

**Proposed Residential Development
321 Hough Lane, Wombwell,
Barnsley**

Desk Study Report

October 2017



FAIRHURST

Hough Lane, Wombwell

Desk Study Report

FAIRHURST

CONTROL SHEET

CLIENT: Balmoral Group Holdings Ltd

PROJECT TITLE: Proposed Residential Development, 321 Hough Lane, Wombwell, Barnsley

REPORT TITLE: Desk Study Report

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Executive Summary

Fairhurst were commissioned by Balmoral Group Holdings Ltd (the Client), to carry out an environmental desk study for the proposed residential development at Hough Lane, Wombwell, Barnsley. The site is currently operated by Balmoral Tanks with offices, a spray paint workshop, maintenance workshop and welding and fabrication workshop on site.

The desk study highlighted the potential for Made Ground and contamination associated with the former industrial uses of the site, which could result in harm to human health and controlled waters. Made Ground could represent a geotechnical constraint to development.

Major contamination is not anticipated (although possible), but at least some degree of contamination is considered likely. There is also considered to be the potential for a ground gas risk to exist. In addition, the adjacent site (to the north and south) was previously a foundry and foundry landfill, with a low to moderate potential for this to present a localised environmental risk to the site. The following sources of contamination will require further investigation:

- Current use of the site (production of tanks) and associated activities (including a waste storage area, workshops and an above-ground diesel tank);
- Made Ground anticipated on site due to the history of the site and suspected past earthworks, especially at the southern end of site;
- Garage historically located on site;
- Foundry historically located to the west of the site; and
- Foundry landfill historically located to the south of the site.

A risk from radon gas has not been identified.

Asbestos containing material is known to be present within the buildings on site. Any asbestos containing material will require to be identified and removed in accordance with current legislation and guidance prior to demolition of buildings on the site.

The site is located within an area affected by historical coal mining. This is considered to be a potentially significant development constraint, but is out with the scope of this report. It is noted that Barnsley Council has requested a coal mining risk assessment report in the pre-application response letter (2016/ENQ/00020). This is to be complete under a separate cover.

The following potential geotechnical constraints were identified:

- Potential for Made Ground of unknown provenance and extent, especially at the southern end of site (due to likely past earthworks), which could infer a requirement for abnormal foundations.
- Below ground structures may exist in relation to demolished buildings on site.
- Existing below ground services will be present below the site potentially requiring either diversion or removal.
- There is a potential for shallow groundwater that may influence foundations and services, although the groundwater regime beneath the site remains unknown;
- The site may be unsuitable for soakaway drainage due to the likely presence of cohesive superficial deposits (as weathered bedrock);
- Shallow bedrock has been recorded on the adjacent site and is anticipated on site.

It is also noted that there is a telecoms compound and mast on site.

It is recommended that a ground investigation is conducted to determine the ground conditions and geotechnical properties of the ground to inform foundation design, road design, soakaway properties, etc. In addition, the ground investigation should include comprehensive environmental assessment, including assessment of ground gas risk and potential groundwater contamination. Cost savings can be made by undertaking environmental and geotechnical investigations at the same time.

The site is within a moderate bomb risk areas. A detailed UXO survey is recommended.

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1.0 Introduction

Fairhurst were commissioned by Balmoral Group Holdings Ltd (the Client), to carry out an environmental desk study for the proposed residential development at Hough Lane, Wombwell, Barnsley; the site is currently used by Balmoral Group Holdings Ltd as a tank manufacturing facility. The desk study is required primarily to address Policy CSP39 'Contaminated and Unstable Land' as raised by Barnsley Metropolitan Borough Council in the planning pre-application response letter (2016/ENQ/00020).

The site location is show on Drawing117436-9100-.

1.1 Aims

The aims of the desk study were to undertake a Phase 1 investigation in accordance with British Standard 10175:2011+A1:2013 "Investigation of Potentially Contaminated Sites" (BSI, 2011). The following specific aims are included:

- To summarise findings by way of a site walkover and review of pertinent published information including historical maps, geological and hydrogeological maps, in addition to relevant online and consultation resources (e.g. EA, MAgIC and Barnsley Council, etc.);
- To identify, assess and evaluate potential for contamination including any sources, pathways and receptors as well as any other environmental factors applicable to the site;
- To assess and evaluate the risk of significant harm occurring to one or more site receptors;
- To identify potential geotechnical constraints or constraints to development;
- To recommend further site investigation, where applicable, in order to facilitate and support development of the site.

2.0 Sources of Information

2.1 Envirocheck

An Envirocheck report was obtained and reviewed in the production of the desk study and is included as Appendix 1. Historical maps are referenced in Table 1 below.

Table 1: List of Historical Maps Consulted.

Sheet	Scale	Date
Yorkshire	1:2,500	1892, 1903, 1930
Yorkshire	1:10,560	1854-1855, 1893, 1894, 1905-1907, 1931, 1938, 1938-1948, 1948
Ordnance Survey Plan	1:2,500	1962
Ordnance Survey Plan	1:1,250	1982
Ordnance Survey Plan	1:10,000	1956, 1966-1967, 1980, 1989
Additional SIMs	1:2,500	1962, 1985
Supply of Unpublished Survey Information	1:2,500	1976
Large-Scale National Grid Data	1:1,250	1993
Historical Aerial Photography	1:2,500	1999
10K Raster	1:10,000	2000, 2006
VectorMap local	1:10,000	2017

2.2 Internet Sources

The following internet sources were consulted for further information concerning the site:

- Barnsley Metropolitan Borough Council planning website;
<https://www.barnsley.gov.uk/barnsley-maps/barnsley-interactive-maps/>;
- MAgiC: <http://www.magic.gov.uk/MagicMap.aspx>;
- British Geological Survey (BGS) online resources: www.bgs.ac.uk;
- Zetica <http://www.zetica.com/>;
- Environmental Agency (EA) 'What's in your backyard' interactive map:
<http://maps.environment-agency.gov.uk/wiyby/>;
- UK Governmental Radon Map Of Britain: <http://www.ukradon.org/information/ukmaps>.

Information from these websites is incorporated into this desk study where relevant.

2.3 Previous Reports

Several geo-environmental reports are available for the adjacent site to the west as detailed in Table 2 below.

Table 2: List of Previous Reports consulted.

Site	Author	Date	Report Ref.
Hough Lane, Wombwell Consolidated Geo-Environmental Investigation Report	Joynes Pike & Associates Ltd	February 2006	DRS/RMB/232095.20051540
Hough Lane, Wombwell Specification for Remediation	Joynes Pike & Associates Ltd	April 2006	DRS/DRS/232095.20060450
Hough Lane, Wombwell Interim Validation Report	Joynes Pike & Associates Ltd	March 2007	DRS/DRS/232095.20061687

2.4 British Geological Survey

Details of the British Geological Survey (BGS) maps referenced for the desk study are listed in Table 3.

Table 3: List of BGS Maps Consulted.

Sheet	Scale	Date
Barnsley Sheet 87 Bedrock and Superficial	1:50 000	2008

2.5 Consultations

Table 4: List of Consultations undertaken.

Organisation	Date Of Enquiry	Date Of Reply
Barnsley Metropolitan Borough Council – Contaminated Land team	28/08/2017	15/09/2017

2.6 Site Walkover

A site walkover was conducted on the 24th August by a Fairhurst Engineer and is detailed further in this report. The photographs taken during the survey can be found in **Appendix 2**.

3.0 Site Description

3.1 Location

The site is located on Hough Lane in Wombwell, located to the south east of Barnsley, at approximate grid reference SE 39072 02476. The site is an irregular shape and is 1.485 ha in size.

3.2 Topography

In general, the site slopes towards the south; from an elevation of 100 m AOD in the north to 93 m AOD in the south.

An area of the site, south of the offices and spray paint workshop, is noted to dip more steeply (Drawing 117436/9000).

A drop in level was noted along the north eastern boundary of the site, with a further drop in level beyond the south of the site (Drawing 117436/9000). This suggests cut at the northern edge of site and fill at the southern edge, indicative of a development platform.

3.3 Site Walkover Summary

3.3.1 Access and Use

The site is accessed from Hough Lane through a security gate (Photographs 1 and 3). The site is accessible by vehicle.

A number of buildings occupy the site and include offices and workshops (spray paint workshop and a maintenance workshop) – see Drawing 117436-9100. More detail is provided below.

Four small units are located at the north west of the site (west of the access gate). The main office which faces Hough Lane is constructed from brick with a pitched tiled roof.

A small area of off street car parking was noted to the north of the building (Photograph 1).

Three prefabricated office buildings are attached to the main office building along the north western boundary of the site (Photograph 5).

An epoxy spray paint workshop is located to the east of the offices. This building is of steep portal frame construction with an intact concrete floor, block and brick walls, and a corrugated cement roof (Photographs 6 and 7). It is understood that metal sheets are painted with an epoxy resin and oven dried: this is undertaken in a confined area, with no evidence of drainage within the buildings.

To the south of the offices the maintenance workshop is located. The workshop comprises two interconnected buildings. The first building comprises steel frame construction finished with corrugated sheeting and a corrugated steel roof. The second building is of brick construction with a suspected asbestos roof (Photographs 6, 10 and 47). The maintenance workshop was noted to be predominantly a storage area (Photographs 11 and 13). A compressed air canister was noted within the building (Photograph 12).

Areas of car parking are located to the north east of the site (Photograph 16) with outdoor storage areas in the west (Photograph 17) and the south of the site (Photographs 21, 22 and 23). The tarmac within the car park was noted to be in bad condition with potholes.

Overhead services were noted in the north of the site, across the site entrance. A telecommunications mast is located in the south west corner of the site (Photograph 18).

A large building, recorded as the welding and fabrication workshop, is located in the south of the site. The workshop comprises three interconnected units of steel portal frame construction with concrete floor and over clad brick elevations. It was noted during the site walkover that the workshop is now predominantly used for storage. Photographs 28 to 33 show the inside of the workshop.

An above-ground fuel storage tank was noted in the east of the site (Photographs 34, 35 and 36) and is understood to be used for heating. There was no evidence of leaks or spills with no records of such held by Balmoral Tanks. Balmoral Tanks have no knowledge of any below ground tanks on site.

Along the eastern edge of the welding and fabrication workshop rubbish in the form of papers, plastic bags and sacks has gathered (Photograph 37).

The north east of the site was predominantly concreted, and was noted to be in good condition. This was noted as a storage area (Photographs 39, 40, 41 and 42).

In the north of the site a waste storage area was noted. Within this area were drums labelled as "contaminated water", a hazardous waste store and general waste skips (Photographs 44, 45 and 46). It is understood that contaminated material is disposed of by a specialist contractor.

3.3.2 Boundaries & Surrounding Land Uses

To the east of the sites entrance, off Hough Lane, semi-detached houses were recorded. It is understood that these are owned by Balmoral Tanks (Photographs 49).

The surrounding area is predominantly residential with new residential properties adjacent to the site to the south and south west. Allotments are located adjacent to the northern and north eastern boundaries of the site. The south eastern boundary of the site backs onto an area of open space.

North of Hough Lane the Wombwell Main Cricket Club is located, with residential areas further north east and north west of the site.

During the site walkover it was noted that the site dipped gradually to the south, with a step in level noted in the north east and south of the site. This is indicative of earthworks on site and the construction of a development platform.

3.3.3 Site Surface & Vegetation

The southern boundary of the site was noted to be heavily vegetated (Photographs 24, 25, 26 and 27). A heavily vegetated bund ran along the boundary in the south east of the site.

No evidence of invasive species was noted; however, a full invasive weed survey was out with the scope of this walkover.

3.3.4 Surface Water

No evidence of surface water features or flooding was noted on site.

3.3.5 Services

Balmoral Tanks stated that they do not have any drainage records for the site. A septic tank was located to the north of the welding and fabrication workshop (Photograph 43). Anecdotal evidence suggests the outflow leads towards Hough Lane.

A gas main connection was noted to the south of the main office building off Hough Lane (Photograph 4).

Three manholes within a line were noted to the west of the access gate. There is potential, due to the location, that this is an interceptor. However based on the topography of the site and anecdotal evidence of no known interceptor on site, it is considered unlikely. It is requested the client confirms the nature of these manholes. To the south of the site, located on Maslin Gardens, a number of manholes were recorded.

4.0 Historical Development of the Site

The historical development of the site and its immediate surrounding area was established from the examination of existing historical Ordnance Survey maps. The findings are summarised in Table 5 and extracts from the historic maps are reproduced in **Appendix 1**.

Table 5: Historical Data from Maps & Air Photos

Date	Notable Features	Potential Sources of Contamination
1854-1855 1892 1893	<u>On site</u> The majority of the site (in the south) was recorded as mixed woodland. The northern section of the site was located within a large field. <u>Off site</u> South of the site the landscape was recorded to be mixed woodland with agricultural fields to the north. A road (Hough Lane) was noted to the north of the site, running north east to south west. Wombwell Main (common land?) was noted to the north west of the site, north of the road, and a reservoir was located approximately 180 m north of the site. Sir George's Arms (a public house) was noted 100 m to the north east. A small building with a well was noted 50 m to the west of the site, with a second building and well noted 230 m to the south. 300 m north of the site an old quarry was noted. Wombwell was located 800 m to the north east. Wombwell Main Colliery was located 800 m to the north west of the site.	
1903 1905 - 1907	<u>On site</u> No significant changes. <u>Off site</u> Wombwell Main to the north of the site was recorded as a cricket ground. A number of buildings were developed along Hough Lane to the north east of the site. A railway line (Chapeltown Branch Extension) was noted approximately 150 m to the south west of the site, with a spur off the main track approximately 100m to the south west of the site. A goods shed was noted 150 m to the south west and Wombwell station 200 m west. Wombwell Main Colliery was noted to have expanded in size to the north.	Railway

Date	Notable Features	Potential Sources of Contamination
1930 1931 1938 1938 - 1948	<u>On site</u> A number of small buildings were constructed in the north of the site. A track was cut through the mixed forest, with clearance noted in the very south of the site. <u>Off site</u> A club and Wombwell Foundry (iron and brass) were shown immediately to the west of the site. The foundry site showed evidence of raised ground to the south east. The reservoir was recorded as disused. Continued residential development was recorded along Hough Lane and allotments were noted to the north east of site. Wombwell Main Colliery continued to expand in size in the north with a kiln and reservoirs recorded on the Colliery site. The old quarry 300 m north of the site was noted to be infilled. Continued development of Wombwell to the north and west of the site.	Foundry
1956	<u>On site</u> No significant changes. <u>Off site</u> Expansion of Wombwell Foundry buildings recorded. Continued development of Wombwell to the north and west of the site, with residential properties reaching the edge of the recreation ground in the north.	
1962 1966 - 1972 1972 1985	<u>On site</u> A number of additional buildings were constructed on site. A garage is noted in the north of the site, with a 'works' located in the west of the site. All forest had been cleared. <u>Off site</u> Expansion of the raised ground associated with Wombwell Foundry – presumably foundry waste. This appears to be immediately adjacent to the site. Foundry was recorded as a works. By 1985 an electrical substation was recorded 100 m west of the site. Wombles mine club located adjacent to the garage. Wombwell Main Colliery now recorded as Mine with no record of the kiln. Continued residential development of Wombwell to the north of the site.	Garage Works

Date	Notable Features	Potential Sources of Contamination
1993 1999 2000	<u>On site</u> The garage building is noted to have changed shape with two smaller building located in its place (possible demolition and re-build). By 1999 the building had extended further south. By 1999 a building was constructed in the south of the site. In 2006 this building was further expanded to the east. It is likely that this coincided with the construction of the development platform noted in the site walkover. <u>Off site</u> Allotment gardens recorded to the north of the site, east of the workshop located in the north east of the site. Wombwell Main Colliery infrastructure demolished; area recorded as fields.	Demolished buildings Made Ground associated with new development
2017	<u>On site</u> No significant changes. <u>Off site</u> Residential development completed immediately to the west of the site in the footprint of the former foundry.	

Due to the distance of the infilled quarry, greater than 250m, this is not considered to represent a potentially significant risk to the site and is, therefore, not considered any further.

Any potential sources over 500 m from the site boundary have been discounted based on distance.

5.0 Consultation Response

5.1 Contaminated Land Unit

Barnsley Metropolitan Borough Council (BMBC) was contacted on the 25th August 2017; and a response was received on the 15th September 2017. A copy of BMBC's response is included in Appendix 6.

BMBC understand that the site was occupied by Galglass Ltd from 1989 to 2014 with Balmoral Tanks occupying the site from 2014. The site was utilised primarily for the manufacture and installation of galvanised steel and fibreglass tanks and containers. BMC noted that associated engineering work, fuel and lubricant oil storage also will have been undertaken on site.

BMBC is unaware of any radon-affected properties on or within 100 metres of the site.

BMBC state that there are no known current or former nuisance issues, prosecutions or enforcements associated with the site or adjoining properties. There have been no recorded complaints of nuisance relating to the site since it has been operated by Balmoral Tanks Ltd. BMC found records of 11 separate nuisance complaints from 3 different properties between 2000 and 2013 while the site was operated by Galglass Ltd. None of these complaints resulted in formal statutory enforcement action by BMBC.

BMBC hold no records of groundwater abstraction in the vicinity of this site

5.2 Barnsley Council Local Plans Interactive Map

Interactive maps available from Barnsley Council indicated that Wombwell Wood, located approximately 50 m to the south west of the site, is recorded as ancient woodland and a local wildlife site. Wombwell Wood is recognised as having biodiversity and/or geological value and is therefore protected.

The site is located within a nature improvement area; the Dearne Valley Green Heart. The north eastern boundary of the site adjoins the green belt.

No tree preservation orders were recorded in the vicinity of the site.

5.3 Archaeology

Information on archaeological sites in the surrounding area was retrieved from the MAgiC website. There are no recorded archaeological sites within the vicinity of the site. In addition, no ancient monuments or listed buildings were recorded within the vicinity of the site.

5.4 Envirocheck

An Envirocheck report was obtained and reviewed in the production of the desk study and is included as **Appendix 1**. Pertinent information is detailed below:

- The site is a local authority pollution prevention and control site, operating under a permit for powder coating processes.
- Wombwell Foundry was recorded to have a registered landfill located approximately 25 m to the south of the site. The landfill is recorded to accept foundry waste including clinker, slag, asbestos sheets, detergent/oily waste, and sand. The landfill was recorded as accepting waste in 1977. It should be noted that there is limited evidence of the infilling of land from historical maps.
- The property is in a low probability radon area (1 to 3% of homes are estimated to be at or above the Action Level). Radon protection is not required.

5.5 UXO

The site, located within South Yorkshire, is located within an area that has a moderate bomb risk (Zetica, 2017). The risk map obtained from Zetica is included in **Appendix 3**. A detailed UXO survey is recommended and is out with the scope of this report.

5.6 Services Information

Service information was requested as part of this desk study. Service plans are contained within **Appendix 4**.

5.6.1 Water

A water main and combined sewer are located along the northern boundary of the site, along Hough Lane.

Water mains and sewers are recorded in Maslin Gardens and Tunstall Close to the south of the site.

5.6.2 Gas

Low Pressure gas mains are recorded along the northern boundary of the site, along Hough Lane. The gas main enters site along the access road in the north west of the site, supplying the office buildings to the north east of the site.

5.6.3 *Electricity*

A 11kv cable and a low voltage cable are located along the northern boundary of the site, along Hough Lane.

A low voltage cable enters the site along the eastern edge of the access road and supplies the spray paint workshop (entering the building at two locations in the north) and the mobile phone mast and the compound in the south west corner of the site. The cable runs along the western edge of the workshop and cuts across the yard to the east of the mast.

5.6.4 *BT*

A BT service is located along the northern boundary of the site, along Hough Lane. The cable enters the office building in the north east corner of the site.

5.6.5 *Virgin Media*

Virgin Media service trench or duct is located along the northern boundary of the site, along Hough Lane. No services are recorded on site.

5.6.6 *Zayo*

A Zayo duct is located along the northern boundary of the site, along Hough Lane. No services are recorded on site.

6.0 **Geology & Hydrogeology**

6.1 **Geology**

6.1.1 *Made Ground*

BGS geindex records Made Ground under the footprint of the current building in the south of the site, with Made Ground extending to the south and west. The BGS identifies this material as “mainly colliery spoil and landfill”. This appears to more or less coincide with the Made Ground from the foundry observed in the historic maps. Although this map shows that Made Ground extends across site it is considered that this should be treated with caution as it is a large scale map and its accuracy is not known.

6.1.2 *Superficial Geology*

The BGS map indicated no superficial deposits on site, indicating shallow bedrock.

6.1.3 *Solid Geology*

The site is recorded as underlain by the Pennine Middle Coal Measures Formation comprising interbedded pale grey sandstone, siltstone, grey mudstone and coal seams (BGS, 2008).

The north east and west of the site are recorded as being underlain by an unnamed mudstone unit, separated by an unnamed sandstone. The Swinton Pottery coal appears likely to underlie the north east of the site.

6.2 **Hydrogeology**

6.2.1 *Superficial Aquifer*

The site is recorded to be underlain directly by bedrock; there is, therefore, no superficial aquifer recorded beneath the site.

6.2.2 *Bedrock Aquifer*

The bedrock aquifer is classified as Secondary A in which permeable layers are capable of supporting water supplies at a local scale, and in some cases forming an important source of base flow to rivers.

6.2.3 *Groundwater Vulnerability*

According to the SEPA interactive map, the site is underlain by a minor aquifer of high leaching potential.

6.2.4 *Groundwater Flow*

It is anticipated, based on the topography and hydrology of the surrounding area, that groundwater flows towards the south of the site.

6.3 Mineral Extraction

6.3.1 *Mineworkings*

The site is located within a coal mining area. A coal mining report was obtained as part of the desk study and is included as **Appendix 5**.

The report notes that the site could be affected by underground mining; 12 seams of coal are recorded 70 m to 590 m in depth, and last worked in 1980. The report states that any movement in the ground due to coal mining activity should have stopped.

The site is not located in an area of present underground mining and is unlikely to be affected by future underground coal mining.

A Coal Mining Risk Assessment report has been requested by the council in the pre-application response letter (2016/ENQ/00020). This will be reported under separate cover.

6.3.2 *Landfills*

Wombwell Foundry was recorded to have a registered landfill located approximately 25 m to the south of the site. The landfill is recorded to accept foundry waste including clinker, slag, asbestos sheets, detergent/oily waste, and sand. The landfill was recorded as accepting waste in 1977. It should be noted, however, that the boundaries of the landfill shown in the Envirocheck report do not appear to coincide that closely with historic maps (and the area shown in BGS Geoindex). As such, there appears to be some uncertainty as to the location of Made Ground relating to the foundry.

6.3.3 *Quarrying*

There are no quarries within 250 m of the site. The nearest quarry is located ~300 m north of the site.

7.0 Hydrology & Flooding

7.1 Hydrology

The nearest surface water feature, a river, is located 140 m to the south of the site (Envirocheck, 2017).

A culverted stream is located in the centre of the adjacent site; although it is understood that the culvert was diverted as part of the residential development (Joynes Pike and Associates, April 2006).

7.2 Flooding

The site is not at risk of flooding from rivers (EA, 2017). Areas along the northern boundary of the welding and fabrication workshop are recorded as having a low to high risk of flooding from surface water (Envirocheck, 2017).

8.0 Previous Reports

8.1 Consolidated Geo-Environmental Investigation Report (February 2006)

A geotechnical report was produced by Joynes Pike and Associates Ltd (JPA) for the development of residential properties at the adjacent site, located immediately to the west of the site. The adjacent site was formerly a foundry with an associated landfill used for disposal of the foundry by-products.

It should be noted that review of the JPB and JPA factual data (including borehole logs and geotechnical testing results) could not be properly undertaken due to the poor scan quality of the available reports. As such, most of the information below is taken from the body text of the report, making interpretation fairly limited.

The report was noted to combine desk study information and two ground investigation. The first investigation was completed by Johnson Poole and Bloomer (JPB) (Sept-Oct 2003) and the second by JPA (December 2005). The investigations included a total of 39 trial pits, 19 rotary open holes, 15 windowless sampler boreholes and 9 shell and auger boreholes; with samples collected for geotechnical analysis and chemical analysis.

Gas and groundwater levels were undertaken over a one year period.

The key findings from this report are as follows:

- The ground investigation identified MADE GROUND across the site, with Made Ground recorded in general at depths of <4 m in the north (with the exception of deeper Made Ground to the south of the former foundry buildings) and >4 m in the former landfill to the south (up to 8.8 m bgl). Made Ground was noted to generally comprise foundry sand with ash, clinker and slag gravel. Asbestos fragments were encountered in the landfill.
- The natural ground beneath the Made Ground was generally a soft to firm, brown, slightly sandy, silty CLAY interpreted as weathered rock. These deposits were generally encountered at depths less than 2.0 m bgl around the edges of the site.
- Bedrock was recorded across the site comprising Middle Coal Measures (sandstone with mudstone bands).
- JPB divided the Made Ground into three groups: brick and rubble, foundry sand and gravel.
- Metals and PAHs were detected above the soil human health guideline values (residential with gardens) in all three types of material, especially elevated PAHs in the foundry sand. Natural deposits were also tested and did not indicate any exceedances.
- JBA state that concentrations of contaminants on site were not considered a significant risk to controlled waters.
- Groundwater was not encountered during trial pits. During the drilling of boreholes groundwater was encountered from ground level to 8.44 m bgl. Post groundwater monitoring encountered groundwater from surface level to 7.61 m bgl. No further details could be obtained from the reports so this remains a significant unknown.
- JPB undertook ground gas monitoring from boreholes located within the boundary of the landfill and within the former foundry site to the north.
 - Methane concentrations within the landfill (to the far south of the adjacent residential development site) were recorded between 0% – 16%, with concentrations of carbon dioxide recorded at a maximum of 5.7% around 40 m from the site boundary.
 - Out with the landfill methane concentrations were recorded at a maximum of 2% and carbon dioxide concentrations recorded at a maximum of 9%.
 - Depleted oxygen levels were recorded within the landfill and to the north of the landfill. Flow rates were recorded at a maximum of 4 l/h.

JPA concluded that it was acceptable to cap the Made Ground on site to break the pollutant pathways. They recommended further investigation of the oil interceptor to identify remediation requirements. In addition they state that following the decommissioning of the substation, underlying soils would require validation.

JPA recommended that further gas monitoring was undertaken, and if this was not plausible there would be a requirement for gas mitigation measures.

Coal Mining: The investigation included rotary holes to confirm the presence of coal. A coal seam was identified within one of the six boreholes at a depth of between 11.5 m and 13 m bgl; there was no evidence of workings (such as voids and broken ground) and the coal seam was described as poor quality. The report concluded the following:

- “Following a rotary open hole borehole investigation it has been proven that shallow coal mining does not affect the site”;
- “There are no abandoned mine entries on or within the site”;
- “No stabilisation works are required with respect to underground coal mining beneath the site”.

8.2 Specification for Remedial Works Report (April 2006)

Following the production of the consolidated ground investigation report, JPA produced a specification for remedial works. Much of the factual data within the report was included within the previous report and therefore only the key aims of the report are included below. The specification required the following:

- The removal and validation of the substation present on site;
- The pumping out of the oil interceptor and the validation of the removal of an underground tanks;
- The installation of gas protection measures; and
- The installation of a clean cover capping of garden areas.

8.3 Interim Validation of Remedial Works Report (March 2007)

An interim validation report, followed by a series of validation letters, indicates that the site was considered suitable for development. The key findings of these reports are included below:

- Made Ground, within the former foundry site, was excavated to a level of 2 m below the level of the capping or to the natural strata, whichever came first. The base of the excavation was compacted with any brick, metal, concrete and other obstructions removed. Suitable material was retained for re-use as engineered fill for the development platform. A development platform was then constructed and approved by NHBC.
- During the development the landfill material required re-engineered. Material was excavated to 5 m below formation level or to natural deposits. All metal and deleterious material was removed with the remaining granular material being re-engineered. A development platform was then constructed and approved by NHBC.
- The remediation of the site included the excavation, removal and validation of PAH contamination hotspots and capping the site with 600 mm of clean material.
- The electrical substation and interceptor/underground tank recorded on site were removed and validated as part of the works.

9.0 Development Proposals

It is proposed to demolish the existing buildings and develop the site for a residential end use. The properties are to include detached, semi-detached and terraced housing with associated areas of landscaping and open space.

10.0 Preliminary Conceptual Model & Qualitative Risk Assessment

A preliminary site conceptual model has been formulated based on all of the data recovered as part of this desk study. The conceptual model presents the potentially viable source → pathway → receptor

contamination linkages for the site and is set out in the following sections. The significance of the viable linkages elements has been evaluated by carrying out a qualitative risk assessment.

10.1 Source Characterisation

The potential sources of contamination that have been identified are outlined in Table 6, below.

Table 6: Identified Potential Sources of Contamination.

Source	Distance (m)	Compass Direction	Identified by:
On site structures and activities: garage, works, spray paint workshop, above-ground diesel tank, and waste storage area	0	On site	Historical maps and site walkover
Made Ground associated with the construction of the development platform and associated with the demolition of buildings on site.	0	On site	Historical maps and site walkover
Foundry Landfill / infilling	uncertain ¹	SW / South	Envirocheck report
Foundry / Works to west of site	0	West	Historical maps
Railway line and associated structures	150	West	Historical maps

Sources discounted from further consideration, along with the reasons for these sources being discounted are detailed in Table 7, below.

Table 7: Sources Discounted from Further Consideration.

Source	Reason for Discounting
Railway line and associated structures	The groundwater flow is anticipated to be towards the south of the site. The railway line and goods shed is therefore across gradient. Based on this, and the distance and the nature of any contamination associated with a railway line, this is not considered to represent a significant risk to the development.

Note that coal mining is also a potentially significant risk factor affecting the site – however, this requires to be addressed via a separate risk assessment so is out with the remit of this report.

Those sources that cannot be discounted are carried forward to the Qualitative Risk Assessment, and are detailed in Table 8, below. Contaminants of concern associated with these sources are listed in Table 9.

¹ Sources of information on the landfilling from the foundry are conflicting. It appears *likely* that Made Ground from the foundry extended at least up to the edge of site, and may extend onto site.

Table 8: Sources carried forward to Qualitative Risk Assessment

Source	Observations
On site structures and activities: garage, works, spray paint workshop, above-ground diesel tank, and waste storage area.	A garage was formerly located in the north of the site. This was demolished and replaced with offices in the late 1980s. There is potential for contamination associated with the garage to remain. The site is understood to have been occupied by Galglass Ltd prior to Balmoral Tanks. It is understood that Galglass undertook the same processes on site. It is unknown when Galglass obtained the site. The site has been recorded as a works since the 1960s. Contamination associated with the industrial use of the site may be present across site, with possible point sources including a diesel tank and a waste area identified.
Made Ground on site: associated with the demolishing of buildings and earthworks	The historical map review indicated a number of buildings were demolished in the north of the site. Made Ground associated with this is anticipated in the north. Based on site topography there is evidence for cut and fill for creation of a development platform. It is not known what material would have been used for fill (anticipated at the southern end of site), but Made Ground is anticipated. Based on the date of the development (before 1999), there is potential material was obtained from the adjacent foundry.
Foundry Landfill / infilling	The Envirocheck report recorded a landfill 25 m to the south of the site. The landfill opened in 1977 is understood to contain foundry waste. The boundary of the landfill is unknown and based on historical maps, and infilling has the potential to extend onto the south west corner of site. It should be noted that as part of the residential redevelopment of the foundry site to the south and west of the site, infilled was extensively excavated and re-engineered. Whilst this may have reduced the risks from off-site contamination and ground gas, ongoing risks cannot be ruled out.
Foundry and works on adjacent site	The adjacent site was utilised as a foundry until 2000 (Joynes Pike and Associates, April 2006). Contamination associated with the historical process on site may still be present. It should be noted that the site has since been developed with hotspots of PAH contamination removed, significant earthworks undertaken and the capping of the site. The risk is considered, therefore, to be reduced but cannot be ruled out.

Table 9: Contaminants of Concern (CoC)

CONTAMINANTS OF CONCERN**										
SOURCE	Metals	TPH	PAH	Ammonia	Sulphate	pH	Ground Gas	SVOCs / VOCs	PCBs	Asbestos
On site structures and activities: garage, works, spray paint workshop, above-ground diesel tank, and waste storage area	X	X	X			X		X		X
Made Ground on site: associated with the demolition of buildings and earthworks	X	X	X		X	X	X			X
Foundry Landfill	X	*	X		X	X	X			X
Foundry and works on adjacent site	X	*	X		X	X				X

* TPH concentrations were not detected above the relevant assessment criteria during the investigation on the adjacent site and therefore have been ruled out as a potentially significant risk.

** Total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs)

10.2 Pathway Characterisation

The potential pathways by which receptors might be exposed to contaminants (sources) at the site can vary depending on the proposed or current land use (e.g. residential properties, public open space, retail). The key pathways are identified below.

10.2.1 Human Health

For humans, the three possible significant routes of exposure to contaminants in Scotland are considered to be:

- inhalation of ground gas or volatile chemicals;
- ingestion of dusts or soil either by hand-to-mouth activity or by eating plants grown in contaminated soils; and
- dermal (skin) contact with contaminated soils and waters and transfer of contaminants through the skin into the body.

10.2.2 Buildings, Properties & Services

Buildings and services can also be affected by contaminants in the following ways:

- build up of methane (ground gas) resulting in an explosion risk;
- by direct contact of building fabric with contaminated soils / aggressive soils;
- permeation of water supply pipes.

10.2.3 Controlled Waters

For Controlled Waters the following pathways may be present:

- leaching of contaminants from the soil into groundwater under the site;
- chemical spillages entering groundwater under the site;
- run-off from the site surface entering surface water courses near the site; and
- migration of contaminated groundwater into surface water bodies

10.3 Receptor Characterisation

The receptors are the elements in the pollutant linkage that can potentially be harmed by the contaminants. These are as follows:

- Humans: site workers and end users (residents);
- Buildings: building fabric and services; and
- Controlled Waters (groundwater).

The nearest water feature to the site is culverted beneath the adjacent site. This river is shown on OS maps to surface approximately 140 m south of the site. At this distance it is unlikely that any potential contamination associated with the site will have a negative influence on the surface water environment.

10.4 Pollutant Linkages

The significance of potential pollutant linkages at the site is now qualitatively assessed by considering the magnitude of the hazard and the possibility of the linkages occurring based on the observations made, as shown in Table 10.

Table 10: Preliminary Qualitative Risk Assessment for Identified Sources of Contamination

Source	Potential contaminants	Potential Pathways	Potential Receptors	Assessment	Potential Severity	Potential Probability	Risk Class	Investigation required?
On site structures and activities: garage, works, spray paint workshop, above-ground diesel tank, and waste storage area	Metals TPH PAH pH SVOCs VOCs Asbestos	Ingestion, dermal contact, vapour inhalation	Human health	The potential for contamination to be present associated with the former uses of the site is considered reasonably high and will require investigation, although major contamination is not anticipated. Contamination, if present, may represent a significant risk to human health.	High	Moderate	Moderate - High	Yes
		Direct contact with foundations and services	Building fabric and services	The potential for contamination to be present associated with the former uses of the site is considered reasonably high and will require investigation. Contamination, if present, may represent a significant risk to building fabric and services, especially water supply pipes.	Moderate	Moderate	Moderate	Yes
		Leaching, migration	Groundwater	The potential for contamination to be present associated with the former uses of the site is considered reasonably high and will require investigation. Contamination, if present, may represent a significant risk to controlled waters.	Moderate	Moderate	Moderate	Yes

Source	Potential contaminants	Potential Pathways	Potential Receptors	Assessment	Potential Severity	Potential Probability	Risk Class	Investigation required?
Made Ground on site	Metals TPH PAH sulphate pH Asbestos	Ingestion, dermal contact, vapour inhalation	Human health	Made Ground is anticipated on site which has the potential to be contaminated, especially at the southern end of site. Contamination, if present, may represent a significant risk to human health.	High	Moderate	Moderate - High	Yes
		Direct contact with foundations and services	Building fabric and services	Made Ground is anticipated on site which has the potential to be contaminated, especially at the southern end of site. Contamination, if present, may represent a significant risk to building fabric and services, especially water supply pipes.	Moderate	Moderate	Moderate	Yes
		Leaching, migration	Groundwater	Made Ground is anticipated on site which has the potential to be contaminated, especially at the southern end of site. Contamination, if present, may represent a significant risk to controlled waters.	Moderate	Moderate	Moderate	Yes

Source	Potential contaminants	Potential Pathways	Potential Receptors	Assessment	Potential Severity	Potential Probability	Risk Class	Investigation required?
	Ground Gas	Build up of carbon dioxide within structures – inhalation risk	Human health	Made Ground is anticipated on site. The nature and contents of the Made Ground is unknown and may have the potential to generate ground gas. Ground gas may represent a significant risk to human health.	High	Moderate	Moderate - High	Yes
		Build up of methane within structures – explosion risk	Buildings	Made Ground is anticipated on site. The nature and contents of the Made Ground is unknown and may have the potential to generate ground gas. Ground gas may represent a significant risk to buildings	High	Moderate / Low	Moderate	Yes
Foundry Landfill	Metals PAHs Sulphate pH Asbestos	Ingestion, dermal contact, vapour inhalation	Human health	The boundary of the landfill is unknown and based on historical maps infilled land has the potential to extend onto site, although this is likely to be of very limited extent. Contamination associated with the landfill material may represent a significant risk to human health.	High	Low	Moderate	Yes
		Direct contact with foundations and services	Building fabric and services	The boundary of the landfill is unknown and based on historical maps infilled land has the potential to extend onto site, although this is likely to be of very limited extent. Contamination associated with the landfill material may represent a significant risk to building fabric and service	Moderate	Low	Moderate / Low	Yes

Source	Potential contaminants	Potential Pathways	Potential Receptors	Assessment	Potential Severity	Potential Probability	Risk Class	Investigation required?
		Leaching, migration	Groundwater	The boundary of the landfill is unknown and based on historical maps infilled land has the potential to extend onto site, although this is likely to be of very limited extent. Contamination associated with the landfill material, may represent a significant risk to controlled waters.	Moderate	Very Low	Low / Very Low	Yes
Foundry Landfill	Ground Gas	Build up of carbon dioxide within structures – inhalation risk	Human health	The former landfill associated with the foundry is located within 0 to 25m of the site. Elevated concentrations of CO₂ have previously been detected originating from the landfill deposits, although these should have been reduced following remediation. Ground gas associated with the landfill may represent a significant risk to human health.	High	Moderate	Moderate - High	Yes
		Build up of methane within structures – explosion risk	Buildings	The former landfill associated with the foundry is located within 0 to 25m of the site. Methane has previously been detected originating from the landfill deposits, although these should have been reduced following remediation. Ground gas associated with the landfill may represent a significant risk to buildings.	High	Moderate	Moderate - High	Yes

Source	Potential contaminants	Potential Pathways	Potential Receptors	Assessment	Potential Severity	Potential Probability	Risk Class	Investigation required?
Foundry and works on adjacent site	Metals PAHs Sulphate pH Asbestos	Ingestion, dermal contact, vapour inhalation	Human health	PAHs were detected within the Made Ground on the adjacent site. Identified hotspots of contamination were removed as part of the residential development works, and therefore it is considered unlikely that significant contamination remains close to the site.	High	Very Low	Low	No
		Direct contact with foundations and services	Building fabric and services	PAHs were detected within the Made Ground on the adjacent site. Identified hotspots of contamination were removed as part of the residential development works, and therefore it is considered unlikely that significant contamination remains close to the site.	Moderate	Very Low	Low / Very Low	No

11.0 Geotechnical Considerations

The development layout has not been finalised; however, proposals include the construction of detached, semi-detached and terraced residential housing. Geotechnical considerations are given below:

Potential Geotechnical Constraints

Based on a review of the available information discussed throughout this report, the following potential geotechnical constraints may be encountered on-site:

- A significant thickness of Made Ground *may* be present on site, especially towards the southern end of site, due to the apparent creation of a development platform for the current industrial structures (and also due to demolition of past structures). The provenance of such material is unknown, but if significant made ground *is* present then it is unlikely to represent a suitable founding stratum.
- Below ground structures may exist in relation to demolished buildings on site.
- Existing below ground services will be present below the site potentially requiring either diversion or removal.
- The groundwater regime beneath the site remains unknown and may influence foundation and floor slab designs – note that very shallow groundwater was recorded on the adjacent site, although the details regarding this are unknown.
- The depth to the base of the Made Ground and geotechnical parameters for the underlying weathered bedrock have not been recorded;
- Superficial deposits are recorded as being CLAY (weathered rock) – as such, drainage *may* be limited on site.
- Shallow bedrock has been recorded on the adjacent site and is anticipated on site.

Foundation Requirements:

Ground investigation is required to confirm the nature and engineering competency of the underlying geology and to investigate whether organic, soft / loose or compressible deposits are present which will also determine the initial feasibility of use of potential ground improvement techniques. It is also important to determine the depth and composition of any Made Ground. The depth to a suitable bearing stratum and proposed engineering levels are therefore likely to dictate the most suitable foundation solution.

At this stage, assuming low rise housing, it is *likely* that foundations will bear on underlying CLAY (weathered rock) or bedrock. It is unknown whether or not abnormal foundations will be required, although this is considered possible due to the potential for Made Ground to be present, which will not be suitable to bear on. Foundations should bear on a singular material type (either CLAY or rock) to ensure no differential settlement.

It is recommended that intrusive ground investigations are undertaken to confirm the nature and extent of the Made Ground, the geotechnical properties and lateral / vertical extent of the CLAY deposits, the depth / strength of the underlying Mudstones and Sandstones, and the groundwater regime.

Excavations:

Based on the available BGS information and ground investigation information from the adjacent site, it is considered, as a preliminary assumption, that groundwater may be present at the site within superficial deposits or within Made Ground beneath the site, with deeper groundwater recorded in the weathered sandstone and mudstones. As such conventional groundwater pump / sump type control and / or support of excavations *may* be required for the excavations on site.

Earthworks and Material Re-Use

If final development plans include a requirement for significant earthworks, it is recommended that a Material Management Strategy is prepared for the site, following ground investigation. Site topography suggests that at least some degree of earthworks may be required.

Based on the findings of the desk study, the site is considered to have a moderate risk of potential contamination with the possibility of encountering significantly contaminated material.

In line with good practice, soils should be reused on site in accordance with a site specific earthworks specification where possible to limit waste generated by the development. Where materials are required to be removed / disposed of off-site the waste classification of the material would need to be determined. The proposed future ground investigations will allow an initial assessment of the likely classification of Made Ground deposits where encountered and natural deposits.

Surface Water Drainage

Soakaway drainage is considered potentially unlikely to be suitable given the largely cohesive nature of the material encountered on the adjacent site and the potential presence of Made Ground on site.

Concrete Design

Ground investigations will be required to confirm the classification of the materials on site for chemical attack on buried concrete in accordance with BRE Special Digest 1.

It is recommended that a ground investigation is carried out to fully characterise and assess the geotechnical conditions for the site.

12.0 Conclusions

Fairhurst were commissioned by Balmoral Group Holdings Ltd (the Client), to carry out an environmental desk study for the proposed residential development at Hough Lane, Wombwell, Barnsley. The site is currently operated by Balmoral Tanks with offices, a spray paint workshop, maintenance workshop and welding and fabrication workshop on site. It is proposed to develop the site into a residential end-use with associated areas of landscaping and open space.

The desk study highlighted the potential for Made Ground and contamination associated with the former industrial uses of the site, which could result in harm to human health and controlled waters.

Major contamination is not anticipated (although possible), but at least some degree of contamination is considered likely. Note also that residential developments are considered a sensitive end-use so relatively minor contamination can still require some form of mitigation to address. There is also considered to be the potential for a ground gas risk to exist. In addition, the adjacent site (to the north and south) was previously a foundry and foundry landfill, with a low to moderate potential for this to present a localised environmental risk to the site. The following sources of contamination will require further investigation:

- Current use of the site (production of tanks) and associated activities (including a waste storage area, workshops and an above-ground diesel tank);
- Made Ground anticipated on site due to the history of the site and suspected past earthworks, especially at the southern end of site;
- Garage historically located on site;
- Foundry historically located to the west of the site; and
- Foundry landfill historically located to the south of the site.

A risk from radon gas has not been identified.

Asbestos containing material is known to be present within the buildings on site. Any asbestos containing material will require to be identified and removed in accordance with current legislation and guidance prior to demolition of buildings on the site. Contractors should be made aware of its location and condition prior to commencing works on site.

The site is located within an area affected by historical coal mining. This is considered to be a potentially significant development constraint, but is outwith the scope of this report. Note that an assessment done for the *adjacent* foundry site concluded that there were no significant development constraints relating to coal mining on the foundry site. Barnsley Council has requested a coal mining

risk assessment report in the pre-application response letter (2016/ENQ/00020). This is to be complete under a separate cover.

The following potential geotechnical constraints were identified:

- Potential for Made Ground of unknown provenance and extent, especially at the southern end of site, which could infer a requirement for abnormal foundations.
- Below ground structures may exist in relation to demolished buildings on site.
- Existing below ground services will be present below the site potentially requiring either diversion or removal.
- The groundwater regime beneath the site remains unknown and may influence foundations and services;
- The site may be unsuitable for soakaway drainage due to the likely presence of cohesive superficial deposits (weathered bedrock);
- Shallow bedrock has been recorded on the adjacent site and is anticipated on site.

13.0 Recommendations

It is recommended that a ground investigation is conducted to determine the ground conditions and geotechnical properties of the ground to inform foundation design, road design, soakaway properties, etc. In addition, the ground investigation should include intrusive investigation to determine if there are significant contaminated land concerns. This will include soil and groundwater chemical testing, and will likely also require ground gas risk assessment. Cost savings can be made by undertaking environmental and geotechnical investigations at the same time.

Additionally, the client should confirm the purpose of the three adjacent manholes located in the north of site as these *may* indicate the presence of interceptor tank (which would be a potential source of contamination). If the purpose of these cannot be ascertained, it is recommended that the covers are lifted for inspection.

An asbestos survey should be undertaken prior to demolition of the buildings, and any asbestos removed from site in accordance with current best practice.

Services are recorded on site associated with the office buildings, workshops and the presence of the telecommunications compound and mast on site.

It would also be beneficial to obtain legible copies of the factual ground data relating to the adjacent former foundry site if possible.

A medium risk from unexploded ordnance was identified from UXO maps. A detailed UXO survey is recommended.

14.0 References

British Standard 10175, 2011, "Investigation of Potentially Contaminated Sites"

Barnsley Metropolitan Borough Council, <https://www.barnsley.gov.uk/barnsley-maps/barnsley-interactive-maps/> [Accessed 28/08/2017]

British Geological Survey, Geoindex www.bgs.ac.uk [Accessed 28/08/2017]

Environmental Agency (EA) 'What's in your backyard' interactive map: <http://maps.environment-agency.gov.uk/wiyby/> Accessed 28/08/2017

Joynes Pike & Associates Ltd, April 2006, Hough Lane, Wombwell Specification for Remediation

Joynes Pike & Associates Ltd, March 2007, Hough Lane, Wombwell Interim Validation Report

Hough Lane, Wombwell

Desk Study Report

FAIRHURST

Joynes Pike & Associates Ltd, February 2006, Hough Lane, Wombwell Consolidated Geo-Environmental Investigation Report

MAgiC, <http://www.magic.gov.uk/MagicMap.aspx> [Accessed 28/08/2017]

Drawings

117436-9000- Topographical Survey

117436-9100- Site Location Plan

117436-9101- Walkover Plan



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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION	
IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.	
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IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.	

Rev		Date	Description	Drawn	Checked	Approved	Notes		Legend		Survey Station Details		Project Title		Fairhurst	
							1) ALL SURVEY STATION INFORMATION TO BE CHECKED RELATIVE TO OTHER STATIONS AND RELATIVE TO ORDNANCE DATUM PRIOR TO USE.		9777 SURVEY STATIONS		STN EASTING NORTHING LEVEL		PROPOSED RESIDENTIAL DEVELOPMENT AT HOUGH LANE WOMBWELL, BARNSELY		88 Queens Road, BARNSELY, S43 4DQ	
							2) THIS TOPOGRAPHICAL SURVEY WAS CARRIED OUT BY FAIRHURST IN MARCH 2017.		BT TELECOM COVER		9001 1000.000 1000.000 100.000		Scale of 1:250		Tel: 01224 321 222 Fax: 01224 323 201	
							3) THIS TOPOGRAPHICAL SURVEY IS CARRIED OUT TO A LOCAL GRID. LEVELS ARE RELATED TO STATION 9001 WITH A GIVEN LEVEL OF 100.00m.		FL FLOOR LEVEL		9002 1107.210 1000.000 100.759		Drawing Title: TOPOGRAPHICAL SURVEY		For Information	
							4) LEVELS OMITTED FOR CLARITY ON DRAWING. LEVELS AVAILABLE ON LAYER "G-901-M FEATURE_LEVELS" IN SURVEY MODEL FILE.		GU GULLY		9003 901.718 974.591 95.166		Drawn: CM		Checked: FC	
									LP LAMP POST		9004 1007.640 951.471 98.381		Date: 06/04/17		Approved: ASK	
									MH MANHOLE		9005 999.071 935.144 98.365		Date: 06/04/17		Date: 06/04/17	
									TP TELECOM POLE		9006 1031.208 880.696 94.886		Drawing No: 117436/9000		Revision: -	
									UC UNIDENTIFIED COVER		9007 1043.821 922.769 96.634					
											9008 1028.256 942.312 98.208					
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											9010 1075.074 883.123 94.756					
											9996 1155.470 885.442 94.707					
											9997 1019.876 877.252 94.432					
											9998 1007.338 891.108 95.187					
											9999 1007.266 965.024 99.199					

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Rev.	Date	Description	Drawn	Checked	Approved
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Project Title:

PROPOSED RESIDENTIAL
DEVELOPMENT AT HOUGH LANE
WOMBWELL, BARNSELY

Drawing Title:

SITE LOCATION PLAN

FAIRHURST

88 Queens Road,
ABERDEEN, AB15 4YQ
Tel: 01224 321 222 Fax: 01224 323 201

Scale at A4: NTS	Status: For Information	
Drawn: RD	Checked: JB	Approved: NLT
Date: 28/08/17	Date: 28/08/17	Date: 30/08/17
Drawing No.: 117436/9100		Revision: —

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