



SOLUTIONS LIMITED

**PHASE I DESKTOP STUDY AND
PRELIMINARY RISK ASSESSMENT
REPORT**

AT

**NICHOLLS COMMUNITY FOOTBALL
CENTRE, MANCHESTER**

FOR

SIS UK LTD

Report Reference: 4677-24 PI

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UPDATE STATUS

Issue	Date	Description	Prepared	Reviewed	Approved
1	March 2024	First Issue	-	-	-

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LIST OF ACRONYMS

Acronym	Meaning
BGS	British Geological Survey
BH	Borehole
CDM	Construction Design and Management
CL:AIRE	Contaminated Land: Applications In Real Environments
CLR	Contaminated Land Report
COSHH	Control Of Substances Hazardous to Health
CSM	Conceptual Site Model
DCP	Dynamic Cone Penetrometer
DEFRA	Department for Environment Foods and Rural Affairs
DoE	Department of Environment
DP	Dynamic Probe
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	Generic Acceptance Criteria
HA	Hand Auger
HP	Hand Pit
LPA	Local Planning Authority
LQM	Land Quality Management
mbgl	Metres Below Ground Level
MP	Mackintosh Probe
NGR	National Grid Reference
NPPF	National Planning Policy Framework
OS	Ordnance Survey
SGV	Soil Guideline Value
SPOSH	Significant Possibility of Significant Harm
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SSV	Soil Screening Value
TP	Trial Pit
TT	Trial Trench
WS	Windowless Sample / Window Sample
WSV	Water Screening Value

1. INTRODUCTION

1.1 BACKGROUND AND INSTRUCTION

GeoEnviro Solutions Limited (GES) were instructed by SIS UK Ltd (the Client) to produce a Phase I: Desktop Study and Preliminary Risk Assessment Report for the site located at Powerleague, Dalberg Street, Manchester, M12 6BN.

A site location plan is presented as Drawing 4677-24/01 in **Appendix 1**.

This report is written in accordance with the guidance set out in Land Contamination Risk Management (LCRM), Guiding Principles for Land Contamination (GPLC) 1 – 3, and the National Planning Policy Framework (NPPF).

1.2 PROPOSED DEVELOPMENT

It is currently proposed to add six new padel courts within a new open-sided two storey steel framed weather cover at the rear of the existing property.

A proposed development plan, as provided to GES, drawn by Bonar Associates, showing the proposed elevations and overall proposed plan referenced Dwg 06 and Dwg02 and dated March 2024, is provided within **Appendix 1**.

This proposed development plan has been utilized in the preparation of this risk assessment, based upon a 'Public Open Space - Park' end-use due to the open sides of the proposed weather cover. If an alternative development is subsequently proposed this assessment may need revising and should not be relied upon in its present outcome.

1.3 OBJECTIVES

The objectives of this Phase I report are to:

- To gain an understanding of any concerns of the regulatory authorities (Local Authority Planning, Building Control and Environmental Health departments and the Environment Agency) regarding local land filling, flooding, mining, quarrying and other concerns.
- Establish the environmental setting, including sensitivity in relation to human health, surface water, groundwater, and ecological receptors.
- Review historical and recent uses to assess the potential for contamination to be present from past and current land-use.
- Assess by qualitative means the potential nature and extent of contamination from those uses and the environmental risk and liabilities which may affect the site redevelopment.
- Identify the prevalent source-pathway-receptor linkages present on site by means of a Tier 1 contamination risk assessment which incorporates the formulation of a Conceptual Site Model.

1.4 INFORMATION SOURCES

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

- Envirocheck Report data obtained from Landmark Information Group Ltd.

- Historical Ordnance Survey mapping at scales ranging from 1:1,250 to 1:10,560, obtained from Landmark.
- BGS Open Geoscience online geological mapping tool.
- OS Open Data online mapping tool.
- Coal Authority Online interactive map.

1.5 PREVIOUS INVESTIGATIONS

GES have not been provided with any previous environmental and/or geotechnical investigation reports and are unaware that any have been carried out to date.

2. SITE LOCATION AND DESCRIPTION

2.1 SITE LOCATION

The site is located at Nicholls Community Football Centre, Dalberg Street, Manchester, M12 6BN, at approximate National Grid Reference (NGR): 385641:397110 (centre of the site).

2.2 SITE DESCRIPTION

A site walkover was carried out on the 26th March 2024 in clear conditions and is summarised below.

The site comprises an irregular shaped piece of land with an approximate area of 0.34 Ha. The topography of the site is generally flat.

The site is currently occupied by derelict land covered in building rubble which has become overgrown with grass and dense brambles. Possible fly tipped material was also noted in the western half of the site which has also become overgrown with scrub materials. A dirt track with concrete kerb boundaries which has become overgrown by grass was also present as access to and from the undeveloped area of the overall site via Devonshire Street North.

Possible evidence of a previously trial pit investigation was also observed in the central part of the site. Three possible pit locations were observed which appeared to have been backfilled with arisings, no other evidence of excavation or infilling was found.

An approximate distribution of the surface covering is given below in Table 2.1.

Table 2.1: Site Surface Covering

Type of Surface Cover	Distribution (%)
Soft Ground (grassed and landscaped areas)	85
Hardstanding	0
Roadways	15
Buildings	0
Water (ponds, streams)	0

The site is bounded by Dalberg Street to the west, Ford street and neighbouring commercial units to the south, Devonshire Street North to the east and commercial units to the north.

Access to the main site is via Ford Street from the south with a track from Devonshire Street North allowing access to the undeveloped land at the rear of the site.

A selection of photographs from the site walkover are presented in [Appendix 2](#).

Surrounding Area

The current surrounding land use to the site is generally commercial and industrial properties in all directions.

The topography of the surrounding area is generally flat.

3. ENVIRONMENTAL AND GEOLOGICAL SETTING

Information on the environmental and geological setting of the site is presented in an Envirocheck Report prepared for the site; a copy of this report is presented in **Appendix 3**.

3.1 SITE GEOLOGY

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

Artificial / Made Ground

There are no records of artificial deposits underlying or within 250 m of the site.

Superficial Ground and Drift Deposits

The superficial ground deposits underlying the study site comprises of the Devensian Till Formation (Diamicton), generally described as '*a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape (diamicton)*' (BGS Lexicon Description).

Bedrock Geology

Underlying the superficial deposits is bedrock comprising of The Chester Formation - Sandstone, generally described as '*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*' (BGS Lexicon Description).

The site also lays within ~100 m of an area where the bedrock consists of the Manchester Marls Formation – Mudstone, generally described as '*Red marl (calcareous mudstone and siltstone) with thin beds of fossiliferous marine limestone and dolomite; locally green; sandy in places especially in top part; local breccias and pebbly beds.*' (BGS Lexicon Description)

Landslips

There are no records within 250 m.

Linear Features

There are no records of linear features directly under the site.

Natural Ground Subsidence

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

- | | |
|--|-------------|
| • Collapsible deposits: | Very low. |
| • Compressible deposits: | Negligible. |
| • Ground dissolution of soluble rocks: | Negligible. |
| • Landslides: | Very low. |
| • Running sands: | Very low. |
| • Shrink / swell clays: | Very low. |

3.2 BOREHOLE RECORDS

There are no BGS boreholes recorded within 50 m of the site.

3.3 HYDROGEOLOGY

These records are derived by Landmark from Environment Agency (EA) and BGS data. Details of the source and coverage of specific records are provided in the Envirocheck Report. Information from these sources referenced in this report have been predominantly limited to those identified within 250 m of the site (or 1000 m of the site for abstractions), in order to focus on the information directly relevant to the site. Information from outside these radii will be referenced when deemed relevant.

The EA aquifer designations used within the following sections are summarised in Table 3.1, below.

Table 3.1: Aquifer Designations

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

Aquifer within Superficial Deposits

As a consequence of the superficial geology underlying the site, one aquifer has been identified and is designated as Secondary Undifferentiated.

Aquifer within Bedrock Geology

As a result of the recorded and potential bedrock geology underlying the site, there are two aquifers identified that are designated as Principal and Secondary (B).

Groundwater Vulnerability

The site is recorded to be located within an area where the EA considers the groundwater to have a Low Vulnerability to mobile pollutants, as summarised in Table 3.2 below.

Table 3.2: Groundwater Vulnerability Definitions

Definition	Description
High Vulnerability	Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
Medium Vulnerability	Intermediate between high and low vulnerability.

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

Groundwater Abstraction Licences

There are no licensed ground water abstractions within 250 m of the site.

Potable Water Abstraction Licences

There are no potable abstractions within 250 m of the site.

Source Protection Zones

There are no Source Protection Zones (SPZ) within 500 m of the site.

3.4 HYDROLOGY

These records are derived by Landmark from EA and BGS data. Details of the source and coverage of specific records are provided in the Envirocheck Report. Information from these sources referenced in this report have been predominantly limited to that identified within 250 m of the site (aquifers, surface water) or 1000 m of the site (abstractions), in order to focus on the information directly relevant to the site. Information from outside these radii will be referenced when deemed relevant.

Ordnance Survey Water Network

There is one entry in the Ordnance Survey Water Network register within 250 m of the site, located 184 m to the southwest of the site attached to an Underground Inland River – Corn Brook – which is part of the Mersey Catchment Area.

Surface Water Features

There are no major surface water courses within 250 m of the site.

River Quality

The nearest river quality record station is located approximately 297 m northwest of the site, for the river Medlock, a river quality rating of 'E' was attributed to this associated stretch of river in 2000.

Surface Water Abstraction Licences

There are no licensed surface water abstractions within 250 m of site.

Discharge Consents

There is one discharge consent with 250 m of the site, for the Discharge of Other Matter – Surface Water into the Cornbrook Culvert, which was revoked in 1994.

Groundwater Flooding

The site lies within an area where there is limited potential for groundwater flooding to occur. Locations 4 m to the north of the site and 6 m to the east are recorded as having potential for groundwater flooding to occur at the surface, and potential for groundwater flooding of property situated below ground level is present in the location 6 m to the east.

Flooding from Rivers or Sea without Defences

The site does not within an area susceptible to flooding from rivers or sea without defences.

The site does not lie within an area benefiting from flood defences including flood water storage areas.

3.5 ENVIRONMENTALLY SENSITIVE AREAS

These records are derived by Landmark from EA, Natural England, Historic England, English Heritage, Forestry Commission and UK Government data. Details of the source and coverage of specific records are provided in the Envirocheck Report.

Information from these sources referenced in this report have been predominantly limited to that identified within 500 m of the site (environmental designations) or 250 m of the site (habitat, visual and cultural designations), in order to focus on the information directly relevant to the site. Information from outside these radii will be referenced when deemed relevant.

Sensitive Land Uses

There are no environmental and habitat designations within 250 m of the site.

4. PAST LAND USE AND POTENTIAL CONTAMINANT SOURCES

Information on past land use and potential contaminant sources is presented in an Envirocheck Report prepared for the site; a copy of this report is reproduced in [Appendix 3](#).

4.1 LAND USE RECORDS

These records are derived by Landmark from historical mapping and each record corresponds to a particular map revision date. Thus, several records may refer to the same feature where it is present over time. Differences in distances quoted from the study site may be due to expansion of the feature over time or geolocation errors.

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

Contemporary Trade Directory

There are 134 recorded historical industrial land uses within 250 m of the site. These potentially contaminative land uses comprise textiles, manufacturing, freight services, car breakdown and recovery services, cosmetic manufacture, office furniture and equipment services, electric motor sales and services, packaging production and supply services, MOT and Garage Services, Tyre Dealers, Car Body Repair services, domestic cleaning services, metal fabricators, recycling centres, brewers and brewery supplies, waste disposal services, bus & coach operators & stations, Road haulage Services, Telecoms services, and Safe and Vault Suppliers and installers.

A further 91 potentially contaminative land uses were recorded within 500 m of the site. These comprise similar uses to those on site and in addition include uses such as Ice Cream Manufacturers, Chemists and firefighting equipment suppliers.

There are likely to be duplicates of the same entry within these records.

Fuel Stations

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

Commercial Services

There are 29 records of commercial services within 250 m of the site, the nearest is a transport, storage and delivery service approximately 57 m to the west and the furthest is shown 248 m to the north of the site.

Education and Health

There are no records of education and health land uses within 250 m of the site.

Manufacturing and Production

There are 11 records of manufacturing services land uses within 250 m of the site, the nearest is an unspecified Tank approximately 26 m to the west and the furthest is listed as a Business Centre 247 m to the southwest of the site.

Public Infrastructure

There are nine records of public infrastructure land uses within 250 m of the site, the nearest is a Recycling Centre approximately 181 m to the north and the furthest is a bus and coach depot 231 m to the southeast of the site.

Recreational and Environmental

There is one record of recreational and environmental land uses within 250 m of the site, a playground located 217 m to the southwest of the site.

Underground Electricity Cables

There are no records of high voltage (HV) underground electricity cables within 250 m of the site.

Gas and / or Oil Pipelines

There are no records of medium- or high-pressure underground gas or oil supply pipelines within 250 m of the site.

4.2 ENVIRONMENTAL PERMITS, INCIDENTS AND REGISTERS

These records are derived by Landmark from Local Authority, Health and Safety Executive and EA data. Details of the source and coverage of specific records are provided in the Envirocheck Report. Information from these sources referenced in this report have been predominantly limited to that identified within 250 m of the site, in order to focus on the information directly relevant to the site. Information from outside this radius will be referenced when deemed relevant.

Sites Determined as Contaminated Land

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

Control of Major Accident Hazards (COMAH)

There are no records within 250 m of the site.

Regulated Explosive Sites

There are no records within 250 m of the site.

Notification of Installations Handling Hazardous Substances (NIHHS)

There are no records within 250 m of the site.

Planning Hazardous Substances Consents

There are no records within 250 m of the site.

Planning Hazardous Substances Enforcements

There are no records within 250 m of the site.

Prosecutions Relating to Controlled Waters

There are no records within 250 m of the site.

Enforcement and Prohibition Notices

There are no records within 250 m of the site.

Integrated Pollution Controls

There are no records within 250 m of the site.

Integrated Pollution Prevention and Control

There are no records within 250 m of the site.

Local Authority Pollution Preventions

There are four records within 250 m of the site all located 35 m to the west of the site for Air Pollution control relating to Quarry processes including roadstone plants and the size reduction of bricks, tiles and concrete. Authorisation was revoked in 1995 for all permits.

Pollution Incidents to Controlled Water

There is a single record of a pollution incident within 250 m of the site, recorded as a minor incident with an unknown pollutant and recorded in 1996.

Prosecutions Relating to Authorised Processes

There are no records within 250 m of the site.

Substantiated Pollution Incident Register

There are no records within 250 m of the site.

Water Industry Act Referrals

There are no records within 250 m of the site.

4.3 WASTE AND LANDFILL

These records are derived by Landmark from EA, BGS, Ordnance Survey (interpreted by Landmark) and Local Authority data. Details of the source and coverage of specific records are provided in the Envirocheck Report.

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

BGS Recorded Landfill Sites

There are no records within 250 m of the site.

Historical Landfill Sites

There are no records within 250 m of the site.

IPC Registered Landfill Sites

There are no records within 250 m of the site.

Licensed Waste Management Facilities

There are no records within 250 m of the site.

Local Authority Landfill Records

The site lies within an area covered by Manchester City Council, Landfill data has been passed to the relevant environment agency.

Potentially Infilled Land

There is a single record within 250 m of the site, an unknown filled water feature mapped in 1848 located 271 m to the west of the site.

Registered Landfill Sites

There are no records within 250 m of the site.

Registered Waste Transfer Sites

There are no records within 250 m of the site.

Registered Waste Treatment or Disposal Sites

There are no records within 250 m of the site.

4.4 MINING, GROUND WORKINGS AND NATURAL CAVITIES

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

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

Cavities – Natural or Man-Made

There are no records within 250 m of the site.

BGS Recorded Mineral Sites

There are no records within 250 m for mineral extraction.

Coal Mining

There are no records within 250 m for coal mining however the site does lie within an area that may be affected by coal mining a Coal Mining Risk Assessment may be required to planning and the LA.

Non-Coal Mining

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

4.5 RADON

These records are derived from the UK Health Security Agency. Information from these sources referenced in this report have been predominantly limited to that identified within a 1 km grid containing the site.

The study site is not located within a Radon Affected Area, as less than 1% of properties are above the Radon Action Level. No radon protection measures are required.

4.6 BACKGROUND SOIL CHEMISTRY

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

- Arsenic: 15-25mg/kg.
- Cadmium: <1.8 mg/kg.
- Chromium: 60-90 mg/kg
- Lead: 100 - 200 mg/kg.
- Nickel: 30-45 mg/kg.

These values are not considered to be elevated with respect to guideline values for Public Open Space - Park end-uses.

5. HISTORICAL MAPPING STUDY

5.1 HISTORICAL MAPPING

The object of this search was to report on the evidence of site history and redevelopment of the site and its environs from available County Series and Ordnance Survey Maps at scales ranging from 1:1,250 to 1:10,560 dating from 1848 to the present day, and Getmapping PLC aerial photography dating from 2000 to the recent past, as provided by Landmark and Google Earth.

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

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

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

The Historical Ordnance Survey Maps were obtained from Landmark and are available for review within [Appendix 4](#) and are summarised in Table 5.1 below.

Table 5.1: Historical Mapping Review

Date	Scale	On-Site	Offsite
1848	1:10,560	Open land, part of the larger Ardwick Cemetery surrounding the site boundary.	Ardwick Cemetery surrounds the site boundaries with road and nearby unmarked buildings – most likely relating to the cemetery.
1893	1:2,500	No significant change from previous map.	Terraced housing has been constructed to the immediate north of the property.
1908	1:2,500	No significant change from previous map.	Further housing has been constructed to the north, with a tramway line just beyond approximately 200 m north. A 'Railyard and depot' is located approximately 300 m to the east of the site.
1932	1:2,500	No significant change from previous map.	A large building 150 m to the east of the site is listed as 'Universal Buildings'.
1948 - 1950	1:1,250	No significant change from previous map.	The Tramway is no longer present.
1963-1965	1:1,250	No significant change from previous map.	No significant change from previous map.
1975	1:25,000	No significant change from previous map.	Further residential development has occurred in all directions around the site.
1985-1987	1:10,000	No significant change from previous map.	The cemetery is now marked as a playing field.
1992	1:1,250	No significant change from previous map.	No significant change from previous map.

Date	Scale	On-Site	Offsite
2006	1:10,000	No significant change from previous map.	A School is listed approximately 250 m to the southeast.
2024	1:10,000	The site is now listed as Nicholls Community Football Centre	The school is no longer listed.

5.2 AERIAL PHOTOGRAPHY

2000 Aerial Photo

The 2000 aerial photo shows the site as an open field, as part of a larger open area with a football pitch marked to the south. The surrounding area is fully developed with commercial and industrial properties.

Recent Aerial Photograph:

Recent aerial photography from google maps shows the site remains an open field adjacent to the existing structures of the present day Community Football centre.

The historical aerial photographs are included in the mapping dataset and are available for review within [Appendix 4](#).

5.3 SUMMARY

Review of available historical ordinance surveys maps and aerial photography indicated no discernible changes to the site area between the years 1848 and 1985 when the larger area of the site surrounding use changed from a cemetery to a playing field. The present-day site was also constructed between 2006 and 2024.

6. FRAMEWORK FOR ASSESSMENT OF CONTAMINATION

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

(a) Significant harm is being caused or there is a significant possibility of such harm being caused.

or

(b) Pollution of controlled water is being, or is likely to be, caused.

Risk from contamination is assessed by consideration of possible linkages between contaminant sources and potential receptors which could be harmed or polluted.

The key aspect of the framework is the development of a Conceptual Site Model (CSM) which illustrates the spatial interaction between the potential sources and receptors on site.

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

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

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

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

Potential sources, pathways and receptors are identified in the sections below and the risks associated with possible pollutant linkages outlined.

6.1 SOURCES

On-Site Sources

The following possible on-site sources have been identified from the historical study and the Envirocheck data:

- No on-site sources detected.

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

- No on-site sources detected.

Offsite Sources

The following off site sources have been identified within influencing distance of the site from the historical study and the Envirocheck data:

- Light Industry from nearby business park.

There are further entries present, but these are considered far enough from the site to pose no risk.

Information provided by Landmark indicates that there is a single area within 250 m of the site where the potential for infilling is possible, however due to the age of the record it is the opinion of GES that any biodegradable materials which may have been present will have degraded beyond the point of risk to human health.

Information provided by Landmark indicates that there are no areas within 250 m of the site where underground workings have taken place.

The historical mapping did not indicate any areas within 250 m of the site where the potential for infilling is possible.

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

- No significant contaminants of concern.

6.2 PATHWAYS

For contaminants to reach potential receptors, there must be a viable **pathway** for the contaminant. Potential pathways that may affect the migration of contaminants are listed in Table 6.1, below.

Table 6.1: Pathways

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

6.3 RECEPTORS

The site-specific **receptors** that could be potentially affected by the contamination hazards identified during this preliminary appraisal are summarised in Table 6.2, overleaf:

Table 6.2: Receptors

Category	Receptor	Properties
Humans	End users (such as residents and visitors)	Potential contact with contaminated soils is likely limited given the commercial end use planned.
	Construction workers	Reworking of contaminant impacted materials in underlying soil during construction works can expose workers to contamination.
Property	Materials and site structures	Foundations and site services may be damaged by potentially aggressive compounds present in soils.
Controlled Waters	Underlying superficial / bedrock Aquifer and surface water	The site is recorded as having a Secondary (Undifferentiated) Aquifer within the superficial deposits and a Principal Aquifer and a Secondary (B) Aquifer within the bedrock underlying the site.
Plant (species and uptake) and Wildlife	Various	Attributes will be influenced by factors such as relative quality, scale, rarity and substitutability.

7. QUALITATIVE RISK ASSESSMENT

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

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

A summary of the risk assessment protocols, and subsequent risk assessment matrix is provided in **Appendix 5**.

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

The assessment is undertaken based on the current proposals for the site, at the time of issuing this report, which would be classed as a generic end land use of 'Public Open Space - Park'. Any change in the development proposals for the site involving a change in end use class may result in a requirement for this assessment to be revised.

8. PRELIMINARY CONCEPTUAL SITE MODEL

Contaminant Source	Pathways	Receptor	Pollutant Linkage	Classification of Probability	Classification of Consequence	Level of Risk	Justification
On Site: Made Ground soils on site possibly containing elevated levels of potential contaminants.	Ingestion, dermal contact, inhalation of dusts/vapours	Future end users and site visitors	Considered inactive	-	-	Very Low ●	A very low risk rating has been assessed due to the lack of potentially contaminative land uses on site. Contact is therefore likely limited between future occupiers/visitors and contaminants.
		Construction Workers	Considered inactive	-	-	Very Low ●	Construction workers are likely to come into direct contact with soils during groundworks. Safe working practices should be implemented, and appropriate personal protective equipment (PPE) should be used to mitigate any potential risk from contact with soils and shallow/perched groundwater.
	Leaching through soils and migration via groundwater or soil pore moisture	Controlled Waters	Considered inactive	-	-	Very Low ●	A very low risk rating has been assessed due to the lack of potentially contaminative land uses on site, combined with the low vulnerability of groundwater in the area.
	Permeation of water pipes	Construction materials, future end users and site visitors	Considered inactive	-	-	Very Low ●	Hydrocarbons, especially aromatics are known to permeate plastic pipes. Provision of water supply pipes and connectors formed from proprietary "barrier pipe" materials (e.g., polyethylene-aluminium-polyethylene) may be required by the water supply company.
	Uptake	Plant and Wildlife	Considered inactive	-	-	Very Low ●	A very low risk rating has been assessed due to the lack of potentially contaminative land uses on site.
On Site: Asbestos at/near ground	Inhalation of fibres in airborne dust	Future end users and site visitors	Considered inactive	-	-	Very Low ●	A very low risk rating has been assessed due to the lack of previous construction or railway works on the site.

Contaminant Source	Pathways	Receptor	Pollutant Linkage	Classification of Probability	Classification of Consequence	Level of Risk	Justification
surface in Made Ground soils.		Construction Workers	Considered inactive	-	-	Very Low ●	A very low risk rating has been assessed due to the lack of previous construction or railway works on the site.
On Site: Ground Gases (CH ₄ , CO ₂ , CO, H ₂ S) from on-site Made Ground.	Gas migration and build up within buildings (explosion/asphyxiation risk)	Future end users and building structures.	Considered inactive	-	-	Very Low ●	A very low risk rating has been assessed given the minimal made ground potential on site and absence of landfills within local proximity to the site. Current CL:AIRE guidance indicates that Made Ground is generally classified as very low risk in terms of potential for gas generation.
Off Site: Historical land uses and activities, Made Ground/infilled material possibly containing elevated levels of potential contaminants	Leaching through soils and migration via groundwater or soil pore moisture	Future end users and site visitors	Considered inactive	-	-	Very Low ●	A very low risk rating has been assessed due to the lack of previous construction or railway works on the site.
	Ingestion, dermal contact, inhalation of dusts/vapours	Future end users and site visitors	Considered inactive	-	-	Very Low ●	A very low risk rating has been assigned as no pollutant linkage has been identified.
Off Site: Ground Gases (CH ₄ , CO ₂ , CO, H ₂ S) from off-site historical landfilling activities.	Gas migration and build up within buildings (explosion/asphyxiation risk)	Future end users and building structures.	Considered inactive	-	-	Very Low ●	The lack of generating sources offsite would consider the risk from ground gas is very low.

9. RECOMMENDATIONS

9.1 PROPOSED SITE INVESTIGATION

Based on the information obtained for the formation of this report, we would recommend that no further action is required based on the CSM with respect to the environmental condition of the site.

However, based on the information obtained for the formation of this report it is recommended that a suitable geotechnical site investigation is carried out at the site to identify the ground conditions and provide details of their engineering properties in order to facilitate foundation design for the proposed development.

9.2 CONSULTEES

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

9.3 FLOOD RISK ASSESSMENT

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

9.4 COAL MINING RISK ASSESSMENT

If the impacts of historical coal mining are considered relevant a separate CMRA should be commissioned.

9.5 INVASIVE PLANT SURVEY

The site reconnaissance visit undertaken herein, whilst reference to the possible presence of invasive plants such as Japanese Knotweed has not been made, this report should not be considered an Invasive Plant Survey and any concerns relating to the possible presence of such plants should be undertaken by an appropriately qualified surveyor.

9.6 ASBESTOS SURVEY

The site reconnaissance visit undertaken herein, whilst reference to the possible presence of Asbestos or Asbestos Containing Material (ACM) has not been made, this report should not be considered an Asbestos Survey and any concerns relating to the possible presence of ACM should be undertaken by an appropriately qualified surveyor.

10. RELIANCE AND LIMITATIONS

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

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

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

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