

LCRM: Stage 1 Risk Assessment

LAND TO REAR OF 35 PEEL STREET, MARSDEN

Project Ref: GUK-0923-03

For: Jennie Steele



GROUNDSMITHS
GEOTECHNICAL ENGINEERS



CLIENT:

Jennie Steele

PROJECT:

Residential Development

SITE REFERENCE:

**Land to rear of 35 Peel Street
Marsden**

REPORT REFERENCE:

GUK-0923-03/Rp-001



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SUMMARY & RECOMMENDATIONS

This summary presents the salient points of the report but should not be referred to in isolation of the body text. There will be other information contained within the report which puts into context the findings of the Executive Summary. No reliance should therefore be placed on the Executive Summary until the report has been read in full. The recommendations given are considered reasonable based on available information and the assessment of the Site as carried out by Groundsmiths (UK) Ltd at this time.

1 ENVIRONMENTAL CONSTRAINTS

Ground Investigation: No formal environmental intrusive ground investigation is considered necessary to satisfy planning given the current status and proposed end use of the Site in relation to the identified levels of risk.

Biogenic Ground Gases: Elevated concentrations of carbon dioxide and/or methane are not expected given the Site's geological and environmental setting. A Characteristic Situation 1 determination for the Site is postulated.

Radon: No radon precautions are indicated to be required in construction.

General Soil Contamination: No particular risk to Site end users in the post-development case is expected on the basis of the Site's history and continued use in the residential setting. Testing and risk assessment should only need to be carried out if currently unforeseen areas of grossly contaminated soil are encountered during enabling works or construction.

Asbestos in Soil: An overall low risk is expected in relation to asbestos containing materials within the on-site soils. No further assessment is considered necessary unless evidence of asbestos containing materials is recorded during enabling works or construction.

Remediation Requirements: An LCRM Stage 3 Remedial Strategy would need to be issued to the Local Planning Authority if any soil remediation was ever found to be required. Validation reporting would be needed on a separate basis, once any remedial works had been completed.

Risk to Construction Workers: Consideration should be given to the level of risk workers involved with in-ground construction will be exposed to given the potential for the release of dusts to air at that time. All works to be undertaken should be specifically assessed as part of a health and safety evaluation to mitigate the exposure of workers to any contaminated dusts as may be generated during development.

Controlled Waters Receptors: Risk from the off-site discharge of any leachable contaminants is considered to be very low. No further assessment is considered necessary.

Invasive Plants Species: Risk from invasive plant species is not expected but should be independently confirmed as required.

UXO: Further assessment with respect to unexploded ordnance risk is not considered necessary.

Archaeology: The need for archaeological monitoring has not been identified within the remit of this assessment.

2 GEOTECHNICAL & GENERAL DEVELOPMENT CONSTRAINTS

Ground Investigation: A limited phase of geotechnical assessment is recommended for the Site, although this is at the discretion of the Client and their designing engineer. This data could be used to inform foundation and ground slab design for instance.

Buried Concrete: Protection to buried concrete products would be required where foundations come into contact with soils that exhibit levels of sulphate above DS1, although final design parameters should be discussed with the designing engineer. Laboratory testing of soils should be completed, as required, to inform the decision making process.



Anticipated Foundation Type: Traditional spread foundations are considered likely to be acceptable, although consultation should be made with the designing engineer with respect to the foundation solution to be adopted. Assessment of the underlying soils should be completed as required.

Anticipated Ground Slab Type: Allow for suspended ground floor construction with subfloor ventilation at this stage. A ground bearing slab may be suitable, although consultation with the designing engineer will need to be made in this regard.

General Ground Stability: Global slope stability problems are not expected.

Heave Precautions: To mitigate against heave, foundations would need to be constructed in accordance with current guidelines where they are found to lie within influencing distance of removed, existing or proposed planting when in cohesive soils. Laboratory testing of soils should be completed, as required, to inform the decision making process.

Excavation Obstructions: Due consideration shall be given to the likely presence of shallow competent bedrock as this could cause excavation problems for foundations and/or where new deep service connections need to be provided.

Potable Water Supplies: Protective measures are unlikely to be required. It is expected for standard PE pipework to be acceptable, although this should be confirmed with the water provider. Laboratory testing should be undertaken as required.

Surface Water Drainage: Should soakaways be proposed, infiltration testing in accordance with BRE365 would need to be completed. It should be noted, however, that it would not be appropriate for unstable, potentially unstable, or contaminated soils to receive point-source flows of water from dedicated soakaways.

Pavement: It would be expected that the excavation and replacement of any unsuitable material with suitably compacted engineered fill would be undertaken for areas of parking and access. Frost susceptibility should be assumed.

3 MINING LEGACY CONSTRAINTS

Surface Ground Workings: None identified.

Underground Mine Workings: None identified.

Mine Entries: None identified.

Ground Treatment: None required.



1 INTRODUCTION

1.1 Appointment

Groundsmiths (UK) Ltd ('Groundsmiths') were appointed by Jennie Steele (the 'Client') to provide professional services in relation to the assessment of land located to the rear of 35 Peel Street, Marsden, Huddersfield (herein referred to as the 'Site').

Groundsmiths have prepared this report for the sole use of the Client that commissioned it in accordance with the agreement under which our services are performed. No other warranty, expressed or implied, is made as to the professional advice included in this report. Any unauthorised third parties using the information presented in this report do so entirely at their own risk and are duly excluded from any warranty, duty of care or skill.

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1.2 Report Context and Status

It is understood that the Client intends to redevelop the Site for residential end-use, with this comprising the construction of a single detached dwelling with associated garage/parking and garden curtilage.

This report provides a baseline assessment of the anticipated land contamination conditions that could potentially be encountered at the Site. The assessment given herein applies to the Site area as a whole and follows a review of currently available third-party environmental, geological, and geo-environmental records. All works have been completed in accordance with the general requirements of BS10175 ^[1], BS5930 ^[2], and Land Contamination Risk Management ('LCRM') guidance ^[3] (which replaced CLR11 in October 2020).

The assessment includes for potential sources of historic ground contamination, its anticipated impact on sensitive receptors, and identifies where any further risk assessment or in-ground investigative works are required to facilitate development within the framework of a generic residential with home-grown produce exposure scenario as defined by the Environment Agency ^[4].

Notwithstanding the above, general comment is also made in relation to any pertinent construction matters that may apply.

Interpretation and recommendations given in this report should not be assumed valid for adjacent areas of land, or for alternate land use. Should the proposed Site usage change, the recommendations and conclusions presented in this report will need to be re-assessed in accordance with current guidance.

1.3 Objectives

The primary objectives of this assessment were to:



Obtain current information from published sources with respect to any environmental designations, SSSI, visual and cultural designations, and agricultural and/or habitat designations as may exist on Site or within the immediate area of development.

- Identify and assess the potential for any ground related geotechnical hazards, including the potential for where any mining legacy, infilled ground or slopes may represent constraints to the proposed development.
- Identify and assess the potential for any ground related environmental hazards, including the potential for where any ground gas and/or vapour regime may represent constraints to the proposed development.
- Define a preliminary Conceptual Site Model ('CSM') of plausible source-pathway-receptor linkages and undertake a qualitative assessment to evaluate the level of risk associated with each linkage in accordance with the proposed development end use scenario.
- Outline preliminary development recommendations, and
- Provide advice on any additional stages of LCRM assessment that may need to be completed to satisfy the concerns of the regulatory authorities, this including Stage 1 generic or detailed quantitative risk assessment with ground investigation, Stage 2 options appraisal ^[5], and/or Stage 3 remedial actions ^[6].

1.4 Scope of Works

Assessment undertaken within the context of this report, over and above any other previously cited documentation, comprised a review of the following information sources:

- British Geological Survey ('BGS') 1:50,000 scale series (solid & drift edition) geological mapsheet ^[7]
- British Geological Survey Onshore GeoIndex records database ^[8]
- Emapsite - Enviro+GeoInsight Data Report (Appendix A) ^[9]
- Emapsite - Historical Ordnance Survey ('OS') Plans (Appendix B) ^[10]

1.5 Previous Ground Investigation Reports

At the time of writing, Groundsmiths are not aware of any other historical assessment that relates to the Site.

1.6 Limitations of Study

This appraisal has been undertaken subject to the limitations detailed in Section 8 and any other limitations stated specifically in the report text. Where further works are identified, these shall be completed within the framework of LCRM, any other current guidance, and/or specific regulatory requirements.

No intrusive ground investigation works have been completed within the scope of this study.



2 SITE SETTING

2.1 Details & Description

A general summary of the Site’s setting is given in Table 2.1, below.

Table 2.1 - General Site Details

National Grid Reference	The National Grid Reference for the Site is indicated to be 405017mE 411556mN.
Current Land Use	The Site comprises an area of former garden curtilage, with this consisting of a grassed (lawned) section and a small tarmac hardstand. Within the boundary to the Site is also a large, detached structure which is currently used for the storage of some old furniture and other residential paraphernalia. A general photographic record of the Site is provided as Plates 1 to 8.
Ground Elevations	Topographic data for the Site indicates that it lies broadly at 188m AOD.
Invasive Species	No Japanese Knotweed was observed during the Site walkover. Further independent assessment should be undertaken as required.

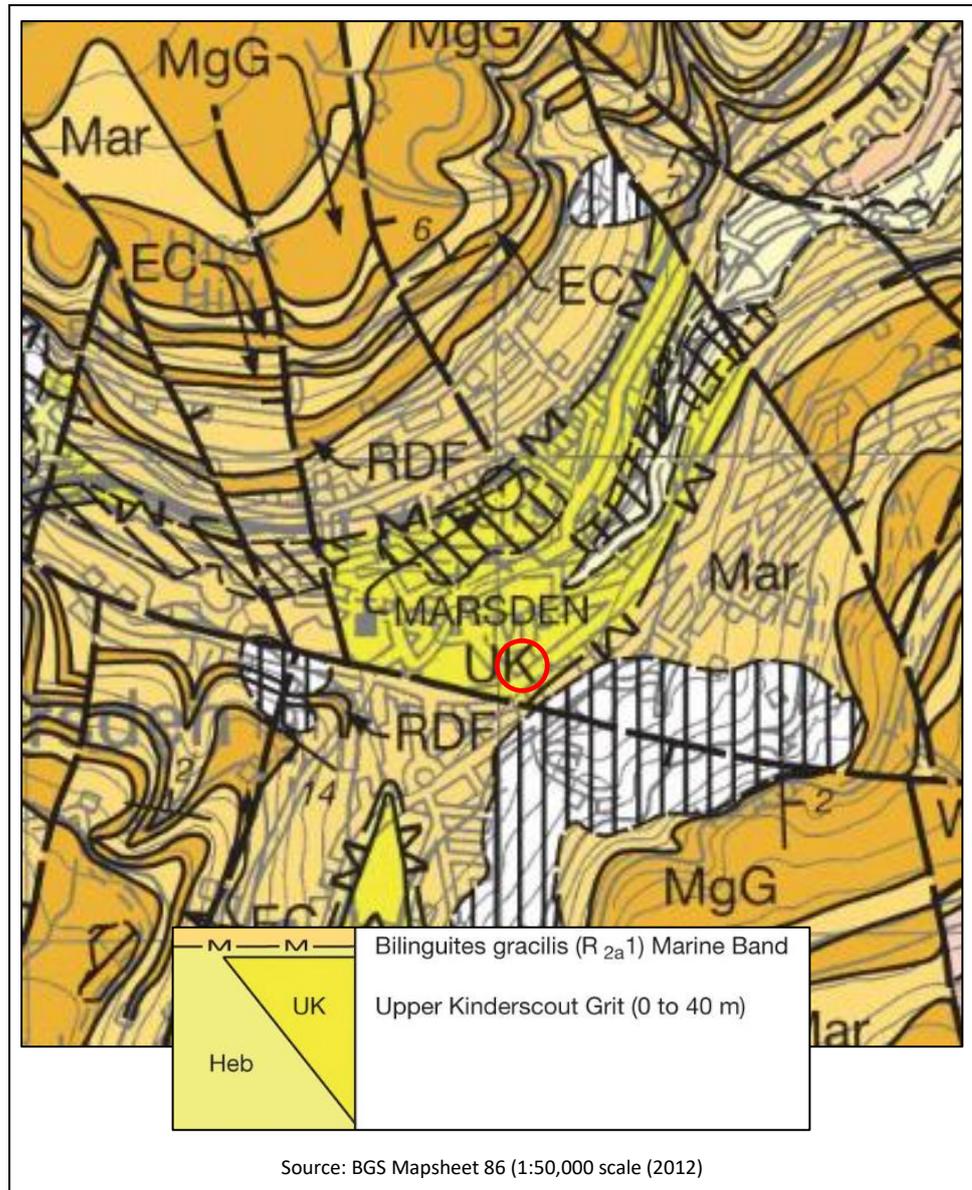
2.2 Anticipated Geological Conditions

A summary of salient geological data for the Site is given in Table 2.2, below and overleaf.

Table 2.2 - Published Geological Conditions

Radon	Third party data suggests that less than 1% of properties exceed the Radon Action Level. No radon protective measures are indicated to be required in new construction on this basis.
Recorded bedrock Faults & other Linear Features	The nearest recorded fault line is indicated from a distance of 55m to the south, with this being the inferred position of a normal geological fault (downthrown to the south).
Infilled or Made Ground Deposits	The nearest recorded area of artificial soil is indicated from a distance of 197m to the north-west. This appears to be associated with former industrial works that were reclaimed and is now public open space and land owned by the National Trust.
Superficial Geology	Records indicate there to be no superficial deposits present beneath the Site, with the nearest being 197m to the north-east.
Solid Geology	The solid geology underlying the Site is indicated to comprise sandstone of the Upper Kinderscout Grit which forms part of the Hebdon Formation (Carboniferous - Millstone Grit Group). These sandstones are typically medium to very coarse grained, massive or cross bedded, and contain a relatively high feldspar content. They are frequently found to contain layers of rounded pebbles, but may also be encountered alongside interbedded and discontinuous horizons of sandy shales, mudstone and siltstone. BGS data suggests that the area around Marsden is heavily faulted. On this basis, there is no reliable bedrock dip data that may be reported.

Table Contd./



Natural Cavities	There are no recorded natural cavities within at least 500m.
Mining Cavities	There are no records of mining cavities within at least 1km.
Coal Mining	Coal Authority data indicates that the Site does not lie within a defined coalfield area. Risk associated with mining legacy is not expected on this basis.
Non-coal Mining	The potential for difficult ground conditions associated with vein mineral mining is indicated in the GroundSure report to be unlikely and/or at a depth where it need not be considered further.
Other Mining	There are no records of gypsum, tin, or clay mining on-Site.

Table Contd./



Hydrogeology	<p><u>Groundwater Vulnerability Zones</u>: The soil/surface leaching potential is classed as being low (<40% infiltration and >550mm/year dilution), whilst the vulnerability of the bedrock geology is indicated to be medium. Groundwater flow through the bedrock would be via secondary porosity.</p> <p><u>Groundwater Vulnerability – Soluble Rock Risk</u>: No soluble rocks are identified as being present beneath the Site.</p>
Hydrology	<p>There are no recorded surface water features within at least 91m.</p> <p>The Site is indicated to be situated on or within close proximity to the boundary between two Water Framework Directive Surface Water Body catchments, these being the:</p> <ul style="list-style-type: none"> • Wessenden Brook from Butterly Reservoir to River Colne (Ref. GB104027063190); • Colne from Wessenden Brook to River Holme (Ref. GB104027063330). <p>Furthermore, the Site is indicated to lie within a Water Framework Directive Groundwater Body Catchment. Data provided by the Environment Agency ^[11] indicates that the groundwater body associated with the 'Aire & Calder Carboniferous Limestone / Millstone Grit / Coal Measures' achieved an overall classification of 'Poor' in 2019.</p>

2.3 Designations

The Enviro+GeoInsight report provides details on property-specific environmental designations in addition to other potential actions associated with non-environmental search returns such as planning constraints.

The following salient information is presented in Table 2.3, below and overleaf.

Table 2.3 - Summary of Designations & Other Potential Actions

SSSI	There are no records relating to statutory protection sites within 500m.
Ramsar	There are no records relating to conserved wetland areas under the Convention of Wetlands of International Importance within 2km.
SAC	There are no records of Special Areas of Conservation having been designated under the EC Habitats Directive within 500m.
SPA	There are no records of sites having been classified by the UK Government under the EC Birds Directive within 500m.
NNR	There are no records relating to important natural or semi-natural terrestrial ecosystems within 2km.
Nature Reserves	There are no local nature reserves within at least 2km.
Green Belt	There nearest area of greenbelt is the 'South and West Yorkshire' which is present from 131m to the south-east.
Nitrate Sensitivity	There are no records relating to nitrate sensitive areas within at least 2km.

Table Contd./



Nitrate Vulnerability Zones	There are no records relating to nitrate vulnerable zones within at least 2km.
Visual & Cultural Designations	There are no world heritage sites, areas of outstanding natural beauty, national parks, scheduled ancient monuments, or registered parks/gardens within at least 250m. The Site does, however, lie within the Marsden conservation area.
Habitat Designations	<p>With respect to priority habitat inventory, deciduous woodland is indicated from a distance of 170m to the north-east.</p> <p>With respect to habitat networks, the Site is indicated to lie within Network Enhancement Zone 2. Although no specific details are given, Zone 2 (as defined in the National Habitat Network Maps, Natural England, 2020) refers to land that connects existing patches of primary and associated habitats but is less likely to itself be suitable for the creation of a primary habitat.</p> <p>There are no records of open mosaic habitats or limestone pavement orders within at least 250m.</p>
Archaeology	The potential for below-ground archaeology has not been identified within the remit of this study.
UXO	Preliminary information obtained from Zetica (https://zeticauox.com) suggests that the Site lies within a low risk zone from Unexploded Ordnance (UXO). No further assessment is considered likely to be required.

2.4 Environmental Records

A summary of salient published environmental data is presented in Table 2.4, below and overleaf.

Table 2.4 - Environmental Data

Landfill & Waste Sites	Other than for a record associated with a potential former waste site located at Bank Bottom Mills, Marsden (c.1985?), there are no other records relating to past, recent, or active sites within 250m.
Historical Industrial Land Use	Within 250m of the Site, records indicate that local industrial works include a smithy, unspecified works, a gas works, unspecified mills, a canal, and various tanks. The nearest of these was the smithy, at a reported distance of 1m to the south.
Abstractions	There are no potable or groundwater abstractions within 2km. For surface water, the nearest recorded abstraction is indicated to be from the River Colne, 81m north-east.
Public Register of Contaminated Land	There are no recorded sites within 500m having been designated as Contaminated Land under Part 2A of the Environmental Protection Act (1990).
Flooding	Assessment of risk against flooding events is not within the remit of this study, so specialist advice should be sought as required. It is noted, however, the Site does not lie within or partly within either a Zone 2 or Zone 3 (fluvial/tidal model) flood area.

Table Contd./



	The highest risk from on-Site surface water flooding is indicated to be negligible, whilst within 50m it is reported as being 1 in 250 years (0.3-1.0m). For groundwater flooding, risk for both on-Site and within 50m is indicated to be negligible.
Radioactive Substances	There are no live radioactive substance authorisations within 500m.
Dangerous or Hazardous Sites	There are no COMAH recorded sites within 500m.
Historical Fuel Sites	There are no records of historical petrol stations within 500m.
Historical Garages	Historical garage sites are indicated at a distance of 110m south-west, 302m north-east and 365m north-east.
National Grid	There are no records relating to National Grid high pressure gas transmission pipelines or high voltage underground electricity transmission cables within 500m.
Mine Gases	Risk associated with mine gas emission requiring action by the Coal Authority is not expected.

2.5 Site History

It is not the intention of this report to reproduce or describe in detail all of the changes that may have occurred on, or within a radius of 250m to the Site, although a general review of available historical Ordnance Survey ('OS') maps has been undertaken to identify any potentially significant contaminative former land-uses that could impact upon the proposed development. A summary of the historical land use at the Site and within its surrounding area is presented in Table 2.5, below and overleaf.

Table 2.5 - Summary of Historical Ordnance Survey Features

Year	Principal On-Site Features	Principal Off-Site Features
1854-1892	The first edition OS plans show the Site to be undeveloped.	The 1854-1892 OS plans show the surrounding land to largely comprise undeveloped scrub, with various nearby buildings consisting of a school, a chapel, and some terraced dwellings. From a distance of c.100+m, development includes a gas works, Marsden Foundry, and some woollen mills.
1904-1932	The existing structure is shown to have been built by c.1930, with this having adjoining buildings to its north and south. Its specific use is not documented.	Little change is noted up to the 1906 mapping event, notwithstanding an area of tipping to the north-west adjacent to the canal. Some additional development within the area around the Site is mapped from c.1932, with this including an extension to the gas works, the construction of (assumed commercial premises) along Peel Street, and some additional buildings within the mill area to the north.

Table Contd./



Year	Principal On-Site Features	Principal Off-Site Features
1955-1980	The 1967 OS mapping indicates the smaller buildings to have been demolished, leaving just the structure as it remains to date.	The 1967 OS plan indicates the construction of dwellings (Parkfield) to the south-east of the Site fronting on Manchester Road, the public house to the west, and the formation of a carpark and track on land to the east.
1993-2001	No further significant changes are noted.	No significant changes are noted on the next available OS plans, although available aerial imagery from c.1999 indicates that the gas works are no longer present at that time. Subsequent imagery shows part of the gas works as having been redeveloped with a large apartment unit.
2003-2023		No significant changes are noted on the most recent OS plans.



3 PRELIMINARY ENGINEERING APPRAISAL

3.1 Anticipated Ground Conditions

Made Ground

No significant made ground is thought likely to exist within the immediate vicinity to the area of proposed development, including soils that may be considered to be deleterious or of character that could be detrimental to the Site or its end users.

The existing structure dates back to at least 1932 and is therefore anticipated to have been constructed directly off the underlying natural strata on shallow foundations. The potential for large volumes of made ground or other unsuitable material to be present beneath is considered to be low. Internally, whilst old and uneven in places, the floor is concrete and appeared to be of reasonable condition with no obvious staining or other such evidence of contamination.

Externally, the small outside hard-paved parts of the Site would have been cobbled originally, although these are now tarmac-covered. A significant thickness of made ground would not be expected beneath these, particularly since the tarmac is flat and shows no signs of distress often caused by soft underlying material. The remaining parts of the Site are soft landscaped, having been formed by the Client's family many years ago when the Site was part of a wider area of residential land ownership. Again, significant made ground would not be expected.

Natural Strata

Based on the Site's geological setting, superficial deposits would not be expected to be present. As such, deposits of the Millstone Grit Group should directly underlie the Site.

Typically, where sandstone bedrock is present and this is found to be weathered it would likely be encountered as a highly fractured medium dense gravelly/cobbly sand or sand and gravel grading into a more competent deposit with depth. Typically, these weathered soils are often bound within a slightly clayey matrix, although by and large they would be anticipated to be non-plastic in the same way that non-weathered sandstone is. Should undifferentiated mudstone, shale and/or siltstone deposits be present at shallow depth, these are also typically subject to a degree of weathering. Within the near surface, these bedrock deposits can become destructured and form a stiff to very stiff, slightly gravelly clay of low to medium plasticity with lithorelicts of the original materials.

Ground conditions should be confirmed as required by the designing engineer to facilitate future decision making, once the existing structure has been demolished.

Groundwater

It is understood that many of the adjacent residential dwellings and commercial properties have cellars or basements. Shallow-depth groundwater is not expected on this basis.

3.2 Landslip (Mass Movement Deposits)

In providing a preliminary assessment of risk associated with potential landslip, consultation was made with the data presented by GroundSure at the 1:10,000 and 1:50,000 scales.



Information presented in the report indicates that there are records of mass movement deposits between 90m and 359m of the Site, although the hazard rating for on-Site slope instability (landslide potential) and within 50m is very low. Further to this, the GroundSure data indicates that there are no records of landslip permeability (i.e. the estimated rate of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposit) within 50m.

3.3 Foundations

The uncertain nature and variability, in addition to typically low strength and high compressibility of any unsuitable materials that may be encountered across the development area means that these would not be suitable founding stratum. A nil allowable bearing capacity value will therefore need to be applied to these soils, if present.

Although the foundation design for the proposed development lies outside the remit of this assessment, it is anticipated at this stage that traditional spread foundations (e.g. strip or trench fill) could potentially be used, with these being founded on undisturbed natural strata of sufficient load carrying capacity.

Where sandstone, mudstone and/or siltstone deposits are present at founding depths, it may be that foundations could end up straddling strata of varying type. This could lead to the occurrence of some small differential settlement, which would need to be accounted for in design (e.g. via widening, thickening, deepening and/or providing additional reinforcement) within the affected parts of the foundation run. It would be advisable for a bearing capacity assessment to be completed by the designing engineer during the foundation design stage to ensure that the serviceability limit state of the structure is not compromised. Although considered to be a low risk, this should take account of the amount of total and/or differential settlement that could potentially occur.

Although considered unlikely, if poor(er) ground conditions are present a different foundation solution, such as a raft, may need to be adopted. However, whichever solution is to be used, all foundations will need to be taken down through any loose, weathered, disturbed or otherwise unsuitable material to be founded in competent natural strata of sufficient load carrying capacity. Further consultation with respect to foundation design should be sought with the designing engineer, with ground conditions and bearing capacities of the underlying soils being assessed as required. Furthermore, all necessary consultations with Building Control and/or any third party warranty provision should also be made.

3.4 Floor Construction

The floor construction to be adopted is dependent on the foundation solution, although it is anticipated that a suspended floor an underlying ventilated void would likely be the most expedient.

If a ground bearing floor slab was proposed it should be noted that this cannot be used where the nature and load carrying capacity of the formation varies across its footprint, where any infill is greater than 600mm, where the ground is waterlogged, and/or where there are



shrinkable or otherwise unstable soils present. Furthermore, all load bearing partitions would need to have proper foundations and not be supported off the floor.

3.5 Heave Precautions

The combination of shrinkable soils and trees, hedgerows and shrubs represent a potential hazard to foundations and supported structures due to the effects of volume change and ground movement.

All foundations would need to be provided in accordance with current heave precautionary guidelines ^[12] if they lie within the zone of influence of removed, existing, or proposed planting when in cohesive soils. Information with respect to the plasticity indices and worst-case volume change potential of any proven or suspected cohesive soils, including mudstone and siltstone, would need to be obtained across the anticipated founding depth range as required, prior to foundation design/construction.

The need for precautions in construction and how these interact with the foundation solution should be discussed further with the designing engineer.

3.6 Retaining Structure

The need for retaining structures in development is not anticipated.

3.7 Slope Stability

Global slope stability problems are not expected to occur on the basis of available information. However, due consideration to potential problems of adjacent areas impacting upon the Site should always be made.

3.8 Superstructure Precautions

The need for superstructure precautions is considered unlikely to be required.

3.9 Excavation

The instability of any loose and/or weathered natural strata may be encountered in excavation, particularly during periods of wet weather, where excavations are deep, or where they are left open for protracted periods of time. Foundation excavations may unduly widen if material collapse is encountered under these conditions.

All excavation works shall be carried out in accordance with current HSE guidance, 'Structural Stability During Excavation' ^[13].

Where there is the possibility of weak/unstable ground being present or passing across any boundary, a geotechnical risk assessment of the integrity/stability should be undertaken prior to excavation works being carried out. Designed and engineered temporary or permanent measures should be deployed to ensure their continued stability as necessary.



3.10 Natural Ground Subsidence

With respect to natural ground subsidence, the Site has been classified as follows:

- 'Very Low' risk rating for collapsible deposits and landslides hazards;
- 'Negligible' risk rating for ground dissolution of soluble rocks hazards, compressible deposits, running sands, and shrink swell clay soils.

3.11 Obstructions

Due consideration shall be given to the likely presence of shallow competent bedrock as this could cause excavation problems for new foundations and/or where deep service connections or soakaways are required. Excavation/breaking machinery of sufficient size and strength will need to be allowed for.

3.12 Concrete

It is anticipated that Design Sulphate Class DS1 and Design Chemical Class AC1s conditions would likely apply, although protection would be required for substructure concrete in accordance with current guidance^[14] if elevated concentrations of sulphate were identified in the founding soils.

Specialist advice should be sought to confirm the concrete mix to be adopted at the design stage to the build once any laboratory analytical work has been completed. The designing engineer should refer to all current guidance as necessary (e.g. BS8500-1^[15]).

3.13 Pyritic Shale Reaction

No particular risk from pyritous ground and elevated concentrations of oxidisable sulphide is anticipated based on available information.

3.14 Stress Relief

Risk associated with stress relief is not anticipated.

3.15 Pavement

It's considered that Site-specific CBR testing should not be required, although due consideration shall be given to the presence of any soft areas as may be encountered during construction of the proposed garage and parking areas. It would be expected that the excavation and replacement of any unsuitable material with suitably compacted engineered fill would therefore be undertaken in development.

Frost susceptibility should be assumed.

3.16 Surface Water Drainage

The hierarchy of surface water management options as defined in H3 (Surface Water Drainage) of The Building Regulations (2010) will need to be followed to determine an appropriate



scheme, although it should be noted that the preferred option of water providers is for surface waters to be discharged to dedicated soakaway.

The drainage strategy for the Site will need to be independently assessed by a drainage engineer once the ground conditions are understood, although it should be noted that it would not be appropriate for unstable, potentially unstable, or contaminated soils to receive point-source flows of water from dedicated soakaways.

Where soakaways are proposed, infiltration testing in accordance with BRE365 ^[16] would likely need to be completed.



4 PRELIMINARY ENVIRONMENTAL APPRAISAL

4.1 Introduction

Current UK legislation on contaminated land is set out in Part 2A of the Environmental Protection Act 1990 ^[17], which was retrospectively inserted by Section 57 of the Environment Act 1995 ^[18]. The Contaminated Land Regulations 2000 ^[19] were amended in 2005. The Environmental Protection Act 1990: Part 2A Contaminated Land, Statutory Guidance, Edition 2 (2006) promulgates the revised statutory guidance with respect to the operation of the Contaminated Land Regime following the implementation of the Contaminated Land Regulations, 2005. The definition of contaminated land is central to the operation of Part 2A.

Legislation adopts the principle of a 'suitable for use' approach for the assessment of contaminated land, the rationale being reflected in the site-specific risk assessment and determination of remedial strategy; action is only required if unacceptable risks are posed to human health or to the environment, considering the site's land use and geo-environmental setting.

The legislation places a responsibility on the Local Planning Authority to determine whether the land under its jurisdiction is contaminated by consideration of whether:

- The presence of substances (potential contaminants) are present at concentrations that are causing significant harm or have the significant possibility of causing significant harm.
- There are receptors which may be harmed (e.g. the water environment, human health, buildings, fauna and flora).
- There is in existence a pathway between the identified sources and receptors.

To qualitatively assess the level of risk at the Site, the above rationale has been applied. This approach is consistent with the preliminary risk assessment procedure defined in LCRM.

The following section summarises the preliminary CSM which has been produced following the review of available pertinent third party information. The CSM summarises Groundsmiths' current understanding of surface and sub-surface features, the potential sources of contamination, transport pathways and receptors in order to support the identification and assessment of plausible potential contaminant linkages.

4.2 Potential Sources of Contamination

A potential source is defined as 'a contaminant which is in, or under the land and has the potential to cause harm to human health or to cause contamination of controlled waters receptors'.

Although no formal soils testing has been undertaken as part of this assessment, risk to development and Site end users is considered likely to be low. The Site has seen limited development and has largely been hard paved (essentially comprising building footprint with some external hard stand) with only minimal soft landscaping to form garden curtilage in more recent years.



Notwithstanding the above, the following significant source-pathway-receptor linkages that may potentially be associated with the Site in its current condition have been considered. These are summarised in Table 4.1, below. Since there are no nearby landfill sites, areas of infilled ground likely to be able to sustain elevated concentrations of biogenic ground gas, and/or naturally occurring soils such as alluvium (silt, peat), however, risk from ground gas is not expected.

Table 4.1 - Summary of Potential Sources and Contaminants

Potential Sources	Potential Contaminants (not limited to)
Any unforeseen shallow-depth potentially contaminated made ground associated with previous development and/or near surface underlying natural strata	Metals, metalloids, inorganic contaminants, phytotoxic contaminants, sulphate, PAHs (e.g. Benzo(a)pyrene) and asbestos

4.3 Potential Migration Pathways

Migration pathways are routes by which contaminant sources may come into contact with receptors. Potential pathways for different types of contaminants vary depending on the properties of the contaminant, the mechanism of its release and the nature of the receptor.

The principal potential contaminant pathways by which receptors might become exposed to potential contamination at the Site are summarised as follows in Table 4.2, below.

Table 4.2 - Summary of Plausible Pathways

Potential Sources	Pathways
Any unforeseen shallow-depth potentially contaminated made ground associated with previous development and/or near surface underlying natural strata	Direct ingestion, dermal contact, dust and/or vapour inhalation
	Direct ingestion and/or dermal contact with liquid contaminants
	Leaching and direct contact with potable water supply pipes
	Proposed areas of soft landscaping
	Leachable contaminants via surface run-off, vertical and lateral migration via any permeable strata with the potential to impact controlled water receptors

4.4 Potential Receptors

A receptor is the potential target of the source contaminant, to which either significant harm or deterioration in quality may be caused. The potential sensitive receptors with respect to the potential contamination hazards identified above are considered in Table 4.3, overleaf.



Table 4.3 - Summary of Potential Receptors

Potential Receptor	Comment
Human Health	Site end-users in the residential with homegrown produce scenario Site operatives (during construction phase only) Future workers involved with any in-ground maintenance works
Construction	Potable water supply pipes Foundations and service conduit Soft landscaping
Controlled Waters	'Secondary A' bedrock aquifer soils

4.5 Environmental Risk Assessment

Risk assessment and the procedure of identifying sources, pathways and receptors is recognised as an approach to determine the extent and significance of contamination either within the context of Part 2A (when assessing current site status or when considering the acquisition of an existing development) or the planning process (for the redevelopment of an existing site, or when considering the acquisition of a site for redevelopment purposes). Either way, the 'suitable for use' approach is adopted when assessing risk and the source-pathway-receptor assessment defines the conceptual model for the site.

The statutory guidance describes a risk assessment methodology in terms of 'significant contaminants' and 'contaminant linkages', using the 'source-pathway-receptor' scenarios for the site. Contaminant linkages are formed when there is a linkage between a contaminant source and a receptor by means of a pathway. The existence of a contaminant linkage is dependent on-site use, as well as environmental conditions. If no contaminant linkages can be proven, then the risks may be discounted. However, it is not to say that remediation is required if contamination is proven.

The identified potential contaminants and receptors have been considered in relation to the pathways that may link them. The risk classification has been estimated in accordance with those methods prescribed in CIRIA C552 ^[20]. Risk is regarded as a combination of the likelihood of an 'event' occurring and its severity: both elements must be considered when assessing risk. The method for risk assessment, or evaluation, is purely qualitative. As defined in CIRIA C552, the magnitude of the potential 'severity' of risk occurring may be assessed against:

- **Severe (acute):** short term risk to human health likely to result in significant harm as defined under Environmental Protection Act 1990, Part 2A. Short term risk of pollution to sensitive water receptor (may result in death).
- **Medium (chronic):** long term risk and significant harm to human health, contamination of sensitive water resource or significant change to an ecosystem or specific organism (may result in death).



- **Mild (chronic, but applicable to less sensitive receptors):** contamination of non-sensitive water resource but significant damage to crops, buildings, structures and services or the environment.
- **Minor (not significant):** harm, which may result in financial loss, or expenditure to resolve. Non-permanent effects to human health. Easily repairable effects of damage to buildings, structures, and services.

Similarly, the classification of the magnitude of the ‘probability’ of the risk occurring may be assessed against:

- **High Likelihood:** a contaminant linkage exists and an event appears very likely in the short term, or almost inevitable in the long term, or contamination is causing harm at the receptor. Urgent action is required.
- **Likely:** a contaminant linkage exists and it is probable that an event will occur. An event may not occur, but it is possible in the short term and likely over the long term.
- **Low Likelihood:** a contaminant linkage exists and it is possible that an event will occur. It is not certain that an event will occur over time, but it is less likely in the short term.
- **Unlikely:** a contaminant linkage exists but it is not possible to say if an event will occur even over a very long time.

Following completion of the severity and probability assessment, classifications can be compared to indicate the actual risk each contaminant linkage presents: this can only be undertaken where there is a possibility of there being an active linkage. The risk categories which can be assigned are presented in Table 4.4, below, and range between ‘very high’ to ‘very low’ (NB - it is not possible to classify an identified risk as ‘no-risk’).

Table 4.4 - Risk Categorisation

		Consequence			
		Severe	Medium	Mild	Minor
Probability	Highly Likely	Very High	High	Moderate	Moderate / Low
	Likely	High	Moderate	Moderate / Low	Low
	Low Likelihood	Moderate	Moderate / Low	Low	Very Low
	Unlikely	Moderate / Low	Low	Very Low	Very Low

- **Very High** – there is a high probability that severe harm could arise or that severe harm is occurring. Urgent investigation and remediation are likely to be required.
- **High** – harm is likely to occur, and that urgent investigation and remediation may be needed in the short term, but are likely over the longer term.
- **Moderate** – harm could occur. It is unlikely to be severe, most probably relatively mild. Investigation is normally required to clarify the risk with some remedial works being required in the longer term.
- **Low** – it is possible that harm could occur, but if it did, at worst it would be mild.
- **Very Low** – low possibility of harm arising, and that if it does it is not likely to be severe.



The identified potential contaminants and receptors have been considered in relation to the potential pathways that may link them. The resulting contaminant linkages are presented in Table 4.5, overleaf.



Table 4.5 - Summary of Environmental Risk (Current Site Condition without Mitigation)

Potential Sources	Potential Receptors	Plausible Pathways	Probability	Severity	Risk Rating	Comment
Any unforeseen shallow-depth potentially contaminated made ground associated with previous development and/or near surface underlying natural strata	<u>Human Health</u> Site end-users, inc. maintenance and site workers (short term risk during demolition / construction)	Direct ingestion, dermal contact with soil or inhalation of dust and/or vapour (Site end user)	Low likelihood	Mild	Low	An overall low risk is anticipated with respect to contamination within the underlying soils for Site end users. No formal environmental investigation is considered necessary at this stage unless currently unforeseen grossly impacted soils are encountered during enabling works.
		Direct ingestion, dermal contact with soil or inhalation of dust and/or vapour (In-ground worker)	Low likelihood	Mild	Low	For asbestos, the level of risk is based to some extent on the severity rating of the contaminant. Given the Site's history, actual risk is expected to be Low to Very Low. Unless there is direct evidence of asbestos containing materials encountered during enabling works, it is considered that soils testing for asbestos shouldn't be required.
		Direct ingestion and/or dermal contact with liquid contaminants	Unlikely	Mild	Very Low	
		Inhalation of asbestos fibres	Unlikely	Severe	Moderate / Low	It is understood that the existing area of soft landscaping is to be retained. Risk to Site end users would be no greater than it has been since it was formed.
	<u>Construction (Vegetation)</u>	Uptake via root system in any soft landscaped areas	Unlikely	Mild	Very Low	
	<u>Construction (Potable Water Supply Pipes)</u>	Direct contact/leaching (tainting)	Low likelihood	Mild	Low	Protective measures are unlikely to be required. It is expected for standard PE pipework to be acceptable, although this should be confirmed with the water provider. Laboratory testing should be undertaken as required.
	<u>Construction (Foundations)</u>	Direct contact/leaching	Low likelihood	Mild	Low	Sulphate precautions are unlikely to be needed, although this should be confirmed through laboratory testing as required.
	Controlled Waters	Vertical and/or lateral migration	Unlikely	Mild	Very Low	No particular risk anticipated.
Ground gas sources	<u>Human Health</u>	Inhalation (via ingress and accumulation into buildings)	No risk from ground gases anticipated based on the Site's geological and environmental setting, unless other information contrary to this comes to light.			



Soils

It is anticipated, on the basis of available information and the preliminary risk assessment presented herein, that the on-Site soils will present an overall low risk in relation to the potential for elevated concentrations of inorganic and organic contaminants of concern to be present at levels above residential with home-grown produce GAC threshold values, these being DEFRA's Category 4 Screening Levels ^[21], the LQM/CIEH Human Health Values ^[22] and/or other in-house derived GAC's calculated by Groundsmiths for organic contaminants ^[23].

Although the Site has seen some previous development, this has been limited in extent and centred around the existing building. The building itself has remained in use by the Client's wider family, without issue, whilst the external areas formed part of the wider garden curtilage to adjacent residential property, also owned by the Client's family. Historic off-Site industrial land use is unlikely to have had any affect on the Site.

It is considered that the need for soils testing would only be required if grossly contaminated soils were evident during either Site enabling works or construction, although the likelihood of this requirement is considered to be low.

Asbestos Containing Materials (ACM)

Qualitative risk modelling prescribes a perceived moderate to low risk in relation to the potential inhalation of fibres associated with asbestos contaminated materials, although the level of risk presented is mostly driven by the severity of the material type, rather than its likelihood of presence. Again, the history of the Site suggests that asbestos within the on-Site soils should not be a problem, so it is considered that the overall risk level to Site end users may be downgraded to low to very low. Testing should only be needed if there is direct evidence of there being asbestos containing materials within the underlying soils.

Unforeseen Soil Contamination

As with any development site, there is the potential for contamination to be present that has not been identified at this stage. This is unavoidable so allowance for additional assessment should be made.

Ground Gases

As indicated above, risk from fugitive ground gases is not anticipated. It is considered reasonable to assume that a Characteristic Situation 1 determination in accordance with BS8485 ^[24] is appropriate.

Construction Workers & Public Safety

For workers involved with development, current contaminated land guidance cannot be used as the basis to assess the acute (short term exposure) risk that they or other such personnel in close contact with potentially contaminated soils may experience during construction activities.

Whilst the above risk profile indicates a low rating for contamination it is not practicable to generate allowable threshold limits for any currently unforeseen metal, metalloid and/or



organic contaminants of concern. It would be expected that the protection of workers involved with in-ground works would be controlled via normal safe working practices, including the wearing of PPE and usual hygiene precautions (e.g. washing hands before eating).

Controlled Waters Receptors

A very low risk is anticipated in relation to the potential for any mobile contaminants of concern to enter into controlled waters receptors. No further assessment is considered necessary at this time.

Potable Water

Water providers are required to maintain the safety of staff, contractors, and customers. On this basis, water providers work with a range of trigger values when laying mains pipes or services in contaminated ground, in the same way that assessment is made by contaminated land practitioners.

A low risk is anticipated on the basis of available information. No specific precautions in construction are considered likely to be required, although the utility provider should be contacted to determine whether there are any specific requirements they may have.

Soils Disposal (Waste Acceptance Criteria)

Where arisings are generated during redevelopment works, and they are intended for disposal to landfill, there is a requirement to determine if they would be classified as inert, non-hazardous or hazardous.

Given that it is a statutory requirement to ensure that wastes are characterised to meet specific acceptance criteria if disposal to landfill is to be undertaken, Waste Acceptance Criteria (WAC) testing would need to be completed in parallel with standard soils analysis. This testing would need to be undertaken on representative samples of the materials to be disposed of, prior to being removed from Site.

Technical Guidance WM3^[25], which was introduced on the 1st July 2015 and is adapted from the third edition of Technical Guidance WM2¹, sets out the requirement for classification. The classification assesses the composition of the material and determines the concentrations of hazardous substances within it, in relation to particular thresholds.

¹ Environment Agency (2011). Technical Guidance (WM2). Hazardous Waste: Interpretation of the Definition and Classification of Hazardous Waste (2nd Edition, Version 2.3).



5 FURTHER WORKS

5.1 Introduction

The overall objective of this preliminary assessment was to contribute towards the understanding of the ground conditions underlying the Client's landholding to the rear of 35 Peel Street, Marsden, Huddersfield. Research into the history and evolution of the Site up to the present day has been undertaken, which allows for a fair assessment of the risks posed to development to be made at this stage.

It is considered that the study has provided sufficient background data in terms of the historical land use to the Site and its surroundings, together with details of the general geology, hydrogeology, mining legacy, and anticipated sources of contamination.

The preliminary environmental risk assessment, when considered within the context of proposed end-use, indicates that some potential low and very low level contaminant linkages may be present although these are unlikely to present an unacceptable level of risk to human health and/or the wider environment in relation to the identified source-pathway-receptor linkages and the Site's post-development end use. No formal investigative works are considered necessary in this regard unless currently unforeseen soil contamination is encountered during enabling works/development.

From a geotechnical perspective however, it would be prudent to complete a limited phase of intrusive works to confirm the nature of the shallow underlying ground conditions. Although considered advisable to be carried out (as such works will assist with the design of foundations, the ground slab, and any heave precautions to be adopted), the undertaking of these works is left to the discretion of the Client and their designing engineer in conjunction with any requirement from Building Control and/or Warranty provision. It is recommended that further consultation is made with Building Control and/or any third party Warranty provider in this regard, as they will likely have their own requirements to fulfil with respect to the development.

No risk has been identified with respect to the potential for mining legacy issues as the Site does not lie within a defined coalfield area, so no further assessment is considered necessary on this basis.

5.2 Testing

Environmental

For information only at this time, should any sampling be undertaken during redevelopment (if unforeseen areas of grossly contaminated soils were encountered) this would need to be in accordance with those guidelines prescribed in BS10175 and any specific requirements of the testing laboratory. All environmental soil samples would need to be collected in a combination of 500ml plastic tubs with sealable lids, 250ml glass amber jars and 60ml glass amber vials (this being subject to analytical requirements). This would also be the case for where WAC samples were taken for soils disposal purposes.

Care would need to be taken to minimise cross contamination between sampling. All of the environmental samples would need to be packed into cool boxes and transported to an MCERTS



and UKAS accredited laboratory for analysis and subsequent storage / disposal. Standard retention times would apply. The analytical strategy adopted for any environmental investigation would need to be designed to provide an overall assessment of potential contaminants thought likely to be present within the soils, as encountered at that time.

Geotechnical

Although its completion is left to the discretion of the Client and their designing engineer, it would be considered prudent to complete a limited phase of intrusive works to confirm the nature and condition of the shallow underlying natural strata and to facilitate the collection of representative soil samples for plasticity determination (if on clay soils) and sulphate analysis (for substructure concrete design); such works will assist with the design of the new foundations, the ground slab to be used, and any heave precautions that may need to be adopted². If any intrusive investigation works were to be undertaken, these shall be completed in general accordance with the requirements of BS5930, BS10175, BS EN 1997-1 (2004+A1:2013) ^[26] and BS EN 1997-2 (2007) ^[27].

All works would need to be logged on-site by a competent engineer, with standard strata descriptions of the soils encountered being in general compliance with BS EN ISO 14688-1 (2002+A1:2013) ^[28], BS EN ISO 14688-2 (2004+A1:2014) ^[29] and BS EN ISO 14689 (2003) ^[30].

5.3 Outline Remediation Requirements

Soil

It is unlikely that any soil remedial activities for contamination would be required within the context of the proposed development. However, if contamination above Generic Assessment Criteria for the residential with home-grown produce exposure scenario was ever found to be present, an inert soil capping layer to any areas of proposed soft landscaped garden curtilage would be required. A soil thickness of 600mm would need to be achieved. If LCRM Stage 3 remediation was required, proposals and verification methodology for all soil remedial activities to be adopted would need to be submitted to the Local Planning Authority in the form of a Remedial Strategy, along with a final Validation Report once works had been completed. These would need to be in accordance with the requirements of the Yorkshire and Lincolnshire Pollution Advisory Group ('YALPAG') ^[31].

Ground Gas Remediation

Not required as a Characteristic Situation 1 determination for the Site is considered appropriate.

Mining

Not required as the Site does not lie within a defined coalfield area.

² Building Control and/or any third party Warranty provision may have their own ground investigation requirements that may need to be satisfied. Further consultation should be made with them as required.



6 REGULATORY APPROVAL

This preliminary risk assessment report has been compiled in accordance with good practice guidance for the assessment and management of land that may be affected by land contamination and ground stability hazards.

The recommendations presented are considered reasonable on the basis of available information and the assessment of the Site as carried out by Groundsmiths. However, it remains the responsibility of the Client to ensure that the Site poses no significant risk to any sensitive receptor(s) and that it remains aligned with the proposed end-use and assessment framework adopted in this report and any accompanying reports.

If at any time in the future, additional information comes to light that puts into doubt the accuracy of the professional opinion or third party information presented herein, then it would be necessary to revisit the assessment.

Works undertaken cannot be guaranteed to gain approval by the regulatory authorities and / or your Warranty provider, so copies of this report should be made available to the relevant organisations for comment and approval, prior to undertaking any irrecoverable works associated with the Site.



7 INFORMATION SOURCES

The following references have been cited in the production of this report:

- 1 BS10175 (2011+A2:2017). Investigation of Potentially Contaminated Sites. Code of practice.
- 2 BS5930 (2015+A1:2020). Code of Practice for Ground Investigations.
- 3 Environment Agency (2021). Land Contamination: Risk Management. LCRM: Stage 1 risk assessment - GOV.UK (www.gov.uk).
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- 9 Groundsure (2023). Enviro+Geo Insight Report. Land to rear of 35 Peel Street, Marsden, Huddersfield. Ref No. EMS-894180_1142099, dated 14th September.
- 10 Groundsure (2023). Historical Ordnance Survey Plans. Land to rear of 35 Peel Street, Marsden, Huddersfield. Ref No. EMS-894180_1142098, dated 14th September.
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- 13 HSE (2023). <https://www.hse.gov.uk/construction/safetytopics/excavations.htm>.
- 14 Building Research Establishment (2005). Special Digest SD1, Concrete in Aggressive Ground.
- 15 BS 8500-1 (2015+A2:2019). Concrete – Complementary British Standard to BS EN 206. Part 1 – Method of Specifying and Guidance for the Specifier.
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- 18 Environment Act (1995).
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- 20 CIRIA C552 (2001). Contaminated Land Risk Assessment – A Guide to Good Practice. D. J. Rudland, R. M. Lancefield & P. N. Mayel.
- 21 Department for Environment, Food & Rural Affairs (2014). SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document.
- 22 LQM / CIEH: The LQM / CIEH S4UL's for Human Health Risk Assessment. Land Quality Press, Nottingham, 2015. Publication Number S4UL3339.
- 23 Environment Agency. Contaminated Land Exposure Assessment (CLEA) software version 1.071. <https://www.gov.uk/government/publications/contaminated-land-exposure-assessment-clea-tool>.



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- 24 BS 8485 (2015+A1:2019) Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings.
 - 25 Environment Agency (2018). Technical Guidance (WM3). Waste Classification, Guidance on the Classification and Assessment of Waste (1st Edition, Version 1.1).
 - 26 BS EN 1997-1 (2004+A1:2013). Eurocode 7. Geotechnical Design. General Rules.
 - 27 BS EN 1997-2 (2007). Eurocode 7. Geotechnical Design. Ground Investigation and Testing.
 - 28 BS EN ISO 14688-1 (2002+A1:2013). Geotechnical Investigation and Testing — Identification and Classification of Soil — Part 1: Identification and Description.
 - 29 BS EN ISO 14688-2 (2004+A1:2014). Geotechnical Investigation and Testing. Identification and Classification of Soil. Principles for a Classification.
 - 30 BS EN ISO 14689 (2003). Geotechnical Investigation and Testing. Identification, Description and Classification of Rock. Part 1: Identification and Description.
 - 31 Yorkshire and Lincolnshire Pollution Advisory Group (2021). Verification Requirements for Cover Systems. Technical Guidance for Developers, Landowners and Consultants. Version 4.1.



8 REPORTING LIMITS

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The findings and opinions provided in this document are given in good faith and are subject to the limitations and constraints imposed by the methods and information sources described. Factual information including, where stated, a visual inspection of the site, has been obtained from a variety of sources. Groundsmiths assumes that third party data is reliable but cannot independently confirm this as the validity and accuracy of this information is outside our control. No guarantee can therefore be given as to the completeness of the information gathered during the study and no responsibility is accepted for errors or omissions in the third party information used. Groundsmiths' professional judgement and experience is however used to ensure that uncertainties are reduced to a level appropriate to the Site's conditions, the purpose of the investigation and the resources devoted to it by the Client.

Whilst every effort has been made to carry out a qualitative Stage 1 LCRM assessment, that enables a realistic preliminary characterisation of the environmental parameters to be identified, the possibility of variation in actual ground (including mining) and groundwater conditions existing cannot be discounted. The findings and opinions presented in this report are relevant to the time this assessment was undertaken but should not necessarily be relied upon to represent conditions at a substantially later date. Further information, ground investigation, construction activities, change of site use, or the passage of time may reveal conditions that were not indicated in the data presented and therefore could not have been considered in the preparation of this report. Where such information might impact upon stated opinions, Groundsmiths reserve the right to modify the opinions expressed in this report. Where opinions expressed in this report are based on current available LCRM guidelines and other legislation, no liability can be accepted for the effects of any future changes to such guidelines and legislation. New information or improved practices and changes in legislation may require reinterpretation of the report as a whole, or in part.

The conclusions and recommendations presented in this report are based on the Site-specific assessment but utilising third party documentary information as appropriate. They are, however, limited to those that could be reasonably made at the time the assessment was undertaken. Where assessments of site areas affected in particular ways are given, these are approximate.

This report does not constitute an archaeological, ecological, arboriculturalist / invasive plant species or UXO survey. Any comment given in relation to these is for information only. Further assessments to assess these may be required as part of any planning condition and should therefore be undertaken by suitably qualified experts as required.

Groundsmiths reserve the right to edit and / or retract any conclusion or recommendation made in this report should any further information, with respect to the Site, become available.

Groundsmiths disclaim any obligation to update the report for events taking place after the time during which the assessment was carried out.

Groundsmiths do not provide or purport to provide legal advice. Should the Client require such advice then that of lawyers should be sought.

Groundsmiths accept no responsibility if any findings given in this report are not implemented by the Client or their agents.

Groundsmiths accept no responsibility if any further works, as requested by the Local Planning Authority in the discharge of their duty of care, are not implemented by the Client or their agents.

This report could be reassigned to a third party if they require warranty in the event that the Site is sold at any time in the future. A fee would be applicable in this instance and should be discussed with Groundsmiths.



GROUNDSMITHS
GEOTECHNICAL ENGINEERS