







EARTH ENVIRONMENTAL & GEOTECHNICAL

Phase 1 GeoEnvironmental Desk Study

Clarence Road

Longsight

November 2024

On behalf of

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PHASE I GEOENVIRONMENTAL DESK STUDY

CLARENCE ROAD

LONGSIGHT

FOR

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EARTH ENVIRONMENTAL & GEOTECHNICAL

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1.0 INTRODUCTION

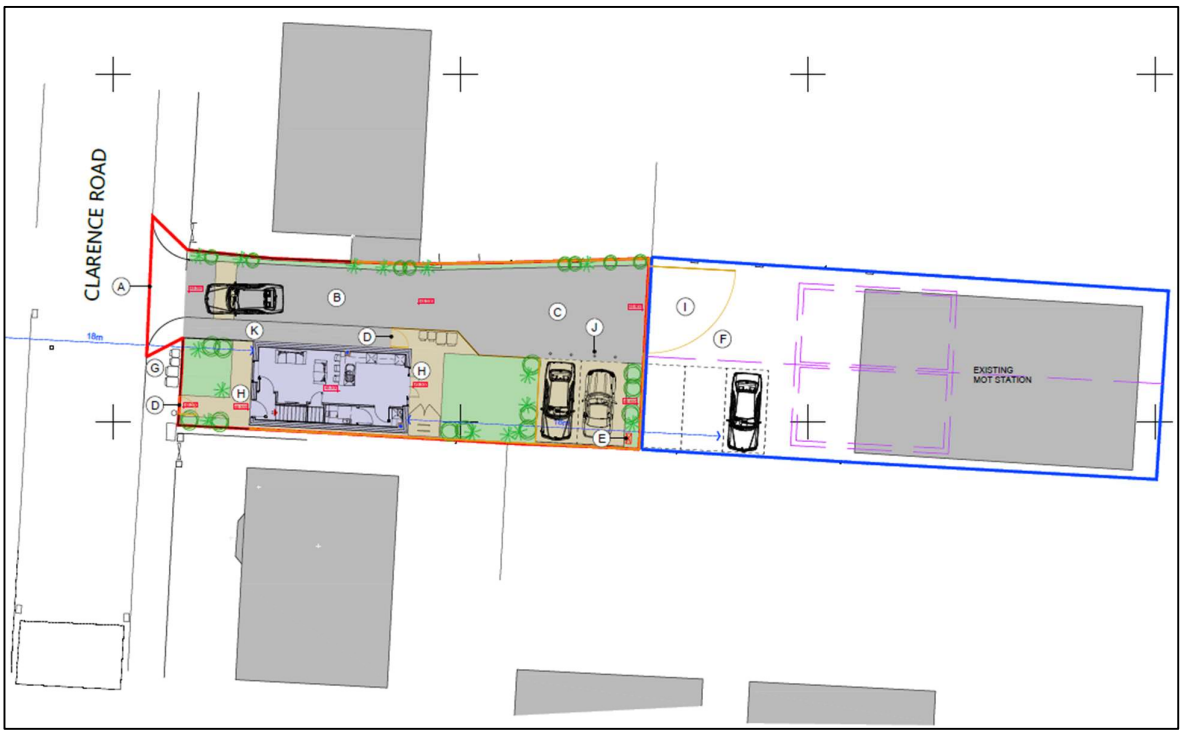
Appointment

1.1 Earth Environmental & Geotechnical Ltd have been commissioned by Vision Architecture and Design Ltd, on behalf of Mohammed Uzair Khan (the Client), to undertake a Phase I Environmental Desk Study for the proposed development at 61 Clarence Road, Longsight, Manchester.

1.2 It is understood that the Client intends to construct a detached dwelling fronting Clarence Road, whilst retaining the MOT business building to the rear. Access will be provided via Clarence Road

1.3 A proposed development plan for the site is shown in Figure 1 below, indicating the location of proposed developed (red outline) and existing MOT business (Blue) will be retained.

Figure 1 Proposed Development Plan



1.4 A planning application has not yet been submitted to Manchester City Council.

Objective

1.5 The purpose of the Desk Study is to collate available geological and environmental data for the site (and its environment) and provide a preliminary geotechnical and geo-environmental appraisal, with a site-specific conceptual model. This enables a preliminary assessment of geo-environmental risks to be undertaken and, if necessary, provides information for the design of a

Phase 2 Ground Investigation.

Scope

1.6 The Phase I Environmental Desk Study comprises of

1.7 a review of the following information sources, some of which was provided by the client.

- British Geological Survey online maps.
- Google Earth imagery.
- Environment Agency online mapping data.
- Historical Ordnance Survey maps.
- The site and surrounding areas environmental, geological, and mining data presented in the site specific GroundSure Reports (Appendix 1).
- Coal Authority Interactive Viewer.
- Manchester City Council planning search.

2.0 SITE LOCATION AND DESCRIPTION

2.1 The site is located at land 61 Clarence Rd, Longsight, Manchester M13 0YF at approximate National Grid Reference SJ 86426 95667 (X: 386426, Y: 395667).

2.2 The topography of the site is flat, the topography of the surrounding area gently slopes to the north.

2.3 The site is accessible via Clarence Road.

2.4 The site is a rectangular shaped parcel of land parcel which comprises of hardstanding (100%) and approximately 0.03 hectares in size.

2.5 The site is currently occupied land associated with the adjacent MOT garage to east, the site is covered by hardstanding with a shipping container in the southwest corner of the site. The site appears to be bound by brick walls on all sides with an access gate to the front. An approximate distribution of surface covering is given below in Table 1.

Table 1: Site Surface Distribution

Type of Surface Covering	Distribution (%)
Soft Ground (grassed and landscaped areas)	0
Hardstanding	90
Roadways	0
Buildings	10
Water (ponds, streams)	0

2.6 To the immediate east of the site is the Longsight MOT Centre. The site surrounded by residential properties is all directions with a Russian Orthodox Church to the west of the site and St Johns Church of England (CofE) Primary School to the north.

2.7 A location plan is shown below as Figure 2 together with a site photograph as Figure 3 (overleaf).

Figure 2: Site Location Plan

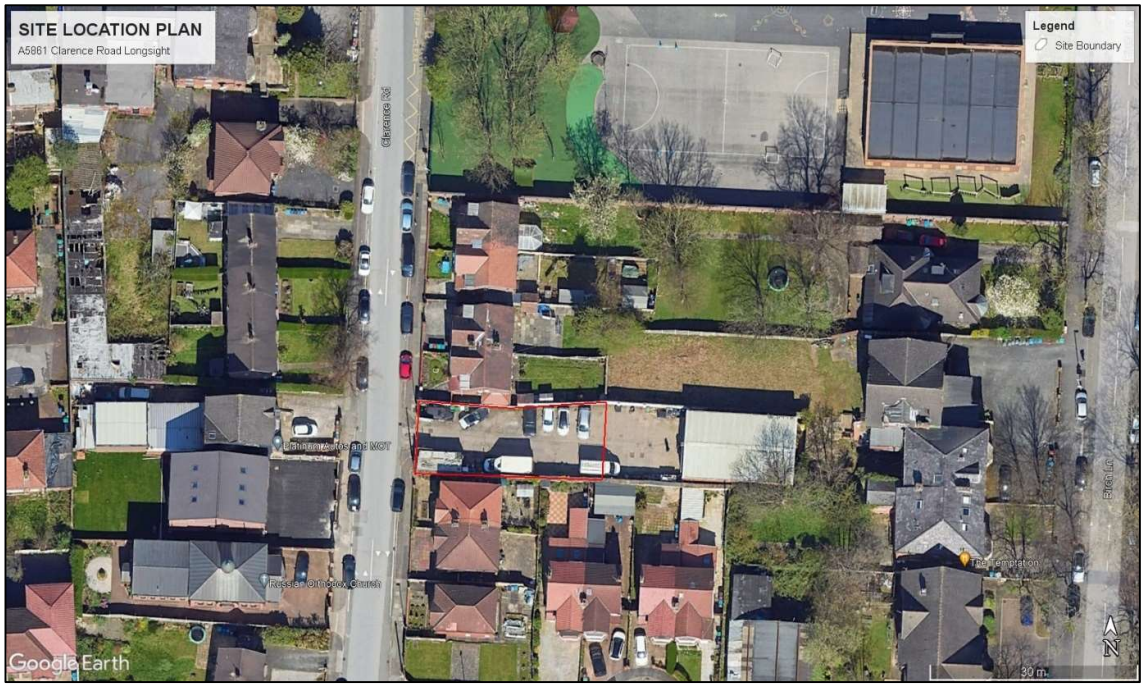


Figure 3: Site Photograph



Site Utility Services

2.8 Site service plans have not been obtained for the site on behalf of the client. The status of all services should be checked prior to any development (including site investigation) commencing.

3.0 ENVIRONMENTAL SETTING

3.1 The geology of the site is covered by British Geological Survey (BGS) online data and the site specific GroundSure GeoInsight report (Appendix 1).

3.2 Environmental conditions are covered by Environment Agency (EA) and British Geological Survey (BGS) online data, and the site specific GroundSure EnviroInsight report (Appendix 1).

Geology

3.3 The BGS states that the site is not underlain by artificial deposits.

3.4 The site is underlain by superficial deposits of Glacial Till, which generally comprising unsorted and unstratified drift, generally over consolidated, consisting of heterogenous mixture of clay, sand, gravel, and boulders, varying widely in size and shape.

3.5 The bedrock geology beneath the site is shown to be the Triassic Chester Pebbles Bed Formation which is generally described as reddish sandstone. Additionally, the Manchester Marls Formation is located, 15m to the east of the site which is generally described as red marl calcareous mudstone and siltstone with thin beds of fossiliferous marine limestone and dolomite.

3.6 There are 3 records of linear features within 500m of the site boundary. The closest record refers to an inferred normal fault located 234m to the northeast of the site.

3.7 There are no records of landslips within 500m of the site boundary.

3.8 There are 22 borehole records identified within 250m of the site. The closest record is 71m to the north of the site, referenced (15018332) which describes 6 trial pits to a maximum depth of 1.9 mbgl. The strata encountered is given below;

- Topsoil from ground level to depths of between 0.10 and 0.15 mbgl
- Made Ground from 0.10 to 0.15 to depths of between 0.50 and 0.852 mbgl.
- Stiff Clay (presumed Glacial Till) to depths of between1.50 and 1.90 mbgl

3.9 A borehole drilled to 6.0 mbgl reference 15018318 indicated indicated the glacial till to a depth of 6.00mbgl.

3.10 The following hazards ratings applicate to the site and land with 50m are presented in the Enviro + Geo Insight Report

- Shrink / swell clays: Very Low
- Running sands: Very Low
- Compressible deposits: Negligible
- Collapsible deposits: Very Low
- Landslides: Very Low
- Ground dissolution of soluble rocks: Negligible

Ground Workings, Mining and Other Underground Workings

3.11 There are no records of natural cavities within 250m of the site.

3.12 There are no records of mining cavities within 250m of the site.

3.13 According to the BGS, there are no records of a British Pit within 500m of the site.

3.14 There is 1 record of historical surface ground working features identified within 250m of the site boundary, this reference a pond 234m to the southwest and dated 1890.

3.15 There are no records of underground workings within 250m of the site.

3.16 There are no records for historical underground working features identified within 1km of the site.

3.17 The site is located within the specified search distance (1km) of an identified coal mining area. Reference to the Coal Authority Interactive viewer shows the site is not within a Development High Risk Area.

3.18 There are 2 records for non-coal mining areas located within 1km of the site. The closest is 648m to the south of the site.

3.19 There are no areas of brine extraction, gypsum extraction, tin mining or clay mining within 1km of the site.

Radon Potential

3.20 The property is not located in a Radon Affected Area. Less than 1% of properties are above the Action Level. Therefore, radon protection measures are not necessary.

Hydrogeology and Hydrology

3.21 The superficial deposits are classified by the Environment Agency (EA) as a Secondary Undifferentiated Aquifer. The Glacial Till deposits have a mixed flow type and low to high permeability. The BGS states the following:

> *'Layers that cannot be attributed to a category A or B rock type. These layers could have previously been described as a minor or a non-aquifer due to their variable characteristics.'*

3.22 The Chester Pebble Bed Formation is classified by the Environment Agency (EA) as a Principal Aquifer with a mixed flow type and moderate to high permeability The BGS states the following:

> *'Layers with high intergranular and/or secondary permeability capable of supporting water supplies at strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Major Aquifers.'*

3.23 The groundwater vulnerability and soil leaching potential of the soils at the site has been classified as low the BGS states:

'Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability'

3.24 There are 5 groundwater abstraction licence records within 2km of the site all for historical licenses. The closest record refers to a historical license for spray irrigation at a site located 1179m to the east of the site, the license expired in 2014.

3.25 There are no surface water abstraction licence records within 2km of the site.

3.26 There are no potable water abstraction licence records within 2km of the site.

3.27 The site is not located within 500m of a Source Protection Zone or Source Protection Zone within a confined aquifer.

3.28 The site is located not within Source Protection Zone.

3.29 There are no water network entries within 500m of the site.

3.30 There are no surface water features identified within 250m of the site.

3.31 There is 1 record of a Water Framework Directive (WDF) surface water body located on site. The record refers to the Irwell/Manchester Ship Canal within the Croal Irwell operational catchment. The water body received a fail chemical rating and moderate ecological rating in 2019.

3.32 There is 1 record of a Water Framework Directive (WDF) groundwater body located on site. The record refers to the Manchester and East Cheshire Permo-Triassic Sandstone Aquifer. The water body received a poor chemical rating in 2019.

Landfill & Waste Management Activity

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

3.34 There are no records of historical potentially infilled features identified within 500m of the site.

3.35 There are 5 historical non-landfill waste records within 500m of the site. Waste exemptions are made available for certain specified activities considered to pose a low risk to the environment and allowable waste types and quantities are limited. The closest is 261m to the east for sorting and de-naturing of controlled drugs for disposal.

Industrial Land Use Information

3.36 There are 68 records of potentially contaminative historical land uses identified within 500m of the site. The closest record refers to industrial school located 78m so the south of the site. Other records in the vicinity refer to an industrial school, unspecified works, print works, unspecified ground workings, cuttings, railway sidings, railway station, good shed.

3.37 There are 10 records of recent industrial land uses within 250m of the site boundary. The nearest, 20m east, is the Longsight MOT Centre.

3.38 There are 3 records of historical tanks identified within 500m of the site. The closest record refers to an unspecified tank located 232m to the west of the site.

3.39 There are 36 records of historical energy features identified within 500m of the site. The closest record refers to electrical substation located 185m to the southwest of the site.

3.40 There are 3 records for current petrol or fuel sites within 500m of the site. The closest record refers to Harvest Energy located 273m to the north of the site.

3.41 There are no records of historical petrol or fuel sites within 500m of the site.

3.42 There are 21 historical garage and motor vehicle repair site records identified within 500m of the site. The closest record refers to garage located 22m to the southeast of the site.

3.43 There are no National Grid high voltage underground electricity transmission cables within 500m of the site.

3.44 There are no National Grid high-pressure gas transmission pipelines within 500m of the site.

3.45 There are no historical railway and tunnel features identified within 250m of the site.

3.46 There are no historical railway lines identified within 250m of the site.

3.47 There are no current active railway lines identified within 250m of the site.

3.48 There are no underground railway lines or tunnels identified within 250m of the site.

3.49 The site is within 5km of the route of the High Speed 2 rail project. The reference refers to a tunnel 441m east of the site.

3.50 The site is not within 500m of the route of the Crossrail 1 rail project.

Environmental Permits, Incidents and Registers

3.51 The Groundsure Report includes records of environmental permits, incidents, and registers within 250m of the site, which are summarised in Table 2 overleaf.

Table 2: Environmental Permits, Incidents and Registers within 250m of the Site

Permit/Incident/Register	Number
Sites Determined as Contaminated Land under Part 2A EPA 1990	0
Dangerous or Hazardous (COMAH and NIHHS) Sites	0
Regulated Explosive Sites	0
Planning Hazardous Substance Consents and Enforcements	0
Historical Licensed Industrial Activities (IPC)	0
Part A (1) and IPPC Authorised Activities	0
Part A (2) and Part B Activities and Enforcements	5
Category 3 or 4 Radioactive Substance Authorisations	0
Licensed Discharge Consents	7
Pollutant Release to Surface Waters (Red List)	0
Pollutant Release to Public Sewer	0
List 1 Dangerous Substances Inventory Sites	0
List 2 Dangerous Substances Inventory Sites	0
Substantiated Pollution Incidents (Category 1 and 2)	2

3.52 There are 5 records for Licensed pollutant release (Part A(2)/B) within 500m of the study site. The closest record refers to unloading of petrol into storage at service station located 273m north east of the site.

3.53 There are 7 records for Licensed Discharge Consents within 500m of the study site. The closest record refers to an historical licence for sewer storm overflow at a site located 434m to the south of the site.

3.54 There are 2 records for Substantiated Pollution Incidents (Category 1 and 2) within 500m of the study site. The closest record refers to an incident involving petrol at a site located 285m to the northeast of the site, in 2002. The incident had no impact on land/water/air.

Environmentally Sensitive Sites

3.55 There are no Sites of Special Scientific Interest (SSSI) within 2km of the study site.

3.56 There are no Special Areas of Conservation (SAC) within 2km of the study site.

3.57 There are no Special Protection Areas within 2km of the study site.

3.58 There are no records of Local Nature Reserves (LNR) within 2km of the study site.

3.59 There are no records of National Parks (NP) within 2km of the study site.

3.60 There are no records of Ancient Woodland within 2km of the study site.

3.61 There are no records of Greenbelt land within 2km of the study site.

3.62 There site is not located within a Nitrate Vulnerable Zone.

3.63 There are no other records for Designated Environmentally Sensitive Sites within 2km of the study site.

Ecology

3.64 An ecological assessment of the site falls outside the brief of this report. Where considered necessary, advice should be sought from an ecological specialist in this respect.

3.65 However, the site is classified as Urban Land, and there are no habitat designations within 250m of the site.

Archaeology

3.66 An archaeological assessment falls outside the brief of this report. Where considered necessary, advice should be sought from an archaeological specialist in this respect.

3.67 There are no visual or cultural designations within 250m of the site, expect for 1 listed building referenced to Church of St John of 198m east of the site.

Potential Flood Risks

3.68 Detailed assessment of flood risks is outside the scope of this report.

3.69 However, the site is not located within a floodplain.

3.70 There are no records of historical flood events within 250m of the site.

3.71 However, the site does not lie within 250m of an Environment Agency Zone 2 or Zone 3 floodplain.

3.72 There are no records of flood defences, areas benefitting from flood defences or areas used for flood storage within 250m of the site.

3.73 There is no risk of flooding from rivers and sea (RoFRaS) within 50m of the site.

3.74 The highest risk of surface water flooding occurring on-site is negligible.

3.75 The highest risk of groundwater flooding occurring on-site is moderate to high.

Previous Site Investigations

3.76 Earth Environmental & Geotechnical Ltd are not aware of any previous site investigations carried out for the site.

4.0 SITE HISTORY

4.1 The historical development of the site has been determined by reference historical plans and Google Earth imagery. Information in the historically mapping study has been predominantly limited to the site or within 100m off the site to focus on the most directly relevant information. Beyond this radius only information deemed relevant will be referenced. Each map or photograph represents a snapshot of the site and its environment at the date of the survey. Any changes that occur at other times may not have been recorded on the maps and could represent an unidentified hazard to the site.

4.2 Only selected maps with a clear view of the site and surrounding area have been used, the information reported might not represent all pertinent information that could be obtained. The interpretation of the maps and/or other data commented on in this report is subjective.

The earliest available historical mapping covering the site dates back to 1848. The site history is summarised in Table 3, below, followed by selected extracts from maps and aerial photographs

Table 3: Summary of Site History

Date	Scale	On-Site History	Surrounding Land Use History
1848-1849	1:10,560	The site is part of Clarence Road in the west and undeveloped land to the east.	The surrounding area is undeveloped, but forms part of Victoria Park.
1890-1892	1:10,560	The area is undeveloped land.	Clarence road is now located to the west. Residential properties have been built approximately 10m to the southwest and 20m to the east
1891	1:500	The site is part of landscaped area associated with a residential development.	A liberal club has been constructed approximately 100m to the north of the site.
1893	1:2,500	No significant change compared to the previous map.	No significant change compared to the previous map.
1905	1:10,560	No significant change compared to the previous map.	More residential properties have been built approximately 80m to the south of the site.
1908	1:2,500	No significant change compared to the previous map.	No significant change compared to the previous map.
1922	1:2,500	No significant change compared to the previous map.	No significant change compared to the previous map.
1923	1:10,560	No significant change compared to the previous map.	No significant change compared to the previous map.
1933	1:2,500	No significant change compared to the previous map.	Residential properties have been built to the immediate north and south of the site and approximately 75m to the west.
1934	1:10,560	No significant change compared to the previous map.	No significant change compared to the previous map.

Date	Scale	On-Site History	Surrounding Land Use History
1938	1:10,560	No significant change compared to the previous map.	No significant change compared to the previous map.
1950	1:1,250	No significant change compared to the previous map.	No significant change compared to the previous map.
1955-1956	1:10,560	No significant change compared to the previous map.	No significant change compared to the previous map.
1965-1968	1:10,560	No significant change compared to the previous map.	No significant change compared to the previous map.
1972-1976	1:1,250	No significant change compared to the previous map.	Minor residential development has occurred approximately 50m to the west of the site. The liberal club is no longer present approximately 50m to the north of the site.
1976-1981	1:10,000	No significant change compared to the previous map.	No significant change compared to the previous map.
1979	1:1,250	No significant change compared to the previous map.	No significant change compared to the previous map.
1983-1985	1:10,000	No significant change compared to the previous map.	No significant change compared to the previous map.
1989-1991	1:10,000	No significant change compared to the previous map.	A St Johns school has been built approximately 75m to the north of the site.
1990-1992	1:1,250	No significant change compared to the previous map.	The garage has been constructed on the site.
1992	1:1,250	No significant change compared to the previous map.	No significant change compared to the previous map.
1993	1:1,250	No significant change compared to the previous map.	No significant change compared to the previous map.
1992-1995	1:1,250	No significant change compared to the previous map.	No significant change compared to the previous map.
2001	1:10,000	No significant change compared to the previous map.	No significant change compared to the previous map.
2003	1:1,250	No significant change compared to the previous map.	No significant change compared to the previous map.
2010	1:10,000	No significant change compared to the previous map.	No significant change compared to the previous map.
2024	1:10,000	No significant change compared to the previous map.	No significant change compared to the previous map.

Table 4: Summary of Site History from Aerial Photographs

Date	On-Site History	Surrounding Land Use History
2000	The site is currently occupied by hardstanding associated with the garage.	The surrounding area is generally residential in all directions with the garage at the immediate east and school to the north
2009	There is no significant change compared to the previous photograph	There is no significant change compared to the previous photograph
2015	There is no significant change compared to the previous photograph	There is no significant change compared to the previous photograph
2019	There is no significant change compared to the previous photograph	There is no significant change compared to the previous photograph
2022	There is no significant change compared to the previous photograph	There is no significant change compared to the previous photograph

To summarise the site comprised part of Clarence Road in the western part of the site on first map in 1848 and is to the west site from the 1891 map onwards where the site is part of the landscaped area of residential property. There is no significant change on site until the 1990 map when the site becomes part of the existing adjacent garage.

Off the site surrounding area is large undeveloped in the 1848 map with residential properties being built approximately 10m to the southwest and 20m to the east in the early 1890s. A liberal club was constructed approximately 100m to the north of the site on the 1890 map and residential properties were built to the southwest and east. Major residential development in the area occurred between the 1923 and 1933 maps. It is unclear when the garage was first built on the site, but building is present from the 1990 maps onwards.

Selected historical maps images and site aerial photographs are presented below in Figures 4 to 7.

Figure 4 OS Map Extract 1891

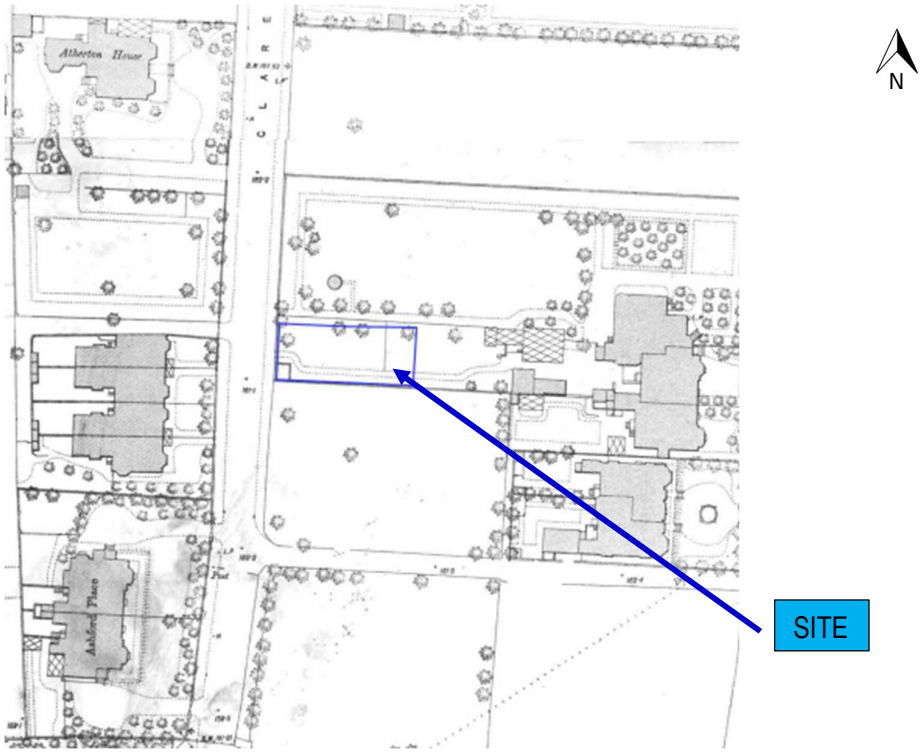


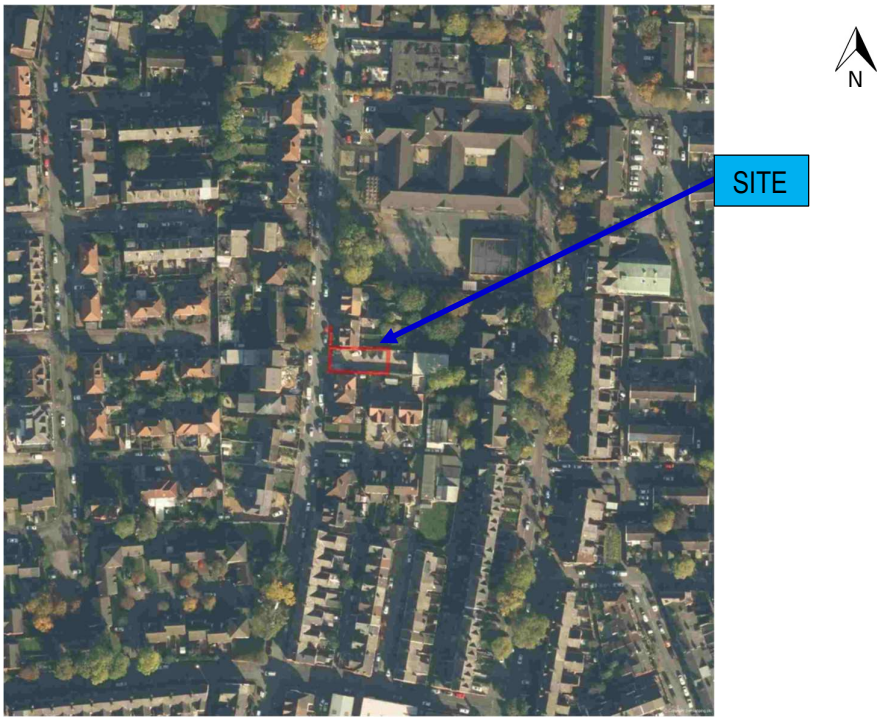
Figure 5 OS Map Extract 1990-1992



Figure 6 OS Map Extract 2003



Figure 7 Google Earth Aerial Photograph 2022



5.0 PRELIMINARY CONTAMINATION RISK ASSESSMENT

Introduction

5.1 The following paragraphs outline a Preliminary Risk Assessment (PRA) for the site based on the above desk study information as defined by DEFRA and the EA Model Procedures for the Management of Land Contamination, CLR11(2004).

5.2 Table 7 provides a Preliminary Conceptual Model (PCM) which considers the source-pathway-receptor linkages present alongside the likelihood, severity and risk level as defined within Table 5 and Table 7 below. The assessment of probability, a modified risk table, and certain consequence definitions are based on CIRIA C552 and CLR11.

5.3 Table 6 considers whether a pollution linkage is potentially present and provides a preliminary qualitative assessment of risk based on the information currently available. Where a possible linkage is identified, it does not necessarily mean that a significant risk exists but indicates that further information is required through appropriate site investigation to substantiate the conceptual model.

5.4 The PCM/PRA is based on a proposed residential end use.

Table 5: Consequence, Probability and Risk

Probability	Consequence,	Risk
High Likelihood- There is a pollution linkage and an event either 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	Very High – acute risk to the human health likely to result in significant harm. Risk of severe or irreversible effect on ground/surface water quality. Catastrophic damage to buildings / property.	Very High – there is a high potential that the source-pathway-receptor scenarios may give rise to harm to human health, or the environment and remedial action is likely to be required.
Likely – there is a pollution linkage, and all the elements are present, which means that it is probable an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.	High – Severe or irreversible effect on human health. Temporary severe or irreversible effect on ground/surface water quality. Reduction of water quality rendering groundwater or surface water unfit to drink and/or substantial adverse impact on groundwater dependant environmental receptors.	High – it is likely that the source-pathway-receptor scenarios may give rise to an impact on human health or the environment, which may require remediation and/or control measures to mitigate risks
Low likelihood– there is a pollutant linkage and circumstances are possible for an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term	Moderate – Long term or short-term moderate effect on human health. Moderate effect on ground/surface water quality, reversible with time. Reduced reliability of a supply at a groundwater or surface water abstraction source	Moderate – it is possible that the source-pathway-receptor scenarios may give rise to an impact on human health or the environment, however it is either relatively unlikely that such would be severe, or if any harm were to occur it is more likely that harm would be mild.
Unlikely – there is a pollution linkage, but circumstances are such that it is doubtful that an event would occur even in the very long term.	Low – Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.) Slight effect on ground/surface water quality, reversible with time. Marginal reduced reliability of a supply at a groundwater or surface water abstraction source.	Low – it is possible that harm could arise at the source, however it is likely that this would at worst be mild.
		Very Low – it is unlikely that the source-pathway-receptor scenarios will give rise to an impact on human health or the environment.

Table 6: Estimation of Level of Risk by Comparison of Consequence and Probability

		Consequence			
		High	**Moderate**	**Low**	**Very low**
Probability	**High Likelihood**	Very High	High risk	Moderate risk	Moderate to low risk
	Likely	High risk	Moderate risk	Moderate to low risk	Low risk
	Low Likelihood	Moderate risk	Moderate to low risk	Low risk	Very low risk
	Unlikely	Moderate to low risk	Low risk	Very low risk	Very low risk

Potential Sources

5.5 To summarise the site comprised part of Clarence Road in the western part of the site on the 1848 map and is to the west of the map from the 1891 map where the site is part of the landscape area of residential property.

5.6 There is no significant change in the remain maps, however the site becomes part of the existing adjacent garage from the 1990 map.

5.7 There is limited potential for the presence of contamination on the site.

Potential Receptors

5.8 The following receptors have been considered for the construction and operational stages of the proposed redevelopment.

- Current site users;
- Adjacent land users;
- Future land users;
- Construction workers during site development works;
- Groundwater within the underlying aquifer.

Potential Pathways

5.9 The following pathways have been considered for the construction and operational stages of the proposed redevelopment.

- Dermal contact, ingestion, inhalation pathways of potentially contaminated soils;
- Downward vertical migration of leachate to shallow groundwater;
- Vertical or lateral migration of ground gas.

Table 7: Preliminary Conceptual Model

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
Made Ground across site (Heavy Metals, PAH, TPH & BTEX)	Dermal contact, ingestion, and inhalation of soils dust	Current Site Users	Unlikely	Low	Very Low	The site is currently covered with hardstanding and therefore direct contact with soils is not possible, breaking the pollutant linkage. Therefore, the risk is considered **VERY LOW**.
		Adjacent land users	Unlikely	Low	Very Low	The risk is considered **VERY LOW** due to lack of pollutant linkage and usual dust control measures should be implemented as part of good site working practices during construction to reduce dust generation.
		Future land users	Low Likelihood	Moderate	Moderate to Low	The proposed development will include residential properties with private gardens. The risk to future site users via direct exposure is considered to be **LOW.** This assessment is based on the sensitivity of the receptor and the potential for contamination to be present beneath the proposed garden area.
		Construction Workers	Low Likelihood	Low	Low	Construction workers are likely to be exposed to potentially contaminated Made Ground materials during construction works, however exposure duration will be short-term only. Assuming appropriate health and safety measures are adopted (in line with CDM and other relevant health and safety guidance) a **LOW** risk to construction workers is anticipated.
	Downward vertical migration of leachate to shallow groundwater	Groundwater within the Underlying Aquifer	Unlikely	Moderate	Low	Shallow groundwater may be present beneath the site however, there are no nearby abstraction licenses, and the underlying superficial soils are anticipated to be cohesive with generally low permeability. The risk to groundwater is therefore considered **LOW.**
	Vertical or lateral migration of ground gas	Current Site Users	Unlikely	Low	Very Low	There is limited potential for Made Ground soils beneath the site. Given the site is covered with hardstanding the pollutant linkage is broken. The risk to current site users from ground gas is therefore considered **VERY LOW.**
		Adjacent land users	Unlikely	Low	Very Low	Considering the age of the potential Made Ground materials present and the cohesive nature of the underlying superficial deposits there is low potential for ground gas migration. The risk to adjacent site users from ground gas is therefore considered **VERY LOW.**
		Future land users	Low Likelihood	Low	Low	There is potential for Made Ground from former structures and potentially organic soils beneath the site. However, given the age of the materials present it is likely that any gasses or volatile vapours originally present would now have dissipated**.** Furthermore, the cohesive nature of the

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
						underlying superficial deposits would likely inhibit migration of any ground gases present. The risk to future site users from ground gas is therefore considered **LOW.**
		Construction Workers	Low Likelihood	Moderate	Low	Construction workers may be exposed to ground gas/depleted oxygen conditions in confined spaces and excavations; however, the duration will be short term. The risk to construction workers from ground gas is considered **LOW.**
Asbestos Containing Material (ACM)		Current Site Users	Unlikely	Low	Very Low	Asbestos may be present in the Made Ground soils beneath the site. However, asbestos is only harmful when disturbed. The site is currently covered by hardstanding and therefore no plausible pollutant linkage exists. The risk to current site users is considered to be **VERY LOW.**
		Adjacent land users	Unlikely	Moderate	Low	Asbestos may be present in the Made Ground soils beneath the site. Disturbance of soil during the construction phase may allow fibres to become airborne. The risk is therefore considered **LOW.** Dust control measures (dampening down) should be implemented as part of good site working practices in order to reduce the risk to **VERY LOW**.
		Future land users	Unlikely	Moderate	Low	The proposed residential development includes private gardens. Although ACM material is not anticipated within the soils disturbance of potential ACM by future resident may allow fibres to become airborne. The risk is therefore considered **LOW** A contamination assessment of the existing on-site soils and appropriate remediation, if required, will reduce the risk to **VERY LOW**.
		Construction Workers	Unlikely	Moderate	Low	Construction workers will be exposed to potential asbestos in soils during the construction phase although unlikely. The risk is considered **LOW.** A contamination assessment of the existing on-site soils would be required to determine the level of risk and necessary mitigation measures.

6.0 GEOTECHNICAL HAZARDS ASSOCIATED WITH THE DEVELOPMENT

6.1 In addition to the environmental hazards there are also geotechnical hazards associated with the stability of the ground including load bearing capacity, slope stability and effects of ground mining activities. Local Authorities follow NPPF (2021) which requires that a site be suitable for its new use taking into account of ground conditions and land instability, including from natural hazards to former activities such as mining. A summary of the geotechnical hazards and geotechnical considerations is provided below Table 8 and Table 9, respectively.

Table 8: Summary of Geotechnical Hazards

Geohazards:	
Highly Compressible Ground	Negligible risk.
Collapsible Soils	Very Low risk.
Swelling Clay	Very Low risk.
Running Sand	Very Low risk.
Ground Dissolution	Negligible risk.
Landslip	Very Low risk.
Mining & Quarrying	No mining or quarrying is recorded as taking place on site. The site is located within a Coal Mining Reporting Area but not within a Development High Risk Area. Therefore, the mining risk is considered low.

Table 9: Summary of Geotechnical Considerations

Geotechnical Design Considerations	
Site Clearance	The residential property is currently occupied with hardstanding and a shipping container which will need to be removed.
Trees	There are no trees present on the site or boundary.
Existing Buildings/Obstructions	There is currently occupied with hardstanding which will need to be removed before construction.
Foundations	The depth and type of proposed foundations would depend on the ground conditions present on site. There are no artificial deposit records underlying the site and most of the site is underlain by Glacial Till. An intrusive geotechnical investigation is recommended prior to any construction works.

Floor Slabs	Again, an intrusive geotechnical investigation is recommended prior to any construction works to discover the most suitable floor slab design for the on-site ground conditions.
Groundwater	Exact groundwater conditions are not known at this stage. For more detailed knowledge of the groundwater regime, an intrusive geotechnical investigation would be needed. However, it is recorded that the site is underlain by Secondary Undifferentiated and Principal aquifers. The highest risk of groundwater flooding on site is recorded as moderate to high.
Earthworks	It is unlikely that any major earthworks will be required on the site.
Slopes	The site is flat lying.
Retaining Walls	It is unlikely retaining walls will be required due to the flat lying nature of the site.
Chemically aggressive ground conditions	Chemically aggressive ground conditions are not expected at this site. However, an intrusive geotechnical investigation would be necessary to confirm this.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

7.1 The site is currently part of an MOT garage. The site has historically been part of landscaped area of a residential property before the site was part of the MOT garage.

7.2 There is limited potential for the presence of contamination within the area being developed.

7.3 The site is underlain by Glacial Till deposits (Secondary Undifferentiated Aquifer) and bedrock geology of Chester Pebble Bed Formation (Principal Aquifer).

7.4 The overall risk from soil contamination to residential end users and construction workers is concluded to be **LOW**.

7.5 The risk to controlled waters is concluded to be **LOW** based on the underlying cohesive geology and absence of a nearby abstraction.

7.5 Given the anticipated extent and age of made ground at the site, the risk from ground gas to end users is considered to be **VERY LOW**.

Recommendations

7.6 An intrusive investigation should be undertaken to establish geotechnical parameters for the design of foundations, floor slabs and pavement construction for the proposed new structures and surrounding area.

APPENDIX 1

GROUNDSURE REPORTS

APPENDIX 2

REPORT LIMITATIONS

LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget, and staff resources allocated to the project.

Other than that, expressly contained in the above paragraph, Earth Environmental & Geotechnical Ltd provides no other representation or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Earth Environmental & Geotechnical Ltd.

If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2024 and should be read in light of any subsequent changes in legislation, statutory requirements, and industry best practices. Ground conditions can also change over time and further investigations, or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice of Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.