEAM WORKED COLOUR EDGED (SEAMS COLOURED FROM LEFT TO RIGHT IN GEOLOGICAL DESCENDING ORDER)						
TOTAL OLD WORKING VOIDS IN COAL SEAM IN CUBIC YDS.						
AREA OF SEAM WHERE OLD WORKING VOIDS WERE LOCATED						
BASE COAL CONTOURS OF EACH SEAM (10' INTERVALS) SHOWN.	280'	350'	390'			
REDUCED LEVELS TO ORDNANCE DATUM SHEWN (RELATIVE TO NEWLYN) — GROUND LEVEL	OL 294.7	OL 347.6	OL 377.4	OL 449.8	OL 399.2	
BOTTOM OF COAL	BC 271.7	BC 342.4	BC 224.9	BC 404.7	BC 184.7	
FAULTS SHEWN WITH THROW IN FEET ON DOWNTHROW SIDE			40			

EXCAVATION ONLY

GENERAL DESCRIPTION

TYPE OF LAND: MIXED FARM LAND, WOODLAND AND PREVIOUSLY RESTORED LAND

NATURE OF OVERBURDEN: SOIL, CLAY, SHALE AND MUDSTONE

NATURE OF COAL:
- GAWBER SEAM TOP LEAF: GOOD QUALITY
- BOTTOM LEAF: MODERATE QUALITY WITH VERY HIGH SULPHUR CONTENT (4%)
- TWIN SEAM: EXCELLENT
- SWALLOW WOOD SEAM TOP LEAF: EXCELLENT
- BOTTOM LEAF: GOOD QUALITY BUT WITH NUMEROUS PYRITES POCKETS
- TOP HAIGH MOOR SEAM TOP LEAF: MODERATE QUALITY CONTAINING BONE DURAIN
- MIDDLE LEAF: GENERALLY RATHER INFERIOR WITH HIGH ASH
- BOTTOM LEAF: GOOD QUALITY
- LOW HAIGH MOOR SEAM TOP LEAF: GOOD QUALITY
- BOTTOM LEAF: GOOD QUALITY

SPECIAL REMARKS:
TOTAL AREA REQUISITIONED: CRAVEN I 85.570 CRAVEN II 100.992 ACRES
TOGETHER WITH RE-ENTRY OK TO 44.008 ACRES OF CRAVEN I
TOTAL AREA WORKED: CRAVEN I 27.88 ACRES CRAVEN II 83.41 ACRES
TOTAL COAL FROM ABOVE: CRAVEN I 80,477 TONS CRAVEN II 475,523 TONS

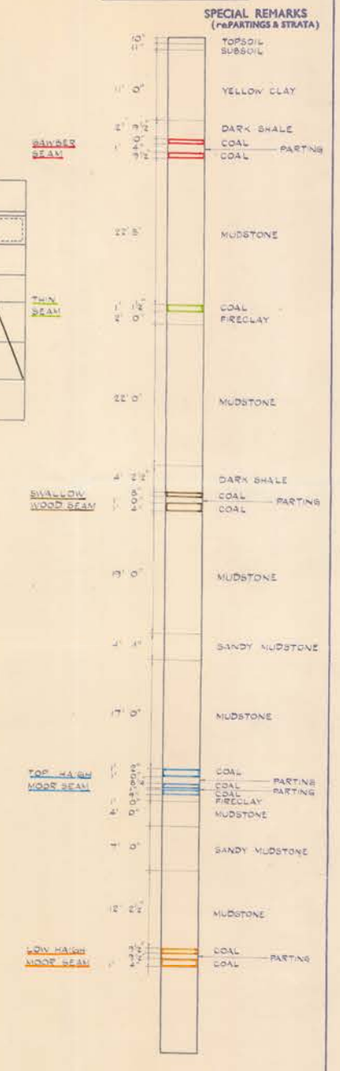
OPERATIONAL DATA

	CRAVEN I	CRAVEN II
DATE REQUISITIONED	21ST MAR 1980	24TH OCT 1966
COMMENCEMENT OF COALING	10TH JULY 1980	20TH APRIL 1967
COMPLETION OF COALING	20TH NOV 1981	4TH FEB 1968
COMPLETION OF RESOILING	JULY 1982	
SITE HANDED BACK TO AGRICULTURE	JULY 1982	
FINAL DEREQUISITION OF SITE		

COPIES TO	DATE	INITIALS
Mining Records (2)		
R.L. Surveyor (1)		

VERTICAL SECTION THROUGH ALL SEAMS

VERTICAL SCALE 10' TO 1 INCH



NATIONAL COAL BOARD OPENCAST EXECUTIVE 85/87 JERMYN STREET LONDON, S.W.1.	LAND SURVEY BRANCH DRAWN BY: J. PALMER DATE: 18T MAY 1964 CHECKED BY: J. G. R. DATE: 5. 5. 64 SCALE 1:2500	NAME OF ZONE OR CONTRACT	NAME OF SITE: CRAVEN I & II

SITE REFERENCE NUMBER 030445
OPERATIONAL CONTRACT NUMBER CRAVEN I OE/CON/3139 CRAVEN II OE/CON/4222
DRAWING NUMBER OE/COMP/03/311
SHEET No. 1 OF 2

OE/CLS/7a

The Coal Authority
IFTS accredited

Catalogue No.: NE498 Sheet Info: 1 OF 3
Date: 27/08/2013
Scale: 1 TO 2500
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Dave Clarke - The Coal Authority

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The Coal Authority, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire NG18 4RG www.coal.gov.uk

WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date	Site Name	Job No.	Borehole No.
12 - 9 - 13	REDBROOK	36284	BH 3

DESCRIPTION OF STRATA

Soft / Firm Stiff / Loose / Dense	Colour Fine Coarse Medium	Clayey Silty Sandy etc	SOIL TYPE	Sand Bands Cobbles etc	DESCRIPTION	DEPTH TO BASE OF STRATA FROM G/L(m)
					GRASS OVER BROWN SANDY CLAY TOPSOIL + ROOTLETS	020
					PALE BEIGE BROWN / BROWN STIFF CLAY + MUD/SILTSTONE GRAVELS + COAL	1.0m
					PALE BROWN OCCASIONAL GREY FIRM MIXED CLAYS + MUD/ SILT STONE / SANDSTONE + SOME BANDS COAL FINES (COAL SPOIL)	2.50
					COAL BAND	260
					PALE GREY BROWN MODERATELY WEAK WEATHERED MUDSTONE BECOMING STRONGER BELOW 3.4	
					END	370

BH COMPLETED	YES	NO	FINAL DEPTH
	(YES)		

SAMPLES AND IN SITU TESTING

Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450	CASING & WATER DEPTH Water	Casing
D1	010										
D2	080										
D3	180										
U4	205	250	34							/	2.0
D5	250	265	24								
D6	340										
SD7	350	358		25/13		50/59				/	345
SD8	365	370	N/R	25/15		50/37				/	345

CASING

SIZE (mm)	FROM (mm)	TO (mm)
150	GL	3.45

GROUNDWATER DETAILS

DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
DRY									

DELAYS / BAD ACCESS / HARD STRATA etc.

Cause & Time Encountered	From (m)	To (m)	Time (hr)
CHISEL	340	350	1/2HR
CHISEL	355	365	1/2HR

REMARKS

50mm PIPE CONSTRUCTION 1HR

EXCESS MOVE 1HR

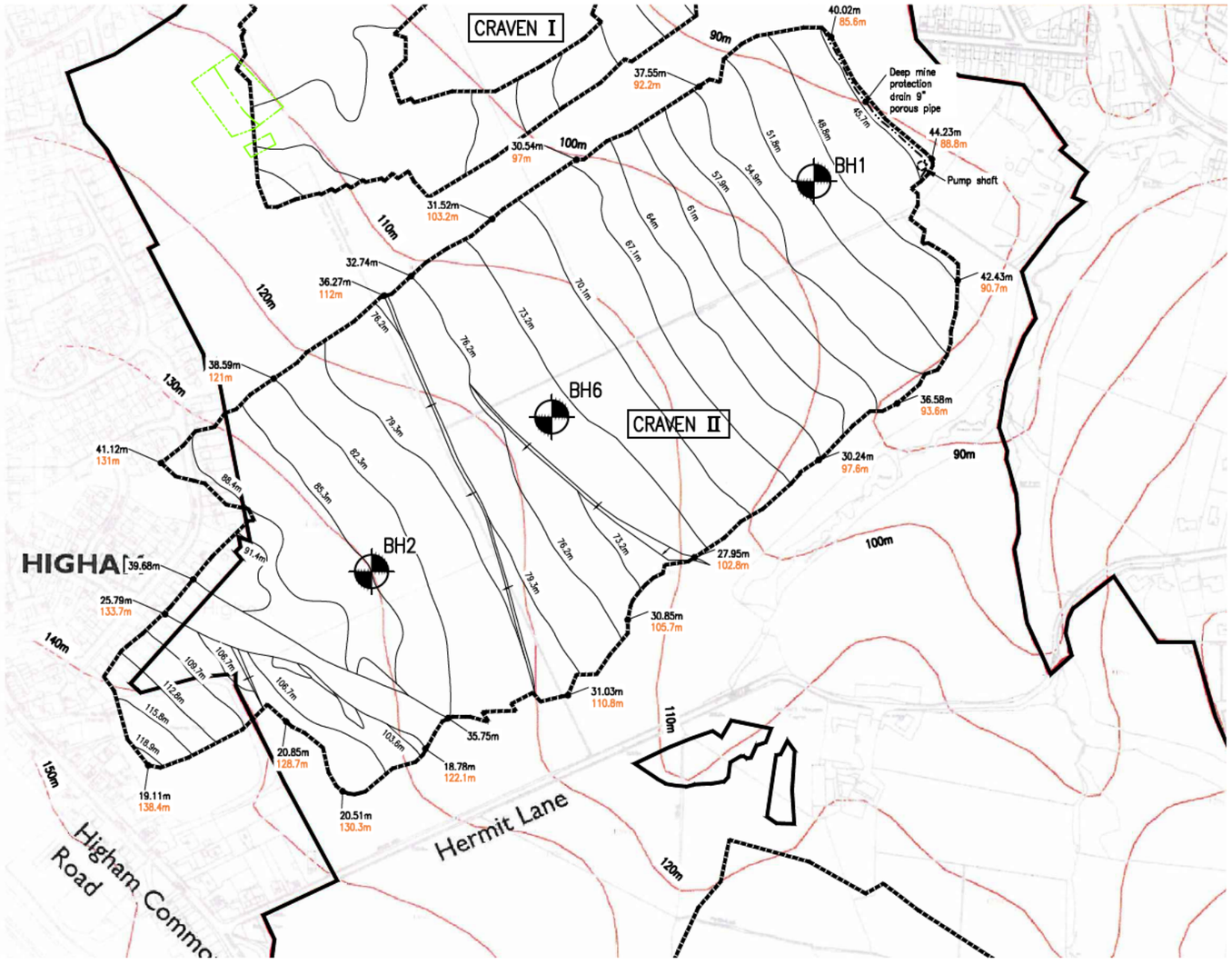
STANDPIPE DETAILS

	FROM	TO
PLAIN PIPE	GL	1M
SLOTTED PIPE	1M	365
GRAVEL - FILTER	1M	365
BENTONITE	1M	050
SEALS		
STOPCOCK COVER	✓	
GAS VALVE & BUNG	✓	

SIGNATURES:

Driller CRAIG ROBERTS

Client



Information within this drawing is not necessarily produced to scale.
Always use figured dimensions and co-ordinates – if in doubt, ask.

This drawing has been produced using the following record drawings:–
Master Plan from link downloaded 12.08.2013

The Coal Authority
Craven I & II – Drawing No. OE/COMP/03/311 Sheet 1 of 2.
Craven I & II – Drawing No. OE/COMP/03/311 Sheet 2 of 2.

1. This drawing to be read in conjunction with Eastwood & Partners drawing 36284/001.

KEY

	Site Boundary
	Approximate Extent of Previous Opencast Mining
91.4m	Approximate Opencast Contours (mAOD)
42.3m	Depth from Original Ground Level to Base of Coal or Excavation
90m	Current Ground Level (mAOD)
102.5m	Original Ground Level (mAOD)
	Approximate position of Cable Percussion Borehole completed for Eastwood & Partners in September 2013.

REV	DESCRIPTION	SIG	CHK	DATE
A	First Issue.			

STRATA

BARNSLEY WEST

CRAVEN II OPENCAST WORKINGS

Eastwood & Partners
CONSULTING ENGINEERS
E&P
St. Andrew's House
23 Kingfield Road
Sheffield
S11 9AS
Tel 0114 255 4554
Fax 0114 255 4330
mail@eastwoodandpartners.com
www.eastwoodandpartners.com

SCALE WHEN PLOTTED AT A3	DRAWING STATUS
Approx 1:5000	INFORMATION

DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
SA/CB	CAT	05-09-13	36284/003	A

The Coal Authority, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire NG18 4RG. www.coal.gov.uk

The Coal Authority

Catalogue No.: NE498 Sheet Info: 2 OF 3

Date: 27/06/2013

Scale: 1 TO 2500

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Dave Clarke - The Coal Authority

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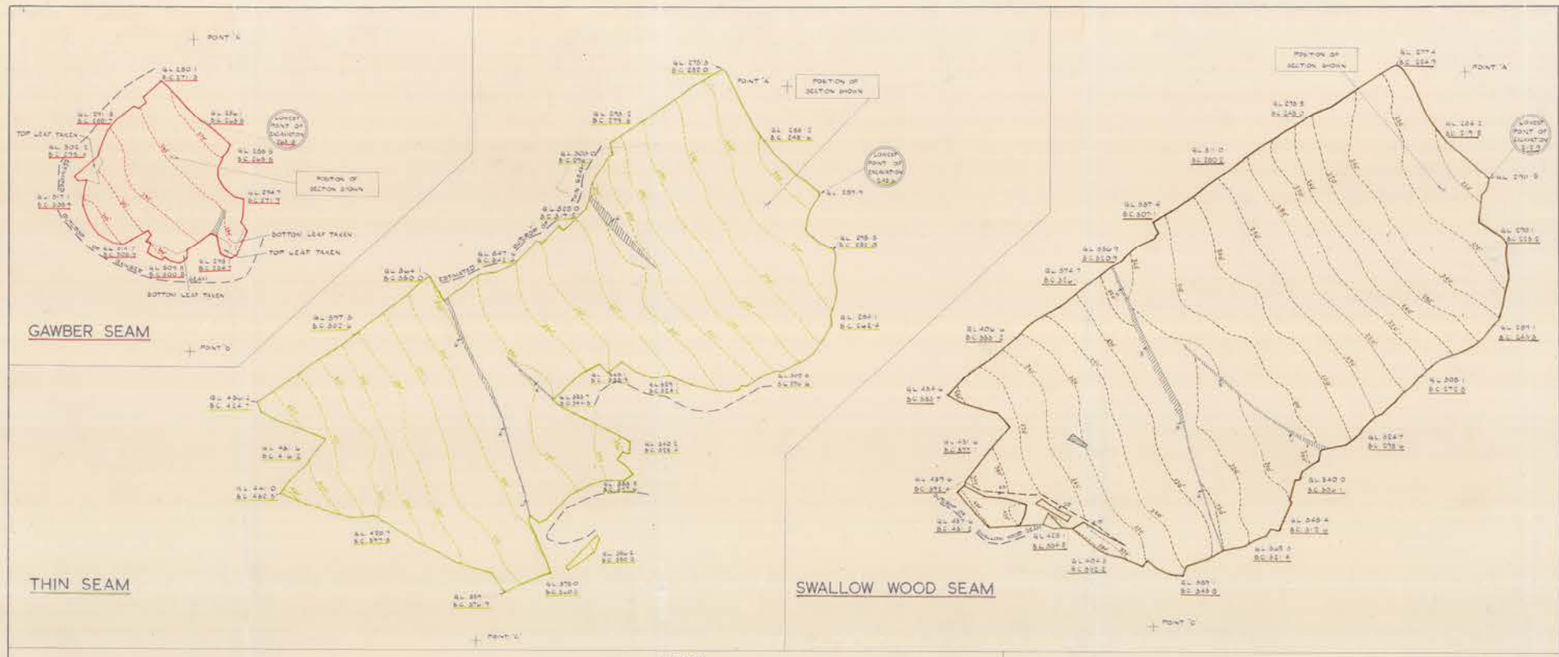
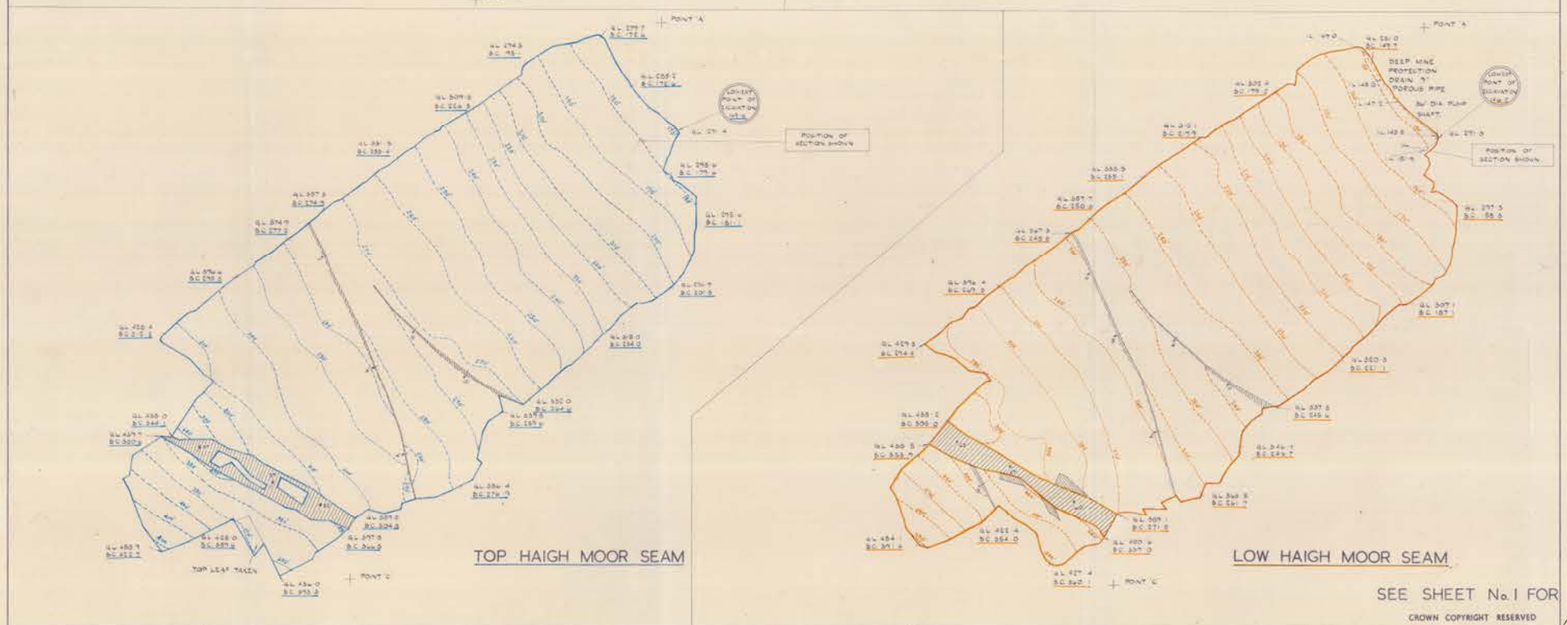
N.E. 498





SEE SHEET No. I FOR COMPOSITE PLAN

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LEGEND

LOCATION

1:2500 SCALE ORDNANCE SHEET REFERENCE 274-E, 274-F
DATE OF ORDNANCE SHEET 1960
NAME OF SITE CRAVEN I & II
LOCATION OF SITE 2 MLS N.W. OF BARNSLEY
COUNTY YORKSHIRE WEST RIDING
PARISH DARTON

QUANTITIES WORKED

TOTAL AREA REQUISITIONED 96.27 ACRES SHEWN
TOTAL AREA WORKED EXCLUDING BATTERS 77.70 ACRES
TOTAL COAL RECOVERED FROM ABOVE 204,459 TONS

NAMES OF SEAMS WORKED FOR ABOVE TONNAGE (SEAMS NAMED FROM LEFT TO RIGHT IN GEOLOGICAL DESCENDING ORDER)

GAWBER	THIN	SWALLOW WOOD	TOP HAIGH MOOR	LOW HAIGH MOOR	

AREA OF COAL SEAM WORKED COLOUR EDGED (SEAMS COLOURED FROM LEFT TO RIGHT IN GEOLOGICAL DESCENDING ORDER)
TOTAL OLD WORKING VOIDS IN COAL SEAM IN CUBIC YDS.
AREA OF SEAM WHERE OLD WORKING VOIDS WERE LOCATED
BASE COAL CONTOURS OF EACH SEAM (10' INTERVALS) SHOWN.
REDUCED LEVELS TO ORDNANCE DATUM SHEWN { GROUND LEVEL / BOTTOM OF COAL
RELATIVE TO W.E.W.L.Y.N.
FAULTS SHEWN WITH THROW IN FEET ON DOWNTHROW SIDE

GENERAL DESCRIPTION

TYPE OF LAND: MIXED PARK LAND, WOODLAND AND PREVIOUSLY RESTORED LAND
NATURE OF OVERBURDEN: DRIFT, CLAY, SHALE AND MUDSTONE
NATURE OF COAL:
- GAWBER SEAM TOP LEAF: GOOD QUALITY
- BOTTOM LEAF: MODERATE QUALITY WITH VERY HIGH SULPHUR CONTENT (HS)
- THIN SEAM: EXCELLENT
- SWALLOW WOOD SEAM TOP LEAF: EXCELLENT
- BOTTOM LEAF: GOOD QUALITY BUT WITH NUMEROUS PYRITES POCKETS
- TOP HAIGH MOOR SEAM TOP LEAF: MODERATE QUALITY CONTAINING SOME DURAIN
- MIDDLE LEAF: GENERALLY RATHER INFERIOR WITH HIGH ASH
- BOTTOM LEAF: GOOD QUALITY
- LOW HAIGH MOOR SEAM TOP LEAF: GOOD QUALITY
- BOTTOM LEAF: GOOD QUALITY

SPECIAL REMARKS: TOTAL AREA REQUISITIONED - CRAVEN I 55.1740 CRAVEN II 180.805 ACRES
POLITICAL WITH RESTRAINT ON THE 44.2030 ACRES OF CRAVEN I
TOTAL AREA WORKED - CRAVEN I 27.93 ACRES CRAVEN II 81.76 ACRES
TOTAL COAL FROM ABOVE - CRAVEN I 60,477 TONS CRAVEN II 178,529 TONS

OPERATIONAL DATA

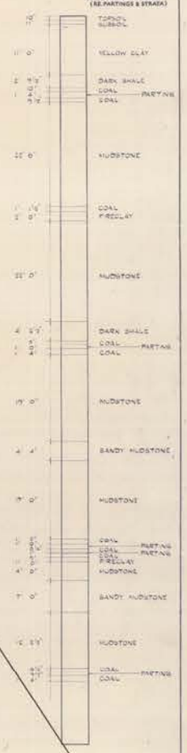
	CRAVEN I	CRAVEN II
DATE REQUISITIONED	5th MAR 1980	24th OCT 1980
COMMENCEMENT OF COALING	27th JULY 1980	27th APRIL 1981
COMPLETION OF COALING	20th NOV 1982	7th FEB 1983
COMPLETION OF RESOILING	JULY 1982	
SITE HANDED BACK TO AGRICULTURE	JULY 1982	
FINAL DERIQUISITION OF SITE		

COPY SENT TO	DATE	INITIALS

VERTICAL SECTION THROUGH ALL SEAMS

VERTICAL SCALE 10 TO 1 INCH

SPECIAL REMARKS (RE PARTINGS & SYRAKS)



NATIONAL COAL BOARD	LAND SURVEY BRANCH	NAME OF ZONE OR CONTRACT	NAME OF SITE	SITE REFERENCE NUMBER	DRAWING NUMBER
OPENCAST EXECUTIVE 85/87 JERMYN STREET LONDON, S.W.1.	DRAWN BY: J. PALMER DATE: 15th MAY 1964 CHECKED BY: J.C.R. DATE: 5 6 64 SCALE 1:2500		CRAVEN I & II	030445	OE/COMP/03/311
				OPERATIONAL CONTRACT NUMBER CRAVEN I OE/CON/3139 CRAVEN II OE/CON/4222	SHEET No. 2 OF 2

OE/CL8/7

WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date	Site Name	Job No.	Borehole No.
9-9-13	REDBROOK	36284	BH1

DESCRIPTION OF STRATA (Soft / Firm Stiff / Loose / Dense; Colour; Fine Coarse Medium; Clayey Silty Sandy etc; SOIL TYPE; Sand Bands Cobbles etc)	DEPTH TO BASE OF STRATA FROM G/L(m)
GRASS OVER BROWN SLIGHTLY SANDY CLAY TOPSOIL + ROOTLETS	0-15
GREY BROWN V STIFF COLLIERY SPOIL - MIXED CLAYES WITH GRAVELS AND COBBLES OF MUDSTONE SILTSTONE OCCASIONAL COAL + BRICK, OCC SILTSTONE BOULDER	
OCCASIONAL SOFT-FIRM BANDS BELOW 3M	
SILTSTONE BOULDERS 8.50-9m	
AND 10.50 - 11m	
PUSHING BOULDER 10-50-10-90	
END SHIFT	11M

BH COMPLETED	YES	NO	FINAL DEPTH
		(NO)	

SAMPLES AND IN SITU TESTING

Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450	CASING & WATER DEPTH Water	Casing
D1	0.10										
D2	0.80										
SD3	1.05	1.50		3	6	8	6	5	5	/	1m
D4	1.80										
U5	2.05	2.50	38							/	1-50
D6	2.80										
SD7	3.05	3.50		3	3	2	3	2	1	/	1.50
D8	3.80										
SD9	4.05	4.50		6	5	6	5	8	4	/	3m
D10	4.80										
U11	5.05	5.50	25								
D12	5.50	5.65	13	U SHOE							
SD13	6.05	6.50		5	7	7	7	8	7	/	3m
D14	6.80										
SD15	7.05	7.50		6	5	5	4	3	7	/	3m
D16	7.80										
SD17	8.05	8.50		5	3	4	5	5	8	/	3m
D18	8.80										

CASING

SIZE (mm)	FROM (mm)	TO (mm)
150	GL	3m

GROUNDWATER DETAILS

DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
DRY									

DELAYS / BAD ACCESS / HARD STRATA etc.

Cause & Time Encountered	From (m)	To (m)	Time (hr)
CHISEL	8.80	8.90	1/4 HR
CHISEL	10.90	11.05	1/2 HR

REMARKS

STANDPIPE DETAILS

	FROM	TO
PLAIN PIPE		
SLOTTED PIPE		
GRAVEL - FILTER		
BENTONITE		
SEALS		
STOPCOCK COVER		
GAS VALVE & BUNG		

SIGNATURES:

Driller ..... CRAIG ROBERTS .....

Client ..... [redacted]

WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date	Site Name	Job No.	Borehole No.
10-9-13	REDBROOK	36284	BH1

DESCRIPTION OF STRATA

Soft / Firm Stiff / Loose / Dense	Colour Fine Coarse Medium	Clayey Silty Sandy etc	SOIL TYPE	Sand Bands Cobbles etc	DEPTH TO BASE OF STRATA FROM G/L(m)
COLLIERY SPOIL					11m
BECOMING MOIST TO WET BELOW 15.5m.					
BOULDER FELL IN ON ADVANCING CASING					
PUSHING BOULDER 16.30 - 17.25					
V. GRAVELLY BELOW 18m WITH CLAYEY POCKETS (MUD/SILTSTONE)					
END SHIFT -					20m

BH COMPLETED	YES	NO	FINAL DEPTH
		(NO)	

SAMPLES AND IN SITU TESTING

Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450	CASING & WATER DEPTH Water	Casing
SD19	9.05	9.50		4	4	6	5	4	4	/	3m
D20	9.80										
U21	10.05	10.50	124							/	3m
S22	11.08	11.11		25/24		50/35				/	3m
D23	11.80										
SD24	12.05	12.50		6	5	6	6	9	9	/	3m
D25	12.80										
SD26	13.10	13.55		4	6	7	7	8	7	/	3m
D27	13.80										
SD29	14.10	14.55		3	4	5	5	5	5	/	3m
D30	14.80										
U31	15.10	15.55	35								
D32	15.80										
SD33	17.25	17.70		4	7	6	7	7	6	/	17-20
D34	18m										
SD35	18.20	18.65		3	4	5	7	9	8	12.8	18.10
D36	19m										
C37	19.20	19.65		3	3	4	5	3	6	12.9	19.15

CASING

SIZE (mm)	FROM (mm)	TO (mm)
150	GL	

GROUNDWATER DETAILS

DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
WATER SEEPAGE 16m NO RISE									
WATER STRIKE 18.1m ROSE 12.8m									

DELAYS / BAD ACCESS / HARD STRATA etc.

Cause & Time Encountered	From (m)	To (m)	Time (hr)
CHISEL	10.90	11.05	1/2 HR
CHISEL	11.10	11.40	1 HR
CHISEL	16 -	16.30	3/4 HR

REMARKS

STANDPIPE DETAILS

	FROM	TO
PLAIN PIPE		
SLOTTED PIPE		
GRAVEL - FILTER		
BENTONITE		
SEALS		
STOPCOCK COVER		
GAS VALVE & BUNG		

SIGNATURES:

Driller CRAIG ROBERTS

Client [redacted]

WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date	Site Name	Job No.	Borehole No.
11-9-13	REDBROOK	36284	BH1

DESCRIPTION OF STRATA					DEPTH TO BASE OF STRATA FROM G/L(m)
Soft / Firm Stiff / Loose / Dense	Colour Fine Coarse Medium	Clayey Silty Sandy etc	SOIL TYPE	Sand Bands Cobbles etc	
AS 18m V GRAVELLY WITH CLAYEY POCKETS					21·80
MOD STRONG SILTSTONE BED - ROCK.					
END					21·86
BH COMPLETED YES NO			FINAL DEPTH		21·86

SAMPLES AND IN SITU TESTING												CASING & WATER DEPTH	
Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450	Water	Casing
D38	20m										
C39	2020	2065		8	11	14	8	8	7	12·8	20·15
D40	21										
S41	2180	2182	N/R	25/07		50/3				12·8	21·75
D42	2180										
S43	2185	–	N/R	25/0		50/08mm				12·8	21·8

CASING		
SIZE (mm)	FROM (mm)	TO (mm)
150	GL	21·8

GROUNDWATER DETAILS									
DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
AM	WATER		12·77						

DELAYS / BAD ACCESS / HARD STRATA etc.			
Cause & Time Encountered	From (m)	To (m)	Time (hr)
CHISEL	2180	2185	1HR

REMARKS
50mm PIPE CONSTRUCTED 1·3/4 HR.

STANDPIPE DETAILS	FROM	TO
PLAIN PIPE	GL	1m
SLOTTED PIPE	1m	21·85
GRAVEL - FILTER	1m	21·85
BENTONITE	1m	0·5m
SEALS		
STOPCOCK COVER	✓	
GAS VALVE & BUNG	✓	

SIGNATURES:

Driller ..... CRAIG ROBERTS .....

Client .....

WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date	Site Name	Job No.	Borehole No.
17/18-9-13	RED BROOK	36284	BH 6

DESCRIPTION OF STRATA (Soft / Firm Stiff / Loose / Dense; Colour; Fine Coarse Medium; Clayey Silty Sandy etc; SOIL TYPE; Sand Bands Cobbles etc)	DEPTH TO BASE OF STRATA FROM G/L(m)
BROWN CLAY - TOPSOIL	0.20
BROWN FIRM CLAY + MUDSTONE BRICK GRAVELS	0.80
GREY OCCASIONAL BROWN CLAYS + MUDSTONE SILTSTONE OCC COAL, BRICK (COLLIERY SPOIL) MUCH SILTSTONE BOULDER COBBLE BETWEEN 5.30 - 6m. OCC COBBLE BELOW 6m	8.70
MODERATELY STRONG SILTSTONE	9.04
END	

BH COMPLETED	YES	NO	FINAL DEPTH

SAMPLES AND IN SITU TESTING

Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450	CASING & WATER DEPTH Water	Casing
D1	0.10										
D2	0.50										
D3	0.80										
D4	1.80										
SDS	2.05	2.50		5	5	9	4	5	4	/	2.0
D6	2.80										
D7	3.80										
SD8	4.05	4.50		5	8	6	5	6	7	/	4.0
D9	4.80										
D10	5.30										
S11	6.05	6.50	N/R	7	6	6	4	4	3	/	6.0
D12	6.80										
D13	7.80										
SD14	8.05	8.50		7	6	7	10	11	10	/	7.5
SD15	8.70	8.77		25/31		50/43				/	7.5
S16	9.0	9.04		25/20		50/15				/	7.5

CASING

SIZE (mm)	FROM (mm)	TO (mm)
150	GL	7.5

GROUNDWATER DETAILS

DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
	DRY	—							

DELAYS / BAD ACCESS / HARD STRATA etc.

Cause & Time Encountered	From (m)	To (m)	Time (hr)
CHISEL	8.80	9.0	1HR

REMARKS

PIPE CONSTRUCTED 1½HR

STANDPIPE DETAILS

	FROM	TO
PLAIN PIPE	GL	1m
SLOTTED PIPE	1m	9m
GRAVEL - FILTER	1m	9m
BENTONITE	1m	0.5
SEALS		
STOPCOCK COVER	✓	
GAS VALVE & BUNG	✓	

SIGNATURES:

Driller ..... CRAIG ROBERTS. .....

Client .....

WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date	Site Name	Job No.	Borehole No.
11-9-13	REDBROOK	36284	BH2.

DESCRIPTION OF STRATA

Soft / Firm Stiff / Loose / Dense	Colour Fine Coarse Medium	Clayey Silty Sandy etc	SOIL TYPE	Sand Bands Cobbles etc	DEPTH TO BASE OF STRATA FROM G/L(m)
GRASS OVER BROWN CLAY/SANDY TOP SOIL.					0.25
BROWN/YELLOW BROWN FIRM-STIFF SANDY CLAY OCCASIONAL GREY MUDSTONE POCKETS + GRAVELS OF COAL SAND/MUDSTONE SILTSTONE.					1.80
COLLIERY SPOIL - MIXED MUD/SILTSTONES, GREY BROWN, + CLAYS OCC COAL, FIRM-STIFF MUCH SILTSTONE BOULDERS AROUND 8.5m.					9.90
MODERATELY STRONG SILTSTONE BEDROCK.					
END					10.54

BH COMPLETED	YES	NO	FINAL DEPTH
	(YES)		

SAMPLES AND IN SITU TESTING

Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450	CASING & WATER DEPTH Water	Casing
D1	0.20										
D2	0.80										
D3	1.80										
SD4	2.05	2.50		3	2	2	4	5	4	/	2
D5	3m										
U6	4.05	4.50	27							/	3
D7	4.50	4.65	10								
D8	5.50										
SD9	6.05	6.50		2	4	3	3	5	16	/	3
D10	7m										
U11	8.05	8.50	47							/	3
D12	8.50	8.65	17								
D13	9.50										
SD14	10.10	10.26		10	15/45	50/39				/	3
SD15	10.50	10.54		25/13		50/27				/	3

CASING

SIZE (mm)	FROM (mm)	TO (mm)
150	GL	3m

GROUNDWATER DETAILS

DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
	DRY								

DELAYS / BAD ACCESS / HARD STRATA etc.

Cause & Time Encountered	From (m)	To (m)	Time (hr)
CHISEL	9.90	10.10	1/2HR
CHISEL	10.30	10.50	1/2HR

REMARKS

50mm PIPE CONSTRUCTED
1½HR

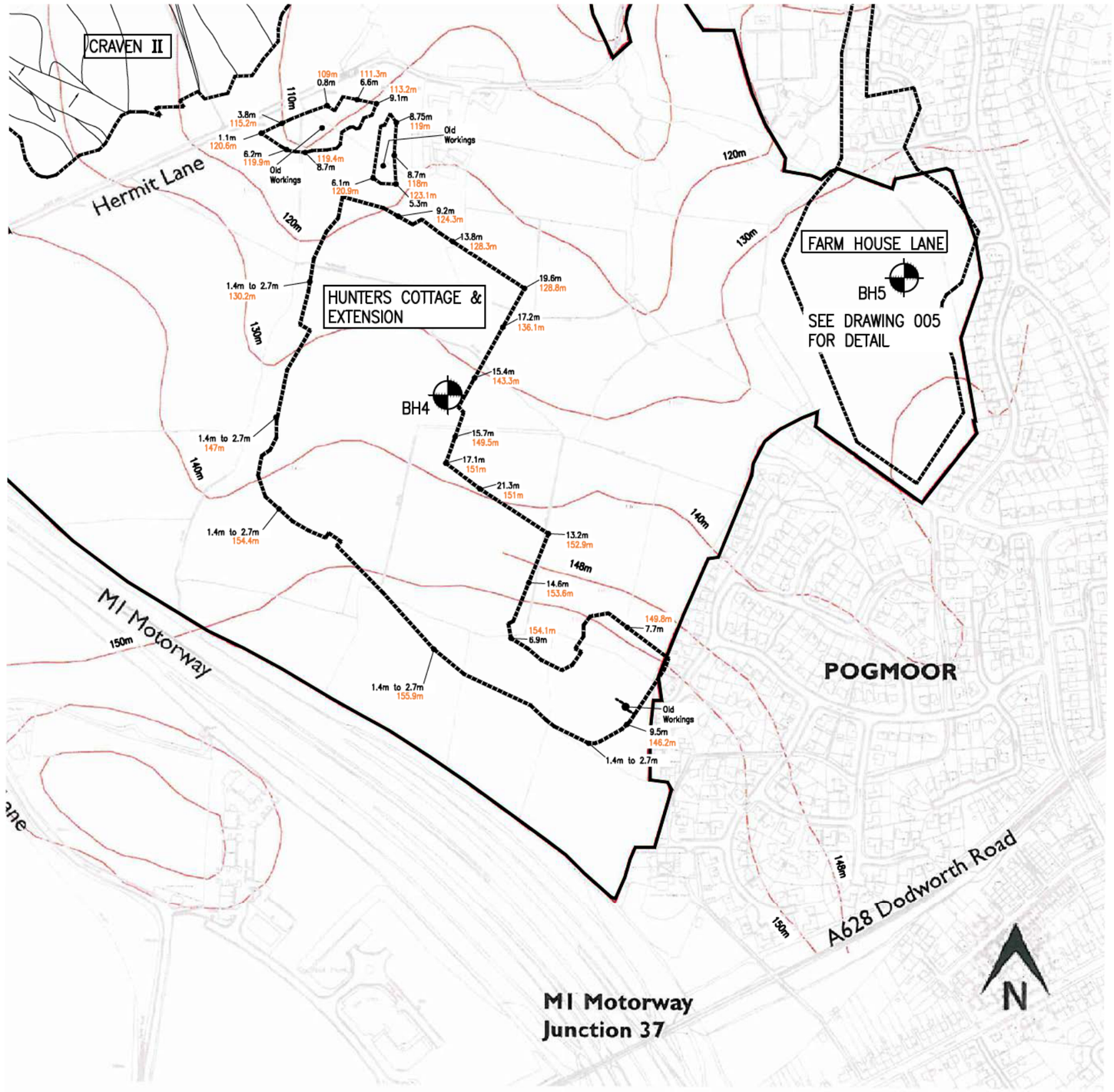
STANDPIPE DETAILS

	FROM	TO
PLAIN PIPE	GL	1m
SLOTTED PIPE	1m	10.50
GRAVEL - FILTER	1m	10.50
BENTONITE	1m	0.50
SEALS		
STOPCOCK COVER	✓	
GAS VALVE & BUNG	✓	

SIGNATURES:

Driller ..... CRAIG ROBERTS .....

Client .....



Information within this drawing is not necessarily produced to scale.
Always use figured dimensions and co-ordinates – if in doubt, ask.

This drawing has been produced using the following record drawings:–

Master Plan from link downloaded 12.08.2013

The Coal Authority

Hunters Cottage & Extension – Drawing No. OE/COMP/03/121

1. This drawing to be read in conjunction with Eastwood & Partners drawing 36284/001.

KEY

	Site Boundary
	Approximate Extent of Previous Opencast Mining
13.2m	Depth from Original Ground Level to Base of Coal or Excavation
120m	Current Ground Level (mAOD)
102.5m	Original Ground Level (mAOD)
	Approximate position of Cable Percussion Borehole completed for Eastwood & Partners in September 2013.

REV	DESCRIPTION	SIG	CHK	DATE
A	First Issue.			

STRATA

BARNSLEY WEST

HUNTERS COTTAGE & EXTENSION OPENCAST WORKINGS

Eastwood & Partners
CONSULTING ENGINEERS
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St. Andrew's House
23 Kingfield Road
Sheffield
S11 9AS
Tel 0114 255 4554
Fax 0114 255 4330
mail@eastwoodandpartners.com
www.eastwoodandpartners.com

SCALE WHEN PLOTTED AT A3	DRAWING STATUS
Approx 1:5000	INFORMATION

DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
SA/CB	CAT	05-09-13	36284/004	A

The Coal Authority
Catalogue No. NE375 Sheet Info:
Date: 27/08/2013
Scale: 1 TO 2500
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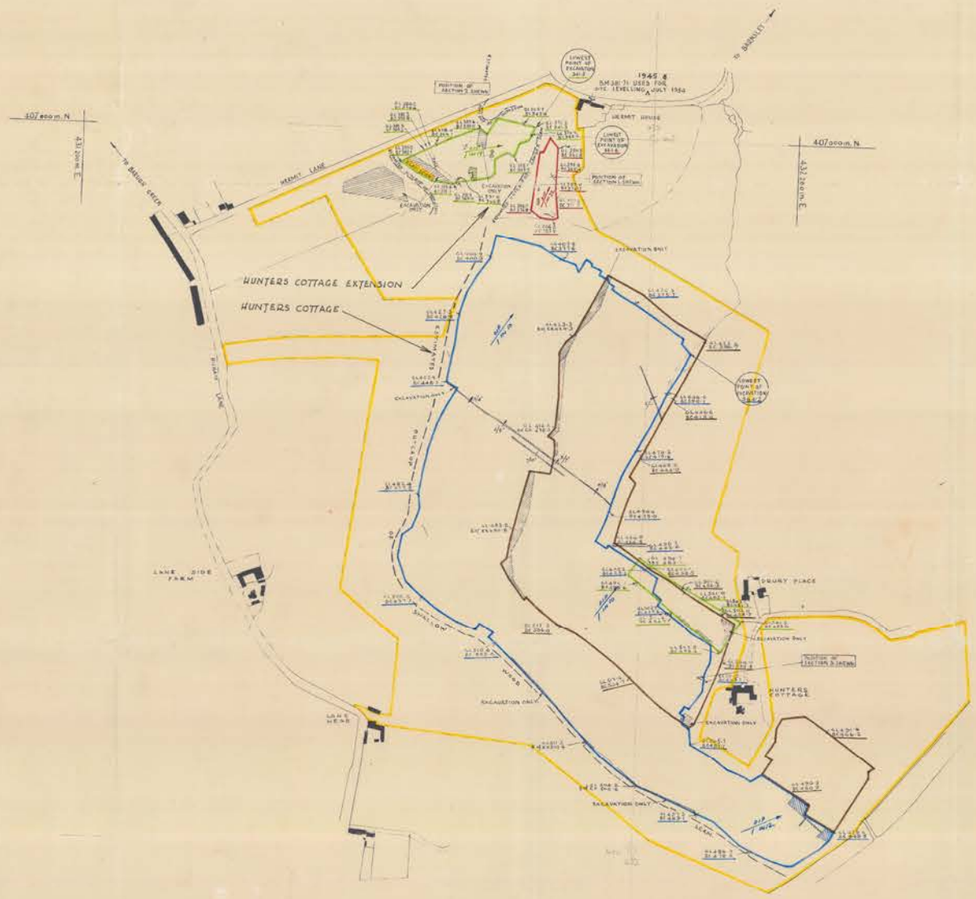

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NE. 375.

LEGEND

LOCATION

1:2500 SCALE ORDNANCE SHEET REFERENCE CE.XXIV. 6, 7, 10
DATE OF ORDNANCE SHEET 1931
NAME OF SITE HUNTERS COTTAGE & EXTENSION
LOCATION OF SITE 1 MILE WEST OF BARNSLEY
COUNTY YORKSHIRE
PARISH BARTON, BARNSLEY, ROYSTON

QUANTITIES WORKED

TOTAL AREA REQUISITIONED 154·922 ACRES. SHEWN
TOTAL AREA WORKED EXCLUDING BATTERS 64·23 ACRES
TOTAL COAL RECOVERED FROM ABOVE 238,405 TONS

NAMES OF SEAMS WORKED FOR ABOVE TONNAGE (SEAMS NAMED FROM LEFT TO RIGHT IN GEOLOGICAL DESCENDING ORDER)	CAWBER	THIN	SWALLOW WOOD TOP	SWALLOW WOOD BOTTOM		
AREA OF COAL SEAM WORKED COLOUR EDGED (SEAMS COLOURED FROM LEFT TO RIGHT IN GEOLOGICAL DESCENDING ORDER)						
TOTAL OLD WORKING VOIDS IN COAL SEAM IN CUBIC YDS.	17	79		550		
AREA OF SEAM WHERE OLD WORKING VOIDS WERE LOCATED						
DIP AND DIRECTION OF EACH SEAM SHEWN	1 in 7 N.W.	1 in 7 N.W.		1 in 7 N.W.		
REDUCED LEVELS TO ORDNANCE DATUM SHEWN RELATIVE TO NEWLYN — GROUND LEVEL	GL 390·0	GL 371·3	GL 201·0	GL 201·0		
REDUCED LEVELS TO ORDNANCE DATUM SHEWN RELATIVE TO NEWLYN — BOTTOM OF COAL	BC 361·0	BC 361·0	BC 483·0	BC 483·7		
FAULTS SHEWN WITH THROW IN FEET ON DOWNTHROW SIDE						

GENERAL DESCRIPTION

TYPE OF LAND: AGRICULTURAL & WOODLAND
NATURE OF OVERBURDEN: TOPSOIL, CLAY & MUDSTONE
NATURE OF COAL: FAIR QUALITY
SPECIAL REMARKS:

OPERATIONAL DATA

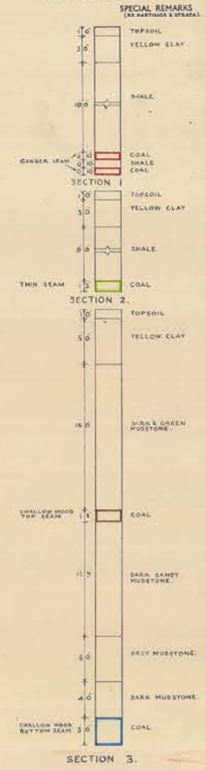
	HUNTERS COTTAGE	HUNTERS COTTAGE EXT
DATE REQUISITIONED	13 - 3 - 45	1 : 5 : 56 (15-253)
COMMENCEMENT OF COALING	12 - 11 - 52	1 : 10 : 56
COMPLETION OF COALING	10 - 8 - 49	2 : 11 : 56
COMPLETION OF RESOILING	1 - 50	29 : 5 : 56
SITE HANDED BACK TO AGRICULTURE	4 - 50	29 : 5 : 56 (28-387)
FINAL DEREQUISITION OF SITE		

COPY SENT TO	DATE	INITIALS

VERTICAL SECTION THROUGH ALL SEAMS

VERTICAL SCALE 5 TO 1 INCH

SPECIAL REMARKS (AS BARTHOLD & STRAZA)



NATIONAL COAL BOARD
OPENCAST EXECUTIVE
85/87 JERMYN STREET
LONDON, S.W.1.

LAND SURVEY BRANCH
DRAWN BY:
DATE:
CHECKED BY:
DATE:
SCALE 1:2500

NAME OF ZONE OR CONTRACT

NAME OF SITE HUNTERS COTTAGE & EXTENSION

SITE REFERENCE NUMBER 030102 B.

OPERATIONAL CONTRACT NUMBER OE/CON/3978.

DRAWING NUMBER OE/COMP/03/121

OE/LLS/7

WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date: 12-13/9-13

Site Name: REDBROOK

Job No.: 36284

Borehole No.: BH 4

DESCRIPTION OF STRATA (Soft / Firm Stiff / Loose / Dense; Colour; Fine Coarse Medium; Clayey Silty Sandy etc; SOIL TYPE; Sand Bands Cobbles etc)	DEPTH TO BASE OF STRATA FROM G/L(m)
GRASS OVER BROWN SANDY CLAY TOPSOIL	0.13
GREY BROWN COLLIERY SPOIL (MUD, SILTSTONES + CLAYS LITTLE COAL FIRM) SOFTER BELOW 2m	5.10
BECOMING V GRAVELLY BELOW 5-1m WITH CLAYEY BANDS	6.20
FIRM CLAYEY COLLIERY SPOIL MUD - SILTSTONES - COAL	7.60
V GRAVELLY AGAIN WITH CLAYEY BANDS POCKETS	
END SHIFT	10m

SAMPLES AND IN SITU TESTING											CASING & WATER DEPTH	
Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450		Water	Casing
D1	0.80											
D2	1.80											
U3	2.05	2.50	18								/	2.0
D4	2.50	2.65	8									
D5	3.80											
SD6	4.05	4.50		2	2	1	2	3	2		/	4.0
D7	4.80											
D8	5.80											
SD9	6.05	6.50		2	2	3	3	4	8		4.4	6.0
D10	6.80											
D11	7.80											
SD12	8.05	8.50		2	3	2	3	3	4		4.5	8.0
D13	8.80											
D14	9.80											
SD15	10.05	10.50		5	5	4	3	4	4		4.4	10.0

BH COMPLETED	YES	NO	FINAL DEPTH
		(NO)	

CASING

SIZE (mm)	FROM (mm)	TO (mm)
150	GL	10M

GROUNDWATER DETAILS

DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
WATER STRIKE			5.1		Rose	4.4		20mins	

DELAYS / BAD ACCESS / HARD STRATA etc.

Cause & Time Encountered	From (m)	To (m)	Time (hr)

REMARKS

AWAIT ACCESS 1HR

STANDPIPE DETAILS

	FROM	TO
PLAIN PIPE		
SLOTTED PIPE		
GRAVEL - FILTER		
BENTONITE		
SEALS		
STOPCOCK COVER		
GAS VALVE & BUNG		

SIGNATURES:

Driller: CRAIG ROBERTS

Client:

WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date	Site Name	Job No.	Borehole No.
16 - 9 - 13	ROD BROOK	36284	BH4

DESCRIPTION OF STRATA					DEPTH TO BASE OF STRATA FROM G/L(m)	SAMPLES AND IN SITU TESTING											CASING & WATER DEPTH	
Soft / Firm Stiff / Loose / Dense	Colour Fine Coarse Medium	Clayey Silty Sandy etc	SOIL TYPE	Sand Bands Cobbles etc		Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450		Water	Casing
GRAVELLY MUD-SILTSTONE COLLIERY SPOIL + GRAVEL POCKETS					10m	D16	1080											
						D17	1180											
						SD18	1205	1250		8	8	9	6	7	8		4.5	12
MUCH SILT MUDSTONE COBBLES BELOW 12m						D19	13.4											
						SD20	1342	1348		25/26		50/29					4.5	13.4
					13.40	S21	1348	1352	M/R	25/14		50/21					4.5	1345
MODERATELY STRONG SILTSTONE BEDROCK.																		
END —					1348													

BH COMPLETED	YES	NO	FINAL DEPTH

CASING

SIZE (mm)	FROM (mm)	TO (mm)
150	GL	1345

GROUNDWATER DETAILS

DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
AM	WATER		4.38.						

DELAYS / BAD ACCESS / HARD STRATA etc.

Cause & Time Encountered	From (m)	To (m)	Time (hr)
CHISEL	1340	1348	1/2HR
CHISEL	1345	1348	1/2HR

REMARKS

50mm PIPE CONSTRUCTED
1 1/2HR

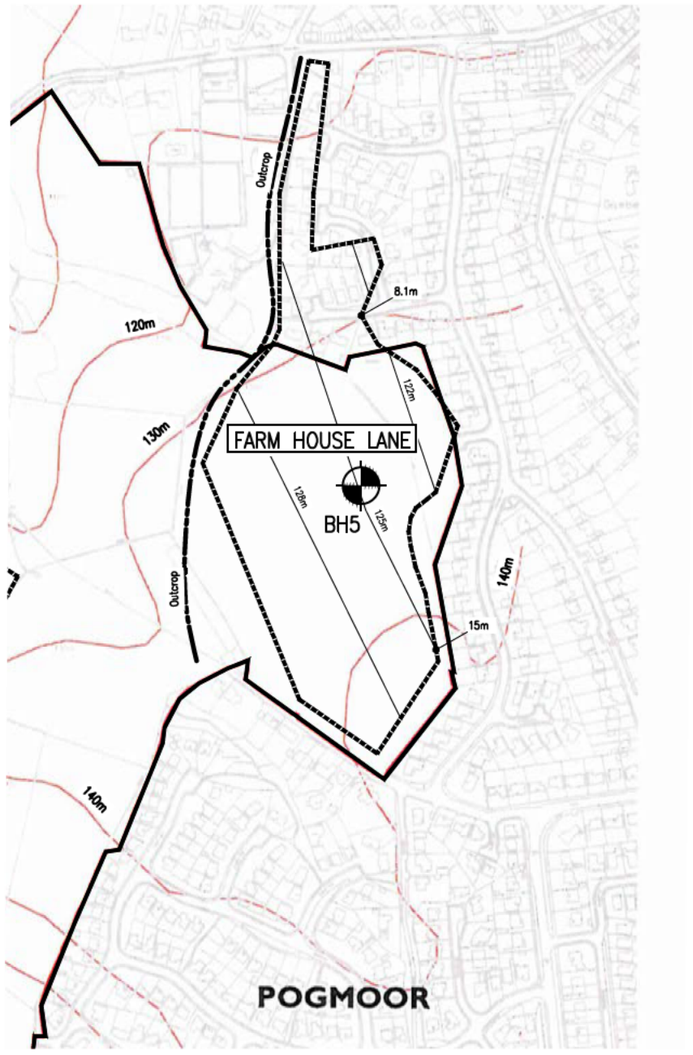
STANDPIPE DETAILS

	FROM	TO
PLAIN PIPE	GL	1m
SLOTTED PIPE	1m	1345
GRAVEL - FILTER	1m	1345
BENTONITE	1m	0.5
SEALS		
STOPCOCK COVER	✓	
GAS VALVE & BUNG	✓	

SIGNATURES:

Driller: CRAIG ROBERTS

Client: .....



Information within this drawing is not necessarily produced to scale.
Always use figured dimensions and co-ordinates – if in doubt, ask.

This drawing has been produced using the following record drawings:–

Master Plan from link downloaded 12.08.2013

The Coal Authority
Farm House Lane – Catalogue No NE415 Sheet Info:

1. This drawing to be read in conjunction with Eastwood & Partners drawing 36284/001.

KEY

	Site Boundary
	Approximate Extent of Previous Opencast Mining
122m	Approximate Opencast Contours (mAOD)
8.1m	Depth from Original Ground Level to Base of Coal or Excavation
120m	Current Ground Level (mAOD)
	Approximate position of Cable Percussion Borehole completed for Eastwood & Partners in September 2013.

REV	DESCRIPTION	SIG	CHK	DATE
A	First Issue.			

STRATA

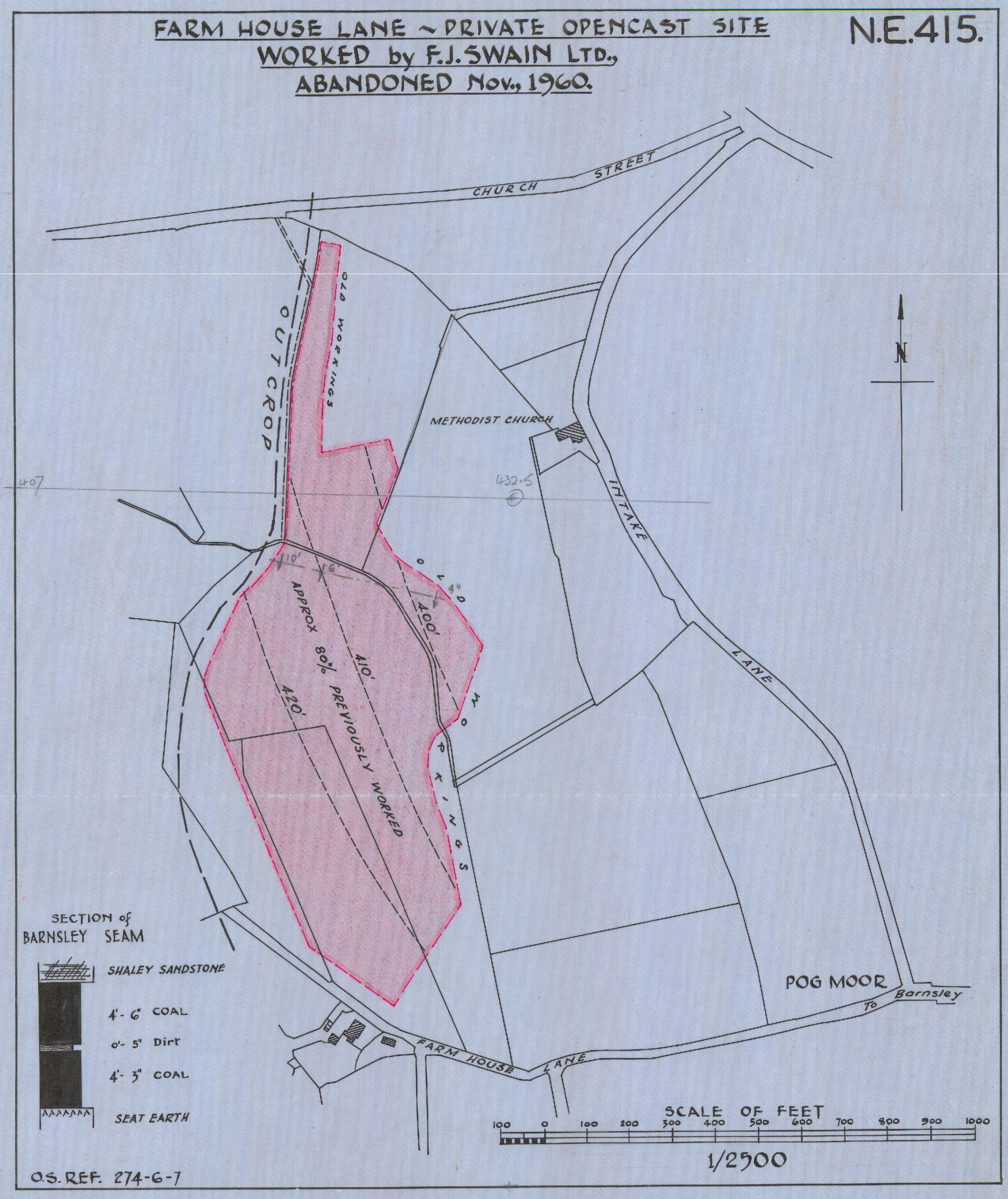
BARNSLEY WEST

FARM HOUSE LANE OPENCAST WORKINGS

Eastwood & Partners
CONSULTING ENGINEERS
E&P
St. Andrew's House
23 Kingfield Road
Sheffield
S11 9AS
Tel 0114 255 4554
Fax 0114 255 4330
mail@eastwoodandpartners.com
www.eastwoodandpartners.com

SCALE WHEN PLOTTED AT A3	DRAWING STATUS
Approx 1:5000	INFORMATION

DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
SA/CB	CAT	05–09–13	36284/005	A



The Coal Authority

IFTS accredited

Catalogue No.: NE415 Sheet Info:

Date: 27/08/2013

Scale: 1 TO 2500

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Kim Godson - The Coal Authority,200 Lichfield Lane,Mansfield,Nottingham,NA,UK

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WELLHEAD DRILLING COMPANY

Wellhead House
Hall Lane
Chapelthorpe
Wakefield
WF4 3JE

Telephone:
01924 257003
Fax:
01924 252136

Date	Site Name	Job No.	Borehole No.
16/17 - 9 - 13	REDBROOK	36284	BH5

DESCRIPTION OF STRATA (Soft / Firm Stiff / Loose / Dense; Colour; Fine Coarse Medium; Clayey Silty Sandy etc; SOIL TYPE; Sand Bands Cobbles etc)	DEPTH TO BASE OF STRATA FROM G/L(m)
BROWN SANDY CLAY - TOPSOIL	0.25
PALE BROWN / BROWN . GREY MIXED CLAYS + MUDSTONE, SILT BRICK COAL GRAVELS	0.90
BROWN / GREY V STIFF SANDY CLAYS + GRAVELS OF MUD-SILT STONE SOME COAL + SOME RED BROWN POCKETS BELOW 2m.	3.10
RED BROWN / GREY / BEIGE BROWN FRIABLE STIFF SANDY CLAY + MUCH MUD / SILTSTONE GRAVELS + COBBLES RARE COAL MUCH MUDSTONE LITTLE CLAY BELOW 6m. V STIFF	8.30
RED BROWN / DK GREY MODERATELY STRONG SILTSTONE / SANDSTONE	

SAMPLES AND IN SITU TESTING											CASING & WATER DEPTH	
Type No	Depth (m) From	Depth (m) To	U blows	S.P.T. / C.P.T. mm 0 to 75 *	75 to 150 *	150 to 225	225 to 300	300 to 375	375 to 450	Water	Casing
D1	020										
D2	080										
D3	180										
SD4	205	250		3	4	3	3	2	2	/	150
D5	280										
D6	380										
U7	405	450	28							/	4
D8	450	465	17								
D9	580										
SD10	605	650		3	6	11	16	23/58		/	6
D11	680										
D12	780										
SD13	805	842		5	7	10	23	27/21		/	7.5
SD14	855	861		25/31		30/29				/	7.5

BH COMPLETED	YES	NO	FINAL DEPTH
	✓		861

CASING

SIZE (mm)	FROM (mm)	TO (mm)
150	GL	750

GROUNDWATER DETAILS

DATE	TIME	DEPTH OF FLOW	RATE OF FLOW	RISING TO MINS 5	10	15	20	CASING DEPTH	SEALED
DRY									

DELAYS / BAD ACCESS / HARD STRATA etc.

Cause & Time Encountered	From (m)	To (m)	Time (hr)
CHISEL	840	855	1HR

REMARKS

EXCESS MOVE 1HR
PIPE CONSTRUCTED 1½ HR

STANDPIPE DETAILS

	FROM	TO
PLAIN PIPE	GL	1m
SLOTTED PIPE	1m	855
GRAVEL - FILTER	1m	855
BENTONITE	1m	0.5
SEALS		
STOPCOCK COVER	✓	
GAS VALVE & BUNG	✓	

SIGNATURES:

Driller: CRAIG ROBERTS

Client: .....