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Coal Mining Risk Assessment

**Foxhall Environmental
Owler Lane
Birstall, West Yorkshire
WF17 9BW**

Date: 7th May 2025

Version 1

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EnviroSolution Ltd
Document Verification

Site Address	Foxhall Environmental, Owler Lane, Birstall, WF17 9BW		
Report Title	Coal Mining Risk Assessment		
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1 Introduction

1.1 Site Location and Description

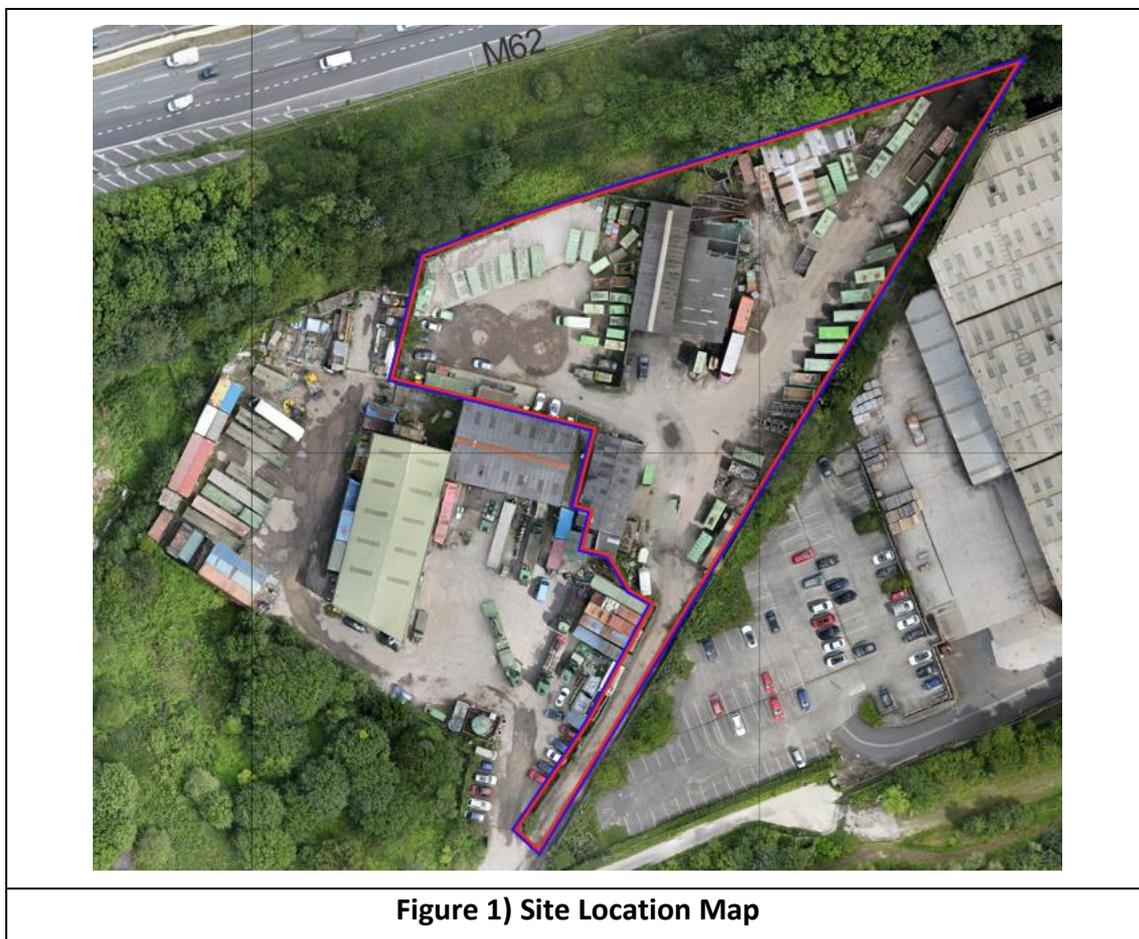
The site for the proposed development is located at Foxhall Environmental, Owler Lane, Birstall, WF17 9BW. The British National Grid Reference for the approximate site centre is GR: 422785 427625.

The site is irregular in shape and covers an approximate area of 6,200 square metres. It is currently occupied by an agricultural type shed and is used as a waste transfer station and storage yard.

The site is bounded by the M62 motorway to the north and commercial units to the west and east.

The site lies at an approximate mean elevation of 182m aOD.

A plan showing the location of the site is presented in **Figure 1**.



1.2 Development Proposal

It is understood that the development plans include the demolition of the existing agricultural building and the construction of 3 no. light industrial buildings for office/ open storage.

The development plans are included in **Figure 3** in **Appendix A**.

1.3 Scope of Coal Mining Risk Assessment

EnviroSolution Ltd (ES) has been commissioned to prepare a Coal Mining Risk Assessment Report (CMRA) for the proposed development site, in order to provide the Local Planning Authority with information on the coal mining legacy risk(s), an assessment of their potential impact on land stability, and recommendations for the need to carry out any further investigations (including intrusive boreholes if necessary) to address these risk(s).

The CMRA has been undertaken in accordance with the principles of best practice including the Coal Authority's guidance document "Risk Based Approach to Development Management - Resources for Developers Version 3" (2014) (Ref. 1), CIRIA "SP32 Construction over Abandoned Mine Workings" (2002) (Ref. 2) and CIRIA "C758D Abandoned Mine Workings Manual" (2019) (Ref. 3), CIRIA, Publication C665, Assessing risks posed by hazardous ground gases to buildings (Ref. 4) and CL:AIRE "Good Practice for Risk Assessment for Coal Mine Gas Emissions", October 2021 (Ref. 5).

The purpose of the CMRA Report is to:

- present a desk-based review of available information on the coal mining issues that are relevant to the application site;
- use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact issues;
- set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development; and
- demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of National Planning Policy with regard to development on unstable land.

1.4 Sources of Information

This report is based on current information of past mining activities relevant to the site. The following information sources have been used:

- Consultants Coal Mining Report dated 15th April 2025 (Ref: 51003492097001 **Appendix B**);
- BGS Geoindex geological map;
- BGS geological 1:50,000 England and Wales Sheet 77 Huddersfield;
- Geology of the Huddersfield district. Sheet description of the British Geological Survey 1:50 000 Series Sheet 77 and Huddersfield (England and Wales). 2005;
- Mining Remediation Authority Map Viewer;
- Historical Ordnance Survey maps.

2 Environmental Setting

2.1 Historic Coal Mining Activity

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area are summarised in Table 1. Copies of the historical OS maps are included in **Appendix D**.

Table 1 - Historic Mapping Review

Date	Scale	Historic Mining Activity
1850-1851	1:10,560	<ul style="list-style-type: none"> - The site is undeveloped and lies within an agricultural field. - Sandstone quarries located 520m southwest, 590m south. - Birstal Colliery located 630m south of the site. - Coal pits located 350m northwest, 640m east, 900m southeast.
1888	1:10,560	<ul style="list-style-type: none"> - Coal pits labelled as old. - Old coal pit located 530m southeast. - Old Colliery located 890m east. - Colliery located 830m southeast.
1904-1905	1:10,560	- No significant change.
1930	1:10,560	<ul style="list-style-type: none"> - Coal drift approximately 200m southeast. - Gregory Spring Colliery approximately 300m west.
1938	1:10,560	- Building of unknown use intersects the site.
1948	1:10,560	- No significant change.

An important feature has been the construction of the M62 carriageway along the northern boundary of the site which took place around the 1970s. This had a significant influence on the road structure in the area. Probably the most significant local feature has been the construction of the very large IKEA store to the immediate east.

2.2 Geological Context

The BGS geological mapping (Geindex and BGS Sheet 77 Huddersfield) show that superficial strata are absent at the site.

The records show that the site is directly underlain by bedrock consisting of the Emley Rock Member (sandstone facies) of the Pennine Lower Coal Measures Formation, which is of Carboniferous age. The Pennine Lower Coal Measures Formation generally consists of interbedded grey mudstones and siltstones with pale grey sandstones and coal seams, some of which have been economically viable. According to the BGS, the bedrock has a local dip of about 2° towards the southeast – **See Appendix D**. The sub-crop of these strata at low dip angles can be affected significantly by steep variations in ground topography.

Information of recorded underground workings around the site obtained from the Mining Remediation Authority interactive map confirms the dip of the bedrock mentioned above.

The nearest geological fault is located 260m southwest of the site. The fault has an approximate trend of 135° (Whole Circle Bearing) and downthrows to the southwest.

Named coal seams expected to be present beneath the site include the Flockton Thin Coal in which the outcrop position reflects the change in topography along the motorway bank.

The BGS Geology of the Huddersfield district: A brief explanation of geological map Sheet 77 states:

“The Flockton Thin Coal has been mined extensively underground throughout the district and was extracted by opencast workings in the south around Flockton, Thornhill Lees and Thornhill Edge and in the north at Gildersome Street.

The Flockton Thin Coal is generally overlain by fissile mudstone with nonmarine bivalves, but around Drighlington in the north and around Emley in the south, it is overlain directly by the Emley Rock, which forms much of the interval below the Flockton Thick Coal. Over the entire district north of Flockton, the uppermost bed of this coal is a waxy cannel coal that was formerly important for its gas and oil content. The main seam was extracted from opencast workings along much of the outcrop south of the Calder, between Thornhill Lees, Thornhill Edge, Flockton and Emley. North of the Calder opencast sites are limited to Gildersome Street and Upper Batley”.

Two BGS borehole records (SE22NW125 and SE22NW126), located approximately 30m north of the site have been obtained from the BGS online records.

- Borehole SE22NW125 shows 2m of firm to stiff clay overlying interbedded sandstone, coal and siltstone. A probable coal seam and probable old workings were noted at a depth of between 6.0m and 6.70m bgl.
- Borehole SE22NW126 shows 2.10m of firm grey clay overlying interbedded sandstone, coal and siltstone. Probable old workings were noted at a depth of between 5.60m and 6.80m bgl.

The location of the boreholes is shown in **Figure 2**.

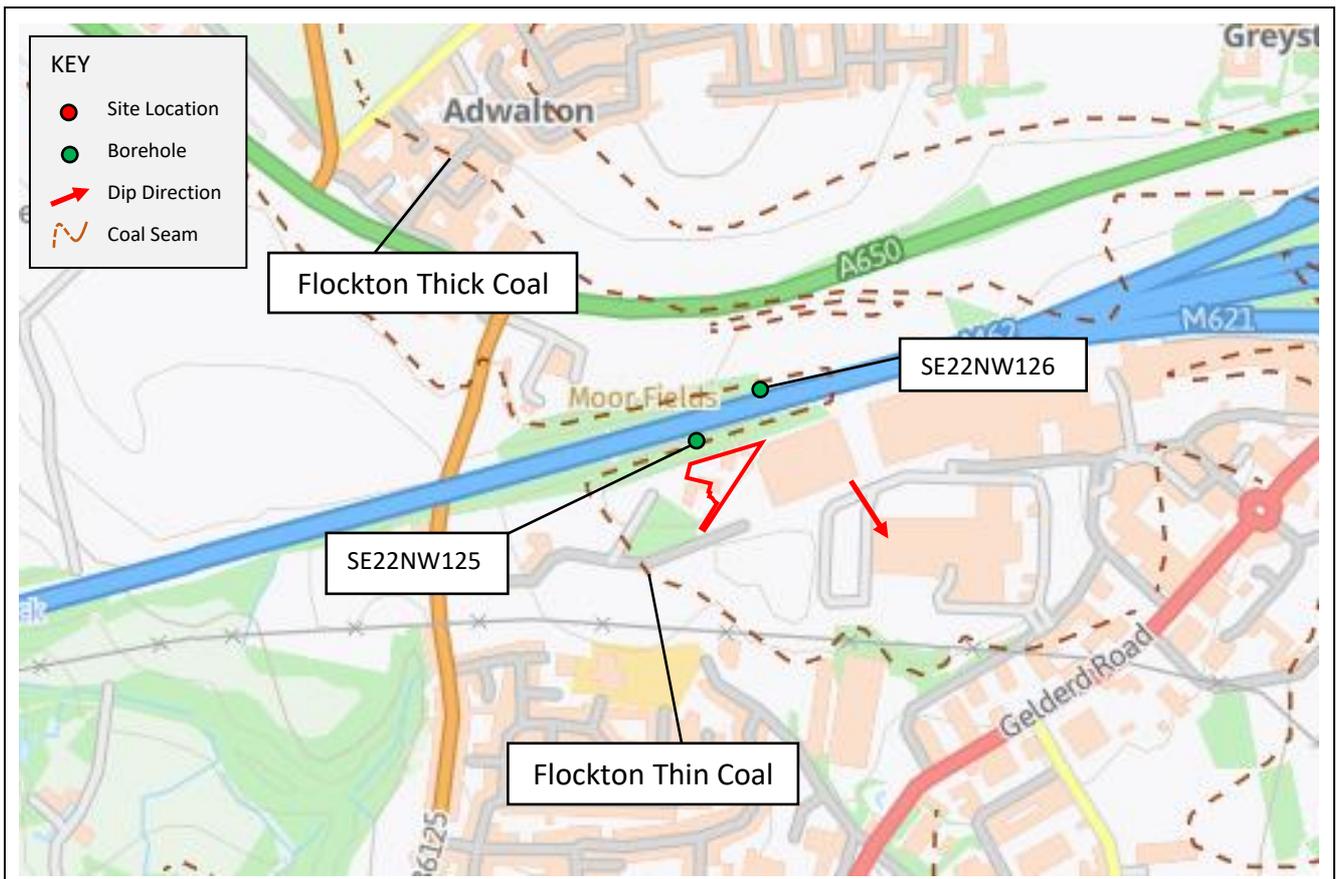


Figure 2) Coal Seam Location Map (Mining Remediation Authority Map Viewer)

The site is situated within a Primary Opencast Coal Resource Area (**Appendix F**). The Primary Opencast Coal Resource Area is defined by the BGS as “an area that constitutes the main target for opencast coal extraction and comprises a relatively closely spaced succession of variable but generally thick coals. Notwithstanding this, it is considered to be very unlikely that there will be any interest in developing open cast coal mining operations at this location in the short or medium-term.

It is also noted that there is an extant notice ‘to withdraw support’ for the site – see Consultants Mining Report in **Appendix B**, which shows that there remain significant mineral resources beneath the site.

Notwithstanding this, it is considered to be very unlikely that there will be any interest in developing open cast coal or underground mining operations at this location in the short or medium-term.

3 Identification and Assessment of Site-Specific Coal Mining Risks

Table 2 below summarises the potential risks associated with coal mining legacy for the proposed development site, which have been identified from list sources of information.

Table 2 - Coal Mining Hazards Summary

Coal Mining Issues	Yes	No
Coal outcrops	X	
Underground coal mining (recorded at shallow depths)		X
Underground coal mining (probable at shallow depths)	X	
Recorded mine entries (shafts and adits)	X	
Unrecorded mine entries (shafts and adits)	X	
Coal mining geology (fissures)		X
Record of past gas emissions		X
Recorded coal mining surface hazard		X
Surface mining (opencast workings)		X
License to withdraw support	X	

The Mining Remediation Authority Map Viewer (**Appendix G**) has identified that the site lies within a Development High Risk Area associated with the potential presence of a shallow unrecorded mine workings beneath the site.

The report obtained from the Mining Remediation Authority revealed that the site is in a surface area that is affected by recorded underground mining workings in 2 no. seams of coal at 3 no. levels at depths of between 166m and 252m bgl. The coal was last worked in 1941.

The Flockton Thin Coal, which was widely worked in the district (Ref. 6), is expected to be present directly beneath the site. Local borehole records drilled for the construction of the motorway record some evidence of underground workings at shallow depth, thought to be working the Flockton Thin Coal.

Using the generally accepted 'rule-of-thumb' guidance that a competent rock strata thickness equivalent to at least ten times the extraction thickness provides adequate protection against crown - hole development and surface instability (Refs. 2 and 3), the potential shallow mine workings may present a risk of surface instability.

The Mining Remediation Authority report states that they are aware of a single recorded mine entry within 100m of the development site boundary. Shaft 422427-012 is located approximately 17m southeast of the site boundary (access road) but 54m from the proposed buildings (see **Figure 3**). The area of influence around the shaft will not intersect the site boundary.

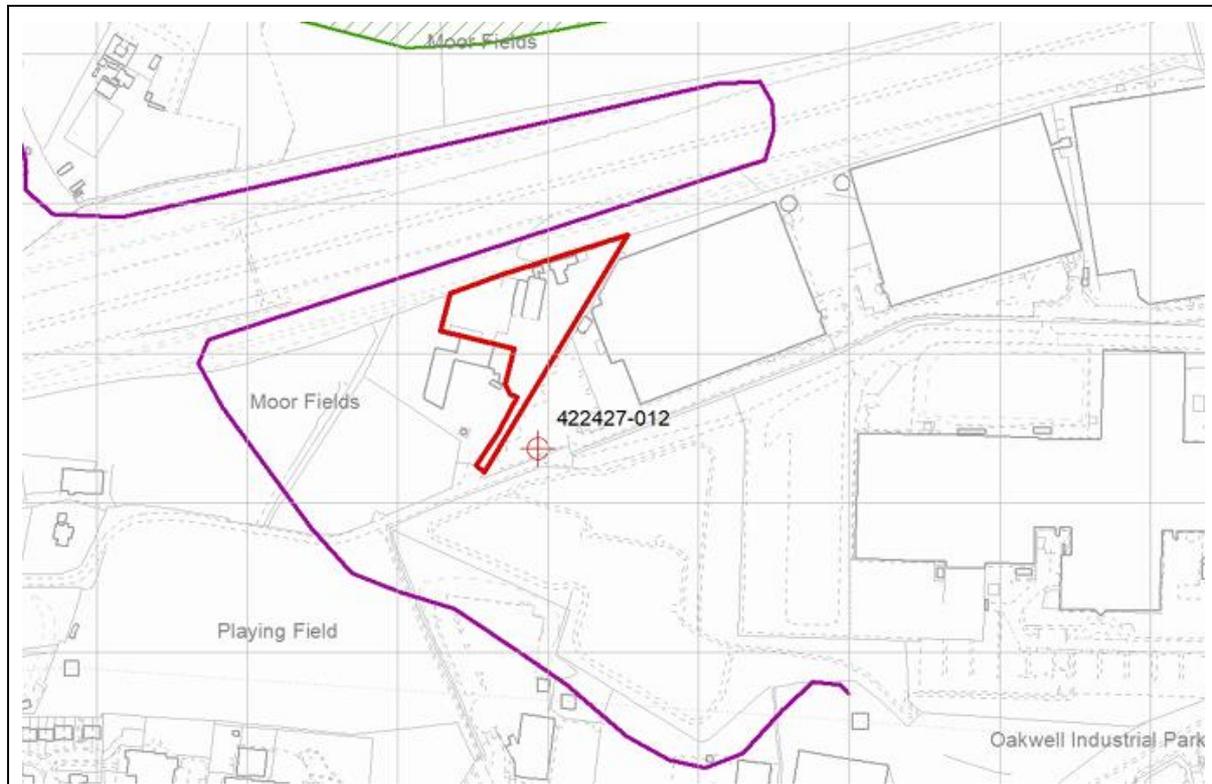


Figure 3) Mine Entry Location Plan

The Mining Remediation Authority report states the property is not within the boundary of a historic or current opencast site, and there are no license requests outstanding to remove coal via this method in the future. The risk posed to the site from opencast mining methods is therefore considered to be negligible.

There are no recorded past mining gas emissions recorded in the surrounding area, however, coal seams and coal mine workings pose a potential gas risk which should be considered in any future investigations and development.

4 Proposed Mitigation Strategy

- It is recommended that a minimum of 4 no. rotary boreholes are advanced to a minimum depth of 30m below ground level. Water flush should be used to safeguard against oxidation and potential spontaneous combustion of shallow coal. In order to undertake these works it will be necessary to obtain a drilling permit from The Coal Authority.
- The possibility of unrecorded mine workings has been highlighted in the Mining Remediation Authority report. Historical maps do not show evidence of shafts within the site boundary. It is considered that this potential risk can be dealt with through vigilance during the earthworks stage of construction.

5 Conclusions

The Coal Mining Risk Assessment for the site at Foxhall Environmental has concluded that the potential risk associated with coal mining related issues cannot be ruled out based on information from the Coal Authority and geological interpretation.

The principal risks to the development arise from:

- The potential presence of unrecorded workings associated with coal seams of workable thickness that are expected to be present beneath the site area at shallow depth; Evidence of these has been shown by historic borehole records. There is also anecdotal evidence that the full IKEA footprint was treated by shallow drill and grout works.
- unrecorded mine entries.

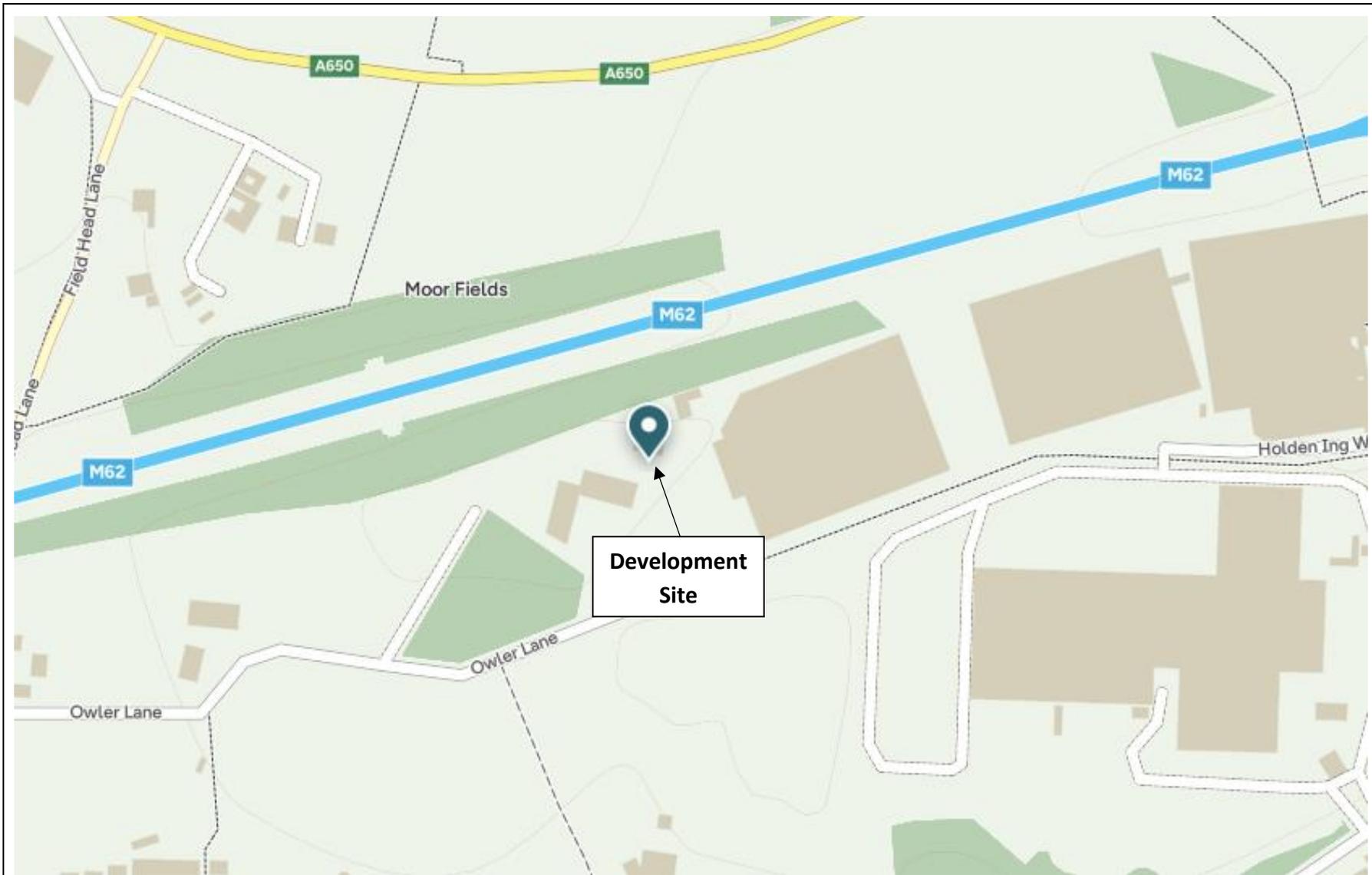
It is therefore recommended that further intrusive ground investigations are undertaken. These might include the drilling of at least 4 no. rotary probe boreholes to a minimum depth of 30m bgl, located close to the proposed development to determine the superficial thickness along with obtaining evidence of potential unrecorded coal mine workings.

Prior to the commencement of intrusive works, a Coal Authority Permit will be required for drilling activities, that will disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits). The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the intrusive works.

6 References

1. Coal Authority, 2014, Risk Based Approach to Development Management Resources for Developers, Version 3.
2. CIRIA, 2002, SP32 Construction over Abandoned Mine Workings.
3. CIRIA, 2019, C758D Abandoned Mine Workings Manual.
4. CIRIA, Publication C665, Assessing risks posed by hazardous ground gases to buildings.
5. CL:AIRE, 2021, Good Practice for Risk Assessment for Coal Mine Gas Emissions.
6. Geology of the Huddersfield district. Sheet description of the British Geological Survey 1:50 000 Series Sheet 77 and Huddersfield (England and Wales). 2005.

Appendix A – Site Location



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Site Location Map



Key

- Ownership Boundary 
- Limit of Proposed Development 
- Existing Concrete hardstanding 

Revision	Date	Change
Rev 1	xx/xx/xx	XXXX

Client
Foxhall Environmental

Plan Title
Existing Site Layout

Plan No.
FOX/BIR/IND/PL/02

Drawn M Leivers	Date Sep 2024	
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M62



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Proposed Site Plan

Appendix B – Coal Authority Report



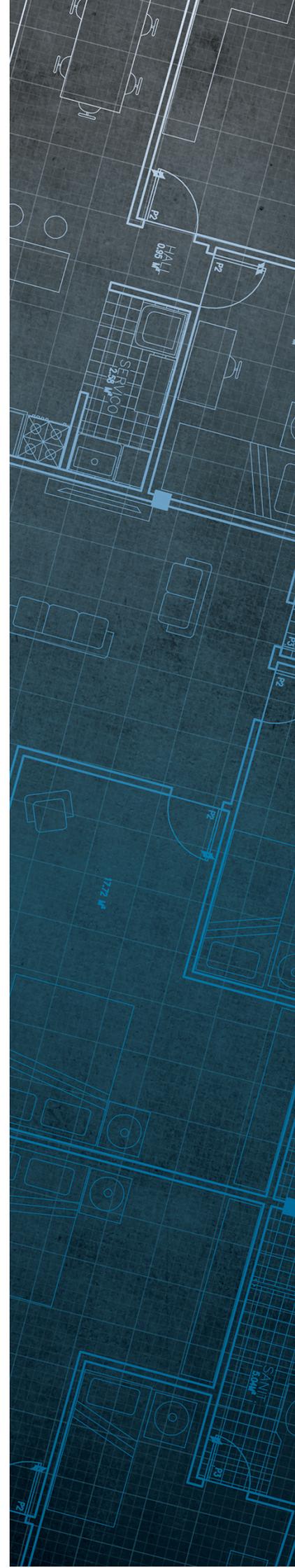
The Coal
Authority

Consultants Coal Mining Report

Foxhall Owler Lane
West Yorkshire

Date of enquiry: 15 April 2025
Date enquiry received: 15 April 2025
Issue date: 15 April 2025

Our reference: 51003492097001
Your reference: GS-IWW-7NG-PLB-A2E



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

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NG18 4RG

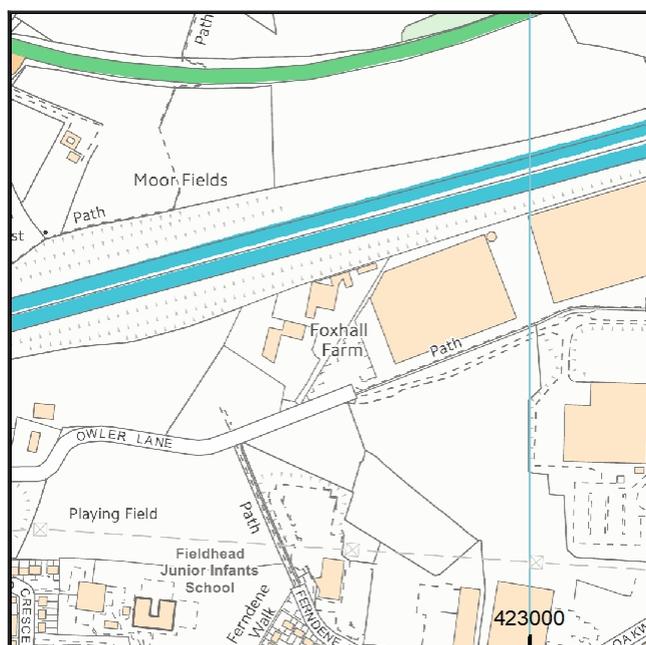
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	WHINMOOR	Coal	6NLC	166	South-East	2.8	East	69	1934
unnamed	WHINMOOR	Coal	6NKC	182	North-West	2.2	South-East	71	1941
unnamed	BLACK BED	Coal	6NNC	252	Beneath Property	1.1	South-East	61	1905

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	422427-012	422794 427536	was capped by developers in May 1992.	Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

CT1	FGB923	FGB945
FGB935	PO0	FGB948
FGB949	CT2	FGB929

Our records show we have more plans than those shown above which could affect the enquiry boundary.

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
FLOCKTON THIN	Coal	Yes	19.0	North	251

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

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.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

The property is in an area where a notice to withdraw support was given in 1946.

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.

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.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

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.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. 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. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

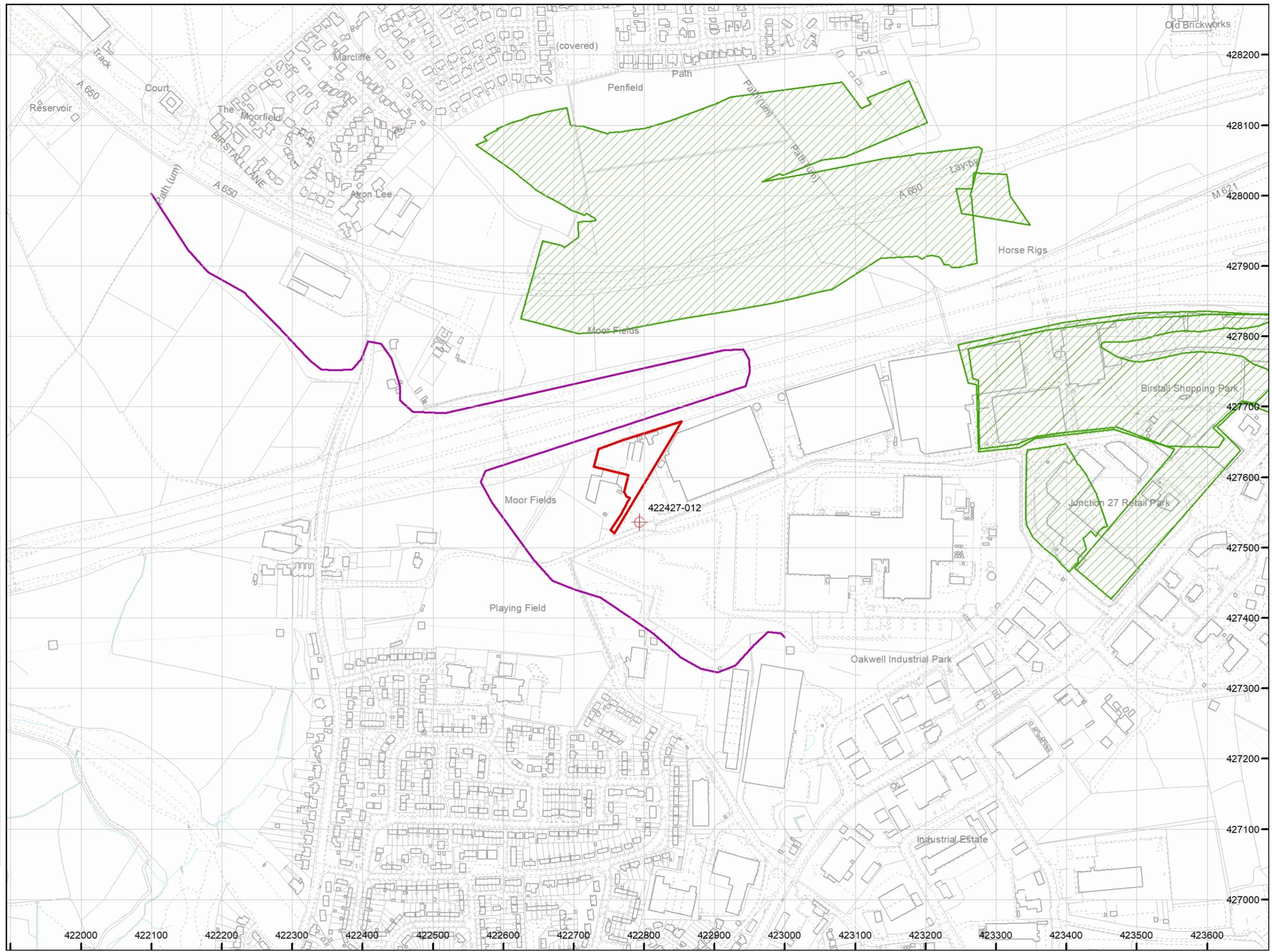
Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

- Approximate position of the enquiry boundary shown 
- Disused mine shaft 
- Outcrop (Proven) 
- Unlicensed opencast site 



How to contact us
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www.groundstability.com

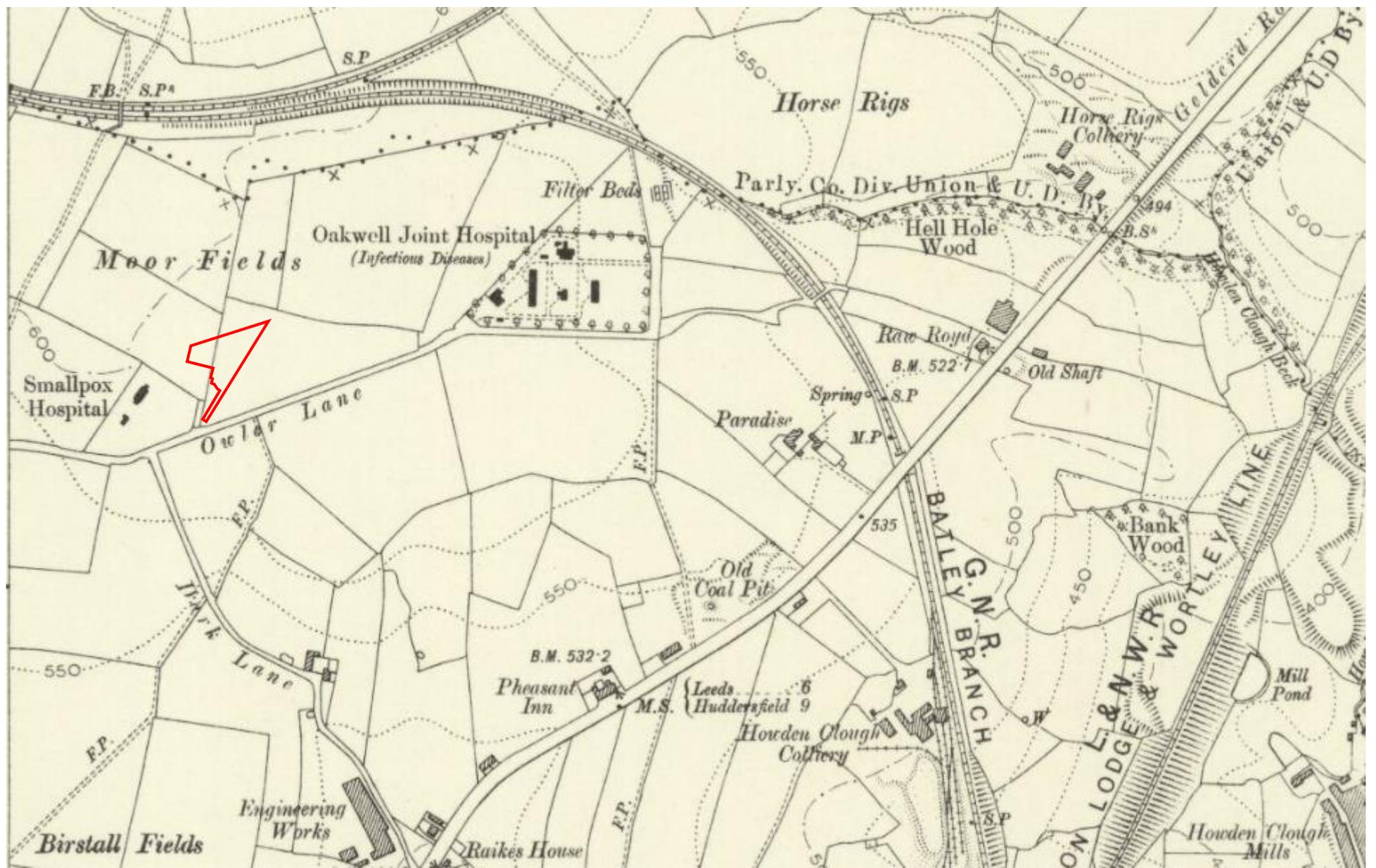
Appendix C – Historic Maps



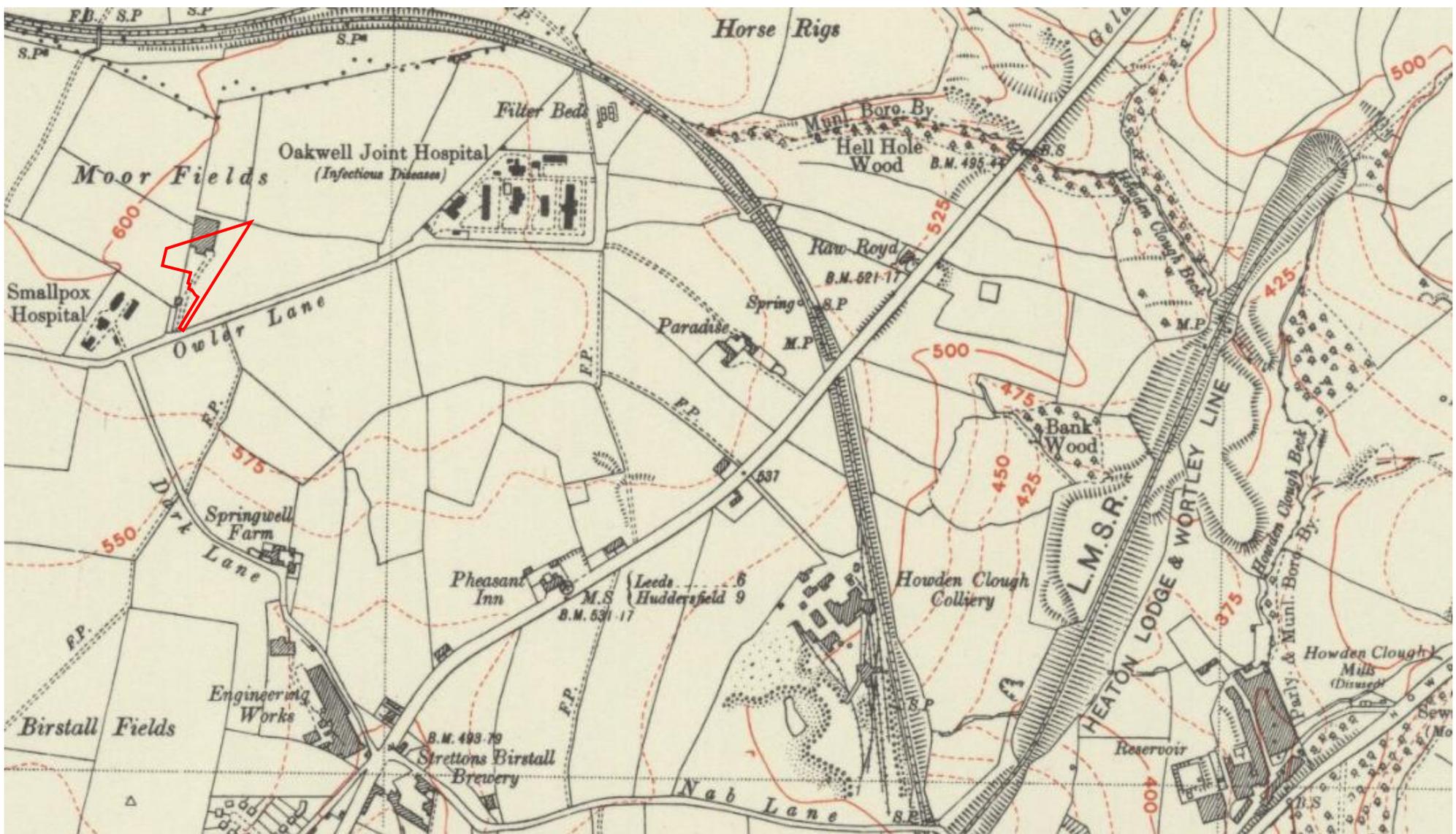
Date: 1850-1951



Date: 1888



Date: 1904-1905



Date: 1948

Appendix D – Geological Maps

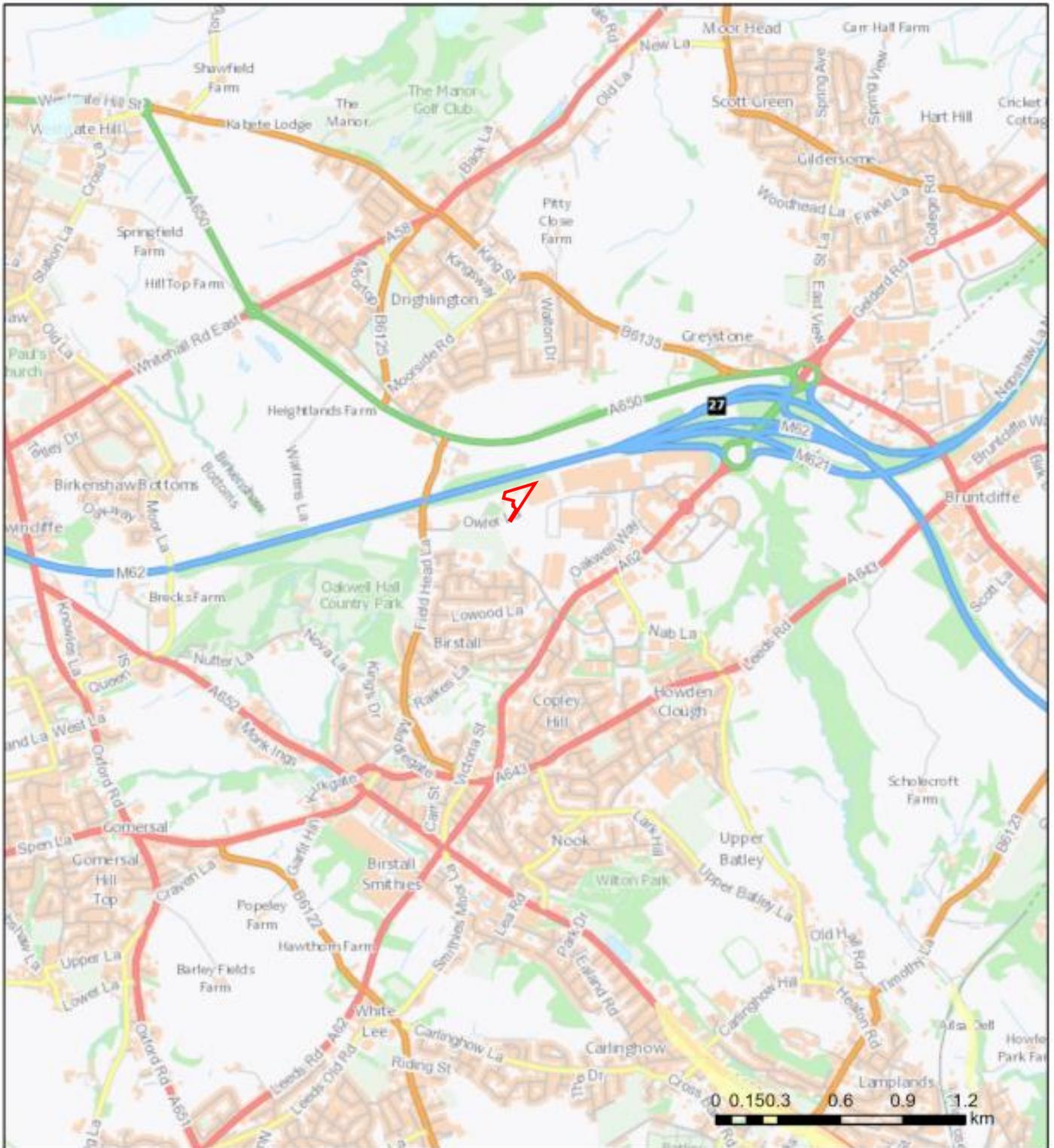
Artificial Geology



Artificial ground 1:50,000 scale

-  **MADE GROUND (UNDIVIDED) - ARTIFICIAL DEPOSIT**
-  **WORKED GROUND (UNDIVIDED) - VOID**
-  **INFILLED GROUND - ARTIFICIAL DEPOSIT**

Superficial Geology



Superficial deposits 1:50,000 scale

- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL**
- TILL, DEVENSIAN - DIAMICTON**
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL**
- ALLUVIAL FAN DEPOSITS - SAND AND GRAVEL**

Bedrock Geology



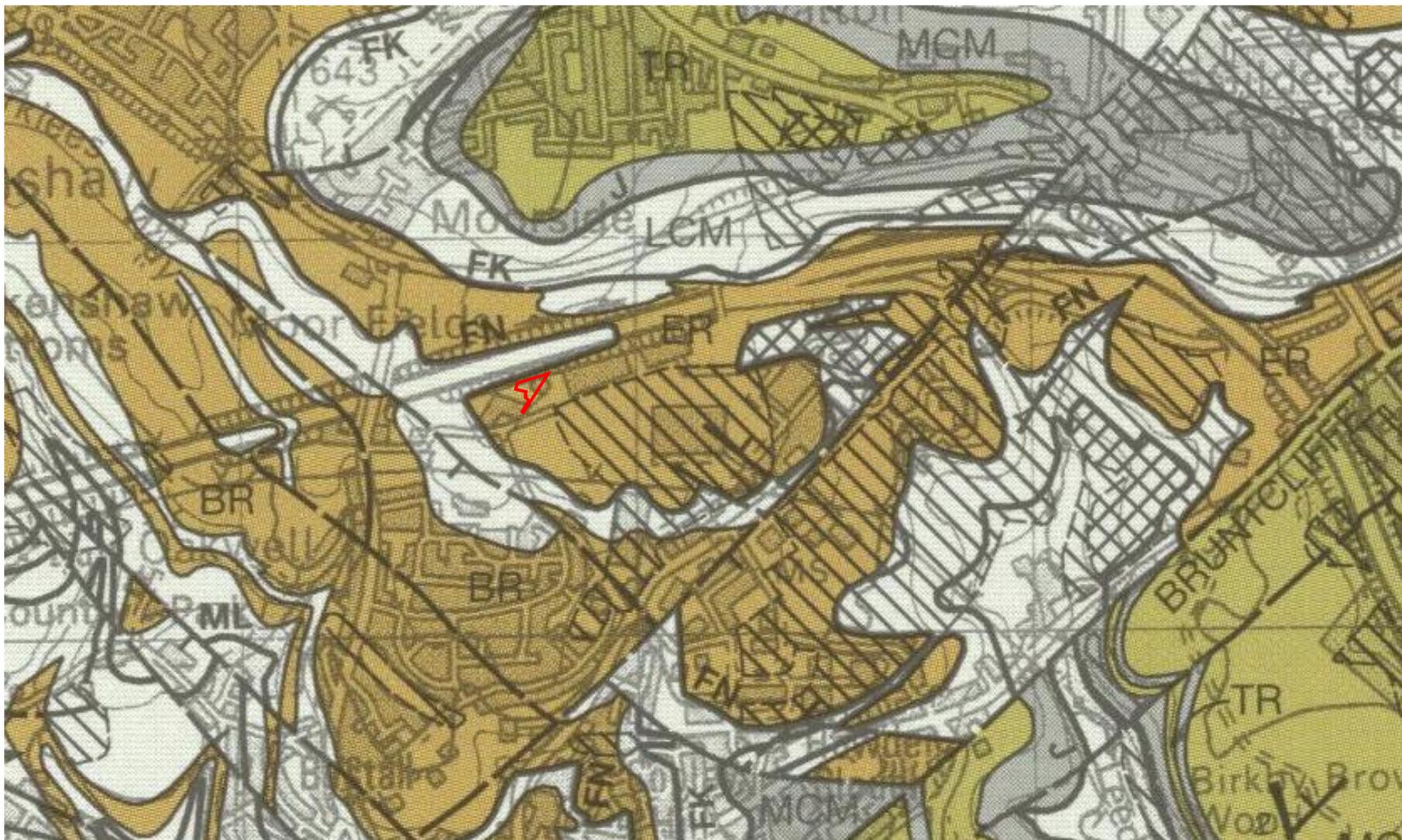
Bedrock geology 1:50,000 scale

	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
	BIRSTALL ROCK - SANDSTONE
	CLIFTON ROCK - SANDSTONE
	ELLAND FLAGS - SANDSTONE
	EMLEY ROCK - SANDSTONE
	FALHOUSE ROCK - SANDSTONE
	GREENMOOR ROCK - SANDSTONE
	GRENOSIDE SANDSTONE - SANDSTONE
	KIRKBURTON SANDSTONE - SANDSTONE
	LEPTON EDGE ROCK - SANDSTONE
	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE
	THICK STONE - SANDSTONE
	HAIGH MOOR ROCK - SANDSTONE
	HORBURY ROCK - SANDSTONE
	PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE
	THORNHILL ROCK - SANDSTONE

Linear features 1:50,000 scale

- Coal_seam_Inf
- Fault_Inf_Crossmark_on_downthrow_side
- Fault_Inf_Downthrow_unspecified
- Ironstone_bed_Inf
- Marine_band

BGS Geological Survey 1:50,000 Series England and Wales Sheet 77, Huddersfield





Appendix E – BGS Borehole Logs

SE22NW125

SE22NW 125 2272-2767

Works: West Riding C.C. M62 Contract G Borehole no. 6100
 Contractor: Wm. Coulson Ltd. Sheet no. 1 of 2
 Site: Motorway, Oakwell Cut. Chainage 102224
 Cut/ (ft) 42-0 Offset from C/L (ft) 61 South
 Type of boring Shell and Auger to 6'-6" B.H. Level (O.D.) 595.75
Rotary Air to 50'-0" Date(s) of boring 1-2-67 (S & A)
 Lining Tubes not used 28-2 to 2-3-67 (Rotary

Samples & Core Recovery. Change of Strata						
No.	Depth	Type or %	Key	Depth	Level	Description of Strata
	1'-0"	(49)		1'-0"	594.75	TOPSOIL.
	6'-6"	B Siltstone		6'-6"	499.25	Firm to stiff brown and orange sandy CLAY, with pieces of very weathered brown iron stained SANDSTONE and small pieces of weathered COAL.
5-50	10'-0"	100%		14'-0"	581.75	Light grey to white fine grained SANDSTONE, micaceous with occasional carbonaceous streaks, brown stained, fragmentary and fractured.
	17'-6"		X	17'-6"	578.25	Grey SILTSTONE slightly micaceous, fissile and brown stained, fragmentary, occasional mussels from 15'-6" to 17'-6".
	18'-6"		X	18'-6"	577.25	Grey SILTSTONE slightly micaceous, fissile, brown stained.
	20'-0"			20'-3"	575.5	Probable COAL seam.
	21'-9"			21'-9"	574.0	Grey MUDSTONE, slickensided with SILTSTONE fragments, very friable (Probable OLD WORKINGS)
	24'-6"	90%		24'-6"	571.25	Grey silty MUDSTONE with plant remains, friable, fragmentary, occasionally fractured, sometimes weathered.
	30'-0"		X			Grey SILTSTONE with plant remains, occasionally weathered and friable bands, some carbonaceous streaks, sometimes muddy, fractured.
	40'-0"	100%	X			
Remarks: (Observations on ground water, etc)						
No water encountered. Weather - stormy.						

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Works: *West Riding C.C. M62 Contract G* Borehole no. *G100*
 Contractor: *Wm. Coulson Ltd.* Sheet no. *2 of 2*
 Site: *Motorway, Oakwell Cut* Chainage *102224*
 Cut/ (ft) *42.0* Offset from C/L (ft) *61 South*
 Type of boring *Rotary Air to 50'-0"* B.H. Level (O.D.) *59.5 - 7.5*
 Lining Tubes *not used* Date(s) of boring *28-2 to 2-3-67 (Rotary)*

Samples & Core Recovery. Change of Strata						
No.	Depth	Type or %	Key	Depth	Level	Description of Strata
			X			<i>Grey SILTSTONE with plant remains, occasionally weathered and friable bands, some carbonaceous streaks sometimes muddy, fractured.</i>
			X			
			X			
			X			
			X			
	50'-0"		X X	50'-0"	54.5 - 7.5	
<i>Borehole Completed.</i>						

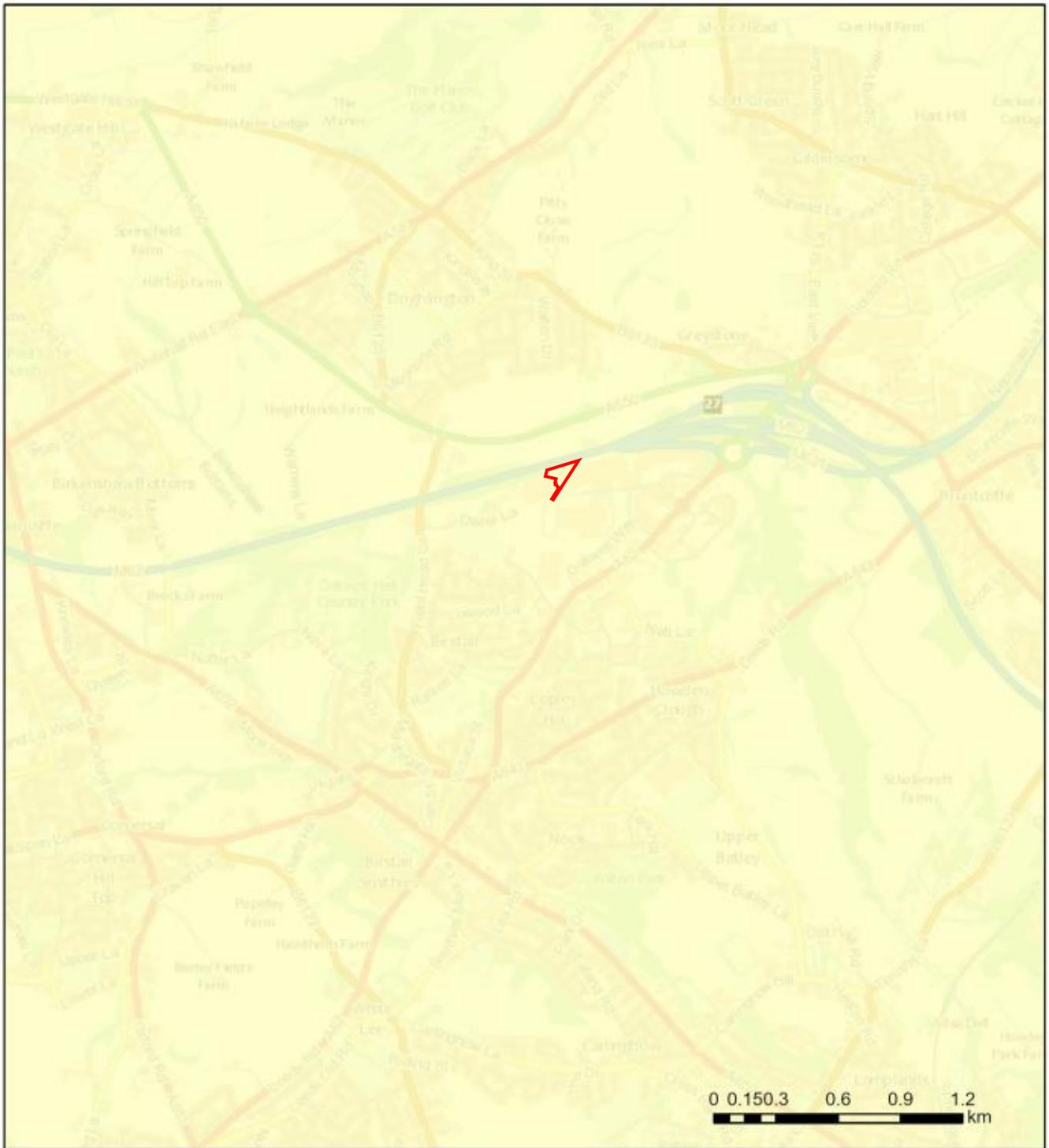
Remarks (Observations on ground water, etc)

SE22NW 12b

Works: *West Riding C.C. M62 Contract G* Borehole no. *G 101*
 Contractor: *Wm. Coulson Ltd.* Sheet no. *2 of 2*
 Site: *Motorway, Oakwell Cut,* Chainage *1025 41*
 Cut (ft) *30.0* Offset from C/L (ft) *56 North*
 Type of boring *Rotary Air to 45'-0"* B.H. Level (O.D.) *595.00*
 Lining Tubes *not used* Date(s) of boring *13/14-3-67 (Rotary)*

Samples & Core Recovery. Change of Strata						
No.	Depth	Type or %	Key	Depth	Level	Description of Strata
			X			<i>Grey SILTSTONE with occasional plant remains.</i>
		100%	X			
	45'-0"		X	45'-0"	550.00	
<i>Borehole Completed.</i>						
Remarks (Observations on ground water, etc)						

Appendix F – Coal Resource Map



Shallow Coal

-  Buried coal resource overlain by up to 50m overburden
-  Primary opencast coal resource area
-  Secondary opencast coal resource area
-  Tertiary opencast coal resource area

Appendix G – Coal Mining Summary Map

