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Report on Phase 1 Desk Top Study

Proposed Residential Development:
Land off Wombwell Lane,
Barsley,
S70 3NR

Chesham
Brighouse
Midlands
Sheffield
Teesside

For Ashmount Homes Ltd

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DESK TOP STUDY REPORT

B20556: Land off Wombwell Lane, Barnsley, S70 3NR

1 INTRODUCTION

This report is required to accompany a Planning Applications for a residential development of 16 dwellings.

1.1 Sources of Information

Information on the above site has been obtained from a full Envirocheck Report centred on the site, examination of all the currently available historic maps of the site, examination of the 1:50,000 British Geological Survey map of the area, Mining Report and a walkover survey.

2 THE SITE

The site is located on Wombwell Lane between the villages of Stairfoot and Wombwell, approximately 3.8km south-east of Barnsley.

2.1 Present Land Use/Walk Over Survey/Trees

A walk over survey was carried out on the 25th June 2015. The site was accessed via the vehicle access to the site on Wombwell Lane.

There is a two storey property located in the south-west corner of the site and a double garage located along the south-east boundary. Both buildings are in good condition but are to be removed to make way for the proposed development. Behind the existing dwelling there is a concrete slab with some small upstands which could possibly be an unfinished or the remains of an extension to the house or a new garage.

The remaining area of the site is mostly overgrown and in places filled with rubble and objects such as bricks, tyres and pieces of wood. There is also a track made up of objects such as gravel and bricks to give access the north of the site from the entrance. There appears to be areas of deposited material to the northern end of the site. The site is flat in most places except for an embankment in the centre of the site, possibly where the old railway line used to run. The site also drops quickly at the north of the site just before reaching the boundary towards the Trans Pennine Trail. The boundaries to the site are mainly bushes and trees except for a blockwork wall to the north-west boundary and a palisade fence to the north-east. There are two separate spoil heaps towards the north of the site. Near the spoil heap there is also two gas canisters but there was no signs of leakage on the day of the walk over survey. There is no standing water on site and no signs of previous flooding.

A new access to the site will be created along the south-west boundary adjacent to the existing gated entrance. This will provide a through road to the northern end of the site and will require the existing brick wall to be knocked down to accommodate the new opening.



Fig 1: Location Plan – Wombwell Lane, Barnsley (Approximate site boundary shown by red line)



Fig 2: Photograph showing the entrance to the site



Fig 3: Photograph showing the garage along the east boundary



Fig. 4: Photograph looking north showing the boundary wall and palisade fence



Fig. 5: Photograph showing general objects across the site



Fig 6: Photograph showing an overgrown area in the centre of the site



Fig 7: Photograph looking south showing the conifer boundary



Fig 8: Photograph looking south-east at assumed old or unfinished foundations

3 SITE HISTORY

Examination of the published Ordnance Survey maps of the area revealed the following:

Map		Features	
Year	**Scale**	**On Site**	**Off Site**
1854-1855	1:10.560	The site is undeveloped.	There is a railway along the north-east boundary of the site noted as 'South Yorkshire Railway'. Dearne and Dove canal approximately 300m to the east. Yew plantation shown to the north.
1892-1893	1:2,500	Railway line built on the site running along the north boundary.	Woodbourn Junction located to the north-west of the site for the connection to the main railway line. New railway line cutting across the site heads south.
1894	1:10,560	Unchanged.	Railway line heading south noted as 'Aldham Curve'.
1906	1:2,500	Unchanged.	Industrial development to the east including Stairfoot Brick Works. Clay pit shown north-west of the site.
1907	1:10,560	Unchanged.	Unchanged.
1931	1:2,500	House built in the south-west corner of the site.	Clay pit to the north-west expanded to join the boundary of the site, another clay pit shown to the north on the opposite side of the railway line. Allotment gardens shown to the east.
1932-1932	1:10,560	Unchanged.	Unchanged.
1938	1:10,560	Unchanged.	Unchanged.
1938-1948	1:10,560	Unchanged.	Unchanged.
1948	1:10,560	Unchanged.	Unchanged.
1955-1956	1:10,000	Unchanged.	Unchanged.
1962	1:2,500	House on site noted as 'Clae-Cott'.	A house noted as 'Lynden Lee' built adjacent to the site (south-east). A pond is shown within the clay pit to the west.
1966	1:10,000	Unchanged.	Housing development to the south-east.

Map		Features	
Year	Scale	On Site	Off Site
1960-1982	1:2,500	Railway line running through the site labelled as 'Dismantled Railway' Another two buildings built on site, one along south-east boundary and one in the centre of the site.	Further housing development to the south-east of the site up to the site boundary. Builder's yard shown to the west.
1974	1:10,000	No information	No information
1980	1:2,500	Building along south-east boundary now not shown.	Pit to the north now noted as 'pit (disused)'
1968-1984	1:2,500	Unchanged.	Pit to the north-west now noted as 'pit (disused)'. Pit to the north now contains a refuse tip and osiers.
1980-1984	1:10,000	Unchanged.	Unchanged.
1983	1:1,250	No information	No information
1989	1:10,000	No embankments for dismantled railway shown.	Property built where railway ran, gardens extended to cover the area where the railway was.
1990	1:1,250	No information	No information
1993	1:1,250	Building along south-east boundary shown again.	Property built where railway ran noted as 'Ash Haven'.
1993	1:10,000	No information	No information
1995	1:1,250	No information	No information
2006	1:10,000	Building in the centre of the site now not shown.	Railway running parallel to north-east boundary now dismantled. Site adjacent noted as 'depot'.
2015	1:10,000	Unchanged.	Unchanged.

3.1 Site History Summary

The historic map study shows that the proposed site is undeveloped on the earliest map (1854-1855). The earliest development was shown on the map of 1892-1893 when a railway line is shown running within the north-east boundary line, this was later noted as Aldham Curve, and it appears to have been built in a cutting through the site. The first housing development was shown on the map of 1931 when the building that currently stands in the south-west corner was shown. The railway line was dismantled in 1960-1982 and two more buildings was built on the same map. Off-site the South Yorkshire Railway was shown on the earliest map until it got dismantled in 2006. Clay pits were shown to the north-west and to the north, these were constructed in 1906 and 1931 respectively. The first housing development near the site wasn't until the 1960's when there was a development to the south-east. Both pit were then noted as disused in the 1980's and used as a refuse tip.

4 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

4.1 Geology

Examination of the published geological map of the area indicated the property is situated in an area of Sandstone over Middle Coal Measures, shales and mudstone.

There is also a geological fault crossing the site from west to east with the down throw side to the north. This appears to be located towards the south of the site.

4.2 Mining History

A Mining Report for the area was obtained and this showed there are no previous coal workings under the site in the likely zone of physical influence on the surface.

The property is **not** situated within the boundary of a former opencast coal mining site, within 200m of a currently operating opencast coal mining site or 800m of the boundary of a future opencast coal mining site.

There is no knowledge of any shafts or adits within 20m of the site and no evidence of coal mining related subsidence claims in relation to the property in the past 10 years.

The property is situated on or adjacent to an area of former quarrying.

4.3 Hydrology /Hydrogeology

The Environment Agency ground water vulnerability map records the bedrocks in this area to be a Secondary A Aquifer.

The Environment Agency define a 'Secondary A Aquifer as

> 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.'

A worse case vulnerability classification of a Minor Aquifer (Low) has been assumed until proven otherwise. These are soils which readily transmit liquid discharges because they are either shallow, or susceptible to rapid by-pass flow directly into the rock, gravel or groundwater.

The nearest surface water feature is 159m south-west of the site. This is a tertiary river.

The nearest water abstraction licence is 992m to the east of the site at Low Laithes, Ardsley, Barnsley and is used for General Farming and Domestic. There are 5 other listed water abstraction points within 2000m of the proposed development.

4.4 Soil Chemistry

British Geological Survey (BGS) soil chemistry data sheets were obtained which present information on the topsoil concentration of five potentially harmful elements (PHEs) which under certain circumstances can pose a significant health risk to plants, animals and humans.

4.4.1 Arsenic

The estimated Arsenic values for the site are 25-35mg/kg. The recommended Soil Guideline Value (SGV) for residential end use is 32mg/kg. Soil chemical testing will determine the risk (if any) of Arsenic contamination.

4.4.2 Cadmium

The estimated Cadmium values for the site are <1.8mg/kg. The recommended Soil Guideline Value (SGV) for residential end use is 10mg/kg.

4.4.3 Chromium

The estimated Chromium values for the site are 90-120mg/kg. The recommended Soil Guideline Value (SGV) for residential end use is 200mg/kg.

4.4.4 Lead

The estimated Lead values for the site are <150mg/kg. The recommended Soil Guideline Value (SGV) for residential end use is 450mg/kg.

4.4.5 Nickel

The estimated Nickel values for the site are 30-45mg/kg. The recommended Soil Guideline Value (SGV) for residential end use is 130mg/kg.

5 INFORMATION HELD BY STATUTORY AUTHORITIES

This section details any relevant information held in the registers maintained by statutory bodies as identified in the Envirocheck Report.

5.1 Landfill Sites

There are two historical and two local authority recorded landfill sites on site. They are:

i. Deposited waste including inert and commercial waste by William Gosney Limited. Last input date 31/12/1989. (historical)
ii. Waste and liquid sludge by Yorkshire Brick Company. Last input date 31/12/1982. (historical)
iii. Waste type not supplied by Barnsley MBC, Environmental Health and Trading (LA)
iv. Waste type not supplied by Barnsley MBC, Environmental Health and Trading (LA)

Soil chemical testing will determine the risk (if any) of contamination. There are another two landfill sites within 250m of the site

5.2 Waste Management Facilities

There is one waste management facility within 500m of the site. This is located at Stairfoot North Quarry, Wombwell Lane, Stairfoot, S71 5BZ, and 353m north-west of the site. License status: issued.

5.3 Contaminated Land Register Entries and Notices

The Envirocheck Report does not identify any Contaminated Land Register Entries and Notices within 2000m of the site.

5.4 Local Authority Pollution Prevention and Controls

There are no Local Authority Pollution Prevention and Controls within 250m of the site.

5.5 Integrated Pollution Control (IPC) Authorisations

There are no Integrated Pollution Control (IPC) Authorisations within 2000m of the site.

5.6 Integrated Pollution Prevention and Control Permits (IPPC)

There are no Pollution Prevention and Control Permits (IPPC) within 2000m of the site.

5.7 Pollution Incidents

There are two pollution incidents within 500m of the site. One incident is minor with one being significant. The significant incident was surcharged sewage at Aldham Crescent, 469m south-east into freshwater stream/river.

5.8 Discharge Consents

There is one discharge consent within 250m of the site. This is sewage discharge from a pumping station operated by Yorkshire Water Services Ltd located 227m west of the site.

5.9 Contemporary Trade Directory Entries

There are 6 contemporary trade directories within 250m of the site. These are:-

i. 55m west – Wombwell Lane Car Exchange, used car dealers (inactive)
ii. 74m west – ASR Autos Ltd, car dealers
iii. 133m south-east – Ids Trade Frames, PVC-U manufacturers and suppliers
iv. 171m south-east – Brian Cook, domestic appliances (inactive)
v. 213m south-east – Advance Auto Services, used car dealers (inactive)
vi. 235m north-west – Lafarge Readymix, concrete & mortar read mixed

5.10 Fuel Sites

There are two fuel stations with 2000m of the site. One open and one obsolete. The open fuel station is Tesco Barnsley Extra located 529m north-west.

5.11 Radon

The property is in an intermediate probability radon area, as between 1 and 3% of homes are above the action level. **No** Radon protection measures are necessary.

5.12 Environmentally Sensitive Areas

5.12.1 Flooding

The Agency and Hydrological (Flood) map shows that the site is not in an area that is affected by flooding from rivers or seas.

5.12.2 Nitrate Vulnerable Zones

The site is within a nitrate vulnerable zone. This would only be applicable to agricultural usage of the site.

6 ADDITIONAL INFORMATION

6.1 Services

These have not been examined as part of the Phase 1 report. Enquiries should be made to ensure that the site can be fully serviced and that there are no restrictions or easements across the site which would impede the proposed development.

6.2 Site Investigation

No intrusive investigations have been undertaken.

7 SUMMARY

From the walk over survey, historic map study and examination of information held by the statutory authorities the site has been previously used as part of a railway line known as 'Aldham Curve'. Then in 1931 the dwelling that currently still stands was built and later on the railway was dismantled. The site has also been used in the past as a landfill site for waste such as sludge and deposited inert and commercial waste. The surrounding area has been used as clay pits and brick works in previous years. The clay pit are now all disused.

8 UK CONTAMINATED LAND LEGISLATIVE FRAMEWORK

8.1 Legislation on Contaminated Land

This section provides a conceptual model and qualitative assessment of the potential risks posed to human health and environmental receptors from potential on-site and off-site sources of contamination. The assessment is presented as a 'source-pathway-receptor' model in accordance with Part IIA of the Environmental Protection Act 1990.

Part IIA of the Environment Protection Act, 1990, which was enacted by section 57 of the Environment Act 1995 and the associated Contaminated Land (England) Regulations (SI 2000/227) was introduced on 1 April 2000. It created a new statutory regime for the identification and remediation of land where contamination poses and unacceptable risk to human health and environment.

Part IIA provides a statutory definition of contaminated land:

'any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is a significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'.

To determine whether land falls under the Part IIA definition of contaminated land the site should be evaluated in the context of a risk based framework. The assessment of contaminated land is typically a two-phase process which is initially based on a qualitative assessment of the likelihood of complete pollution linkages, with a quantitative element which seeks to determine the degree and the significance of the harm. Land is only defined as 'Contaminated Land' if a 'significant pollutant linkage' is present.

A pollutant linkage must comprise the following:

Source - a contaminant at a concentration capable of causing adverse health or environmental effects.

Receptor - there must be a human or environmental receptor present, which may be at risk of harm or impact from the source.

Pathway - there must be an exposure pathway through which the receptor comes into contact with the contamination source.

Each of these elements can exist independently but they create risk only when they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway.

The responsible authority then needs to consider whether the identified pollution linkage:

- is resulting in significant harm being caused to the receptor in the pollutant linkage;
- presents a significant possibility of significant harm being caused to that receptor;
- is resulting in the pollution of controlled waters, which constitute the receptor; or is likely to result in such pollution.

If a pollutant linkage is demonstrated, then the Part IIA legislation provides powers for remedial action to be enforced by the Local Authority in whose area the contaminated land is situated.

9 CONCEPTUAL MODEL

9.1 General

This section uses information the sources noted in section 1.1 to provide a conceptual model and qualitative assessment of the potential risks posed to human health and environmental receptors from potential on-site and off-site sources of contamination. The assessment is presented as a 'source-pathway-receptor' model in accordance with Part IIA of the Environmental Protection Act 1990.

9.2 Potential On-site Sources of Contamination

Potential on-site sources of contamination are from past use of the site and the soil heaps which are currently on site.

9.3 Potential Off-site Sources of Contamination

Potential off-site sources of contamination are from the clay pits the surrounded the site in past years.

9.4 Receptors

The primary receptors, considered to be potentially at risk from any identified contamination are as follows:

Human Health

- Construction workers during the redevelopment phase.
- Residential end users.

Controlled Waters

- The nearest controlled surface water being 159m south-west of the site. This is a tertiary river.
- Groundwater stored within the Secondary A Aquifer underlying the site.

9.5 Pathways

Potential contaminant migration pathways considered relevant to the site are:

Human Health

- Ingestion of contamination soils and dust particles.
- Direct physical contact with near surface soils and contaminated dust particles.
- Inhalation of vapours and gases, migrating vertically into the atmosphere.

Controlled Waters

- Contaminants in Made Ground impacting groundwater underlying the site via vertical leaching mechanisms.
- Contaminants in Made Ground impacting surface water downhill of the site via lateral leaching mechanisms.

9.6 Pollutant Linkages

A 'pollutant linkage' describes the relationship between a contaminant, a pathway and a receptor, a 'pollutant' being the contaminant in a pollutant linkage. A contaminant, pathway and receptor must all be present for a pollutant linkage to exist, which forms the basis for determination that a piece of land is Contaminated Land. Potential sources, pathways and receptors have been assessed to present below a list of potential significant pollutant linkages to be considered.

Potential Source-Pathway-Receptor Linkages for Human Health Risk Assessment

Source	Pathway	Receptor	Risk
Contaminated soils	Ingestion of soil	On site female child – 6yrs old	YES
		On site construction worker	YES
	Ingestion of household dust	On site female child – 6yrs old	YES
	Ingestion of contaminated vegetables	On site female child – 6yrs old	YES
	Ingestion of soil attached to vegetables	On site female child – 6yrs old	YES
	Dermal contact	On site female child – 6yrs old	YES
		On site construction worker	YES
	Dermal contact with household dust	On site female child – 6yrs old	YES
	Inhalation of fugitive soil dust	On site female child – 6yrs old	YES
		On site construction worker	YES
	Inhalation of fugitive household dust	On site female child – 6yrs old	YES
	Inhalation of vapours in outdoor air	On site female child – 6yrs old	YES
		On site construction worker	YES
	Inhalation of vapours in indoor air	On site female child – 6yrs old	YES
	Direct contact	Services and Infrastructure	YES
		On site female child – 6yrs old	YES
		On site construction worker	YES
Ground Gas and Mine Gas	Vertical and lateral Migration	End Users	YES
		Residential Housing	YES
		Services and Infrastructure	YES

Potential Source-Pathway-Receptor Linkages Controlled Water Risk Assessment

Source	Pathway	Receptor	Risk
Contaminated soils	Leaching Mechanisms	Groundwater stored in the Secondary A Aquifer. Nearby watercourse.	YES
Contaminated groundwater	Vertical migration	Groundwater stored in the Secondary A Aquifer. Nearby watercourse.	YES

The conceptual model has been refined and the plausible pollutant linkages evaluated against generic criteria in accordance with CLR 11 – 'Model Procedures for the Management of Land Contaminations'.

There is a pollutant linkage from source, pathway and receptor. Contamination testing of the soils and gas testing will determine the risk (if any) to receptors.

9.7 Risk

The risk in this case is expected to be **HIGH,** subject to further investigation.

Soil chemical testing and further investigation into the neighbouring landfill site will determine the risk (if any) to the proposed development.

10 CONCLUSIONS OF THE DESK STUDY

- A review of the historic maps shows that the site was not developed until 1892-1893 when the Aldham Curve was built across the site. The property that now stands was developed in 1931. The surrounding around historically was made up of clay pits which are now disused.

- Potential on sites sources of contamination are from past use of the site as a landfill and the soil heaps which are currently on site.

- Potential off site contamination sources are from the clay pits that surrounded the site in past years that have been used as landfills.

- The soil chemistry data sheets show estimated natural values for Cadmium, Chromium, Lead and Nickel in the top soil to be below the recommended SGVs for residential end use. However, Arsenic is above therefore soil chemical testing will determine the risk (if any) of Arsenic contamination.

- The nearest active landfill site is 691m from the site.

- There is a geological fault crossing the site.

- The site overlies a Secondary A Aquifer.

- The Agency and Hydrological (Flood) map shows that the site is not in an area that is affected by flooding from rivers or seas.

- No radon protection measures are necessary.

- Active pollutant linkages at the site are considered to be present.

11 RECOMMENDATIONS

1. Trial pits will be required to determine the near surface soils and depth to suitable foundation for the proposed structure. If the subsoils are granular in nature it may be necessary to investigate the site by boreholes to obtain SPT values for assessing the allowable bearing pressures.

2. A trenching exercise should be carried out to identify the geological fault crossing the site.

3. Trial pits should be excavated at appropriate locations around the site and samples of soil taken for contamination testing. Samples should be taken from the near surface soils and testing should comprise of a full contaminations suite which will include CLEA Metal Suite plus Copper and Zinc, the Inorganic Suite, hydrocarbons (speciated PAH and carbon bonded TPH). In addition asbestos should be tested for due to the previously demolished buildings on site.

4. Soils at proposed foundation level should be tested for sulphates and pH, in order to determine the concrete classes of buried concrete.

5. Any water encountered within the trial pits should be sampled and taken for contamination testing.

6. Boreholes may be required in the area of the filled railway cutting to determine the depth to suitable strata if the trial pits cannot determine this.

7. Should clay soils be encountered, then these should be tested for Plasticity Index and Moisture Content.

8. A gas monitoring exercise should be carried out beneath the site to identify any potential landfill gases. Alternatively further information on the nature of the landfill site can/may be obtained from the local council for a small fee and a gas monitoring exercise undertaken if required.

9. Provision should be made for locating existing services beneath the site during the intrusive investigations. The hand digging of the top metre should be considered.

10. During construction and reduced level dig, careful observation should be made to identify any signs that the soils could be contaminated in terms of appearance or odour. Should this be encountered, then the Engineer must be informed immediately.

11. Should any soils be imported on to site, then these should come from a supplier who can provide necessary testing certificates or the soils should be sampled and tested, to verify that the soils are suitable for their intended use.

12. Construction workers should be protected from exposure to contaminated soils with the provision of all necessary personal protective equipment.