



**BROWNFIELD
SOLUTIONS LTD**

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

ASK REAL ESTATE MBP LIMITED

Manchester Business Park, Aviator Way

Phase I Geo-Environmental Assessment Report

BW/C6035/14703 Rev A

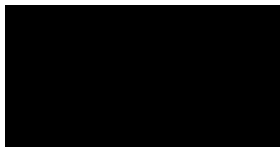
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PROJECT QUALITY CONTROL DATA SHEET

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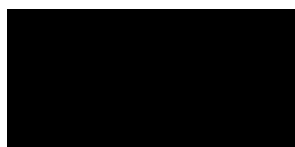
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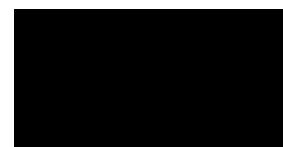
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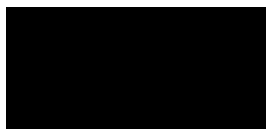


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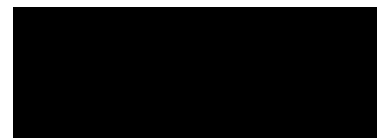
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DRAWINGS		
Drawing Number	Rev	Title
NA	-	Red Line Boundary
C6035/01	A	Site Location Plan
C6035/02	A	Site Features Plan

APPENDICES	
Appendix	Title
Photographs	Site Walkover Photograph
Appendix A	BSL Methodology and Guidance
Appendix B	Historical Maps
Appendix C	Geo-Environmental Data Report
Appendix D	BGS Exploratory Hole Records
Appendix E	UXO Screening Map & Pre-Desk Study Assessment

1.0 INTRODUCTION

1.1 Context

This report describes a desk-based Phase I Geo-Environmental Assessment Report carried out by Brownfield Solutions Limited (BSL) for Ask Real Estate MBP Ltd on a site off Aviator Way, Manchester, and has been completed in general accordance with the following guidance:

-
- Environment Agency guidance - Land Contamination: Risk Management (LCRM).
 - BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites.
 - BS 5930: 2015+A1:2020 Code of Practice for Ground Investigations.
 - BS EN 1997-1:2004+A1:2013 Eurocode 7. Geotechnical design. General rules plus UK National Annex.
 - BS EN 1997-2:2007 Eurocode 7 Geotechnical design. Ground investigation and testing plus UK National Annex.
-

Definitions of terms and acronyms used within this report is presented in Section 7.0.

1.2 Proposed Development

The Proposed Development is for a commercial end-use comprising 9 two-storey B2 (General Industry) and B8 (Storage and Distribution) units with a max height of 11.72m. The units will be used for light industrial and ancillary office spaces, with associated loading bays, landscaping works, access and car parking. Car parking will include 145 car park spaces, including 12 accessible spaces, and 18 EV charging spaces. 48 cycle parking spaces will also be included.

1.3 Previous Reports

BSL have been provided with a copy of RSK's Geo-environmental Site Assessment (ref. 313110-02 (01)) issued in October 2015. Although no reliance has been placed on the report, the information it contains has been considered for guidance purposes only. Conclusions are summarised in Section 3.12 of this report.

1.4 Objectives and Scope

The objectives of this assessment were to determine the environmental setting and ground conditions of the Site, highlighting potential areas of concern that may govern the redevelopment.

The scope of works comprises a Phase I Assessment and site walk-over, with a review of the Site, surroundings, historical uses and environmental setting in order to develop a preliminary Conceptual Site Model (CSM).

This report is intended to meet the requirements of a Preliminary Investigation as defined in BS 10175:2011+A2:2017 and has been produced in general accordance with the recommendations for a Tier 1 Preliminary Risk Assessment as described in LCRM guidance.

1.5 Limitations

This Phase 1 Geo-Environmental Assessment Report has been prepared in accordance with the relevant legislative framework, guidance and risk assessment methodology as outlined in Appendix A.

The findings and opinions conveyed via this assessment are based on information obtained from a number of sources as detailed within this report, BSL have assumed this information is correct and

reliable. Nevertheless, BSL cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

BSL have used reasonable skill, care and diligence in the production of this report. There may be other conditions prevailing on the Site which are outside the scope of work and have not been highlighted by this assessment and therefore have not been taken into account by this report. Responsibility cannot be accepted for such site conditions not revealed by the assessment.

This report has been prepared for the sole use and reliance of the Client, Ask Real Estate MBP Ltd. No other third party may rely upon or reproduce the contents of this report without the written permission of Brownfield Solutions Ltd (BSL); a charge may be levied against such approval. If any unauthorised third party comes into possession of this report, then they rely on it at their own risk and BSL do not owe them any Duty of Care. This report may not be relied upon by the client or submitted to a third party for their reliance for the purposes of valuation, mortgage, insurance and regulatory approval, until all invoices have been settled in full.

Any recommendations made in this report should be confirmed with the Regulatory Authorities prior to implementation to ensure compliance.

This assessment has been based on the proposed planning layouts provided. Any subsequent change to the planning layout may have an impact on the validity of recommendations made within this report. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

The Site plans enclosed in this report should not be scaled off. Any site boundary line depicted on plans does not imply legal ownership of land.

Notwithstanding site observations concerning the presence or otherwise of archaeological issues, asbestos-containing materials (ACM) or invasive weeds (e.g. Japanese knotweed), this report does not constitute a formal survey of these potential issues and specialist advice should be sought.

2.0 THE SITE

2.1 Location

The Site is located at Unit 2000, Aviator Way, near Manchester Airport, Greater Manchester, M22 1GE centred on National Grid Reference 382633, 385614 as shown on the Site Location Plan, Drawing No. C6035/01.

2.2 Site Description

A site reconnaissance survey was carried out at the Site on 26th March 2025. The main site features and potential issues identified during this survey are detailed below and are shown on the Site Features Plan, Drawing No. C6035/02. A selection of photographs from the site walkover are presented to the rear of this report.

Feature	Description
Site Area	Approximately 3.21 hectares/7.93 acres.
Site Access	Access to the Site is gained off Aviator Way to the south.
Site Overview Imagery	 Orientated North Update from Google: All images: Imagery Google©2023, Imagery ©2023 Airbus, CNES / Airbus, Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, The Geoinformation Group, Map data ©2023.
Current Land Use and Site Features	The Site comprises undeveloped grassland. Two underground utility covers were noted in the southern area, denoting possible drainage / sewers. A ditch is present along the grass bordering Aviator Way.
Potential Sources of Gross Contamination	None noted during walkover.
Vegetation / Ecology	There are sporadic mature and semi-mature trees along the Site boundaries. The Site itself is mainly surfaced with grass with rare shrubbery.
Topography	The Site is generally flat with an approximately 0.5m deep ditch along the eastern, southern and western boundaries.
Site Boundaries	The eastern, northern and western boundaries are denoted by trees and hedges. The southern boundary is open, marked by a public footpath and Aviator Way.
Surrounding Area	The Site is set within a mixed commercial and residential area, with commercial land to the east and west, and residential properties to the north. North of the Site is residential housing along Thornsgreen Road. Existing Manchester Business Park offices exist to the east. To the south is Aviator Way, a railway, and Ringway Road W (A555), with commercial land associated with Manchester Airport further afield. Woodhouse Lane and other existing Manchester Business Park offices exist to the west.

3.0 GEO-ENVIRONMENTAL SETTING

3.1 Historical Setting

A review of the available historical Ordnance Survey Maps and satellite imagery has been conducted, with the pertinent issues that may have affected the Site, or its environs, summarised below. The Historical Maps are presented in Appendix B. A review of the historical industrial data within the geo-environmental data report has also been undertaken below, the report is presented in Appendix C.

Notable features on site, and potentially contaminative or geotechnically relevant features within 100m of the Site boundary have been presented. Any features that have potentially been infilled will be considered up to 250m from the Site boundary.

Feature	Distance & Direction	Years Present	Description
Residential properties and glasshouses / nursery	On-site	Pre-1872 – 2001	Two residential properties are marked on the western site boundary from pre-1872. The most northerly of these is no longer marked by 1987 mapping. The southerly property is associated with a series of glass houses, drains and tracks occupying the centre and east of the Site from the 1960s until 2003 when the Site was cleared. All that remains of the nursery is the surface drain in the centre-south.
Potentially infilled ponds	Off-site From 10m NE	Pre-1872 – 1960	Numerous historic ponds were identified within 250m of the Site. Features of note include: • 10m NE – comprising two abutting ponds both less than 15m in diameter. • 20m NE – less than 15m in diameter. • 90m S – less than 5m in diameter. None of these features are shown following 1960s mapping, suggesting they were either seasonal or infilled as part of the development in the area. Notably the closest two abutting ponds were only shown pre-1910.
Electrical substation	Off-site 31m W	2003 – present	An electrical substation is noted 31m west of the Site, first shown 2003 mapping.
Railway	Off-site 24m S	1993 – present	Railway lines were first depicted on the map dated 1993, these features are still present today.

In summary, the Site has been occupied by a nursery over the majority of the mapped history, having been cleared by 2003. Historical land use in the surrounding area has been predominantly residential / commercial.

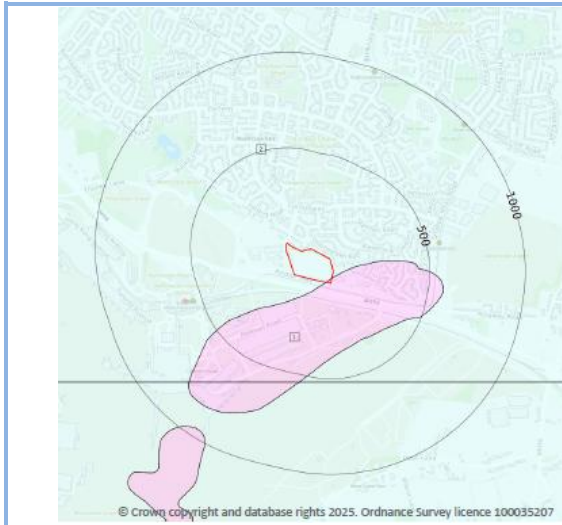
3.2 Published Geology

The following publications of the British Geological Survey (BGS) were examined in respect of the geology underlying the Site:

- British Geological Survey (BGS) 1:50,000 Scale Geological Map Sheet 98 Stockport. Drift Edition.
- British Geological Survey (BGS) 1:50,000 Scale Geological Map Sheet 98 Stockport. Solid Edition.
- BGS 1:10,560 Scale Geological Map Sheet SJ88NW. Solid and Drift Edition.
- BGS Geology of Britain Map Viewer.
- BGS GeoIndex Onshore.
- Geo-Environmental Data Report.
- Mining Remediation Authority Interactive Map.

Extracts of the 1:10,000 geological mapping from the Geo-Environmental Data Report are presented below for reference:

BGS 1:10 000 Superficial Geology



BGS 1:10 000 Solid Geology



Made Ground

BGS mapping does not display any made ground deposits on site, however based on the historical mapping and the development that has historically taken place, made ground deposits are likely to be present.

Superficial Deposits

The Site is indicated to be predominantly underlain by Till. This stratum typically comprises mixed clay, sand and gravel (diamicton).

The far southeastern corner is indicated to be underlain by Glaciofluvial Deposits, typically comprising sand and gravel.

Solid Geology

The deeper solid geology is indicated to be part of the Bollin Mudstone Member of the Sidmouth Mudstone Formation, which typically comprises mudstone.

Two faults are shown 37m and 48m to the east, trending broadly north – south and running parallel to the eastern boundary. Any movements associated with this fault should now have stopped.

3.3 BGS Exploratory Hole Records

There are three BGS exploratory hole records within a relevant distance of the Site (assumed as an approximate 50m radius). A summary of the ground conditions is presented in the table below:

Reference	Distance and Direction	Depth Made Ground (m bgl)	Depth Superficial Deposits (m bgl)
SJ88NW1325	36m S	GL-0.8 – Topsoil over sand and gravel of limestone and brick.	0.8-6.2 – Interbedded SAND and firm to stiff CLAY.
SJ88NW1340	38m S	GL-1.0 – Topsoil over sand and gravel of limestone, ash and brick.	1.0-2.9 – Firm to stiff sandy CLAY.
SJ88NW1354	41m S	GL-0.4 – Topsoil over gravelly sand of sandstone, concrete and limestone.	0.4-3.3 – Firm to stiff CLAY, firm SILT, and SAND.

No bedrock was encountered within the above boreholes, and groundwater was encountered above 3m bgl. The BGS Borehole Logs are presented in Appendix D.

3.4 Mining and Mineral Extraction

The Site is outside the area of a designated coalfield or brine extraction area, and no further consideration of coal mining / brine related risks is required.

3.5 Hydrogeology

Based on the inferred geology, a summary of the Environment Agency aquifer designations is presented in the table below:

Stratum	Coverage	Aquifer Designation
Superficial Aquifer – Till	Full Site	Secondary Aquifer (Undifferentiated). The classification is assigned where it is not possible to attribute either category A or B to the aquifer.
Bedrock Aquifer – Bollin Mudstone	Full Site	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 off the former non-aquifers.

A summary of the pertinent hydrogeological features within the Geo-Environmental Data Report are provided below:

Feature	Distance & Direction	Details
Nearest Active Groundwater Abstraction	-	None recorded within 2000m.
Nearest Active Potable Groundwater Abstraction	-	None noted within 2000m.
Source Protection Zones	-	None within 500m.

3.6 Hydrology

A summary of the pertinent hydrological aspects within the Geo-Environmental Data Report are provided below:

Feature	Distance & Direction	Details
Nearest Named Watercourse	On-site	"Inland river not influenced by normal tidal action" – this pertains to the on-site ditch and likely drains to the River Bollin (approximately 2km to the south)
Nearest Active Surface Water Abstraction	-	None noted within 2000m.
Closest Active Licenced Discharge Consent	241m SW	This pertains to site drainage into the River Bollin and it's nearby tributaries from Manchester Airport.

There are no Environment Agency (EA) Risk of Flooding from Rivers and the SEA (RoFRaS) database records within 50m of the Site.

The Site is not indicated to lie within an EA designated Zone 2 / Zone 3 flood plain.

The British Geological Survey indicate there is a very low risk of surface water flooding at the subject site.

The British Geological Survey indicate there is a potential for groundwater flooding at the subject site, with a low-risk rating.

No further consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regards to drainage and flooding.

3.7 Landfill and Waste Management Sites

There are no known current landfill sites recorded within 500m.

There is one historic landfill recorded 292m southeast at Airport Woodhouse Park, Greater Manchester with no information pertaining to active dates or waste types accepted. No evidence of voids or potential infilling are present on historical mapping.

There are no known current or historical waste management sites recorded within 250m of the Site.

3.8 Environmental Regulatory Data

A summary of the relevant environmental aspects, both on the Site and within 250m of the Site contained in the Geo-Environmental Data Report, are presented in the table below:

Entry	On-site	0 – 50m	50 – 250m	Details
Recent Industrial Land Uses	0	3	24	The three closest include engineering services, vehicle hire and rental, and an electricity substation.
Current or Recent Fuel Stations	-	-	-	None recorded within 500m.
Licensed Industrial Activities (Part A(1))	-	-	-	None recorded within 500m.
Licensed Pollutant Release (Part A(2)/B)	-	-	2	These both pertain to “unloading of petrol into storage at service stations” associated with car rental facilities 221 and 232m to the south.
Radioactive Substances	-	-	-	None recorded within 500m.
Pollution Incidents (EA/NRW)	-	-	-	None recorded within 500m.

None of the entries identified above are considered to be of significant relevance to be carried forward to the preliminary CSM.

3.9 Radon

Information from the environmental database report indicates the property is in an area where <1% of properties are above the Action Level for radon, and therefore radon protective measures are not required in accordance with BRE Report 211 ‘Radon – Guidance on protective measures for new dwellings’.

3.10 UXO Risk

In accordance with CIRIA Report C681, BSL have reviewed non-specialist UXO data for the Site using the online Zetica Bomb Risk Mapping data.

In addition, a Pre-Desk Study Assessment was commissioned, with the findings summarised below:

- The Royal Air Force (RAF) requisitioned Ringway Airfield (c. 500m south) from 1939 to 1957.
- No readily available records have been found to indicate that activities associated with RAF Ringway extended onto the Site.
- During WWII, 1 No. British bomber aircraft crashed on the northeastern part of RAF Ringway, approximately 300m south of the Site.
- The Site was located in Manchester County Borough which experienced a total of 737 recorded high explosive bombs during the second world war.

- Potential targets within 5km of the Site included: transport infrastructure and engineering works, RAF Ringway, military establishments and training areas, and anti-aircraft and anti-invasion defences.
- No readily available records have been found indicating the Site was bombed.
- The report recommendations indicate that a detailed desk study is not considered essential for the Site.

A copy of the UXO map and Pre-Desk Study Assessment are presented in Appendix E.

The Pre-Desk Study Assessment has not identified any potential sources of UXO hazard affecting the Site and as such, while always prudent, a detailed risk assessment is not considered essential, and no additional supervision during the Site works is required.

3.11 Other Potential Development Constraints

If asbestos is present in soils, this will need to be dealt with in accordance with the Control of Asbestos Regulations (CAR) 2012 and CARSOILS™.

No invasive species have been noted during the walkover; however, it would be prudent to undertake a specialist survey prior to any works on site.

There are known services on / near the Site, these may need to be disconnected prior to any construction activities. Low pressure gas mains and electricity cables run along the northeastern and southern boundary, a BT cable is mapped in the centre-south of the Site, and surface water / public sewage pipes and water mains about the southern and western borders.

3.12 Summary of Previous Report

A summary of the relevant points from RSK's Geo-environmental Risk Assessment (ref. 313110-02(01)) dated October 2015 reference is presented below:

- The following site work was carried out between the 14th and 18th of September 2015:
 - 3 no. cable percussion boreholes to depths of between 7.95m and 8.45m bgl,
 - 5 no. window sample boreholes to depths of between 4.15m and 5.00m bgl,
 - 8 no. trial pits to depths of between 2.70m to 3.20m bgl,
 - 4 no. in-situ CBRs,
 - 3 no. in-situ soakaway tests,
 - Installation of 8 no. shallow combined ground gas and groundwater monitoring wells, and
 - 4 no. ground gas and groundwater monitoring visits.
- The following ground conditions were encountered:
 - Topsoil from 0.1m to 0.5m bgl.
 - Made ground in one location to 0.8m bgl.
 - Glacial Till comprising soft to firm (stiff with depth) clay with secondary sand and gravel, and bands of loose to medium dense sand.
 - Groundwater was encountered from between 0.44m and 5.35m bgl.
 - No visual or olfactory evidence of contamination was noted.
- Based on the findings of the GI, the following geo-environmental conclusions were drawn:
 - Based on the commercial GAC adopted, no risks from soil contamination were identified.
 - The gas monitoring results indicate the Site falls in the Characteristic 1 classification.
 - No risks to controlled waters were identified.
- The following Geotechnical observations were made pertaining to the Till:
 - It was suggested that Design Sulphate Class 2 and ACEC class 2 was adopted.
 - Based on the infiltration rates recorded, it was suggested soakaways were unlikely to be a suitable method of site drainage.
 - In-situ testing generally recorded CBR values ranging from 1.5% to 10%.

-
- The modified plasticity index ranged from 7-11% (low volume change potential).
 - Undrained shear strength derived from SPT N values ranged from 25kPa to >250kPa.
-

4.0 PHASE 1 SUMMARY AND RISK ASSESSMENT

4.1 Introduction

The risk posed by any contaminants in soil or groundwater will depend on the nature and level of the source, the probability of exposure occurring, the potential pollution pathway and the likely effects on the receptors.

A contaminant is defined as a substance that has the potential to cause harm, a risk is considered to exist if such a substance is present at sufficient concentrations to cause harm and if a pathway is present through which a receptor could be exposed to the contaminant.

The following sections discuss the identified potential on-site and off-site sources, and any pollution that could impact receptors via the pathways associated with the proposed development. Pollution linkages are assessed which may represent a risk to human health and/or controlled water receptors from the information gained from the Phase I Assessment searches. The assessment has been carried out on a qualitative basis and aims to produce a complete and comprehensive Preliminary Conceptual Site Model.

Three potential impacts exist for any given site and all three need to be considered in the qualitative risk assessment, these are:

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- On-site impacts.
 - The Site impacting its surroundings.
 - Off-site sources impacting the subject site.
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4.2 Potential Contaminative Sources

On-Site

From the information obtained, only the made ground associated with historic development has been identified as a possible on-site source of contamination which may affect the redevelopment of the Site for a commercial end-use.

Off-Site

The assessment indicates that only the historic ponds (of which the nearest is approximately 10m to the east) have been identified as possible off-site sources that could impact the Site's redevelopment.

Discounted Sources of Contamination

Given their age, distance from the Site, and the generally cohesive nature of the Till, soilborne contamination associated with the nearby ponds (nearest 10m northeast) and railway (24m southwest) is not considered to pose a risk to the study site.

An electricity substation is located 31m to the northwest and first appears on 2003 mapping. Based on historical mapping, this facility postdates the 1986 ban on PCBs. As PCBs are the primary contaminant associated with substations, this substation is not considered to pose a risk to site end-users.

Few details are available regarding the nearby historic landfill site, and no associated indications are evident on historical mapping. Given the lack of information, the Site's distance (292m southwest), and the typically cohesive nature of the underlying Till, the landfill is not considered to pose a risk and will not be assessed further.

Associated Contaminants

The contaminants commonly associated with the potential sources of contamination identified are tabulated below:

Contaminative Sources	Department of the Environment Industry Profile or Other Source	Commonly Associated Contaminants
On Site		
Made ground	AGS Guides BS 8485 and BS 8576	Heavy metals, PAHs, asbestos, and ground gases (carbon dioxide and methane).
Off Site		
Potentially infilled historic ponds	BS8485 and BS8576	Ground gases (carbon dioxide and methane).

4.3 Pathways

A pathway is defined as a medium by which a contaminant comes into contact with, or otherwise impacts a receptor.

At this stage the potential contaminants identified above are considered to present potential risks to site end-users and controlled waters through the following pathways:

Potential Pathways	
Pathways in respect to Human Health	• Dermal contact with contamination. • Inhalation of dusts. • Inhalation of gases or vapours in both indoor and outdoor air.
Pathways in respect to Controlled Waters – Surface water	• Drainage discharge. • Base flow from groundwater.
Pathways in respect to Controlled Waters – Groundwater	• Leaching of mobile contamination into groundwater via the unsaturated zone. • Migration of perched groundwater in any permeable soils or along existing or proposed service runs. • Migration into the saturated zone and flow through the aquifers underlying the Site.
Pathways in respect to Property / structures / water pipes	• Direct contact with substances deleterious to building materials and potable water supply pipelines.

4.4 Receptors

The identified receptors are listed below:

- Commercial end-users (human health).
- Structures / property.
- Surface waters. On-site ditch - tributary of the River Bollin (Controlled waters).
- Superficial Aquifer. Till Secondary Undifferentiated Aquifer (Controlled waters).
- Bedrock Aquifer. Bollin Mudstone Member Secondary (B) Aquifer (Controlled waters).

Under current UK health and safety legislation, employers are required to carry out their own appropriate site-specific risk assessments and mitigation to protect employees. It has been assumed

that any future construction works on-site will be undertaken in compliance with these requirements. Therefore, construction workers have not been specifically considered as part of this assessment.

4.5 Preliminary Conceptual Site Model (CSM)

The information obtained in the previous sections has been used to compile a Preliminary CSM. The identified potential contaminants and receptors have been assessed in the table below as to whether a plausible source-pathway-receptor pollutant linkage for the proposed end-use of the Site exists. The risk classification has been estimated in accordance with information in the BSL Guidance and Methodology in Appendix A.

The Preliminary CSM's are presented in the tables overleaf, any assessed risk above moderate will possibly require further action:

Human Health						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
On-site Made ground Metals, PAHs & asbestos.	Ingestion, direct contact, inhalation of dusts.	End-users	Unlikely	Medium	Low	Based on the previous investigation by RSK, made ground is largely absent and no contamination was identified. The risk is therefore considered low. BSL has no reliance on this information, and a ground investigation is required to confirm these findings.
On-site Made ground PAHs	Migration into / chemical attack of water supply pipelines	Water Pipelines / End-users	Unlikely	Medium	Low	
On-site Made ground Ground gases	Migration into confined spaces and inhalation.	End-users / property / structures	Unlikely	Medium	Low	No deep or putrescible made ground has been identified at the Site; accordingly, the risk is considered low. As noted above, an intrusive investigation will be required to confirm this.
Off -site Potentially infilled ponds Ground gases	Migration into confined spaces and inhalation.	End-users / property / structures	Unlikely	Medium	Low	Three small ponds are present within 100m of the Site, all of which were potentially infilled before the 1960s. Their gas generation potential is likely very low to low, and it is considered unlikely that any emissions would migrate laterally to the Site. The risk is therefore considered low. Monitoring previously undertaken by RSK supports this assessment; however, the potential risk rating should be confirmed by gas monitoring.

Controlled Waters						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
Made Ground PAHs, Metals	Overland flow / migration through saturated zone	On-site ditch (Surface waters)	Unlikely	Medium	Low	Based on the previous investigation by RSK, made ground is largely absent and no contamination was identified. Accordingly, the risk to controlled waters is considered low to very low. BSL has no reliance on this information, and a ground investigation is required to confirm these findings.
	Leaching through unsaturated zone / Migration through saturated zone	Till - Secondary Undifferentiated (Groundwater)	Unlikely	Mild	Very low	
		Bedrock - Secondary (B) Aquifer	Unlikely	Mild	Very low	

Human Health Risk – Soils Contamination Summary

Based on the preliminary CSM and the current use of the Site, the overall risk from land contamination at the Site is considered to be **low** for a redeveloped site. This would need to be confirmed by appropriate intrusive investigation, testing and assessment.

Human Health Risk – Ground Gas Summary

A potential on-site gas source has been identified, associated with possible made ground from the previous development. Off-site sources include nearby potentially infilled ponds. Viable linkages are considered to exist; however, the preliminary CSM considers these sources to present a low potential risk.

In accordance with BS 8576 and CIRIA C665 as set out in Appendix A of this report, the gas generation potential is considered to be very low to low. The sensitivity of the development is low on account of the proposed commercial use.

In line with current guidance, it is recommended that ground gas monitoring should comprise four visits over a one-month period.

Controlled Waters Risk - Summary

Based on the preliminary CSM, BSL believes the overall risk to controlled waters at the Site is **very low to low**.

The above assessed level of risk will need to be confirmed by intrusive investigation and quantitative risk assessment.

5.0 PRELIMINARY GEOTECHNICAL ASSESSMENT

5.1 Hazard Identification

A preliminary geotechnical hazard identification exercise has been undertaken in general accordance with the Highways England document CD 622, 'Managing geotechnical risk'. Potential geotechnical hazards based on the expected ground conditions are listed below:

-
- Made ground of unknown nature; if placed in a non-engineered manner may cause excessive settlement of foundations, highways and infrastructure.
 - Low strength, compressible ground (peat and soft organic clays); may cause excessive settlement of foundations, highways and infrastructure.
 - Presence of obstruction in the ground from historical developments (e.g. relict foundations) causing difficulties with excavations or penetrative works (e.g. piling).
 - Attack of buried concrete by aggressive ground conditions.
 - Shrink / swell of clay; settlement / heave of foundations and floor slabs when located within the influence of trees and vegetation.
 - Running sands or loose fill materials leading to difficulty with excavation due to trench collapse.
 - Shallow groundwater / groundwater rise causing resulting in difficulties with excavations due to trench collapse.
-

The above identified geotechnical hazards will need to be considered as part of further investigations and assessments. If reliance can be obtained for the previous GI, the majority of these risks could be discounted.

5.2 Foundation and Geotechnical Design

The proposed development is for a commercial end-use comprising five single storey warehouse units with associated loading bays, HGV and car parking, infrastructure and soft landscaping. The type of foundation solution should be informed by an on-site intrusive investigation to confirm ground conditions and obtain geotechnical parameters for preliminary foundation and floor slab design. Intrusive investigation should also obtain data to allow appropriate concrete classification in accordance with BRE SD1 and for preliminary highways / pavement design.

5.3 Drainage

Based on the data obtained by RSK, soakaway drainage is unlikely to be suitable at the Site. BSL have no reliance on this data, and as such this may need to be confirmed by an on-site intrusive investigation to confirm ground conditions and infiltration rates. Testing should be carried out in general accordance with BRE Digest 365 "Soakaway design" and CIRIA C753 "The SuDS Manual".

5.4 Recommendations

To confirm the ground conditions in respect to the identified potential geotechnical hazards and risks, an appropriate intrusive investigation will need to be undertaken.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Geo-Environmental Summary

The Site's previous uses included residential properties and a nursery, and based on the proposed commercial development, the overall risk to human health from on-site soils contamination is considered to be low.

The risk from off-site sources of soil contamination is negligible.

The risk from permanent ground gases is considered to be low, and radon is not considered to pose a risk.

The overall risk to controlled waters is considered to be very low to low.

Intrusive investigations will be required to confirm the above assessed levels of risks and determine remedial requirements, if any.

6.2 Geotechnical Summary

Intrusive investigations will be required to confirm the most suitable foundation solution and to obtain parameters for concrete classification, floor slab and highways design.

Drainage to SuDS is unlikely to be viable, subject to intrusive investigation and testing.

6.3 Further Work

To confirm the risks to the identified receptors and confirm the ground conditions in respect to the identified geotechnical and geo-environmental risks, an appropriate intrusive investigation will need to be undertaken. The following further works are recommended, although this list is not exhaustive and should be read in conjunction with any planning conditions that are applicable to the Site:

-
- Topographical survey / utility mapping.
 - Intrusive ground investigation comprising:
 - Trial pitting and dynamic sampling / rotary coring (requirement TBC).
 - Installation of standpipes in boreholes to allow gas concentrations and groundwater levels to be monitored.
 - Soil infiltration rate testing (if required).
 - In-situ CBR testing (if required).
 - Geotechnical testing of soils.
 - Contamination analyses of soil.
 - Assessment and recommendations based on the above, including requirements for further work, if necessary.
-

7.0 ABBREVIATIONS AND DEFINITIONS

GLOSSARY	
Term / Abbreviation	Definition
AST	Above Ground Storage Tank.
B(a)P	Benzo (a) Pyrene.
BGS	British Geological Survey.
BRE	Building Research Establishment.
BS	British Standard.
BSL	Brownfield Solutions Ltd.
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes.
CBR	California Bearing Ratio (used in pavement/highways design).
CAR 2012	Control of Asbestos Regulations (2012).
CBCB	Cheshire Brine Compensation Board.
CBCD	Cheshire Brine Compensation District.
CBR	California Bearing Ratio.
CIEH	Chartered Institute of Environmental Health.
CIRIA	Construction Industry Research Association.
CL:AIRE	Contaminated Land: Applications in Real Environments.
CLEA	Contaminated Land Exposure Assessment.
CLO	Contaminated Land Officer.
COMAH	Control of Major Accident Hazards.
Contamination	Presence of a substance which is in, on or under land, and which has the potential to cause significant harm or to cause significant pollution of controlled water. There is no assumption in this definition that harm results from the presence of the contamination. Naturally enhanced concentrations of harmful substances can fall within this definition of contamination. Contamination may relate to soils, surface water, groundwater or ground gas.
Controlled Waters	Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three-mile limit of territorial waters.
CPT	Cone Penetration Test.
CSM	Conceptual Site Model. A schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information from the preliminary investigation and refined during subsequent phases of investigation and which is an essential part of the risk assessment process. The conceptual site model is initially derived from the information obtained by the preliminary investigation (i.e. the Phase I Phase I Assessment). This conceptual model is used to focus subsequent investigations, where these are considered to be necessary, in order to meet the objectives of the investigations and the risk assessment. The results of intrusive investigations can provide additional data that can be used to further refine the conceptual site model.
DCP	Dynamic Cone Penetrometer.
DNAPL	Dense Non-Aqueous Phase Liquid.
DoWCoP	Definition of Waste Code of Practice.
DWS	Drinking Water Standard.
EA	Environment Agency.
EHO	Environmental health Officer.
EQS	Environmental Quality Standard.
GAC	Generic Assessment Criteria.

GLOSSARY	
Term / Abbreviation	Definition
GDR	Geotechnical Design Report.
GFR	Geotechnical Feedback Report.
GIR	Ground Investigation Report.
GSV	Gas Screening Value.
Harm	Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case of human health, including property/structures and water supply pipelines.
Hazard	Inherently dangerous quality of a substance, procedure or event.
HDPE	High Density Polyethylene.
HSV	Hand Shear Vane.
K	Modulus of Subgrade Reaction.
LCRM	Land Contamination: Risk Management (EA guidance).
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene).
LOD	Limit of Detection (for particular method adopted).
MMP	Materials Management Plan.
Mv	Modulus of Volume of Compressibility.
ND	Not Detected.
NHBC	National House Building Council.
NR	Not Recorded.
OS	Ordnance Survey.
PAH	Polycyclic Aromatic Hydrocarbon.
Pathway	Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.
PCB	Poly-Chlorinated Biphenyl.
PCSM	Preliminary Conceptual Site Model.
pH	Scale used to specify how acidic or basic a water-based solution is.
PHC	Petroleum Hydrocarbons.
PID	Photo Ionisation Detector.
PNEC	Predicted No-Effect Concentration.
Precision	Level of agreement within a series of measurements of a parameter.
PSD	Particle Size Distribution.
PVC	Polyvinyl Chloride.
Receptor	Human health, living organisms, ecological systems, controlled waters (surface waters and groundwater within aquifers), atmosphere, structures and utilities that could potentially be adversely affected by contaminant(s).
Risk	Probability of the occurrence, magnitude and consequences of an unwanted adverse effect on a receptor.
Risk Assessment	Process of establishing, to the extent possible, the existence, nature and significance of risk.
Sampling	Methods and techniques used to obtain a representative sample of the material under investigation.
SOM	Soil Organic Matter.
Source	Location from which contamination is, or was, derived. This could possibly be the location of the highest soil, groundwater or gas concentration of the contaminant(s).
SPT	Standard Penetration Test.
SVOCs	Semi Volatile Organic Compounds.
TOC	Total Organic Carbon.
TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group).

GLOSSARY	
Term / Abbreviation	Definition
TVOCs	Total volatile organic compounds.
UCS	Unconfined Compressive Strength.
Uncertainty	Parameter, associated with the result of a measurement that characterises the dispersion of the values that could reasonably be attributed to the measurement.
UST	Underground Storage Tank.
UXO	Unexploded Ordnance.
VCCs	Vibro Concrete Columns.
VSCs	Vibro Stone Columns
VOCs	Volatile Organic Compounds.
WAC	Waste Assessment Criteria.
WFD (in waste context)	Waste Framework Directive.
WFD (in water context)	Water Framework Directive.
Units	Definition
°	Degrees
Φ	Phi angle (in degrees)
g/l	Grams per Litre
Km	Kilometres
kPa	Kilo Pascal (Equivalent to kN/m ²)
KN/m ² /mm	Kilo Newton per metered squared per millimeter
kN/m ²	Kilo Newtons per metre squared
kPa	Kilo Pascal (Equivalent to kN/m ²)
l/hr	Litres per hour
MJ/kg	Mega joule per kilogram
MN	Mega Newton
M ² /MN	Mega Newton per metre squared
M	Metres
m bgl	Metres Below Ground Level
m OD	Metres Ordnance Datum (sea level)
µg/l	Micrograms per Litre (parts per billion)
µm	Micrometre
mb	Millibars (atmospheric pressure)
mg/kg	Milligrams per kilogram (parts per million)
mg/m ³	Milligram per metre cubed
mm	Millimetre
ppb	Parts Per Billion
Ppm	Parts Per Million

8.0 REFERENCES

References used in the production of this report are listed below; note not all of the below are relevant to the subject site and may not have been utilised.

Association of Ground Investigation Specialists. 'Description Of Anthropogenic Materials– A Practitioners' Guide'. 2018.

BS 8576 'Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)'. 2013.

BS 5930+A1:2020: 'Code of Practice for Site Investigations'. 2020.

BS 10175:2011+A2:2017 'Investigation of Potentially Contaminated sites - code of practice'. 2017.

BRE Report BR211, Scivyer, C. 'Radon – Guidance on protective measures for new buildings' 2023 Edition.

CIRIA Special Publication SP32, PSA Civil Engineering Technical Guide 34, 'Construction over abandoned mine workings'. 1984.

CIRIA C574 'Engineering in Chalk'. 2002.

CIRIA C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings'. 2007.

CIRIA C681 'Unexploded Ordnance (UXO) A guide for the construction industry'. 2009.

CIRIA C753 'The SuDS Manual'. 2015.

CIRIA C758 'Abandoned Mine Workings Manual'. 2019.

CL:AIRE RB17 'A Pragmatic Approach to Ground Gas Risk Assessment'. 2012.

CL:AIRE TB19 'Managing Risks and Liabilities associated with Per and Polyfluoroalkyl Substances (PFASs)'. 2019.

CL:AIRE TB22 'An overview of the uses of PFAS to assist with identification of sites of concern'. 2023.

Department of the Environment. 'Industry Profiles' - 48 separate publications available from The Stationery Office, London. 1995.

DEFRA and the Environment Agency, CLR Report No 11 'Model Procedures for the Management of Contaminated Land'. 2004. [Withdrawn 2019.]

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Highways England. CD 622, 'Managing geotechnical risk'. 2020.

National Planning Policy Framework (NPPF). 2023.

National Planning Policy Framework - Technical Guidance. March 2012.

NHBC Standards. Chapter 4.1: Land Quality - Managing Ground Conditions.

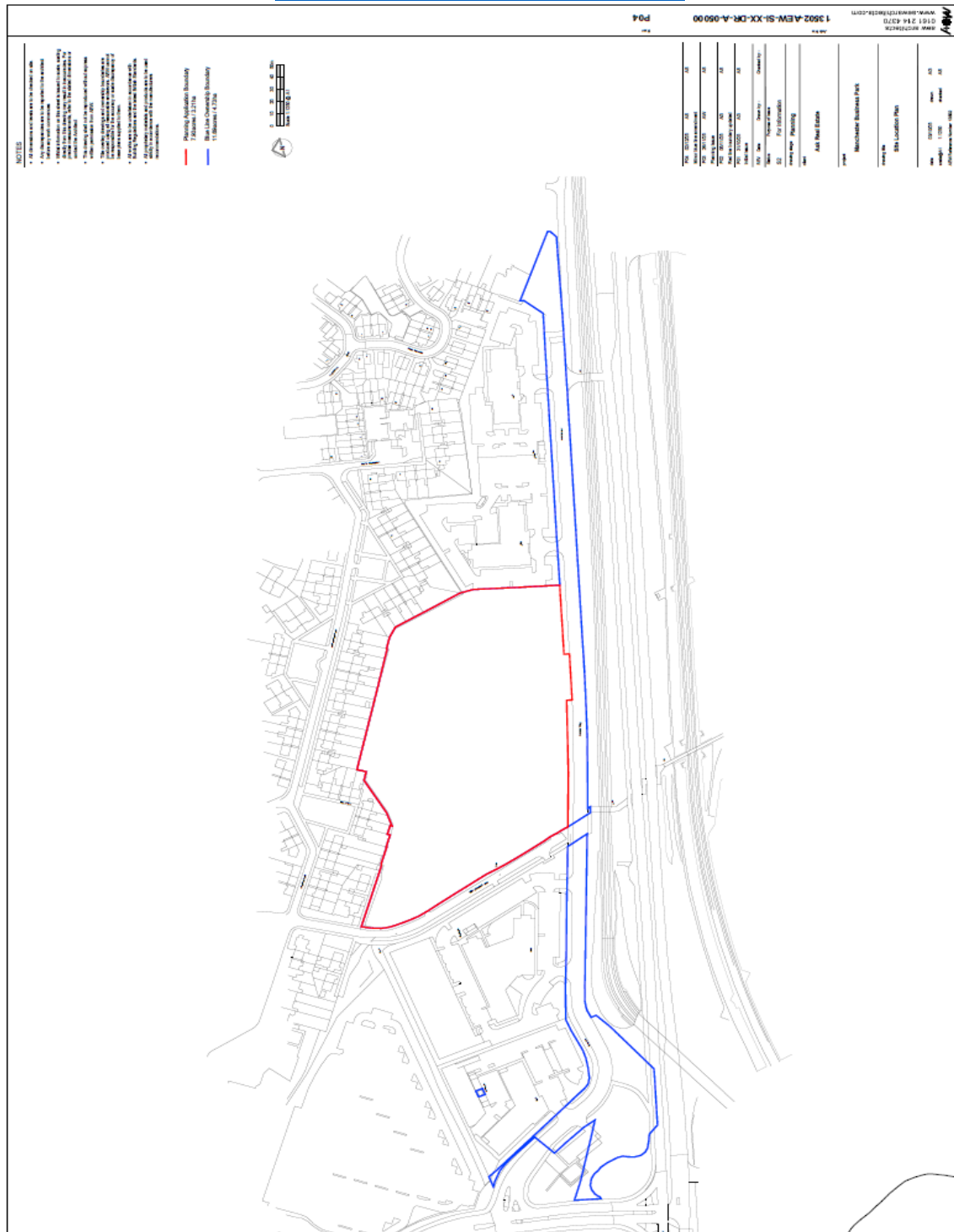
NHBC. 'Hazardous Ground Gas - An essential guide for housebuilders'. May 2023.

Water Framework Directive, 2000.

DRAWINGS

C6035 01 REV A Site Location Plan.pdf

C6035_02_REV A Site Features Plan.pptx





- NOTES**
- All dimensions and levels are to be checked on site.
 - Any discrepancies are to be reported to the architect before any work commences
 - This drawing shall not be scaled to ascertain any dimensions. Work to figured dimensions only.
 - This drawing shall not be reproduced without express written permission from AEW.
 - Title overlay drawings and ownership boundaries are produced using all reasonable endeavors. AEW cannot be responsible for the accuracy or scale discrepancy of base plans supplied to them.
 - All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
 - All proprietary materials and products are to be used strictly in accordance with the manufacturers recommendations.

CDM 2015

Client notified of duties:

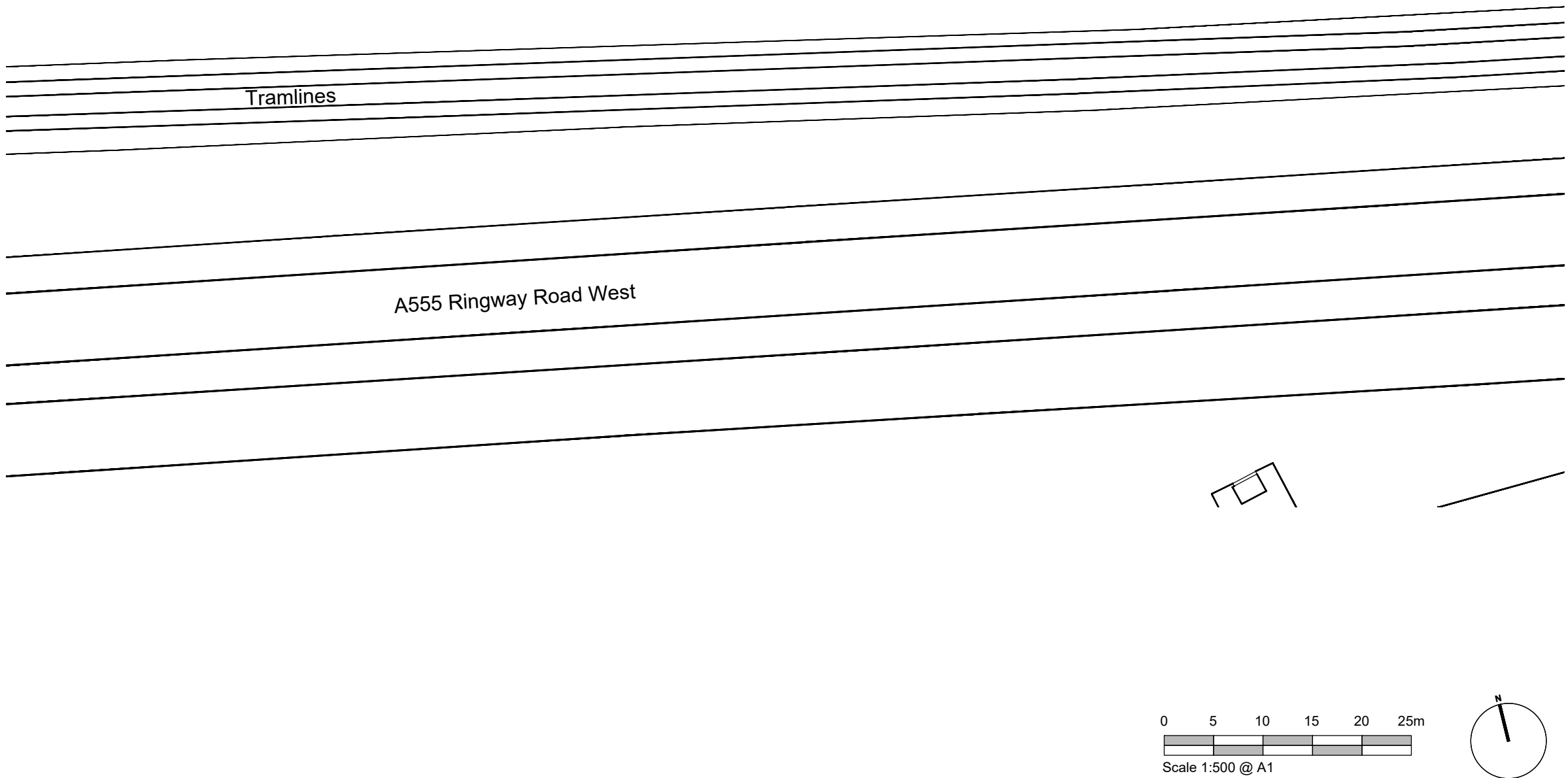
Principal Designer: **Client**

Unless noted below, all known hazards have been highlighted on the drawing:

Schedule of Accommodation										
Unit	Ground Floor GIA	First Floor Office GIA	Total Office %	TOTAL UNIT GIA	Office NIA	"NET" Office %	Ground Floor GEA	First Floor Office GEA	TOTAL UNIT GEA	Car Parking (Accessible)
Unit 1A	1,488 m ² / 16,017ft ²	192m ² / 2,067ft ²	13.3%	1,680m ² / 18,084ft ²	144m ² / 1,550ft ²	10.0%	1,552m ² / 16,706ft ²	231m ² / 2,466ft ²	1,783m ² / 19,192ft ²	32 (2)
Unit 1B	1,736m ² / 18,686ft ²	216m ² / 2,325ft ²	12.9%	1,952m ² / 21,011ft ²	168m ² / 1,808ft ²	10.0%	1,808m ² / 19,461ft ²	259m ² / 2,788ft ²	2,067m ² / 22,249ft ²	24(2)
UNIT 1 TOTAL				3,632m ² / 39,095ft ²					3,850m ² / 41441ft ²	57 (4)
Unit 2A	800m ² / 8,611ft ²	120m ² / 1,292ft ²	15.0%	920m ² / 9,903ft ²	84m ² / 1,163ft ²	10.5%	850m ² / 9,149ft ²	147m ² / 1,582ft ²	997m ² / 10,732ft ²	13 (1)
Unit 2B	480m ² / 5,167ft ²	96m ² / 1,033ft ²	20.0%	576m ² / 6,200ft ²	60m ² / 646ft ²	12.5%	504m ² / 5,425ft ²	119m ² / 1,281ft ²	623m ² / 6,706ft ²	10 (1)
Unit 2C	480m ² / 5,167ft ²	96m ² / 1,033ft ²	20.0%	576m ² / 6,200ft ²	60m ² / 646ft ²	12.5%	504m ² / 5,425ft ²	119m ² / 1,281ft ²	623m ² / 6,706ft ²	10 (1)
UNIT 2 TOTAL				2,072m ² / 22,303ft ²					2,243m ² / 24,144ft ²	33 (3)
Unit 3A	1,000m ² / 10,764ft ²	144m ² / 1,550ft ²	14.4%	1,144m ² / 12,314ft ²	108m ² / 1,163ft ²	10.8%	1,053m ² / 11,334ft ²	172m ² / 1,851ft ²	1,225m ² / 13,186ft ²	20 (1)
Unit 3B	800m ² / 8,611ft ²	120m ² / 1,292ft ²	15.0%	920m ² / 9,903ft ²	84m ² / 1,163ft ²	10.5%	832m ² / 8,956ft ²	144m ² / 1,550ft ²	976m ² / 10,506ft ²	14 (1)
Unit 3C	600m ² / 6,458ft ²	96m ² / 1,033ft ²	16.0%	696m ² / 7,491ft ²	60m ² / 646ft ²	10.0%	637m ² / 6,857ft ²	119m ² / 1,281ft ²	756m ² / 8,138ft ²	11 (1)
UNIT 3 TOTAL				2,760m ² / 29,709ft ²					2,957m ² / 31,829ft ²	45 (3)
Unit 4	1,392m ² / 14,983ft ²	188m ² / 2,024ft ²	13.5%	1,580m ² / 17,007ft ²	140m ² / 1,504ft ²	10.0%	1470m ² / 15,823ft ²	218m ² / 2,347ft ²	1,688m ² / 18,170ft ²	22 (2)
GRAND TOTAL	8,776m ² / 9,4464ft ²	1,268m ² / 13,649ft ²		10,044m ² / 108,113ft ²	908m ² / 9,774ft ²		9,210m ² / 99136ft ²	1,528m ² / 16,447ft ²	10,738m ² / 115,583ft ²	157 (12)

- Key:**
- Site Boundary 7.90acres / 3.20ha
 - Existing trees to be removed
 - Existing Trees
 - Landscape area to be retained & enhanced
 - Enhanced Landscape Bund
 - Proposed Acoustic Fencing
 - Office - estimated NET area
 - Office - estimated core area

Key:



P05	22/09/25	AG	AS
Unit 1 and 4 areas updated, gates and fence removed			
P04	17/04/25	TW	CF
Highway Consultant Alterations			
P03	28/02/25	AS	AS
Office areas updated			
P02	06/02/25	AS	AS
GEA areas updated			
P01	29/01/25	TW	AS
Initial issue			
REV	Date	Drawn by: -	Checked by: -
Status	Purpose of Issue		
S2	For Information		
drawing stage	Feasibility		
client			
Ask Real Estate			
project			
Aviator Way, Manchester Business Park			
drawing title			
Proposed Site Plan Option 05			
date	29/01/25	drawn	TW
scale@A1	1:500	checked	AS

Rev

P05

13502-AEW-XX-XX-DR-A-0007

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**POTENTIAL
VEHICULAR
SITE ACCESS**

KEY

- APPROXIMATE SITE BOUNDARY
- TREES & SHRUBS
- PEDESTRIAN SITE ACCESS
- DRAINAGE DITCH
- ELECTRICITY SUBSTATION
- PEDESTRIAN ACCESS ONLY
- HISTORIC POND

- NOTES
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REV	DATE	DESCRIPTION	BY	CKD
A	02/12/2025	Updates for client	BW	SM

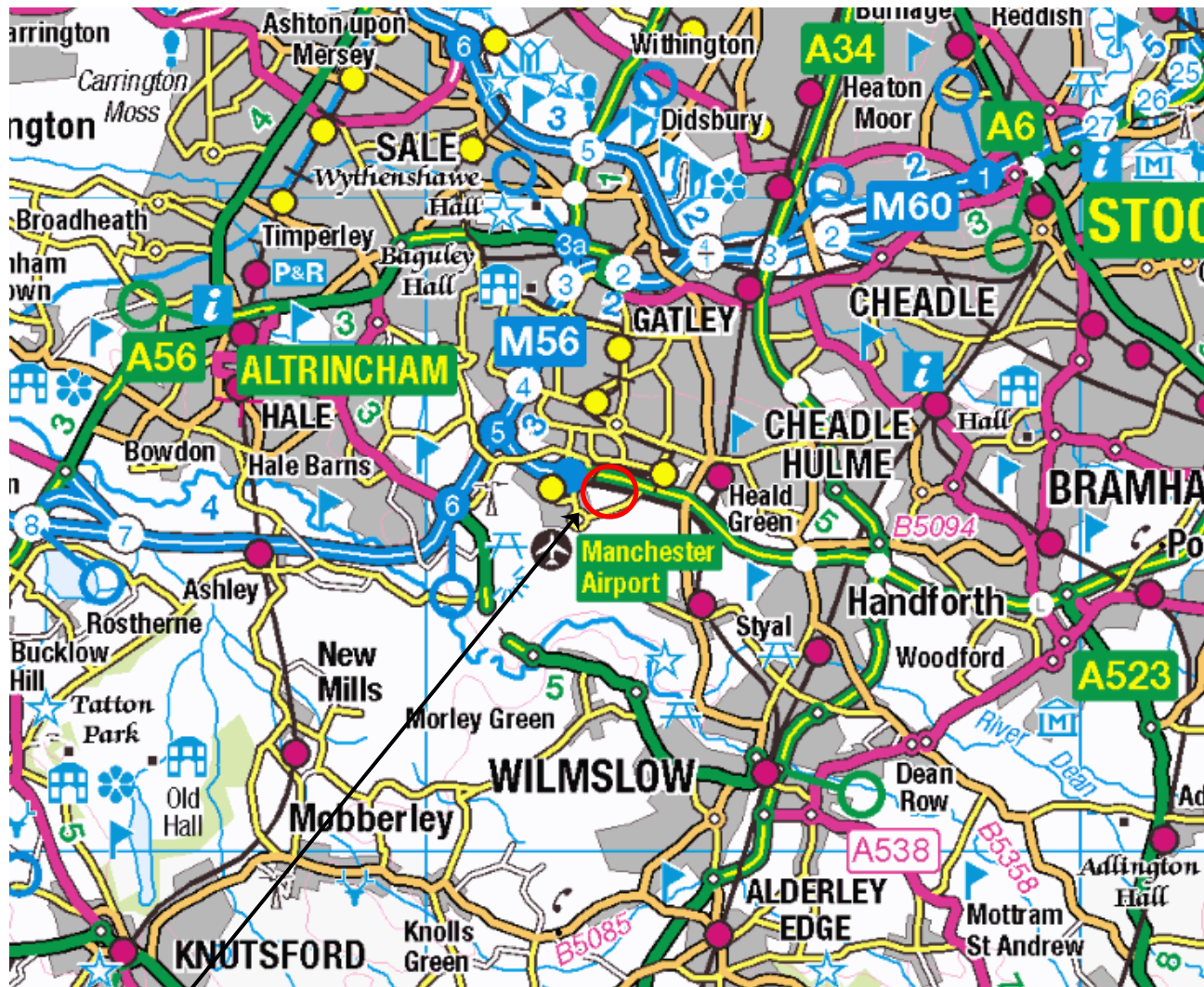


CLIENT
ASK REAL ESTATE MBP LTD

PROJECT TITLE
**MANCHESTER BUSINESS PARK,
AVIATOR WAY**

DRAWING TITLE
SITE FEATURES PLAN

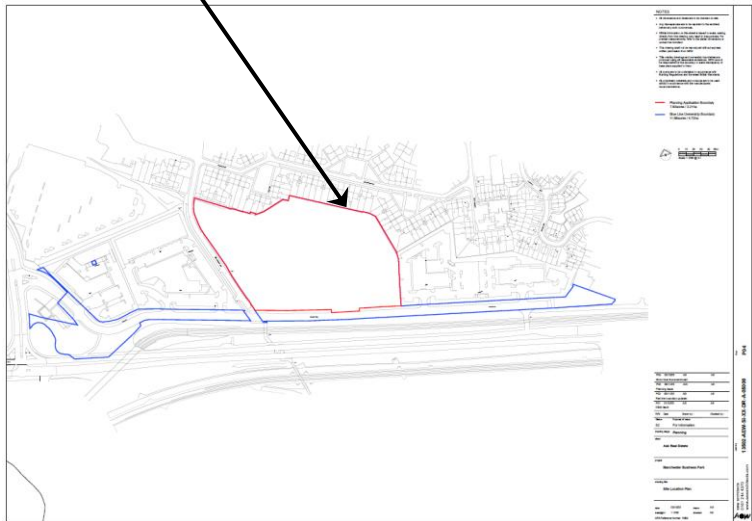
DRAWING No.	REVISION	SCALE	DATE
C6035	A	NTS	02/12/2025
DRAWN BY BW		CHECKED BY SM	



SITE LOCATION

NEAREST POSTCODE: M22 5TG

SITE ENTRANCE WHAT3WORDS: ///PRUDE.NOUN.CRACKING



REV	DATE	DESCRIPTION	BY	CKD
A	02/12/25	Updates for client	BW	SM
 BROWNFIELD SOLUTIONS LTD CEO-ENVIRONMENTAL ENGINEERING EXCELLENCE				
CLIENT				
ASK REAL ESTATE MBP LTD				
PROJECT TITLE				
MANCHESTER BUSINESS PARK, AVIATOR WAY				
DRAWING TITLE				
SITE LOCATION PLAN				
DRAWING No. C6035/01	REVISION A	SCALE NTS	DATE 02/12/25	
DRAWN BY BW		CHECKED BY SM		

PHOTOGRAPHS



Photograph 1: Site Entrance from Woodhouse Lane



Photograph 2: Western Boundary



Photograph 3: Northern Boundary



Photograph 4: Site Overview



Photograph 5: Site Overview



Photograph 6: NW Corner



Photograph 7: Utility Cover



Photograph 8: Ditch on Southern Boundary



Photograph 9: Pedestrian Entrance on Western Boundary



Photograph 10: Eastern Boundary



Photograph 11: Ditch on SE corner



Photograph 12: Utility Cover

APPENDIX A

BSL Methodology and Guidance

BSL Phase I Geo-Environmental Assessment Reports - Methodology and Guidance

Background

This Appendix provides information on the approaches, methods and guidance used by Brownfield Solutions Ltd in the preparation of this report.

The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential soils and groundwater contamination). The term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). It should be noted that this is an integrated investigation and these two main aspects are related, unless otherwise specified within the report.

Phase I reports are written in general accordance with the description of a Preliminary Investigation as defined in BS10175:2011+A2:2017 and are also produced in general accordance with the recommendations for a Tier 1 Preliminary Risk Assessment as described in LCRM guidance.

The first stage of the investigation and assessment of a site is the Preliminary Investigation/Tier 1 Preliminary Risk Assessment, often referred to as a Phase 1 Desk Study, comprising a desk study and walk-over survey and collation of desk-based searches, which culminates in the Preliminary Risk Assessment and the development of a preliminary/initial **Conceptual Site Model (CSM)**. From this are identified any potential geotechnical and geo-environmental hazards and the qualitative degree of risk associated with them. In the case of the geotechnical hazard identification, this is referred to as the **Ground Model**.

From the geo-environmental perspective, the hazard Identification process uses professional judgement to evaluate all the hazards in terms of possible contaminant linkages (of source-pathway-receptor). Possible contaminant linkages are potentially unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and generic risk assessment as part of Phase II investigations and reports.

The second stage is the Ground Investigation, Generic Risk Assessment and Geotechnical Interpretation. This represents the further assessment mentioned above. The Ground Investigation comprises field work and laboratory testing based on the findings of the Preliminary Risk Assessment, to reduce uncertainty in the geotechnical and geo-environmental hazard identification. This may include an exploratory, a detailed or/and supplementary Investigations as described in BS 10175:2011+A2:2017. Phase II Assessments are produced in general accordance with the recommendations for a Tier 2 Generic Quantitative Risk Assessment as described in LCRM guidance and are also intended to fulfil the requirements of a Ground Investigation Report (GIR) as detailed in BS EN 1997-2:2007.

Contaminated Land - Legislative Background

Land contamination can be addressed in several ways, e.g. during planning, under Part 2A, following an incident, during an investigation into environmental damages, or during the application of an environmental permit, or its surrender.

For the planning process the key test is **as a minimum the site cannot be determined as contaminated land**, e.g. there is not significant harm, significant possibility of significant harm to human health or that there is not significant harm to, or the significant possibility that the pollution of controlled waters will occur.

Environmental liabilities and risks have been evaluated in terms of a source -pathway - target relationship in accordance with the approach set out in:

-  The 1995 Environment Act.
-  The Contaminated Land Statutory Guidance, DEFRA – April 2012.
-  The Contaminated Land (England) Regulations 2006.
-  The Contaminated Land (England) Amendment Regulations 2012.
-  Water Resources Act.
-  Water Framework Directive.
-  Environmental Damage Regulations.
-  Environment Agency (EA) - Land Contamination Risk Management (LCRM) 2019.

Contaminated land is defined within the legislative framework as land which is in such condition by reason of substances in, on or under the land that:

- 1) Significant harm is being caused or there is a significant possibility of such harm being caused.
- 2) Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm is based on the presence of three factors:

Source - substances that are potential contaminants or pollutants that may cause harm.

Pathway - a potential route by which contaminants can move from the source to the receptor, and the impact of that migration on the source e.g., attenuation.

Receptor - a receptor that may be harmed, for example the water environment, humans and water, considering the sensitivity of the receptor.

Where a source, pathway and target are all present a pollutant linkage exists and there is potential for harm to be caused.



Where any one of the “pollution linkages” between the above is absent there is deemed to be no risk.

The presence of a source does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors are site specific and will vary according to the intended end use of the site, its characteristics and its surroundings.

The key principle which supports the S-P-R approach is ‘suitable for use’ criteria. This requires remedial action only where contamination is considered to pose unacceptable actual or potential risks to health or the environment and, taking into account the proposed use of the site.

Relevant Guidance Documents

This report has been prepared in accordance with the list of guidance below, however the list is not exhaustive:

- DETR: Circular 02/2000: Environmental Protection Act 1990: Part IIA: Contaminated land. 2012.
- Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the EPA1990, May 2002.
- BS 10175:2011+A2:2017.
- Environment Agency (EA) - Land Contamination Risk Management (LCRM). 2019.
- Groundwater Protection <https://www.gov.uk/government/collections/groundwater-protection>
- UK Technical Advisory Group (UKTAG) - - Water Framework Directive
- Incidents and their classification: the Common Incident Classification Scheme (CICS) – Used by the Environment Agency to classify pollution incidents.

Relevant Legislative Documents

The following is a non-exhaustive list of legislative framework documents that has been considered in the production of this report:

- The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012).
- The Environment Protection Act (1990).
- The Water Resources Act (1991).
- The Environment Act (1995).
- The Contaminated Land (England) Act (2000).
- The Pollution Prevention and Control (England and Wales) Regulations (2000).
- The Landfill Regulations (England and Wales) Regulations (2002).
- The Landfill (England and Wales) (Amendment) Regulations (2004).
- Contaminated Land (England) Regulations (2012).
- The Environmental Damage (Prevention and Remediation) Regulations (2009).
- Environmental Permitting Regulations (England and Wales) Regulations (2010).
- The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017).
- Health and Safety at Work Act.
- National Planning Policy Framework (NPPF) – latest version.

Contaminated Land Risk Assessment Approach

Contaminated Land Risk Assessment is a technique that identifies and considers the associated risk, determines whether the risks are significant and whether action needs to be taken. The four main stages of risk assessment are:



LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. The starting point of the risk assessment is to identify the context of the problem and the objectives of the process. Under LCRM, three tiers of risk assessment exist – Stage/Tier Preliminary Risk Assessment, Stage 2 Generic Quantitative Assessment and Stage 3 Detailed Quantitative Assessment.

Further information can be found at the below site:

<https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

Formulating and developing a conceptual model for the site is an important requirement of risk assessment, this supports the identification and assessment of pollutant linkages. Development of the conceptual model forms the main part of preliminary risk assessment, and the model is subsequently refined or revised as more information and understanding is obtained through the risk assessment process.

Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk.

The risk assessment process needs to take into account the degree of confidence required in decisions. Identification of uncertainties is an essential step in risk assessment.

The likelihood of an event is classified on a four-point system using the following terms and definitions from CIRIA C552, with reference to Incidents and their classification: the Common Incident Classification Scheme (CICS), Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance 2012 and other guidance as appropriate which will be detailed within the main body of the report if applied.

The likelihood of a given receptor being impacted is related to a number of factors, e.g. the geology which could inhibit contaminant migration. For example, a site with a significant thickness of clay between it and a receptor may reduce migration of contamination via the subsurface, which will reduce the likelihood of a given receptor being impacted. The geology or drainage for example could offer a preferential pathway e.g. mines shafts/faults increasing the likelihood and potential magnitude of an impact. The depth of contamination will also affect the exposure pathway, for example petroleum hydrocarbons at depth are unlikely to reach a receptor via dermal contact but could via vapour pathways which will influence the likelihood of an impact being felt e.g. if there are no buildings on site.

The terms and definitions used for the assessment of the likelihood are provided below:

High likelihood: There is a pollution linkage and an event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.

Examples - Extensive areas with concentrations above saturation limits for mobile contamination e.g. petroleum hydrocarbons within the water table.

Likely: There is a pollution linkage and all the elements are present and in the right place, which means it is probable that an event will occur. Circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term.

Examples – Localised areas of contaminants with concentrations above saturation limits for mobile contamination e.g. localised petroleum hydrocarbons within the water table; shallow contamination above relevant human health generic assessment criteria is present with little or no hardstanding,

Low likelihood: There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain even over a longer period such event would take place, and is less likely in the short term.

Examples - A thickness/distance of low permeability deposits preventing contaminant migration to a receptor is present; a site is mostly covered hard standing preventing exposure to soil contamination.

Unlikely: There is a pollution linkage but circumstances are such that it is improbable the event would occur even in the long term.

Examples – A site is underlain by a substantial thickness of low permeability clays, between the source and potential receptors which will inhibit significantly, but not completely rule out migration to sensitive receptors.

The severity is also classified using a system based on CIRIA C552, with reference to Incidents and their classification: the Common Incident Classification Scheme (CICS), Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance 2012 and other guidance as appropriate which will be detailed within the main body of the report, if applied. The terms and definitions are:

Severe: Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);

Examples – High concentrations of contaminant on surface of recreation area, major spillage of contaminants from site into controlled waters, explosion causing building to collapse.

Medium: Chronic damage to human health ('significant harm' as defined in DETR 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);

Examples - Concentrations of contaminants exceed the generic assessment criteria, leaching of contaminants from a site to a Principal or Secondary Aquifer, death of species within a designated nature reserve.

Mild: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures, services or the environment.

Examples - Pollution of non-classified groundwater or damage to buildings rendering it unsafe to occupy.

Minor: harm, not necessarily significant harm, which may result in financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by use of personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Examples - Presence of contaminants at such concentrations PPE is required during site work, loss of plants in landscaping scheme or discolouration of concrete.

Once the likelihood and severity have been determined, a risk category can be assigned using the table below.

		Consequences			
		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
	Negligible	Negligible Risk / No Linkage			

Definitions of the risk categories obtained from the above table are as follows together with an assessment of the further work that might be required:

Very high: There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability. Urgent investigation and remediation are likely to be required.

High: Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term.

Moderate: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it would be more likely to be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term.

Low: It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

Very Low: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Some linkages may be identified which constitutes a theoretical connection between a source and a receptor, but professional judgement shows them not to be possible for some reason. These are labelled ‘negligible risk’ and ‘no linkage’ in the summary table, which give rise to an overall **negligible** risk category and no further action is required.

Ground Gas Risk Assessment

BS8485:2015+A1:2019, BS 8576:2013, CL:AIRE RB17, and NHBC ‘Hazardous Ground Gas - An essential guide for housebuilders’ 2023, are the current guidance which gives up-to-date advice on all aspects of permanent ground gas risk. BS8576 alongside CIRIA C682 also provides guidance on assessment of hydrocarbon vapour intrusion.

The CL:AIRE publication ‘Good Practice for Coal Mine Gas Emissions’ 2021 provides guidance on the assessment of risks from mine gas sources.

The above all outline good practice in investigation, the collection of relevant data and monitoring programmes in a risk-based approach to ground gas contamination. The aim of the guidance is for a consistent approach to decision making, particularly relating to the scope of protective design measures on a site-specific basis.

Legislative Framework

BS8485:2015+A1:2019, BS 8576:2013 and CIRIA C665 provides technical guidance, however they also recognise the context into which the guidance has to be employed. Government policy is based upon a “suitable for use approach”, which is relevant to both the current and proposed future use of land. When considering the current use of land, Part IIA of the Environment Protection Act 1990 provides the regulatory regime. The presence of hazardous ground gases could provide the “source” in a “pollutant linkage” which could lead the regulator to determine that considerable harm or there is a significant possibility of such harm being caused. Under such circumstances, the regulator would determine the land to be “contaminated land” under the provisions of the Act, setting out the process of remediation as described in the DETR Circular 02/2000 *Statutory guidance on contaminated land*.

Generation Potential of Sources

BS 8576:2013 Figure 6 provides a basis for assessing the generation potential from sources identified as part of the Phase I Assessment. These are summarised below:

Generation Potential	Typical Sources
Very Low	- Natural carbonate soil and strata, e.g. chalk and limestone. - Natural soil strata with a low degradable organic content, e.g. alluvium, peat. - In-filled pond less than 15 m diameter, in-filled before 1930s to 1940s. - Made ground with low degradable organic content (e.g. up to 5% organic material such as pieces of wood, pieces of paper, rags, etc. with a high proportion of ash and no food or other easily degradable waste). - Mine workings shallow or shaft (where there is clear evidence that they are flooded). - Inert landfill sites.
Low	- Natural soil strata with a high degradable organic content (DOC). - Made ground with total organic carbon (TOC) up to 6% (e.g. dock silt, no food or other easily degradable waste). - Foundry sand (includes phenolic binders, rags and wood that decay, albeit at low rates). - Landfill 1945 to mid 1960s (see also Moderate below).
Moderate	- Sewage sludge. - Mine workings – unflooded, more than 50 years since last worked (gas is liberated from coal when mine workings are excavated; this continues for up to about 50 years). - Landfill 1945 to mid 1960s (this could also be “low” or, if disturbed, “high”).
High	- Landfill mid 1960s to early 1990s. - Mine workings – unflooded – less than 50 years since last worked.
Very High	- Municipal landfill sites. - Landfill early 1990s onward.

Frequency and Duration of Monitoring

BS8576 notes to determine where and how to monitor ground gases requires consideration of credible pathways of possible exposure of the receptors, taking into account what is known about the geology and hydrogeology, building construction and services layout, foreseeable events such as flooding, changes in groundwater level, climate change, extreme weather conditions, the closure of mines, and possible changes to the gas regime caused by future development.

The monitoring period for a specific site should cover the “worst case” scenario. A “worst case” scenario will typically occur during falling atmospheric pressure and, in particular, weather conditions such as rainfall, frost and dry weather.

The benefits of additional information and whether it is likely to change the scope of gas protection should be considered, as are the consequences of failing to characterise adequately pollutant linkages. Investigations concerned with ground gas are required to provide monitoring data sufficient to allow prediction of worst case conditions enabling the confident assessment of risk and subsequent design of appropriate gas protection schemes. Monitoring programmes should not be an academic exercise in data collection. CL:AIRE publication TB17 “Ground Gas Monitoring and ‘Worst-Case’ Conditions” provides further guidance.

Below are matrices that will aid in determining an appropriate number of gas monitoring visits and the length of monitoring period.

Typical/idealised periods of monitoring

		Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	1 month	2 months	3 months	6 months	12 months
	Moderate (Apartments)	2 months	3 months	6 months	12 months	24 months
	High (Low rise Residential)	3 months	6 months	6 months	12 months	24 months

Typical/idealised frequency of monitoring/Number of Visits Required

		Gas Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	4	6	6	12	12
	Moderate (Apartments)	6	6	9	12	24
	High (Low rise Residential)	6	9	12	24	24

Notes

- 1 Generation potential of sources based on descriptions within BS 8576:2013.
- 2 At least two sets of readings should be at low and falling atmospheric pressure (but not restricted to periods below <1000 mb) known as worst case conditions. Historical data can be used as part of the data set (Table 5.5b).

RB17 Approach

CL:AIRE RB17 (Card et al 2012) is a pragmatic approach to ground gas risk assessment and was developed because gas concentration, pressure and flow rate measured in a well headspace may not be representative of the conditions in the surrounding formation.

In these low-risk situations, the approach is to use the conceptual site model and the estimation of the likely gas generation from a source to identify where or if gas monitoring is required to better define the risks.

Under this approach, for sites with natural soils only with no credible methane source, then no action is required (no monitoring or gas protection measures) as this represents Characteristic Situation 1 (CS1).

Radon

Advice on radon protection in England is provided by the UK Health Security Agency, <https://www.ukradon.org/information/ukmaps> and by the BRE (BR 211 (Scivyer 2023)).

Areas of the country can be categorised according to the percentage of existing homes where radon is present above the Action Level:

-  0-1% lower probability.
-  1-3% and 3-10% intermediate probability.
-  >10% higher probability.

Basic radon protection measures are required in new buildings and extensions in areas of England and Wales where 3-10% of properties exceed the Action Level and full radon protection measures where >10% exceed the Action Level.

Unexploded Ordnance (UXO) Guidance

Clients have a legal duty under the CDM 2015 Regulations to provide designers and contractors with project-specific health and safety information needed to identify hazards and risks. This includes the possibility of unexploded ordnance (UXO) being encountered on the site. Further details are given in CIRIA report C681.

BSL carry out non-specialist UXO screening exercises by considering any evidence of UK defence activities on or near the site evident from gathered desk study information and the unexploded aerial delivered bomb (UXB) online risk maps produced by Zetica. Other data sources are available, but as a first stage screening exercise the freely available online Zetica maps have been used. The level of risk stated is that determined by Zetica, a company experienced and considered competent in the assessment of UXO.

Geotechnical Guidance

A preliminary risk assessment of geotechnical hazards is carried out at the desk study stage and confirmed (or amended) at the ground investigation stage. The desk-based stage may include the requirements for a Coal Mining Risk Assessment (CMRA) which specifically assesses the risks from mining induced instability and related issues in high risk development areas: <https://www.gov.uk/guidance/planning-applications-coal-mining-risk-assessments>

APPENDIX B

Historical Maps

[BRO-JEL-Y4U-OXA-RK5_smallScale.pdf](#)

[BRO-JEL-Y4U-OXA-RK5_largeScale.pdf](#)

APPENDIX C

Geo-Environmental Data Report
[BRO-4DC-L2W-HFA-ZO5.pdf](#)

APPENDIX D

BGS Exploratory Hole Records

[BGS Logs](#)

APPENDIX E

UXO Screening Map & Pre Desk Study Assessment

[UXO map.pdf](#)

[PA022359 Zetica UXO PDSA Aviator-Way-Wythenshaw.pdf](#)

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