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Phase 1

Environmental Assessment Report

Waterloo Road

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Executive Summary

The preliminary environmental site assessment indicates that the site can be classified as moderate risk in terms of contamination and the risks to the identified receptors (e.g., human health and buildings) following redevelopment is considered to be moderate.

This classification is due to the historical presence of a tramway line that ran along the western boundary of the site. The presence of Made Ground (track-bed material) extending beneath the site cannot be ruled out. Potential associated contaminants could include heavy metals, hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and sulphates.

The completion of a targeted Phase 2 Investigation is recommended prior to site redevelopment to obtain additional information on the ground conditions and the contamination status. The investigation should be carried out by qualified and competent persons. The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the Phase 2 intrusive works.

Disclaimer

This report has been prepared by EnviroSolution Ltd who has exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant experienced in preparing reports of a similar scope.

However, to the extent that the report is based on or relies upon information contained in records, reports or other materials provided to EnviroSolution Ltd, which have not been independently produced or verified, EnviroSolution Ltd, gives no warranty, representation or assurance as to the accuracy or completeness of such information.

The scope of this report is restricted to potential ground contamination and its environmental impact; it does not cover above-ground hazards (e.g., asbestos in buildings), ecological sensitivities (e.g., bats), biological or horticultural hazards (e.g., Japanese Knotweed) or structural hazards (e.g., building stability) unless specifically referred to in the text of this report.

Table of Contents

1 Introduction 7

1.1 Background 7

1.2 Objectives 7

1.3 Scope of Work 7

1.4 Information Sources 8

2 The Site 9

2.1 Site Location 9

2.2 Site Description 9

2.3 Development Proposals 9

2.4 Site History 9

3 Environmental Setting 12

3.1 Geology 12

3.2 Radon 12

3.3 Coal Mining Activity 12

3.4 Hydrogeology 12

3.5 Hydrology 13

3.6 Flood Risk 13

3.7 Waste Management Facilities 13

3.8 Environmental Permits, Incidents and Registers 14

3.9 Designated Environmentally Sensitive Sites 14

4 Preliminary Conceptual Site Model 15

4.1 Introduction 15

4.2 Potential Contamination Sources 15

4.3 Receptors 16

4.4 Pathways 17

4.5 Potential Pollution Linkages 18

4.5.1 Human Health 18

4.5.2 Controlled Waters 18

4.5.3 Building/Construction Materials/Buried Services 18

4.6 Environmental Designations 19

4.7 Preliminary Hazard Assessment 19

5 Conclusions and Recommendations 23

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Tables

Table 1 - Historic Mapping Review 9

Table 2 - Historic Landfill Summary 13

Table 3 - Environmental Designations Summary 14

Table 4 - Off-Site Land Use Summary 16

Table 5 - Receptor Description 16

Table 6 - Exposure Pathways Summary 17

Table 7 - Preliminary Hazard Assessment 20

Table 8 - Risk Matrix, Degree of Risk (R) = Likelihood (L) x Effect (E) 22

Appendices

Appendix A – Site Plans

Appendix B – Site Photographs

Appendix C – Historical OS Maps

Appendix D – Geological Maps

Appendix E – BGS Borehole Logs

Appendix F – Coal Mining Summary Map

Appendix G – Hydrogeology Maps

Appendix H – Flood Risk Map

Appendix I – Historic Landfill Map

Appendix J – Environmental Designations

1 Introduction

1.1 Background

EnviroSolution Ltd was commissioned to undertake a Phase 1 Environmental Site Assessment at a site located at Waterloo Road in Manchester. This report was commissioned to provide information on the potential contamination status of the site.

1.2 Objectives

The objective of the preliminary environmental site assessment was:

1. To provide a summary of the environmental setting and historical land use of the site and immediate surrounding area.
2. To obtain information on the ground conditions present beneath the site.
3. To develop a conceptual site model and complete a generic quantitative risk assessment to identify any environmental risks and liabilities associated with ground conditions at the site.

1.3 Scope of Work

To achieve the objectives, the following scope of work was completed:

1. A desk-based study of the site comprising a review of available environmental information for the site such as geological and hydrogeological data and historical land use information.
2. A site walkover survey.
3. Assessment of potential hazards and constraints during construction and longer term.

This work has been devised to generally comply with the relevant principles and requirements of the following legalisation and guidance:

- Part IIA of the Environmental Protection Act, 1990 and Section 57 of the Environmental Act 1995;
- Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (DEFRA, April 2012);
- National Planning Policy Framework (Ministry of Housing, Communities and Local Government, July 2021);
- BS10175: 2026 “Investigation of Potentially Contaminated Sites- Code of Practice”; and

- Environment Agency (2020) Land Contamination Risk Management Report LCRM "How to assess and manage the risks from land contamination".

1.4 Information Sources

Historical Ordnance Survey maps have been obtained from historical records, ranging from 1848 to 2026. These maps provide high quality information on historical site use.

The British Geological Survey Geoindex database has been used to provide information on geo-environmental aspects of the site and the immediate surrounding area such as geological, hydrogeological and hydrological data.

The Environment Agency website (www.gov.uk/government/organisations/environment-agency) and Magic website (www.magic.gov.uk) was also used to obtain environmental information.

Industry Profiles produced by the Department of the Environment were utilised to obtain information on processes, materials and wastes associated with potential contaminative land uses near the site.

Readily available information sources have been used to produce this desk-based study. Additional information may be requested by the Local Planning Authority (e.g., local authority environmental information request).

2 The Site

2.1 Site Location

The site is located directly southeast of the junction between Waterloo Road and Abercarn Close, in Manchester. The British National Grid Reference for the approximate site centre is GR: 384015, 401060.

The site location is shown on **Figure 1** in **Appendix A**.

2.2 Site Description

The site description has been prepared following a walkover survey conducted by EnviroSolution Ltd on the 4th of June 2026. The site photographs are included in **Appendix B.**

The site is irregular in shape and covers an approximate area of 825 m². It is a green plot of land opened to the east, north and west, bounded to the south by a residential property. Vehicular access is gained from the north via Abercarn Close.

The site is covered in lawn, with a small shrub located in the northeastern corner. Visual inspection did not identify any obvious sign of contamination. A small pile of demolition rubble, consisting of bricks, concrete and timber, and general waste, is located to the east of the site. Asbestos containing materials were not identified.

The ground is generally flat lying at approximately 66m aOD.

Land use in the surrounding area is predominantly residential.

There is a petrol filling station located 210m northeast of the site.

The existing site plan is shown on **Figure 2** which is included in **Appendix A**.

2.3 Development Proposals

It is understood that the development proposal includes the construction of 4 no. semi-detached residential dwellings, with back gardens and parking spaces.

The proposed development plan is shown on **Figure 3** which is included in **Appendix A.**

2.4 Site History

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area is summarised in Table 1. Copies of the historical OS maps are included in **Appendix C**. A search buffer of 250m has been used.

Table 1 - Historic Mapping Review

Date	Scale	On Site	Off Site
1848	1:10,560	The site is an undeveloped plot of land within an agricultural field.	Surrounding land is mostly agricultural land with residential dwellings to the northwest.
1890	1:500	The northern part of the site intersects a cricket ground.	Residential developments have expanded to the west and south of the site. Cricket grounds are located to the east and north. Tramway line 195m northeast.
1908	1:2,500	Site intersects a bowling green.	Further residential development to the west and south. Tramway line 5m west. Sand pit 225m northeast.
1933	1:2,500	No significant change.	Further residential development north and northwest of the site. Sand pit infilled and redeveloped.
1950-1952	1:1,250	No significant change.	Residential dwellings developed directly south of the site. Tramway lines no longer identified on the map. Allotment gardens 120m east. Warehouse 160m southwest.
1966-1976	1:1,250	Site within sports ground. Small outbuilding intersects the southeastern section of the site.	Petrol station 225m northeast. Electricity transformer 160m west.

Date	Scale	On Site	Off Site
1981-1984	1:1,250	Outbuilding demolished.	Residential development 10m east. Electricity substation 80m northeast. Works 170m northeast, 200m northeast.
1992	1:1,250	No significant change.	No significant change.
2006	1:10,000	No significant change.	No significant change.
2026	1:10,000	No significant change.	No significant change.

3 Environmental Setting

3.1 Geology

Geological maps of the area indicate that the site is directly underlain by superficial glaciofluvial sheet deposits, which are of Quaternary age. They are mostly composed of sand and gravel, locally with lenses of silt, clay or organic material.

The underlying bedrock is the Chester Formation which was deposited during the Early Triassic. The formation comprises conglomerates and reddish brown, cross-bedded, pebbly sandstones with subordinate beds of red-brown mudstone. The conglomerates have a reddish-brown sandy matrix and consist mainly of pebbles of brown or purple quartzite, with quartz conglomerate and vein quartz.

The nearest geological fault is located approximately 735m east of the site.

A borehole (Ref: SD80SW122) located 230m west of the site was obtained from BGS online records. The borehole penetrates to 10.5m bgl. and shows 1.5m of Made Ground overlying 2.85m of alternating sand and clay, overlying 6.15m of sand.

A copy of the geological maps is included in **Appendix D.** A copy of the BGS borehole records is included in **Appendix E**.

3.2 Radon

The site lies within the lowest band of radon potential where it is estimated that less than 1% of the properties are above the action level (low probability). Radon protective measures are not deemed necessary for the development.

3.3 Coal Mining Activity

The site falls within a coal mining reporting area described as having minable coal deposits but does not lie within a 'Development High Risk Area' for coal mining, as defined by the Mining Remediation Authority. As such, this site is not considered to be at risk from coal mining related hazards.

A review of the Mining Remediation Authority Interactive Viewer Map (**Appendix F**) has shown that there are no coal mining features within a 1km radius of the site.

A copy of the coal mining summary map is included in **Appendix F**.

3.4 Hydrogeology

The underlying glaciofluvial sheet deposits are designated as Secondary A Aquifer, defined as; permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The underlying Chester Formation is designated as a Principal Aquifer, defined as; layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

There are no records of groundwater abstraction licences located within a 1km radius of the site and the site does not lie within a Source Protection Zone.

A copy of the hydrogeological maps is included in **Appendix G**.

3.5 Hydrology

There are no significant surface water features (rivers, lakes and reservoirs) located within a 1km radius of the site.

There are no minor surface water features located within a 250m radius of the site.

3.6 Flood Risk

The site lies within a Flood Zone 1 (low probability), land assessed as having less than a 1 in 1,000 annual probability of river flooding (0.01%) in any year (low risk). The completion of a detailed Flood Risk Assessment is not deemed necessary for this site.

A copy of the flood risk map is included in **Appendix H**.

3.7 Waste Management Facilities

There are 4 no. records of historic landfill sites located within a 1km radius of the site. The landfill information is summarised in Table 2 below:

Table 2 - Historic Landfill Summary

Landfill Site	Operation Dates	Waste Type	Distance from Site
Land at Fairy Lane	No Information	Commercial, household	505m SW
Abraham Moss Centre	No information	No information	685m NE
Elizabeth Street	No information	No information	770m S
Queens Road Tip	1955 – 1970	Inert, Industrial, commercial, household, special	805m SE

A copy of the historic landfill map is included in **Appendix I**.

There are no records of currently authorised landfill sites, or sites operating under an environmental permit for waste operations located within a 1km radius of the site.

3.8 Environmental Permits, Incidents and Registers

There are no records of sites located within a 1km radius of the development site operating under an environmental permit for discharges to water and groundwater.

There are no records of pollution incidents recorded by the Environment Agency having occurred within a 1km radius of the site.

3.9 Designated Environmentally Sensitive Sites

There is a single record of designated environmentally sensitive site located within a 1km radius of the site.

The environmental designations is summarised in Table 3 below:

Table 3 - Environmental Designations Summary

Designation	Distance	Details
Nitrate Vulnerable Zone	On Site	The site lies within a Nitrate Vulnerable Zone.

A copy of the environmental designations map is included in **Appendix J**.

4 Preliminary Conceptual Site Model

4.1 Introduction

In order to assess the environmental risks present, a preliminary conceptual model has been developed for the site. This model has been developed using best practice guidelines in conjunction with the current assessment framework taking into account the development proposals. This preliminary conceptual model is based on the gathered desk-based information (e.g., historical OS data and data sourced from the, EA, Geoindex and Magic databases).

The conceptual site model is a representation of the hypothesised relationships between sources, pathways and receptors which allows the identification of potential pollutant linkages and whether these linkages have the potential to comprise significant harm and/or pollution of controlled waters in relation to the site. This model comprises three elements:

Source – the key pollutant hazards associated with the site

Receptor – the key targets at risk from the sources

Pathway – the means by which the contaminant can cause harm to the receptor

If all three elements are present, then a potential pollutant linkage exists, and this may require further assessment.

4.2 Potential Contamination Sources

The site has historically remained mostly undeveloped and as part of former cricket/sports grounds. A small outbuilding intersected the southeastern corner of the site during the 1960s – 1970s and it was demolished during the 1980s. Due to the scale of the site is not expected to have resulted in any contamination on the site.

Given the close proximity of the tramway line directly west of the site, it is considered possible that the track bed intersects with the site boundary. Potential contaminants could include heavy metals, hydrocarbons, polycyclic aromatic hydrocarbons (PAHs) and sulphates.

No other sources of contamination have been identified on-site.

Several off-site land uses have been identified in the surrounding area that have the potential to contaminate the shallow soils at the site. The land uses and their associated contaminants are summarised in Table 4 below:

Table 4 - Off-Site Land Use Summary

Land Use	Potential Contaminants
Tramway lane	Heavy metals, hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), sulphates
Sand pit (infilled)	Ground gases (i.e., methane and carbons dioxide)
Allotment gardens	Heavy metals, polycyclic aromatic hydrocarbons (PAHs), nitrates
Warehouse, works	Heavy metals, hydrocarbons, asbestos
Petrol station	Hydrocarbons, heavy metals, solvents
Electricity transformer, electricity substation	Polychlorinated biphenyls (PCBs)

The historic landfill sites can be discounted as feasible sources of contamination due to the distance from site (≥505m).

The above off-site land uses can be discounted as feasible sources of contamination due to the distance from site (≥80m).

4.3 Receptors

The potential receptors considered to be at risk from soil and groundwater contamination associated with the site are summarised in Table 5 below:

Table 5 - Receptor Description

Receptor	Details
Human (On Site)	- Construction workers - Future site users - Site visitors
Human (Off Site)	- Adjacent site users
Controlled Waters	- Secondary A Aquifer - Principal Aquifer
Building/ construction materials	- Foundations

Receptor	Details
	- Buried services
Environmental Receptors	- Nitrate Vulnerable Zone

4.4 Pathways

The potential exposure pathways linking contamination with the receptors identified above are summarised in Table 6 below:

Table 6 - Exposure Pathways Summary

Receptor	Details of Exposure Pathway
Human (on-site)	- Direct ingestion of contaminated soil/groundwater - Dermal contact with soil/groundwater - Inhalation of gases and vapours
Human (off-site)	- Inhalation of fibres and particulates - Inhalation of migrating gases and vapours
Controlled waters	- Vertical and lateral migration of dissolved phase contaminants via preferential pathways to groundwater aquifers - Direct surface water run-off to surface water features
Building/construction	- Buried materials/services - Contact with contaminated soil and/or groundwater

4.5 Potential Pollution Linkages

4.5.1 Human Health

A formal planning application has been submitted for the site to Manchester City Council. Future development plans include the construction of four residential houses including landscaping and parking. This is considered to be a sensitive end use.

The presence of buildings and hardstanding would eliminate the risk of exposure, via the dermal contact and ingestion pathways to future site users to any ground contamination that may remain following development.

There could be a potential risk of exposure to any ground contamination that remains following redevelopment in any areas of soft landscaping (i.e., gardens), to future site users, via all possible exposure pathways including the potential consumption of homegrown produce.

Any ground gases (i.e., methane and carbon dioxide) and vapours that are present within the soils beneath the site could potentially ingress into future buildings through preferential pathways (e.g., service entry points). Therefore, there would be a risk of exposure via inhalation to future site users.

There is the potential for construction workers and adjacent land users to be exposed to soil and groundwater contamination during site redevelopment. However, the use of appropriate PPE and the adoption of suitable Health and Safety methods will help to reduce the risks posed to human health during this work.

4.5.2 Controlled Waters

The site is immediately underlain by glaciofluvial sheet deposits which are designated as a Secondary A Aquifer. BGS boreholes in the area encountered sand to silty sand within the superficial deposits, which could provide a migration pathway for contaminants. It is considered that if Made Ground is present at the surface, it would be in direct contact with the underlying aquifer and could allow the migration of contaminants to the groundwater.

However, the site does not lie within a Source Protection Zone and there are no groundwater abstraction licences held within a 1km radius of the site.

There are no surface water features located within the surrounding area (i.e., within a 250m radius).

Overall, the risk to controlled waters is deemed to be low.

4.5.3 Building/Construction Materials/Buried Services

The presence of any soil and groundwater contaminants beneath the site could potentially impact on construction materials for future new developments, such as below ground

structures and services. Concrete foundations are particularly sensitive to aggressive ground conditions, i.e., sulphate attack.

If ground gases and vapour are present in the soil beneath the site, then there would be the potential risk of ingress into new properties which could present a risk of explosion.

4.6 Environmental Designations

The proposed development is not considered to pose a risk to the identified environmental receptors.

4.7 Preliminary Hazard Assessment

A preliminary hazard assessment is presented in Table 7. The preliminary hazard assessment is a qualitative assessment of the risks posed by each potential pollutant linkage described above and is used to identify the requirement for additional work (e.g., intrusive ground investigation).

Table 7 - Preliminary Hazard Assessment

Source 1	Pathway	Receptor	Likelihood	Effect	Risk	Assessment
Contaminated soil	Ingestion (via soil dust), inhalation (via soil dust and vapours), ingestion through dirty hands, dermal contact with soil/water.	Future site users Adjacent site users Construction workers	2	3	Moderate	Contamination source potential identified. Future building footprint and hardstanding will sever any exposure pathway to site users. However, pathways would remain in areas of soft landscaping. Risk to potential future construction workers mitigated through use of PPE.
Contaminated soil / groundwater	Direct contact	Buildings/ services	2	3	Moderate	Contamination source potential identified. New foundations and services in direct contact with potentially contaminated soils.
Contaminated groundwater	Downward or lateral migration Surface water run-off	Secondary A Aquifer Principal Aquifer	2	2	Low	Contamination source identified. The site does not lie within a Source Protection Zone and there are no groundwater abstraction licences held within a 1km radius of the site.
Ground gas / vapours	Inhalation, ingress into buildings	Buildings / services Future site users	1	4	Low	Ground gas /vapour source not identified. Site located within a low probability area for radon.

Radon		Adjacent site users Construction workers				

Using Risk Matrix (Table 8) Degree of Risk (R) = Likelihood (L) x Effect (E)

Table 8 - Risk Matrix, Degree of Risk (R) = Likelihood (L) x Effect (E)

Likelihood	Description	Probability	Effect (E)	Description
5	Almost certain	>70%		
4	Probable	50-70%	4	Severe
3	Likely	30-50%	3	Medium
2	Unlikely	10-30%	2	Mild
1	Negligible	<10%	1	Minor
Risk (R)	**Risk Level**	**Action**		
1-5	Low	None required		
6-10	Moderate	Further assessment via Phase 2 intrusive ground investigation.		
>10	High	Further assessment via Phase 2 intrusive ground investigation.		

5 Conclusions and Recommendations

The preliminary environmental site assessment indicates that the site can be classified as moderate risk in terms of contamination and the risks to the identified receptors (e.g., human health and buildings) following redevelopment is considered to be moderate.

This classification is due to the historical presence of a tramway line that ran along the western boundary of the site. The presence of Made Ground (track-bed material) extending beneath the site cannot be ruled out. Potential associated contaminants could include heavy metals, hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and sulphates.

The completion of a targeted Phase 2 Investigation is recommended prior to site redevelopment to obtain additional information on the ground conditions and the contamination status. The investigation should be carried out by qualified and competent persons. The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the Phase 2 intrusive works.

APPENDICES