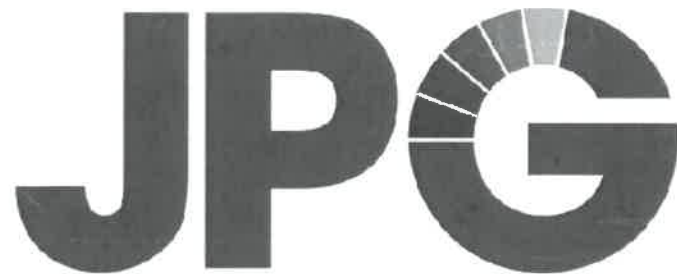


Attachment No 1.



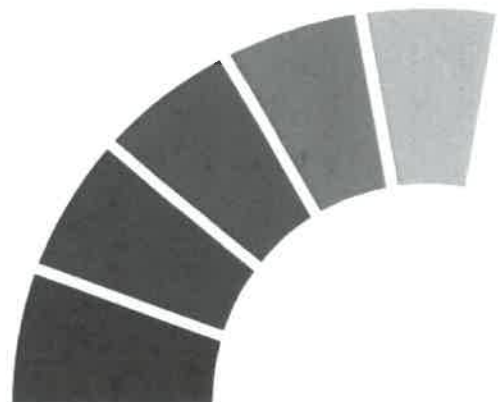
## **COAL MINING RISK ASSESSMENT & COAL RECOVERY REPORT**

### **Roberts Mart Extension Thornes Farm Way Leeds**

<b>Reference</b>	<b>JBW/CMRA/5264.v1</b>
<b>Date</b>	<b>June 2018</b>
<b>Version</b>	<b>1</b>

5 John Charles Way  
LEEDS  
LS12 6QA

Tel: 0113 263 1155  
admin@jpg.group  
www.jpg.group





## CONTENTS

<b>1.0</b>	<b>Section 1 – Application</b>	<b>1</b>
1.1	Site Location and Description	1
1.2	Description and Layout of Proposed Development	1
1.3	Scope of the Coal Mining Risk Assessment	1
<b>2.0</b>	<b>Section 2 – Sources of Information Used to Inform this Report</b>	<b>2</b>
<b>3.0</b>	<b>Section 3 – Identification and Assessment of Site Specific Coal Mining</b>	<b>3</b>
<b>4.0</b>	<b>Section 4 – Mitigation Strategy Proposed</b>	<b>4</b>
<b>5.0</b>	<b>Section 5 – Coal Recovery</b>	<b>4</b>
<b>6.0</b>	<b>Section 6 – Conclusion</b>	<b>5</b>
<b>7.0</b>	<b>Section 7 – Relevant Appendices</b>	<b>5</b>

## APPENDICES

**Appendix A Figures/Drawings**

**Appendix B Supporting Information**



## 1.0 SECTION 1 – APPLICATION

A planning application for a proposed extension at Roberts Mart of an existing production/warehouse facility has been submitted to the Local Planning Authority (LPA), Planning Application 17/07780/FU.

The site lies within a Coal Authority Development High Risk Area and, as such, the Coal Authority has requested a Coal Mining Risk Assessment.

JPG (Leeds) Ltd has been commissioned to prepare the Coal Mining Risk Assessment Report for the proposed development, in order to provide the LPA with information on coal mining and an assessment of its potential impact on land stability.

### 1.1 Site Location and Description

The site is located adjacent to Aire Valley House, Thornes Farm Way, Leeds. The approximate centre of the site is located at NGR 433496, 432476. A Site Location Plan is included in Appendix 1.

The site has an irregular shape which extends to an area of approximately 0.9ha.

The site comprises a landscaped area immediately to the west of the existing building. The site slopes down from the west to the east towards the Robert Mart building. This slope was created from excess material on site when the existing building was constructed. The elevation difference from west to east is approximately 1m to 2m.

### 1.2 Description and Layout of Proposed Development

It is proposed to construct an extension to the existing building. A new compressor housing unit and a car park area is to be provided. The proposed layout plan is referenced below and a copy is contained in Appendix A.

- Sanderson Weatherall Architecture. Roberts Mart. Extension, as proposed, option 3A. Job Ref: 171389. Drawing No. 300-08. Revision 01.

### 1.3 Scope of the Coal Mining Risk Assessment

The purpose of the Coal Mining Risk Assessment Report is to:

- Present a desk-based review of all available information on the coal mining issues which are relevant to the application site.
- Use that information to identify and assess the risks to the proposed development from coal mining legacy, including cumulative impact of 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.



- 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.

## **2.0 SECTION 2 – SOURCES OF INFORMATION USED TO INFORM THIS REPORT**

Sources of information upon which this risk assessment of coal mining is based are detailed below:

- The Coal Authority. CON29M Non-Residential Mining Report. Roberts Mart, West Yorkshire, LS9 0AN. Ref 51001724215001. Dated 15 December 2017.
- JPG. Geoenvironmental Ground Investigation Report. Proposed Extension, Roberts Mart, Leeds. Ref DH/GI/5264.v1. Date of issue September 2017.
- WSP Environmental Ltd. Pontefract Lane, Cross Green, Leeds. Report on a Site Investigation. Roberts Mart & Co. Ref. 20911LE. Dated November 2000.
- British Geological Survey, Sheet 70, Leeds, at 1:50,000 Scale, Solid and Drift Edition, dated 1970.
- British Geological Survey, Sheet SE33SW (South-east Leeds), at 1:10,000 Scale, dated 1991.
- British Geological Survey. Technical Report WA/92/1. Leeds: A geological background for planning and development.



### 3.0 SECTION 3 – IDENTIFICATION AND ASSESSMENT OF SITE SPECIFIC COAL MINING

Coal Mining Issue	Yes	No	Remarks
Underground coal mining (recorded at shallow depths).		No	<p>The site is in the zone of influence of underground workings in 2No. coal seams at 30m to 110m depth and last worked in 1917.</p> <p>Any movement in the ground due to coal mining activity in these seams should have stopped.</p> <p>Reference to geological maps indicates that the worked seams are likely to be the Beeston Coal and Better Bed.</p> <p>There is no recorded underground coal mining at depths of &lt;30m.</p>
Underground coal mining (probable at shallow depths)	Yes		<p>The Coal Mining Report states that they believe there to be coal at or close to the surface and that the coal may have been worked at some point in the past.</p> <p>The Blocking Coal seam outcrops approximately 600m to the west of the site; the younging side being recorded on the west of the outcrop. Based on the geological maps including the Generalised Vertical Section and topography of the site and surrounding area, the site is at a stratigraphical level below the Blocking Coal and the shallowest coal seam below the site is anticipated to be a thin unnamed coal seam and then the Beeston Coal, understood to be at least 30m below the site.</p> <p>In order to investigate the presence and condition of coal seams below the overall site, seven boreholes were drilled to depths of between 22 and 31m as part of the 2000 WSP Environmental Ltd ground investigation. Three of the boreholes (BH5 to BH7) were located within the area of the proposed extension. The boreholes confirmed bedrock strata to comprise predominantly mudstone and sandstone. One coal seam was proven at a depth of between 23.0m and 24.0m bgl in BH5 in the north west. At this depth any underground coal workings, if present, are not considered to pose a risk to the surface stability of the site. No evidence of coal seams or coal workings was identified in any other borehole.</p>
Mine entries (shafts and adits)	Yes		<p>There is one recorded mineshaft on the site, according to the Coal Authority Mining Report. The mine shaft was drilled and grouted in 2002 to the satisfaction of Leeds City Council. The treated mineshaft is located below the existing Roberts Mart building.</p> <p>There may be other, unrecorded mineshafts on the site.</p>



Coal Mining Issue	Yes	No	Remarks
			Vigilance should be maintained during any groundworks and if a suspected mine entry is encountered, a suitably qualified person should be consulted.
Coal mining geology (fissures)		No	One fault, aligned east to west, crosses the northern most part of the site, with downthrow to the north.  The Coal Mining Report states that they are not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.
Record of past mine gas emissions or potential		No	The Coal Authority has no record of a mine gas emission requiring action.  Ground gas monitoring carried out on the site as part of the 2000 WSP Environmental Ltd ground investigation confirmed no methane, a maximum carbon dioxide concentration of 1.6% v/v and no detectable flow rates. On this basis, there should be no special requirements regarding ground gas (including coal/mines gas).
Recorded coal mining surface hazard		No	None recorded (other than recorded mineshaft).
Surface mining (opencast workings)		No	The site is not located within the boundary of an opencast coal site.

#### 4.0 SECTION 4 – MITIGATION STRATEGY PROPOSED

The above assessment indicates that no further action is required with regard to coal mining legacy.

However, vigilance should be maintained during any groundworks and if a suspected mine entry or other potential coal mining feature is encountered, a suitably qualified person should be consulted.

#### 5.0 SECTION 5 – COAL RECOVERY

The site is located within the Leeds City Council Coal Resource area, in accordance with the Coal Resource Map.

However, as there are no shallow coal seams within 20m of the surface, there is little opportunity to recover any coal prior to development of the site.



## 6.0 SECTION 6 – CONCLUSION

Based on this coal mining risk assessment, past mining activity does not pose any risk to the proposed development on the site and no mitigation measures regarding past mining are required.

In addition, there is no opportunity to extract shallow coal prior to development on the site.

## 7.0 SECTION 7 – RELEVANT APPENDICES

Appendix A – Figures/Drawings:

- Site Location Plan
- Sanderson Weatherall Architecture. Roberts Mart. Extension, as proposed, option 3A. Job Ref: 171389. Drawing No. 300-08. Revision 01.

Appendix B – Supporting Information:

- Coal Authority Mining Report. Ref 51001724215001. Dated 15 December 2017.
- Extracts from WSP 2000 Report.

**JB Wilson**  
**BEng (Hons) FGS**

For and on behalf of JPG (Leeds) Limited

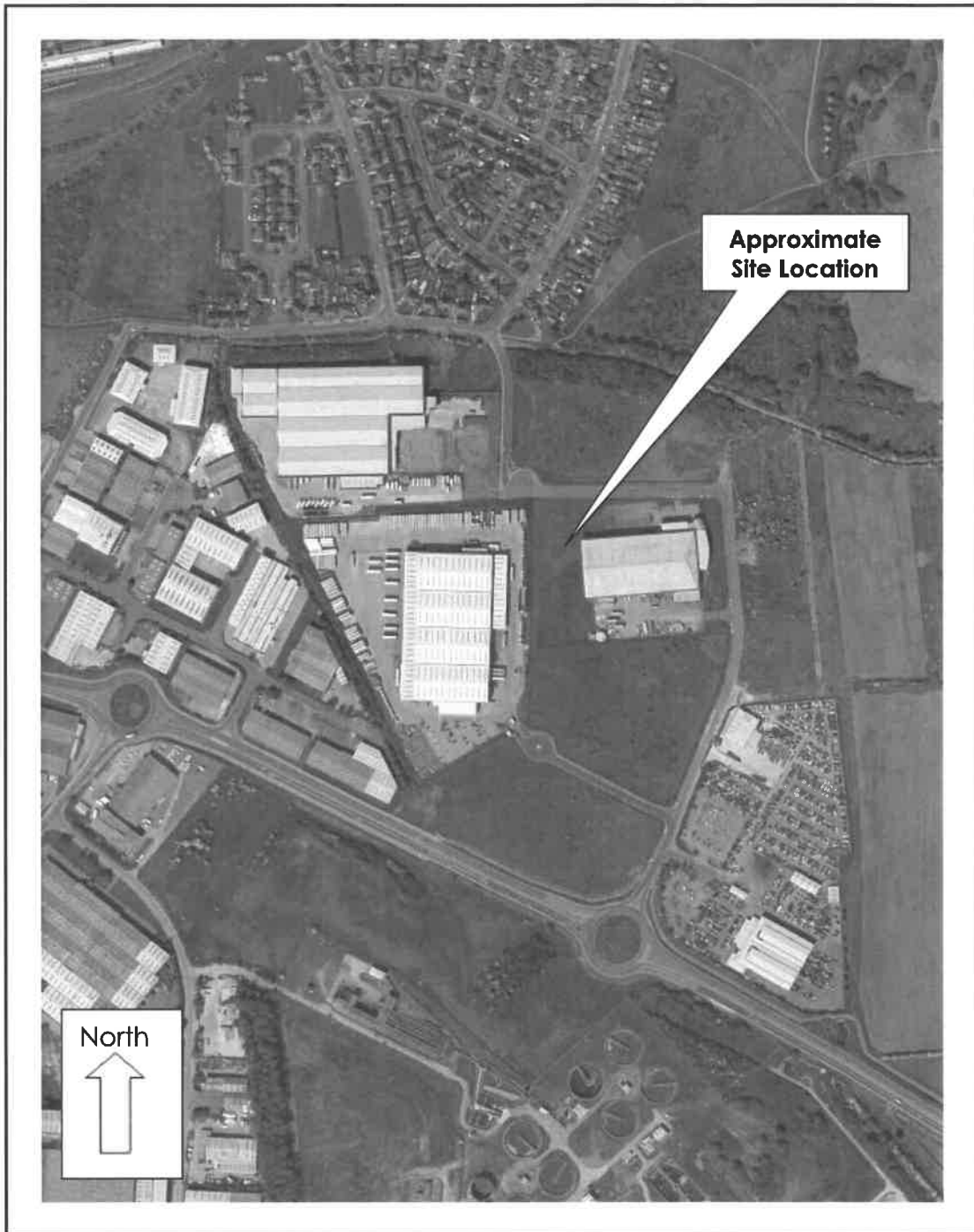
March 2018



---

## **Appendix A Figures/Drawings**





**Figure 1 – Site Location Plan**

<b>Site</b>	<b>Roberts Mart, Aire Valley House, Thornes Farm Way, Leeds, LS9 0AN</b>
<b>Client</b>	<b>Roberts Mart</b>
<b>Job Number</b>	<b>5264</b>
<b>Scale</b>	<b>NTS</b>



## **Appendix B Supporting Information**



The Coal  
Authority

Resolving the impacts of mining

# CON29M Non-Residential Mining Report

ROBERTS MART  
WEST YORKSHIRE  
LS9 0AN

Date of enquiry: 15 December 2017  
Date enquiry received: 15 December 2017  
Issue date: 15 December 2017

Our reference: 51001724215001  
Your reference: Roberts Mart



# CON29M Non-Residential Mining Report

This report is based on, and limited to, the records held by the Coal Authority and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

## Client name

JPG (LEEDS) LIMITED

## Enquiry address




ROBERTS MART, WEST YORKSHIRE, LS9 0AN

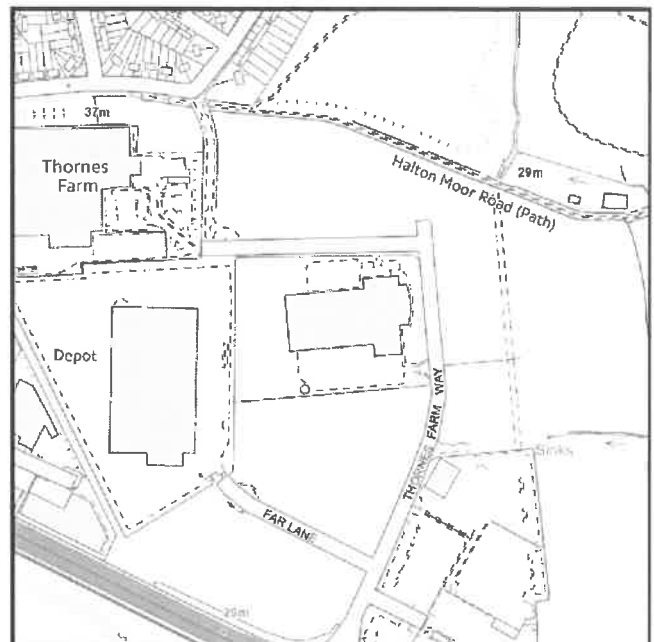
## How to contact us

0345 762 6848 (UK)  
+44 (0)1623 637 000 (International)

200 Lichfield Lane  
Mansfield  
Nottinghamshire  
NG18 4RG

[www.groundstability.com](http://www.groundstability.com)

 /company/the-coal-authority  
 /thecoalauthority  
 /coalauthority



Approximate position of property



Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2017. All rights reserved.

Ordnance Survey Licence number: 100020315

# Summary

<b>Has the search report highlighted evidence or potential of</b>		
1	Past underground coal mining	Yes
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	Yes
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	No
13	Working facilities order	No
14	Payments to owners of former copyhold land	No
15	Information from the Cheshire Brine Subsidence Compensation Board	No

<b>Further recommended reports</b>
Mine entry interpretive report
Mine entry plan and data sheets

**For detailed findings, please go to page 4.**

# Detailed findings

## **1. Past underground coal mining**

The property is in a surface area that could be affected by underground mining in 2 seams of coal at 30m to 110m depth, and last worked in 1917.

Any movement in the ground due to coal mining activity should have stopped.

In addition the property is in an area where the Coal Authority believe 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 prior to any site works or future development activity. Your attention is drawn to the Comments on the Coal Authority information section 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 plans to grant a licence to remove coal using 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**

Within, or within 20 metres of, the boundary of the property there is 1 mine entry, the approximate position of which is shown on the enquiry boundary plot.

Our records disclose the following information:

433432-002. is filled and an area of located fill that was believed to be the shaft fill was drilled and grouted to rock head by Weatherall Green and Smith to the satisfaction of Leeds City Council in 2002.

There may however be mine entries/additional mine entries in the local area which the Coal Authority has no knowledge of.

For an additional fee, the Coal Authority can provide a Mine Entry Interpretive Report. The report will provide a separate assessment for the mine entry/entries referred to in this report. It gives an opinion on the likelihood of mining subsidence damage caused from ground movement as a consequence of the mine entry/entries. It also gives details of the remedies available for subsidence damage where the mine entry was sunk in connection with coal mining.

Please note that it may not be possible to produce a report if the main building to the property cannot be identified from Coal Authority plans (ie for development sites and new build).

For further advice on how to order this additional information please visit [www.groundstability.com](http://www.groundstability.com).

### **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 not 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 31st 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 Authority, under its Emergency Surface Hazard Call Out procedures.

#### **12. Withdrawal of support**

The property is not in an area where a notice to withdraw support has been given.

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.

#### **15. Information from the Cheshire Brine Subsidence Compensation Board**

The property lies outside the Cheshire Brine Compensation District.



# Comments on the Coal Authority information

The Coal Authority own the copyright in this report and the information used is protected by our database right.

The boundary plot shows the approximate location of the disused mine entry/entries referred to in this report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.

Property owners have the benefit of statutory protection (under the Coal Mining Subsidence Act 1991\*). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A leaflet setting out the rights and obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by visiting [www.groundstability.com](http://www.groundstability.com).

If you wish to discuss the relevance of any of the information contained in this report, you should seek the advice of a qualified mining engineer or surveyor. If you or your advisor wish to examine the source plans from which the information has been taken, these are available to view, free of charge, at our Head Office in Mansfield. To book an appointment please ring 01623 637225. Should you or your advisor wish to carry out a physical investigation that may enter, disturb or interfere with any disused mine entry, prior permission of the owner must be sought. For coal mine entries, the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number is 01623 646333.

\*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.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore 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 good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

## Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

## Disclaimer

The Coal Authority owns the copyright in this report and the information used to produce this report is protected by our database rights. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

## Alternative formats

If you would like this report in an alternative format, please contact our communications team.

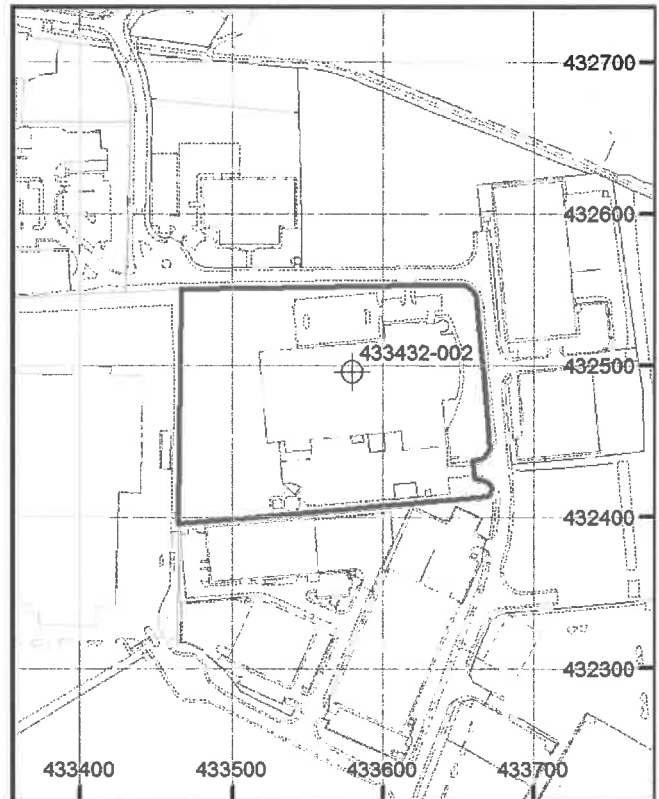
# Enquiry boundary

## Key

Approximate position of enquiry boundary shown



Disused mineshaft



## How to contact us

0345 762 6848 (UK)  
+44 (0)1623 637 000 (International)

200 Lichfield Lane  
Mansfield  
Nottinghamshire  
NG18 4RG

[www.groundstability.com](http://www.groundstability.com)

 /company/the-coal-authority

 /thecoalauthority

 /coalauthority



Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2017. All rights reserved.

Ordnance Survey Licence number: 100020315

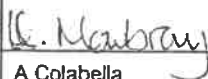
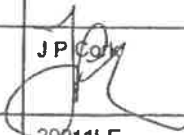
3040

# PONTEFRACT LANE, CROSS GREEN, LEEDS

## REPORT ON A SITE INVESTIGATION

ROBERTS MART & CO

WSP Environmental Ltd  
Elton Lodge  
Newton Road  
LEEDS  
LS7 4HE  
Tel: +44(0) 113 262 3464  
Fax: +44(0)113 239 2089  
<http://www.wspgroup.com>

Issue/revision	Issue 1 - for use	Revision 1	Revision 2	Revision 3
Remarks				
Date	15 November, 2000			
Prepared by	K Mowbray			
Signature				
Checked by	A Colabella			
Signature				
Authorised by	J P Cole			
Signature				
Job number	20911LE			
File reference				

4.2 Fieldwork and soil descriptions were carried out in general accordance with BS5930:1999, "Code of Practice for site investigations". The locations of the trial pits are shown on Figure 1.

### **Rotary Boreholes - Mining**

4.3 In order to assess the shallow mining potential at the site, seven boreholes, using rotary open hole drilling techniques, were put down to depths of between 22 and 31 metres on 21 and 26 September, 2000.

### **Instrumentation**

4.4 In view of the restored open cast coal mines in the vicinity, gas monitoring wells were installed in three rotary boreholes (boreholes 1, 4 and 7) to depths of 5 metres to determine whether combustible gases are present within the site. The wells comprised 63mm diameter HDPE slotted well screen to within 1 metre of the ground surface, casings to ground level with appropriate gravel packs and seals. The wells were terminated with a gas valve.

4.5 The installations were monitored on four occasions, in the period 29 September to 20 October, 2000, for combustible gas, carbon dioxide and oxygen, using a portable infra-red gas analyser.

4.6 The locations of the boreholes are shown on the exploratory hole location plan, Figure 1.

### **Laboratory testing**

### **Contamination related testing**

4.7 In order to provide a preliminary assessment of contamination in the subsoils nineteen samples were screened for the following determinands:-

locally very weak mudstone was encountered. This is underlain by siltstone, encountered in trial pits 1, 9 and 20, from depths of between 2.2 and 3.25 to the base of the trial pits.

5.8 Also of note is within trial pit 6, located in the north western corner, where an intact coal seam of 250mm thickness was encountered at a depth of 1.75 metres.

#### **In situ CBR assessment**

5.9 The in situ assessment of CBR values carried by a MEXE cone, within the trial pit records, indicates some slight variability across the site with CBR values varying from about 1.5% in cohesive soils to in excess of 5% in granular soils.

#### **Mining – Rotary Boreholes**

5.10 By nature of the drilling technique it is only possible to identify the main strata from an examination of flushing returns, where possible. Voids or broken ground are identified from changes in flushing returns and the drill behaviour.

5.11 A brief description of the strata encountered in the boreholes is given below:

5.12 The rotary boreholes profiled the Lower Coal Measures, to a maximum depth of 31.0 metres, principally as mudstone with sandstone bands. Mudstone was encountered from beneath the superficial deposits in the eastern area of the site and sandstone was initially encountered from beneath the superficial deposits in the western area of the site. A coal seam was encountered in borehole 5, located in the north western corner of the site from 23.0 to 24.0 metres depth. No evidence of coal seams or workings was present in any other boreholes.

#### **Groundwater**

5.13 In general the trial pits remained dry during their brief period of opening. The exception were trial pits 4, 5 and 6 located in the north western corner of the site and trial pit 16 located in the centre of the site, where groundwater seepages were encountered at depths of between 2.0 and 2.5 metres, within the sandstone bedrock.

5.14 Within the rotary boreholes groundwater was encountered at depths between 5.0 and 13.0 metres.

5.15 During the monitoring visits, standing water levels within the boreholes were recorded at depths of between 1.2 and 2.96 metres.

#### **Excavation progress and stability**

5.16 In general, satisfactory excavation progress was achieved within all strata, however, at depth within the sandstone bedrock, excavation progress was restricted.

5.17 The results of groundwater monitoring within the well installations, included in Appendix C, indicated groundwater levels at depths between 1.2 and 2.96 metres.

#### **Gas Monitoring**

5.18 The well installations were monitored on four occasions from the 29<sup>th</sup> September to 20 October, 2000, using a portable infra-red gas analyser, for combustible gas, carbon dioxide and oxygen.

5.19 The results of the gas monitoring are included as Appendix D. No combustible gas was detected. However, carbon dioxide was detected during the monitoring period, at levels up to 1.4% by volume. The oxygen levels were also noted to be slightly depleted to near normal.

5.20 No gas flows were detected.

#### **Laboratory testing**

##### **Contamination testing - soils**

5.21 The results of chemical analyses undertaken on 19 samples of made ground and natural horizons from across the site are given on the certificates of analysis attached as Appendix D. The results have been assessed using guidelines given in ICRCL Guidance Note 59/83: "Guidance on the Assessment and Redevelopment of Contaminated Land" (second edition, 1987). This document quotes a threshold trigger (TTV) and an action trigger

## Gas protection measures

6.6 When assessing the ground gas hazard, account has been taken of guidance presented in the following documents:

- Landfill Gas, Waste Management Paper Number 27;
- The Building Regulations 1991, Approved Document C, Section 2;
- Construction of New Buildings on Gas-contaminated Land, BRE Report, 1991.

6.7 The gas monitoring has not detected combustible gases. Levels of carbon dioxide have been recorded up to a maximum of 1.4% together with near normal levels of oxygen. Therefore, it is considered that there is no requirement for specialist gas protection measures.

6.8 The BRE publication BR211 indicates that no radon gas protective measures are required at the site.

## CIMAH and NISSH sites

6.9 Within 1 kilometre there is 1 CIMAH site that may impact upon the redevelopment. However, this issue will be addressed as part of the planning process.

## Shallow Mining

6.10 An intact coal seam was proved within trial pit 6, located in the north western corner of the site from a depth of 1.75 to 2.0 metres. A coal seam was also identified at depth in borehole 5 only, again located in the north western corner of the site from 23.0 to 24.0 metres depth.

6.11 The coal seams have been identified in the north western corner of the site only, to the north of the fault identified on the geology maps. The area to the south of the fault, which covers the majority of the site has proved to be absent from the presence of near surface coal.

6.12 Given the thickness of the shallow coal seam and the limited extent of the coal seam both at depth and at surface it is considered unlikely that the seams have been worked.



However, had the coal seam at depth been worked, the thickness of competent cover is considered adequate to maintain stability at the surface from the migration of voids from collapsing workings. Consequently, there is no requirement for additional structural precautions in this respect.

6.13 The Coal Authority mining report has indicated one mineshaft within the site, and this should be located, and although the report indicates the mineshaft has been filled, it is uncertain whether it has been made safe or requires capping. At this stage, therefore, it is recommended that an allowance is made within the development costs to deal with the mineshaft on the basis that it requires capping.

6.14 At the same time, should any features be exposed suggesting mineshafts or a disparity in materials evident, these should be inspected by suitably experienced personnel and appropriate precautions taken.

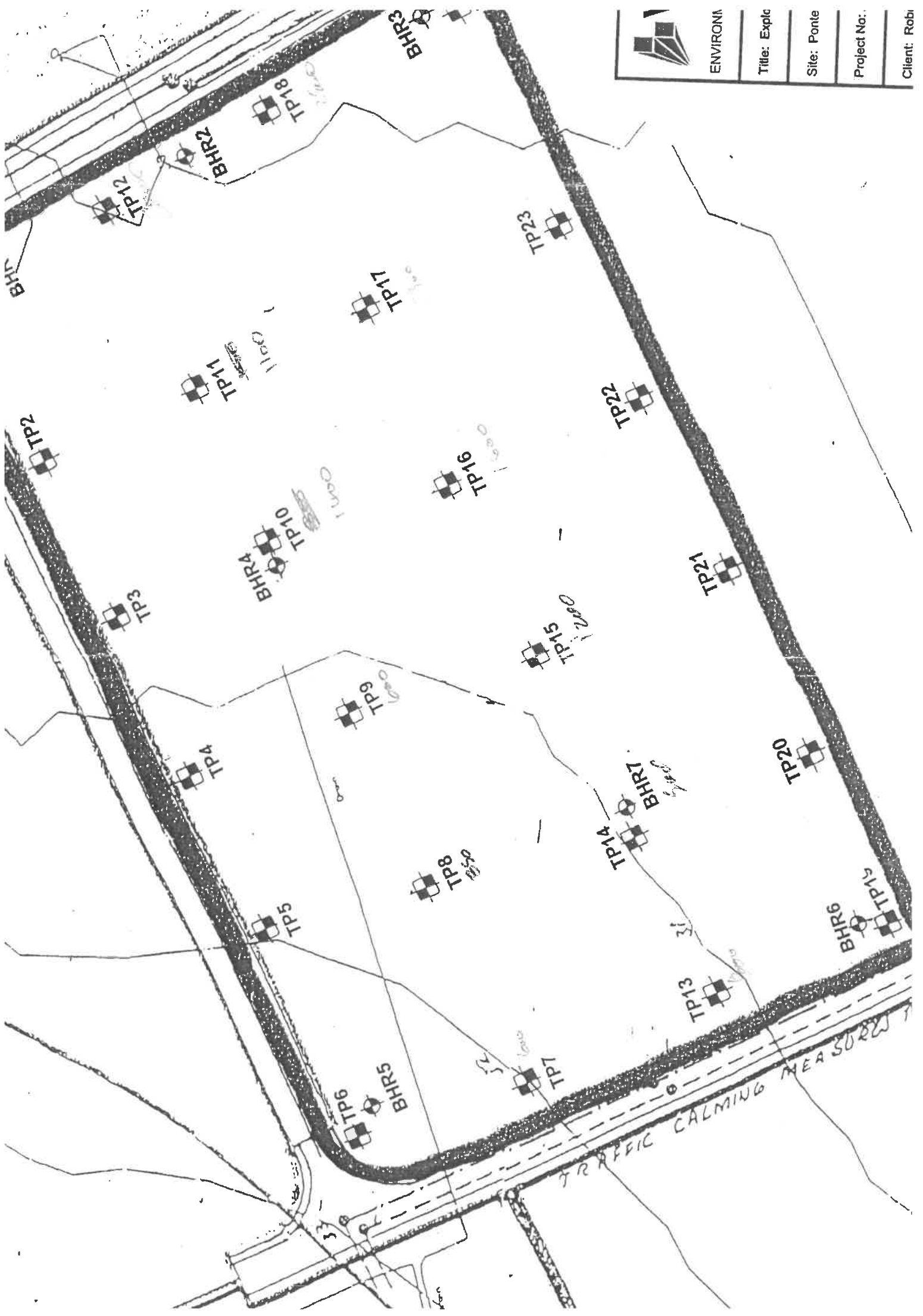
#### Foundations

6.15 As discussed previously, the proposed development is to comprise a large warehouse unit and two storey office area. Final design proposals are not available but it is anticipated that the ground floor loading will be approximately 35-40kN/m<sup>2</sup>.

6.16 Given the variable nature of the near surface soils, encountered across the site. It is observed that the site can be divided into two, on a north – south axis, with the eastern third of the site initially underlain by soft to firm cohesive deposits underlain by weathered mudstone with mudstone bedrock encountered from depths of between 1.7 and 2.8 metres.

6.17 The western two thirds of the site is underlain by either cohesive or granular superficial deposits with sandstone bedrock, encountered from depths of between 0.6 and 2.4 metres. The deeper bedrock encountered along the northern boundary of the site.

6.18 Traditional pad and strip foundations can be utilised on the site. However, due to the variable nature of the superficial deposits and given the potential for differential settlement it is recommended that foundations are extended through the superficial deposits and founded within either sandstone or mudstone bedrock. On these strata a presumed bearing value of 300kN/m<sup>2</sup> is appropriate with settlement expected be less than 10mm.



5 John Charles Way  
LEEDS  
LS12 6QA

Tel: 0113 263 1155  
admin@jpg.group  
www.jpg.group

