



Your Environment

PHASE 1: DESKTOP STUDY AND
PRELIMINARY RISK ASSESSMENT
REPORT FOR
41 MARKET STREET,
WATFORD,
WD18 0PN
For Maan Property Ltd

Your Environment

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Executive Summary

Summary of Contamination Recommendations

The below table shows a snapshot of the recommendations concerning ground contamination within this report. It is advised that the report is read in its entirety to gain a better understanding of our findings and recommendations. This section is relevant to Contamination ONLY and further recommendations concerning other aspects may be presented later in this report.

Potential Linkage	No Investigation Recommended	Investigation Recommended
Soil Contamination	✓	
Ground Gas	✓	

No Investigation Recommended

From our site walkover, historical study, and review of the Enviro + Geo-insight report, there is no evidence of material sources of concern within the site itself or in the surrounding area. This does NOT mean that there is definitively no contamination on site, and we would always recommend a watching brief.

1.0 Introduction

YourEnvironment (YE) was instructed by Stanf to produce a Phase 1: Desktop Study and Preliminary Risk Assessment Report for the site located at 41 Market Street, Watford, WD18

We understand current plans for the redevelopment of the site comprise:

- Change of use from industrial use to nine (9no.) residential flats

A proposed site plan provided to YE, at the time of issuing this report can be reviewed within [Appendix A](#).

Objectives

The objectives of this Phase 1 report are to:

- Establish the environmental setting, including sensitivity in relation to human health, surface water, groundwater and ecological receptors
- Review historical and recent uses to assess the potential for contamination to be present from past and current land-use
- Assess by qualitative means the potential nature and extent of contamination from those uses and the environmental risk and liabilities which may affect the site redevelopment
- Identify the prevalent source-pathway-receptor linkages present on site by means of a Tier 1 contamination risk assessment which incorporates the formulation of a Conceptual Site Model

Information Sources

During the production of this report the following primary information sources have been utilised:

- Enviro + Geo Insight data obtained from Groundsure
- Historical Ordnance Survey mapping at scales ranging from 1:1,250 to 1:10,560, obtained from Groundsure
- Zetica bomb risk maps

The full information from these sources can be reviewed within [Appendices B & C](#).

2.0 Environmental and Geological Setting

Information on the environmental and geological setting of the site is presented in a Groundsure Enviro + Geo Insight Report prepared for the site, a copy of this report is reproduced in [Appendix B](#).

2.1 Site Geology

Site geology has been assessed by reference to information from British Geological Survey mapping summarised in the Groundsure Enviro + Geo Insight data. Information from these sources referenced in this report has been predominantly limited to that identified within 50m of the site (underlying geology) or 250m of the site (structural features, borehole records), in order to focus on the information directly relevant to the site. Information from outside these radii will be referenced when deemed relevant.

Artificial/Made Ground

There are no records of artificial/Made Ground underlying the site.

Superficial Ground and Drift Deposits

The superficial ground deposits underlying the study site comprise the Westmill Gravel Member (Sand and Gravel).

Bedrock Geology

Underlying the superficial drift deposits is bedrock comprised of the Chalk group.

Landslips

There are no records within 250m.

Linear Features

There are no records within 250m.

Natural Ground Subsidence

The following hazard ratings applicable to the site and land within 50m are presented in the Enviro + Geo Insight Report:

Shrink swell clays	Negligible
Running sands	Negligible
Compressible deposits	Negligible
Collapsible deposits	Very low
Landslides	Very low
Ground dissolution	Very low

Table 2.1: Natural Ground Subsidence

2.2 Site Hydrogeology and Hydrology

These records are derived by Groundsure from Environment Agency and British Geological Survey data. Details of the source and coverage of specific records are provided in the Enviro + Geo Insight Report. Information from these sources referenced in this report has been predominantly limited to that identified within 250m of the site (aquifers, surface water) or 1000m of the site (abstractions), in order to focus on the information directly relevant to the site. Information from outside these radii will be referenced when deemed relevant.

Table 2.2 presents Environment Agency aquifer designations:

Principal Aquifer	Layers with high intergranular and/or secondary permeability capable of supporting water supplies at strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Major Aquifers.
Secondary (A) Aquifer	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.
Secondary (B) Aquifer	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water bearing parts of former Non-Aquifers.
Secondary Undifferentiated Aquifer	Layers that cannot be attributed to a category A or B rock type. These layers could have previously been described as a minor or a non-aquifer due to their variable characteristics.
Unproductive strata	Rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Table 2.2: Aquifer Designations

Aquifer within Superficial Deposits

As a consequence of the superficial geology on site, the Westmill Gravel Member is designated as a Secondary (A) Aquifer.

Permeability of Superficial Deposits

The minimum permeability is recorded as being high with the maximum permeability recorded as being very high.

Aquifer within Bedrock Geology

As a result of the bedrock geology on site, the chalk group is designated as being a Principal Aquifer.

Water Framework Directive Groundwater Bodies

The site is within the Mid-Chilterns Chalk groundwater water body.

Permeability of Bedrock Deposits

The minimum and maximum permeability is recorded as being very high.

Groundwater Vulnerability

Table 2.3 presents Environment Agency groundwater vulnerability definitions:

High Vulnerability	Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
Medium Vulnerability	Intermediate between high and low vulnerability.
Low Vulnerability	Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Table 2.3: Groundwater Vulnerability Definitions

The groundwater vulnerability in the vicinity of the site is classified as high due to the superficial and bedrock aquifers underlying the site.

Groundwater Abstraction Licences

There are two (2no.) abstraction licences within 1000m. The closest of which is an active record for a use of non-evaporating cooling from Thames groundwater, located 659m south. The other record is 750m southeast for an active record of extraction for a Potable supply.

Surface Water Abstraction Licences

There are no records within 1000m.

Potable Water Abstraction Licences

There is one record 750m southeast.

Source Protection Zones

The study site is located within a Total Catchment (Type 3) Source Protection Zone. There is also a record of a Outer catchment (Type 2) located 205m northeast.

Ordnance Survey Water Network

There are no records within 250m.

Surface Water Features

There are no records within 250m.

Water Framework Directive Surface Water Bodies and Catchments

The site is within the Colne (from Confluence with Ver to Gade) river water body catchment. The Colne (from Confluence with Ver to Gade) is located 606m east.

2.3 Environmentally Sensitive Areas

These records are derived by Groundsure from Environment Agency, Natural England, Historic England, English Heritage, Forestry Commission and UK Government data. Details of the source and coverage of specific records are provided in the Enviro + Geo Insight Report. Information from these sources referenced in this report has been predominantly limited to that identified within 500m of the site (environmental designations) or 250m of the site (habitat, visual and cultural designations), in order to focus on the information directly relevant to the site. Information from outside these radii will be referenced when deemed relevant.

Environmental and Habitat Designations

There are no habitat designation records within 250m of the site.

Visual and Cultural Designations

There are twenty-three records of listed buildings within 250m of the site. The closest of these records are 51m north, 74m north, 91m northwest and 98m northwest. All other records are over 100m from the site.

There are also two records of conservation areas within 250m. the closest is St Mary's located 43m east. The second is High Street and King Street located 177m southeast.

3.0 Past Land Use and Potential Contaminant Sources

Information on past land use and potential contaminant sources is presented in a Groundsure Enviro + Geo Insight Report prepared for the site, a copy of this report is reproduced in [Appendix B](#).

3.1 Land Use Records

These records are derived by Groundsure from historical mapping and each record corresponds to a particular map revision date. Thus, several records may refer to the same feature where it is present over time. Groundsure has in some cases grouped such records in the Enviro + Geo Insight report. Differences in distances quoted from the study site may be due to expansion of the feature over time or geolocation errors.

Information from these sources referenced in this report has been predominantly limited to that identified within 250m of the site, in order to focus on the information directly relevant to the site. Information from outside this radius will be referenced when deemed relevant.

Historical Industrial Land Uses

There are six records within 250m, all of which refer to a hospital located 103m to 110m south of the site.

Historical Tanks

There are four records of historical tanks within 250m. The closest of which is an unspecified tank located 84m north. The other three records refer to a tank or trough and are located, 90m southeast, 92m southeast and 217m north.

Historical Energy Features

There are five records of electricity sub-stations within 250m. The closest of which is located 191m east.

Historical Petrol Stations

There are no records of historical petrol stations within 250m.

Historical Garages

There are three records of historical garages within 250m. These are located 46m northeast, 88m northeast and 146m north.

Historical Military Land

There are no records of historical military land within 250m.

Current or Recent Industrial Land Uses

There are nineteen records within 250m, which are summarised in table 3.2 below:

Land Use	Distance and Direction	To include in Sources Summary (Y/N)
Published goods (2)	16m northwest	Y
Disability and mobility equipment (2)	45m northeast and 155m northeast	N
Bakery	77m west	N
Fireplaces and mantelpieces	86m northeast	N
Electrical equipment, repair and servicing (2)	110m north and 138m south	N
Bed and bedding (2)	126m west	N
Telephone exchange	187m north	N
Substation (2)	221m south and 238m north	N
Medical equipment, supplies and pharmaceuticals	200m northeast	N
Workshop	244m north	Y
General construction supplies	244m southwest	N
Vehicle repair, testing and servicing	249m southwest	Y

Table 3.2 - Current Industrial Land Uses

Current or Recent Petrol Stations

There are no records of current or recent petrol stations within 250m.

Electricity Cables

There are no records of high voltage underground electricity cables within 250m.

Gas Pipelines

There are no records of high pressure underground gas pipelines within 250m.

Railway Infrastructure

There are no records of historical or current railway infrastructure or projects within 250m.

3.2 Environmental Permits, Incidents and Registers

These records are derived by Groundsure from local authority, Health and Safety Executive and Environment Agency data. Details of the source and coverage of specific records are provided in the Enviro + Geo Insight Report. Information from these sources referenced in this report has been predominantly limited to that identified within 250m of the site, in order to focus on the information directly relevant to the site. Information from outside this radius will be referenced when deemed relevant.

Sites Determined as Contaminated Land

There are no records of sites determined as contaminated land under Part 2A of the Environmental Protection Act 1990 within 250m.

Control of Major Accident Hazards (COMAH)

There are no records within 250m.

Regulated Explosive Sites

There are no records within 250m. Note that details of some sites may be redacted for security reasons.

Planning Hazardous Substances Consents

There are no records within 250m.

Records of Historic IPC Licensed Activities

There are no records within 250m.

Records of Part A (1) Licensed Activities

There are no records within 250m.

Records of Part A (2)/B Licensed Activities and Pollutant Release

There is one record 96m north for a dry cleaners.

Records of Radioactive Substance Authorisations

There are no records within 250m.

Licensed Discharges to Controlled Waters

There are no records within 250m.

Pollutant release to Surface Waters (Red List)

There are no records within 250m.

Pollutant Release to Public Sewer

There are no records within 250m.

List 1 and List 2 Dangerous Substances

There are no records within 250m.

Substantiated Pollution Incidents

There is one record of a pollution incident within 250m of the site Located 75m southeast was an incident in 2003 for a pollutant of mixed/waste oils. This record had no recorded impact to land, water or air.

Pollution Inventory Substances

There are no records within 250m.

Pollution Inventory Waste transfers

There are no records within 250m.

Pollution Inventory Radioactive Waste

There are no records within 250m.

3.3 Waste and Landfill

These records are derived by Groundsure from Environment Agency, British Geological Survey, Ordnance Survey (interpreted by Groundsure) and local authority data. Details of the source and coverage of specific records are provided in the Enviro + Geo Insight Report.

Information from these sources referenced in this report has been predominantly limited to that identified within 500m of the site (landfills) or 250m of the site (non-landfill waste operations), in order to focus on the information directly relevant to the site. Information from outside these radii will be referenced when deemed relevant.

Active or Recent Landfill

There are no records of active landfill within 500m of the site.

Historical Landfill

There are no records of historic landfill within 500m of the site.

Non-Landfill Waste Records

There is one record of a waste exemption located 188m south for the recovery of scrap metal.

3.4 Mining, Ground Workings and Natural Cavities

These records are derived by Groundsure from British Geological Survey, Ordnance Survey (interpreted by Groundsure), Coal Authority, Peter Brett Associates, Johnson Poole and Bloomer, Cheshire Brine Subsidence Compensation Board, British Gypsum, Mining Searches UK, Kaolin and Ball Clay Association and local authority data. Details of the source and coverage of specific records are provided in the Enviro + Geo Insight Report.

Information from these sources referenced in this report has been predominantly limited to that identified within 250m of the site, in order to focus on the information directly relevant to the site. Information from outside these radii will be referenced when deemed relevant.

Natural Cavities

There are four records within 250m. All four records refer to solution pipes and are located 148m northeast, 191m north, 209m east and 240m southwest. The record 191m north also contains reference to a sinkhole.

Mining Cavities

There are no records within 250m.

BritPits Data (Surface and Underground Mineral Workings)

There are no records within 250m.

Historical Mineral Planning Areas

There are no records within 250m.

Surface Ground Workings

There are no records within 250m.

Underground Workings

There are no records within 250m.

Coal Mining

There are no records held by the Coal Authority or by Johnson Poole and Bloomer within 250m.

Non-Coal Mining

There are no records within 250m for brine extraction or gypsum, tin or clay mining.

3.5 Radon and Background Soil Chemistry

These records are derived by Groundsure from British Geological Survey and Public Health England data. Details of the source and coverage of specific records are provided in the Enviro + Geo Insight Report. Information from these sources referenced in this report has been predominantly limited to that identified on or within 50m of the site.

Radon

The study site is not located within a Radon Affected Area, as less than 1% of properties are above the Radon Action Level. No radon protective measures are necessary for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment.

Background Soil Chemistry

Values estimated by BGS for background concentrations of five potentially harmful elements are provided as follows:

Arsenic	15 mg/kg
Bio-accessible arsenic	No data
Lead	100-200mg/kg
Bio-accessible lead	60-120 mg/kg
Cadmium	1.8 mg/kg
Chromium	60-90 mg/kg
Nickel	15-30 mg/kg

Table 3:1 Background Soil Chemistry

3.6 Unexploded Ordnance (UXO)

According to bomb risk maps made available online by Zetica and the site is in an area considered to be at low-moderate risk from wartime unexploded ordnance.

The Zetica bomb risk map is reproduced in [Appendix D](#).

4.0 Historical Mapping Study

The object of this search was to report on the evidence of site history and redevelopment of the site and its environs from available County Series and Ordnance Survey Maps at scales ranging from 1:1,250 to 1:10,560 dating from the mid to late 19th Century to the present day, and Getmapping PLC aerial photography dating from the late 1990s to the recent past, as provided by Groundsure.

Information in the historical mapping study has been predominantly limited to that identified on the site or within 100m of the site, in order to focus on the information directly relevant to the site. Information from outside this radius will be referenced when deemed relevant.

Each map or photographs only represents a “snap-shot” of the site and its environs at the date of the survey. Changes that had occurred at other times may not have been recorded on the maps and could represent an unidentified hazard to the site.

The information reported might not represent all pertinent information that could be obtained. The interpretation of the maps and/or other data commented on in this report is subjective.

Year	On site	Off site
1871	The site appears to contain buildings belonging to a riding school.	Graveyard - 30m southeast Brewery - 200m southeast
1896 to 1898	Building no longer part of the riding school	Extensive urban development - adjacent north Graveyard labelled as disused - 30m southeast
1913 to 1914	No discernible changes	Cottage hospital - 130m south Brewery no longer present - 200m southeast
1920	No discernible changes	No relevant changes
1938	No discernible changes	No relevant changes
1940	No discernible changes	Hospital now labelled Victoria House Hospital - 130m south
1959 to 1960	No discernible changes	Garage - 100m northeast Abattoirs - 110m northeast Works - 110m north Ruin - 125m southeast Depot - 175m southeast
1966	No discernible changes	No relevant changes
1970	No discernible changes	Garage, abattoirs, and works are no longer present Telephone exchange - 200m north
1975	No discernible changes from partial mapping	No relevant changes from partial mapping
1978	No discernible changes	No relevant changes
1986	No discernible changes from partial mapping	No relevant changes from partial mapping
1990 to 1995	No discernible changes	Depot - 50m west Substations - 200m southeast and 210m south
2001	No discernible changes	No relevant changes
2003	No discernible changes	No relevant changes
2010 to 2013	No discernible changes	No relevant changes
2015 to 2021	No discernible changes	No relevant changes

Table 4.1: Historical Mapping Review

The Historical Ordnance Survey Maps were obtained from Groundsure and are available for review within [Appendix C](#). The aerial photographs are included in the Groundsure Enviro + Geo Insight Report and are available for review within [Appendix B](#).

5.0 Framework for Assessment of Contamination

Environmental risks are assessed within the risk management framework established in Part IIA of the Environmental Protection Act (EPA) 1990 introduced by Section 57 of the Environment Act 1995 which provides a statutory definition of contaminated land. To fall within this definition it is necessary that, as a result of the condition of the land, substances may be present on or under the land such that:

- (a) Significant harm is being caused or there is a significant possibility of such harm being caused; or
- (b) Pollution of controlled water is being or is likely to be caused.

Risk from contamination is assessed in accordance with the Land Contamination Risk Management Framework (LCRM) prepared by the Environment Agency on 8 October 2020. Which considers possible linkages between contaminant sources and potential receptors which could be harmed or polluted.

The key aspect of the framework is the development of a Conceptual Site Model (CSM) which considers the potential contaminant linkages between potential contaminant sources, the receptors that could be affected by the contaminants, and the pathways by which the receptors could be exposed to the contaminants.

The information presented in this report was collated and evaluated to develop an initial CSM to assess ground contamination issues at the site.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- A source - a substance that is capable of causing pollution or harm
- A receptor - something which could be adversely affected by the contaminant
- A pathway - a route by which the contaminant can reach the receptor

If one of these elements is absent there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

Potential sources, pathways and receptors are identified in the sections below and the risks associated with Potential Contaminant Linkages outlined.

6.0 Possible Contaminant Sources, Pathways and Receptors

Potential Sources

The sources of potential contamination that have been identified at the site or in the vicinity of the site are summarised below:

Source	Identified by	Location	Description
Hospital	Envirosearch report	Off site:	A broad spectrum of contaminants may be associated with hospitals. On site tanks may contain a variety of contaminants such as PAH and TPH.
Industrial uses including; garages, workshops and depots	Envirosearch report and historical mapping	On site	Due to the variety of industrial activities identified in the surrounding area, a broad spectrum of contaminants may be associated. These included, PAH, TPH, VOCs, SVOCs, heavy metals and asbestos.
Tanks	Envirosearch report	Off site	Tanks may contain a variety of contaminants, including PAH and TPH.

Table 7.1: Potential Sources

The following contaminants are potentially associated with the on-site sources:

- None identified

The following contaminants are potentially associated with the off-site sources:

- Heavy Metals
- PAH
- TPH
- VOCs
- SVOCs
- Heavy metals

In practice, a broad contaminant screen should be analysed for in any intrusive investigation recommended to ensure that potential contaminants are not omitted.

Pathways

In order for contaminants to reach potential receptors, there has to be a viable pathway for the contaminant. Potential pathways that may affect the migration of contaminants are listed below:

Pathway	Medium	Properties
Direct Contact	Dust, solid and liquid phase	There may be direct contact with potentially impacted soil and Made Ground across the site. There is a possibility of dust fumes being produced during earthworks in the construction phase. Dermal contact and ingestion of potentially contaminated soils during construction or operational phase of the site.
Leaching through Made Ground	Unsaturated flow	Potential for leaching and migration of potential contaminants along preferential flow paths in the ground.
Foundations and Underground Infrastructure and Obstructions	Preferential flow	Contaminants will flow the path of least resistance which can be gaps around foundations, services, and floor construction
Migration of Ground Gas	Gaseous flow	Infilled land material is likely to be variable in composition. Migration through granular material within superficial deposits is possible.

Table 6.2: Pathways

Receptors

The site specific receptors that could be potentially affected by the contamination hazards identified during this preliminary appraisal are summarised below:

Category	Receptor	Properties
Humans	End users (such as residents and visitors)	Potential contact with contaminated soils in existing/proposed soft landscaping areas, however it is understood that the site will be asphalt surfaced. Potential contact with ground gas within enclosed buildings
	Construction workers	Reworking of contaminant impacted materials in underlying soil during construction works can expose workers to contamination.
Property	Materials and site structures	Foundations and site services may be damaged by potentially aggressive compounds present in soils.
Controlled Waters	Underlying superficial / bedrock Aquifer and surface water	The site is recorded as having a Secondary (A) Aquifer within the superficial deposits and a Principal Aquifer within the bedrock underlying the site.
Plant (species and uptake) and Wildlife	Various	Attributes will be influenced by factors such as relative quality, scale, rarity and substitutability; however, it is understood there are no areas of soft landscaping as part of proposals.

Table 6.3: Receptors

7.0 Qualitative Risk Assessment

Potential pollutant linkages are identified using the source-pathway-receptor framework detailed above. An assessment of the potential significance of each linkage is then made by consideration of the likely magnitude and mobility of the source, the sensitivity of the receptor and nature of the migration/exposure pathways.

This qualitative risk assessment has been undertaken in accordance with Annex 4 of the National House Building Council/Environment Agency/Chartered Institute of Environmental Health R&D publication 66, Guidance for the Safe Development of Housing on Land Affected by Contamination (NHBC/EA/CIEH, 2008) which updates and supersedes CIRIA C552: Contaminated Land Risk Assessment, A Guide to Good Practice (Rudland et al., 2001).

An assessment of the likelihood of the risk being realised and the magnitude of potential risk is presented below to give an estimation of the significance of each potential pollutant linkage identified. Where it is considered that there is no credible linkage, this is indicated in the table. In accordance with the R&D66 guidance, if there is no pollution linkage then there is no need to apply tests for probability and consequence.

The assessment is undertaken based on the current proposals for the site, at the time of issuing this report, which would be classed as a generic end land use of ‘residential (without consumption of homegrown produce)’. Any change in the development proposals for the site involving a change in end use class may result in a requirement for this assessment to be revised.

8.0 Preliminary Conceptual Site Model

Contaminant Source	Pathways	Receptor	Potential Severity	Probability of Risk	Level of Risk	Justification
On Site: Made Ground soils on site possibly containing elevated metals, other organics such as TPH, PAH, and phenols.	Ingestion, dermal contact, inhalation of dusts/vapours	Future end users and site visitors	Mild	Unlikely	Very Low ●	A low risk rating has been assessed due to the absence of potentially contaminative land uses on site meaning the contamination potential is not considered to be high. Direct contact is not likely between future residential occupiers/visitors and contaminants in the shallow soil as the proposed development does not contain any soft landscaping areas.
		Construction Workers	Mild	Low Likelihood	Low ●	Construction workers may come into direct contact with soils during groundworks. Safe working practices should be implemented and appropriate personal protective equipment (PPE) should be used to mitigate any potential risk from contact with soils and shallow/perched groundwater.
	Leaching through soils and migration via groundwater or soil pore moisture	Controlled Waters	Mild	Low Likelihood	Low ●	A low risk rating has been assessed due to the absence of potentially contaminative sources on site and the presence of a Secondary (A) Aquifer within the superficial deposits and a Principal Aquifer within the bedrock underlying the site.
	Permeation of water pipes	Construction materials, future end users and site visitors	Medium	Low Likelihood	Moderate/Low ●●	Hydrocarbons, especially aromatics are known to permeate plastic pipes. Provision of water supply pipes and connectors formed from proprietary “barrier pipe” materials (eg polyethylene-aluminium-polyethylene) may be required by the water supply company.
	Uptake	Plant and Wildlife	Mild	Unlikely	Very Low ●	Uptake is unlikely as it is understood there are no areas of proposed soft landscaping as part of development proposals.

Contaminant Source	Pathways	Receptor	Potential Severity	Probability of Risk	Level of Risk	Justification
On Site: Asbestos at/near ground surface in Made Ground soils.	Inhalation of fibres in airborne dust	Future end users and site visitors	Medium	Unlikely	Low ●	A moderate/low risk rating has been assessed due to the commercial history of the site creates potential for asbestos. However, contact with contaminated soils is unlikely as there are no area soft landscaping as part of the development proposal.
		Construction Workers	Medium	Low Likelihood	Moderate/Low ●●	Given the age and commercial history of the exiting building there is a possibility of asbestos on site. However, it is understood there is currently no soft landscaping nor is there any soft landscaping as part of development proposals. During subsequent normal groundworks, safe working practices should be implemented, and appropriate personal protective equipment (PPE) should be used to mitigate any potential risk from residual asbestos in soils.
On Site: Ground Gases (CH4, CO2) from on site Made Ground.	Gas migration and build up within buildings (explosion/asphyxiation risk)	Future end users and building structures.	Mild	Unlikely	Very Low ●●	A very low risk rating has been assessed due to the limited thickness and lack of organic and/or degradable content assumed to be present in the made ground. Such made ground is generally classified as very low risk in terms of potential for gas generation.
Off Site: Historical land uses and activities, Made Ground/infilled material possibly containing elevated metals, other inorganics, TPH, PAH, phenols, VOC and SVOCs.	Leaching through soils and migration via groundwater or soil pore moisture	Future end users and site visitors	Medium	Low Likelihood	Moderate/Low ●●	Given the variable permeability of the underlying geology and hydrogeology, there is a moderate risk for the leaching and migration of contaminants. This combined with the presence of industrial land uses in the surrounding area creates a risk for contamination on site.
	Ingestion, dermal contact, inhalation of dusts/vapours	Future end users and site visitors	Medium	Unlikely	Low ●	Given the variable permeability of the underlying geology and hydrogeology, there is a moderate risk for the leaching and migration of contaminants. This combined with the presence of industrial land uses in the surrounding area creates a risk for contamination on site. There is no soft landscaping as part of this site, as such contact between site users and contaminated soils is considered unlikely.

Contaminant Source	Pathways	Receptor	Potential Severity	Probability of Risk	Level of Risk	Justification
Off Site: Ground Gases (CH ₄ , CO ₂ , H ₂ S) from off site historical landfilling activities.	Gas migration and build up within buildings (explosion/asphyxiation risk)	Future end users and building structures.	Mild	Unlikely	Very Low ●●	A very low risk rating has been assessed due to the limited thickness and lack of organic and/or degradable content assumed to be present in the made ground. Such made ground is generally classified as very low risk in terms of potential for gas generation.

Table 8.1: Preliminary Conceptual Site Model

9.0 Recommendations

9.1 Proposed Site Investigation

The site is located within an area of coal mining activity and it may be prudent to obtain coal mining reports from the Coal Authority which may be required by the Local Authority and Building regulations.

Given the findings of this report we do not make any recommendations for Site Investigation (SI) works. The historical, current and proposed use of the site and the surrounding environs suggests there are no pollutant linkages present that are viable or that represent an unacceptable risk. However, we would recommend that a watching brief be undertaken during the groundworks stage.

9.2 Consultees

It is highly recommended that this report be forwarded to the relevant Local Authority Environmental Health and Planning Departments to seek their comments and subsequent approval, otherwise further works may be required.

9.3 Groundworks Watching Brief

If during construction works any material is noted to show visual and/or olfactory signs of contamination an environmental consultant should be contacted to supervise/guide further works.

If any landscaping materials are to be imported on site they should be tested to check that they are suitable for the intended use.

9.4 Flood Risk Assessment

This report does not replace a full hydrogeological survey and specialist studies may need to be undertaken to ascertain the risks posed from flooding. Further details on site flood information can be found within the appendices.

10.0 Limitations and Uncertainties

This report has been prepared by YE with all reasonable skill, care and diligence. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources, together with a site walkover inspection of the site.

The opinions given in this report have been dictated by the finite data on which are they based and are relevant only to the purpose for which the report was commissioned.

Information reviewed should not be considered exhaustive and accepted in good faith as providing true and representative data with respect to site conditions. Should additional information become available which may influence the opinion expressed in this report, YE reserves the right to review such information and, if warranted, to alter the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site. This report is an environmental phase 1 report and does not consider the geotechnical implications for the site, its redevelopment and proposed future use. Further advice should be sought on geotechnical investigation requirements for the proposed development.