



London Borough of Haringey

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# STANHOPE ROAD BRIDGE

Preliminary Risk Assessment





London Borough of Haringey

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## Preliminary Risk Assessment

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**PROJECT NO. 70077287**

**OUR REF. NO. 70077287-WSP-EGT-B-RP-LE-0002**

**DATE: SEPTEMBER 2021**

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# 1 INTRODUCTION AND OBJECTIVES

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## 1.1 INTRODUCTION

- 1.1.1. WSP has been appointed by the London Borough of Haringey (the Client) to undertake a Preliminary Risk Assessment (PRA) to support detailed Planning Application for the “Construction of a new footbridge with associated ramp access and steps, and landscaping, involving demolition of the existing bridge and abutments (“the Proposed Development”) located on Stanhope Road, Highgate in the London Borough of Haringey. The Application Site Boundary plan drawing no 70077287-WSP-GEN-B-DR-TC-0001 is presented at **Appendix A**.

## 1.2 PROPOSED DEVELOPMENT

- 1.2.1. The existing footbridge and abutments have been identified by the Client as being no longer fit for purpose and require demolition; the abutments failed their structural assessment and there are bearing failures at the east abutment. Feasibility studies concluded it was not financially viable to repair the bridge and therefore demolition and replacement of the bridge is proposed. It is proposed the new bridge will be a painted steel Warren truss deck structure that will link up the Parkland Walk either side of Stanhope Road in the same vicinity as the existing bridge deck. The bridge will be used to accommodate shared, unsegregated use of cyclists and pedestrians. To minimise concrete surfaces and enhance opportunities for wildlife, the wing walls will be constructed primarily from reinforced earth with planting on the slopes.
- 1.2.2. The proposals also involves the construction of separate ramp and step accesses at the south east and south west ends of the proposed bridge, as shown on the Proposed General Arrangement Plan drawing no. 70077287-WSP-SBR-B-DR-BR-0008, submitted with the planning application.

## 1.3 AIMS AND OBJECTIVES

- 1.3.1. The key aims of this assessment are to:
- Develop a preliminary Conceptual Site Model (CSM) to identify potential contamination risks associated with the proposed development of the Site;
  - Evaluate likely contaminated land exposure pathways and their potential significance on identified receptors to support the proposed redevelopment; and
  - Highlight environmental considerations (i.e. potential risks/constraints) with respect to ground, ground gas and groundwater conditions.

## 1.4 SCOPE OF WORKS

- 1.4.1. In order to meet the aims stated above, the following scope of works have been undertaken:
- Site walkover to document the current land use, potential sources of contamination, make observations of current potential impact and the setting of the Site;
  - Review of publicly available historical maps and Site plans to identify former land uses and potentially contaminative activities on the Site and within the area surrounding the Site;

- Review of relevant publicly available information relating to hydrology, hydrogeology, neighbouring land use, ecologically sensitive uses and geology in order to establish the environmental setting of the Site;
- Develop a preliminary Conceptual Site Model (CSM) for the Site utilising the source-pathway-receptor contaminant linkage approach;
- Outline the environmental risks and / or opportunities with respect to ground, groundwater and ground gas conditions which may potentially arise as liabilities or constraints associated with the redevelopment of the Site; and,
- Preparation of a PRA report.

## **1.5 LEGISLATIVE CONTEXT AND GUIDANCE**

1.5.1. This report has been prepared in general accordance with:

- Part 2A of the Environmental Planning Act 1990; and,
- The National Planning Policy Framework (NPPF) 2021.

1.5.2. The following good practice and statutory guidance were considered and the assessment was undertaken in general accordance with:

- Environment Agency (EA) Land Contamination Risk Management (LCRM), 2020; and,
- CIRIA C552 'Contaminated Land Risk Assessment. A guide to good practice' (2001).

## **1.6 SOURCES OF INFORMATION**

1.6.1. The following relevant sources of information were used in the production of this report:

- Groundsure Enviro and Geo Insight Report, Ref: GS-7271613, dated 12 November 2020;
- British Geological Survey (BGS) Online Viewer (<https://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>) accessed 12 November 2020;
- BGS map – North London, England and Wales Sheet 256, Bedrock and Superficial Edition, 1:50 000 accessed 12 November 2020;
- Flood Maps for Planning Service (<https://flood-map-for-planning.service.gov.uk/>) accessed 12 November 2020;
- Defra's Multi-Agency Geographic Information for the Countryside MAGIC website (<https://magic.defra.gov.uk/MagicMap.aspx>) accessed 12 November 2020;
- Public Health England, UK Maps of Radon (<https://www.ukradon.org/information/ukmaps>) accessed 12 November 2020;
- Haringey Borough Council Planning Services (<http://www.planningservices.haringey.gov.uk/portal/>), accessed 16 November 2019;
- The Coal Authority Interactive Viewer accessed at <http://mapapps2.bgs.ac.uk/coalauthority/home.html> on 12 November 2020;
- Zetica UXO Pre-Desk Study Assessment, dated 18 November 2020; and,

- Bomb Sight WWII Bomb Maps (<http://bombsight.org/>), accessed 12 November 2020.
- Stanhope Road Bridge, Stanhope Road, London, N6 5NE Geotechnical Investigation. Herts and Essex Site Investigations, May 2018. Ref: DAH/14336.
- Stanhope Road Bridge, Structural Investigation. RSK, December 2019. Ref: 1281594-02 (00).
- Parkland Walk Footbridges – Stapleton Hall Road and Stanhope Road Embankments Factual Letter Report. RSK, December 2019. Ref: 1920944 L02 (00).

## 1.7 LIMITATIONS

- 1.7.1. This report is addressed to and may be relied upon by London Borough of Haringey. It may not be relied upon or transferred to any other parties without the express written agreement of WSP. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party. WSP cannot be held liable for third party information. Full details of the limitations are provided in **Appendix B**.

## 1.8 UNDERSTANDING RISK

- 1.8.1. It is important to recognise that any risks identified during the preliminary assessment such as those presented below, are perceived risks based on the recorded information reviewed. A more detailed assessment of the actual risks can only be assessed following intrusive investigations. The preliminary assessments presented herein are qualitative based on professional judgement following review of the available data and within the context of the existing / future use. The risk categories presented (Very Low, Low, Low to Moderate, Moderate, High, Very High) follow guidance presented in CIRIA Publication C552, Contaminated Land Risk Assessment – A Guide to Good Practice. CIRIA states that the risk levels should be based on an understanding of both the probability (likelihood) of a risk occurring and the magnitude of the potential consequence (severity) of a risk.
- 1.8.2. CIRIA defines four levels of probability and four levels of severity with relation to contaminated land, as presented in **Appendix C**.

## 2 SUMMARY OF THE SITE AND SURROUNDING AREA

### 2.1 SITE DESCRIPTION AND CURRENT USE

- 2.1.1. The Application Site Boundary Plan drawing no. no. 70077287-WSP-GEN-B-DR-TC-0001 is presented at **Appendix A**.
- 2.1.2. **Table 2-1** provides a detailed summary of the Site and information obtained from a site walkover undertaken by a representative of WSP on the 18 November 2020. Site photographs are presented at **Appendix D**.

**Table 2-1 – Summary of Site Details**

| Detail                            | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name and Address of Site          | Stanhope Road Bridge, Stanhope Road, London, N6 5DE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| National Grid Reference           | 529331, 187828                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Site Area                         | 0.82 Hectares (Ha)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Site Description and Current Use  | <p>The Site is irregular in shape and is centred around a footbridge which crosses Stanhope Road, with two parcels of land, one to the east and one to the west of the bridge. The land to the east and west of the bridge is elevated approximately 5m above the level of Stanhope Road. Two steel supports were noted under the footbridge.</p> <p>The Site is currently a part of Parkland Walk, a nature reserve and area of public open space. A foot / cycle path runs through the centre of the Site from east to west. It is understood that the Site was historically a railway line.</p> <p>Pedestrian access steps from Stanhope Road to the Site are present to the east of the bridge over Stanhope Road.</p> <p>Mature trees and shrubs were noted on the embankments of the Site.</p>                                                                                                                    |
| Site Setting and Surrounding Area | <p>The Site is located within a predominantly residential area.</p> <p>North – Residential properties with gardens bound the Site to the north. Stanhope Road is present to the north of the central part of the Site, running through the centre of the Site in a north west to south east orientation. An electrical substation is present adjacent to the north east.</p> <p>East – Parkland Walk continues to the east of the Site. Residential properties with gardens are located to the north east and south east.</p> <p>South – Residential properties with gardens bound the Site to the south. Stanhope Road is present to the south of the central part of the Site, running through the centre of the Site in a north west to south east orientation.</p> <p>West – Parkland Walk continues to the west of the Site. Residential properties with gardens are located to the north west and south west.</p> |
| Surface Cover and Topography      | The foot / cycle path on the Site are relatively flat. The embankments on either side of the path were noted to be steep, having a fall of up to 5m towards the north and south.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Detail                               | Comment                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | <p>Retaining walls were noted in the north of the Site along either side of Stanhope Road. Cracking was noted in the walls at road level.</p> <p>The majority of the Site area comprised vegetation (mature trees and shrubs). The path was surfaced with rubble hardcore. The bridge which crosses Stanhope Road was covered with concrete and tarmacadam hardstanding.</p> |
| Visual observations of Contamination | No visual evidence of contamination or evidence of vegetation stress.                                                                                                                                                                                                                                                                                                        |
| Waste                                | Occasional litter and blocks of concrete (potentially from the former railway) were noted during the walkover. Waste bins were present at multiple locations along the length of the path.                                                                                                                                                                                   |
| Invasive Species                     | None observed during the walkover.                                                                                                                                                                                                                                                                                                                                           |

## 3 HISTORICAL LAND USE

### 3.1 HISTORY ON-SITE AND THE SURROUNDING AREA

- 3.1.1. Historical maps were obtained as part of the Groundsure report (**Appendix E**) and were reviewed to identify potentially contaminative former land uses on the Site and within a 500 m radius of the Site boundary.
- 3.1.2. A summary of the on-site and off-site features relevant to contaminated land are presented in **Table 3-1** and **Table 3-2**.

**Table 3-1 – Summary of Pertinent History of the Site**

| Date of Historical Map | Land Use on Site                                                                                                                                                                                                                                                                                                                                    |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1864                   | The Site is occupied undeveloped agricultural land. A path crosses the central part of the Site.                                                                                                                                                                                                                                                    |
| 1870 - 1879            | The Great Northern Railway (Edgware, Highgate and London Line) runs in a west to east orientation through the centre of the Site. The railway line appears to be raised on an embankment which fall on either side of the tracks to the north and south. The railway line appears to cross a bridge in the same location as the present-day bridge. |
| 1894                   | Stanhope Road passes through the centre of the Site in its present-day alignment.                                                                                                                                                                                                                                                                   |
| 1974 - 1991            | The railway is labelled as 'Dismantled Railway'.                                                                                                                                                                                                                                                                                                    |
| 1991 - 2003            | Parkland Walk (a footpath) runs through the centre of the Site, following the same orientation as the former railway line.                                                                                                                                                                                                                          |

**Table 3-2 – Summary of Pertinent History of the Surrounding Area**

| Date of Historical Map | Land Use Surrounding the Site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1864                   | The area surrounding the Site is dominated by undeveloped agricultural land in all directions. Ponds are located approximately 75m north, 150m north east, 75m south and 150m south west. Hornsey Lane Farm is located approximately 150m south.                                                                                                                                                                                                                                                                                                                                                      |
| 1870                   | The Great Northern Railway (Edgware, Highgate and London Line) is present to the east and west (running through the Site) with embankments on either side of the tracks. Brick Fields are located approximately 250m south west. The residential areas of Crouch End, Islington and Highgate are present approximately 650m to the north east, 500m to the south and 750m south west, respectively.                                                                                                                                                                                                   |
| 1894 - 1935            | Stanhope Road runs through the central part of the Site in a north west to south east orientation. Hornsey Lane Farm is present adjacent to the south. The brick field to the south west is no longer present (potentially infilled). Residential properties are present adjacent to the north, north west, south and south west with further expansion of residential areas of Crouch End, Islington and Highgate in all directions. Crouch Hall Park is present approximately 250m north. The ponds to the north, north east and south are no longer present and are assumed to have been infilled. |

| Date of Historical Map | Land Use Surrounding the Site                                                                                                                                   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1951 - 1958            | No significant changes. Hornsey Lane Farm, adjacent to the south is labelled as a milk depot. A pond is located approximately 150m south.                       |
| 1962 – 1974            | The pond located to the south is no longer present and is assumed to have been infilled. An electrical substation is present adjacent to the north of the Site. |
| 1974 - 1991            | The railway to the east and west of the Site is labelled as 'Dismantled Railway'. The milk depot located adjacent to the south of the Site has been cleared.    |
| 1991                   | Parkland Walk (a footpath) is present to the east and west.                                                                                                     |
| 2003                   | No significant changes. Residential properties associated with Parkgate Mews are present adjacent to the south of the Site.                                     |

## 4 ENVIRONMENTAL SETTING

### 4.1 GEOLOGY

- 4.1.1. British Geological Survey (BGS) map 256 of North London (1:50,000 scale Bedrock and Superficial Edition) and the BGS Online Viewer indicate that the Site is underlain by a bedrock geology comprising the London Clay Formation. The London Clay Formation is underlain sequentially by the Lambeth Group, Thanet Formation and Chalk Group. No superficial deposits are mapped on the Site; however, the Site is located within an area denoted as having 'head propensity' on BGS mapping, which means that there is the potential for quaternary head deposits to be present.
- 4.1.2. WSP has reviewed two publicly available BGS borehole logs located approximately 150m south east (TQ28NE286 and TQ28NE332). BGS borehole logs are presented in **Appendix F**. **Table 4-1** provides a summary of the borehole logs.

**Table 4-1 – Ground Profile with Material Description**

| Stratum*              | Depth to Top of Strata (m bgl) | Depth to Base of Strata (m bgl) | Typical Strata Description                                                   |
|-----------------------|--------------------------------|---------------------------------|------------------------------------------------------------------------------|
| Made Ground / Topsoil | 0.00                           | 0.40 - 0.45                     | Concrete, brick, rubble<br>Topsoil                                           |
| London Clay Formation | 0.45                           | >11.00                          | Firm silty clay<br>Firm sandy silty clay<br>Stiff clay with partings of silt |

\* Inferred from log description

- 4.1.3. It is anticipated that the embankment on the Site is man-made, therefore, the thickness of Made Ground deposits on the Site are considered likely to be thicker than those presented in **Table 4-1**.

### 4.2 HYDROGEOLOGY AND HYDROLOGY

- 4.2.1. The Environment Agency classifies the units underlying the Site as follows:
- London Clay Formation – Unproductive strata
  - Lambeth Group – Secondary A Aquifer
  - Thanet Formation – Secondary A Aquifer
  - Chalk Group – Principal Aquifer
- 4.2.2. One of the BGS borehole logs (TQ28NE286) identified the groundwater level to be at 3.50m below ground level within the London Clay Formation. This is assumed to be perched water within a granular or claystone layer within the London Clay Formation.
- 4.2.3. There are no records of groundwater abstractions within 2km of the Site.
- 4.2.4. The Site is not located within a Source Protection Zone (SPZ) and there are no SPZ located within 2km of the Site.

- 4.2.5. The closest surface water feature to the Site are ponds associated with Waterlow Park located approximately 1km south west of the Site.
- 4.2.6. There are no records of surface water abstractions within 2km of the Site.

### 4.3 FLOODING

- 4.3.1. The Site is located within an area classified by the EA as Flood Zone 1 indicating a low probability of flooding. The Site is located within an area designated as having negligible risk of groundwater flooding.
- 4.3.2. An area in the centre of the Site is designated as being at risk from surface water flooding in extreme rainfall events (1 in 100-year event).

### 4.4 GROUND STABILITY

- 4.4.1. The ground stability hazards summarised in **Table 4-2** were outlined as part of the Groundsure Report (ultimately sourced from the BGS).

**Table 4-2 - Summary of Ground Stability Hazards**

| Hazard                        | Potential  |
|-------------------------------|------------|
| Collapsible Deposits          | Very Low   |
| Compressible Deposits         | Negligible |
| Ground Dissolution            | Negligible |
| Landslide                     | Very Low   |
| Running Sands                 | Very Low   |
| Shrinking or Swelling of Clay | Moderate   |

### 4.5 MINING AND GROUND WORKINGS

- 4.5.1. The Coal Authority interactive viewer confirmed that the Site is not located within a Coal Authority designated mining area.
- 4.5.2. The Groundsure report indicates that the Site is not located within an area where non-coal mining activities occurred.
- 4.5.3. The Groundsure report indicates that areas of surface ground workings are present adjacent to the south and east of the Site, they are recorded as 'unspecified ground workings' and 'cuttings', respectively.

### 4.6 RADON

- 4.6.1. Public Health England records indicate that the Site lies within a lower probability Radon area (less than 1% of homes are estimated to be at or above the Action Level).

## **4.7 PRELIMINARY HYDROGEOLOGICAL MODEL**

- 4.7.1. Made Ground is considered likely to be present at the Site, however, the Environment Agency does not provide an aquifer classification for Made Ground deposits. Although there is the potential for groundwater to be present within Made Ground deposits, it is considered unlikely to be a continuous groundwater body, but rather localised pockets or perched water that are likely to be recharged via surface infiltration.
- 4.7.2. The London Clay Formation is classified as Unproductive strata, therefore is not anticipated to yield significant quantities of groundwater. Perched groundwater may be present in granular or claystone layers within the London Clay Formation, however this is not considered to represent a continuous groundwater body.
- 4.7.3. Groundwater present within the Lambeth Group, Thanet Sand Formation and Chalk Group are likely to be confined by the London Clay Formation. It is considered that the London Clay Formation will act as an aquitard, restricting the downward migration of any shallow perched groundwater into the underlying aquifers of the Lambeth Group, Thanet Sand Formation and Chalk Group.

## 5 REGULATORY INFORMATION AND CONSULTATION

### 5.1 REGULATORY DATABASE

- 5.1.1. The Groundsure report includes information and data collected from several organisations including the Environment Agency, the Local Authority, the British Geological Survey (BGS), Department of Environment, Food and Rural Affairs (Defra), Health and Safety Executives (HSE) and the National Radiological Protection Board (NPRB).
- 5.1.2. It is considered that the information in **Table 5-1** represents those of the potential concern in relation to contamination at the Site. The full Groundsure report is provided in **Appendix E**.

**Table 5-1 – Summary of Database Searches**

| Descriptor                 | Onsite | 0-50 m | 50-250 m | 250-500 m | Details                                                                                                                                                                                            |
|----------------------------|--------|--------|----------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Licensed Pollutant Release | 0      | 0      | 0        | 4         | Four current records located within 500m of the Site. The closest record to the Site is held by Archway Dry Cleaners, located 305m south west of the Site. No enforcements have been made.         |
| Pollution Incidents        | 0      | 0      | 1        | 3         | Four records located within 500m of the Site, of which the closest is recorded 205m west. The pollutant is recorded as being inert materials and wastes which had no impact to water, land or air. |

- 5.1.3. There are no current or historical landfills or licensed waste sites located within 500m of the Site.

### 5.2 SENSITIVE LAND USES

- 5.2.1. The Site is located within the Parkland Walk Local Nature Reserve which is also listed on the Priority Habitat Inventory due to its deciduous woodland.
- 5.2.2. The western part of the Site is located within Highgate Conservation Area.

### 5.3 LOCAL AUTHORITY

- 5.3.1. The Environmental Health Officer (EHO) at London Borough of Haringey was contacted via email on 9 November 2020 regarding environmentally pertinent information held relating to the Site. A response was received on 22 December 2020, which is presented in **Appendix H**, pertinent points are summarised below:
- The local authority confirmed that the Site is partially on land identified as contaminated land of medium risk, relating to a railway. The Site is also located within 200m of a contaminated site relating to unknown filled ground (pond, marsh, river, stream, docket) of medium risk to the north east of the Site. There is also record of a 'clay, bricks and tiles (manufacture)' site located 100m to the south west of the Site. No further details are given;
  - The Site has not been designated as Contaminated Land under Part IIA of the Environmental Protection Act 1990; and,
  - The local authority was not aware of any records of landfills or waste transfer sites within 500m of the Site.

## 5.4 ENVIRONMENT AGENCY

5.4.1. The Environment Agency (EA) was contacted via email on 9 November 2020 regarding environmentally pertinent information held relating to the Site. A response was received on 25 November 2020, which is presented at **Appendix H**, pertinent points are summarised below.

- The EA had not performed any investigations on the Site or within 500m of the Site. In addition, they were not aware of any land remediation works;
- It was noted that the Site is not designated as a Special Site under Part IIA of the EPA 1990;
- The EA were not aware of any oil tanks above / below ground in this area;
- No landfill sites or permitted waste sites were noted in the area; and
- No pollution incidents were identified on the Site or within the immediate vicinity of the Site.

## 5.5 PLANNING INFORMATION

5.5.1. A search of the Haringey Borough Council planning portal was undertaken on 16 November 2020.

5.5.2. No recent environmentally pertinent applications were identified.

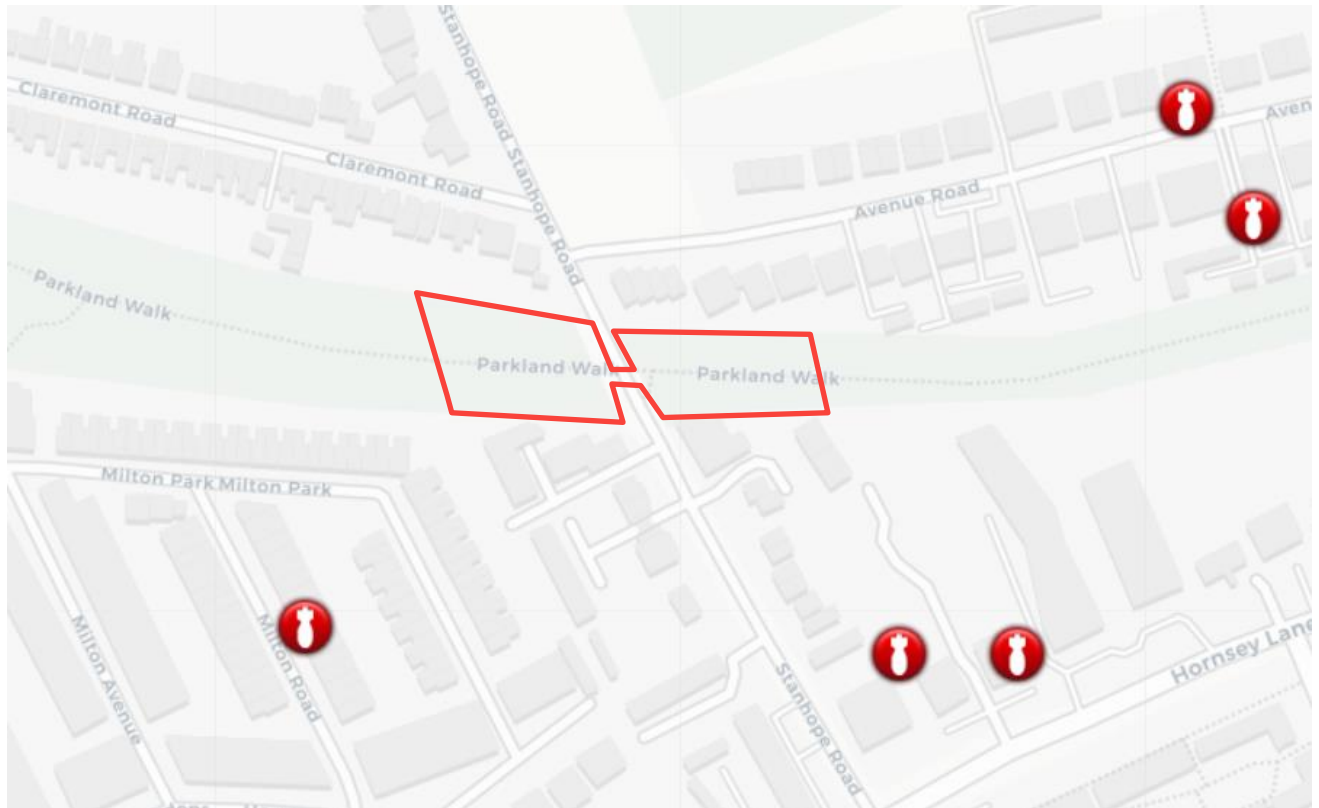
## 5.6 UNEXPLODED ORDNANCE (UXO)

5.6.1. A preliminary UXO enquiry with Zetica, dated 18 November 2020, indicated that during World War II the Site was located in the Municipal Borough of Hornsey, close to the boundary with the Metropolitan Borough of Islington. Records indicate that several high explosive bombs fell within a close proximity of the Site.

5.6.2. The preliminary enquiry indicated that a detailed desk study should be commissioned in order to assess the UXO risk at the Site. The preliminary enquiry is presented at **Appendix G**.

5.6.3. The Bomb Sight website summarises the London World War II bomb census information between 07/10/1940 and 06/06/1941. The information presented on the website suggests that a high explosive bombs fell to the east and south of the Site (**Insert 5-1**).

## Insert 5-1 – Bomb Sight London War II Census Information



## 6 HISTORICAL REPORTS

---

6.1.1. A review of environmentally pertinent historical reports relevant to the Stanhope Road bridge which have been made available to WSP has been undertaken and a summary presented in the following section.

**Stanhope Road Bridge, Stanhope Road, London, N6 5NE Geotechnical Investigation. Herts and Essex Site Investigations, May 2018. Ref: DAH/14336.**

- Investigation comprised three cable percussive boreholes to a maximum depth of 10m bgl and one trial pit to expose the bridge abutment;
- Made Ground was identified to depths ranging from 0.80m to in excess 5.00m bgl, with the London Clay Formation identified below and proven to a maximum depth of 10m bgl;
- Groundwater strikes were identified within the London Clay Formation at 8.00m and 9.50m bgl and were attributed to claystone bands; and,
- Soil and groundwater samples for environmental testing were not collected.

**Stanhope Road Bridge, Structural Investigation. RSK, December 2019. Ref: 1281594-02 (00).**

- Investigation comprised three trial pits to a maximum depth of 3.20 m bgl around the bridge abutments;
- Four soil samples collected and submitted for pH, asbestos identification, metals, polycyclic aromatic hydrocarbon (PAH), total petroleum hydrocarbon analysis (TPH) and waste acceptance criteria (WAC) analysis;
- Made Ground was identified in all trial pits and proven to a maximum depth of 3.20m bgl; the base of the Made Ground was not proven in any of the pits;
- Asbestos was not identified in any of the soil samples analysed; and,
- Concentrations of metals, PAH and TPH were encountered above laboratory method detection limits. However, the results are presented factually, and no assessment of the results has been undertaken.

**Parkland Walk Footbridges - Stapleton Hall Road and Stanhope Road Embankments Factual Letter Report. RSK, December 2019. Ref: 1920944 L02 (00).**

- Investigation comprised three trial pits to a maximum depth of 1.20 m bgl on the embankments to either side of the Stanhope Road bridge
- Two soil samples collected and submitted for pH, asbestos identification, metals, polycyclic aromatic hydrocarbon (PAH), total petroleum hydrocarbon analysis (TPH) and waste acceptance criteria (WAC) analysis;
- Made Ground was identified in all trial pits and proven to a maximum depth of 1.20m bgl; the base of the Made Ground was not proven in any of the pits;
- Asbestos was not identified in any of the soil samples analysed; and,
- Concentrations of metals, PAH and TPH were encountered above laboratory method detection limits. However, the results are presented factually, and no assessment of the results has been undertaken.

## 7 PRELIMINARY CONCEPTUAL SITE MODEL

### 7.1 INTRODUCTION

- 7.1.1. The preliminary Conceptual Site Model (CSM) is based upon the environmental conditions of the Site as described in the previous sections and was developed in the context of the proposed development.
- 7.1.2. The assessment followed a risk-based approach with the potential environmental risk assessed qualitatively using the 'source-pathway-receptor' contaminant linkage concept introduced in the guidance documents (principally the EA's LCRM guidance) on the practical implementation of the Environmental Protection Act 1990.
- 7.1.3. Environmental risk can be defined as the combination of the consequence of a harmful effect and the probability of its occurrence. The existence of a contaminant linkage is primarily dependant on Site usage and environmental conditions.
- 7.1.4. The environmental risk assessment has been carried out by identifying and evaluating the significance of the following:
- Potential sources of contamination: these include actual or potentially contaminating materials and activities, located on or in the vicinity of the Site;
  - Potential receptors of contamination: these include Site users; and,
  - Potential pathways for contamination migration: these are routes or mechanisms by which contaminants migrate from the source to the receptor.

### 7.2 POTENTIAL SOURCES OF CONTAMINATION

- 7.2.1. **Table 7-1** provides a summary of the potential sources of contamination that may be present at the Site, as well as the likely nature of such sources.

**Table 7-1 – Potential Sources of Contamination**

| Potential Source                | Potential Contaminants of Concern                                                                                                                                                                                                                                                                                         | Likely / Anticipated Distribution |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| <b>ON-SITE</b>                  |                                                                                                                                                                                                                                                                                                                           |                                   |
| Made Ground and Embankment Fill | A wide range of potential contaminants including:- asbestos, heavy metals, inorganics, petroleum hydrocarbons, polyaromatic hydrocarbons (PAH), BTEX (benzene, toluene, ethylbenzene and xylene), semi volatile organic compounds (SVOC), volatile organic compounds (VOC) and ground gases (methane and carbon dioxide). | Site wide                         |
| Railway Line and Railway Land   | Asbestos, heavy metals, inorganics (e.g. sulphates) petroleum hydrocarbons, PAH, solvents, herbicides, polychlorinated biphenyls (PCBs).                                                                                                                                                                                  | Site wide                         |
| <b>OFF-SITE</b>                 |                                                                                                                                                                                                                                                                                                                           |                                   |

| Potential Source                                                           | Potential Contaminants of Concern                                                                                                                                                  | Likely / Anticipated Distribution |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Made Ground, Embankment Fill, potentially infilled ponds and brick fields. | A wide range of potential contaminants including:- asbestos, heavy metals, inorganics, petroleum hydrocarbons, PAH, BTEX, SVOC, VOC and ground gases (methane and carbon dioxide). | All directions                    |
| Milk depot                                                                 | A wide range of potential contaminants including:- asbestos, heavy metals, inorganics, mineral oils, petroleum hydrocarbons, PAH and organics.                                     | South                             |
| Electrical Substation                                                      | Mineral oils and PCBs.                                                                                                                                                             | North                             |

## 7.3 POTENTIAL RECEPTORS

7.3.1. In the context of the proposed development works at the Site, the following potential receptors were identified:

### Human Health

- Current and future Site users;
- Construction and maintenance workers; and,
- Third party neighbours.

### Flora

- Plant life.

### Building Fabric and Services

- Below ground services; and,
- Building structures.

7.3.2. Groundwater within the Lambeth Group, Thanet Formation and Chalk Group has been discounted from the assessment as it is considered likely that the London Clay Formation is confining the units and acting as an aquitard, thus preventing the migration of contaminants from shallow soils to the deeper aquifers.

7.3.3. The ponds associated with Waterlow Park are located approximately 1km to the south west of the Site. Given the distance to the receptor, it is considered unlikely that it would be influenced by contamination associated with the Site.

7.3.4. In addition, the London Clay Formation underlying the Site is classified as unproductive strata, indicating that there is no laterally continuous groundwater body underlying the Site. Therefore, there is no active contamination pathway between the Site and the ponds associated with Waterlow Park.

7.3.5. Given this, risks to controlled waters have not been further assessed.

## 7.4 PLAUSIBLE PRELIMINARY CONTAMINANT LINKAGES

- 7.4.1. **Table 7-2** provides an evaluation of the potential contaminant linkages that were considered to be plausible on the basis of the information currently available for the Site and the proposed development of the bridge.

**Table 7-2 – Preliminary Conceptual Site Model**

| Potential Contaminant Sources                                                                                                | Receptor                                                                                                                                                                                        | Pathways                                                                                                                                                                                         | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ON-SITE</b>                                                                                                               |                                                                                                                                                                                                 |                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>■ Made Ground and Embankment Fill</li> <li>■ Railway Line and Railway Land</li> </ul> | <b>Human Health</b> <ul style="list-style-type: none"> <li>■ Current and future Site users;</li> <li>■ Construction and maintenance workers; and,</li> <li>■ Third party neighbours.</li> </ul> | <ul style="list-style-type: none"> <li>■ Dermal contact</li> <li>■ Indirect ingestion of contaminants</li> <li>■ Inhalation of dust / fibres</li> <li>■ Ground gas / vapour migration</li> </ul> | <p>A large proportion of the Site is occupied by soft landscaping and open ground, therefore there is the potential for direct contact pathways (i.e. dermal contact, ingestion, inhalation) to be present. However, given that Site is an area of public open space, the nature of Site users is considered to be transient. The risk to current and future Site users and third-party is considered to be <b>Low</b>.</p> <p>Ground gas and vapours have the potential to be present, however given the nature of the proposed development works the likelihood for confined spaces, in which ground gases and vapours can accumulate, to be present is minimal. The risk from ground gas is considered to be <b>Low</b>.</p> <p>Construction workers or maintenance workers may come in to contact with contaminated soils/groundwater during ground or maintenance works (e.g. dermal exposure or inhalation of vapours or ground gases). The risk is considered to be <b>Low-Moderate</b>, however these risks should be managed via Health and Safety protocols during the works.</p> |
|                                                                                                                              | <b>Flora</b> <ul style="list-style-type: none"> <li>■ Plant life</li> </ul>                                                                                                                     | <ul style="list-style-type: none"> <li>■ Direct contact with contaminated soils or groundwater.</li> </ul>                                                                                       | <p>Given the historical land uses, there is the potential for contaminants to be present within Made Ground deposits on the Site. Additionally, the Site was noted to be vegetated and is designated as a Local Nature Reserve. Therefore, the risk to plant life on the Site is considered to be <b>Low-Moderate</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Potential Contaminant Sources                                                                                                                                                         | Receptor                                                                                                                                                                                  | Pathways                                                                                                                                                  | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                       | <b>Building Fabric and Services</b> <ul style="list-style-type: none"> <li>Below ground services; and</li> <li>Building structures.</li> </ul>                                            | <ul style="list-style-type: none"> <li>Direct contact</li> <li>Permeation of hydrocarbons through plastic pipes</li> </ul>                                | <p>Given the historical land uses, there is the potential for permeation of hydrocarbons into plastic pipes. Additionally, the Site is underlain by the London Clay Formation, which is known to be sulphate bearing. Therefore, there is a risk to below ground concrete structures from sulphate attack. Given the former land uses at the Site and the underlying geology, the risk is considered to be <b>Low-Moderate</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>OFF-SITE</b>                                                                                                                                                                       |                                                                                                                                                                                           |                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>Made Ground, Embankment Fill, potentially infilled ponds and brick fields;</li> <li>Milk depot; and,</li> <li>Electrical substation</li> </ul> | <b>Human Health</b> <ul style="list-style-type: none"> <li>Current and future Site users;</li> <li>Construction and maintenance workers; and,</li> <li>Third party neighbours.</li> </ul> | <ul style="list-style-type: none"> <li>Inhalation of windblown dust and asbestos fibres;</li> <li>Migration of ground gas and volatile vapours</li> </ul> | <p>The majority of the areas surrounding the Site are covered with hardstanding, buildings or grass cover, therefore it is considered unlikely that windblown dust and fibres from off-site sources will impact receptors on the Site. The risk to human health receptors from windblown dust and fibres from off-Site is considered to be <b>Low</b>.</p> <p>Ground gas and vapours generated from Made Ground, embankment fill, infilled ponds and brick fields in the areas surrounding the Site may migrate laterally in the subsurface. However, confined spaces for ground gases and vapours to accumulate in are not anticipated to be a part of the proposed development works. Therefore, the risk from ground gases and vapour migrating on to the Site from off-Site sources is considered to be <b>Low</b>.</p> |
|                                                                                                                                                                                       | <b>Flora</b> <ul style="list-style-type: none"> <li>Plant life</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>Direct contact with contaminated soils or groundwater.</li> </ul>                                                  | <p>Given that the London Clay Formation (unproductive strata) underlies the Site and immediate area surrounding the Site, there is no laterally continuous groundwater body underlying the Site. Therefore, there is no active contamination pathway for contaminants to migrate in groundwater from off-Site sources and impact plant life. The risk is considered to be <b>Very Low</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Potential Contaminant Sources | Receptor                                                                                                                                       | Pathways                                                                                                     | Comments                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <b>Building Fabric and Services</b> <ul style="list-style-type: none"> <li>Below ground services; and</li> <li>Building structures.</li> </ul> | <ul style="list-style-type: none"> <li>Lateral migration of contaminants via impacted groundwater</li> </ul> | <p>Given that the London Clay Formation (unproductive strata) underlies the Site and immediate area surrounding the Site, there is no laterally continuous groundwater body underlying the Site. Therefore, there is no active contamination pathway for contaminants to migrate in groundwater from off-Site sources and impact building fabric and services. The risk is considered to be <b>Very Low</b>.</p> |

## 8 CONCLUSIONS AND RECOMMENDATIONS

---

- 8.1.1. Based on the findings of the site walkover and desk-based assessment, the following conclusions and recommendations have been made in the context of the proposed development.

### 8.2 CONCLUSIONS

- 8.2.1. Earliest available mapping from 1864 suggests that the Site comprised undeveloped agricultural land. From 1870, the Great Northern Railway ran in a west to east orientation through the centre of the Site. The railway line appears to be raised on an embankment and crosses a bridge in the present-day bridge location. From 1974, the railway is labelled as being dismantled and from 1991, the Site is occupied by Parkland Walk.
- 8.2.2. It has been assumed that the embankment on the Site is man-made, and therefore there is anticipated to be Made Ground or reworked natural deposits present on the Site. No superficial deposits are mapped on the Site; however, the Site is located within an area denoted as having 'head propensity' on BGS mapping, which means that there is the potential for quaternary head deposits to be present. The bedrock geology underlying the Site comprises the London Clay Formation (unproductive strata). The London Clay Formation is underlain by the Lambeth Group (Secondary A Aquifer) which is subsequently underlain by the Thanet Formation (Secondary A Aquifer) and Chalk Group (Principal Aquifer). It is anticipated that the London Clay Formation acts as an aquitard preventing a pathway for shallow contaminants in perched groundwater to the deeper aquifers within the Lambeth Group, Thanet Formation and Chalk Group.
- 8.2.3. The closest surface water feature to the Site are ponds associated with Waterlow Park located approximately 1km south west of the Site.
- 8.2.4. A large proportion of the Site is occupied by soft landscaping and open ground, therefore there is the potential for direct contact pathways (i.e. dermal contact, ingestion, inhalation) to be present. However, given that Site is an area of public open space, the nature of Site users is considered to be transient. The risk to current and future Site users and third-party is considered to be **Low**.
- 8.2.5. Ground gas and vapours have the potential to be present, however given the nature of the proposed development works the likelihood for confined spaces, in which ground gases and vapours can accumulate, to be present is minimal. The risk from ground gas is considered to be **Low**.
- 8.2.6. Construction workers or maintenance workers may come in to contact with contaminated soils/groundwater during ground or maintenance works (e.g. dermal exposure or inhalation of vapours or ground gases). The risk is considered to be **Low-Moderate**, however these risks should be managed via Health and Safety protocols during the works.
- 8.2.7. Given the distance to the ponds associated with Waterlow Park it is considered unlikely that it would be influenced by contamination associated with the Site. In addition, the London Clay Formation underlying the Site is classified as unproductive strata, indicating that there is no laterally continuous groundwater body underlying the Site. Therefore, there is no active contamination pathway between the Site and the ponds associated with Waterlow Park. Given this, the risk to controlled waters receptors is considered to be **Very Low**.

- 8.2.8. Given the historical land uses, there is the potential for contaminants to be present within Made Ground deposits on the Site. Additionally, the Site is designated as a Local Nature Reserve. Therefore, the risk to plant life on the Site is considered to be **Low-Moderate**.
- 8.2.9. Based on the historical land uses, there is the potential for permeation of hydrocarbons into plastic pipes. Additionally, the Site is underlain by the London Clay Formation, which is known to be sulphate bearing. Therefore, there is a risk to below ground concrete structures from sulphate attack. Given the former land uses at the Site and the underlying geology, the risk is considered to be **Low-Moderate**.
- 8.2.10. The Site was noted to be located in an area with a risk of unexploded ordnance.

### **8.3 RECOMMENDATIONS**

- 8.3.1. Based on the proposed development works, further investigation may be required to obtain additional information regarding the waste classification of materials requiring off-site disposal.

# Appendix A

## FIGURES

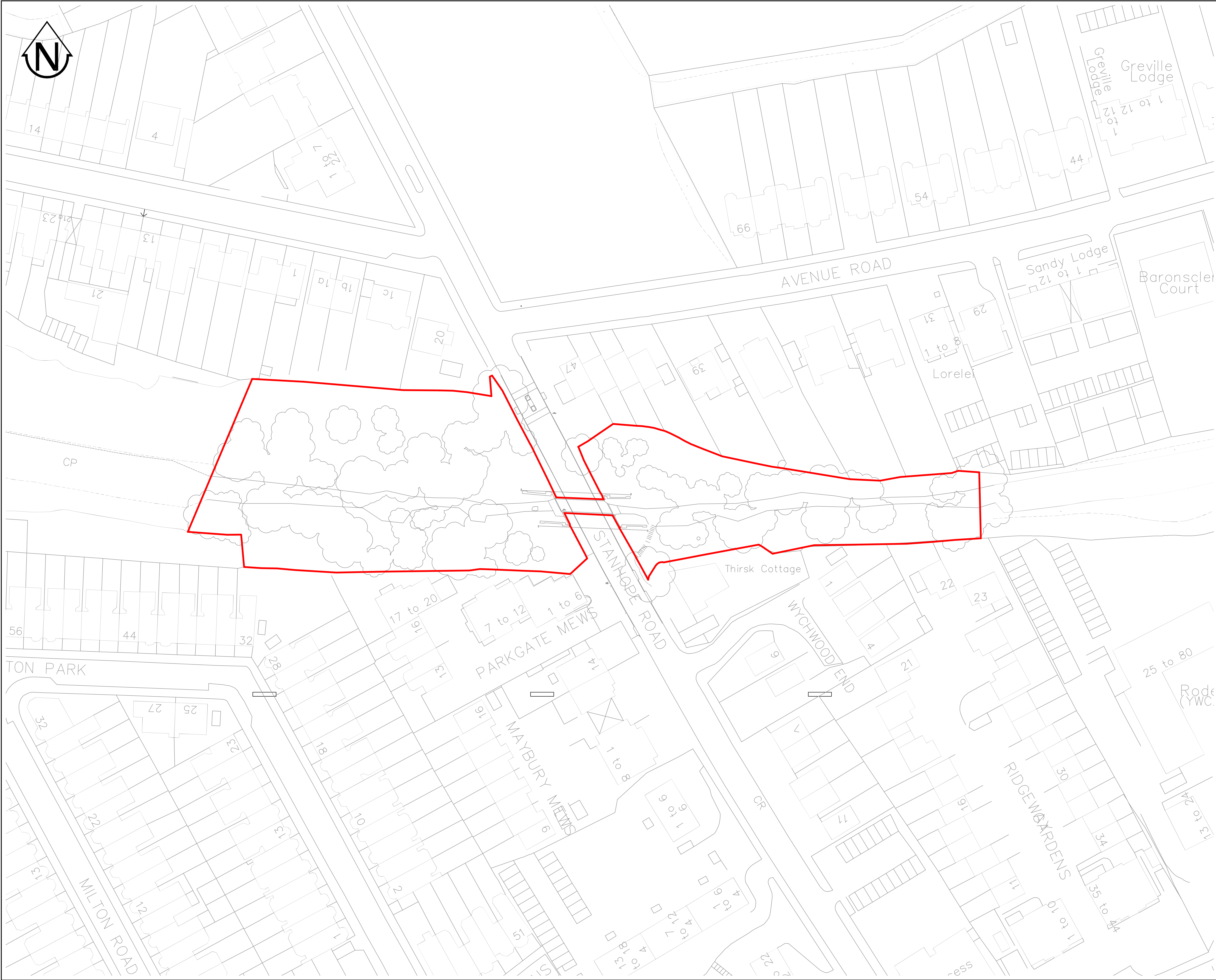






TITLE:  
Stanhope Road Bridge

FIGURE No:  
Site Location Plan



File name: I:\UK\WSP\GROUP\COMMON\DATA\PROJECTS\70077287-WSP-GEN-B-DR-TC-0001.DWG, printed on 27 October 2020 13:29:31, by Roland, Daniel

DO NOT SCALE

LEGEND

APPLICATION SITE BOUNDARY (DRAFT)

|     |            |    |             |     |     |
|-----|------------|----|-------------|-----|-----|
| P01 | 26/10/2020 | DR | FIRST ISSUE | AMW | HI  |
| REV | DATE       | BY | DESCRIPTION | CHK | APP |

DRAWING STATUS: S0 - WORK IN PROGRESS

2 London Square, Cross Lanes, Guildford, Surrey, GU1 1UN  
T+ 44 (0) 1483 528 400  
wsp.com

CLIENT:

SITE/PROJECT: STANHOPE ROAD BRIDGE

TITLE: PROJECT BOUNDARY

|                                           |               |           |
|-------------------------------------------|---------------|-----------|
| SCALE @ A1: 1:500                         | CHECKED:      | APPROVED: |
| PROJECT NO: 70077287                      | DESIGNED: AMW | DRAWN: DR |
| DRAWING No: 70077287-WSP-GEN-B-DR-TC-0001 |               | REV: P01  |

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# Appendix B

## REPORT LIMITATIONS



## REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

### GENERAL

1. WSP UK Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.
2. Unless explicitly agreed otherwise, in writing, this report has been prepared under WSP UK Limited standard Terms and Conditions as included within our proposal to the Client.
3. Project specific appointment documents may be agreed at our discretion and a charge may be levied for both the time to review and finalise appointments documents and also for associated changes to the appointment terms. WSP UK Limited reserves the right to amend the fee should any changes to the appointment terms create an increase risk to WSP UK Limited.
4. The report needs to be considered in the light of the WSP UK Limited proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

### PHASE 1 GEO ENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

**Coverage:** *This section covers reports with the following titles or combination of titles: phase 1; desk top study; geo environmental assessment; development appraisal; preliminary environmental risk assessment; constraints report; due diligence report; geotechnical development review; environmental statement; environmental chapter; project scope summary report (PSSR), program environmental impact report (PEIR), geotechnical development risk register; and, baseline environmental assessment.*

5. The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. WSP UK Limited cannot be held responsible for any disclosures that are provided post production of our report and will not automatically update our report.
6. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP UK Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.
7. 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 intrusive investigations of the site.
8. WSP UK Limited does not warrant work / data undertaken / provided by others.

## REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

### INTRUSIVE INVESTIGATION REPORTS

**Coverage:** *The following report titles (or combination) may cover this category of work: geo environmental site investigation; geotechnical assessment; GIR (Ground Investigation reports); preliminary environmental and geotechnical risk assessment; and, geotechnical risk register.*

9. The investigation has been undertaken to provide information concerning either:
  - i. The type and degree of contamination present at the site in order to allow a generic quantitative risk assessment to be undertaken; or
  - ii. Information on the soil properties present at the site to allow for geotechnical development constraints to be considered.
10. The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.
11. For contamination purposes, the objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters.
12. For geotechnical investigations the purpose is to broadly consider potential development constraints associated with the physical property of the soils underlying the site within the context of the proposed future or continued use of the site, as stated within the report.
13. The amount of exploratory work, soil property testing and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions.
14. The number of sampling points and the methods of sampling and testing do not preclude the possible existence of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.
15. The inspection, testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. As part of this assessment, WSP UK Limited has used reasonable skill and care to extrapolate conditions between these points based upon assumptions to develop our interpretation and conclusions. The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation. Conditions can change between investigation points and these interpretations should be considered indicative.
16. The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values. Specific assumptions associated

## REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

with the WSP UK Limited risk assessment process have been outlined within the body or associated appendix of the report.

17. Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.
18. Where soil contamination concentrations recorded as part of this investigation are used for commentary on potential waste classification of soils for disposal purposes, these should be classed as indicative only. Due consideration should be given to the variability of contaminant concentrations taken from targeted samples versus bulk excavated soils and the potential variability of contaminant concentrations between sampling locations. Where major waste disposal operations are considered, targeted waste classification investigations should be designed.
19. The results of the asbestos testing are factually reported and interpretation given as to how this relates to the previous use of the site, the types of ground encountered and site conceptualisation. This does not however constitute a formal asbestos assessment. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and / or trace loose asbestos fibres within the soil matrix at the site.
20. If costs have been included in relation to additional site works, and / or site remediation works these must be considered as indicative only and must be confirmed by a qualified quantity surveyor.

## EUROCODE 7: GEOTECHNICAL DESIGN

21. On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.
22. In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

## DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIAL STRATEGY REPORTS

23. These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected on the basis of the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.



## REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

- 24. The outputs of the Detailed Quantitative Risk Assessments are based upon WSP UK Limited manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.
- 25. Prior to adoption on site they will need discussing and agreeing with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of WSP UK Limited. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

### GEOTECHNICAL DESIGN REPORT (GDR)

- 26. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. All the relevant information needs to be provided to allow for a GDR to be produced.

### MONITORING (INCLUDING REMEDIATION MONITORING REPORTS)

- 27. These reports are factual in nature and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of an earthworks or remedial works.
- 28. The data is presented and will be compared with assessment criteria.

# Appendix C

## **CIRIA RISK DEFINITIONS**



## CIRIA RISK DEFINITIONS

**Table A1 - Classifications of Probability**

| Classification  | Definition                                                                                                                                                                                                                                                            |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High Likelihood | There is a pollution linkage / identified geotechnical hazard and an event that 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.                                     |
| Likely          | There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that 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. |
| Low Likelihood  | There is a pollution linkage and circumstances are possible under which 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.                                  |
| Unlikely        | There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term                                                                                                                                    |

**Table A2 - Classifications of Consequence**

| Classification | Definition                                                                                                                                                                                                                                                                                                                                |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Severe         | Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem. |
| Medium         | Chronic damage to Human Health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem.                                                                                                                         |
| Mild           | Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services (significant harm as defined in the Draft Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.                                                                   |
| Minor          | Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve, Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.). Easily repairable effects of damage to buildings, structures and services                           |

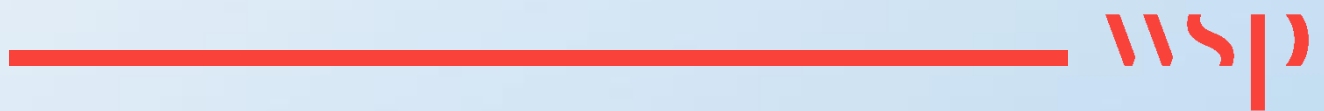
The risk categories presented in this report, taking into account both probability and severity, are based on the matrix presented in **Table A3** below, following CIRIA C552.

**Table A3 - Adopted Risk Categories / Comparison of Consequence Against Probability**

| Probability     | Consequence          |                      |                      |                      |
|-----------------|----------------------|----------------------|----------------------|----------------------|
|                 | Severe               | Medium               | Mild                 | Minor                |
| High Likelihood | Very High Risk       | High Risk            | Moderate Risk        | Low to Moderate Risk |
| Likely          | High Risk            | Moderate Risk        | Low to Moderate Risk | Low Risk             |
| Low Likelihood  | Moderate Risk        | Low to Moderate Risk | Low Risk             | Very Low Risk        |
| Unlikely        | Low to Moderate Risk | Low Risk             | Very Low Risk        | Very Low Risk        |

# Appendix D

## PHOTOGRAPHIC LOG





**Photo 1:** View of the western part of the Site looking towards the east.

WSP



**Photo 2:** View of the bridge over Stanhope Road, looking towards the east.

WSP



**Photo 3:** View of the eastern part of the Site looking towards the east.

**wsp**



**Photo 4:** View of the vegetated embankment in the central part of the Site. View looking west from Stanhope Road.

**wsp**



**Photo 5:** Pedestrian access steps from Stanhope Road to Parkland Walk. View from Stanhope Road looking towards the north east.

**wsp**



**Photo 6:** Example of the concrete blocks present on the site, potentially related to the former railway.

**wsp**



**Photo 7:** View of Stanhope Road towards the north from the Site.

**wsp**



**Photo 8:** View of Stanhope Road towards the south from the Site.

**wsp**



**Photo 9:** Residential properties located adjacent to the south of the Site. Photo taken from Stanhope Road looking towards the west.



**Photo 10:** Residential properties located adjacent to the north of the Site. Photo taken from Stanhope Road looking towards the west.





**Photo 11:** Photo of the electric substation located adjacent to the north east of the Site. Photo taken from the Site looking towards the north.

wsp



**Photo 12:** Bridge that crosses Stanhope Road. Photo is taken from Stanhope Road looking towards the north.

wsp

# Appendix E

## **GROUNDSURE REPORT**



## Parkland Walk Bridge at Stanhope Road, N6 5DE

### Order Details

**Date:** 12/11/2020

**Your ref:** 20118857

**Our Ref:** GS-7271613

**Client:** WSP UK Ltd

### Site Details

**Location:** 529331 187828

**Area:** 0.82 ha

**Authority:** [London Borough of Haringey](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

p.13

[groundsure.com/insightuserguide](https://groundsure.com/insightuserguide)

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000

## Summary of findings

| Page      | Section    | Past land use                                   | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|-----------|------------|-------------------------------------------------|---------|-------|---------|----------|-----------|
| <b>14</b> | <b>1.1</b> | <b><u>Historical industrial land uses</u></b>   | 0       | 5     | 9       | 43       | -         |
| <b>17</b> | <b>1.2</b> | <b><u>Historical tanks</u></b>                  | 0       | 0     | 1       | 5        | -         |
| <b>17</b> | <b>1.3</b> | <b><u>Historical energy features</u></b>        | 0       | 1     | 7       | 23       | -         |
| 19        | 1.4        | Historical petrol stations                      | 0       | 0     | 0       | 0        | -         |
| <b>19</b> | <b>1.5</b> | <b><u>Historical garages</u></b>                | 0       | 0     | 7       | 9        | -         |
| 20        | 1.6        | Historical military land                        | 0       | 0     | 0       | 0        | -         |
| Page      | Section    | Past land use - un-grouped                      | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>21</b> | <b>2.1</b> | <b><u>Historical industrial land uses</u></b>   | 0       | 6     | 13      | 53       | -         |
| <b>24</b> | <b>2.2</b> | <b><u>Historical tanks</u></b>                  | 0       | 0     | 3       | 5        | -         |
| <b>25</b> | <b>2.3</b> | <b><u>Historical energy features</u></b>        | 0       | 4     | 23      | 61       | -         |
| 28        | 2.4        | Historical petrol stations                      | 0       | 0     | 0       | 0        | -         |
| <b>28</b> | <b>2.5</b> | <b><u>Historical garages</u></b>                | 0       | 0     | 9       | 22       | -         |
| Page      | Section    | Waste and landfill                              | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 31        | 3.1        | Active or recent landfill                       | 0       | 0     | 0       | 0        | -         |
| 31        | 3.2        | Historical landfill (BGS records)               | 0       | 0     | 0       | 0        | -         |
| 31        | 3.3        | Historical landfill (LA/mapping records)        | 0       | 0     | 0       | 0        | -         |
| 31        | 3.4        | Historical landfill (EA/NRW records)            | 0       | 0     | 0       | 0        | -         |
| 31        | 3.5        | Historical waste sites                          | 0       | 0     | 0       | 0        | -         |
| 32        | 3.6        | Licensed waste sites                            | 0       | 0     | 0       | 0        | -         |
| 32        | 3.7        | Waste exemptions                                | 0       | 0     | 0       | 0        | -         |
| Page      | Section    | Current industrial land use                     | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>33</b> | <b>4.1</b> | <b><u>Recent industrial land uses</u></b>       | 0       | 1     | 6       | -        | -         |
| <b>34</b> | <b>4.2</b> | <b><u>Current or recent petrol stations</u></b> | 0       | 0     | 0       | 2        | -         |
| 34        | 4.3        | Electricity cables                              | 0       | 0     | 0       | 0        | -         |
| 35        | 4.4        | Gas pipelines                                   | 0       | 0     | 0       | 0        | -         |
| 35        | 4.5        | Sites determined as Contaminated Land           | 0       | 0     | 0       | 0        | -         |



| 35        | 4.6                | Control of Major Accident Hazards (COMAH)              | 0                        | 0     | 0        | 0        | -         |
|-----------|--------------------|--------------------------------------------------------|--------------------------|-------|----------|----------|-----------|
| 35        | 4.7                | Regulated explosive sites                              | 0                        | 0     | 0        | 0        | -         |
| 35        | 4.8                | Hazardous substance storage/usage                      | 0                        | 0     | 0        | 0        | -         |
| 36        | 4.9                | Historical licensed industrial activities (IPC)        | 0                        | 0     | 0        | 0        | -         |
| 36        | 4.10               | Licensed industrial activities (Part A(1))             | 0                        | 0     | 0        | 0        | -         |
| <b>36</b> | <b><u>4.11</u></b> | <b><u>Licensed pollutant release (Part A(2)/B)</u></b> | 0                        | 0     | 0        | <b>4</b> | -         |
| 37        | 4.12               | Radioactive Substance Authorisations                   | 0                        | 0     | 0        | 0        | -         |
| 37        | 4.13               | Licensed Discharges to controlled waters               | 0                        | 0     | 0        | 0        | -         |
| 37        | 4.14               | Pollutant release to surface waters (Red List)         | 0                        | 0     | 0        | 0        | -         |
| 37        | 4.15               | Pollutant release to public sewer                      | 0                        | 0     | 0        | 0        | -         |
| 37        | 4.16               | List 1 Dangerous Substances                            | 0                        | 0     | 0        | 0        | -         |
| 38        | 4.17               | List 2 Dangerous Substances                            | 0                        | 0     | 0        | 0        | -         |
| <b>38</b> | <b><u>4.18</u></b> | <b><u>Pollution Incidents (EA/NRW)</u></b>             | 0                        | 0     | <b>1</b> | <b>3</b> | -         |
| 39        | 4.19               | Pollution inventory substances                         | 0                        | 0     | 0        | 0        | -         |
| 39        | 4.20               | Pollution inventory waste transfers                    | 0                        | 0     | 0        | 0        | -         |
| 39        | 4.21               | Pollution inventory radioactive waste                  | 0                        | 0     | 0        | 0        | -         |
| Page      | Section            | Hydrogeology                                           | On site                  | 0-50m | 50-250m  | 250-500m | 500-2000m |
| 40        | 5.1                | Superficial aquifer                                    | None (within 500m)       |       |          |          |           |
| <b>41</b> | <b><u>5.2</u></b>  | <b><u>Bedrock aquifer</u></b>                          | Identified (within 500m) |       |          |          |           |
| <b>42</b> | <b><u>5.3</u></b>  | <b><u>Groundwater vulnerability</u></b>                | Identified (within 50m)  |       |          |          |           |
| 43        | 5.4                | Groundwater vulnerability- soluble rock risk           | None (within 0m)         |       |          |          |           |
| 43        | 5.5                | Groundwater vulnerability- local information           | None (within 0m)         |       |          |          |           |
| 44        | 5.6                | Groundwater abstractions                               | 0                        | 0     | 0        | 0        | 0         |
| 44        | 5.7                | Surface water abstractions                             | 0                        | 0     | 0        | 0        | 0         |
| 44        | 5.8                | Potable abstractions                                   | 0                        | 0     | 0        | 0        | 0         |
| 44        | 5.9                | Source Protection Zones                                | 0                        | 0     | 0        | 0        | -         |
| 45        | 5.10               | Source Protection Zones (confined aquifer)             | 0                        | 0     | 0        | 0        | -         |
| Page      | Section            | Hydrology                                              | On site                  | 0-50m | 50-250m  | 250-500m | 500-2000m |
| 46        | 6.1                | Water Network (OS MasterMap)                           | 0                        | 0     | 0        | -        | -         |



| 46        | 6.2         | Surface water features                                    | 0                                            | 0     | 0       | -        | -         |
|-----------|-------------|-----------------------------------------------------------|----------------------------------------------|-------|---------|----------|-----------|
| <b>47</b> | <b>6.3</b>  | <b><u>WFD Surface water body catchments</u></b>           | 1                                            | -     | -       | -        | -         |
| <b>47</b> | <b>6.4</b>  | <b><u>WFD Surface water bodies</u></b>                    | 0                                            | 0     | 0       | -        | -         |
| 48        | 6.5         | WFD Groundwater bodies                                    | 0                                            | -     | -       | -        | -         |
| Page      | Section     | River and coastal flooding                                | On site                                      | 0-50m | 50-250m | 250-500m | 500-2000m |
| 49        | 7.1         | Risk of Flooding from Rivers and Sea (RoFRaS)             | None (within 50m)                            |       |         |          |           |
| 49        | 7.2         | Historical Flood Events                                   | 0                                            | 0     | 0       | -        | -         |
| 49        | 7.3         | Flood Defences                                            | 0                                            | 0     | 0       | -        | -         |
| 49        | 7.4         | Areas Benefiting from Flood Defences                      | 0                                            | 0     | 0       | -        | -         |
| 50        | 7.5         | Flood Storage Areas                                       | 0                                            | 0     | 0       | -        | -         |
| 51        | 7.6         | Flood Zone 2                                              | None (within 50m)                            |       |         |          |           |
| 51        | 7.7         | Flood Zone 3                                              | None (within 50m)                            |       |         |          |           |
| Page      | Section     | Surface water flooding                                    |                                              |       |         |          |           |
| <b>52</b> | <b>8.1</b>  | <b><u>Surface water flooding</u></b>                      | 1 in 30 year, Greater than 1.0m (within 50m) |       |         |          |           |
| Page      | Section     | Groundwater flooding                                      |                                              |       |         |          |           |
| <b>54</b> | <b>9.1</b>  | <b><u>Groundwater flooding</u></b>                        | Negligible (within 50m)                      |       |         |          |           |
| Page      | Section     | Environmental designations                                | On site                                      | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>55</b> | <b>10.1</b> | <b><u>Sites of Special Scientific Interest (SSSI)</u></b> | 0                                            | 0     | 0       | 0        | 1         |
| 56        | 10.2        | Conserved wetland sites (Ramsar sites)                    | 0                                            | 0     | 0       | 0        | 0         |
| 56        | 10.3        | Special Areas of Conservation (SAC)                       | 0                                            | 0     | 0       | 0        | 0         |
| 56        | 10.4        | Special Protection Areas (SPA)                            | 0                                            | 0     | 0       | 0        | 0         |
| 56        | 10.5        | National Nature Reserves (NNR)                            | 0                                            | 0     | 0       | 0        | 0         |
| <b>57</b> | <b>10.6</b> | <b><u>Local Nature Reserves (LNR)</u></b>                 | 1                                            | 0     | 0       | 0        | 3         |
| <b>57</b> | <b>10.7</b> | <b><u>Designated Ancient Woodland</u></b>                 | 0                                            | 0     | 0       | 0        | 3         |
| 57        | 10.8        | Biosphere Reserves                                        | 0                                            | 0     | 0       | 0        | 0         |
| 58        | 10.9        | Forest Parks                                              | 0                                            | 0     | 0       | 0        | 0         |
| 58        | 10.10       | Marine Conservation Zones                                 | 0                                            | 0     | 0       | 0        | 0         |
| 58        | 10.11       | Green Belt                                                | 0                                            | 0     | 0       | 0        | 0         |
| 58        | 10.12       | Proposed Ramsar sites                                     | 0                                            | 0     | 0       | 0        | 0         |



| 58        | 10.13               | Possible Special Areas of Conservation (pSAC)  | 0                        | 0     | 0       | 0        | 0         |
|-----------|---------------------|------------------------------------------------|--------------------------|-------|---------|----------|-----------|
| 59        | 10.14               | Potential Special Protection Areas (pSPA)      | 0                        | 0     | 0       | 0        | 0         |
| 59        | 10.15               | Nitrate Sensitive Areas                        | 0                        | 0     | 0       | 0        | 0         |
| 59        | 10.16               | Nitrate Vulnerable Zones                       | 0                        | 0     | 0       | 0        | 0         |
| <b>60</b> | <b><u>10.17</u></b> | <b><u>SSSI Impact Risk Zones</u></b>           | 3                        | -     | -       | -        | -         |
| <b>62</b> | <b><u>10.18</u></b> | <b><u>SSSI Units</u></b>                       | 0                        | 0     | 0       | 0        | 1         |
| Page      | Section             | Visual and cultural designations               | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| 63        | 11.1                | World Heritage Sites                           | 0                        | 0     | 0       | -        | -         |
| 64        | 11.2                | Area of Outstanding Natural Beauty             | 0                        | 0     | 0       | -        | -         |
| 64        | 11.3                | National Parks                                 | 0                        | 0     | 0       | -        | -         |
| 64        | 11.4                | Listed Buildings                               | 0                        | 0     | 0       | -        | -         |
| <b>64</b> | <b><u>11.5</u></b>  | <b><u>Conservation Areas</u></b>               | 1                        | 2     | 2       | -        | -         |
| 65        | 11.6                | Scheduled Ancient Monuments                    | 0                        | 0     | 0       | -        | -         |
| 65        | 11.7                | Registered Parks and Gardens                   | 0                        | 0     | 0       | -        | -         |
| Page      | Section             | Agricultural designations                      | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>66</b> | <b><u>12.1</u></b>  | <b><u>Agricultural Land Classification</u></b> | Urban (within 250m)      |       |         |          |           |
| 67        | 12.2                | Open Access Land                               | 0                        | 0     | 0       | -        | -         |
| 67        | 12.3                | Tree Felling Licences                          | 0                        | 0     | 0       | -        | -         |
| 67        | 12.4                | Environmental Stewardship Schemes              | 0                        | 0     | 0       | -        | -         |
| 67        | 12.5                | Countryside Stewardship Schemes                | 0                        | 0     | 0       | -        | -         |
| Page      | Section             | Habitat designations                           | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>68</b> | <b><u>13.1</u></b>  | <b><u>Priority Habitat Inventory</u></b>       | 9                        | 1     | 6       | -        | -         |
| 69        | 13.2                | Habitat Networks                               | 0                        | 0     | 0       | -        | -         |
| 69        | 13.3                | Open Mosaic Habitat                            | 0                        | 0     | 0       | -        | -         |
| 70        | 13.4                | Limestone Pavement Orders                      | 0                        | 0     | 0       | -        | -         |
| Page      | Section             | Geology 1:10,000 scale                         | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>71</b> | <b><u>14.1</u></b>  | <b><u>10k Availability</u></b>                 | Identified (within 500m) |       |         |          |           |
| <b>72</b> | <b><u>14.2</u></b>  | <b><u>Artificial and made ground (10k)</u></b> | 0                        | 0     | 1       | 5        | -         |
| 74        | 14.3                | Superficial geology (10k)                      | 0                        | 0     | 0       | 0        | -         |

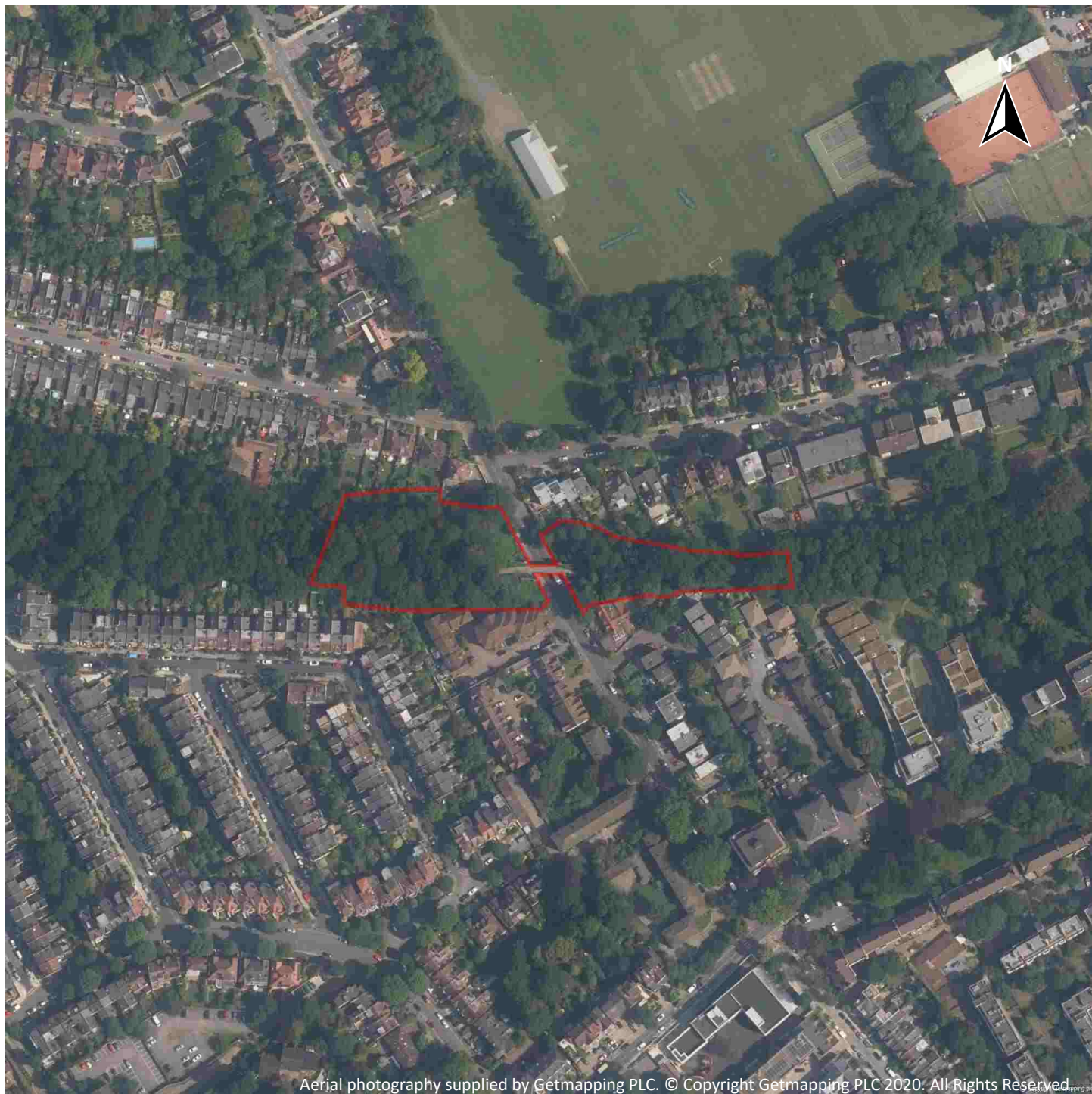
| 74        | 14.4        | Landslip (10k)                                    | 0                        | 0     | 0       | 0        | -         |
|-----------|-------------|---------------------------------------------------|--------------------------|-------|---------|----------|-----------|
| <b>75</b> | <b>14.5</b> | <b><u>Bedrock geology (10k)</u></b>               | 1                        | 0     | 1       | 2        | -         |
| 76        | 14.6        | Bedrock faults and other linear features (10k)    | 0                        | 0     | 0       | 0        | -         |
| Page      | Section     | Geology 1:50,000 scale                            | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>77</b> | <b>15.1</b> | <b><u>50k Availability</u></b>                    | Identified (within 500m) |       |         |          |           |
| <b>78</b> | <b>15.2</b> | <b><u>Artificial and made ground (50k)</u></b>    | 0                        | 0     | 1       | 3        | -         |
| 79        | 15.3        | Artificial ground permeability (50k)              | 0                        | 0     | -       | -        | -         |
| 80        | 15.4        | Superficial geology (50k)                         | 0                        | 0     | 0       | 0        | -         |
| 80        | 15.5        | Superficial permeability (50k)                    | None (within 50m)        |       |         |          |           |
| 80        | 15.6        | Landslip (50k)                                    | 0                        | 0     | 0       | 0        | -         |
| 80        | 15.7        | Landslip permeability (50k)                       | None (within 50m)        |       |         |          |           |
| <b>81</b> | <b>15.8</b> | <b><u>Bedrock geology (50k)</u></b>               | 1                        | 0     | 1       | 2        | -         |
| <b>82</b> | <b>15.9</b> | <b><u>Bedrock permeability (50k)</u></b>          | Identified (within 50m)  |       |         |          |           |
| 82        | 15.10       | Bedrock faults and other linear features (50k)    | 0                        | 0     | 0       | 0        | -         |
| Page      | Section     | Boreholes                                         | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>83</b> | <b>16.1</b> | <b><u>BGS Boreholes</u></b>                       | 0                        | 0     | 12      | -        | -         |
| Page      | Section     | Natural ground subsidence                         |                          |       |         |          |           |
| <b>85</b> | <b>17.1</b> | <b><u>Shrink swell clays</u></b>                  | Moderate (within 50m)    |       |         |          |           |
| <b>86</b> | <b>17.2</b> | <b><u>Running sands</u></b>                       | Very low (within 50m)    |       |         |          |           |
| <b>87</b> | <b>17.3</b> | <b><u>Compressible deposits</u></b>               | Negligible (within 50m)  |       |         |          |           |
| <b>88</b> | <b>17.4</b> | <b><u>Collapsible deposits</u></b>                | Very low (within 50m)    |       |         |          |           |
| <b>89</b> | <b>17.5</b> | <b><u>Landslides</u></b>                          | Very low (within 50m)    |       |         |          |           |
| <b>90</b> | <b>17.6</b> | <b><u>Ground dissolution of soluble rocks</u></b> | Negligible (within 50m)  |       |         |          |           |
| Page      | Section     | Mining, ground workings and natural cavities      | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| 91        | 18.1        | Natural cavities                                  | 0                        | 0     | 0       | 0        | -         |
| 92        | 18.2        | BritPits                                          | 0                        | 0     | 0       | 0        | -         |
| <b>92</b> | <b>18.3</b> | <b><u>Surface ground workings</u></b>             | 0                        | 6     | 16      | -        | -         |
| <b>93</b> | <b>18.4</b> | <b><u>Underground workings</u></b>                | 0                        | 0     | 0       | 7        | 10        |
| 94        | 18.5        | Historical Mineral Planning Areas                 | 0                        | 0     | 0       | 0        | -         |



| 94         | 18.6        | Non-coal mining                                       | 0                        | 0     | 0       | 0        | 0         |
|------------|-------------|-------------------------------------------------------|--------------------------|-------|---------|----------|-----------|
| 94         | 18.7        | Mining cavities                                       | 0                        | 0     | 0       | 0        | 0         |
| 94         | 18.8        | JPB mining areas                                      | None (within 0m)         |       |         |          |           |
| 95         | 18.9        | Coal mining                                           | None (within 0m)         |       |         |          |           |
| 95         | 18.10       | Brine areas                                           | None (within 0m)         |       |         |          |           |
| 95         | 18.11       | Gypsum areas                                          | None (within 0m)         |       |         |          |           |
| 95         | 18.12       | Tin mining                                            | None (within 0m)         |       |         |          |           |
| 95         | 18.13       | Clay mining                                           | None (within 0m)         |       |         |          |           |
| Page       | Section     | Radon                                                 |                          |       |         |          |           |
| <b>96</b>  | <b>19.1</b> | <b><u>Radon</u></b>                                   | Less than 1% (within 0m) |       |         |          |           |
| Page       | Section     | Soil chemistry                                        | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| <b>97</b>  | <b>20.1</b> | <b><u>BGS Estimated Background Soil Chemistry</u></b> | 1                        | 1     | -       | -        | -         |
| <b>97</b>  | <b>20.2</b> | <b><u>BGS Estimated Urban Soil Chemistry</u></b>      | 3                        | 9     | -       | -        | -         |
| 98         | 20.3        | BGS Measured Urban Soil Chemistry                     | 0                        | 0     | -       | -        | -         |
| Page       | Section     | Railway infrastructure and projects                   | On site                  | 0-50m | 50-250m | 250-500m | 500-2000m |
| 99         | 21.1        | Underground railways (London)                         | 0                        | 0     | 0       | -        | -         |
| 99         | 21.2        | Underground railways (Non-London)                     | 0                        | 0     | 0       | -        | -         |
| 100        | 21.3        | Railway tunnels                                       | 0                        | 0     | 0       | -        | -         |
| <b>100</b> | <b>21.4</b> | <b><u>Historical railway and tunnel features</u></b>  | 1                        | 0     | 1       | -        | -         |
| 100        | 21.5        | Royal Mail tunnels                                    | 0                        | 0     | 0       | -        | -         |
| <b>100</b> | <b>21.6</b> | <b><u>Historical railways</u></b>                     | 3                        | 2     | 2       | -        | -         |
| 101        | 21.7        | Railways                                              | 0                        | 0     | 0       | -        | -         |
| 101        | 21.8        | Crossrail 1                                           | 0                        | 0     | 0       | 0        | -         |
| 101        | 21.9        | Crossrail 2                                           | 0                        | 0     | 0       | 0        | -         |
| 102        | 21.10       | HS2                                                   | 0                        | 0     | 0       | 0        | -         |



## Recent aerial photograph



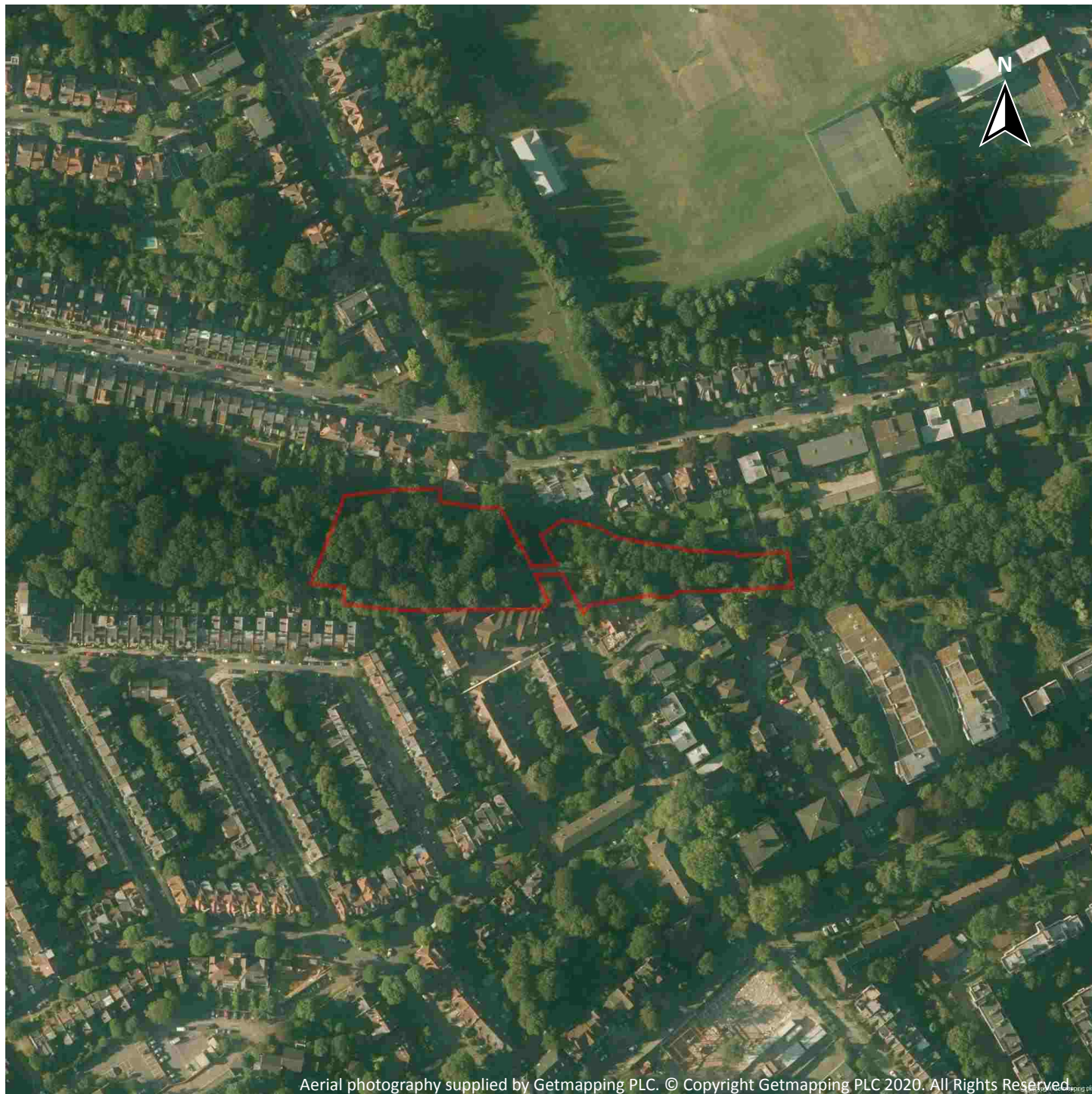
Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2020. All Rights Reserved.

Capture Date: 29/06/2019

Site Area: 0.82ha



## Recent site history - 2016 aerial photograph



Capture Date: 12/08/2016

Site Area: 0.82ha



## Recent site history - 2013 aerial photograph



Capture Date: 20/04/2013

Site Area: 0.82ha



## Recent site history - 2008 aerial photograph



Capture Date: 15/04/2008

Site Area: 0.82ha



## Recent site history - 1999 aerial photograph

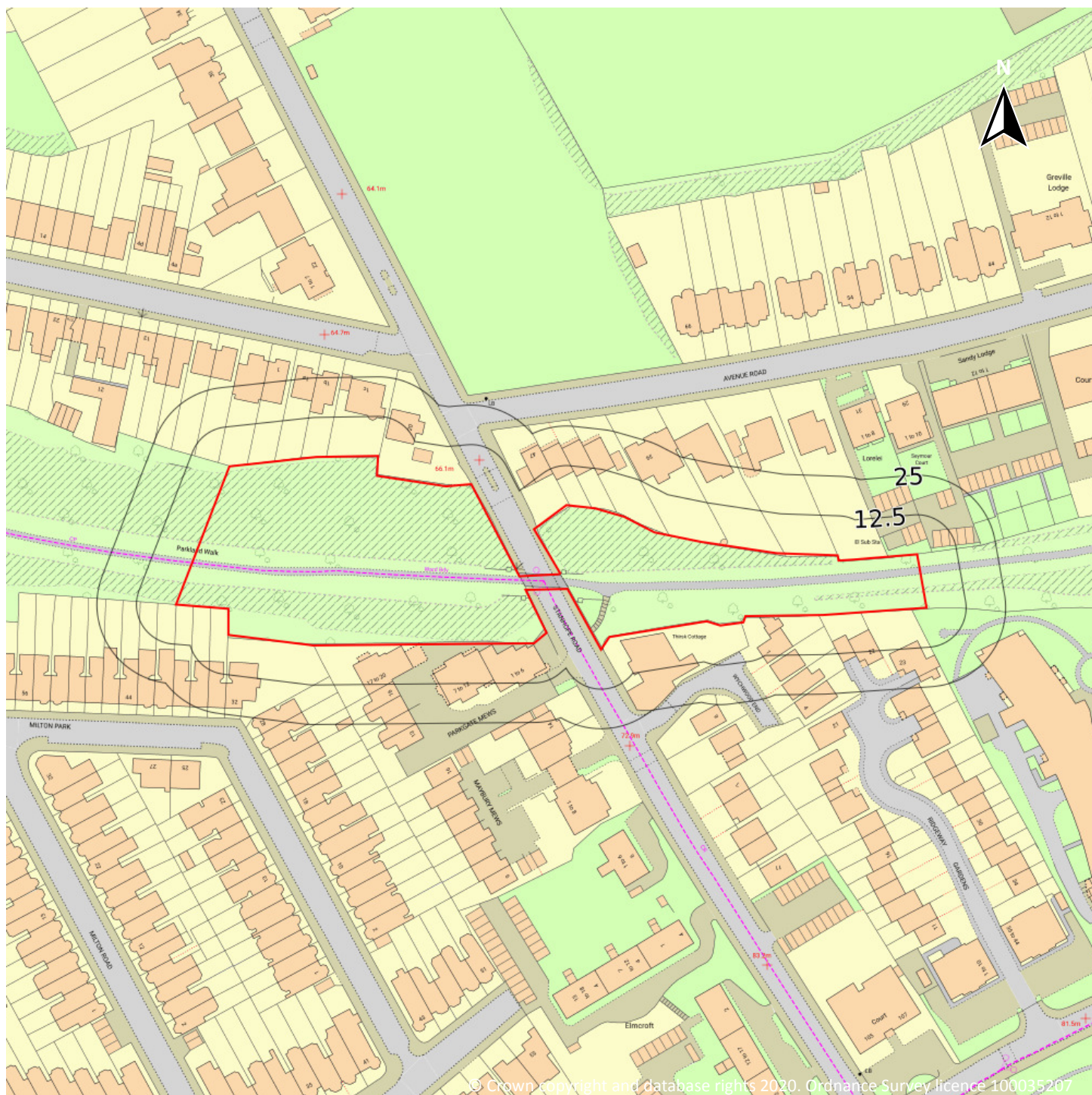


Capture Date: 04/09/1999

Site Area: 0.82ha



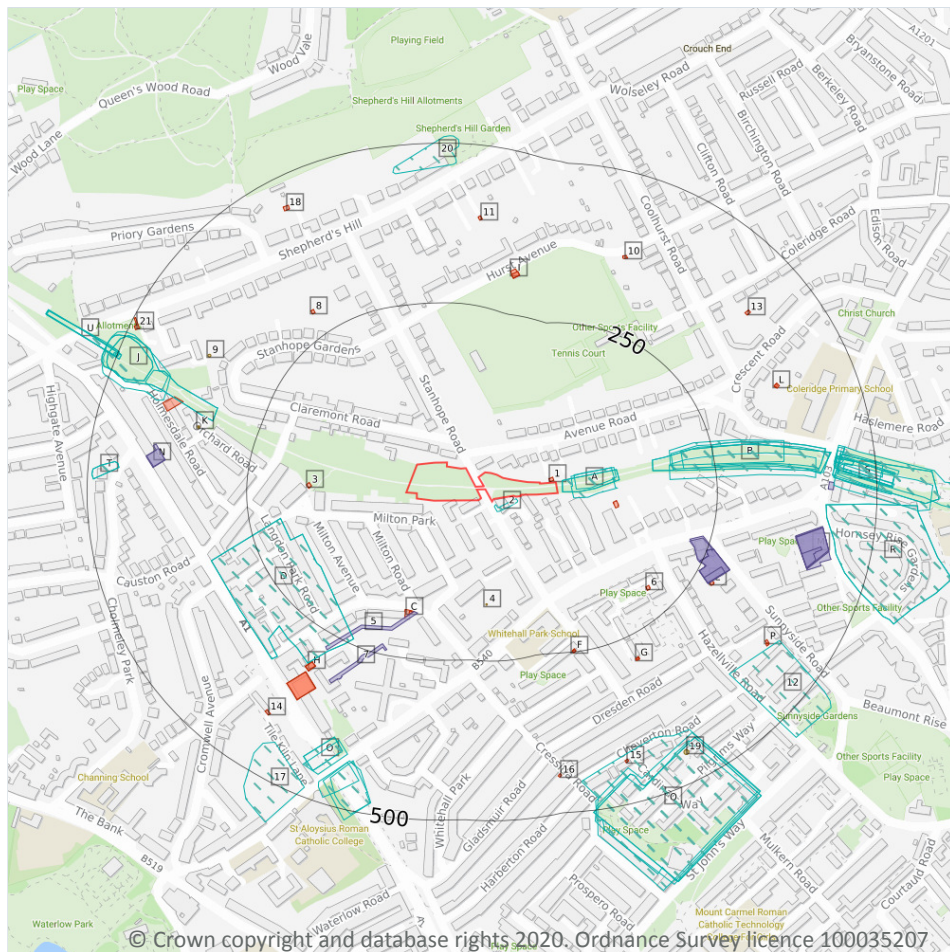
## OS MasterMap site plan



Site Area: 0.82ha



## 1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

### 1.1 Historical industrial land uses

#### Records within 500m

57

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

| ID | Location | Land use                    | Dates present | Group ID |
|----|----------|-----------------------------|---------------|----------|
| 2  | 3m S     | Unspecified Ground Workings | 1949          | 2133663  |



| ID | Location | Land use              | Dates present | Group ID |
|----|----------|-----------------------|---------------|----------|
| A  | 8m E     | Cuttings              | 1869          | 2210358  |
| A  | 8m E     | Cuttings              | 1879          | 2245909  |
| A  | 23m E    | Cuttings              | 1920 - 1938   | 2219657  |
| A  | 30m E    | Cuttings              | 1949          | 2201409  |
| B  | 153m E   | Cuttings              | 1869          | 2266125  |
| B  | 153m E   | Cuttings              | 1879          | 2277260  |
| D  | 175m SW  | Brick Field           | 1879          | 2240003  |
| D  | 175m SW  | Brick Field           | 1869          | 2275407  |
| B  | 177m E   | Cuttings              | 1920          | 2288740  |
| B  | 181m E   | Cuttings              | 1894          | 2271217  |
| B  | 184m E   | Cuttings              | 1938 - 1949   | 2191805  |
| B  | 201m E   | Cuttings              | 1958 - 1996   | 2265669  |
| B  | 246m E   | Railway Sidings       | 1938          | 2128659  |
| J  | 323m W   | Cuttings              | 1879          | 2225193  |
| J  | 323m W   | Cuttings              | 1869          | 2236935  |
| 12 | 391m SE  | Unspecified Workhouse | 1920          | 2152521  |
| O  | 395m S   | Cuttings              | 1949          | 2173404  |
| O  | 395m S   | Cuttings              | 1958          | 2210052  |
| O  | 398m S   | Cuttings              | 1996          | 2250851  |
| J  | 407m W   | Cuttings              | 1894 - 1938   | 2254272  |
| Q  | 412m S   | Unspecified Workhouse | 1938          | 2200400  |
| J  | 413m W   | Cuttings              | 1949          | 2243122  |
| R  | 421m E   | Brick Field           | 1869          | 2219186  |
| R  | 421m E   | Brick Field           | 1879          | 2272780  |
| O  | 423m S   | Cuttings              | 1958 - 1996   | 2268116  |
| O  | 424m S   | Cuttings              | 1894          | 2270394  |
| O  | 427m S   | Cuttings              | 1949          | 2229044  |
| Q  | 430m SE  | Unspecified Workhouse | 1894          | 2224507  |



| ID | Location | Land use                | Dates present | Group ID |
|----|----------|-------------------------|---------------|----------|
| S  | 431m E   | Railway Station         | 1920          | 2282165  |
| S  | 432m E   | Cuttings                | 1949          | 2187070  |
| S  | 432m E   | Cuttings                | 1920          | 2274015  |
| S  | 433m E   | Cuttings                | 1879          | 2181315  |
| S  | 433m E   | Cuttings                | 1869          | 2196394  |
| S  | 435m E   | Railway Station         | 1938          | 2245850  |
| S  | 435m E   | Disused Railway Station | 1965          | 2141244  |
| S  | 435m E   | Railway Station         | 1949          | 2198075  |
| S  | 435m E   | Railway Station         | 1958          | 2205783  |
| S  | 436m E   | Railway Station         | 1894          | 2252529  |
| S  | 439m E   | Railway Station         | 1869          | 2179398  |
| S  | 439m E   | Railway Station         | 1879          | 2280409  |
| Q  | 439m SE  | Unspecified Workhouse   | 1879          | 2226338  |
| Q  | 439m SE  | Unspecified Workhouse   | 1869          | 2294634  |
| Q  | 439m SE  | Unspecified Workhouse   | 1920          | 2261505  |
| S  | 439m E   | Cuttings                | 1894          | 2283320  |
| J  | 441m W   | Cuttings                | 1949          | 2173476  |
| J  | 441m W   | Cuttings                | 1958 - 1996   | 2202529  |
| 17 | 442m SW  | Unspecified Heap        | 1958          | 2136553  |
| T  | 452m W   | Unspecified Pit         | 1879          | 2179929  |
| T  | 452m W   | Unspecified Pit         | 1869          | 2190504  |
| 20 | 456m N   | Unspecified Heap        | 1949          | 2136544  |
| U  | 494m W   | Tunnel                  | 1869          | 2179796  |
| U  | 494m W   | Tunnel                  | 1879          | 2188510  |
| J  | 497m W   | Railway Sidings         | 1938          | 2128661  |
| U  | 499m W   | Tunnels                 | 1958          | 2196692  |
| U  | 499m W   | Tunnels                 | 1965 - 1996   | 2270249  |
| J  | 499m W   | Railway Building        | 1949          | 2149005  |

*This data is sourced from Ordnance Survey / Groundsure.*



## 1.2 Historical tanks

### Records within 500m

**6**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

| ID | Location | Land use         | Dates present | Group ID |
|----|----------|------------------|---------------|----------|
| 4  | 160m S   | Unspecified Tank | 1951 - 1967   | 382364   |
| K  | 340m W   | Unspecified Tank | 1967          | 404496   |
| K  | 340m W   | Unspecified Tank | 1962          | 387989   |
| K  | 340m W   | Unspecified Tank | 1951          | 401960   |
| 9  | 365m NW  | Unspecified Tank | 1896          | 364721   |
| 19 | 449m SE  | Unspecified Tank | 1896          | 364722   |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

### Records within 500m

**31**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

| ID | Location | Land use               | Dates present | Group ID |
|----|----------|------------------------|---------------|----------|
| 1  | 2m N     | Electricity Substation | 1978 - 1997   | 263939   |
| A  | 88m E    | Electricity Substation | 1974 - 1992   | 290140   |
| 3  | 149m W   | Electricity Substation | 1978 - 1997   | 265515   |
| C  | 175m S   | Electricity Substation | 1978 - 1991   | 272313   |
| C  | 176m S   | Electricity Substation | 1997          | 277050   |



| ID | Location | Land use               | Dates present | Group ID |
|----|----------|------------------------|---------------|----------|
| 6  | 202m SE  | Electricity Substation | 1974 - 1992   | 278855   |
| F  | 245m S   | Electricity Substation | 1985 - 1997   | 273334   |
| F  | 246m S   | Electricity Substation | 1978          | 282946   |
| E  | 276m SE  | Electricity Substation | 1974 - 1992   | 290449   |
| G  | 286m SE  | Electricity Substation | 1974 - 1992   | 264285   |
| 8  | 286m NW  | Electricity Substation | 1975 - 1991   | 259183   |
| G  | 287m SE  | Electricity Substation | 1992          | 268556   |
| H  | 303m SW  | Electricity Substation | 1951 - 1991   | 270608   |
| H  | 303m SW  | Electricity Substation | 1997          | 265174   |
| I  | 306m N   | Electricity Substation | 1950 - 1991   | 291293   |
| I  | 307m N   | Electricity Substation | 1950          | 265912   |
| H  | 322m SW  | Electricity Substation | 1997          | 270958   |
| H  | 322m SW  | Electricity Substation | 1951 - 1991   | 265602   |
| 10 | 366m N   | Electricity Substation | 1968 - 1991   | 280892   |
| L  | 373m NE  | Electricity Substation | 1992          | 277555   |
| L  | 374m NE  | Electricity Substation | 1974 - 1992   | 266654   |
| J  | 377m W   | Electricity Substation | 1951          | 245020   |
| 11 | 383m N   | Electricity Substation | 1975 - 1991   | 277542   |
| 13 | 398m NE  | Electricity Substation | 1968 - 1991   | 271055   |
| P  | 399m SE  | Electricity Substation | 1983 - 1992   | 277598   |
| P  | 402m SE  | Electricity Substation | 1992          | 283859   |
| 14 | 404m SW  | Electricity Substation | 1991          | 245022   |
| 15 | 431m S   | Electricity Substation | 1971          | 245024   |
| 16 | 438m S   | Electricity Substation | 1991          | 245025   |
| 18 | 447m NW  | Electricity Substation | 1975 - 1991   | 282790   |
| 21 | 485m NW  | Electricity Substation | 1973 - 1991   | 264860   |

*This data is sourced from Ordnance Survey / Groundsure.*



## 1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

Records within 500m

16

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

| ID | Location | Land use | Dates present | Group ID |
|----|----------|----------|---------------|----------|
| 5  | 176m S   | Garages  | 1951          | 74162    |
| E  | 219m E   | Garage   | 1985 - 1992   | 83950    |
| E  | 220m E   | Garage   | 1992          | 79484    |
| 7  | 234m S   | Garages  | 1951          | 74161    |
| E  | 247m SE  | Garage   | 1967 - 1974   | 84474    |
| E  | 247m SE  | Garages  | 1951          | 74160    |
| E  | 247m SE  | Garage   | 1963          | 78644    |
| E  | 265m SE  | Garage   | 1970          | 74391    |
| M  | 379m E   | Garage   | 1974          | 77388    |
| M  | 379m E   | Garage   | 1967 - 1992   | 84372    |
| M  | 379m E   | Garage   | 1963 - 1992   | 80161    |
| M  | 380m E   | Garages  | 1951          | 74176    |
| N  | 381m W   | Garage   | 1962 - 1996   | 82206    |
| N  | 381m W   | Garage   | 1967          | 76970    |

