Pam Brown Associates



September 2020

Coal Mining Investigation Report

PLOT 7, DEARNE VALLEY PARKWAY

BARNSLEY

S70 5SZ

Report Ref. 2023-20 / Revision 1

Pam Brown Associates

COAL MINING INVESTIGATION REPORT

PLOT 7, DEARNE VALLEY PARKWAY
BARNSLEY
S70 5SZ

Client Company Name:	Glanville Group
Report Status:	Revision 1
Issued By:	Pam Brown Associates Ltd Needwood House, Lancaster Park, Newborough Road, Needwood, Burton on Trent DE13 9PD Telephone: 01283 575733 Web site: www.pambrownassociates.co.uk

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1.0 INTRODUCTION

Pam Brown Associates Ltd (PBA) was commissioned by the Glanville Group Ltd to carry out a Coal Mining Investigation to support the planning application for the proposed McDonalds scheme off Dearne Valley Parkway, Barnsley, S70 5SZ.

The main objective of this investigation was as follows:

- To assess ground conditions beneath the proposed new structures by rotary open hole drilling techniques and establish whether voided ground occurs above any former shallow (<30m) workings.

This report has been drafted in accordance with the Coal Authority Coal Mining Risk Assessment Template (January 2011). It should be read in conjunction with the following document:

- Coal Authority 'CON 29M Non-Residential' Mining Report. Ref. 51002279596001. 3rd July 2020.

The assessment is supported by the findings of the ground investigation conducted on site in July 2020, aimed to prove/disprove the presence of shallow depth coal mining features in the proposed development area.

This report presents full factual records of the site work carried out and the ground conditions encountered in the exploratory holes. All information collected has been used to provide an interpretation of the ground conditions, with recommendations on the risk posed by former coal mine workings beneath the site for the proposed development.

Limitations

The conclusions and recommendations made within this report are restricted to those that can be determined from the available data and within the inherent limitations of a discrete investigation, the specific exploratory locations and scope under which the study was commissioned. As with any site, there may be differences in conditions between exploratory hole locations, the data included in the report reflects the observations made at the time of the investigation. Seasonal fluctuations may occur in groundwater and ground gas levels which may not be accounted for as part of this study. PBA cannot take responsibility for conditions that have not been revealed by the exploratory holes, or variations which may occur between them, opinions expressed on the spatial distribution of strata between sampling locations is for guidance only and no responsibility can be accepted with regards to its accuracy.

Conclusions and/or recommendations made in this report may be subject to amendment in the light of additional information becoming available, improved practices or changes in the legislation.

The information provided by third parties is presented in good faith; however, PBA cannot accept any responsibility/liabilities for the information derived from these and/or for discrepancies or inaccuracies found in the data.

This report has been prepared solely for the use of Glanville Group / McD for the purpose of the redevelopment scheme under the scope the investigation was commissioned. If the document is used/viewed by any other party for any other purpose than the one specified above, reference must be made to PBA to confirm its suitability for use. No responsibility

will be accepted where a third party uses this report, either in part or in its entirety, unless formally re-assigned.

This report should be reviewed at all stages of construction by someone familiar with the terms and assumptions it contains. It is essential that a suitably qualified and experienced engineer be appointed for design purposes, and to supervise construction.

2.0 SITE OVERVIEW

2.1 SITE LOCATION AND DESCRIPTION

The site is located the A6195, Dearne Valley Parkway, Rockingham near Barnsley in South Yorkshire. and is located at National Grid Reference with the nearest postcode being S70 5SZ.

The approximate National Grid reference for the site is 435118E 400829N. An aerial photograph of the site is presented below with the site boundary marked in red. The site location plan is included as Figure 1.



The site covers an area of approximately 0.51ha and is irregular in shape. At the time of the investigation, the site was unoccupied and covered with rough grass.

The site is bounded to the southeast by the A6195, to the north and east by large office and commercial units and a pub to the west.

The current site layout is presented as Figure 2.

2.2 PROPOSED DEVELOPMENT

The proposed development includes the construction of a McDonalds restaurant with associated car parking and drive-thru areas. The proposed site layout is included as Figure 3.

2.3 SITE HISTORY

Historically, the site and wider area was subject to deep underground mining (Rockingham Colliery pre-1893 to 1980) and used for opencast coal mining (1991 to 1995). Subsequent backfilling and restoration appeared to have been completed by 2002.

The main buildings for the Rockingham Colliery, including coke ovens, railway sidings and colliery buildings were located to the west of the site. Between 1893 and 1987, the topography of the area appears to alter, with additional and expanding spoil heaps. By 2002, the general site area appears to have been levelled with no spoil heaps or buildings shown to be present.

3.0 GEOLOGY

3.1 PUBLISHED GEOLOGY

According to the British Geological Society (BGS), the site is underlain by the Pennine Middle Coal Measures Formation of Carboniferous age. The Pennine Middle Coal Measures Formation is described as interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit.

3.2 HISTORICAL BOREHOLE RECORDS

The closest historical BGS record (reference SE30SE24) is located at NGR 435077 400942 (approximately 120m to the N of the site).

The borehole was carried out by the National Coal Board in 1975 for the purpose of proving the presence of the Shallow Wood coal seam, presumably for opencast mining purposes, which was carried out during the 1990s (see Section 4.3).

A copy of the borehole log can be found in Appendix 1.

Table 1. Summary of Ground Conditions Encountered (BGS Borehole 1975)

Strata Name	Description	Depth	
		From	To
	Open hole drilling	0.0m	4.44m
	Massive pale grey SANDSTONE	4.44m	4.80m
	Complexly bedded pale grey SANDSTONE with finely comminuted plant debris on bedding	4.80m	5.87m
	Dark grey MUDSTONE with ironstone lenses and bands	5.87m	6.10m
SWALLOW WOOD	COAL (thickness 95mm)	6.10m	6.94m
	Coaly dirt (60mm thickness)		
	Inferior COAL (240mm thickness)		
	COAL (445mm thickness)		

3.3 PREVIOUS GROUND INVESTIGATION

A ground investigation carried out by Grontmij in 2015 for the adjacent site to the south west, encountered Made Ground (silty, sandy clay) to a maximum depth of 0.20mbgl, overlying dense very clayey, sandy, silty mudstone fill with occasional gravel and cobbles, to a maximum proven depth of 4.00mbgl. In one of the boreholes to the south, dense dark grey clayey, sandy, gravel with cobbles was encountered beneath the mudstone fill to a maximum proven depth of 6.50mbgl. The made ground was underlain the Pennine Middle Coal Measures - very weak, light grey, silty, finely banded mudstone to a maximum depth of 7.72mbgl.

4.0 COAL MINING

A coal mining report from the Coal Authority has been obtained as part of the coal mining investigation, a copy of which is included in Appendix 2, and summarised below.

4.1 UNDERGROUND MINING

The report indicates the site is in a surface area that could be affected by underground mining in 7 seams of coal at 140m to 340m depth, last worked in 1962. Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

In addition, the site is in an area where the Coal Authority believes there is coal at or close to the surface which may have been worked sometime in the past.

The site is not within an area of present or planned future underground mining. However, reserves of coal exist in the local area which could be worked at some time in the future.

Examination of the Coal Authority online interactive map viewer indicates the site is within a Development High Risk Area, associated with probable unrecorded shallow coal mine workings.

4.2 MINE ENTRIES

There are no recorded coal mine entries known to the Coal Authority within, or within 20 metres, of the site boundary.

4.3 OPENCAST MINING

The site is located within the Rockingham opencast site from which coal has been removed by opencast methods.

The site is not within 200m of the boundary of a current working opencast site. The site is not within 800m of the boundary of a future-planned opencast site.

4.4 COAL MINING GEOLOGY

There are no records of damage due to geological faults or other lines of weakness that have been affected by coal mining.

4.5 COAL MINING SUBSIDENCE

The Coal Authority has not received a damage notice or claim for the subject site, or any site within 50m of the site boundary, since 31 October 1994. There is no current Stop Notice delaying the start of remedial works or repairs to the site.

The Coal Authority is not aware of any request having been made to carry out preventive works. The site has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

4.6 MINE GAS

The Coal Authority has no record of a mine gas emission requiring action.

5.0 PRELIMINARY COAL MINING RISK ASSESSMENT

5.1 GENERAL

The purpose of the Coal Mining Risk Assessment was to collate available geological, mining, historical and site investigation data in order to assess the potential for the site to be affected by underground mining.

The risk assessment has been drafted in accordance with the Coal Authority Coal Mining Risk Assessment Template (January 2011).

5.2 SOURCES OF INFORMATION

The Coal Mining Risk Assessment comprises of a review of the following information sources:

- Online British Geological Survey maps and data
- Coal Authority 'CON 29M Non-Residential' Mining Report. Ref. 51002279596001. 3rd July 2020.
- Coal Authority Interactive Map Viewer.
- British Geological Survey online borehole records
- Google Earth imagery
- Site Investigations in Areas of Mining Subsidence, FG Bell, 1975.
- The threat of abandoned mines on the stability of urban areas, Barry Clarke, IAEG2006. Paper Number 379, The Geological Society of London, 2006.
- Construction over abandoned mine workings, CIRIA Special Publication 32, 2002.
- Abandoned Mineworkings, Draft Guidance, CIRIA 758.

5.3 SCOPE OF COAL MINING RISK ASSESSMENT

Objectives of the coal mining risk assessment are to provide a desk-based assessment of available geological, historical and mining information relating to the site (and wider area) and to use this information to identify the risks present to the development from the legacy of mining.

As part of the risk assessment potential mitigation measures (if required) should be considered, including any necessary remedial works.

The outcome of the risk assessment should demonstrate to the Local Authority that the proposed development is, or can be made safe (and stable) to meet the requirements of the National Planning Policy Framework (NPPF).

5.4 DATA LIMITATIONS

It should be appreciated that it did not become a legal requirement to deposit coal mining abandonment plans until the 1870's and that this requirement was not rigorously enforced for some time after. Many shallow coal seams were worked prior to the introduction of first edition Ordnance Survey Maps and information on these workings is often not available.

Therefore, if coal seams were accessible then invariably, they could have been worked by formal or informal means.

It is also possible that if unrecorded workings are present then unrecorded mine entries may be present.

5.5 COAL MINING RISKS

In general, risks associated with coal mining are as follows:

- Collapse of relict workings beneath buildings causing damage to the building fabric and infrastructure.
- Migration of dangerous gases from old mine works and mine entries resulting in build-up of flammable and asphyxiating gases (such as methane and carbon dioxide) in confined areas.
- Consolidation of relict workings and overlying strata causing structural defects in building fabric and infrastructure.
- Failure of mine entries causing loss of ground beneath building and external areas.
- Spontaneous combustion of old mineworkings.

5.6 SUMMARY OF RISK

There are recorded workings beneath the from 140m to 340m which are considered sufficiently deep enough not to influence development at the surface.

The Coal Authority believes there is coal at or close to the site surface which could have been worked sometime in the past.

The site is located within the Rockingham opencast site, which was in operation between 1991 and 1995 and subsequently backfilled by 2003. It is likely any shallow depth coal seams beneath the site have now been removed by opencast methods.

The following table summarises the potential risks associated with coal mining legacy for the proposed development site.

Table 2. Summary of Potential Risks Associated with Coal Mining Legacy

Coal Mining Issue	Yes	No	Risk Assessment
Underground coal mining (Recorded at shallow depths)		N	Low
Underground coal mining (Probable at shallow depths)	Y		Low to Moderate
Mine Entries (Shafts and adits)		N	Low
Coal Mining Geology (Fissures)		N	Low
Record of past mine gas emissions		N	Low
Record of coal mining surface hazard		N	Low
Surface Mining (Opencast Workings)	Y		Low (now backfilled)

5.7 PROPOSED MITIGATION STRATEGY

Based on the findings of the preliminary coal mining risk assessment, the following mitigation works were proposed:

- Three (3 No.) rotary boreholes to 30m depth.

These works are discussed in the following section

6.0 SITE INVESTIGATION

6.1 GENERAL

The fieldwork relevant to informing of shallow coal mining was carried out between 8th and 13th July 2020 and comprised three (3No.) boreholes (designated BH1, BH2 and BH3), sunk to a depth of 30m below existing ground level, using a track-mounted rotary coring rig.

The fieldwork was carried out generally in accordance with BS 5930: 2015+ A1:2020 *Code of Practice for Site Investigations* and *Eurocode 7* unless otherwise stated. All rotary drilling works were undertaken in accordance with The Coal Authority's Permit Reference 20225, dated 26th June 2020.

6.2 ROTARY DRILLING

The boreholes were initially drilled through overburden using dynamic sampling methods, until bedrock was encountered. The boreholes were progressed through the bedrock using a combination of rotary open hole drilling and rotary coring. Water was used as the flushing medium. Standard Penetration Tests (SPTs) were undertaken in the boreholes in accordance with accordance with BS EN ISO 22476-3:2005+A1:2011.

The boreholes were partially backfilled on completion with cement bentonite grout, and installations were placed within the near surface materials.

A summary of exploratory holes undertaken is presented in the following table. The exploratory hole location plan is included as Figure 4 and logs are included in Appendix 3.

Details of ground water conditions were noted where possible. Water levels may have been affected by the installation of casing to the boreholes or the use of water as a flushing medium. In addition, water level observations are those at the time of the investigation and do not necessarily reflect seasonal fluctuations.

On completion, all samples recovered from the site were sent to a specialist laboratory for further examination and testing. Details of the depths and types of samples recovered are indicated on borehole logs, included as Appendix 3.

7.0 GROUND CONDITIONS ENCOUNTERED

7.1 SOIL PROFILE ENCOUNTERED

The sequence of strata encountered beneath the site was as follows:

- Made Ground (backfill to opencast pit).
- Coal Measures Bedrock

The depths of the various materials encountered in each of the exploratory holes are summarised in the following table. Ground conditions encountered are discussed below.

Table 3. Summary of Ground Conditions Encountered

Hole	Depth to Stratum (m)			GROUNDWATER
	MADE GROUND		COAL MEASURES BEDROCK	
	Sandy/gravelly CLAY FILL	Sandy/clayey GRAVEL FILL	MUDSTONE	
BH1	GL - 1.65 2.25 - 9.30	1.65 - 2.25	9.30 - 30.00	5.99m & 24.50m
BH2	GL - 1.45 1.60 - 10.10 10.30 - 11.10	1.45 - 1.60 10.10 - 10.30	11.10 - 30.00	5.40m
BH3	GL - 1.00 1.30 - 5.00 5.75 - 8.00 8.20 - 9.50	1.00 - 1.30 5.00 - 5.75 8.00 - 8.20	9.50 - 30.00	5.00m

7.2 OBSTRUCTIONS

Underground man-made obstructions were not encountered during the investigation.

7.3 GROUNDWATER

Groundwater was encountered in all 3No. boreholes at depths of between 5.0m and 24.5m below existing ground level.

7.4 EVIDENCE OF MINING

Evidence of shallow depth coal mining, such as broken ground, voids and loss of drilling flush was not encountered in any of the boreholes.

No coal seams or partings were encountered in any of the boreholes.

8.0 COAL MINING RISK

8.1 GROUND CONDITIONS ENCOUNTERED

The exploratory holes have encountered a significant thickness of Made Ground representing backfill to the former opencast site (9.3m-11.1m thickness) overlying Coal Measures Bedrock (mudstone) encountered to 30m depth below existing ground level.

Groundwater was encountered in all the boreholes at depths of between 5.0m and 24.5m below existing ground level.

Evidence of shallow depth coal mining, such as broken ground, voids and loss of drilling flush was not encountered in any of the boreholes. No coal seams or partings were encountered in any of the boreholes.

8.2 RISKS POSED BY SHALLOW DEPTH COAL MINING

Evidence of shallow depth coal mining, such as broken ground, voids and loss of drilling flush was not encountered in any of the boreholes. No coal seams or partings were encountered in any of the boreholes.

The site is located within a former opencast site and any shallow depth coal seams are likely to have been removed by opencast methods associated with this site. Ground conditions have encountered a significant thickness of Made Ground which represents backfill to the opencast pit.

Coal Authority records indicate 'deeper' worked coal seams at depths of between 140m to 340m which are considered sufficiently deep enough not to affect any development at the surface.

Based on the above, it is considered the risk posed by shallow depth coal mine workings beneath the site is low.

8.3 COAL MINING RISKS

Table 4 below summarises the perceived risks and provides relevant comments, based on the findings of the investigation.

Table 4. Summary of Coal Mining Risks

Risk	Comment
Collapse of relict workings beneath buildings causing damage to the building fabric and infrastructure.	Voids/Workings/broken ground have not encountered. Perceived risk is LOW.
Migration of mine gases from old mine works and mine entries resulting in build-up of flammable and asphyxiating gases in confined areas.	Voids/Workings/broken ground have not been encountered. Perceived risk from mine gas is LOW.
Consolidation of relict workings and overlying strata causing structural defects in building fabric and infrastructure.	Voids/Workings/broken ground have not been encountered. Consolidation risk due to workings perceived as LOW.

Failure of mine entries causing loss of ground beneath building and external areas.	No mine entries on site. Risk Negligible.
Spontaneous combustion of old mine-workings.	None of identified seams beneath site are known to be combustible. Perceived risk is LOW.

8.4 CONCLUSIONS

From the above sections, it can be seen there is a **Low risk** from shallow depth underground coal mine workings.

However, the presence of significant thickness of backfill to the former opencast site could cause the following problems:

- Variable bearing and consolidation properties, making it unsuitable as foundation stratum.
- Significant thickness of fill could generate land gas.

Based on the findings of the investigation and proposed development, foundation options such as piles should be considered.

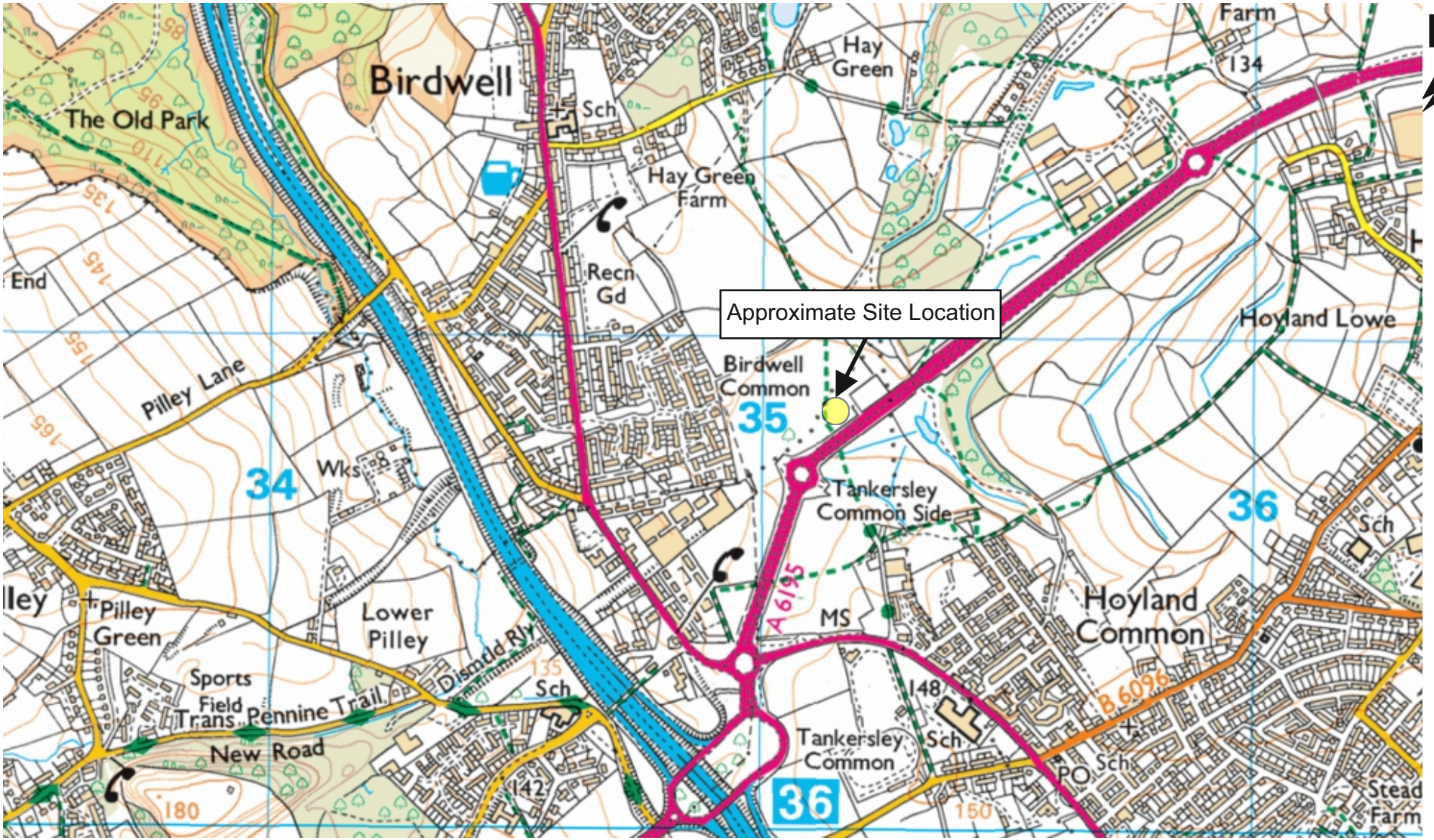
Gas monitoring should be carried out across the site and appropriate protection measures incorporated into new buildings, where elevated levels of land gas are encountered.

Pam Brown Associates
September 2020

Terms and Conditions

1. Interpretative assessments are based upon the ground conditions as revealed by trial pits and boreholes, together with the results of any field or laboratory testing, plus other relevant data, which may have been obtained including previous site investigations. Due to the nature of geotechnical or contamination issues, there can be no certainty that any or all such areas will have been located and/or sampled.
2. Should at a future date, any additional information be made available with regard to special conditions associated with the site, the findings may be subject to amendment.
3. Where any data supplied by the client or from other sources, including that from previous site investigations, has been used it has been assumed that the information is correct. However it is always advised that without the appropriate indemnification all data supplied by others should be verified, and no responsibility can be accepted by Pam Brown Associates Ltd for inaccuracies within the data.
4. Whilst an opinion may be expressed on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.
5. Comments on groundwater conditions will be based upon observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects. Where possible an assessment of likely changes will be made for guidance purposes. Additional investigation may be required for confirmation.
6. The quotation has been prepared in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the findings in whole or part after its original submission.
7. The copyright in the written materials shall remain the property of Pam Brown Associates Ltd, but with a royalty-free perpetual licence to the Client deemed to be granted on payment in full to Pam Brown Associates Ltd by the Client of the outstanding amounts.
8. The report is provided for sole use by the Client and is confidential to them and their professional advisers. No responsibility whatsoever for the contents of the report will be accepted to any persons other than the Client.
9. These terms apply (or in addition to another written contract which may be in place instead thereof) unless specifically agreed otherwise in writing.
10. Fees are based on the methods and evaluation stated in this proposal. This fee proposal will be void and a revised fee proposal will be produced if the client alters or requires an alteration to be made to the proposal. This quote will remain valid for three months from the date of this quote
11. The client shall be entitled to use documents prepared by the consultant in the execution of this agreement provided that: i) all fees due to the consultant at that stage have been paid, ii) the use relates only to the project or part of the project for which the material was prepared.
12. If either party to this agreement considers modifications to the project to be necessary, full details must be provided in writing.
13. Fees associated with the acquisition of data, ground investigation, laboratory testing, monitoring, etc. shall be paid in full prior to the final factual and/or interpretive report of the findings is issued. The findings of any investigation and assessment shall remain the property of PBA and may not be able to be disclosed until full payment for the above has been received.
14. Terms of payment are **strictly 30 days** from date of invoice. Payment shall be made via BACS.
15. In accordance with Late Payment of Commercial Debts Regulations (2002), Pam Brown Associates reserves the right to charge interest on any outstanding amount after the payment due date. We reserve the right to charge interest at 3% over bank base rate on overdue invoices.
16. It is the policy of the company to recover all debts, associated costs, and legal fees incurred in so doing.

FIGURES



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Project:

Plot 7
Dearne Valley Parkway
Barnsley
S70 5SZ

Title:

Site Location Plan

Scale: NTS

Job No.: 2023-20

Figure 1



Pam Brown Associates
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Needwood House, Lancaster Park
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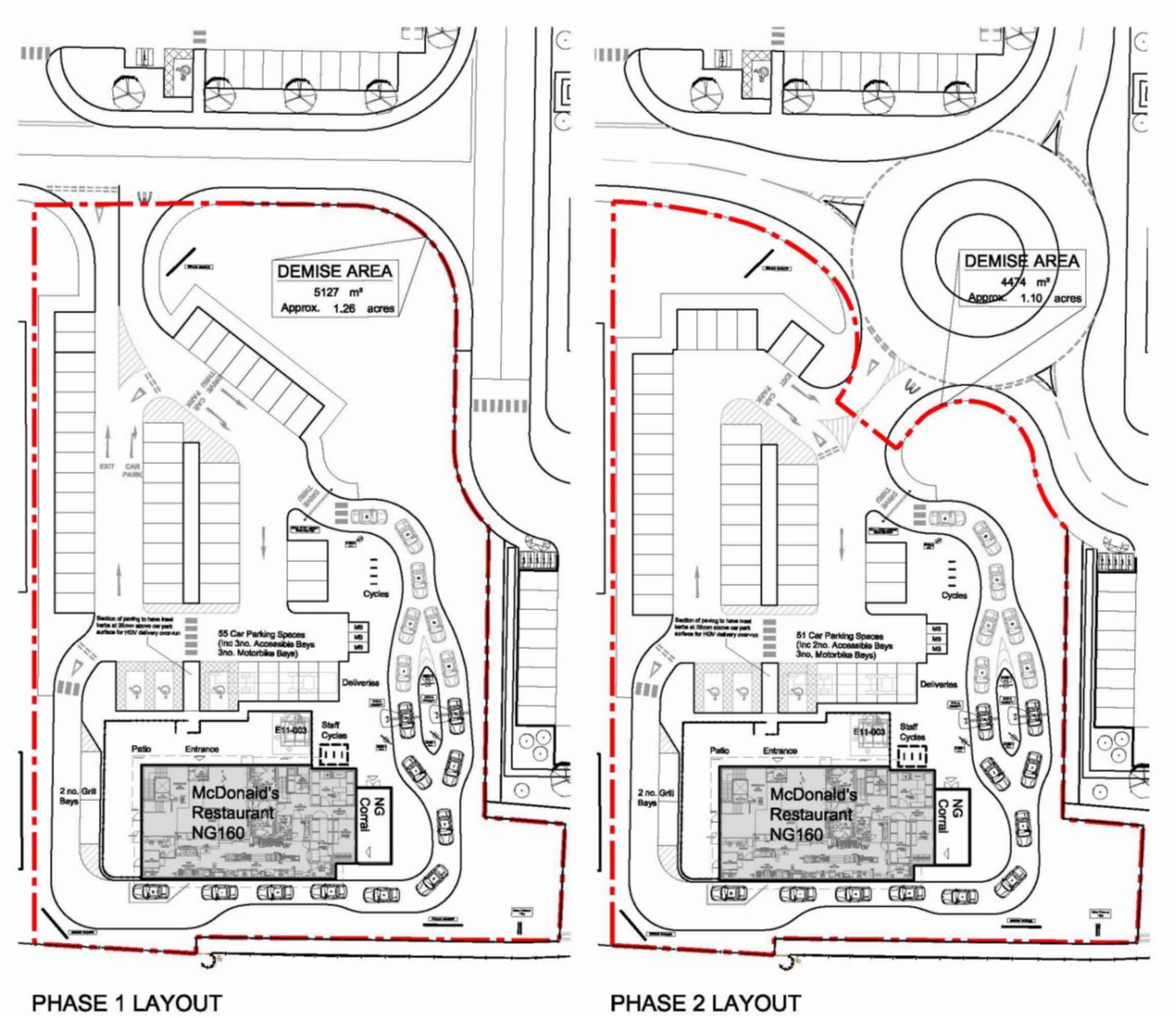
Project:
Plot 7
Dearne Valley Parkway
Barnsley
S70 5SZ

Title:
Existing Site Plan

Scale: NTS

Job No.: 2023-20

Figure 2



Based on the AEW Architects Drawing Ref. 11627_AEW_8415_F004, Rev. A, 19/05/2020

Pam Brown Associates
Environmental Consultants
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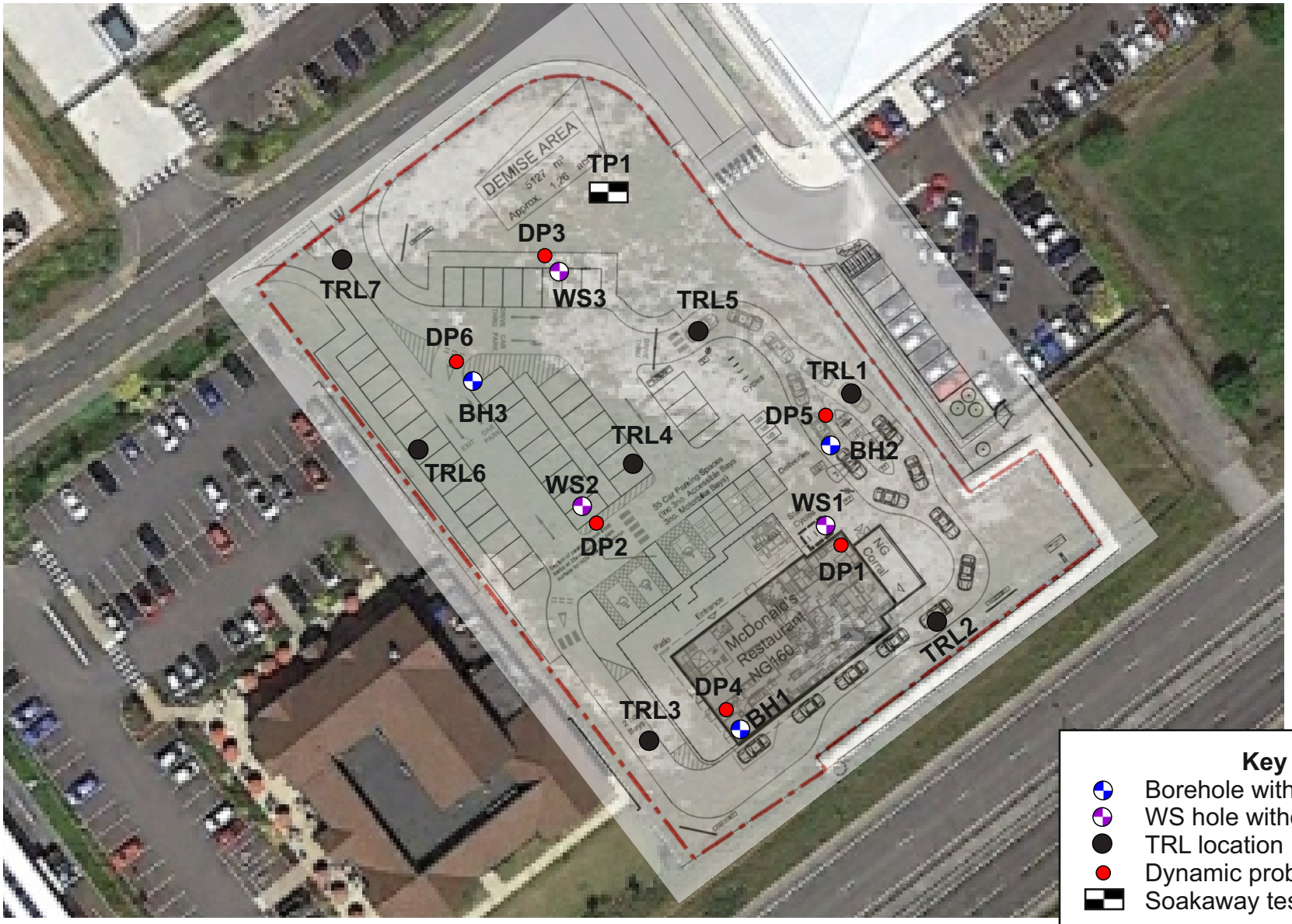
Project:
Plot 7
Dearne Valley Parkway
Barnsley
S70 5SZ

Title:
Proposed Site Plan

Scale: NTS

Job No.: 2023-20

Figure 3



Pam Brown Associates
Environmental Consultants
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Project:

Plot 7
Dearne Valley Parkway
Barnsley
S70 5SZ

Title:

Exploratory Location Plan (Final)

Scale: NTS

Job No.: 2023-20

Figure 4

APPENDIX 1

FORM F 70
SKRIES 680

6-INCH MAP	B/H REGD. No.
Yorks. 282 NE (County, Sheet and Qtr.)	
SE 30 SE 24 (Nat. Grid, Sheet & Qtr.)	

Attach tracing from a map or sketch map if possible

Section of ROCKINGHAM COLLIERY -

No. 9 (Surface) Borehole

Purpose To prove the Swallow Wood Seam

Exact Site O.S. N.G.R. SE/35077/00942

Level at which ~~shaft~~ bore ~~drift~~ commenced relative to O.D. 426·5 ~~*or~~ ft* A.O.D.

Date of sinking or boring December 1975

Sinker or borer National Coal Board

Cores, other than coal, examined by S. Graham.

*Delete as appropriate

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS ~~*or~~ ft*	THICKNESS ~~*or~~ m*	DEPTH ~~*or~~ ft*	DEPTH ~~*or~~ m*
	OPEN HOLE - no cores	4·414	7	14	7
	Massive pale grey sandstone	0·36 1	2	15	4·8
	Complexly bedded pale grey sandstone with finely comminuted plant debris on bedding	1·07 3	6	19	5·83
	Dark grey mudstone with ironstone lenses and bands	0·23	9	20	6·1
SWALLOW WOOD	COAL 3¾"				
	Coaly dirt 2¼"				6·93
	Inferior COAL 9½"	0·842	9	22	9
	COAL 1'- 5½"				
	BOTTOM OF BOREHOLE				

British Geological Survey

31 MAY 1975
COMMERCIAL IN CONFIDENCE

YORKSHIRE 282 NE — SE 30 SE /24
ROCKINGHAM COLLIERY — DEC 1974
No 9 (Surface) BH — 426·5' A.O.D.

Principal Horizons	Log	Seam Sections & Depths to Important Horizons	ELECTRIC LOG	CASING	CORING
	FT O				
SWALLOW WOOD	OPEN HOLE	C 3¾" / D 2¼" / IC 9½" / C 1' 5½" } 2'9" at 22'9"		NIL	

BOTTOM OF BOREHOLE 22' 9"

British Geological Survey

YORKSHIRE WATER AUTHORITY – Survey of Existing Boreholes

I.G.S. Ref. No SE. 30. SE/24 N.G.R. SE. 3508..0094....

Licence No.

OWNERS NAME .....NCB.....

ADDRESS ...Rockingham..Colliery.....

.....

App No

Authorised Abstraction

g.p.h.
g.p.d.
m.g.a.

commenced at OD 426.5

STRATA DETAILS	Thick's	Depth
Open hole	14'7"	19'1"
Sandstone	9"	19'10"
Mudstone	9"	20'7"
Swallow wood OD	2'9"	22'9"

Dia. .....

Depth .....

Lining .....

Well sinker NCB..

Date 1975.....

R.W.L. .....

P.W.L. .....

British Geological Survey

APPENDIX 2

The Coal Authority

CON29M
coal mining report

UNIT 7, KESTREL WAY, BIRDWELL, BARNSLEY, S70 5SZ, SOUTH YORKSHIRE

Known or potential coal mining risks

Past underground coal mining	Page 4
Future underground coal mining	Page 4
Mine entries	Page 5
Past opencast coal mining	Page 5
Withdrawal of support	Page 6

Further action

No further reports from the Coal Authority are required. Further information on any next steps can be found in our Professional opinion.

For more information on our reports please visit www.groundstability.com

Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. In view of the coal mining circumstances we would recommend that any planned or future development should follow detailed technical advice before beginning work on site. Please see page 3 for further details on Future development.

Your reference: GS-6831508
Our reference: 51002279596001
Date: 3 July 2020

Client name: GROUNDSURE LIMITED

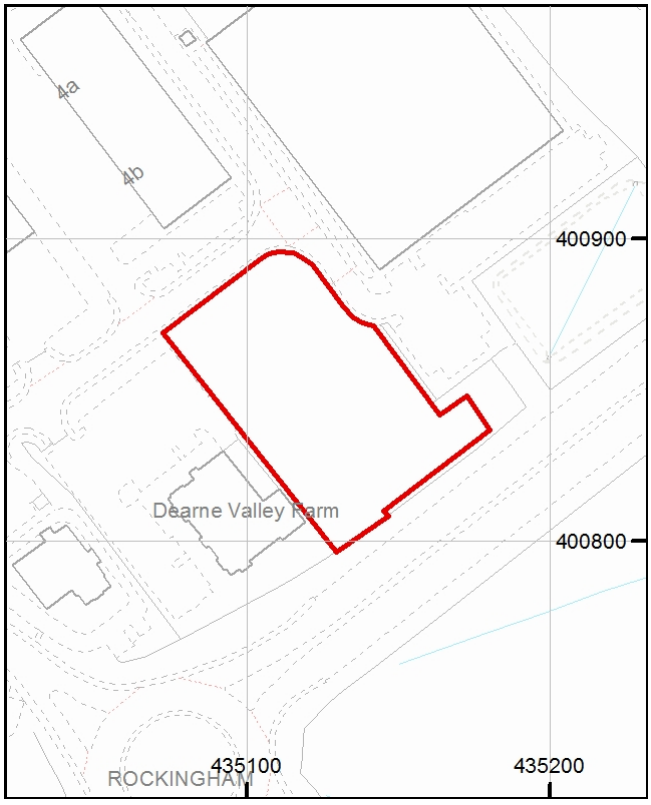
If you require any further assistance please contact our experts on:
0345 762 6848
groundstability@coal.gov.uk

The Law Society

Enquiry boundary

Key

Approximate position of enquiry boundary shown



We can confirm that the location is **on the coalfield**

Map data

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This report is prepared in accordance with the latest Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

Accessibility

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

Professional opinion

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed.

If you are looking to develop, or undertake works, within a coal mining development high risk area your Local Authority planning department may require a Coal Mining Risk Assessment to be undertaken by a qualified mining geologist or engineer. Should you require any additional information then please contact the Coal Authority on 0345 762 6848 or email cmra@coal.gov.uk.

Detailed findings

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL.

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1 Past underground coal mining

The property is in a surface area that could be affected by underground mining in 7 seams of coal at 140m to 340m depth, and last worked in 1962.

Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

In addition the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Professional opinion sections of the report.

2 Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3 Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4 Mine entries

There are no recorded coal mine entries known to the Coal Authority within, or within 20 metres, of the boundary of the property.

This information is based on the information that the Coal Authority has at the time of this enquiry.

Based on the Coal Authority's knowledge of the mining circumstances at the time of this enquiry, there may be unrecorded mine entries in the local area that do not appear on Coal Authority records.

5 Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6 Past opencast coal mining

The property is within the boundary of the Rockingham opencast site from which coal has been removed by opencast methods.

The property is within the boundary of an opencast site from which coal has been removed by opencast methods.

7 Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8 Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9 Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10 Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11 Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

12 Withdrawal of support

The property is in an area where a notice to withdraw support was given in 1950.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13 Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14 Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Statutory cover



Coal mining subsidence

In the unlikely event of any coal mining related subsidence damage, the Coal Authority or the mine operator has a duty to take remedial action in respect of subsidence caused by the withdrawal of support from land or property in connection with lawful coal mining operations.

When the works are the responsibility of the Coal Authority, our dedicated public safety and subsidence team will manage the claim. The house or land owner ("the owner") is covered for these works under the terms of the Coal Mining Subsidence Act 1991 (as amended by the Coal Industry Act 1994). Please note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

If you believe your land or property is suffering from coal mining subsidence damage and you need more information on what to do next, please use the following link to our website which sets out what your rights are and what you need to consider before making a claim.
www.gov.uk/government/publications/coal-mining-subsidence-damage-notice-form



Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call 01623 646 333. Further information can be found on our website: www.gov.uk/coalauthority.

Glossary

Key terms

adit - horizontal or sloped entrance to a mine

coal mining subsidence - ground movement caused by the removal of coal by underground mining

Coal Mining Subsidence Act 1991 - the Act setting out the duties of the Coal Authority to repair damage caused by coal mining subsidence

coal mining subsidence damage - damage to land, buildings or structures caused by the removal of coal by underground mining

coal seams - bed of coal of varying thickness

future opencast coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal from the surface

future underground coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal underground. Although it is unlikely, remaining coal reserves could create a possibility for future mining, which would be licensed by the Coal Authority

mine entries - collective name for shafts and adits

payments to owners of former copyhold land - historically, copyhold land gave rights to coal to the copyholder. Legislation was set up to allow others to work this coal, but they had to issue a notice and pay compensation if a copyholder came forward

shaft - vertical entry into a mine

site investigation - investigations of coal mining risks carried out with the Coal Authority's permission

stop notice - a delay to repairs because further coal mining subsidence damage may occur and it would be unwise to carry out permanent repairs

subsidence claim - a formal notice of subsidence damage to the Coal Authority since it was established on 31 October 1994

withdrawal of support - a historic notice informing landowners that the coal beneath their property was going to be worked

working facilities orders - a court order which gave permission, restricted or prevented coal mine workings

APPENDIX 3

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Borehole Log

Borehole No. **BH1**

Sheet 1 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: 630339.00 - 406294.00	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 08/07/2020 - 09/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.14	D		0.14			Grass and rushes over soft to firm, friable grey slightly silty slightly gravelly clay. Gravel is fine to coarse, subangular of mudstone, limestone and occasional fine coal. Frequent roots and rootlets. [Made Ground]
		0.14 - 0.32	D		0.32			Firm, friable brownish grey slightly silty clay. [Made Ground]
		0.14 - 0.32	ES		0.44			Firm, friable dark grey slightly sandy slightly gravelly clay. Sand is fine. Gravel is fine to coarse subangular to angular of mudstone, carbonaceous mudstone, and possible occasional coal. Occasional cobbles of subangular to angular mudstone [Made Ground]
		0.32 - 0.44	D					
		0.32 - 0.44	ES					
		0.44 - 0.60	B					
		0.44 - 0.60	D					
		0.60 - 1.00	ES					
		1.00		50 (25 for 95mm/50 for 105mm)				
		1.00 - 1.45	SPTL S		1.65			
		1.65 - 2.00	B		1.80			Firm, very friable light grey slightly silty slightly sandy gravelly clay. Sand is fine. Gravel is fine to coarse, subangular to angular of mudstone. Occasional cobbles of subangular to angular mudstone. Occasional boulders of mudstone. [Made Ground]. Sand component absent below 0.6m bgl.
		1.80		50 (25 for 85mm/50 for 125mm)				
		1.80 - 2.25	D		2.25			
		1.80 - 2.25	SPTL S					
		2.25 - 2.50	B					
		2.50 - 3.00	D					
		2.50 - 3.00	ES					
		3.20 - 3.50	D		3.20			Light grey slightly silty gravel. Gravel is fine to coarse, angular to subangular of mudstone. Frequent cobbles of angular to subangular mudstone [Made Ground]
		3.50		N=24 (4,4/4,5,6,9)	3.50			
		3.50 - 3.90	B					Light grey slightly sandy clayey gravel. Sand is fine. Gravel is fine to coarse, angular to subangular of mudstone and rare ironstone. [Made Ground]
		3.50 - 3.95	SPTL S					
		4.00 - 4.30	D					
		4.30		N=24 (3,4/4,7,6,7)				Stiff, friable dark grey/black gravelly clay. Gravel is fine to coarse, angular of carbonaceous mudstone and coal. Rare angular brick in upper 0.25m . [Made Ground]
		4.30 - 4.75	SPTL S					
		4.30 - 5.30	D					
		5.30		N=40 (5,7/7,10,11,12)	5.30			Stiff, friable grey slightly silty gravelly clay. Gravel is medium to coarse, subangular of ironstone, mudstone and occasional carbonaceous mudstone. Frequent cobbles of subangular mudstone and ironstone [Made Ground]
		5.30 - 5.75	SPTL S					
▼		5.30 - 6.30	B					Firm to stiff, friable dark grey/black slightly sandy slightly gravelly clay. Sand is fine, gravel is fine to medium, angular of mudstone, ironstone, carbonaceous mudstone and rare brick and coal. [Made Ground] Pocket of light grey gravelly fine sand from 3.9m to 4.0m. Gravel is fine to medium, angular of mudstone.
		5.30 - 6.30	D					
		7.00 - 7.50	D					Firm to stiff, dark grey slightly silty gravelly clay. Gravel is fine to coarse, angular to subrounded of mudstone, carbonaceous mudstone, coal and occasional ironstone. [Made Ground] Very stiff from 6.3m bgl.
		7.80		N=23 (4,4/4,4,6,9)				
		7.80 - 8.25	SPTL S					
		8.50 - 9.00	D					
		9.30		50 (4,5/50 for 20mm)	9.30			
		9.30 - 9.75	SPTL S					Very weak, light grey mottled dark grey MUDSTONE. Extremely closely bedded. Medium spaced subhorizontal (ca 5°) rough discontinuities. No

Continued on next sheet

Remarks

BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.6m bgl (Ground Density).
Dynamic Sampling to 4.3m. Rotary Coring to 12.3m. Rotary open hole coring to 30.0m.
Groundwater strikes at 5.99m and 24.5m bgl.

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Borehole Log

Borehole No. **BH1**
Sheet 2 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: -	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 08/07/2020 - 09/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								obvious partings. Possible bioturbation noted in upper 1m.
		10.55 - 10.75	C		10.50			Weak to medium strong, light grey MUDSTONE. No visible bedding. Very closely spaced subhorizontal (ca. 0-5°) and diagonal (ca. 45°) discontinuities from 10.8m.
					11.50			Medium strong light grey MUDSTONE. No visible bedding. Very closely spaced subhorizontal discontinuities. No obvious partings.
		12.03 - 12.30	C		12.30			Light grey MUDSTONE. Recovered as medium light grey angular gravel.

Continued on next sheet

Remarks
BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.6m bgl (Ground Density).
Dynamic Sampling to 4.3m. Rotary Coring to 12.3m. Rotary open hole coring to 30.0m.
Groundwater strikes at 5.99m and 24.5m bgl.

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Borehole Log

Borehole No.
BH1
Sheet 3 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: -	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 08/07/2020 - 09/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼				30.00			End of borehole at 30.00 m

21 22 23 24 25 26 27 28 29 30

Remarks
BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.6m bgl (Ground Density).
Dynamic Sampling to 4.3m. Rotary Coring to 12.3m. Rotary open hole coring to 30.0m.
Groundwater strikes at 5.99m and 24.5m bgl.

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Borehole Log

Borehole No. **BH2**

Sheet 1 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: 630326.00 - 406331.00	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 09/07/2020 - 09/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.40	B					Grass and rushes over soft, friable grey slightly silty gravelly clay. Gravel is fine to coarse, angular to subangular of mudstone and occasional sandstone and carbonaceous mudstone. Frequent cobbles of angular to subangular mudstone. [Made Ground] Occasional boulders of mudstone.
		0.00 - 0.40	D					
		0.00 - 0.40	ES		0.40			
		0.40 - 0.52	B					
		0.40 - 0.52	D					
		0.40 - 0.52	ES					
		0.80 - 1.00	ES					
		1.00		N=17 (3,3/4,4,4,5)				
		1.00 - 1.45	B					Firm, friable grey/light grey slightly silty gravelly clay. Gravel is fine to coarse, angular to subangular of mudstone, carbonaceous mudstone, rare ironstone and coal. [Made Ground] Firm to stiff from 0.52m bgl.
		1.00 - 1.45	SPTL S		1.45			
		1.60 - 2.00	D		1.60			
		2.00		N=16 (1,2/3,3,4,6)				
		2.00 - 2.40	ES					
		2.00 - 2.45	SPTL S		2.40			Mudstone boulder recovered as coarse dark grey angular gravel and cobbles. [Made Ground]
		2.40 - 3.00	B					Soft, grey slightly silty slightly sandy gravelly clay. Sand is fine. Gravel is fine to coarse, angular of mudstone and carbonaceous mudstone. [Made Ground] Wet.
		3.00		N=23 (3,4/4,5,5,9)	3.00			
		3.00 - 3.20	D					
		3.00 - 3.45	SPTL S					
		3.20 - 4.00	B					Firm to stiff, friable grey slightly silty gravelly clay. Gravel is fine to coarse, angular to subangular of mudstone sandstone and rare ironstone. [Made Ground]
		4.00		N=19 (2,2/2,3,5,9)				Firm to stiff, friable grey slightly silty slightly sandy gravelly clay. Sand is fine. Gravel is fine to coarse, angular of mudstone, rare ironstone and carbonaceous mudstone. [Made Ground] Cobbly from 4.0m Cobbles are angular of mudstone.
		4.00 - 4.45	SPTL S					
		4.60 - 5.00	D		4.60			
		5.00 - 5.45	SPTL S					Firm, friable dark grey/black slightly silty gravelly clay. Gravel is fine to coarse, angular of mudstone, sandstone and coal. [Made Ground] Rare brick from 6.4m bgl.
	▼	5.00 - 6.00	B					
		6.00		N=16 (2,4/3,4,4,5)				
		6.00 - 6.20	D					
		6.00 - 6.45	SPTL S					
		6.20 - 7.00	B					
		7.00		N=16 (2,3/3,3,3,7)				
		7.00 - 7.45	SPTL S					
		7.20 - 7.60	B					
		7.60 - 7.80	D		7.60			
		7.80 - 8.60	B					Stiff, friable dark grey/black slightly silty slightly gravelly clay. Gravel is fine to coarse, angular to subrounded of mudstone, carbonaceous mudstone, rare ironstone, coal and brick.
		8.60		N=45 (2,5/11,13,11,10)	8.60			Stiff, friable dark grey/black slightly silty slightly sandy slightly gravelly clay. Sand is fine to medium. Gravel is fine to coarse, angular to rounded of mudstone, carbonaceous mudstone, rare ironstone, coal, brick. and quartzite. [Made Ground]
		8.60 - 9.05	SPTL S					
		8.80	D					
		8.80 - 10.10	B					

Continued on next sheet

Remarks

BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.52m bgl (Ground Density).
Dynamic Sampling to 7.6m. Rotary Coring to 14.1.0m. Rotary open hole coring to 30.0m.
Groundwater strike at 5.4m bgl.

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Borehole Log

Borehole No. **BH2**
Sheet 2 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: -	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 09/07/2020 - 09/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.10		N=0 (1,0/0,0,0,0)	10.10			Dark grey/black gravel. Gravel is coarse, angular to subangular of mudstone, sandstone and possible anthracite. Cobbles are angular to subangular of mudstone and possible anthracite. [Made Ground]
		10.10 - 10.30	D		10.30			
		10.30 - 10.50	D		10.50			
		10.50 - 11.00	D					
		11.10		50 (2,13/50 for 125mm)	11.10			Stiff, friable dark grey/black slightly silty slightly sandy slightly gravelly clay. Sand is fine to medium. Gravel is fine to coarse, angular to rounded of mudstone, carbonaceous mudstone, rare ironstone and coal. [Made Ground]
		11.10 - 11.55	SPTL S		11.50			
		12.03 - 12.23	C		12.20			Stiff, light grey slightly sandy gravelly clay. Gravel is fine to coarse, angular to subangular of mudstone and rare ironstone and coal. [Made Ground]
								Extremely weak light grey MUDSTONE. Recovered as coarse angular gravel between 11.1m - 11.2m and 11.4m-11.5m. [Destructured /completely weathered bedrock]
								Very weak light grey MUDSTONE. Extremely closely, horizontally bedded. Very closely spaced subhorizontal (0-5°) discontinuities. No obvious partings. Bedding absent 11.7-11.9m. Recovered as coarse, angular gravel of mudstone between 11.85m and 11.9m bgl. Diagonal (ca. 45°) discontinuity at 12.1m
		13.56 - 13.87	C		14.10			Medium strong light grey MUDSTONE. No obvious bedding. Very closely spaced diagonal (ca. 45°) discontinuities between 12.35m and 12.5m. No obvious partings. Occasional organic inclusions (horizontal veins of organic material) at 11.45m Very closely spaced subhorizontal discontinuities from 12.8m. Coarse angular gravel adjacent discontinuities at 12.8m and 13.05m bgl. Iron staining of discontinuities from 13.46m.
								Light grey MUDSTONE. Recovered as medium light grey angular gravel.

Continued on next sheet

Remarks
BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.52m bgl (Ground Density).
Dynamic Sampling to 7.6m. Rotary Coring to 14.1.0m. Rotary open hole coring to 30.0m.
Groundwater strike at 5.4m bgl.

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Borehole Log

Borehole No.
BH2
Sheet 3 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: -	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 09/07/2020 - 09/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					30.00			End of borehole at 30.00 m

21
22
23
24
25
26
27
28
29
30

Remarks
BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.52m bgl (Ground Density).
Dynamic Sampling to 7.6m. Rotary Coring to 14.1.0m. Rotary open hole coring to 30.0m.
Groundwater strike at 5.4m bgl.

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Borehole Log

Borehole No. **BH3**

Sheet 1 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: 630372.00 - 406340.00	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 10/07/2020 - 13/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.38	B					Grass and shrubs over firm, friable brownish grey slightly silty slightly sandy gravelly clay. Sand is fine to medium. Gravel is fine to coarse., angular to subangular of mudstone, carbonaceous mudstone, and rare coal and ironstone. Frequent cobbles of subangular mudstone and ironstone. [Made Ground]
		0.00 - 0.38	D					
		0.00 - 0.38	ES		0.38			
		0.38 - 0.83	B					
		0.38 - 0.83	D					
		0.38 - 0.83	ES					
		1.00		N=28 (14,6/7,6,7,8)	1.00			
		1.00 - 1.45	SPTLS					Firm, friable slightly silty slightly sandy gravelly clay. Sand is fine. Gravel is fine to coarse, subangular to angular of mudstone, rare carbonaceous mudstone, brick and concrete. Frequent cobbles of subangular to angular mudstone. [Made Ground]
		1.30 - 1.70	ES		1.30			
		1.70 - 2.00	D		1.70			
		2.00		N=22 (4,4/4,5,6,7)	2.00			Boulder of mudstone recovered as light grey subangular cobbles.
		2.00 - 2.45	SPTLS					Stiff, friable greyish brown slightly silty slightly sandy gravelly clay. Sand is fine. Gravel is fine to coarse, angular to subangular of mudstone, sandstone and rare coal. [Made Ground]
		2.00 - 2.50	D		2.50			
		2.50 - 3.00	ES					
		3.00		N=28 (1,5/6,7,7,8)	3.00			Stiff, friable light grey slightly silty gravelly clay. Gravel is fine to coarse, angular to subangular of mudstone. [Made Ground]
		3.00 - 3.45	SPTLS					Soft, grey slightly silty slightly sandy clay. Sand is fine [Made Ground] Wet
		3.00 - 4.00	D					
		4.00		N=26 (2,3/4,5,7,10)				Stiff, grey slightly silty gravelly clay. Gravel is fine to coarse, angular to subangular of mudstone.
		4.00 - 4.45	SPTLS					Stiff, friable, grey/light grey slightly silty gravelly clay. Gravel is fine to coarse, angular to subangular of mudstone, ironstone and rare carbonaceous mudstone. [Made Ground] Cobbly from 4.5m. Cobbles are subangular to angular of mudstone.
		4.00 - 5.00	B					
	▼	5.00		N=39 (2,5/9,8,8,14)	5.00			Rare coal, recovered as coarse, angular gravel from 4.5m.
		5.00 - 5.45	SPTLS					
		5.00 - 5.75	D					Grey, slightly clayey slightly silty gravel. Gravel is medium to coarse. Gravel is angular to subangular of mudstone and occasional carbonaceous mudstone. Occasional cobbles of angular to subangular mudstone. [Made Ground]
		5.75 - 6.30	D		5.75			
		6.50		N=37 (10,4/7,8,9,13)				Stiff, friable grey slightly silty gravelly clay. Gravel is fine to coarse, angular to subangular of mudstone. [Made Ground][Limited recovery.
		6.50 - 6.95	SPTLS					
					7.10			Very stiff, friable black slightly silty, gravelly clay. Gravel is fine to coarse, subangular to angular of coal, mudstone, carbonaceous mudstone, rare possible anthracite and rare brick. Frequent cobbles of subangular to angular mudstone. [Made Ground]
		7.70 - 8.00	B					
		8.00		N=34 (3,4/7,8,8,11)	8.00			Dark grey/black gravel. Gravel is coarse, subangular of mudstone and possible anthracite. Frequent cobbles of subangular mudstone and possible anthracite. [Made Ground]
		8.00 - 8.45	SPTLS		8.20			
		8.20 - 8.40	D					
		8.40 - 9.50	B					Dark grey/black slightly sandy gravelly clay. Sand is fine to medium. Gravel is fine to coarse, angular to subrounded of mudstone, carbonaceous mudstone and occasional coal. Occasional cobbles of angular to subrounded mudstone. [Made Ground]
		9.50		50 (4,17/50 for 20mm)	9.50			Extremely weak grey/light grey MUDSTONE. Bedding not visible. Very closely to closely spaced horizontal to 20°
		9.50 - 9.95	SPTLS					
								Continued on next sheet

Remarks

BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.83m bgl (Ground Density).
Dynamic Sampling to 3.0m. Rotary Coring to 9.5m. Rotary open hole coring to 30.0m.
Groundwater strike at 5.0m rising to 2.93m bgl.

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Borehole Log

Borehole No. **BH3**

Sheet 2 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: -	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 10/07/2020 - 13/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.75 - 10.95	C		10.85			rough discontinuities. No visible partings. Very weak from 9.7m bgl. Rough, undulating subhorizontal discontinuity at 9.9m Weak from 10.4m bgl. Very closely spaced subhorizontal to diagonal (0-45°) discontinuities from 10.4m bgl.
		11.10 - 11.33	C					Medium strong grey/light grey MUDSTONE. No visible bedding. Very closely spaced rough subhorizontal to 20° discontinuities with no partings from 12.4m bgl. Sub-vertical fracture/discontinuity between 11.7m and 12.5m bgl.
					12.50			Light grey MUDSTONE. Recovered as medium light grey angular gravel.

Continued on next sheet

Remarks

BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.83m bgl (Ground Density).
Dynamic Sampling to 3.0m. Rotary Coring to 9.5m. Rotary open hole coring to 30.0m.
Groundwater strike at 5.0m rising to 2.93m bgl.

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Borehole Log

Borehole No.
BH3
Sheet 3 of 3

Project Name: Dearne Valley Parkway	Project No. 2023-20	Co-ords: -	Hole Type BH
Location: Dearne Valley, Barnsley		Level:	Scale 1:50
Client: Glanville		Dates: 10/07/2020 - 13/07/2020	Logged By SW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					30.00			End of borehole at 30.00 m

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Remarks
BH Terminated at 30.0m bgl. Hand Excavated Pit to 0.83m bgl (Ground Density).
Dynamic Sampling to 3.0m. Rotary Coring to 9.5m. Rotary open hole coring to 30.0m.
Groundwater strike at 5.0m rising to 2.93m bgl.