



Desk Based Geoenvironmental and Geotechnical Site Assessment

Shinfield Park, Reading
Shinfield
Reading
RG2 9FW

July 2024

610344.0000.0000

Prepared For:

Wrenbridge Land Limited
Mill House Mill Court
Station Road
Great Shelford
Cambridge
CB22 5LD

Prepared By:

TRC Companies Limited
20 Red Lion Street
London
WC1R 4PS

Quality Control

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1.0	16/07/2024	Eunice Wong / Tim Singer	James Gooding-Hurst	Adam Sokolowski
2.0	25/07/2024	Kirsty Paterson	Christos Botsialas	Christos Botsialas

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Executive Summary

TRC Companies Limited (TRC) was commissioned by Wrenbridge Land Limited (the 'Client') to undertake a Tier 1 Desk Based Geoenvironmental and Geotechnical Site Assessment at Shinfield Park, Reading, RG2 9FW (hereafter referred to as the 'Site').

This Executive Summary is part of the complete report; and findings, opinions or conclusions in this Executive Summary are made in context with the complete report. TRC recommends that the user reads the entire report for all supporting information related to findings opinions and conclusions.

Executive Summary	
Site Details	
Client	Wrenbridge Land Limited
Site Address & Grid Reference	Shinfield Park, Shinfield, Reading, RG2 9FW Easting 472830, Northing 169060
Site Area	5.8 Ha
Proposed Development	The proposed development will comprise demolition and clearance of all existing structures and construction of five warehouse units with associated external yards and car parking. It is noted that development plans intend to retain much of the existing woodland on the north and west of the Site area.
Site Setting	
Current Site Use	The Site currently comprises a large concrete office building with underground car parking, ancillary buildings and external surface car parking. There is existing woodland to the north and west of the Site.
Site History	The Site was an undeveloped woodland until 1959-1968, when the Site was developed as a camp (possible military). A tank appeared on-site in 1976-1979. The entire Site appears to have been in its current layout since at least 1984, with footpaths and carparks on-site, and two ponds just off-Site.
Expected Geology	Made Ground – Due to previous developments and as indicated by BGS maps Superficial deposits (mainly to the north of the Site) – River Terrace Deposits Bedrock geology – London Clay Formation
Expected Hydrogeology	Superficial deposits – Secondary (A) aquifer Bedrock geology – Unproductive Strata The Site does not lie within a groundwater source protection zone. The superficial deposits aquifer is not believed to be confined. Groundwater is inferred to be flowing to the southwest, based on historical data. Groundwater is considered to be moderately sensitive to contamination where the Site is directly underlain by a permeable Secondary A aquifer.
Expected Hydrology	The nearest surface water feature is 5m southwest off-Site. There are no surface water bodies on-Site. These ponds are possibly be in continuity with the groundwater beneath the Site if granular superficial deposits are found to be present across the Site. Surface water is therefore considered to be moderately sensitive to contamination.

Executive Summary	
Environmental Assessment	
Initial Conceptual Site Model	On Site: The historical Made Ground and fuel tanks associated with emergency power generators. Potential source of heavy metals, Polycyclic Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons (TPH), asbestos and ground gas. Potentially complete contaminant linkages have been identified and are considered to pose a low risk to the identified receptors.
Ground Gas/Organic Vapour/Radon	The historic Made Ground and potential for contamination is considered to be a potential source of ground gas. Less than 1% of homes are above the Action Level, as such no special precautions are required.
Geotechnical Assessment	
Geotechnical Hazards	The following potential geotechnical hazards have been identified: • Made Ground of unknown depth; • Buried obstructions, such as old foundations, cobbles in Made Ground and River Terrace Deposits, claystones in London Clay Formation; • Ground conditions aggressive to buried concrete; • The anticipated volume change potential (shrink-swell capacity) of soils; • Soil desiccation in the vicinity of vegetation; • Shallow groundwater level; and • Variations in site level and consequent need for earthworks and/or retaining walls.
Other Property Related Issues	
Mining	The Site is not in an area affected by coal mining. The Site is not in an area affected by any other mining activity.
Flood Risk	The Site is located within Flood Zone 1, which means it has a low probability of flooding. There is a very low risk of flooding from surface water. There is a very low risk of flooding from rivers and the sea. Flooding from groundwater and reservoirs is unlikely in this area.
Unexploded Ordnance Risk Assessment	The Site is not in an area affected by historical UXO risk.
Recommendations	
A ground investigation should be designed, implemented, and reported by a competent person, in accordance with LCRM 2020 (amended 2023), BS10175:2011 (+A2:2017), BS5930:2015 (+A1:2020), and Eurocode 7 Part 2 (and the associated national annex), and in accordance with current relevant technical guidance. The ground investigation should confirm the geology, groundwater regime and engineering properties of the underlying ground. Further, it should target the identified potential contaminant linkages and ensure that the geotechnical hazards identified in this report are addressed with focus on the proposed development. Following the ground investigation, an intrusive Geoenvironmental and Geotechnical Site Assessment Report (Tier 2) should be prepared in order to update the conceptual site model and to determine the environmental characterisation of the Site. The Tier 2 report will include a geotechnical evaluation and provide geotechnical design recommendations for the proposed development.	

1.0 Introduction

1.1 Appointment and Purpose

TRC Companies Limited (TRC) was commissioned by Wrenbridge Land Limited (the 'Client') to undertake a Tier 1 Desk Based Geoenvironmental and Geotechnical Site Assessment for Shinfield Park, Reading, RG2 9FW (hereafter referred to as the 'Site').

A Site location plan is presented as Figure 1 in Annex A.

This Tier 1 report has been commissioned to assess environmental considerations, predominantly with respect to ground conditions at the Site, which will be used to aid due diligence and subsequent stages of planning and design for the proposed redevelopment works.

1.2 Proposed Development

The proposed development will comprise demolition and clearance of all existing structures and construction of five warehouse units with associated external yards and car parking. A couple of pond features are proposed in the northern area. It is understood that the development plans intend to retain much of the existing woodland on the north and west of the Site area.

Based on the above, the proposed development is considered to fall into geotechnical category 2 with respect to BS EN 1997 (Eurocode 7).

The end user sensitivity is considered "low" for the proposed industrial end use.

A proposed development plan is presented as Figure 2 in Annex A.

1.3 Available Information and Standards

This Tier 1 report presents the findings of a desk study based on the following information:

- Historical uses of the Site and surroundings;
- Current use and condition of the Site;
- Environmental setting in terms of geology, hydrogeology, hydrology and surrounding land uses, based on publicly available environmental records;
- A Landmark Envirocheck Report (Annex B); and,
- A site visit.

This Tier 1 report has been conducted with due regard to the following guidance:

- The National Planning Policy Framework;
- BS5930:2015 (+A1:2020) Code of Practice for Ground Investigations;
- BS EN 1997 Eurocode 7;
- BS10175:2011 (+A2:2017) Investigation of Potentially Contaminated Sites – Code of Practice; and,
- Land Contamination Risk Management (LCRM) 2020 (updated in 2023).

1.4 Significant Assumptions

This report presents TRC's observations, findings, and conclusions as they existed on the date that this report was issued. This report is subject to modification if TRC becomes aware of additional information after the date of issue of this report that is material to its findings and conclusions.

The reliability of information provided by others to TRC cannot be guaranteed to be accurate or complete. Performance of this Tier 1 report is intended to reduce, but not eliminate, uncertainty of geo-environmental and geotechnical conditions associated with the subject site; therefore, the findings and conclusions made in this report should not be construed to warrant or guarantee the subject site, or express or imply, including

without limitation, warranties as to its marketability for a particular use. TRC found no reason to question the validity of information received unless explicitly noted elsewhere in this report.

1.5 User Reliance

This report was prepared for Wrenbridge Land Limited. Reliance on the report by any other third party is subject to requesting and fully executing a reliance letter between TRC and the third party that acknowledges the TRC Standard Terms and Conditions with the Client, to the same extent as if they were the Client thereunder.

TRC has been provided with information from third parties for information purposes only and without representation or warranty, express or implied as to its accuracy or completeness and without any liability on such third parties part to revise or update the information. Where reliance has been provided by third parties to potential purchasers this is noted in our report.

2.0 Site Location and Description

2.1 Site Location

The Site comprises an approximate 5.8 ha plot of land located at Shinfield Park, Shinfield, Reading, RG2 9FW, centred on National Grid Reference Easting 472830, Northing 169060, situated approximately 4.85km south of Reading Train Station.

The Site location is presented as Figure 1 in Annex A.

2.2 Site Description

2.2.1 General

Adam Sokolowski (TRC) visited the site on 11th June 2024 to perform a site walkover. The site walkover was led by Anton Squire (Site Representative).

The walkover was limited to the external and car parking areas only. No access was permitted to the offices or ancillary buildings. No access was permitted to the roof spaces and no walkover was conducted in the woodland area.

Photographs of the site reconnaissance are presented in Annex C.

2.2.2 Site Walkover

The 5.8 hectare site is irregular in shape and is located approximately 160m to the north of the M4. The Site was active at the time of the walkover and occupied by a large office block, ancillary buildings and car parking both below and at ground level. There are semi-mature and mature woodland areas to the north and west of the Site, which were accessed via various walkways. A pond was present to the west of the main office building.

The main office building was occupied by a consultancy company. The Site Representative indicated that the Site had been previously occupied by the Royal Air Force (RAF), but the use of the property was not fully known.

According to the Site Representative, the current main office building was designed in 1975 and the build was completed in 1980. The original intention for the building was a council office for the south of England, but at that time councils were subdivided into county level administrations which meant that the office was never fully occupied. The building was occupied by several administrative and private companies before being occupied by the engineering consultancy Foster Wheeler, which subsequently became Wood Group (the Occupier).

The Site Representative indicated that the building has been previously owned by the Occupier but was sold and leased back.

The main office building is constructed from concrete. It includes office accommodation with two levels of underground car parking and plant rooms. There is a smaller steel framed office block constructed prior to 2020 to accommodate office workforce. The Site Representative noted that working habits have changed since the 2020 pandemic and the offices are no longer operating at full occupancy.

There are additional ancillary buildings located to the north of the Site near the woodland area. These are garage and workshop type structures associated with former council operations. No access was gained to that part of the Site.

There were three hardstanding areas designated for car parking in the north, northeast and southwest of the Site. There are a couple of ponds at the southwest of the Site. There were several areas of soft landscaping across the Site.

The Site has an average elevation of approximately 75m above Ordnance Datum (aOD). Topographically the Site slopes downwards from north to south. The main office block is built up from the road. The underground car parking is approximately at road level at its lowest point. Access to the Site is from the B3270 road in the east.

2.2.3 Above and Underground Ground Storage Tanks (AST/UST)

Three diesel storage tanks are present at the Site. These are located in three plant rooms associated with the three backup generators within the building. Two are located within the below ground car park and one is located adjacent to the main plant room.

The Site Representative indicated that the backup generators were installed when the main office building was constructed. The generators are intended to provide essential emergency power supply in the event of a mains power failure. They are of insufficient size to provide complete power resource to support office activities.

Each of the tanks comprise steel constructed storage tanks within a concrete plant room. The exact dimensions were not provided by the Site representative. It is presumed that the concrete plant room provides secondary containment for the tanks. The plant room surrounding the tank showed no significant signs of surface contamination or spillage.

Diesel refuelling is from surface connections. The generators are run up on regular occasions to ensure operations and maintenance in the event of an emergency. The Site Representative indicated that there is no significant fuel consumption at the Site for these operations.

2.2.4 Hazardous Substances and Waste Management

No hazardous substances or wastes were observed on Site. The Site has well established management protocols for the management of wastes and any hazardous products / substances used for maintenance of the building.

2.2.5 Energy Infrastructure

Three backup generators were observed at the Site as noted above.

The Site has a significant plant room and chiller system associated with the building operation. The Site Representative indicated that they perform routine PCB and legionella testing.

2.2.6 Asbestos Containing Materials (ACMs)

The Site Representative indicated that when the building was first constructed, the use of asbestos was excluded within the design and on handover of the building from the council to the Occupier, the council considered the building to be asbestos free.

Regardless, the Occupier has performed routine asbestos management surveys. They have identified minor asbestos contamination in the form of asbestos lagging to the lifts, asbestos rope in some drainage and drainage joints. The Site maintain an Asbestos Register, but this was not available for TRC to view.

TRC recommend that an asbestos surveyor is engaged to undertake a formal review and pre-demolition survey.

2.2.7 Non-Natural Mounds, Depressions, Excavations and Fill

The Site topography is varied, rising above highways to the south. The main office building has a two storey underground car park, which appears in part to accommodate some of the topographic change at the Site. The areas directly northwest of the office building have a retaining wall for access to the sub-basement loading bay and the roads ramp down to the former council garages / ancillary buildings.

2.2.8 Invasive Plant Species

The potential presence of invasive plant species, such as Japanese Knotweed, has not been assessed and it is recommended that an appropriately qualified specialist carries out a survey. Whilst the woodland area is not

designated for redevelopment, TRC recommends ecological surveys are undertaken to characterize this area and ensure that it is appropriately managed in the future.

2.3 Surrounding Area

The Site is located within an area of predominantly residential land use. Land uses in the immediate vicinity include the following principal features.

Table 2.1: Summary of Surrounding Land Use

Direction	Land Use
North	The Site is bound to the north by a vegetated area and residential buildings.
East	The Site is bound to the east by Whitley Wood Lane and B3270. Beyond these roads is greenspace.
South	The Site is bound to the south by a vegetated area.
West	The Site is bound to the west by a vegetated area.

2.4 Summary

TRC has noted the following potential sources of contamination during the walkover:

- Diesel storage tanks; and,
- Electrical transformers that may contain PCB oils;
- Made Ground associated with previous phases of development at the Site.

TRC has noted the following potential geotechnical hazards during the walkover:

- Anticipated presence of Made Ground due to past developments;
- Anticipated presence of underground obstructions including utilities, existing building foundations and retaining walls, basements and underground car parks;
- Presence of trees and potential for ground desiccation in case cohesive soils of volume change potential are present on-site; and,
- Variations in Site level and consequent need for earthworks and/or retaining walls for any future development.

3.0 Previous Assessment, Investigations or Remediation

TRC is not aware of any previous assessments or reports undertaken for the subject Site.

4.0 Review of Site Data

4.1 Environmental Setting

The environmental setting of the Site can influence the susceptibility to, and relative magnitude of, environmental and geotechnical impacts and liabilities associated with on and off-site sources of contamination and geotechnical hazards.

The following sections present a summary of environmental and geotechnical reviews conducted on available records.

4.1.1 Geology

The following information has been reviewed:

- The British Geological Survey (BGS) geological map, scale 1:50,000, Sheet 268, Reading, dated 2000;
- The BGS website;
- The BGS historic boreholes with reference no. SU76NW25, SU76NW36, SU76NW56, SU76NW72;
- The Landmark Envirocheck Report (Annex B).

Based on the above information, the Site is underlain by variable thickness of Made Ground over London Clay Formation. Superficial River Terrace Deposits may be encountered to the north of the Site, if present at all. Locally, within the Site, the River Terrace Deposits could have been removed by excavation due to the basement and underground car park construction.

The anticipated site geology is summarised in Table 4.1.

Table 4.1: Summary of Anticipated Geology

Strata	Depth to Base (m bgl)	Depth to Base (m aOD)*	Thickness (m)	Typical Description
Made Ground	Unknown	Unknown	Unknown	Heterogeneous mix of sandy, gravelly clay with brick fragments and concrete obstructions.
River Terrace Deposits	2.00	73.00	2.00	Very clayey sandy gravel and clayey gravelly sand.
London Clay Formation	>45.00	<30.00	>40.00	Blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay

* Assuming a ground level of 75m aOD across the site

The anticipated geology is based upon archive boreholes records and may not be reflective of conditions across the site area.

4.1.2 Coal Mining

The Landmark Envirocheck indicates that the Site is not within an area that may be affected by coal mining.

Further, according to the Coal Authority website, the Site is not located within the Coal Mining Reporting Area. Therefore, a Coal Mining Risk Assessment is not required.

4.1.3 Radon

BGS records indicate that the Site is in a lower probability radon area where less than 1% of homes are estimated to be at or above the Action Level. On this basis, the BGS states that “no radon protective measures are necessary in the construction of new dwellings or extensions”.

4.1.4 Seismicity

The national foreword to BS EN 1998-1:2004+A1:2013 'Eurocode 8: Design of Structures for Earthquake Resistance – Part 1' states that there are no requirements in the UK to consider seismic loading, and the whole of the UK may be considered an area of very low seismicity in which the provisions of EN 1998 need not apply.

4.1.5 Hydrogeology

Table 4.2: Summary of Hydrogeology

Geology	Geological Description	Aquifer Status	Aquifer Description
Superficial Deposits: River Terrace Deposits	Sand and Gravel	Secondary (A) Aquifer	Permeable strata 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, lakes or wetlands.
Bedrock Deposits: London Clay Formation	Clay, Silt, and Sand	Unproductive Strata	Geological strata with low permeability that have negligible significance for water supply or river base flow. They consist of deposits that naturally offer protection to any aquifers that may be present beneath.

The superficial deposits could potentially be present in the north of the Site.

The Site does not lie within a groundwater source protection zone (SPZ).

The nearest active groundwater abstraction is located greater than 500m SE of the Site and is for domestic use.

Historical borehole record in the vicinity of the Site (approximately 350m northeast) indicates that groundwater is present at depth of around 6.5m bgl within weathered London Clay Formation. However, historical BGS borehole data for SU76NW7 indicates groundwater may be as shallow as 1.07m bgl.

Groundwater is inferred to be flowing to the southwest, based on historical data.

The Landmark Envirocheck report indicates limited potential for groundwater flooding to occur at the Site and in the surrounding area.

4.1.6 Hydrology

The nearest surface water feature is located 5m southwest of the southern site boundary. These are two ponds, with Foundry Brook also located 85m south of the Site.

These ponds are possibly in continuity with the groundwater beneath the Site if permeable superficial are present across the Site.

There are no surface water abstractions within 500m of the Site.

A spring could be present 75m south of the Site, based on historical map 1911 and 1913 (1:2,500 and 1:10,560). This spring is last observed on the 1961 map (1:10,000).

The Site is located within Flood Zone 1, which means that the Site has a low probability of flooding.

There is a very low risk of flooding from surface water. There is a very low risk of flooding from rivers and the sea. Flooding from groundwater and reservoirs is unlikely in this area.

4.1.7 Sensitive Land Uses

There is an ancient and semi-natural woodland (Nores Hill) on-site.

Two ancient and semi-natural woodlands are found 124m and 185m north of Site.

A designated local nature reserves (Pearmans Copse) is found 306m east of Site.

4.1.8 Summary of Site Sensitivity

The Site is considered to be of “moderate” environmental sensitivity, based on the following key factors:

- The published geology indicates that the Site is underlain by Made Ground over London Clay Formation.
- The River Terrace Deposits are classified as Secondary (A) Aquifer and the bedrock deposits are classified as Unproductive Strata..
- There are no surface water features on-site.
- There is an ancient woodland on-site, two ancient woodlands 124m and 185m north of Site, and a designated local nature reserve 306m east of the Site.

4.2 Environmental Regulatory Database Review

The following environmental data have been obtained from a Landmark Envirocheck Report (Annex B), which includes a search of databases held by regulatory bodies including the EA, BGS, the Department for the Environment, Food and Rural Affairs (DEFRA), City, District and Borough Councils and County Councils.

The table below summarises key features identified on-site and within the 500m search radius.

Table 4.3: Summary of Environmental Regulatory Database Review

Database	On-Site	0-500m	Description
Agency and Hydrological			
Contaminated Land Register Entries and Notices	0	0	n/a
Discharge Consents	0	0	n/a
Prosecutions Relating to Controlled Waters	0	0	n/a
Enforcement and Prohibition Notices	0	0	n/a
Integrated Pollution Controls	0	0	n/a
Integrated Pollution Prevention and Control	0	0	n/a
Local Authority Integrated Pollution Prevention and Control	0	0	n/a
Local Authority Pollution Prevention and Controls	0	0	n/a
Local Authority Pollution Prevention and Control Enforcements	0	0	n/a

Database	On-Site	0-500m	Description
Pollution Incidents to Controlled Waters	0	2	Two category 3 – Minor Incident occurred 320m northeast and 447m north, in 1995 and 1991, by known chemicals and unknown sewage, respectively.
Prosecutions Relating to Authorised Processes	0	0	n/a
Registered Radioactive Substances	0	2	2m west of Site, there is an expired authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7). 427m south of Site, there is a transferred authorisation with unknown permit and process type.
Substantiated Pollution Incident Register	0	0	n/a
Water Industry Act Referrals	0	0	n/a
Waste			
BGS Recorded Landfill Sites	0	0	n/a
Historical Landfill Sites	0	0	n/a
Integrated Pollution Control Registered Waste Sites	0	0	n/a
Licensed Waste Management Facilities	0	0	n/a
Local Authority Landfill Coverage	1	0	Wokingham District Council has supplied landfill data for the Site.
Local Authority Recorded Landfill Sites	0	0	n/a
Registered Landfill Sites	0	0	n/a
Registered Waste Transfer Sites	0	0	n/a
Registered Waste Treatment or Disposal Sites	0	0	n/a
Hazardous Substances			
Control of Major Accident Hazards Sites (COMAH)	0	0	n/a
Explosive Sites	0	0	n/a
Notification of Installations Handling Hazardous Substances (NIHHS)	0	0	n/a
Planning Hazardous Substance Consents	0	0	n/a
Planning Hazardous Substance Enforcements	0	0	n/a
Industrial Land Use			

Database	On-Site	0-500m	Description
Contemporary Trade Directory Entries	1	18	The entry onsite is for an Engineering services company, but is inactive. Of the 18 entries off-site, 13 are active. Active entries include garage services, caravans servicing & repairs, waste disposal services, road haulage services, pest & vermin control, blast cleaning, car body repairs, metal finishing services, coal & smokeless fuel merchants & distributors and domestic cleaning services.
Fuel Station Entries	0	0	n/a
Sensitive Land Use			
Ancient Woodland	1	2	An ancient and semi-natural woodland (Nores Hill) is present on-site. Two ancient and semi-natural woodlands are 124m and 185m north of Site.
Areas of Adopted Green Belt	0	0	n/a
Areas of Unadopted Green Belt	0	0	n/a
Areas of Outstanding Natural Beauty	0	0	n/a
Environmentally Sensitive Areas	0	0	n/a
Forest Parks	0	0	n/a
Local Nature Reserves	0	1	306m east of Site there is a designated local nature reserves (Pearmans Copse).
Marine Nature Reserves	0	0	n/a
National Nature Reserves	0	0	n/a
National Parks	0	0	n/a
Nitrate Sensitive Areas	0	0	n/a
Nitrate Vulnerable Zones	1	0	Onsite, the surface water body - Foudry Brook is part of the Nitrate Vulnerable Zones.
Ramsar Sites	0	0	n/a
Sites of Special Scientific Interest	0	0	n/a
Special Areas of Conservation	0	0	n/a
Special Protection Areas	0	0	n/a
World Heritage Sites	0	0	n/a

The Landmark Envirocheck report indicates low to very low potential for landslides, shrinking or swelling clay, collapsible ground, running sand and no hazard for compressible ground and ground dissolution for the Site. Mining, coal mining, non-coal mining, natural cavities and brine areas were not identified on Site or in the vicinity based on the Landmark Envirocheck report.

4.3 History of the Site and the Surrounding Area

The history of development on the Site and immediate surrounding area was investigated with reference to historical Ordnance Survey (OS) mapping and aerial photographs. The findings are presented in subsequent sections below.

4.3.1 Historical Mapping

A summary of the development history of the Site and immediate surrounding area obtained from historic OS mapping and aerial photographs (Annex B) is detailed in the table below.

Table 4.4: Summary of Historical Mapping

Edition and Scale	On-Site Activities	Off-Site Activities (within ~ 250m)
1872-1879 (1:2,500)	The Site was undeveloped and was a (mixed) wood; a small building was present at the northeastern corner of the Site.	The surrounding was largely undeveloped and was a mixed wood, with several buildings at the south and northeast at about 100m from Site. The Grove was at approximately 100m east of the Site, Duckett's Farm 250m northeast, and the Black Boy 250m southeast of the Site. Shinfield Lodge was found 100-250m north of the Site. Nores Hill, a mixed wood, was within 120m northwest to the Site. The area 100-250m west to the Site was rough pasture, orchard and wood. A few buildings, the Nursery Corner, the Glebe and multiple footpaths connecting them were found 200-250m to the south. A road that orientated approximately N/S (current Shinfield Road) was 200-250m east of the Site.
1899 (1:2,500)	Another building was constructed at the northeastern corner of the Site.	A building was constructed next to the Site boundary at the northeast.
1911 (1:2,500)	A footpath was constructed across the Site (in an E-W orientation), at the northern part of the Site.	A spring was present 75m south of the Site. A triangulation station appeared 75m north of the Site. A footpath extended from within the Site to 250m east of the Site.
1936-1937 (1:2,500)	No significant change.	Several buildings and the Foxglade House had been developed within 100-250m south of the Site.
1959-1968 (1:2,500)	A complex with multiple buildings was constructed in the southern-central part of the Site, where the current office complex is situated at. The rest of the Site remained as wood or undeveloped land.	The area to the southeast and east (Whitley Wood), within 50-250m from the Site, had been developed for residential use with houses, gardens, footpaths, paved roads and mad-made slope. Water tanks appeared 200m east of the Site. A tennis court and a pavilion were built 100-250m north of the Site.
1971-1973 (1:10,000)	No significant change.	A drain appeared 250m northeast of the Site, and another one about 120m east of the Site.

Edition and Scale	On-Site Activities	Off-Site Activities (within ~ 250m)
1976-1979 (1:10,000)	A tank was built on Site, at the southern part of the complex. Man-made slope was constructed along the eastern boundary of the Site, along a road (current B3270).	The Shinfield Lodge northeast of the Site seemed to have become a college. A major road (where the M4 is currently at) had been constructed, spanning NE/SW within 50-250m southeast to the Site, with artificial slope surrounding part of the road. Another road (current B3270) was built, extending from the eastern Site boundary to join the current M4 at the south.
1984 (1:10,000)	The complex appeared to have the same layout as the one currently at Site, with two ponds to the south of the complex, and a pond within the complex. The complex was called the Shire Hall. Multiple footpaths had been constructed to the north of the complex around the open space/carpark, and around the ponds to the south.	Two ponds appeared within 50-100m of east of the Site. The European Weather Centre was constructed 250m north of the Site. The building 100m north of the Site was used as meteorological station.
1990 (1:10,000)	No significant change.	No significant change.
1994 (1:1,250)	Posts were constructed north of the complex along the footpaths.	No significant change.
1999 (1:10,000)	A spring appeared to the south of one pond, flowing approximately south/southeast. The complex on Site was of office use.	Drains were built along the M4, southeast of the Site.
2003 (1:10,000)	No significant change.	No significant change.
2005 (1:10,000)	No significant change.	No significant change.
2009 (1:10,000)	No significant change.	50-100m northeast of the Site, Cirrus Drive was constructed, extending from the existing Whitley Wood Lane. 200-250m northeast, a roundabout was built, connecting B3270, M4 and Shinfield Road (A327)
2013 (1:10,000)	No significant change.	Multiple roads (Zenith Avenue, Pascal Crescent and Aphelion Way) were constructed 50-250m northeast of the Site.
2024 (1:10,000)	No significant change.	No significant change.

4.3.2 Summary of the History of the Site and Surrounding Area

Based on the information obtained by TRC, the history of the Site and surrounding area can be summarised as follows:

- The Site was an undeveloped woodland until 1959-1968, when the site was developed as a camp (possible military). This is supported by anecdotal comments provided by the Site Representative who indicated that prior to current development, the Site was occupied by the RAF. The land use was not fully known and given the military land use may not be fully recorded on mapping.

- A tank appeared on-site in 1976-1979. The entire Site appears to have been in its current layout since at least 1984, footpaths and carparks on-site, with two ponds located just off-Site. This is supported by anecdotal information provided by the Site Representative who noted that the main building was designed in 1975 and constructed by 1980. The original intention was to house council offices, but later became occupied by the engineering consultancy Foster Wheeler, who later became Wood Group.
- The surrounding area appears relatively undeveloped till 1959, with only a few buildings scattering 100-250m away from the Site (e.g. the Grove, Duckett's Farm, the Black Boy, Shinfield Lodge, Nursery Corner, the Glebe). By 1959, residential buildings were constructed 50-250m to the southeast and east of the Site. By 1976, Shinfield Lodge that was 100-250m north of the Site became part of a college, and by 1984, the college and the surrounding area has become the European Weather Centre. By 2009, more residential buildings were constructed around the European Weather Centre.

4.4 Planning Department Records

The Reading Borough Council planning portal was searched to appraise the history of planning applications for the Site. The database records show no applications in the last 30 years.

4.5 Unexploded Ordnance (UXO) Records

Based on online UXO mapping available on the Zetica website the Site lies in an area of "low" risk of potential UXO.

Given the low risk potential for UXOs to be present below Site and in accordance with the guidance given in CIRIA C681, no further control measures relating to UXOs will be required prior to undertaking intrusive investigations.

5.0 Preliminary Environmental Risk Assessment

5.1 General

The methodology of this risk assessment uses the source-pathway-receptor contaminant linkage to provide a qualitative appraisal of environmental risks and potential liabilities associated with soil and groundwater contamination at the Site.

The initial conceptual Site model (CSM) is prepared based on the current proposed development, which will comprise five warehousing units. Should proposals change then the CSM will need to be revisited.

5.2 Contamination Sources

Based on the information presented in this report the following sources of contamination have been identified.

Table 5.1: Summary of Potential Contamination Sources

Potential Sources	Potential Contaminants
Made ground from previous development	Metals, Polycyclic Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons (TPH), asbestos, ground gas
Made ground within fill material	Metals, PAH compounds, TPH, asbestos, ground gas
Diesel Storage Tank	TPH
Electrical Transformers	Polychlorinated Biphenyls (PCB)

5.3 Pathways

Based on the information presented in this report the following potentially active pathways have been identified.

- Dermal contact or ingestion with soil and groundwater;
- Inhalation of soil dust or respirable fibres of asbestos;
- Surface runoff;
- Leaching of contaminants and vertical migration into groundwater;
- Lateral migration of contaminants in groundwater;
- Contact with buried services; and,
- Migration of ground gas/organic vapour and ingress into buildings.

5.4 Receptors

Based on the information presented in this report the following receptors have been identified.

- Future site users;
- Neighbouring site users;
- Construction and maintenance workers;
- Construction materials;
- Groundwater;
- Surface waters; and,
- Ancient woodland and local nature reserve.

5.5 Initial Conceptual Site Model

Based on the information presented in this report the following potential contaminants linkages have been identified.

Table 5.2: Potential Contaminant Linkages

Source	Pathway	Receptor	Potential Contaminant Linkage
On-Site Sources			
Made Ground associated with previous developments	Dermal contact, ingestion and inhalation pathways	Future site users	Yes Relevant contaminant linkage present. However, proposed development will mitigate risks through presence of engineered hardtanding and clean capping in areas of landscaping.
		Neighboring residents/site users	Yes Neighboring residents may be exposed to soil dust, particularly during the construction phase.
		Construction and maintenance workers	Yes Construction works will involve work in the ground.
Made ground within fill material	Surface runoff	Surface water (The unnamed pond in the southwest of the Site)	Yes There is potential for surface runoff to the unnamed pond on the Site.
Diesel Storage Tanks			
Electrical transformers	Leaching of contaminants and vertical migration into groundwater	Groundwater (Secondary (A) Aquifer potentially underlying the Site)	Yes The Site is potentially underlain by a Secondary Aquifer, however this is confined by low permeability superficial deposits.

Source	Pathway	Receptor	Potential Contaminant Linkage
	Lateral migration of contaminants in groundwater	Surface water (Receptor Brook and River Example)	Yes Surface waters may be in hydraulic continuity with groundwater beneath the Site due to the potential presence of permeable deposits.
	Contact with buried services	Buried services	Yes New below ground services are proposed.
	Migration of ground gas/organic vapour and ingress into buildings	Future site users	Yes New development is proposed and ground gas and vapours can enter and accumulate in new buildings.
		Construction workers	Yes Ground gas and vapours could accumulate in excavations during construction.

5.6 Other Property Related Environmental Issues

Table 5.3: Summary of Other Potential Environmental Issues

Issue	Detail
Mining	The Site is not in an area that may be affected by coal mining. The Site is not in an area affected by any other mining activity.
Radon	BGS records indicate that the Site is in a lower probability radon area where less than 1% of homes are estimated to be at or above the Action Level. On this basis, the BGS states that “no radon protective measures are necessary in the construction of new dwellings or extensions”.
Flood Risk	The Site is in a flood zone 1 meaning it has a low probability of flooding from rivers and the sea. There is a very low risk of flooding from surface water. There is a very low risk of flooding from rivers and the sea. Flooding from groundwater and reservoirs is unlikely in this area.
Asbestos Containing Materials	An asbestos survey was not conducted as part of this scope of works. Given the age of the buildings it is possible that asbestos containing materials may be present. Should the existing structures be demolished or refurbished, an asbestos survey will be required prior to construction.
UXO Risk	The Site lies in an area of “low” risk of potential UXO.

6.0 Preliminary Geotechnical Hazards Assessment

Based on the available information presented in the preceding sections, the anticipated geotechnical hazards associated with the Site are summarised in the table below.

Table 6.1: Summary of Geotechnical Hazards

Hazard	Distance	Description
Made Ground	On-Site	The available information indicates that the Site has generally been undeveloped land in the past with a double storey basement underground car park, large office building and retaining wall structures being present on Site. Therefore, some Made Ground is anticipated in the areas of past development. The Made Ground has high variability and poor engineering properties. Consequently, unless adequately treated, the Made Ground is not considered a suitable founding stratum.
Buried Obstructions	On-Site	There is potential of buried obstructions within the Made Ground associated with past developments such as relict foundations, underground tanks and utilities, basements and underground car parks. Also, the potential presence of large gravels and cobbles within the Made Ground, the River Terrace Deposits (if present) or claystones within London Clay Formation cannot be ruled out at this stage. Buried obstructions may delay construction operations and will require consideration for the selection of appropriate equipment.
Buried Concrete	On-Site	London Clay Formation and materials derived from them can naturally contain elevated concentrations of minerals that can be aggressive to buried concrete. Made Ground and superficial deposits should also be checked in that regard.
Volume Change Potential	On-Site	The cohesive strata of the River Terrace Deposits (if present) and London Clay Formation will likely exhibit volume change potential when subject to moisture content changes. The volume change potential characteristics should be investigated and assessed to inform the design of foundations.
Soil Desiccation	On-Site	Due to the expected presence of cohesive strata on-Site, ground desiccation may be present to a certain depth, in the vicinity of existing or recently removed vegetation. Any desiccation present on-Site should be investigated and assessed to inform the design of foundations.
Shallow Groundwater Level	On-Site	Based on historical BGS borehole data groundwater may be as shallow as 1.07m bgl in London Clay Formation. Also, shallower perched groundwater within Made Ground cannot be ruled out at this preliminary stage. Shallow groundwater, if present, will require management during construction, including dewatering, in relation to maintaining stability of proposed excavations and facilitating construction activities in dry conditions.

Hazard	Distance	Description
Variations in Site Level	On-Site	The variations in the site levels will likely lead to a consequent need for earthworks and/or retaining walls. Slope stability should also be assessed. Geotechnical investigation and assessment will be required to inform the design of earthworks and retaining structures.

The above potential geotechnical hazards should be investigated with a site-specific ground investigation and further assessed as discussed in the following sections.

7.0 Summary and Conclusions

7.1 Findings

The Site was active at the time of the walkover and currently comprises offices occupied by a consultancy company.

The Site history indicates that the Site was undeveloped woodland until 1959-1968, when the site was developed as a camp. Anecdotal evidence suggests that this may have comprised RAF use.

The Site was subsequently developed as the main office building with associated car parking in 1975 to 1980. The office was initially occupied by the council before being taken over by the Occupier who is still present to date. A second office unit was added in more recent years to accommodate office accommodation requirements, but site use has reduced since the 2020 pandemic.

The walkover identified fuel storage and electrical transformers that represent potential sources of contamination. However, the facilities are managed to a high standard and do not show any significant evidence of fuel or oil loss that could affect soil and groundwater condition.

The Site is underlain by variable thickness of Made Ground over London Clay Formation, with the possibility of River Terrace Deposits being present in the north of the Site. The River Terrace Deposits are a secondary (A) aquifer and the underlying London Clay Formation is an unproductive strata. The superficial River Terrace Deposits are noted to the north of the Site.

Made Ground soils will likely be associated with previous phases of development at the Site. These soils have an unknown source and composition and may contain elevated contamination.

The nearest surface water feature is 5m southwest, off-site. There are no surface water bodies on-Site. These ponds are possibly be in continuity with the groundwater beneath the Site if granular superficial deposits are found to be present across the Site.

TRC note the presence of undeveloped woodland to the north and west of the Site. It is understood that this will not be subject to development and has not be considered further.

7.2 Summary of Environmental Risk

The assessment has identified potential sources of contamination. However, TRC considers that the proposed development of industrial warehouse units at the Site is not introducing a more sensitive end use receptor and remediation requirements may not be onerous.

Warehouse developments can readily address potential contaminant risks to human health receptors (i.e. end users) through design led mitigation such as engineered hardstanding across built areas and clean capping placed in areas of landscaping. These design led features mitigate contaminant hazards through the removal of risk pathways.

Hazards to groundwater may be reduced if extensive presence of the Unproductive London Clay Formation is encountered beneath the Site. This low permeability deposit will limit the potential for contaminant migration from the point of release and has low environmental sensitivity due to its Unproductive aquifer status.

7.3 Summary of Geotechnical Hazards

The ground investigation has identified a number of geotechnical hazards at the Site which relate to the proposed development. These are thick Made Ground, buried obstructions, ground's aggressiveness to buried concrete, volume change potential of cohesive soils, soil desiccation, shallow groundwater, variation in site level and need for earthworks and existing slopes on Site

A tailored site-specific ground investigation with geotechnical testing should be undertaken to ensure that the geotechnical hazards, discussed in this report are addressed and appropriate mitigation measures are proposed to inform the structural and civil engineering design.

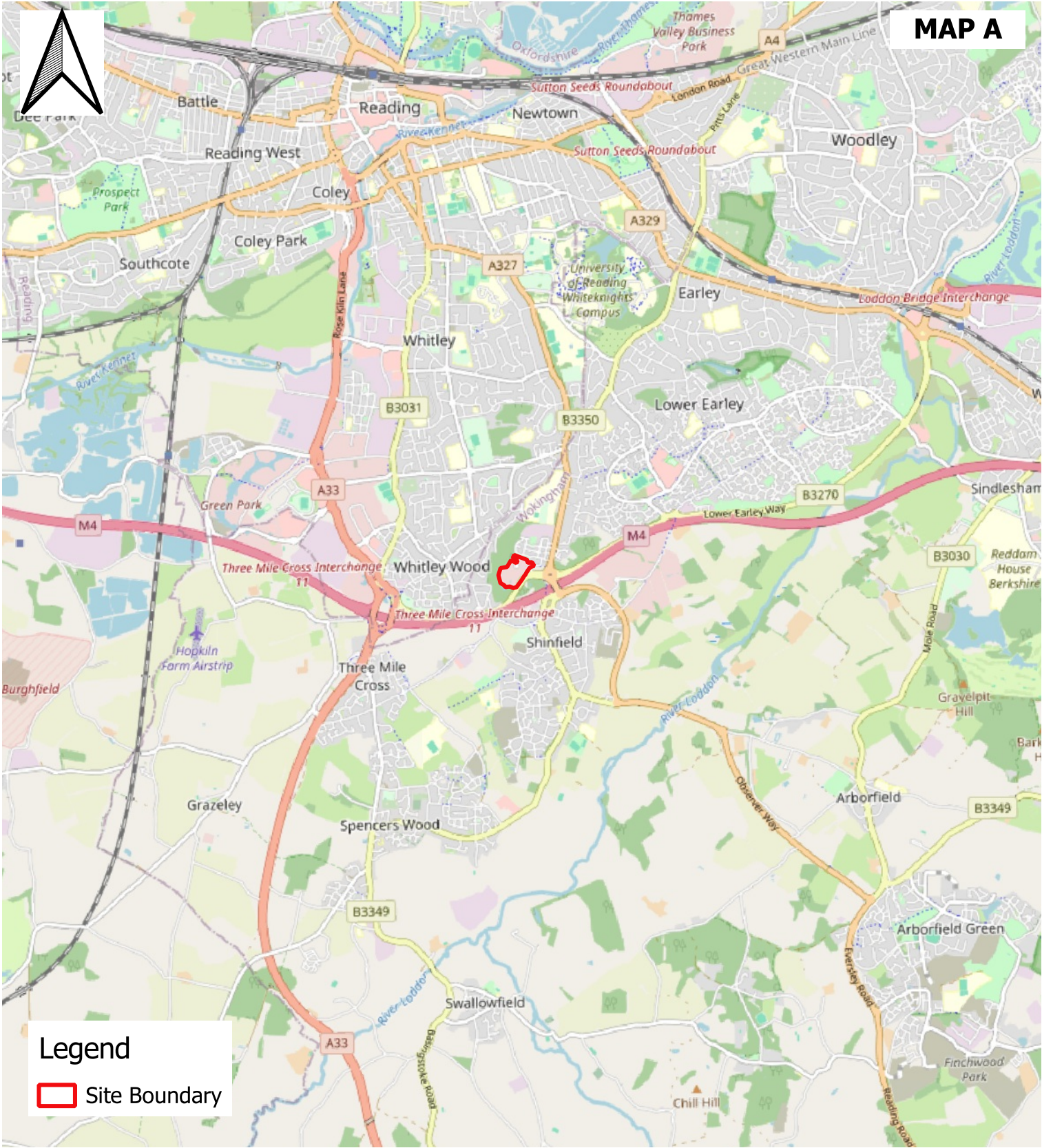
7.4 Recommendations

TRC recommend that a ground investigation should be designed, implemented, and reported by a competent person, in accordance with LCRM 2020 (updated in 2023), BS10175:2011 (+A2:2017), BS5930:2015 (+A1:2020), and Eurocode 7 Part 2 (and the associated national annex), and in accordance with current relevant technical guidance. The ground investigation should confirm the geology, groundwater regime and engineering properties of the underlying ground. Further, it should target the identified potential contaminant linkages and ensure that the geotechnical hazards identified in this report are addressed with focus on the proposed development.

Following the ground investigation, an intrusive Geoenvironmental and Geotechnical Site Assessment Report (Tier 2) should be prepared in order to update the conceptual site model and to determine the environmental characterisation of the Site. The Tier 2 report will include a geotechnical evaluation and provide geotechnical design recommendations for the proposed development.

These intrusive works were completed in June 2024 and will be reported under separate cover.

Annex A: Figures



NOTES	COPYRIGHT NOTES			REVISIONS			 Work.Life, 20 Red Lion St, London WC1R 4PQ		TITLE	
	Google Imagery January 2024					SITE LOCATION PLAN				
	© OpenStreetMap contributors - Data is available under the Open Database License. Cartography licensed as CC BY-SA.					TRC PROJECT NO.	SCALE			
						610344	MAP A: 50,000:1 MAP B: 2,000:1			
	P01	FIRST ISSUE			CLIENT WRENBRIDGE		PURPOSE OF ISSUE SUITABLE FOR INFORMATION		STATUS	
		Initials	TS	17/6/2024						
	REV.	REVISION NOTES/COMMENTS			PROJECT SHINFIELD PARK, READING		DRAWING NO FIGURE 01		REVISION PO1	
Initials										