

# Hagmill Road, Coatbridge, North Lanarkshire

## Mineral Investigation Report

March 2020



**JWHROSS**

## CONTROL SHEET

**CLIENT:** Wemyss Properties Ltd

**PROJECT TITLE:** Hagmill Road, Coatbridge, North Lanarkshire

**REPORT TITLE:** Mineral Investigation Report

**PROJECT REFERENCE:** 133900/GL/J/R02

### Issue and Approval Schedule:

ISSUE 1	Name	Signature	Date
Prepared by	Dave Milne Principal Mining Engineer	Signed copy held on file	30/03/2020
Reviewed by	Donald Robertson Senior Mining Engineer	Signed copy held on file	30/03/2020
Approved by	Alan Blair Partner	Signed copy held on file	30/03/2020

### Revision Record:

Issue	Date	Status	Description	By	Chk	App
2						
3						
4						
5						

This report has been prepared in accordance with procedure OP/P02 of our integrated Quality and Environmental Management System

*This document has been prepared in accordance with the instructions of the client, Wemyss Properties Ltd, for the client's sole and specific use. Any other persons who use any information contained herein do so at their own risk.*

## **CONTENTS**

1.0	Title.....	1
2.0	Introduction.....	1
3.0	Geology and Past Mining .....	1
4.0	Site Investigation .....	3
5.0	Results .....	3
6.0	Conclusions/Recommendations.....	4

### **Appendices**

Appendix 1 - Drawing No. 133900/9001 – Site Location Plan

Appendix 2 - Drawing No. 133900/9002 – Borehole Location Plan

Appendix 3 - Drawing No. 133900/9003 – Composite Site Plan

Appendix 4 - Borehole Journals

## 1.0 Title

Report relative to the Mineral Investigation undertaken to identify the past mining situation beneath the site at Hagmill Road, Coatbridge, North Lanarkshire.

## 2.0 Introduction

As instructed by Messrs. Wemyss Properties Ltd, we have investigated the mineral stability situation by means of boreholes relative to the site at Hagmill Road, Coatbridge, North Lanarkshire at the location shown an appended Drawing No. 133900/9001 and as shown within red boundaries on appended Drawings 133900/9002 and 9003. The site is centred around National Grid coordinate 273610, 662778.

At the outset, we should advise that this Report is for the private and confidential use of the Client(s) for whom the Report is undertaken and should not be reproduced in whole or in part, or relied upon by third parties for any use whatsoever. JWH Ross accepts no duty or responsibility (including negligence) to any party other than the stated Client(s) and disclaims all liability of any nature whatsoever to any such party in respect if this Report.

The Report is based on the geological and mining records at present available. The contents of the Report are believed to be accurate but since mining records and information for this District may be incomplete, we cannot accept responsibility for any insufficiency or inaccuracy in the information provided.

## 3.0 Geology and Past Mining

According to published geological information, the solid strata underlying the Subjects belong to the Upper and Middle Coal Measures of the Carboniferous Period and appear to dip generally to the south at a slight gradient. The foregoing series of rocks are sedimentary in nature and consist of sandstones, siltstones and mudstones together with occasional ironstones and numerous seams of coal particularly with respect to the Middle Coal Measures.

In order that the relationship of each mineral horizon may be better appreciated, we have shown below, in tabular form, the general succession together with the average thickness and approximate depth to the principal seams, with the Main Coal taken as a convenient datum. This section is given as a guide only since the seam thicknesses and strata intervals may vary locally:-

<b>Seam</b>	<b>Average Thickness (m)</b>	<b>Approx. Depth (m)</b>
<i>Main Coal</i>	1.4	0 – relevant datum
<i>Humph Coal</i>	0.5	14
<i>Splint Coal</i>	1.2	24
<i>Virgin Coal</i>	0.6	28
<i>Airdrie Blackband Coal</i>	0.6	54
<i>Virtuewell Coal</i>	0.6	73
<i>Ladygrange Coal</i>	0.4	83
<i>Kiltongue Coal</i>	1.8	109
<i>Upper Drumgray Coal</i>	0.5	120

The relevant National Grid Series Geological Map indicates that the continuity of the strata hereabouts will have been disrupted by the presence of a substantial geological fault inferred to traverse the site on an approximate northwest to southeast trend, the movement about which displacing the strata down towards the north. We should explain however that faults are planes of movement about which adjacent blocks of rock strata have moved relative to each other. They are seldom vertical and commonly consist of zones, perhaps up to several tens of metres wide, containing several fractures. The portrayal of faults as a straight line is therefore a generalisation.

To the south of the fault, the abovementioned geological map, indicates that the Main Coal will outcrop through the southern area of the site in an approximate east to west trend. Taking account of the prevailing strata dip towards the southwest at the site locus, it follows that the Main Coal will be present beneath that part of the site extending from the outcrop position thereof to the southern site boundary.

By contrast, to the north of the fault, the geological maps infer that the movement attributable thereto has the effect of juxtaposing the older rock of the Middle Coal Measures against the much younger strata of the overlying Upper Coal Measures. Despite their name, the Upper Coal Measures are known to be largely devoid of any workable seams, instead predominantly consisting of reddish brown sandstones, siltstones and Mudstones. As a consequence, the area to the north of the fault will be free from shallow mineworkings.

Extensive past mining has taken place in the District within the majority of the coal seams belonging to the Middle Coal Measures from the nearby Rosehall, Glen, Thankerton and Hattonrig Collieries. The workings took place during various periods of time dating from the mid 1800's until finally being abandoned in the 1980's. Nevertheless, we consider that in the assessment of mineral stability, cognisance need only be taken of the topmost seam underlying the site, namely, the Main Coal.

Our search of official Abandonment Plans, other unsigned 'Abandonment' plans recently catalogued by the Coal Authority, together with mining records and plans held in our own Archives, reveals that the Main Coal has been extracted under and in close proximity to the site with the workings having been undertaken via the nearby Rosehall Colliery. The corresponding plan records indicate that workings therein will encroach beneath the site from the south to underlie the southeast corner thereof. It is of particular note however, that the workings are not shown as having encountered the seam outcrop position, instead having terminated against geological faulting at depth. This raises some dubiety as to the accuracy of the recording of the outcrop position of the Main Coal on the geological map which can be considered as conjectural at best.

On perusal of the aforementioned mine plans, we note that the seam hereabout has been worked utilising the Longwall system of mining. Where the Longwall method is employed the seam is completely extracted and the strata overlying the mined area is allowed to collapse. As a result thereof, subsidence of the ground surface is usually complete shortly after the extraction of the seam. Access roadways are provided and maintained through the worked out area, but these roadways quickly collapse after maintenance of them ceases, except in the case of workings at shallow depths where, depending on the nature of the superincumbent strata, they may remain intact for a considerable period after the cessation of workings. In such cases when the old underground roadways eventually collapse, isolated plump holes or sits may appear on the surface ground.

Given the apparent ambiguity surrounding the outcrop position of the Main Coal, together with the corresponding uncertainty pertaining to the depth at which the recorded workings in this seam will be present beneath the site, the potential instability risk attributable to thereto if located at shallow depth could not be discounted on account of the information presently available. As a consequence we recommended that the depth to and condition of the Main Coal be determined by means of boreholes, as well as an attempt to establish the position of the fault through the site that appears to delineate the extent of the workable seams beneath the Subjects.

#### **4.0 Site Investigation**

In accordance with our recommendations, we were instructed by Messrs. Wemyss Properties Ltd, to investigate the mineral stability position beneath the site by means of boring. Towards this end, we set out and supervised the sinking of 6 no. rotary boreholes (2no. cored and 4no. open-hole) positioned in cognisance of the results of our previous research. The approximate borehole locations are shown by means of blue circles on appended Drawing No. 133900/9002.

Drilling operations were undertaken by Messrs. GB Land Engineering and the official journals supplied to us by the Drilling Contractor are attached as appendix 3.

#### **5.0 Results**

It will be observed on perusing the Borehole Journals that rockhead depth was variable across the site ranging from 12.60 – 18.50 metres bgl. It is of particular note that the depth to rockhead appears to increase across the site from southeast to northwest. The drilling technique utilised does not allow recovery of the superficial deposits for examination or identification but rather relies on factors such as penetration rate, resistance while drilling and examination of the cuttings to form an assessment as to the type of material encountered. Notwithstanding, the driller remarked at the time of drilling that the conditions encountered were fairly typical of penetrating clay with occasional boulders.

In order that the information disclosed by the drilling works may be more readily understood, our interpretation of the borehole results is summarised in the following table:-

**Table 1 – Borehole Results**

<b>BOREHOLE</b>	<b>ROCKHEAD</b>	<b>DETAILS</b>
R01	18.50m	Alternating Sandstone and Mudstone strata Total depth = 35.00m
R02	16.00m	Alternating sandstone and mudstone strata Total depth = 30.00m
R03	15.80m	Alternating sandstone and mudstone strata Total depth = 33.00m
R04	15.60m	0.30 Coal @ 26.00m (Humph Coal) Total depth = 33.00m

<b>BOREHOLE</b>	<b>ROCKHEAD</b>	<b>DETAILS</b>
R05	14.00m	1.30 Coal @ 17.30m (Main Coal) 0.30 Coal @ 27.60m (Humph Coal) Total depth = 30.00m
R06	12.60m	1.00m Seatclay and Coal @ 20.44m (Main Coal Working) Total depth = 21.00m

*NB. Depths are in metres below existing ground level*

On perusal of the information above, we observe that boreholes R01, R02 and R03 were all sunk to depths in excess of 30 metres without encountering any seams of coal. It is of particular note that on review of the borehole log pertaining to R02 which had been formed by rotary coring methods, the strata is often described as being reddish or purplish grey in colour with frequent occurrences of iron staining throughout. Numerous references to smooth or polished fractures are also notable which, together with the prevalence of iron staining, suggests that the strata at the position of R02 may have been subject to faulting. Moreover, the colour description is consistent with the strata of the Upper Coal Measures which are anticipated to occupy the area to the north of the inferred fault position.

Rockhead level is observed to decrease by 1.60 metres between boreholes R04 and R05, where a 1.30 metre thick coal was recorded at 17.30 metres below ground level. With the prevailing strata dip towards the south combining with the reduction in rockhead level, the absence of this seam within R04 suggests that it will likely outcrop at some point between the two borehole positions. The same seam is again noted to be absent in R06 however, the strata description within the relevant borehole log describes the corresponding horizon as *“very weak, poorly bedded, black to grey, carbonaceous SEATCLAY”*. Upon completion of this borehole, the driller remarked that drilling flush was lost while penetrating this section of strata and that the material encountered offered very little resistance to the drilling rig. On the basis of the strata description and the driller’s account of the conditions encountered, we consider it likely that the rig passed through an old waste or remnant working at or around 19.00 metres in R06.

## **6.0 Conclusions/Recommendations**

Having carried out the rotary drilling works and taking into account the previous research pertaining to our desk study, we are of the opinion that the current investigation has identified the location and condition of what we would consider to be the Main Coal where it lies beneath the site.

Taking cognisance of the relevant mine plan records we are of the view that the conditions encountered in borehole R06 between 19.44 and 20.44 metres may be representative of a mine working in this seam. We should advise that the upward transmission, nature and extent of subsidence movement is directly related, amongst other factors, to the extraction height, inclination of strata, method of mining, percentage extraction, degree of natural consolidation of the wastes and the thickness, nature and bulking factor of the overlying deposits.

In view of the above, taking account of the thickness of superincumbent rock strata intervening between the roof of the workings and rockhead, we are of the opinion that the extent thereof will be insufficient to preclude the effects of belated mineral subsidence attributable to these workings manifesting at surface.

Correlation of the results of boreholes R04, R05 and R06 leads us to consider that the 1.30 metre thick coal recorded in R05 is also the Main Coal however in an intact condition. The geological structure at the site, as derived from the current investigation, indicates that the seam will outcrop at a point between the positions of boreholes R04 and R05. We have shown the outcrop position of this seam as conjectured from the investigation results on appended Drawing No.133900/9003

In addition to the foregoing, we are of the view that the current investigation has identified the likely position of the geological fault indicated on the relevant geological map to traverse through the site. The variation in strata conditions noted in boreholes R01, R02 and R03 when compared to R04, R05 and R06, most significantly the lack of common horizons therein, is symptomatic of the displacement of strata at a point intervening between the two lines of holes, most likely as a result of the aforementioned fault.

We have shown the likely position of this fault as derived from the results of the investigation on appended Drawing No. 133900/9003, and would note that this location appears consistent with the inferred position from the relevant geological maps. Where the investigation has identified a mineral stability risk to the Subjects attributable to shallow workings in the Main Coal, the interaction between the seam outcrop and the position of the aforementioned fault combine to restrict this area of the site to the southeast corner thereof. We have shown hatched green on appended Drawing No. 133900/9003, the approximate area of the site potentially at risk from shallow workings in the Main Coal.

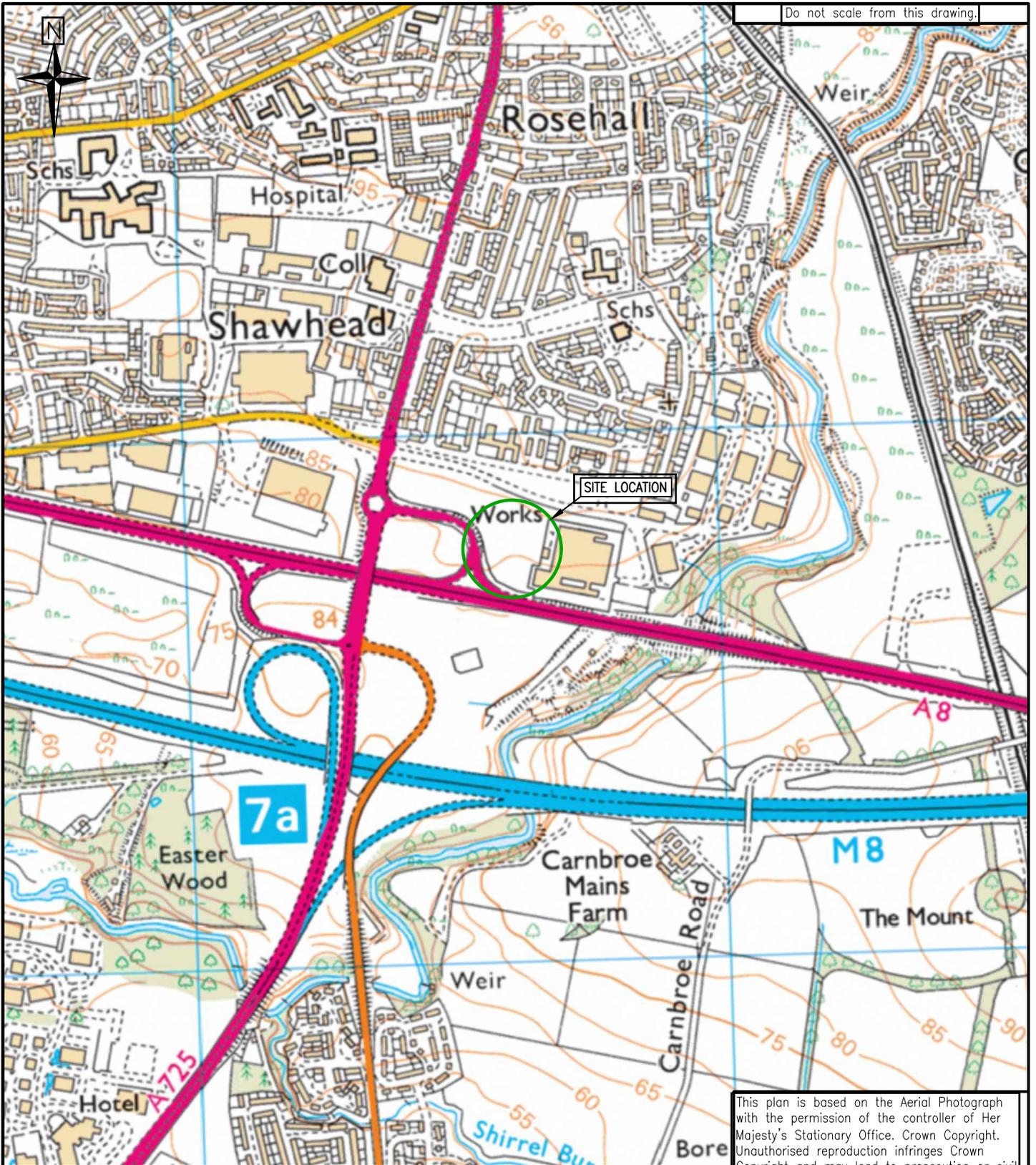
If a more definitive assessment on the extent to which the aforementioned workings will encroach within the site boundary is required, it will be necessary to undertake a programme of probe drilling directed to establish the limit of extraction in the Main Coal. Any such works should be undertaken under the direction and supervision of an appropriately qualified mining engineer.

We should point out that the foregoing deals with the mining stability aspect and should not be construed as inferring that the engineering or chemical properties of the superincumbent rock strata, or the natural or man-made superficial deposits are satisfactory or otherwise, since these latter matters are outwith the scope of our brief.

## Appendix 1

**Drawing No. 133900/9001 – Site Location Plan**

Do not scale from this drawing.



This plan is based on the Aerial Photograph with the permission of the controller of Her Majesty's Stationary Office. Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings.

Rev.	Date	Description	Drawn	Checked	Approved

Client: **WEMYSS PROPERTIES LIMITED**

Project Title: **HAGMILL ROAD, COATBRIDGE**

Drawing Title: **SITE LOCATION PLAN**

**JWHROSS**

225 Bath Street,  
GLASGOW, G2 4GZ  
Tel: 0141 285 8700 Fax: 0844 381 4412

Scale at A4:	Status:	
NTS	For Report	
Drawn:	Checked:	Approved:
CMCC	DM	ARB
Date:	Date:	Date:
30/03/20	30/03/20	30/03/20
Drawing No.:	Revision:	
133900/9001		