



Ruddlesden geotechnical

# Phase 1: Preliminary Geotechnical and Contamination Assessment Report



Teddington Playing Fields, Teddington,  
Greater London

Quantum Land and Property Ltd

October 2016

AC/JW/SR/16325/PGCAR

**REPORT CONTROL SHEET**

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**APPENDIX A PHOTOGRAPHS (4 pages)**

**APPENDIX B DESK STUDY INFORMATION**  
 Historical Ordnance Survey Maps (29 pages)  
 Geological Information (41 pages)  
 Environmental Information (58 pages)  
 Preliminary Unexploded Ordnance Risk Assessment (13 pages)

**APPENDIX C SITE PLANS**  
 Site Location Plan (1 page)  
 Aerial Photograph (1 page)



## EXECUTIVE SUMMARY

**Proposals** It is understood that the northern third of the existing playing fields are to be developed for residential purposes; no further details were provided at the time of writing this report.

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**Site History** Historical Ordnance Survey maps show the site has remained largely undeveloped and used as playing fields/ sports pitches, with the exception of a pavilion, stand and some smaller ancillary buildings, located in the northwest and west of the site.

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**Site Geology** The British Geological Survey (BGS) map of the area indicates the site to be underlain by the Quaternary Kempton Park Gravel Formation. This is shown to be underlain by the Palaeogene London Clay Formation.

A soakaway test investigation has previously been undertaken at the site by Ruddlesden geotechnical ltd in September 2016 (report ref: AC/JW/SR/16325/STR). Ground conditions encountered during the investigation comprised made ground to depths of between 0.65m and 1.20m, underlain by slightly clayey silty sand and gravel (Kempton Park Gravel Formation), to the base of the trial pits, to depths of between 2.40m and 2.60m.

Groundwater was not encountered within any of the trial pits excavated at the site.

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**Foundations** Subject to confirmation by intrusive investigation, providing that made ground is not present to significantly greater depths than was encountered during the soakaway test investigation, traditional strip/ trench-fill foundations should be suitable to support low-rise structures. However, if deep made ground or loose superficial deposits are present beneath the site, piled foundations might be required to support the proposed structures.

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**Soakaways** In-situ soakaway testing showed that the ground has a relatively low permeability, but may be suitable for infiltration/ soakaway drainage, subject to further testing.

In the absence of further testing, on-site attenuation with off-site discharge is likely to provide the most suitable drainage solution.

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**Preliminary Contamination Risk Assessment** Although the site has primarily been used as playing fields/ sports pitches a number of past and present potential sources of contamination have been identified, primarily associated with the former fuel tanks associated with the pavilion and relatively superficial depths of made ground.



**Radon/ Ground Gas**

No radon protection measures are required.

Consideration should be given to the ground gas and hydrocarbon vapour generation potential of the on-site made ground once the extent and nature of the material has been confirmed as part of the intrusive investigation (see below).

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**Further Work**

An intrusive ground investigation is recommended for both contamination and geotechnical purposes.

A combination of both windowless sample boreholes and machine-excavated trial pits is considered to be the most appropriate investigation method at this site.

The preliminary unexploded ordnance risk assessment (Appendix B) has indicated an overall High risk from UXO at the site. As such, it is recommended that exploratory positions be cleared by a specialist UXO surveyor, such as BACTEC Ltd, prior to excavation.

For geotechnical purposes, representative samples should be taken and tested for plasticity classification, to determine volume change potential, and pH and soluble sulphate, to determine the concrete class required for buried concrete.

For contamination purposes, soil samples should be taken from the most likely areas of contamination. Soil samples should also be taken from the natural soils to ascertain the potential for contaminant migration beneath the site.

Should groundwater be encountered, this should also be sampled and tested to assist in the assessment of the risks to the water environment.

In addition, contamination laboratory testing will assist in classifying the soils for off-site disposal purposes and provide information for water supply pipe selection.

**This executive summary is to be read in conjunction with, and not in isolation from, the full report text and appendices.**



# 1 INTRODUCTION

## 1.1 General

It is proposed to develop the northern third of the existing Teddington Playing Fields, Teddington, for residential purposes.

In order to gain background information to aid the design and construction of the new development, a Phase 1: Preliminary Geotechnical and Contamination Assessment has been undertaken which included the study of historical Ordnance Survey maps, geological maps, environmental information, geological information, a preliminary unexploded ordnance risk assessment and a walkover survey.

A soakaway test report has previously been undertaken at the site by Ruddlesden geotechnical Ltd in September 2016 (report ref: AC/JW/SR/16325/STR), the salient findings of which are detailed within this report.

The investigation was undertaken in September 2016 and carried out by Ruddlesden geotechnical Ltd, acting on behalf of Quantum Land and Property Ltd.

## 1.2 Development Proposals

It is understood that the northern third of the existing playing fields is to be redeveloped for residential purposes. No further details were available at the time of writing this report.

## 1.3 Scope of Investigation

The investigation covers geotechnical and contamination aspects relating to the development. The brief was understood to comprise the following:

- Study historical, geological and environmental information relating to the site.
- Obtain a preliminary unexploded ordnance (UXO) risk assessment.
- Undertake a walkover survey of the site.
- Make preliminary recommendations for foundations and associated structures.
- Comment on any other geotechnical matters arising from the investigation.
- Produce a conceptual site model, incorporating relevant findings from the recent soakaway investigation (report reference AC/JW/SR/16325/STR).
- Undertake a preliminary contamination risk assessment.
- Undertake a preliminary ground gas assessment.
- Provide recommendations for further investigation.

## 1.4 Scope of Report

The report is presented as a description of the data obtained. This is followed by an interpretation and discussion of the results together with preliminary engineering recommendations for foundation design, a conceptual model of the site and preliminary contamination risk assessment. The final part of the report comprises proposals for any intrusive investigation required.

The presence of asbestos containing materials (ACM) within buildings and invasive plants are outside the scope of this report and should be addressed by respective suitably qualified experts, if necessary.



## 2 THE SITE

### 2.1 Site Location

The site is located at Teddington Playing Fields, Teddington, Greater London, see Appendix C (Dwg. Nos. 16325/01 and 16325/AP). The British National Grid Reference of the site is 516451, 170838, and the nearest postcode is TW11 9HL.

The site is located within a predominantly residential area, approximately in the centre of the town of Teddington, in the London Borough of Richmond upon Thames. Access to the site is gained via Udney Park Road, to the west of the site.

### 2.2 Site Description

The site is roughly rectangular in shape, measuring approximately 200m x 280m, and is generally flat and level.

The site comprises a large recreational sports field, together with a tennis court, clubhouse building and other small ancillary structures, including a car parking area.

The sports field comprises mowed grass at the surface and is currently split into a series of football, rugby and cricket pitches.

The clubhouse is located in the west of the site and comprises a two-storey (and locally one-storey) building of brick construction with a tiled pitched roof. Two above ground fuel storage tanks, understood to contain diesel, were observed within a brick extension to the northwest of the clubhouse building. The tanks were of metal construction, were situated within a brick and concrete bund and were in moderate condition. However, some minor stains and spillages were noted within the areas surrounding the tanks. It is understood that the tanks were historically used to fuel a boiler within the clubhouse building, although this boiler has since been removed and the tanks are no longer used.

The car parking area is located within the west of the site, to the south of the clubhouse building, and comprises loose gravel at the surface. A storage building is located within the northeast of the car parking area and is of concrete block construction with a corrugated metal roof. The building is currently used for the storage of paints/ line markers and small quantities of oils/ lubricants and fuels. It is of note that some of the paint containers were located upon a poly-spill containment pallet, although some minor spillages of paint were observed around the outside of the pallet.

The tennis court is located within the southwest corner of the site and comprises artificial grass at the surface. A series of large manhole covers were observed within the south of the site, adjacent to the east of the tennis court. Anecdotal evidence (personal communications with the groundsman) suggests that these covers are associated with a large water main.

Numerous trees and hedgerows, no taller than approximately 20m in height, are located at the site, predominantly around the site's perimeter.

The site is bordered to the north and southwest by residential properties and to the east, south and west by Kingston Lane, Cromwell Road and Udney Park Road, respectively, before residential properties.

Photographs of the site are presented in Appendix A of this report.



## 3 DESK STUDY

### 3.1 General

A desk study was undertaken, comprising the consultation of:

- Old Ordnance Survey maps.
- Geological maps and information.
- Environmental information.
- Preliminary unexploded ordnance risk assessment.
- Previous investigation.

This information was used to produce a “conceptual site model”.

### 3.2 Site History

A full set of historical Ordnance Survey maps of the site was obtained as part of the desk study (Appendix B of this report). The salient points are listed below:

**1864** The site is shown to be undeveloped and includes parts of three fields.

Udney Farm is shown to be located immediately beyond the southeast corner of the site and Kingston Lane is shown adjacent to the site's eastern boundary.

In addition, further afield, the London and South Western Railway (Kingston Line) is present around 210m to the southwest.

**1896-1915** The site remains undeveloped, however; two small copses are shown in the centre and southwest of the site.

Cromwell Road and Udney Park Road are shown to have been constructed, to the south and west of the site, respectively, and some residential developments are shown beyond the site peripheries.

Orchards are also shown to be present to the west of the site, beyond Udney Park Road.

On 1915 mapping, a small rectangular building is shown in the northern third of the site, the use of which is unclear. In addition, significant residential development has taken place in the surrounding area.

**1934** The site is labelled as a sports ground.

A rectangular building, labelled as a pavilion, is present within the northwest corner of the site. A small circular structure is present immediately to the north of the pavilion, potentially resembling an above ground fuel storage tank.

In addition, a long rectangular building and a smaller associated structure are present on the western side of the site.

Tennis courts are present immediately to the north.

**1958-1959** The site is labelled as St Mary's Hospital Medical School Athletic Ground.





The pavilion building within the northwest of the site appears to have been extended. The small circular structure adjacent to the north of the pavilion is now shown to be rectangular.

An additional smaller structure is also present to the north of the long rectangular building on the western side of the site.

Udney Farm has been redeveloped into domestic dwellings.

The railway line, to the southwest of the site, appears to have been dismantled. Additionally, a garage and telephone exchange are mapped approximately 100m northwest of the site. A works is located ~100m to the west.

**1973-1978** The site remains largely unchanged, however, the pavilion building appears to have been extended again. The small structure (resembling an above ground storage tank) that was present to the north of the pavilion is no longer present.

A builders yard is now present 100m northwest of the site. The garage is no longer shown.

The long rectangular building on the western side of the site is labelled as a stand.

**1991-2014** The site remains largely unchanged. The stand present on the western side of the site is no longer present; two smaller structures are shown in a similar position until 2010, after which only a single structure is present.

In summary, the site has remained largely undeveloped and used as playing fields/sports pitches, with the exception of a pavilion and stand as well as some smaller ancillary buildings located in the northwest and west of the site.

### 3.3 Site Geology

The British Geological Survey (BGS) map of the area indicates the site to be underlain by the Quaternary Kempton Park Gravel Formation, which is described as 'sand and gravel, locally with lenses of silt, clay or peat'.

This is shown to be underlain by the Palaeogene London Clay Formation, which is described as bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay.

An area of 'worked ground or made ground' is shown around 235m to the southeast of the site.

The key geological information contained within the Groundsure Geo Insight report is listed below:

- There are no records of artificial/ made ground on-site, however, an area of 'worked ground or made ground' is shown 235m to the southeast.
- There are no recorded landslips within 500m of the site.
- There are no recorded geological faults within 500m of the site.
- The nearest recorded historical ground working is 219m to the south of the site: unnamed pond/ waterbody; mapped in 1894-1938.
- There are no current ground workings recorded within 250m of the site.



- There are no historical mine workings recorded within 250m of the site.

A published historical BGS borehole record carried out approximately 15m to the south of the site, which is considered to be the most characteristic of the ground conditions likely to be present at this site, encountered the following ground conditions:

- MADE GROUND, to a depth of 0.60m, underlain by...
- Interbedded sandy clay and gravel, to a depth of 6.70m, underlain by...
- Brown and blue clay, to the termination of the borehole at around 42.0m depth
- Groundwater was not encountered.

### 3.4 Environmental Information

The key environmental information contained within the Groundsure Enviro Insight report (Appendix D of this report) is listed below:

- There are no recorded pollution incidents within 500m of the site.
- There are no registered landfill sites within 1km of the site.
- There are no historical landfill sites recorded within 500m of the site.
- There are 31 records of historical potentially contaminative industrial land uses within 250m of the site. Those considered to be of significance are detailed below:
  - Unspecified pit, 85m to the west.
  - Railway sidings, between 171m and 229m to the southwest.
  - Smithies, between 175m and 250m to the northwest.
  - Nursery, between 231m and 238m to the northeast.
- There are two records of historical tanks within 250m of the site:
  - On site, unspecified tank, mapped 1934; likely referring to the small circular feature shown immediately to the north of the pavilion.
  - 46m west, unspecified tank, mapped 1994.
- There are 14 records of historical energy features (electricity substations) between 90m and 246m of the site.
- There are 19 records of historical garage and motor vehicle repair premises (likely relating to only three separate locations) within 250m of the site:
  - Garage, 67m to the northwest, mapped 1959.
  - Garage, between 141m and 155m to the north, mapped between 1959 and 1991.
  - Garage, 181m to the north, mapped between 1958 and 1991.
- There are ten records of potentially infilled land (likely relating to only two locations) within 250m of the site:
  - Unspecified pit, 85m to the west, mapped in 1938.
  - Water body/ ponds, between 212m and 222m to the south, mapped between 1894 and 1938.
- There are 20 records of potentially contaminative industrial land uses within 250m of the site, the most significant of which are:
  - Vehicle repair, testing and servicing (Meades Motors), 187m to the north.
  - General construction supplies (Focus Metals Ltd), 189m to the northwest.
  - Unspecified works or factories (works), 210m to the northwest and 217m to the north.
  - Vehicle repair, testing and servicing (Apollo Garage), 231m to the northwest.
  - Unspecified works or factories (works), 236m to the northwest and 217m to the north.



- There are no records of current or historical petrol or fuel sites within 250m.
- The underlying superficial strata are classified as a Principal Aquifer. This is geology of high intergranular and/ or fracture permeability, usually providing a high level of water storage and may support water supply/ river base flow on a strategic scale.
- The underlying bedrock strata are classified as Unproductive. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
- The nearest (historical) groundwater abstraction point is 325m to the northeast of the site: Borehole at the Lensbury Club, Teddington.
- There are no active groundwater abstraction points recorded within 2km of the site.
- The nearest surface water abstraction point is 1573m to the southeast of the site: River Thames at former Kingston Power Station.
- There are no recorded potable water abstraction points within 2km of the site.
- There are no recorded Source Protection Zones (SPZ) within 500m of the site.
- The soils are classified as having a high leaching potential. These are soils assumed to be highly permeable in the absence of site-specific information.
- There are no surface water features within 250m of the site.

### 3.5 Radon

Site-specific radon information, contained within the desk study information, and British Geological Survey (BGS) data indicate that less than 1% of homes are above the Radon Action Level and that no radon protective measures are required in the construction of new dwellings.

### 3.6 Preliminary Unexploded Ordnance Risk Assessment

Information obtained from *Dynasafe BACTEC Ltd* (presented in Appendix B of this report) indicate that the borough within which the site is situated sustained an overall high density of bombing during World War II. Furthermore, a bomb strike was recorded within 50m of the site on the London ARP Bomb Census Maps.

The preliminary risk assessment has resulted in an overall High risk from UXO at the site.

### 3.7 Previous Investigation

A soakaway test investigation has previously been undertaken at the site by Ruddlesden geotechnical ltd in September 2016 (report ref: AC/JW/SR/16325/STR). This report should be consulted for further information, although for clarity, the salient points are detailed below.

Three trial pits were excavated to depths of between 2.40m and 2.60m below existing ground level in the northern third of the playing fields (area of proposed development).

Topsoil was encountered to depths of between 0.20m and 0.30m, underlain by made ground, predominantly comprising sandy gravelly silt and gravelly sand, to depths of between 0.65m and 1.20m.

The made ground was underlain by slightly clayey silty sand and gravel (Kempton Park Gravel Formation), to the base of the trial pits, to depths of 2.40m and 2.60m.



Water level falls of between 0.28m and 0.55m were recorded over the duration of the testing, which was undertaken up to a maximum of 321 minutes.

Groundwater was not encountered within any of the trial pits excavated at the site.



## **4 PRELIMINARY GEOTECHNICAL ASSESSMENT**

### **4.1 Proposals**

It is understood that the northern third of the existing playing fields is to be redeveloped for residential purposes. No further details were provided at the time of writing this report.

### **4.2 Ground Profile**

The consultation of historical maps shows the site to have remained largely undeveloped, with the exception of the existing pavilion building and a former stand located on the western side of the site, associated with the site's general use as playing fields/ sports pitches.

Some localised made ground could be expected as a result of these previous developments, i.e. to create a level playing field.

From the published information, the expected underlying geology is the Quaternary Kempton Park Gravel Formation to a depth of between 6.0m and 7.0m, beneath which the London Clay Formation is expected.

The ground conditions encountered in the soakaway test investigation, as described in Section 3.7 above, confirm the presence of the Quaternary Kempton Park Gravel Formation. The investigation also indicated that made ground is more widespread than the previous lack of development of the site would indicate, likely as a result of formation and levelling of the playing fields, and extends to depths of between 0.65m and 1.20m below existing ground level.

The trial pitting revealed the Kempton Park Gravel Formation to comprise slightly clayey silty sand and gravel. The underlying London Clay is anticipated to comprise stiff fissured silty clay with subordinate partings of sandy silt.

It is considered that the Quaternary Kempton Park Gravel Formation will provide a suitable founding stratum for the adoption of strip/ trench-fill foundations for low-rise (two to three storey) structures.

No groundwater was encountered during the recent soakaway testing, or in the borehole previously undertaken to the south of the site. Groundwater is therefore anticipated to lie at depths of greater than 5m below existing site levels. It is possible that groundwater is locally perched within the gravels overlying the London Clay.

### **4.3 Preliminary Foundation Recommendations**

#### **4.3.1 General**

Subject to confirmation by intrusive investigation, providing that made ground is not present to significantly greater depths than was encountered during the soakaway test investigation, traditional strip/ trench-fill foundations should be suitable to support low-rise (two to three storey) structures. However, if deep made ground/ loose superficial deposits are present beneath the site, piled foundations might be required to support the proposed structures.



### 4.3.2 Strip/ Trench-Fill Foundations

Subject to confirmation by in-situ strength testing, strip or trench-fill foundations seated in the natural Quaternary Kempton Park Gravel Formation may be suitable.

Foundations must be built at least 0.20m below any superficial soft/ loose deposits and made ground.

Given the expected thickness of the Quaternary Kempton Park Gravel Formation, it is unlikely that foundations will need to be deepened where building near trees in accordance with NHBC Standards, Chapter 4.2, as the soils are anticipated to be non-shrinkable.

### 4.3.3 Ground Floor Slabs

Where the depth of made ground is more than 600mm, fully suspended ground floor slabs are required.

Where the depth of made ground is less than 600mm, ground bearing slabs may be suitable.

### 4.3.4 Radon Protection Measures

BRE Report 211 "Radon: Guidance on Protective Measures for New Dwellings" and British Geological Survey (BGS) information obtained as part of the desk study (Appendix B of this report) indicate that no radon protection measures are required.

## 4.4 Soakaways

As aforementioned, a soakaway test report has previously been undertaken at the site by Ruddlesden geotechnical ltd in September 2016 (report ref: AC/JW/SR/16325/STR).

The results of the soakaway testing indicated the ground to have a relatively low permeability. It was therefore considered that the use of soakaways for surface water drainage might be suitable, although any soakaways would necessarily be quite large.

It was concluded that, if limited space were available at the site to accommodate (relatively large) soakaway drains, on-site attenuation combined with off-site discharge would likely provide the most suitable drainage solution at this site.

If soakaways were still considered to be the preferred means of surface water drainage, it was recommended that further testing be undertaken in full accordance with BRE DG 365 (i.e. three times at each location), at the location and depth of any proposed soakaways.



## 5 PRELIMINARY CONTAMINATION ASSESSMENT

### 5.1 General

It is understood that approximately the northern third of the existing playing fields are to be developed for residential purposes; no further details were provided at the time of writing.

The preliminary assessment has been carried out in accordance with the latest guidance using a source-pathway-receptor analysis method, to assess whether or not the recorded levels of contamination are safe and suitable for use and to determine the extent of any further assessment or remedial measures that might be necessary. In particular, reference has been made to the following documents:

- Defra (2014): SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report.
- Defra (2014): SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Policy Companion Document.
- Defra & Environment Agency (2004): CLR 11: Model Procedures for the Management of Land Contamination.
- Defra (2012): Environmental Protection Act 1990: Part 2A: Contaminated Land Statutory Guidance.
- Department for Communities and Local Government (2012): National Planning Policy Framework.
- Environment Agency (2005): The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils.
- Environment Agency (2006): Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination.
- Environment Agency (2009): Human Health Toxicological Assessment of Contaminants in Soil (SR2).
- Environment Agency (2009): Updated Technical Background to the CLEA Model (SR3).
- LQM/ CIEH (2015): The LQM/ CIEH S4ULs for Human Health Risk Assessment. Publication No. S4UL3408.

### 5.2 Conceptual Site Model

#### 5.2.1 Source

Although the site has been primarily used as playing fields/ sports pitches, a number of past and present on-site features have been identified that could potentially result in localised areas of contamination.

A potential source of on-site contamination is considered to be the two above ground fuel storage tanks within a brick extension to the northwest of the clubhouse/ pavilion building. The tanks are understood to have historically contained diesel used to fuel a boiler within the clubhouse building, although this boiler has since been removed and the tanks are no longer used.

The tanks were of metal construction, were in moderate condition, and were situated within a brick and concrete bund. However, some minor stains and spillages were noted within the areas surrounding the tanks.



It is considered, however, that any contamination of the ground resulting from the tanks is likely to be highly localised, and therefore unlikely to have caused widespread contamination of the ground beneath the site.

In addition, some potential former fuel tanks were identified on the historical maps to the north of the pavilion; however, these appear to have been removed during the 1950s.

A storage building is located within the northeast of the car parking area, located on the western side of the site. The building is currently used for the storage of paints/ line markers and small quantities of oils/ lubricants and fuels. It is of note that some of the paint containers were located upon a poly-spill containment pallet, although some minor spillages of paint were observed around the outside of the pallet.

Made ground was encountered across the site during the soakaway test investigation, as discussed in Section 3.7. The made ground was present to depths of between 0.65m and 1.20m and contained some anthropogenic material, including brick, metal, glass, ceramics, and occasionally charcoal fragments. Made ground of unknown origin has the potential to be generically contaminated, which might include asbestos containing materials.

A number of existing off-site potential sources of contamination have been identified within 250m of the site. The most significant potential sources comprise vehicle repair garages and factories, located between 187m and 236m from the site.

Garages and factories are a potential source of contamination of the ground. The main source of potential contamination is normally leakages from tanks containing fuel or industrial chemicals; a small leak that goes undetected for any significant length of time can cause significant contamination of the ground. Significant contamination is more associated with older tanks as they tend to be less well constructed than newer tanks, which are also now monitored for discrepancies between input and output rates.

However, given the distance of these potential sources from the site, it is considered unlikely that significant contamination will be present beneath the site as a result.

There are numerous recorded past potentially contaminative land uses within 250m of the site, including garages, smithies, railway sidings and nurseries; the closest being a former garage 67m to the northwest, mapped in 1959.

As described above, former garages and older industrial sites are generally more prone to contamination of the ground than their modern equivalents. However, due to the age and distance of these potential sources from the site, it is considered unlikely that any significant widespread contamination would remain, and therefore the risk posed to the site is considered to be low.

Furthermore, any contamination resulting from the former smithies, nurseries and railway sidings is likely to be highly localised, and is not considered to present a risk to the site.

The nearest recorded historical energy feature, an electricity substation, is 90m to the southeast of the site. Older electricity substations can cause polychlorinated biphenyl (PCB) contamination. However, given the extremely localised nature of this type of potential contamination, and the distance of the substation from the site, it is considered that no significant contamination of the ground beneath the site is likely to have occurred as a result.





A number of instances of potentially infilled land have been identified within 250m of the site that are considered to be potential sources of ground gas (carbon dioxide and methane); the nearest is 85m to the west (mapped 1938) and the largest is an infilled water body around 220m to the south (mapped 1938).

Given the age of the pavilion and associated developments, it is possible that some asbestos containing materials (ACM) may be present on and/ or within the soil at this site.

### 5.2.2 Pathway

In accordance with the CLEA model, a residential with home grown produce land use is considered to be most appropriate for this development and has been used in this risk assessment. The following exposure pathways potentially linking contamination to humans have been considered:

- Direct soil and indoor dust ingestion.
- Consumption of homegrown produce.
- Consumption of soil adhering to homegrown produce.
- Skin contact with soils and indoor dust.
- Inhalation of indoor and outdoor dust and vapours.

If present, groundwater flow within the made ground and Kempton Park Gravel Formation is considered to be the main migration pathway linking any on-site contamination to the water environment and any off-site contamination to the site.

Similarly, matrix flow within the made ground/ Kempton Park Gravel Formation is considered to be the most likely ground gas migration pathway.

### 5.2.3 Receptor

As a residential land use, end users are considered as potential receptors of any contamination, with a young female child (aged zero to six years old), being the critical receptor.

There are no recorded potable abstraction points within 2km of the site and no surface water features within 250m. Therefore, groundwater beneath the site (Kempton Park Gravel Principal Aquifer) is considered to be the main potential controlled waters receptor.

## 5.3 Discussion and Recommendations

In order for land affected by contamination to cause harm, there must be a source of contamination, a receptor that can be harmed and a pathway by which the receptor can be exposed to the contamination.

The results of this preliminary contamination risk assessment indicate there to be a moderate risk of contamination resulting from the made ground encountered across the site during the soakaway test investigation. In addition, it is considered that some localised areas of contamination may be present in close proximity to existing and former site features, including the tanks associated with the pavilion and the chemical storage in the car park.

It is considered, however, that any significant contamination is likely to be confined to the near surface soils and/ or made ground, though the possibility of deeper contamination, potentially affecting the water environment should not be discounted.



Intrusive investigation (see section 6 of this report) is required to determine which parts of the source-pathway-chain actually exist, and to what extent remedial measures are likely to be necessary.

Precise remedial recommendations will depend on the extent and nature of contamination, though for the most part, it is considered likely that the majority of contamination will be able to be dealt with by means of breaking the source-pathway-receptor chain, such as isolating end users from contamination by means of a covering of hard-standing or the incorporation of a clean soil capping layer/capillary break layer/ geotextile membrane, for example.

If the intrusive investigation works show there to be a risk to controlled waters or particularly heavy contamination to be present, however, removal or treatment of the contamination source may be a more appropriate remedial technique.

As well as determining which parts of the source-pathway-receptor chain are present with respect to human health and controlled waters, the intrusive investigation will also need to consider the presence of potentially hazardous soils, e.g. those contaminated with asbestos, for off-site disposal purposes and to confirm the water supply pipe requirements for the local water authority.

Further intrusive investigation is also recommended to provide information for the design of foundations and associated structures (see section 6).

#### **5.4 Preliminary Ground Gas Assessment**

The desk study information indicates that no radon protective measures are required at this site.

In order to assess the risks posed by ground gas, the principles outlined in BS 8485 (2015) "Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings" and NHBC Report No. 10627-RO1 (2007) "Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present" have been followed.

There are no recorded landfill sites within 250m of the site. However, a significant thickness of made ground was encountered across the site during the soakaway test investigation. Some biogenic materials may exist within the made ground, the ground gas generation potential of which should be considered as part of any future intrusive investigation.

The breakdown of organic material in made ground can produce ground gas, though it may also be produced by other, natural, sources (e.g. coal, peat). The principal components of ground gas are methane (potentially explosive) and carbon dioxide (potential asphyxiant).

A number of instances of potentially infilled land have been identified within 250m of the site that are considered to be potential sources of ground gas; the nearest is 85m to the west (mapped 1938) and the largest is an infilled water body around 220m to the south (mapped 1938). Given the distance of these potential ground gas sources from the site, and their age, it is not expected that significant quantities of ground gas would still be being generated (if at all), no significant ground gas would be anticipated to be present beneath the site as a result of these potential sources.

However, further consideration should be given to the ground gas and hydrocarbon vapour generation potential of the on-site made ground once the extent and nature of the material has been confirmed as part of the intrusive investigation.



## 6 PROPOSED INTRUSIVE INVESTIGATION

In order to confirm the above preliminary recommendations, an intrusive ground investigation is required, for both contamination and geotechnical purposes.

A combination of both windowless sample boreholes and machine-excavated trial pits is considered to be the most appropriate investigation method at this site.

The preliminary unexploded ordnance risk assessment (Appendix B) has indicated an overall High risk from UXO at the site. As such, it is recommended that exploratory positions be cleared by a specialist UXO surveyor, such as BACTEC Ltd, prior to excavation.

Windowless sample boreholes allow Standard Penetration Testing (SPTs) to be carried out to provide quantitative strength information of the anticipated underlying granular deposits for use in foundation design.

Depending on site observations, it is recommended that some of the boreholes be installed with ground gas/ groundwater monitoring wells. Subsequent monitoring might be recommended to confirm the expected absence of significant levels of ground gas and confirm the groundwater levels across the site for foundation design.

Trial pits enable a large volume of the ground to be inspected in-situ and samples to be recovered for geotechnical and chemical laboratory analysis.

For geotechnical purposes, representative samples should be taken and tested for plasticity classification, to determine volume change potential, and pH and soluble sulphate, to determine the concrete class required for buried concrete.

For contamination purposes, soil samples should be taken from the most likely areas of contamination. The most likely sources of contamination are detailed in Section 5.2.1 of this report. Soil samples should also be taken from the natural soils to ascertain the background levels of contamination within the soil.

Should groundwater be encountered, this should also be sampled and tested to assist in the assessment of the risks to the water environment.

To enable quantitative contamination risk assessments to be undertaken, samples should also be taken and tested for the following suites of contaminants: heavy metal suite; speciated polycyclic aromatic hydrocarbons (PAH); total petroleum hydrocarbons (TPHs); soil organic matter (SOM); asbestos, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs).

This new data would enable human health and controlled waters risk assessments to be undertaken so that appropriate remedial measures, if any, may be proposed.

In addition, contamination laboratory testing will assist in classifying the soils for off-site disposal purposes and provide information for water supply pipe selection.



## 7 REFERENCES

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- NHBC (2007): Report No 10627-RO1: Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present.



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4. The comments given in this report assume that ground conditions do not vary beyond the range revealed by the investigation. There may, however, be conditions at or adjacent to the site that have not been disclosed by the investigation and which, therefore, have not been considered in this report. Accordingly, a careful watch should be maintained during any future groundworks and the recommendations of this report reviewed as necessary.
5. Whilst confident in the findings of the report, the recommendations may not necessarily be accepted by other authorities without question. It is advisable that, where appropriate, the report be submitted to the relevant statutory authorities and approval obtained before detailed design, site works or other irrevocable action is undertaken.
6. All comments and recommendations are based on groundwater conditions encountered at the time of investigation. It should be noted that groundwater levels might fluctuate according to the season and from year to year. This may have implications on other recommendations, including foundations and excavations.
7. All third party data referred to in the report, e.g. environmental searches and laboratory testing, has been obtained in good faith from bona fide sources. Ruddlesden geotechnical Ltd cannot be held liable for any incorrect information supplied to us.



## APPENDICES



## **APPENDIX A**

### **PHOTOGRAPHS**





**Plate 1**

The west of the site and pavilion, viewed from the northeast.



**Plate 2**

Cricket nets in the northeast corner of the site.







**Plate 3**

The east of the site, viewed from the north.



**Plate 4**

The pavilion, viewed from the north.





**Plate 5**

Rear of the pavilion, including tank room, viewed from the southwest.



**Plate 6**

Former fuel tanks at the rear of the pavilion.





**Plate 7**

Interior of storage building in the car park.



**Plate 8**

Stand on west side of the site, viewed from the east.



## **APPENDIX B**

### **DESK STUDY INFORMATION**



## **HISTORICAL ORDNANCE SURVEY MAPS**



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**Report Ref:** HMD-411-3246241  
**Grid Ref:** 516470, 170850

**Map Name:** County Series

**Map date:** 1864

**Scale:** 1:2,500

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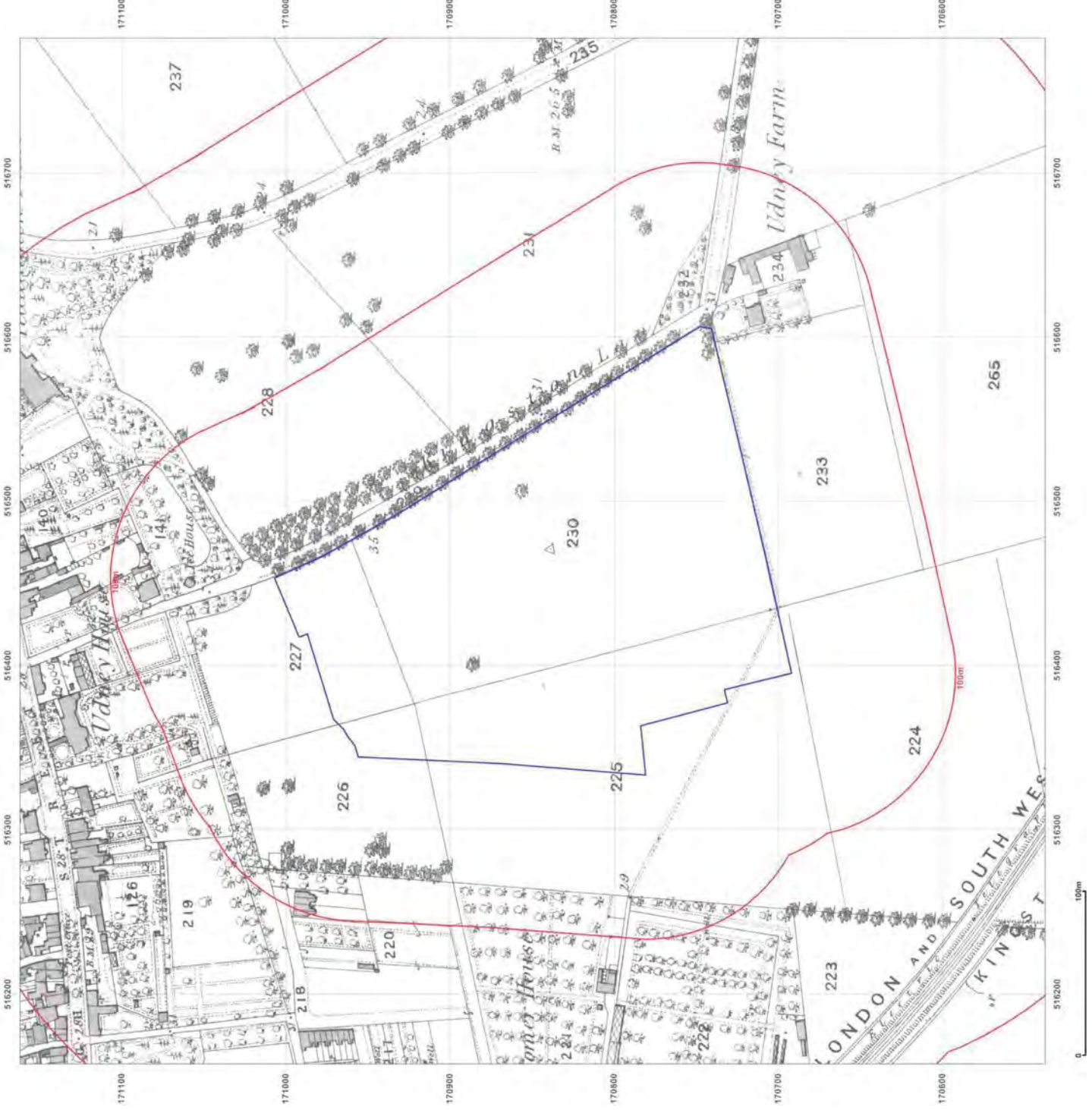


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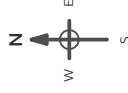
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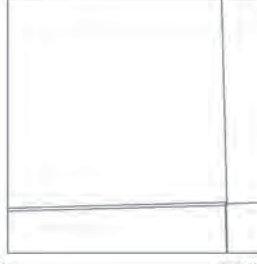
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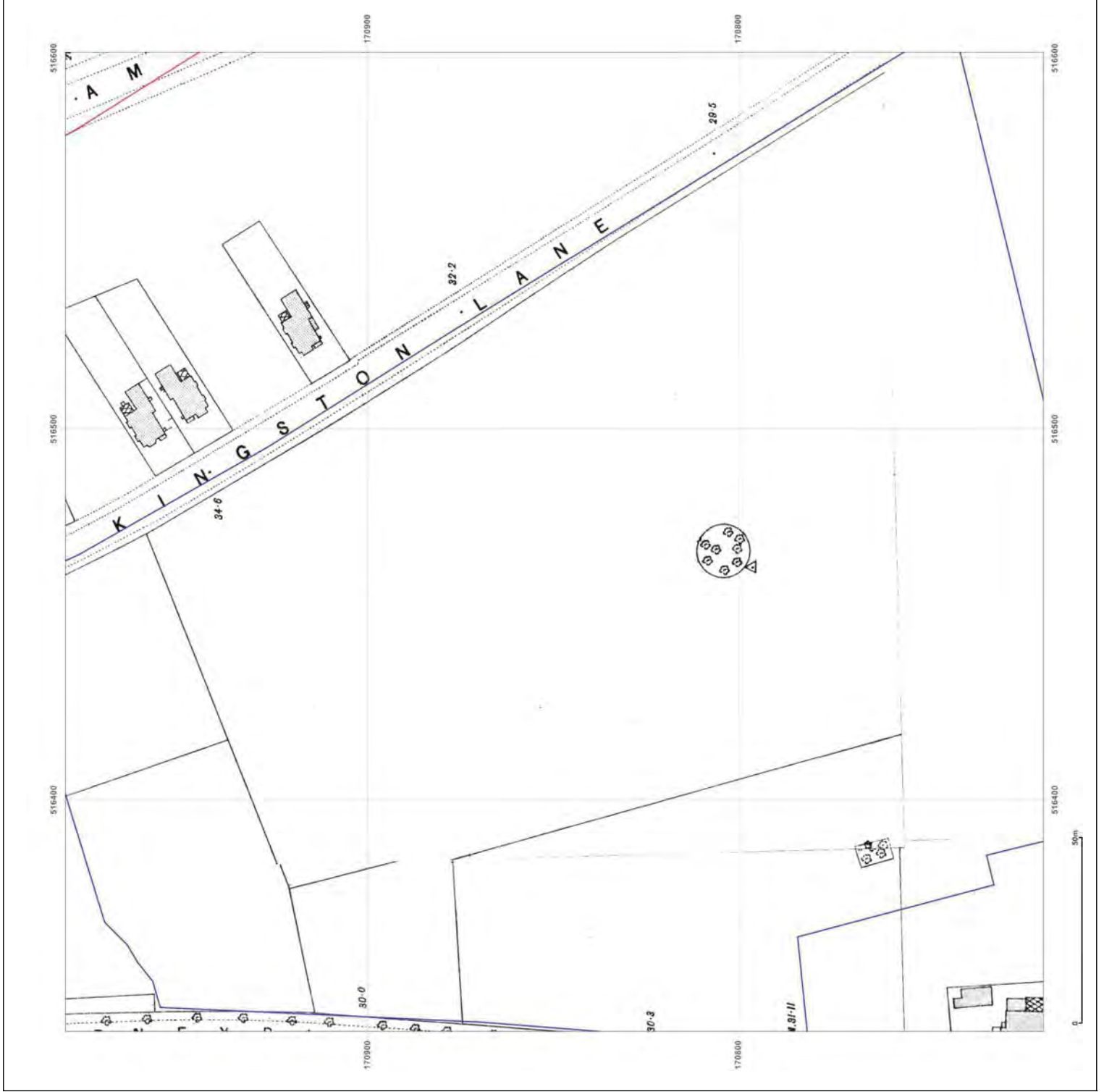


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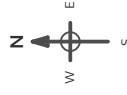
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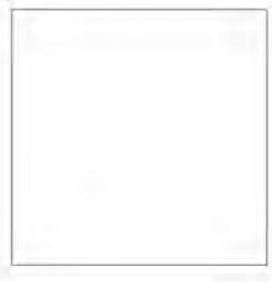
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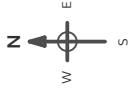
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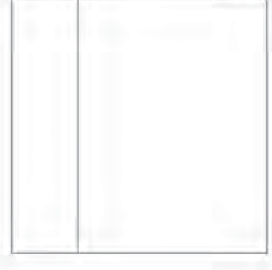
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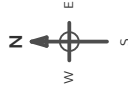
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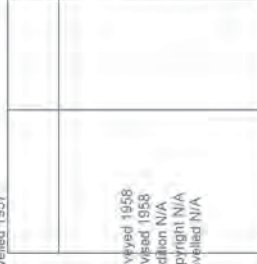
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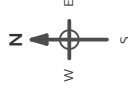
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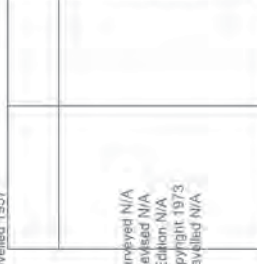
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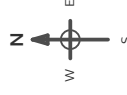
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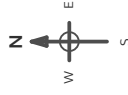
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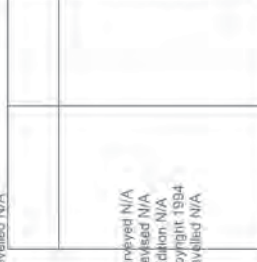
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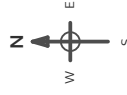
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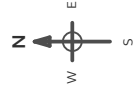
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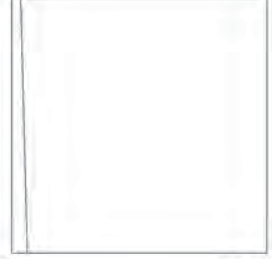
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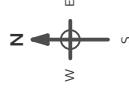
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**Grid Ref:** 516470, 170850

**Map Name:** County Series

**Map date:** 1868

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1868  
Revised 1868  
Edition N/A  
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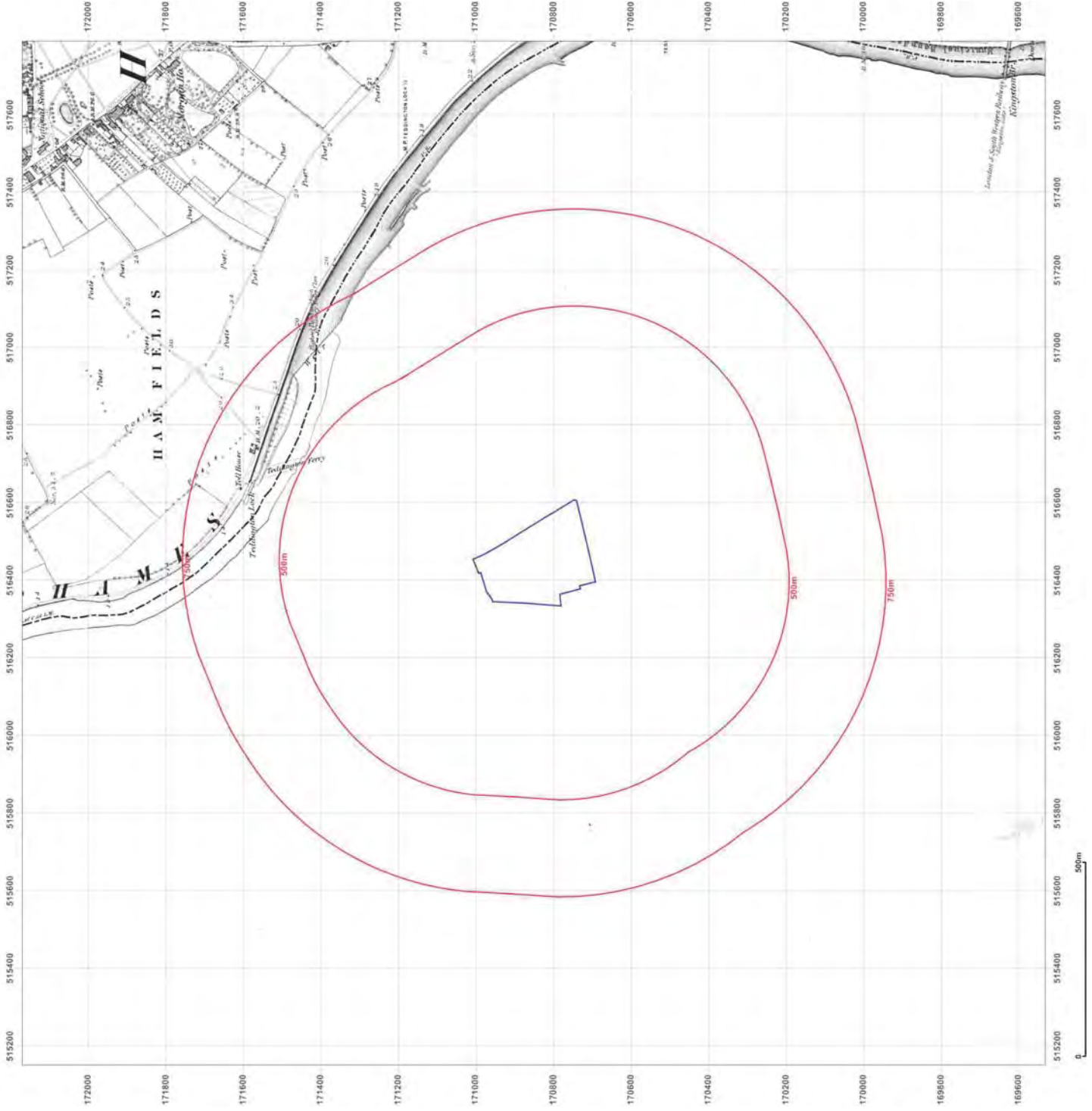


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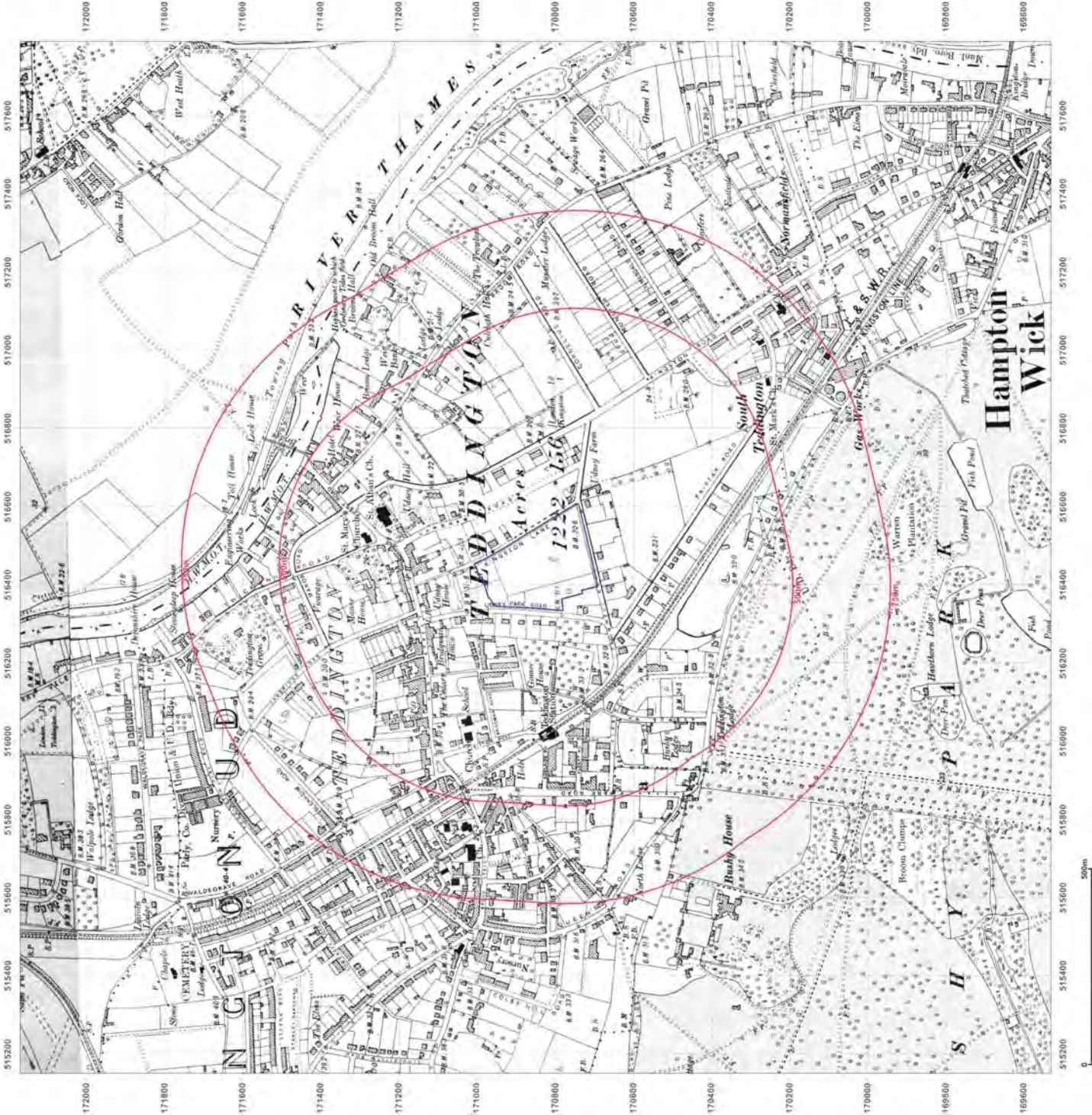


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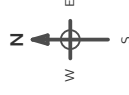
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Revised 1895  
Edition N/A  
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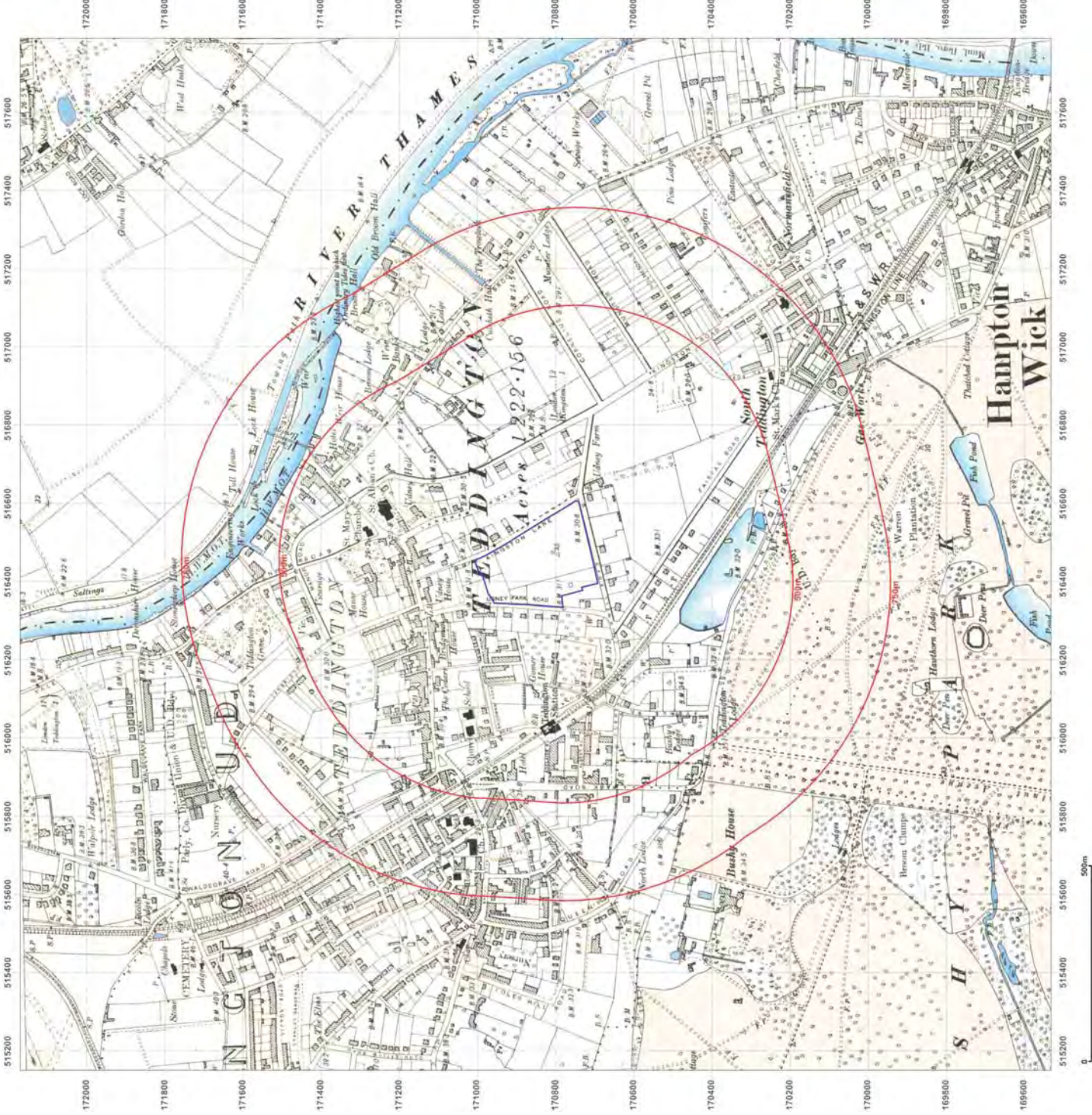


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**Map Name:** County Series

**Map date:** 1912

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Edition 1920  
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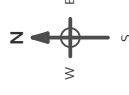
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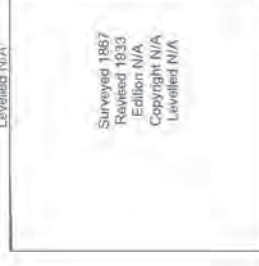
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Revised 1933  
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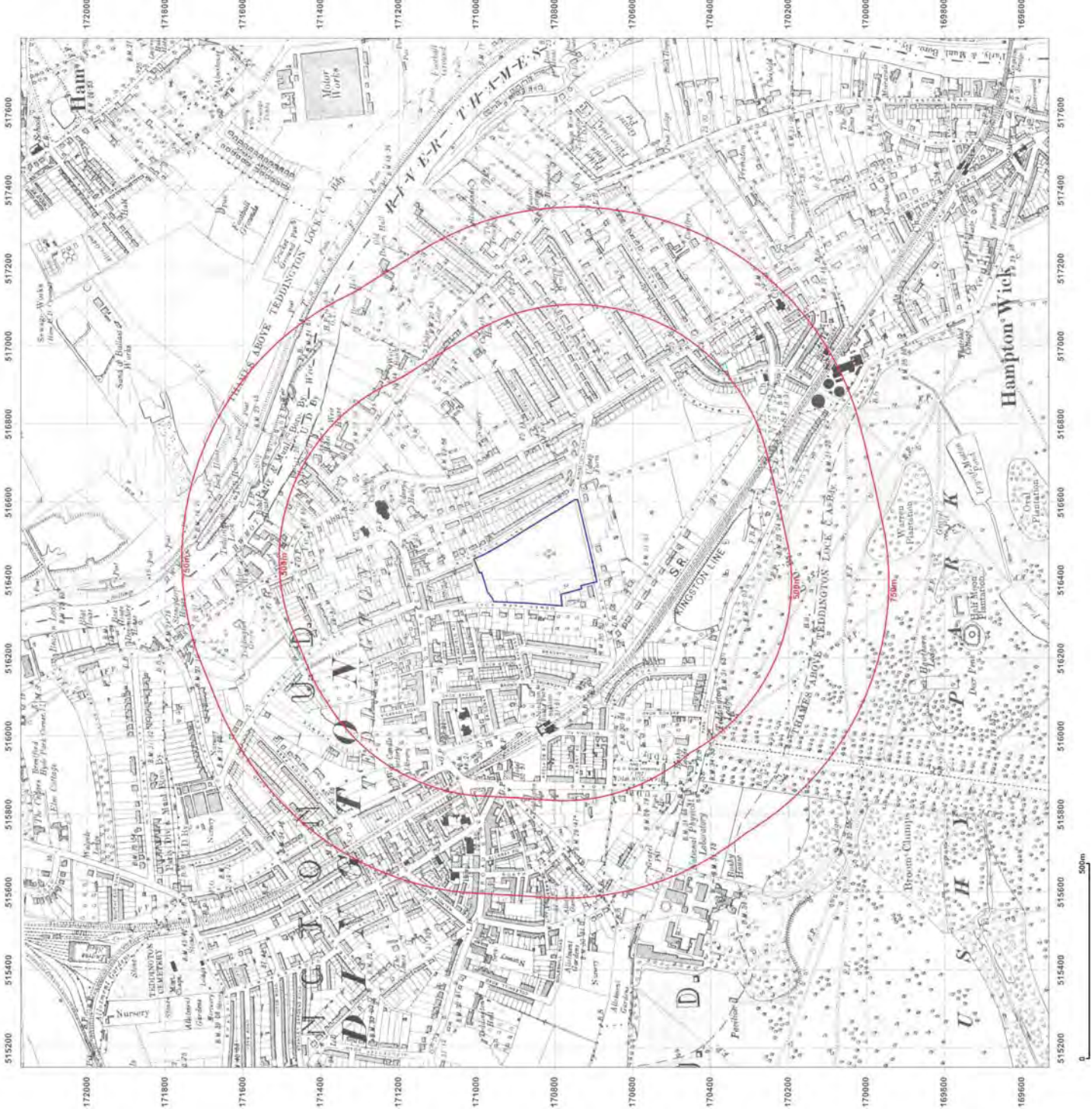


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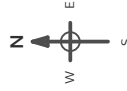
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**Map Name:** County Series

**Map date:** 1934-1935

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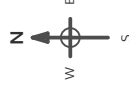
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**Map Name:** County Series

**Map date:** 1938

**Scale:** 1:10,560

**Printed at:** 1:10,560



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**Grid Ref:** 516470, 170850

**Map Name:** County Series

**Map date:** 1938

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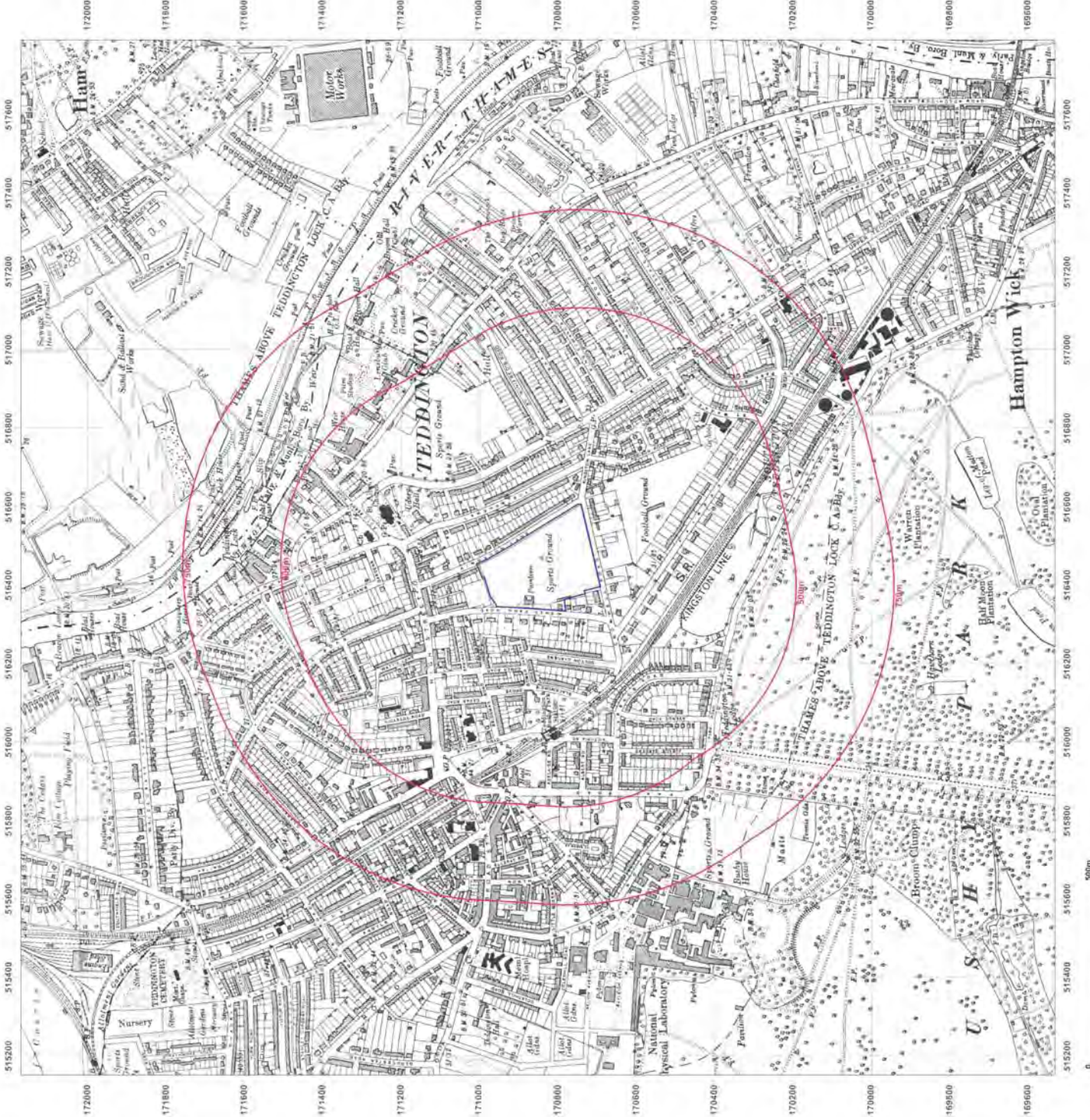


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**Client Ref:** 16325  
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**Grid Ref:** 516470, 170850

**Map Name:** Provisional

**Map date:** 1948

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1940  
Revised 1948  
Edition N/A  
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Surveyed N/A  
Revised 1948  
Edition N/A  
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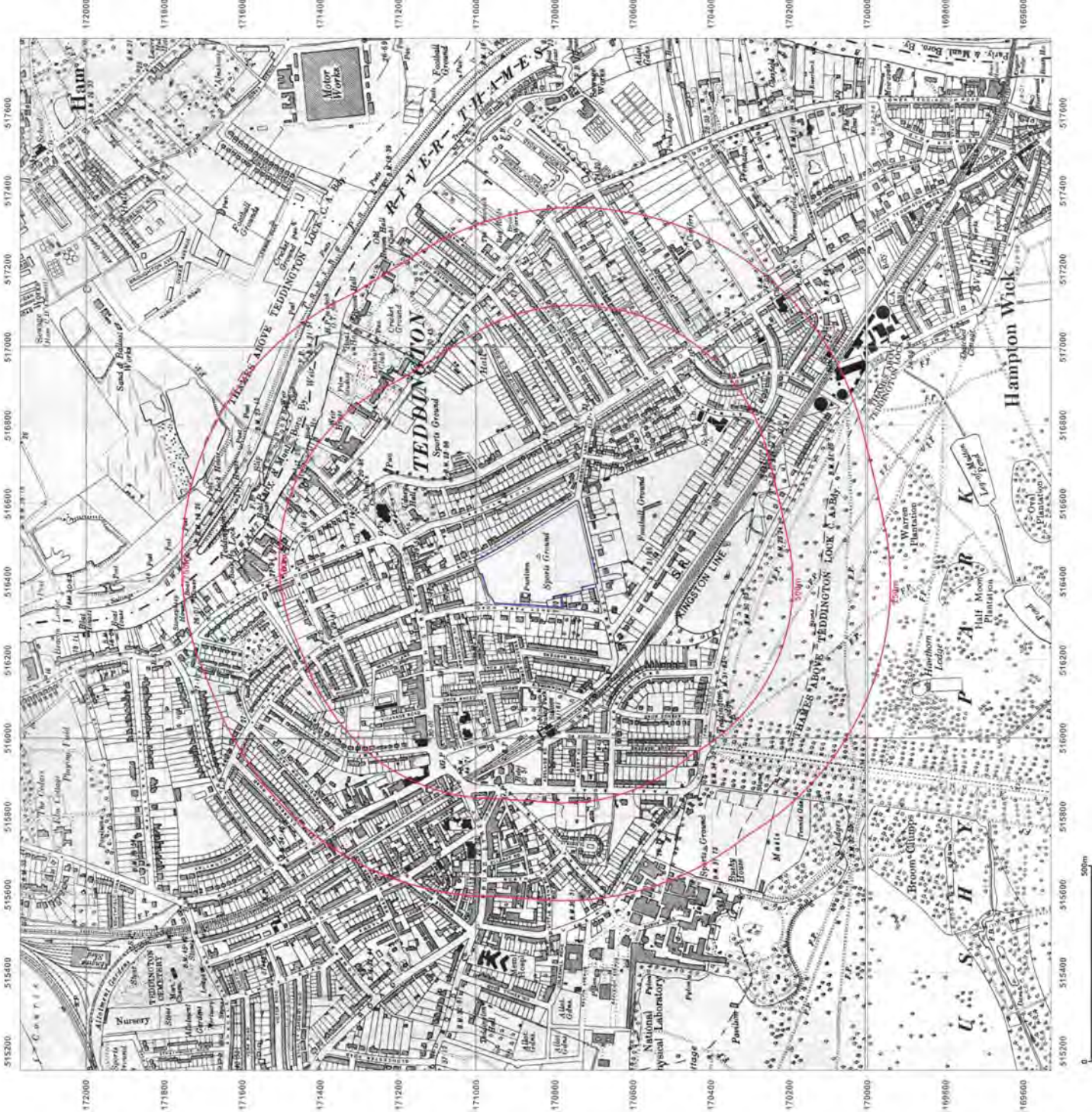


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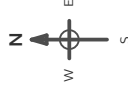
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**Map Name:** Provisional

**Map date:** 1962-1966

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1966  
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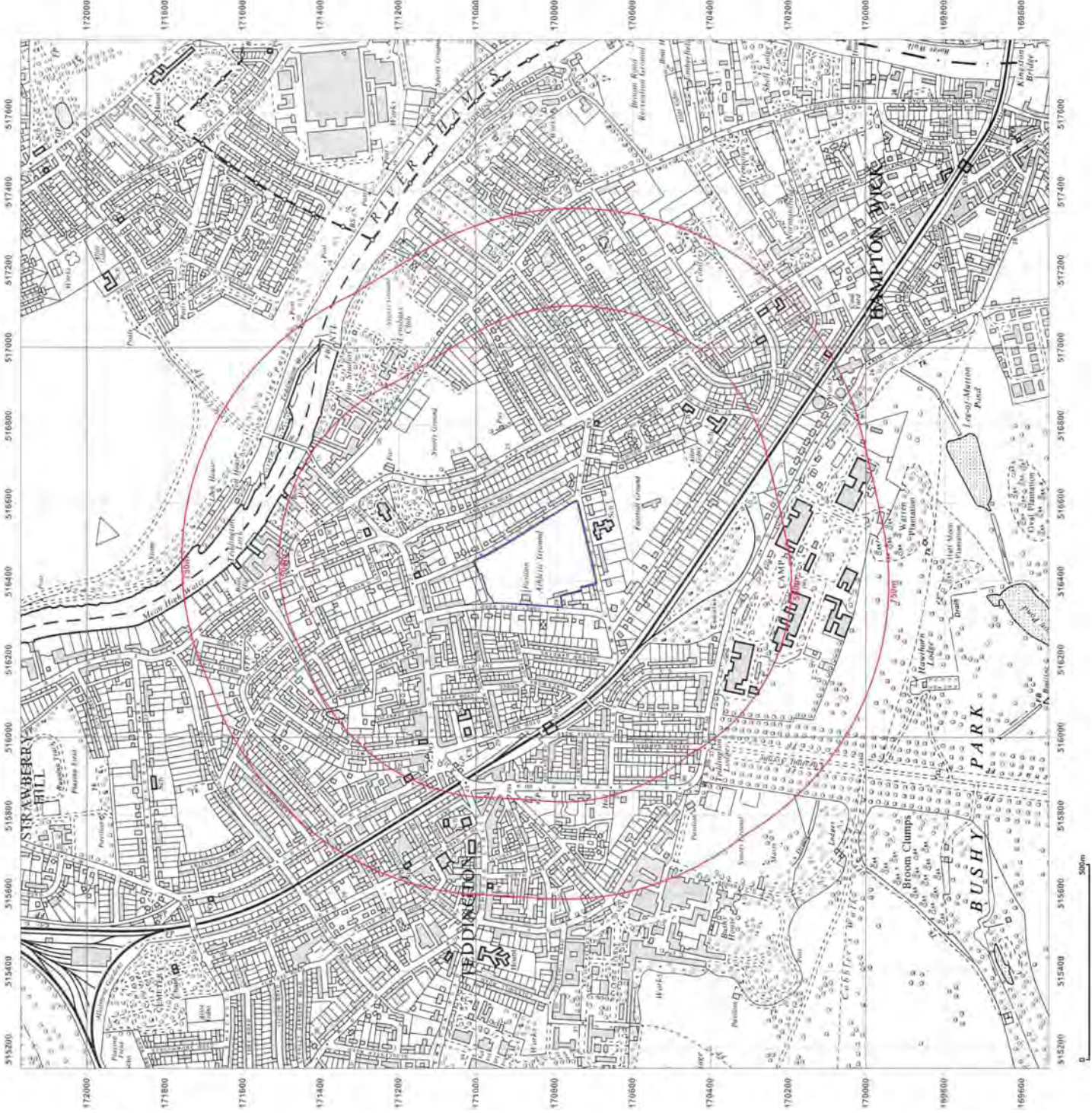


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**Report Ref:** HMD-411-3246241  
**Grid Ref:** 516470, 170850

**Map Name:** National Grid

**Map date:** 1973-1974

**Scale:** 1:10,000

**Printed at:** 1:10,000



Surveyed 1973  
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Revised 1974  
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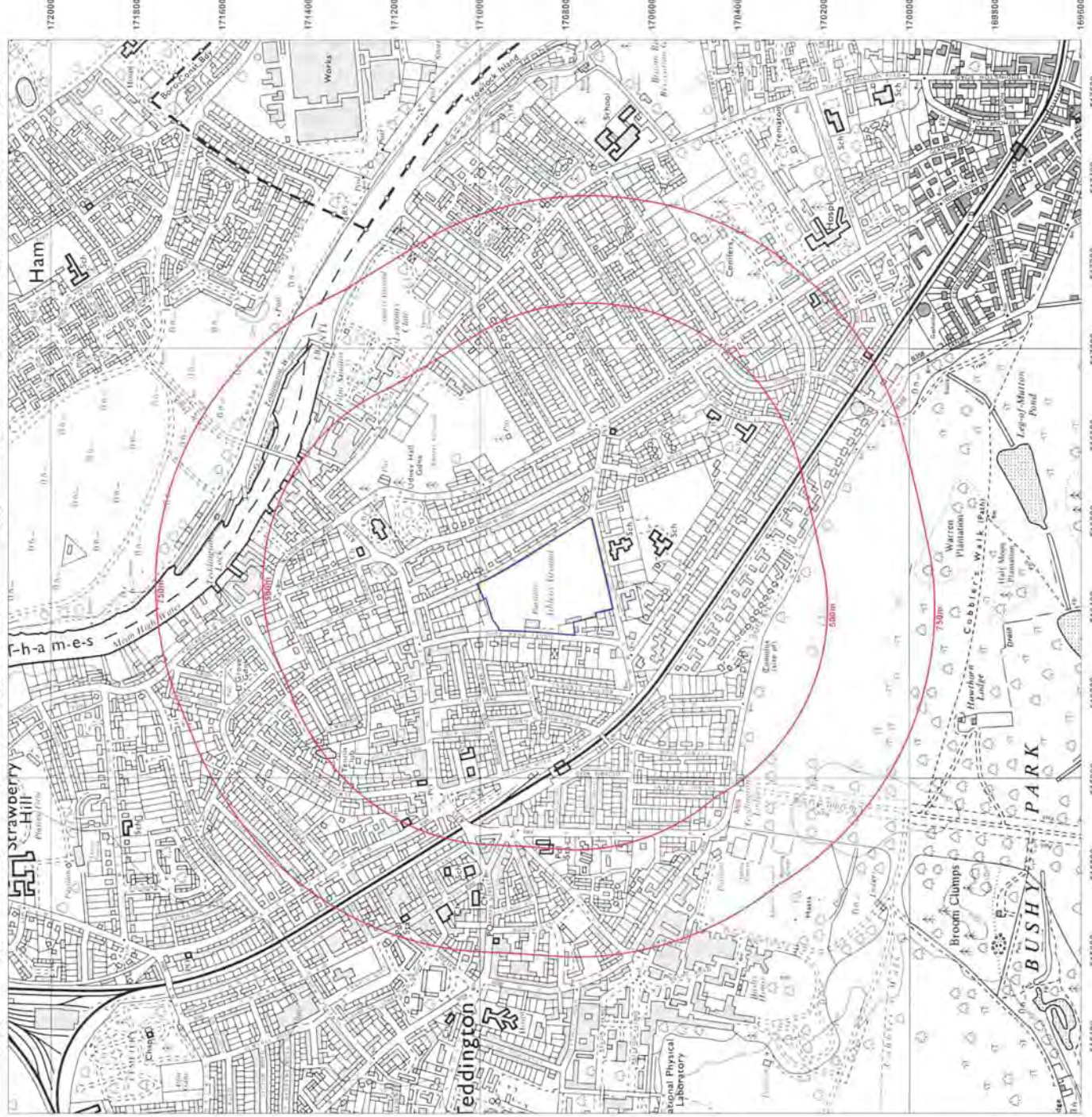


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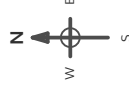
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**Grid Ref:** 516470, 170850

**Map Name:** National Grid

**Map date:** 1991

**Scale:** 1:10,000

**Printed at:** 1:10,000



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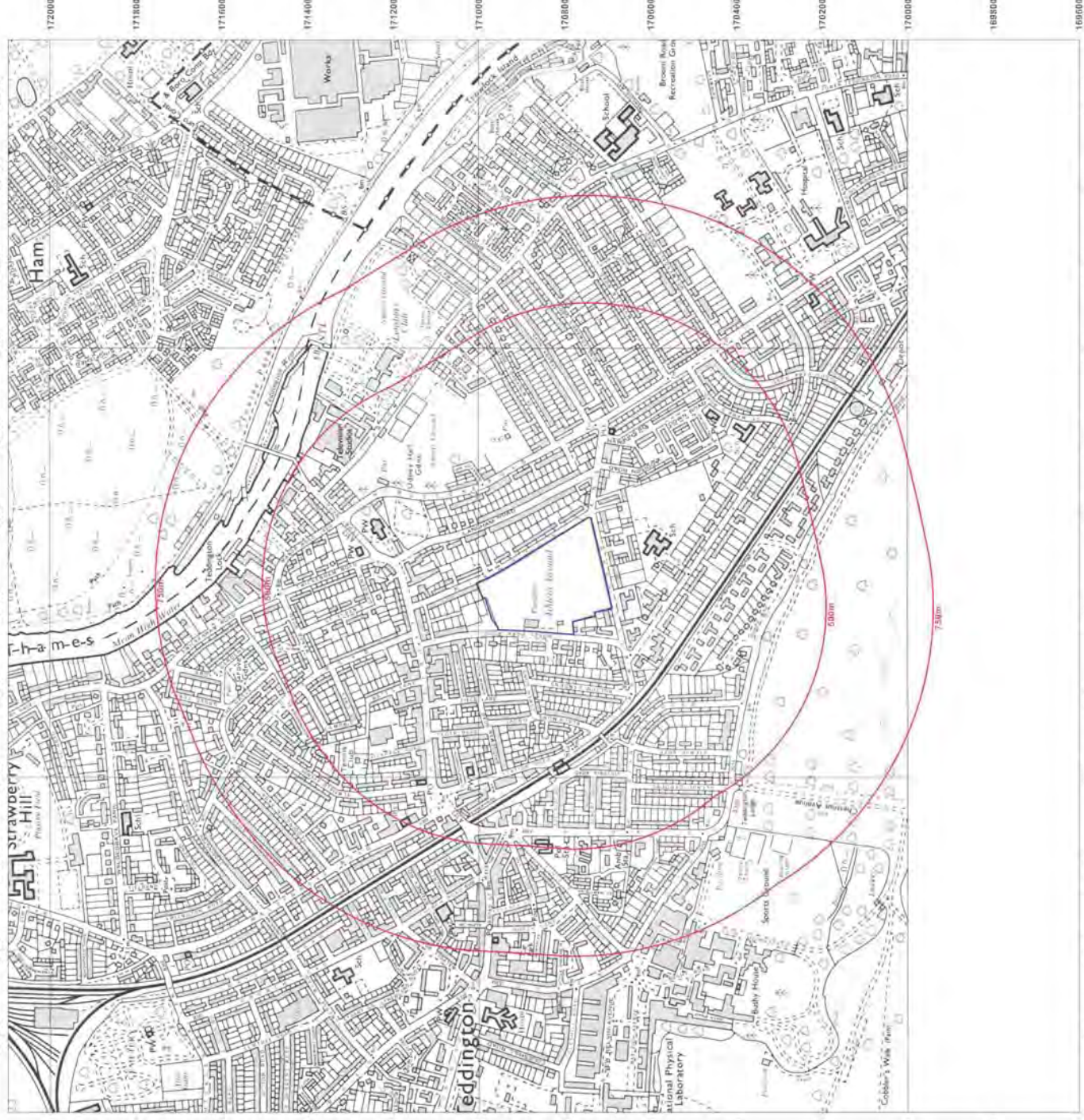


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**Grid Ref:** 516470, 170850

**Map Name:** 1:10,000 Raster

**Map date:** 2002

**Scale:** 1:10,000

**Printed at:** 1:10,000

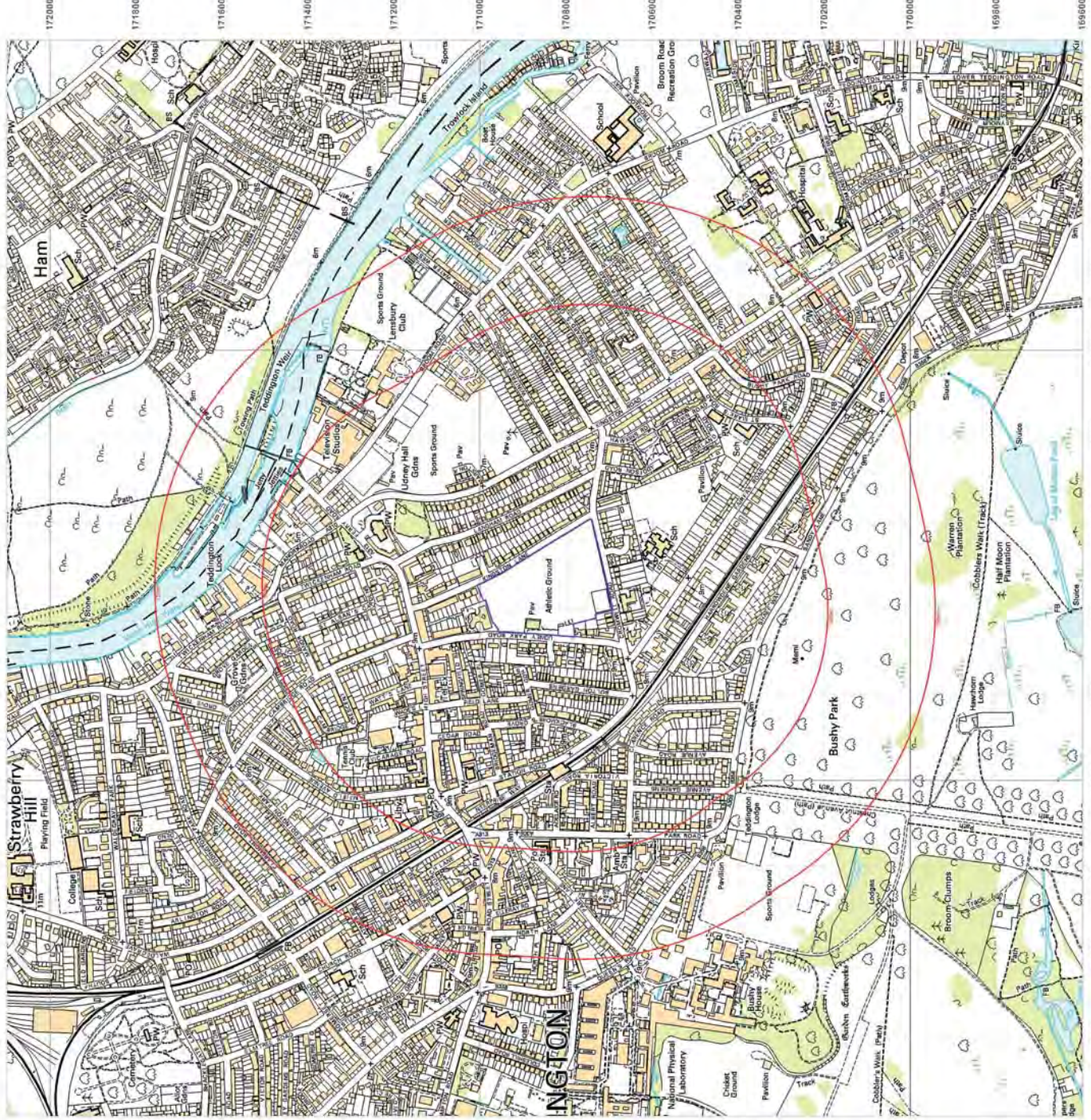


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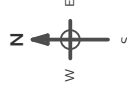
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**Map Name:** National Grid

**Map date:** 2010

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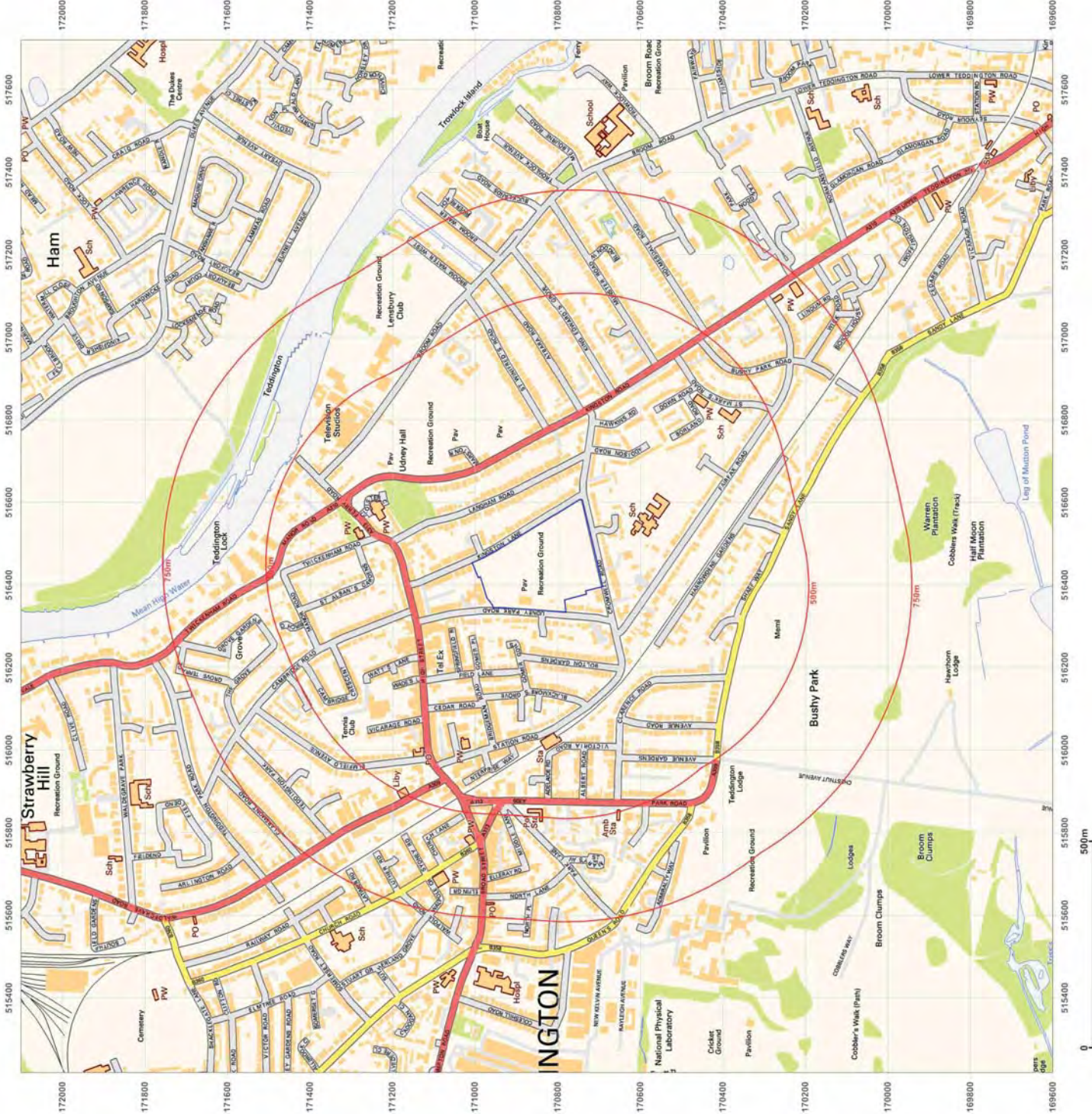


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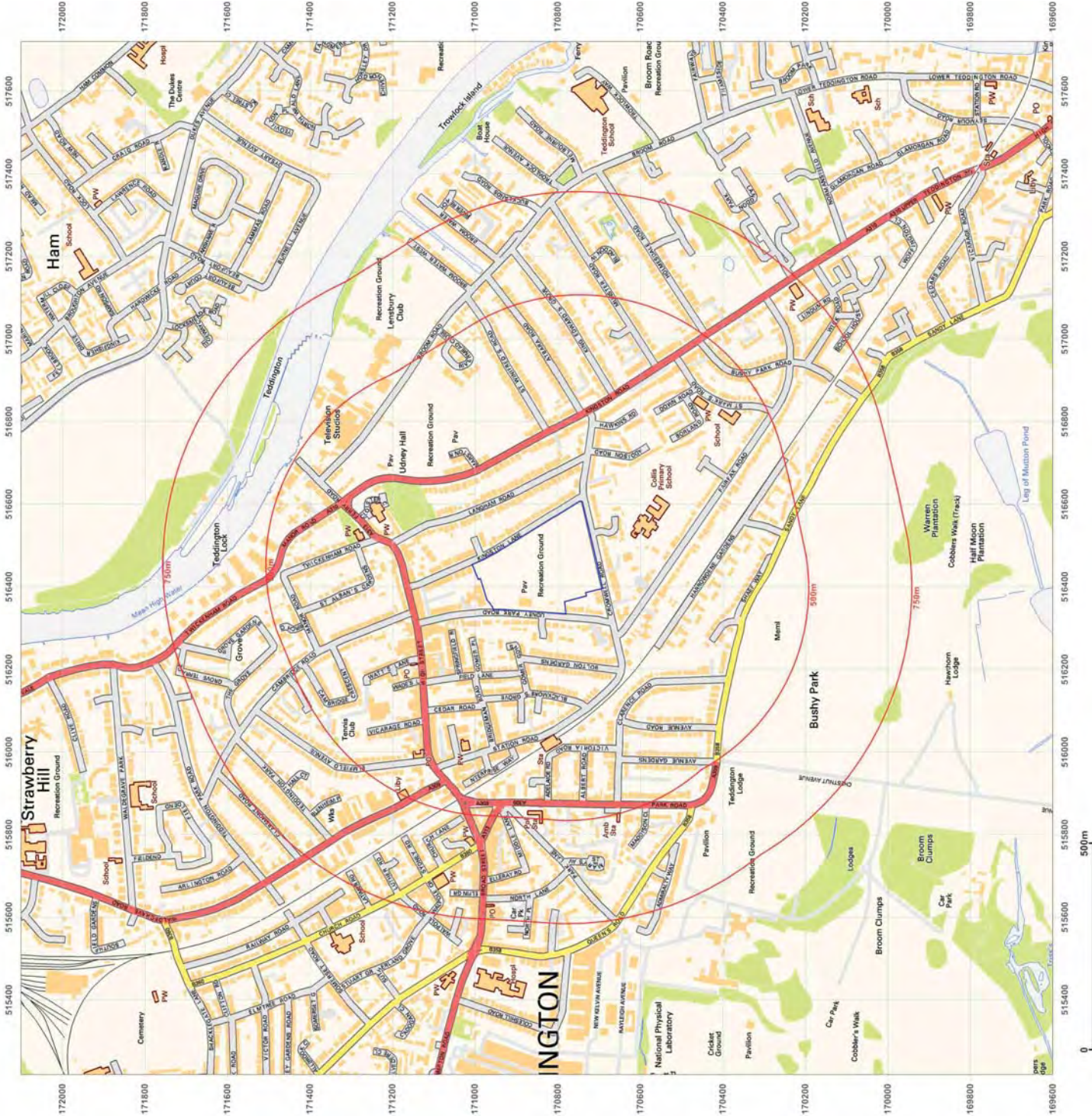


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## GEOLOGICAL INFORMATION





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Your Reference: 16325  
Report Date: 18 Aug 2016  
Report Delivery Method: Email - pdf

## Groundsure Geo Insight

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Yours faithfully,

Managing Director  
Groundsure Limited

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# Groundsure Geo Insight

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**Date:** 18 Aug 2016  
**Reference:** HMD-411-3246240  
**Client:** Ruddlesden Geotechnical



Aerial Photograph Capture date: 20-Apr-2013  
Grid Reference: 516436,170843  
Site Size: 5.19ha

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# Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

## Section 1:Geology

1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	No
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

Section 2:Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	5	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	0	1	5



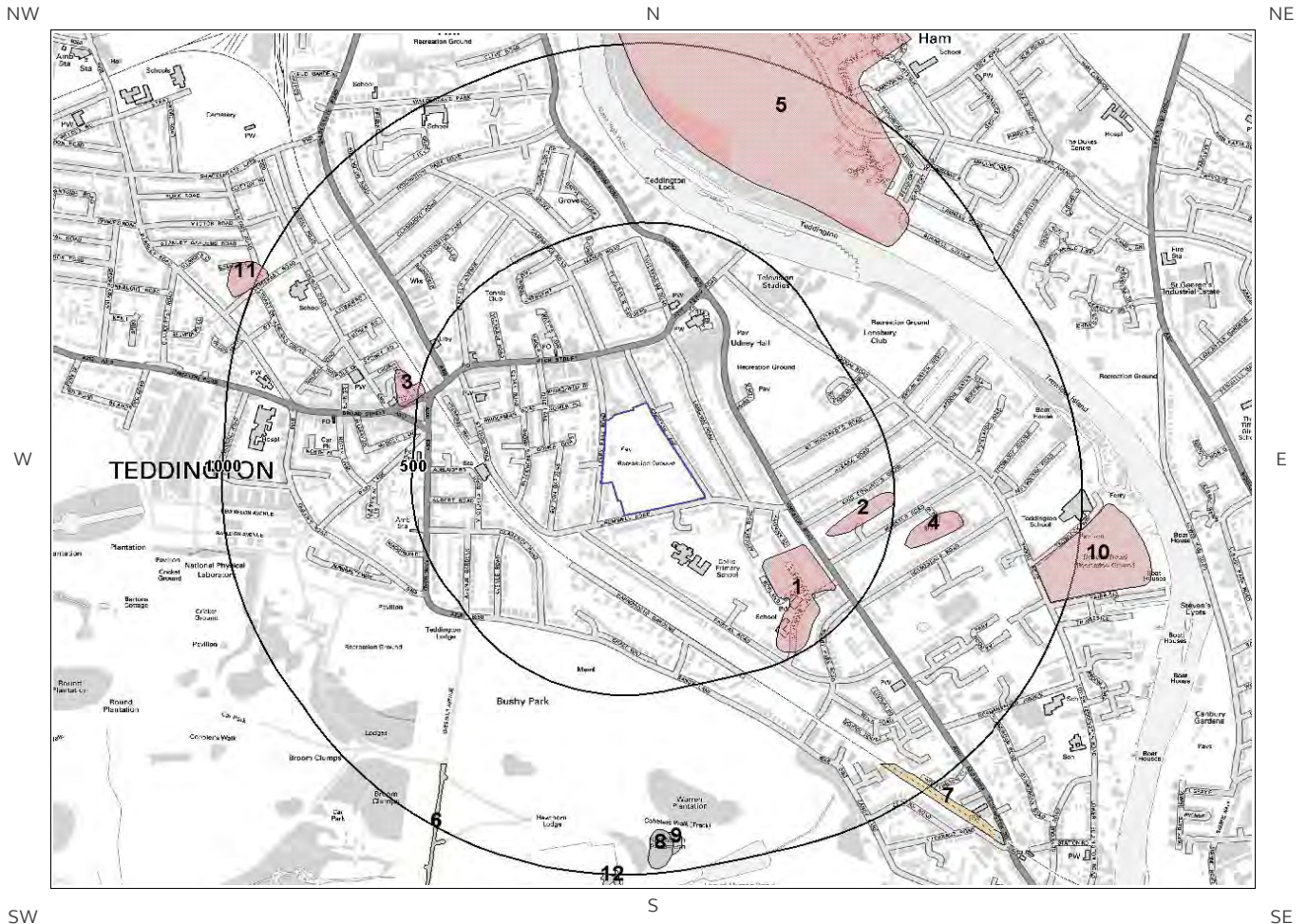
Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	0	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0
Section 4: Natural Ground Subsidence	On-site				
4.1 Shrink Swell Clay	Negligible				
4.2 Landslides	Very Low				
4.3 Ground Dissolution of Soluble Rocks	Negligible				
4.4 Compressible Deposits	Negligible				
4.5 Collapsible Deposits	Very Low				
4.6 Running Sand	Very Low				
Section 5: Borehole Records	On-site	0-50m	51-250		
5 BGS Recorded Boreholes	0	1	4		
Section 6: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
6 Records of Background Soil Chemistry	3	1	2		
Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500	
7.1 Tunnels	0	0	0	Not Searched	
7.2 Historical Railway and Tunnel Features	0	0	26	Not Searched	
7.3 Historical Railways	0	0	0	Not Searched	
7.4 Active Railways	0	0	3	Not Searched	

Section 7:Railways and Tunnels	On-site	0-50m	51-250	251-500
7.5 Railway Projects	0	0	0	0

---

# 1 Geology

## 1.1 Artificial Ground Map



Artificial Ground Legend

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# 1 Geology

## 1.1 Artificial Ground

### 1.1.1 Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:270

Are there any records of Artificial/Made Ground within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	235.0	SE	WMGR-MGRD	INFILLED GROUND	ARTIFICIAL DEPOSIT
2	335.0	E	WMGR-MGRD	INFILLED GROUND	ARTIFICIAL DEPOSIT
3	481.0	W	WMGR-MGRD	INFILLED GROUND	ARTIFICIAL DEPOSIT

---

### 1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

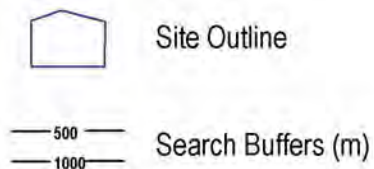
---

# 1.2 Superficial Deposits and Landslips Map



**Superficial Deposits and Landslips Legend**

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# 1.2 Superficial Deposits and Landslips

## 1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	KPGR	KEMPTON PARK GRAVEL FORMATION	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
2	355.0	N	ALV	ALLUVIUM	CLAY, SILTY, PEATY, SANDY [UNLITHIFIED DEPOSITS CODING SCHEME]

## 1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	High

## 1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

## 1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site\*\* boundary? No

Database searched and no data found.

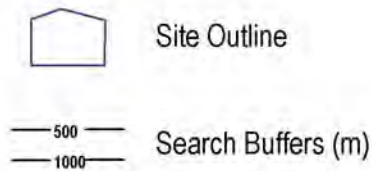
\* This includes an automatically generated 50m buffer zone around the site

# 1.3 Bedrock and Faults Map



**Bedrock and Faults Legend**

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# 1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:270

## 1.3.1 Bedrock/ Solid Geology

Records of Bedrock/ Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	LC-CLSI	London Clay Formation - Clay And Silt	No Details

## 1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site\* boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	Low	Very Low

## 1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

\* This includes an automatically generated 50m buffer zone around the site



# 1.4 Radon Data

## 1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?      The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level

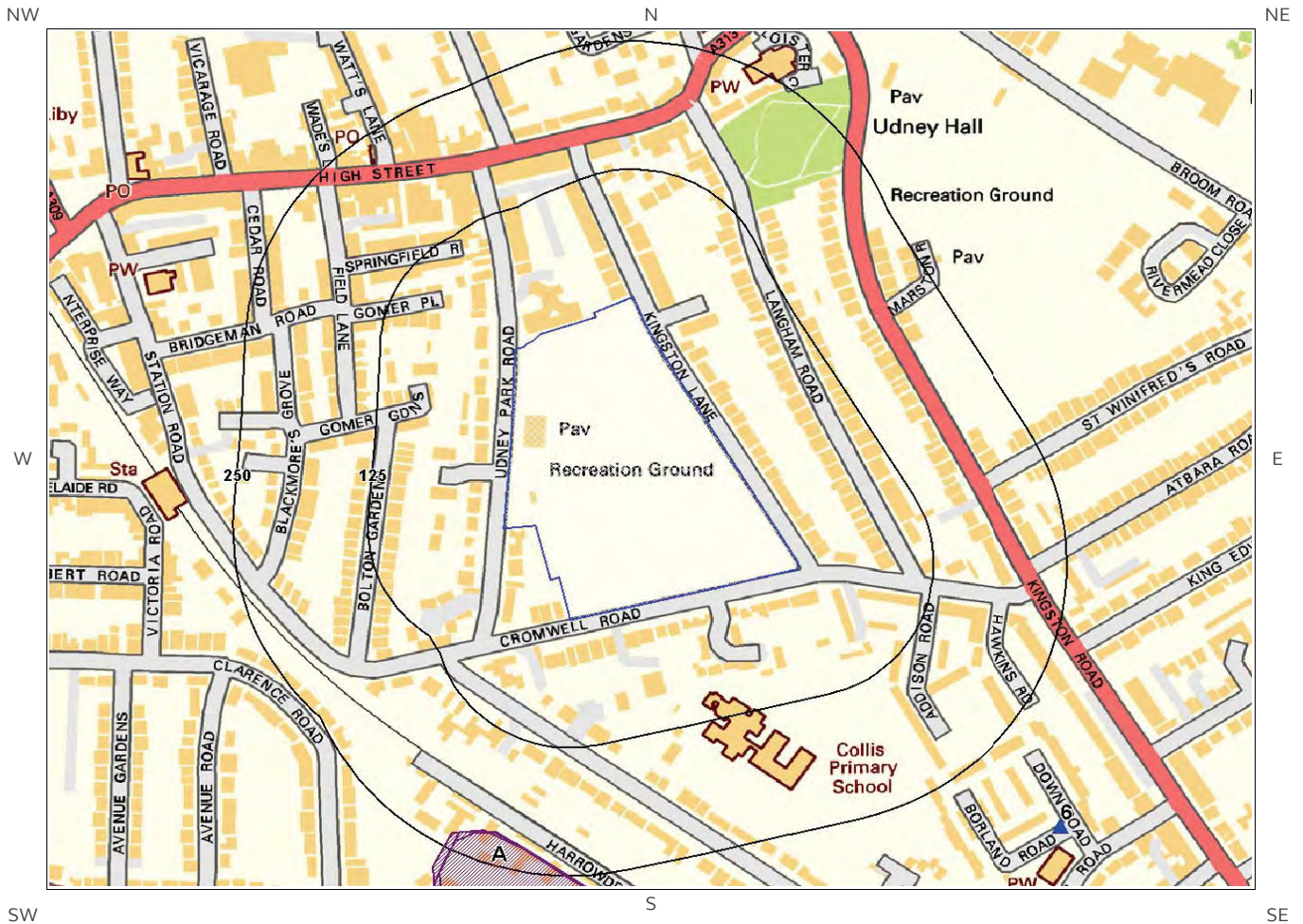
---

## 1.4.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?      No radon protective measures are necessary


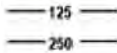



---

# 2 Ground Workings Map



Ground Workings Legend

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-  Site Outline
-  Search Buffers (m)
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings

# 2 Ground Workings

## 2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

The following Historical Surface Ground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
1A	219.0	S	516426 170370	Ponds	1913
2A	220.0	S	516431 170374	Water Body	1938
3A	220.0	S	516431 170374	Water Body	1895
4A	220.0	S	516431 170374	Water Body	1912
5A	220.0	S	516425 170377	Pond	1894

## 2.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

## 2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
6	351.0	SE	516850 170490	Sand	Kingston Road Sand Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	545.0	SE	516980 170345	Sand	Kingston Road Sand Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	733.0	W	515638 170548	Sand & Gravel	Bushy House Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	867.0	NE	516825 171790	Sand & Gravel	Ham	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	947.0	S	516509 169752	Sand & Gravel	Hawthorn Lodge Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	980.0	E	517575 170600	Sand & Gravel	Broom Road Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

# 3 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend

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# 3 Mining, Extraction & Natural Cavities

## 3.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

## 3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

## 3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

---

## 3.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level.

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary?

No

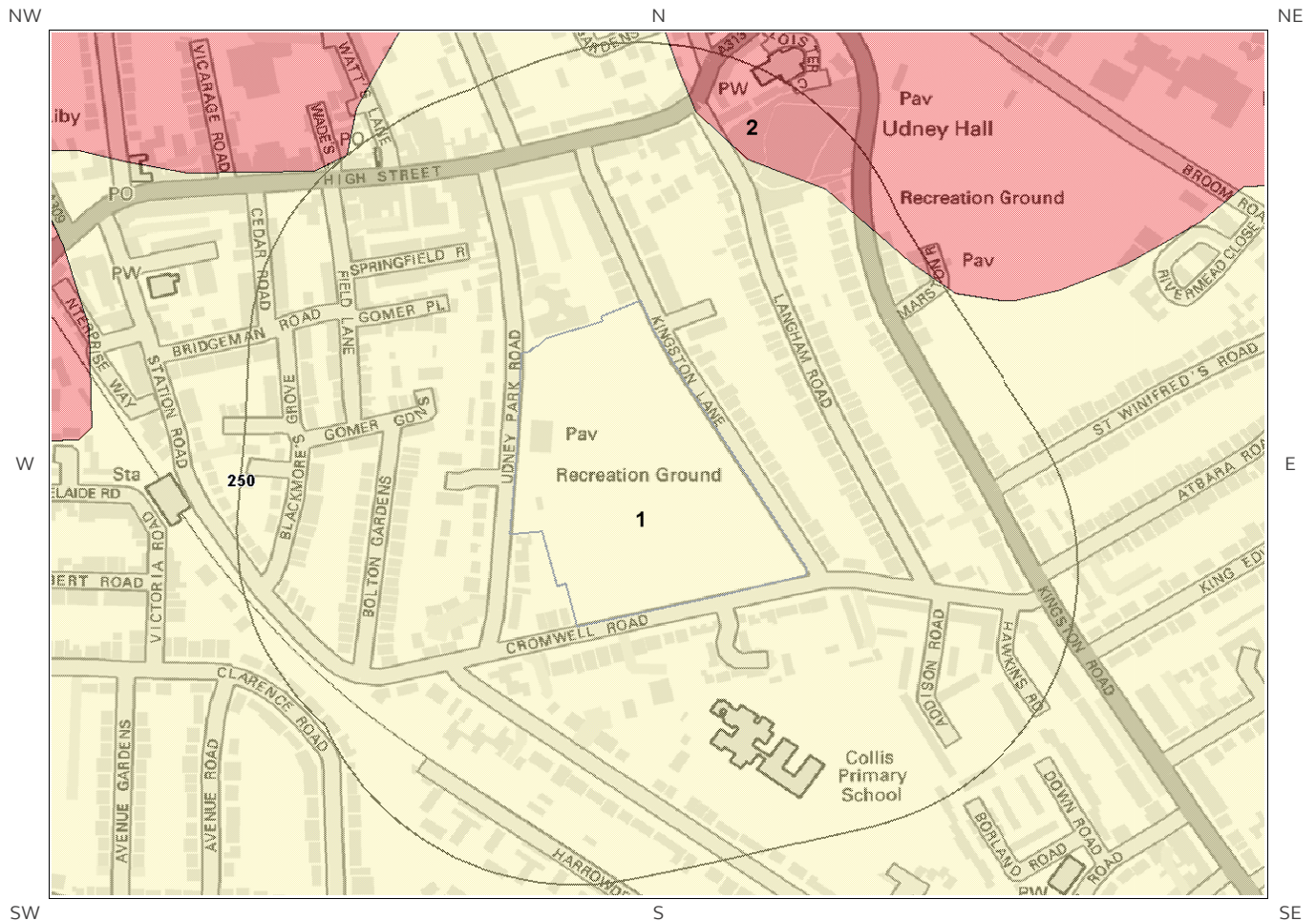
Database searched and no data found.

---



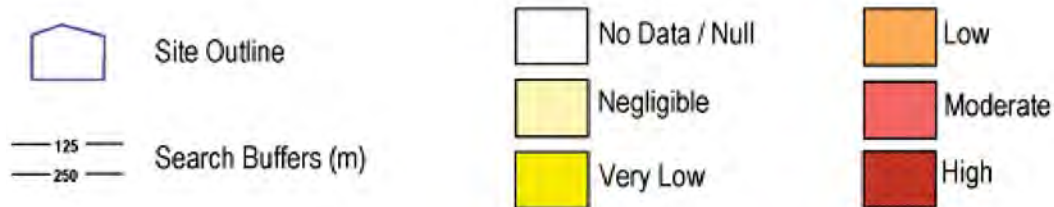
# 4 Natural Ground Subsidence

## 4.1 Shrink-Swell Clay Map



Shrink Swell Clay Legend

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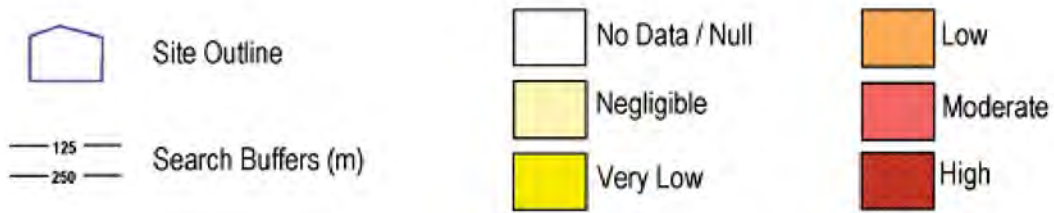


# 4.2 Landslides Map

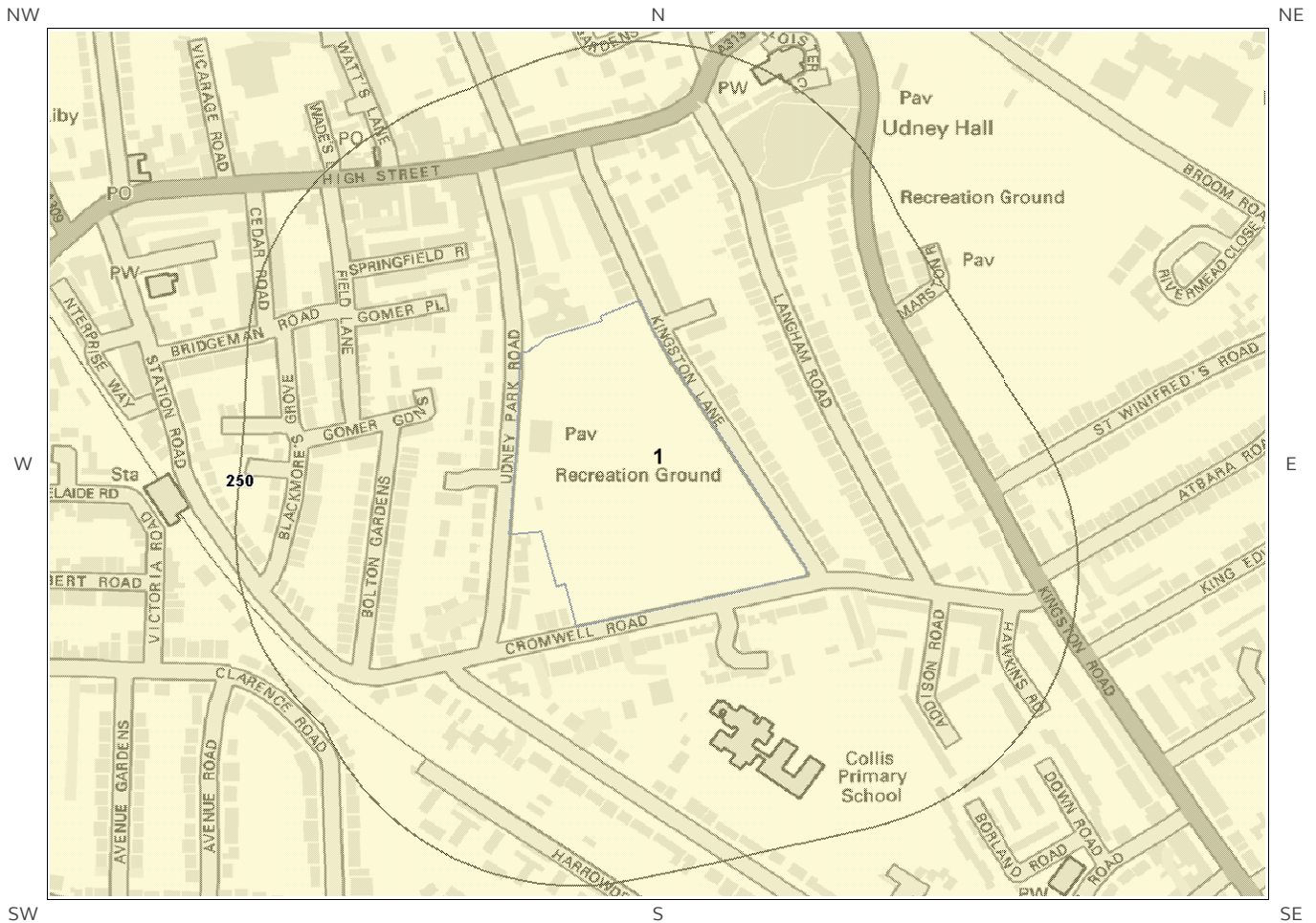


**Landslides Legend**

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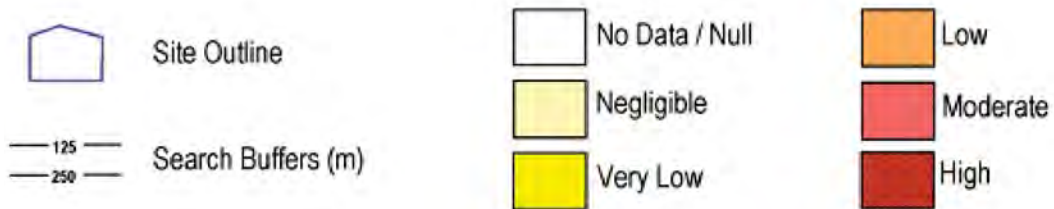


# 4.3 Ground Dissolution Soluble Rocks Map

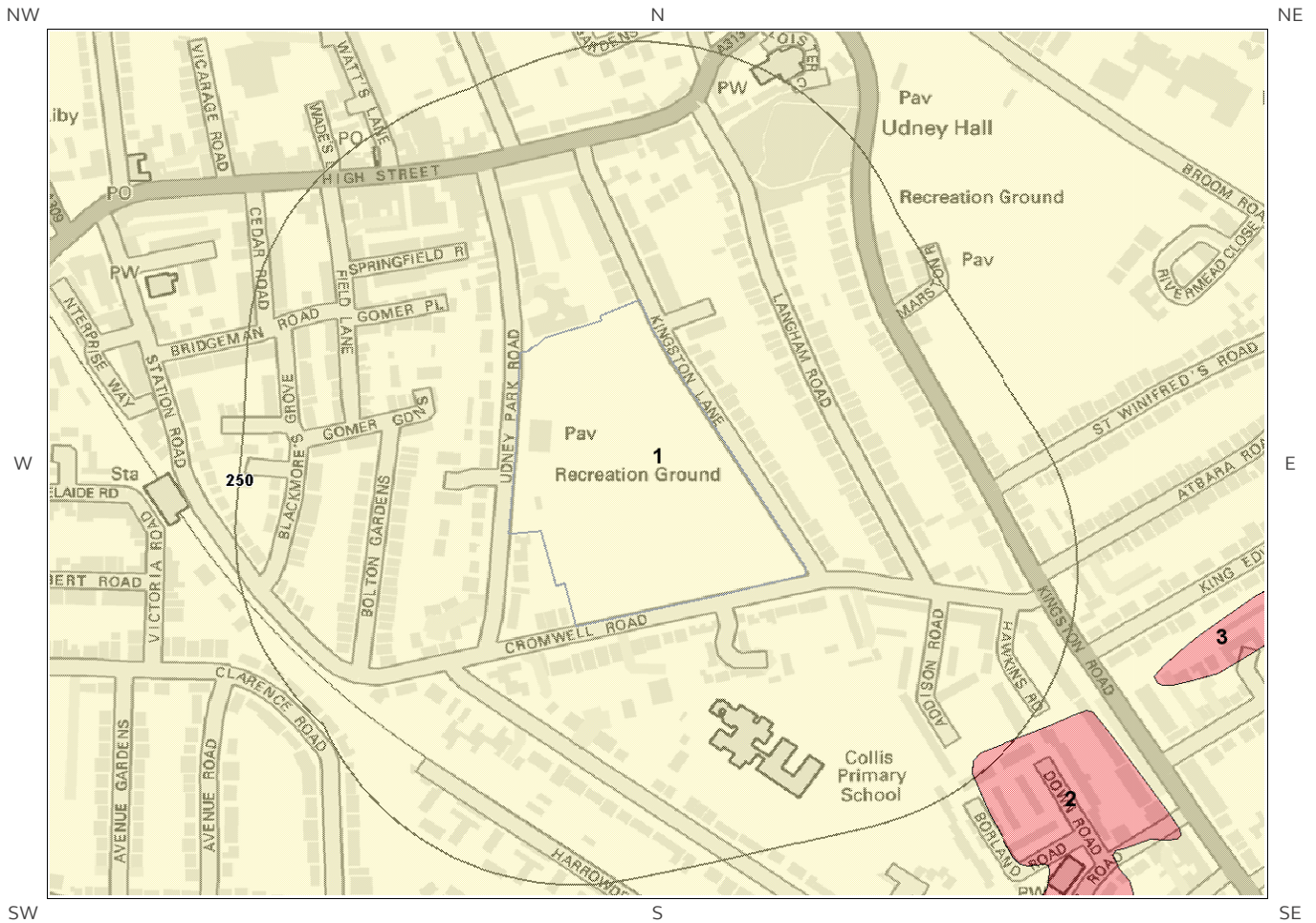


**Ground Dissolution Soluble Rocks Legend**

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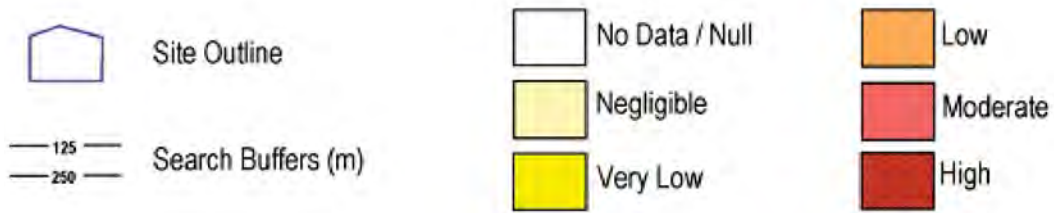


# 4.4 Compressible Deposits Map



Compressible Deposits Legend

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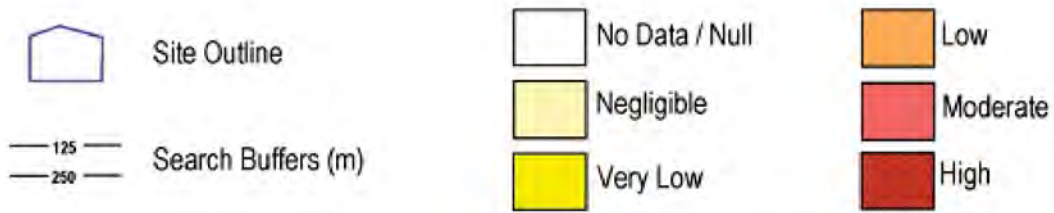


# 4.5 Collapsible Deposits Map



**Collapsible Deposits Legend**

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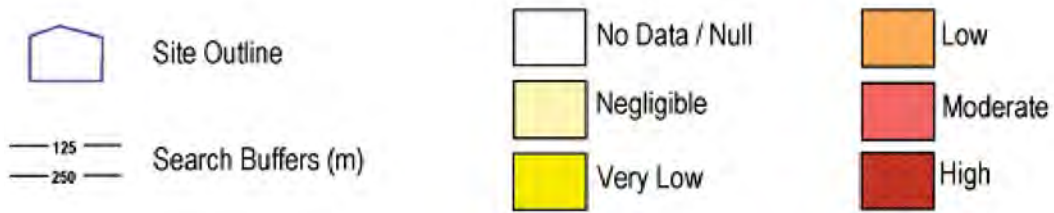


# 4.6 Running Sand Map



Running Sand Legend

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# 4 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site\*\* boundary? Very Low

## 4.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

## 4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

## 4.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

\* This includes an automatically generated 50m buffer zone around the site

## 4.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible ground identified. No special actions required to avoid problems due to compressible ground. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible ground.

## 4.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

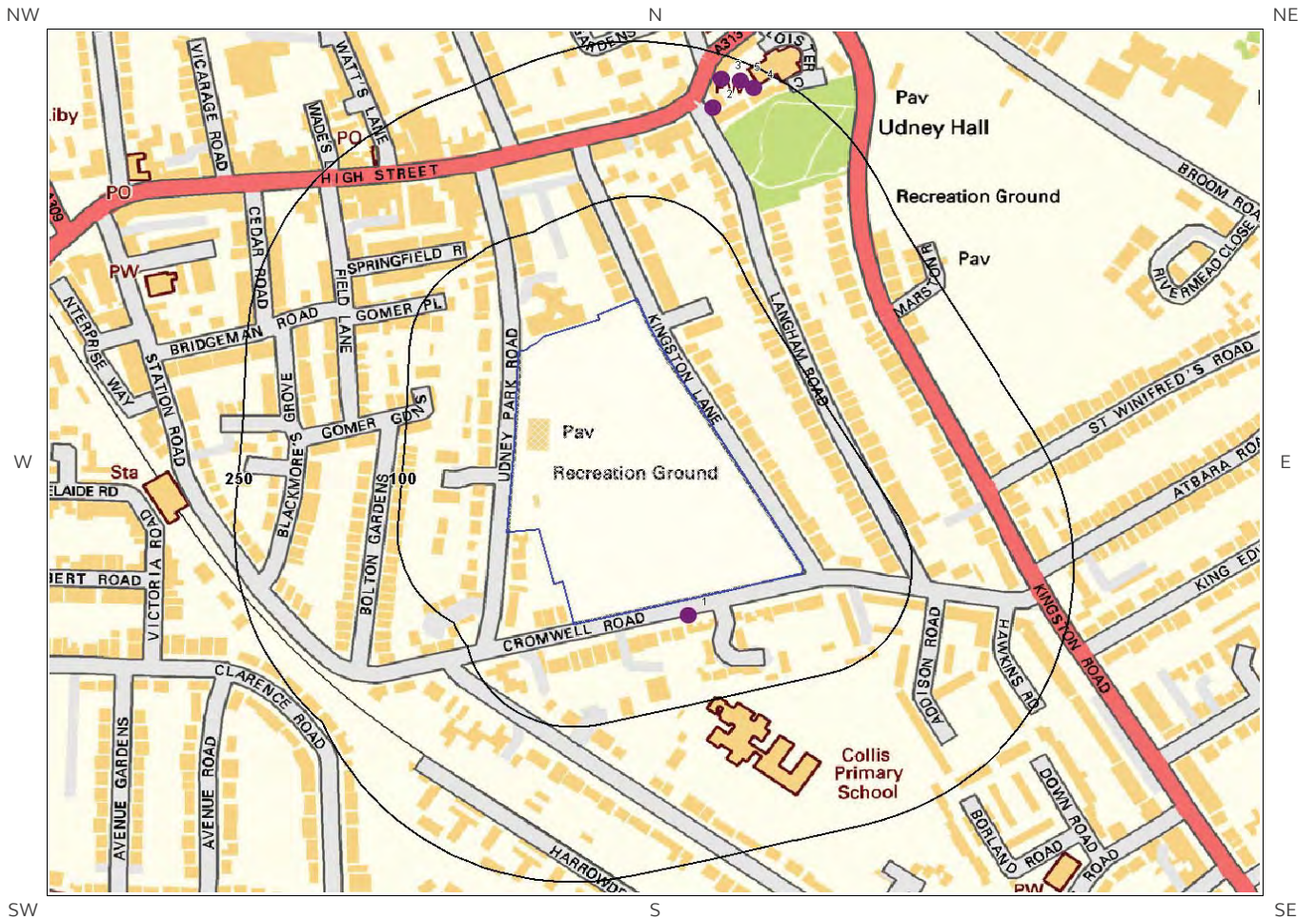
## 4.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

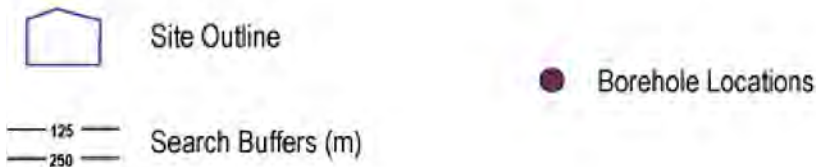


# 5 Borehole Records Map



Borehole Records Legend

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## 5 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

5

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	15.0	S	516500 170700	TQ17SE115	42.67	CROMWELL ROAD TEDDINGTON
2	198.0	N	516523 171192	TQ17SE153	12.0	FERRY ROAD TEDDINGTON F7925 2
3	226.0	N	516530 171220	TQ17SE154	12.0	FERRY ROAD TEDDINGTON F7925 3
4	230.0	NE	516560 171211	TQ17SE152	12.0	FERRY ROAD TEDDINGTON F7925 1
5	231.0	NE	516548 171218	TQ17SE155	12.0	FERRY ROAD TEDDINGTON F7925 4

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: [scans.bgs.ac.uk/sobi\\_scans/boreholes/581552](https://scans.bgs.ac.uk/sobi_scans/boreholes/581552)

#2: [scans.bgs.ac.uk/sobi\\_scans/boreholes/581590](https://scans.bgs.ac.uk/sobi_scans/boreholes/581590)

#3: [scans.bgs.ac.uk/sobi\\_scans/boreholes/581591](https://scans.bgs.ac.uk/sobi_scans/boreholes/581591)

#4: [scans.bgs.ac.uk/sobi\\_scans/boreholes/581589](https://scans.bgs.ac.uk/sobi_scans/boreholes/581589)

#5: [scans.bgs.ac.uk/sobi\\_scans/boreholes/581592](https://scans.bgs.ac.uk/sobi_scans/boreholes/581592)

# 6 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

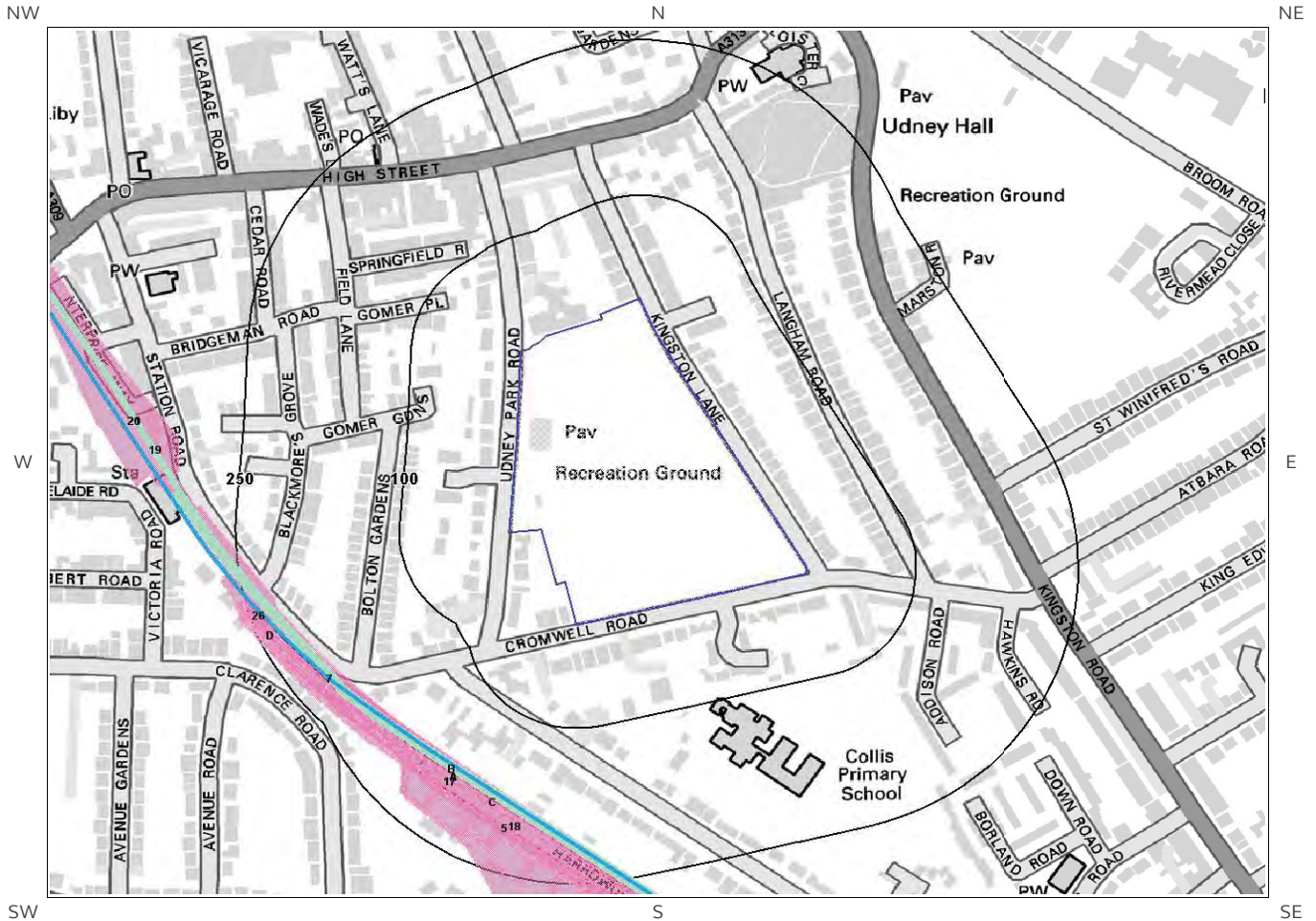
6

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	London	No data	No data	No data	No data	No data
0.0	On Site	London	No data	No data	No data	No data	No data
0.0	On Site	London	No data	No data	No data	No data	No data
40.0	NE	London	No data	No data	No data	No data	No data
192.0	S	London	No data	<1.8 mg/kg	No data	No data	200 - 300 mg/kg
210.0	S	London	No data	No data	No data	No data	No data













\*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

# 7 Railways and Tunnels Map



**Railways and Tunnels Legend**

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	Site Outline		Underground or Partially Underground Railway / Subway System		Railway Track (OpenStreetMap)
	Search Buffers (m)		Railway Tunnel (OS Mapping)		High Speed 2
	250		Abandoned or Dismantled Railway (OpenStreetMap)		Crossrail 1
	500		Railway Track (OS Mapping)		Railway and/or Tunnel Feature from Historical Mapping

# 7 Railways and Tunnels

## 7.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

*Any records that have been identified are represented on the Railways and Tunnels Map.*

---

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

*Any records that have been identified are represented on the Railways and Tunnels Map.*

---

## 7.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1A	171	SW	516521 170377	Railway Sidings	1938
2A	171	SW	516521 170377	Railway Sidings	1912
3B	171	SW	516346 170516	Railway Sidings	1934
4B	172	SW	516519 170375	Railway Sidings	1948
5	173	SW	516519 170375	Railway Sidings	1966
6B	176	SW	516531 170365	Railway Sidings	1913

ID	Distance (m)	Direction	NGR	Details	Date
7	180	SW	516168 170640	Railway Sidings	1894
8C	181	SW	516568 170345	Railway Sidings	1933
9B	181	SW	516487 170399	Railway Sidings	1895
16	181	SW	n/a	Railway	1857
10A	183	SW	516518 170377	Railway Sidings	1938
11B	184	SW	516668 170277	Railway Sidings	1938
12B	187	SW	516664 170276	Railway Sidings	1913
17	188	SW	516323 170461	Railway Sidings	1958
13C	189	SW	516566 170338	Railway Sidings	1913
14A	189	SW	516483 170400	Railway Sidings	1894
18	193	SW	516492 170390	Railway Sidings	1898
19	205	SW	n/a	Railway	1915
20	224	W	n/a	Railway	1936
21	224	W	n/a	Railway	1918
22D	227	SW	516116 170683	Railway Sidings	1959
15D	229	SW	516115 170678	Railway Sidings	1913
23D	229	SW	516121 170672	Railway Sidings	1934
24D	229	SW	516121 170672	Railway Sidings	1915
25D	232	SW	516108 170688	Railway Sidings	1898
26	235	SW	516104 170697	Railway Sidings	1896

*Any records that have been identified are represented on the Railways and Tunnels Map.*

### 7.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

*Any records that have been identified are represented on the Railways and Tunnels Map.*

## 7.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary?	No
Have any active railway lines been identified within 250m of the study site boundary?	Yes

Distance (m)	Direction	Name	Type
175	SW	Kingston Loop Line	Rail
176	SW	Not given	Multi Track
179	SW	Kingston Loop Line	Rail

Note: multiple sections of the same track may be listed in the detail above  
*Any records that have been identified are represented on the Railways and Tunnels Map.*

## 7.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project?	No
Is the study site within 500m of the route of the Crossrail 1 rail project?	No

*Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.*

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

# Contact Details



Groundsure Helpline  
Telephone: 08444 159 000  
info@groundsure.com



## British Geological Survey Enquiries

Kingsley Dunham Centre  
Keyworth, Nottingham NG12 5GG  
Tel: 0115 936 3143.  
Fax: 0115 936 3276.  
Email: [enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)  
Web: [www.bgs.ac.uk](http://www.bgs.ac.uk)



BGS Geological Hazards Reports and general geological enquiries

## British Gypsum

British Gypsum Ltd  
East Leake  
Loughborough  
Leicestershire  
LE12 6HX



## The Coal Authority

200 Lichfield Lane  
Mansfield  
Notts NG18 4RG  
Tel: 0345 7626 848  
DX 716176 Mansfield 5  
[www.coal.gov.uk](http://www.coal.gov.uk)



## Public Health England

Public information access office  
Public Health England, Wellington House  
133-155 Waterloo Road, London, SE1 8UG  
<https://www.gov.uk/government/organisations/public-health-england>  
Email: [enquiries@phe.gov.uk](mailto:enquiries@phe.gov.uk)  
Main switchboard: 020 7654 8000



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# Contact Details



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## Standard Terms and Conditions

### 1 Definitions

In these terms and conditions unless the context otherwise requires:

**“Beneficiary”** means the person or entity for whose benefit the Client has obtained the Services.

**“Client”** means the party or parties entering into a Contract with Groundsure.

**“Commercial”** means any building or property which is not Residential.

**“Confidential Information”** means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

**“Support Services”** means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

**“Contract”** means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

**“Third Party Data Provider”** means any third party providing Third Party Content to Groundsure.

**“Data Reports”** means reports comprising factual data with no accompanying interpretation.

**“Fees”** has the meaning set out in clause 5.1.

**“Groundsure”** means Groundsure Limited, a company registered in England and Wales under number 03421028.

**“Groundsure Materials”** means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

**“Intellectual Property”** means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

**“Mapping”** means a map, map data or a combination of historical maps of various ages, time periods and scales.

**“Order”** means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.

**“Ordnance Survey”** means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

**“Order Website”** means the online platform through which Orders may be placed by the Client and accepted by Groundsure.

**“Report”** means a Risk Screening Report or Data Report for Commercial or Residential property.

**“Residential”** means any building or property used as or intended to be used as a single dwelling.

**“Risk Screening Report”** means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.

**“Services”** means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.

**“Site”** means the area of land in respect of which the Client has requested Groundsure to provide the Services.

**“Third Party Content”** means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.

**“User Guide”** means the user guide, as amended from time to time, available upon request from Groundsure and on the website ([www.Groundsure.com](http://www.Groundsure.com)) and forming part of this Contract.

### 2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 Groundsure agrees to provide the Services in accordance with the Contract.

2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure.

Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

### 3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

### 4 Reliance

4.1 The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,  
(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),  
(iv) the first purchaser or first tenant of the Site, and  
(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

### 5 Fees and Disbursements

5.1 Groundsure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together “Fees”).

5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client (“Payment Date”). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

### 6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and  
(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.

6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure

acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

#### **7. Liability: Particular Attention Should Be Paid To This Clause**

7.1 This Clause 7 sets out the entire liability of Groundsure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 Groundsure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

#### **8 Groundsure's right to suspend or terminate**

8.1 If Groundsure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, Groundsure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 Groundsure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

#### **9. Client's Right to Terminate and Suspend**

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event  
(b) by their nature cannot be returned.

#### **10 Consequences of Withdrawal, Termination or Suspension**

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

#### **11 Anti-Bribery**

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

#### **12 General**

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.

12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.

12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond Groundsure's reasonable control.

In the event that Groundsure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then Groundsure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 Groundsure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner. In the event you are not satisfied with Groundsure's complaints handling process or you are unable to resolve the complaint, at your discretion you may refer the complaint to The Property Ombudsman Scheme at the following URL/email: website [www.tpos.co.uk](http://www.tpos.co.uk) or email: [admin@tpos.co.uk](mailto:admin@tpos.co.uk)

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law

## ENVIRONMENTAL INFORMATION





Ruddlesden Geotechnical  
65, Langaton Lane,  
Exeter, EX1 3SP

Groundsure Reference: HMD-411-3246239

Your Reference: 16325

Report Date 18 Aug 2016

Report Delivery Method: Email - pdf

## Groundsure Enviro Insight

Address: Teddington Playing Fields, Teddington, TW11 9HL

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

Managing Director  
Groundsure Limited

Enc.  
Groundsure Enviroinsight



# Groundsure Enviro Insight

Address: Teddington Playing Fields, Teddington, TW11 9HL  
Date: 18 Aug 2016  
Reference: HMD-411-3246239  
Client: Ruddlesden Geotechnical



Aerial Photograph Capture date: 20-Apr-2013  
Grid Reference: 516436,170843  
Site Size: 5.19ha

Report Reference: HMD-411-3246239  
Client Reference: 16325

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# Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

<b>Section 1: Historical Industrial Sites</b>	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	0	0	31	96
1.2 Additional Information – Historical Tank Database	1	1	0	11
1.3 Additional Information – Historical Energy Features Database	0	0	15	30
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	19	11
1.6 Potentially Infilled Land	0	0	10	23

<b>Section 2: Environmental Permits, Incidents and Registers</b>	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	1	1
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	0	2
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	0
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
<b>3.1 Landfill Sites</b>						
3.1.1 Environment Agency Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency Historic Landfill Sites	0	0	0	0	1	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
<b>3.2 Landfill and Other Waste Sites Findings</b>						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency Licensed Waste Sites	0	0	0	0	0	0

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	0	20	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m					
6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes					
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes					
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	2	3	0
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	2
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	1	Not searched	Not searched
	On-site	0-50m	51-250	251-500	501-1000	1000-1500

## Section 6: Hydrogeology and Hydrology 0-500m

6.9 Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	Yes	No
6.10 Detailed River Network entries within 500m of the site	0	0	0	0	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

## Section 7: Flooding

7.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	Yes
7.2 Are there any Environment Agency Zone 3 floodplains within 250m of the study site	Yes
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	Very Low
7.4 Are there any Flood Defences within 250m of the study site?	No
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	Yes
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Potential at Surface
7.8 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Moderate

## Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
--	---------	-------	--------	---------	----------	-----------

8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	1	4	2
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	1	2
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	0	0	0	0	1	2
8.14 Records of Green Belt land	0	0	0	0	0	0

## Section 9: Natural Hazards

9.1 What is the maximum risk of natural ground subsidence?	Very Low
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Negligible
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Negligible
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Negligible
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Very Low
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Very Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

## Section 10: Mining

10.1 Are there any coal mining areas within 75m of the study site?	No
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	No
10.3 Are there any brine affected areas within 75m of the study site?	No

# Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

## 1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

## 2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

## 3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

## 4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

## 5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

## 6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

## 7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

## 8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

## 9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

## 10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

## 11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

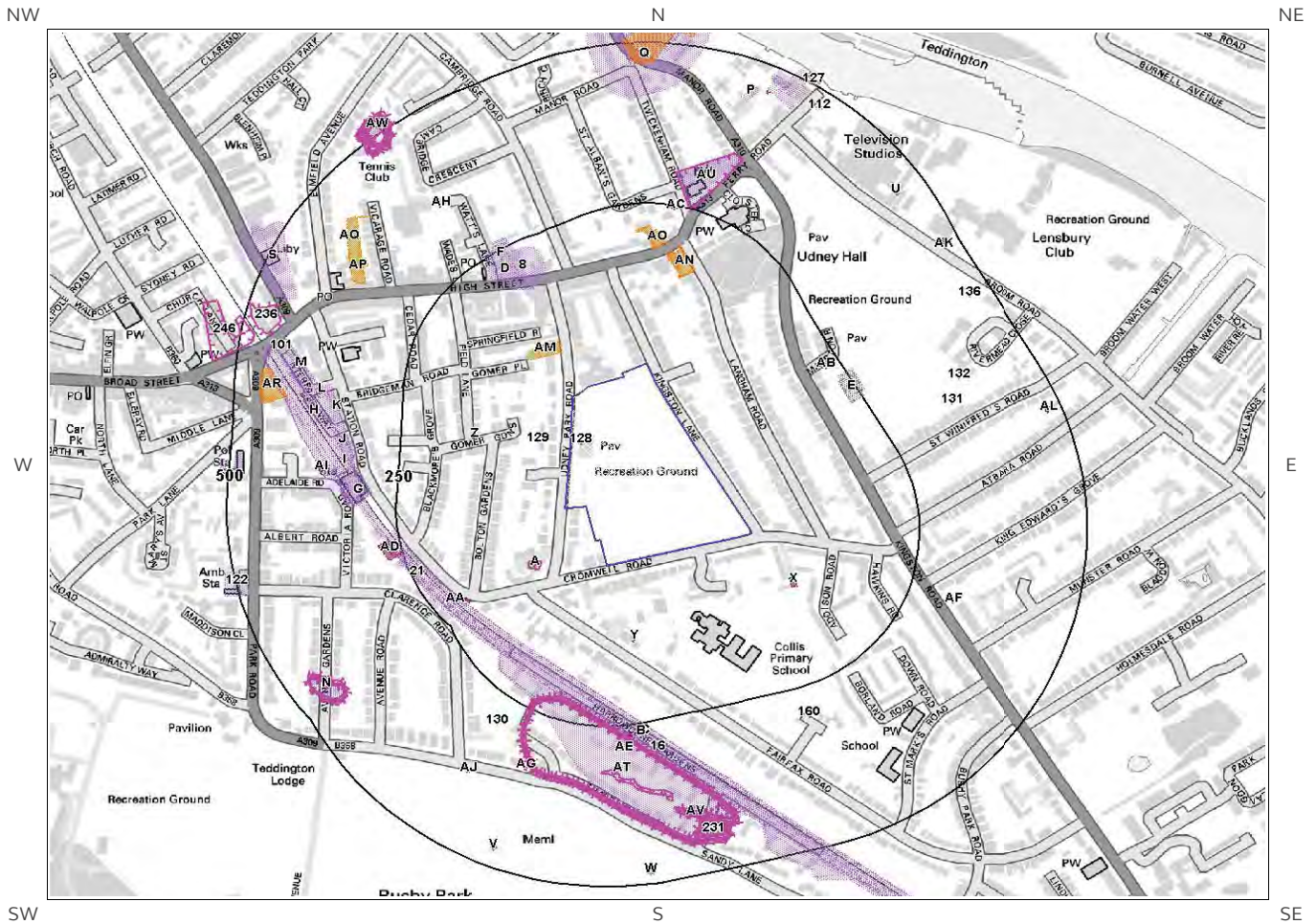
### Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

# 1. Historical Land Use



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# 1. Historical Industrial Sites

## 1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 127

ID	Distance [m]	Direction	Use	Date
1A	85	W	Unspecified Pit	1938
2A	85	W	Unspecified Pit	1938
3B	171	SW	Railway Sidings	1938
4B	171	SW	Railway Sidings	1912
5C	171	SW	Railway Sidings	1934
6C	172	SW	Railway Sidings	1948
7AE	173	SW	Railway Sidings	1966
8	175	NW	Smithy	1913
9C	176	SW	Railway Sidings	1913
10AA	180	SW	Railway Sidings	1894
11C	181	SW	Railway Sidings	1933
12B	181	SW	Railway Sidings	1895
13B	183	SW	Railway Sidings	1938
14B	184	SW	Railway Sidings	1938
15B	187	SW	Railway Sidings	1913
16	189	SW	Railway Sidings	1913
17B	189	SW	Railway Sidings	1894
18D	198	NW	Smithy	1895
19D	205	NW	Smithy	1894
20F	223	NW	Smithy	1913
21	229	SW	Railway Sidings	1913
22E	231	NE	Nursery	1913
23E	232	NE	Nursery	1913
24E	232	NE	Nursery	1913
25E	232	NE	Nursery	1938
26E	234	NE	Nursery	1912
27E	234	NE	Nursery	1938
28E	238	NE	Nursery	1933
29F	242	NW	Smithy	1899
30F	248	NW	Smithy	1913
31F	250	NW	Smithy	1894
32AU	252	N	Grave Yard	1865
33F	254	NW	Smithy	1933
34F	256	NW	Smithy	1938

35F	256	NW	Smithy	1912
36F	256	NW	Smithy	1938
37G	261	W	Railway Station	1933
38G	263	W	Railway Station	1913
39G	286	W	Railway Station	1895
40G	287	W	Railway Station	1899
41G	289	W	Railway Station	1865
42G	292	W	Railway Station	1934
43G	293	W	Railway Station	1894
44G	293	W	Railway Station	1913
45G	295	W	Railway Station	1894
46G	295	W	Railway Station	1938
47G	295	W	Railway Station	1913
48G	295	W	Railway Station	1938
49G	296	W	Railway Station	1966
50G	296	W	Railway Station	1973
51G	296	W	Railway Station	1948
52G	296	W	Railway Station	1991
53G	297	W	Railway Station	1912
54G	297	W	Railway Station	1938
55H	313	W	Railway Sidings	1865
56H	314	W	Railway Sidings	1913
57H	316	W	Railway Sidings	1913
58H	316	W	Railway Sidings	1938
59H	316	W	Railway Sidings	1934
60H	318	W	Railway Sidings	1948
61H	318	W	Railway Sidings	1966
62H	318	W	Railway Sidings	1973
63H	318	W	Railway Sidings	1938
64H	318	W	Railway Sidings	1912
65H	318	W	Railway Sidings	1938
66AS	319	S	Gravel Pit	1865
67H	323	W	Railway Sidings	1913
68H	324	W	Railway Sidings	1933
69I	325	W	Railway Building	1934
70I	328	W	Railway Building	1938
71J	329	W	Railway Building	1934
72J	330	W	Railway Building	1913
73J	331	W	Railway Building	1938
74J	331	W	Railway Building	1913
75J	331	W	Railway Building	1933
76J	331	W	Railway Building	1913
77I	332	W	Railway Building	1948
78J	334	W	Railway Building	1938
79J	334	W	Railway Building	1938
80J	334	W	Railway Building	1912

81J	334	W	Railway Building	1966
82J	334	W	Railway Building	1948
83J	334	W	Railway Building	1973
84H	338	W	Railway Sidings	1933
85K	344	W	Railway Building	1913
86K	347	W	Railway Building	1948
87L	362	W	Railway Building	1912
88L	362	W	Railway Building	1938
89M	398	W	Railway Building	1938
90M	398	W	Railway Building	1912
91M	405	W	Railway Building	1913
92M	406	W	Railway Building	1933
93M	409	W	Railway Building	1938
94M	409	W	Railway Building	1912
95M	409	W	Railway Building	1938
96Q	416	N	Timber Yard	1913
97N	426	SW	Unspecified Ground Workings	1912
98N	427	SW	Unspecified Ground Workings	1913
99N	428	SW	Unspecified Ground Workings	1913
100N	429	SW	Unspecified Ground Workings	1913
101	433	W	Railway Building	1913
102P	434	N	Boat House	1966
103S	435	W	Wax Candle Factory	1913
104O	449	NE	Boat House	1938
105O	449	NE	Boat House	1912
106P	463	NE	Boat House	1913
107Q	464	N	Timber Yard	1913
108R	464	N	Motor Works	1913
109O	467	NE	Boat House	1938
110Q	467	N	Timber Yard	1913
111R	467	N	Unspecified Commercial/Industrial	1938
112	469	NE	Boat House	1865
113Q	472	N	Timber Yard	1912
114Q	472	N	Timber Yard	1938
115O	473	NE	Boat House	1938
116Q	473	N	Timber Yard	1933
117Q	474	N	Timber Yard	1938
118O	475	NE	Boat House	1913
119S	476	NW	Candle Factory	1913
120O	477	NE	Boat House	1934
121O	478	NE	Boat House	1933
122	479	W	Ambulance Station	1991

123T	480	W	Police Station	1991
124T	480	W	Police Station	1973
125S	483	NW	Wax Candle Factory	1912
126AW	496	NW	Unspecified Pit	1991
127	498	NE	Boat House	1913

## 1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

13

ID	Distance (m)	Direction	Use	Date
128	0	On Site	Unspecified Tank	1934
129	46	W	Unspecified Tank	1994
130	292	SW	Unspecified Tank	1896
131	356	NE	Unspecified Tank	1898
132	386	NE	Unspecified Tank	1913
133AQ	410	NW	Unspecified Tank	1978
134U	450	NE	Tanks	1958
135U	451	NE	Tanks	1959
136	465	NE	Unspecified Tank	1897
137V	465	S	Unspecified Tank	1958
138V	465	S	Unspecified Tank	1959
139W	477	S	Unspecified Tank	1958
140W	478	S	Unspecified Tank	1959

## 1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

45

ID	Distance (m)	Direction	Use	Date
141X	90	SE	Electricity Substation	1983
142X	90	SE	Electricity Substation	1989
143Y	116	S	Electricity Substation	1971
144Y	117	S	Electricity Substation	1994
145Z	138	W	Electricity Substation	1971
146Z	138	W	Electricity Substation	1994

147AA	199	SW	Electricity Substation	1994
148AA	200	SW	Electricity Substation	1971
149AB	227	NE	Electricity Substation	1993
150AB	227	NE	Electricity Substation	1978
151AC	242	N	Electricity Substation	1978
152AC	245	N	Electricity Substation	1991
153AC	246	N	Electricity Substation	1989
154AC	246	N	Electricity Substation	1989
155AC	246	N	Electricity Substation	1978
156AD	251	W	Electricity Substation	1971
157AD	258	W	Electricity Substation	1994
158AE	265	S	Electricity Substation	1971
159AE	266	S	Electricity Substation	1971
160	292	S	Electricity Substation	1983
161AF	315	E	Electricity Substation	1989
162AF	316	E	Electricity Substation	1971
163AG	333	S	Electricity Substation	1991
164AG	333	S	Electricity Substation	1978
165AH	353	NW	Electricity Substation	1989
166AH	354	NW	Electricity Substation	1989
167AH	354	NW	Electricity Substation	1987
168AH	354	NW	Electricity Substation	1983
169AI	361	W	Electricity Substation	1986
170AI	362	W	Electricity Substation	1983
171AI	362	W	Electricity Substation	1992
172AI	362	W	Electricity Substation	1994
173AI	362	W	Electricity Substation	1971
174AI	362	W	Electricity Substation	1987
175AJ	378	SW	Electricity Substation	1994
176AJ	378	SW	Electricity Substation	1992
177L	396	W	Electricity Substation	1993
178L	397	W	Electricity Substation	1993
179L	397	W	Electricity Substation	1978
180O	456	NE	Electricity Substation	1994
181AK	472	NE	Electricity Substation	1979
182AK	473	NE	Electricity Substation	1968
183AL	476	NE	Electricity Substation	
184AL	477	NE	Electricity Substation	
185AL	483	NE	Electricity Transformer	

## 1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary:

0

Database searched and no data found.

## 1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary:

30

ID	Distance (m)	Direction	Use	Date
186AM	67	NW	Garage	1959
187AM	67	NW	Garage	1959
188AM	67	NW	Garage	1958
189AN	141	N	Garage	1993
190AN	143	N	Garage	1978
191AN	150	N	Garage	1991
192AN	154	N	Garage	1989
193AN	154	N	Garage	1989
194AN	154	N	Garage	1978
195AN	154	N	Garage	1959
196AN	154	N	Garage	1959
197AN	155	N	Garage	1958
198AO	181	N	Garage	1989
199AO	181	N	Garage	1989
200AO	181	N	Garage	1991
201AO	181	N	Garage	1958
202AO	181	N	Garage	1978
203AO	181	N	Garage	1959
204AO	181	N	Garage	1959
205AP	353	NW	Garage	1959
206AP	353	NW	Garage	1959
207AQ	353	NW	Garage	1958
208AP	353	NW	Garage	1978
209AR	421	W	Garage	1959
210AR	421	W	Garage	1963
211AR	421	W	Garage	1960
212AR	423	W	Garage	1983
213AR	423	W	Garage	1986
214AR	423	W	Garage	1983
215Q	468	N	Motor Repair Works	1934

## 1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 33


The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
216A	85	W	Unspecified Pit	1938
217A	85	W	Unspecified Pit	1938
218AT	212	S	Ponds	1934
219AS	217	S	Ponds	1913
220AT	219	S	Ponds	1913
221AT	220	S	Water Body	1938
222AT	220	S	Water Body	1912
223AT	220	S	Water Body	1895
224AT	220	S	Pond	1894
225AS	222	S	Ponds	1899
226AU	252	N	Grave Yard	1865
227AS	319	S	Gravel Pit	1865
228AV	394	S	Pond	1938
229AV	415	S	Pond	1894
230AV	415	S	Pond	1938
231	421	S	Pond	1938
232N	426	SW	Unspecified Ground Workings	1912
233N	427	SW	Unspecified Ground Workings	1913
234N	428	SW	Unspecified Ground Workings	1913
235N	429	SW	Unspecified Ground Workings	1913
236	446	W	Pond	1865
237AW	470	NW	Pond	1913
238AW	473	NW	Pond	1973
239AW	473	NW	Pond	1966
240AW	475	NW	Pond	1934
241AW	475	NW	Pond	1913
242AW	476	NW	Pond	1938
243AW	479	NW	Pond	1933
244AW	479	NW	Pond	1938
245AW	479	NW	Pond	1912
246	480	W	Pond	1865
247AW	481	NW	Pond	1948
248AW	496	NW	Unspecified Pit	1991

# 2. Environmental Permits, Incidents and Registers Map



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- |   |                    |   |                               |   |  |
|---|--------------------|---|-------------------------------|---|--|
|  | Site Outline       |  | Recorded Pollution Incident   |  | RAS 3 & 4 Authorisations                                       |
|  | 250                |  | Dangerous Substances (List 1) |  | Part A(1) Authorised Processes and Historic IPC Authorisations |
|  | 500                |  | Dangerous Substances (List 2) |  | Part A(2) and Part B Authorised Processes                      |
|   | Search Buffers (m) |  | Water Industry Referrals      |  | COMAH / NIHHS Sites  |
|   |                    |  | Licenced Discharge Consents   |  | Sites Determined as Contaminated Land                          |
|   |                    |  | Red List Discharge Consents   |  | Hazardous Substance Consents and Enforcements                  |



# 2. Environmental Permits, Incidents and Registers

## 2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

### 2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

---

### 2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

---

### 2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

### 2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

---

### 2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

---

### 2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

2

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
3	197	NW	516227 171114	Address: Oceana Dry Cleaners, 84 High Street, Teddington, TW11 8JD Process: Dry Cleaning Status: Current Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
4	338	NW	516055 171132	Address: Pristine Laundries, 37 High Street, Teddington, TW11 8ET Process: Dry Cleaning Status: Current Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

### 2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

### 2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

2

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
1A	405	S	516500 170300	Address: Harrowdene Gardens, Harrowdene Gardens, -, -, - Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: TEMP.1107 Permit Version: 2 Receiving Water: Status: SURRENDERED UNDER EPR 2010 Issue date: 03/09/2010 Effective Date: 03-Sep-2010 Revocation Date: 19/08/2014
2A	405	S	516500 170300	Address: Harrowdene Gardens, Harrowdene Gardens, -, -, - Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: TEMP.1107 Permit Version: 1 Receiving Water: Status: TEMPORARY CONSENTS (WATER ACT 1989, SECTION 113) Issue date: 02/11/1989 Effective Date: 02-Nov-1989 Revocation Date: 02/09/2010

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

---

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

---

## 2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

0

Database searched and no data found.

---

## 2.3 Environment Agency Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

0

Database searched and no data found.

---

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

---

## 2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site?

0

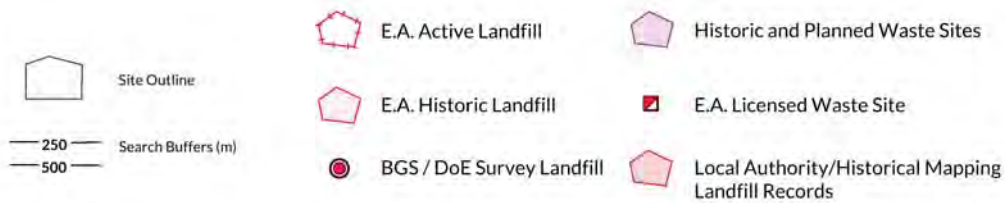
Database searched and no data found.

---

# 3. Landfill and Other Waste Sites Map



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# 3. Landfill and Other Waste Sites

## 3.1 Landfill Sites

### 3.1.1 Records from Environment Agency landfill data within 1000m of the study site:

0

Database searched and no data found.

### 3.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site:

1

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
Not shown	894	E	517600 170500	Site Address: Broom Road Recreation Ground, Broom Road Waste Licence: - Site Reference: 8RI001, RIC001 Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -

### 3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

### 3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

## 3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

---

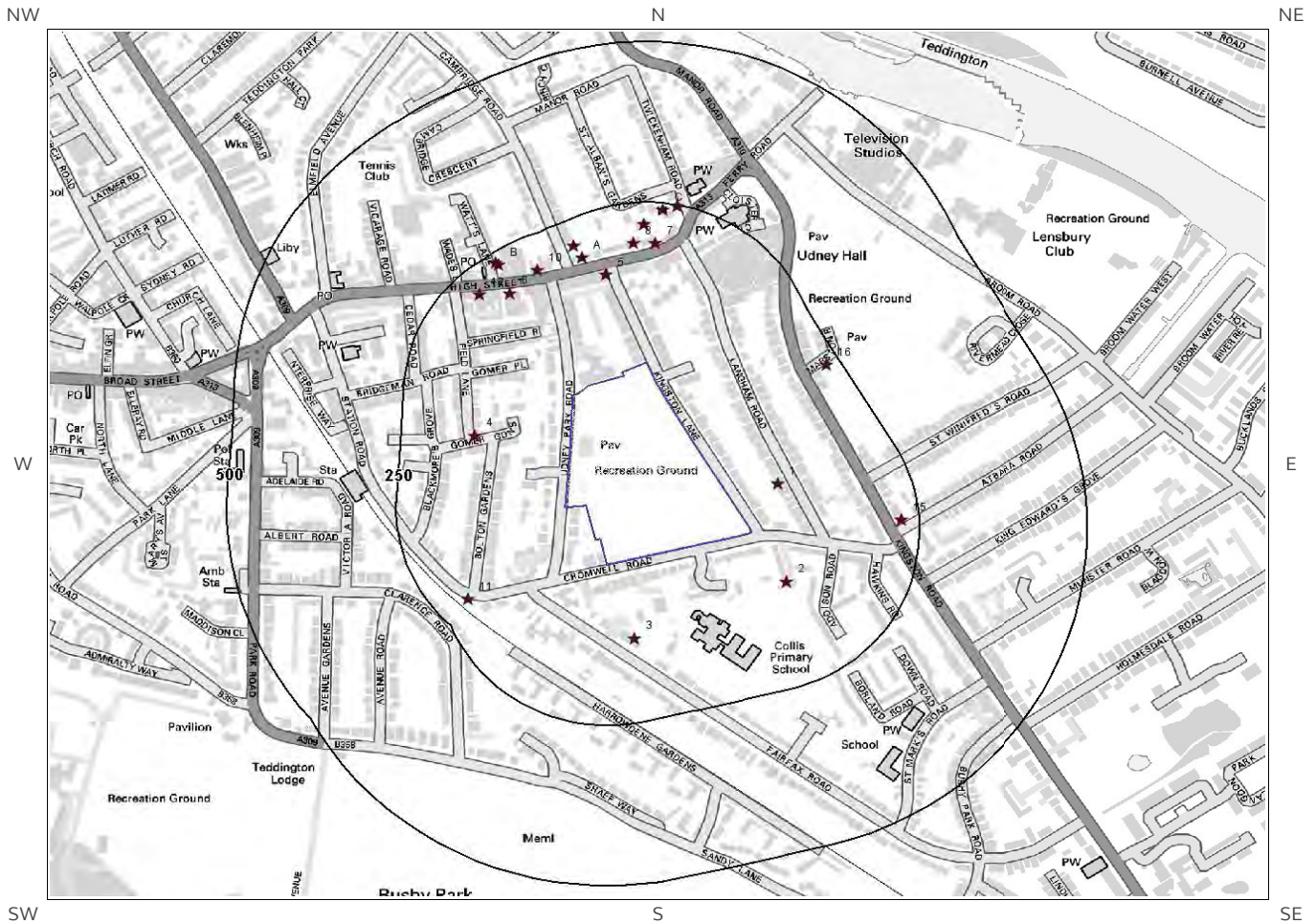
3.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

0

Database searched and no data found.

---

# 4. Current Land Use Map



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# 4. Current Land Uses

## 4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

20

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	72	NE	Cakes by Trudi	516646 170818	Flat 1 94, Langham Road, Teddington, TW11 9HJ	Baking and Confectionery	Foodstuffs
2	92	SE	Electricity Sub Station	516659 170667	TW11	Electrical Features	Infrastructure and Facilities
3	120	S	Electricity Sub Station	516435 170578	TW11	Electrical Features	Infrastructure and Facilities
4	143	W	Electricity Sub Station	516198 170894	TW11	Electrical Features	Infrastructure and Facilities
5	150	NW	Works	516393 171145	TW11	Unspecified Works Or Factories	Industrial Features
6	185	NW	Telephone Exchange	516251 171116	TW11	Telecommunications Features	Infrastructure and Facilities
7	187	N	Meades Motors	516464 171193	161, High Street, Teddington, TW11 8HH	Vehicle Repair, Testing and Servicing	Repair and Servicing
8	188	N	Prefect Lockers & Equipment	516432 171194	153b, High Street, Teddington, TW11 8HH	Educational Equipment and Supplies	Industrial Products
9A	189	NW	Focus Metals Ltd	516357 171171	131, High Street, Teddington, TW11 8HH	General Construction Supplies	Industrial Products
10	196	NW	Nichols Jewellers	516291 171151	121a, High Street, Teddington, TW11 8HG	Jewellery, Gems, Clocks and Watches	Consumer Products
11	202	SW	Electricity Sub Station	516189 170639	TW11	Electrical Features	Infrastructure and Facilities
12	210	NW	Works	516206 171114	TW11	Unspecified Works Or Factories	Industrial Features
13A	210	NW	Wizard Ltd	516344 171189	2a, Cambridge Road, Teddington, TW11 8DR	Hobby, Sports and Pastime Products	Consumer Products
14	217	N	Works	516449 171224	TW11	Unspecified Works Or Factories	Industrial Features
15	223	E	Teddington Tyres Ltd	516828 170762	161, Kingston Road, Teddington, TW11 9JP	Vehicle Parts and Accessories	Motoring
16	230	NE	Electricity Sub Station	516718 171004	TW11	Electrical Features	Infrastructure and Facilities
17B	231	NW	Apollo Garage	516234 171160	2-8, Watts Lane, Teddington, TW11 8HQ	Vehicle Repair, Testing and Servicing	Repair and Servicing
18B	236	NW	Works	516230 171163	TW11	Unspecified Works Or Factories	Industrial Features
19C	240	N	Electricity Sub Station	516476 171246	TW11	Electrical Features	Infrastructure and Facilities

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
20C	248	N	Electricity Sub Station	516497 171251	TW11	Electrical Features	Infrastructure and Facilities

---

## 4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

---

## 4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

---

## 4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

---

# 5. Geology

## 5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

## 5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
KPGR	KEMPTON PARK GRAVEL FORMATION	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]

## 5.3 Bedrock and Solid Geology

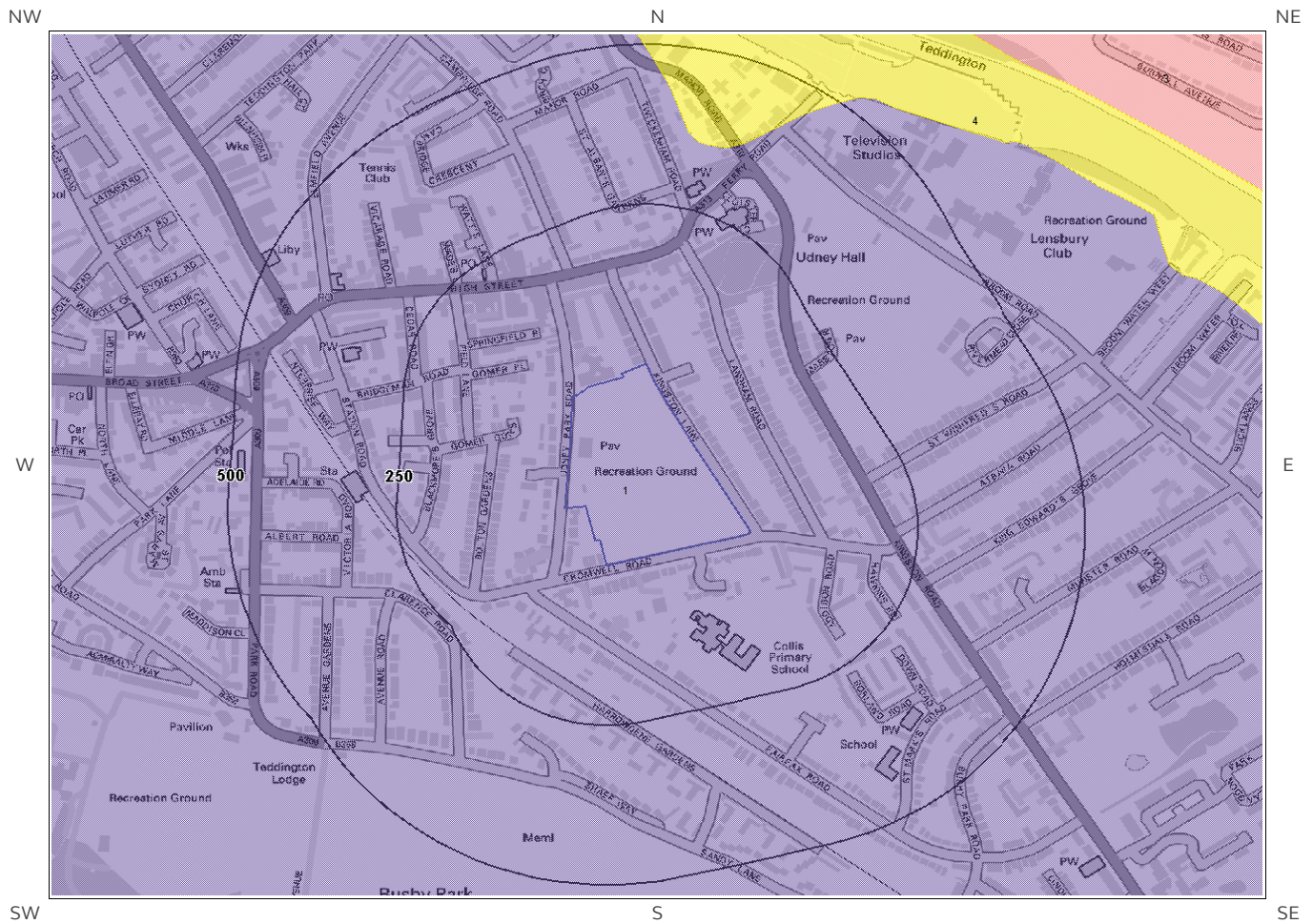
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
LC-CLSI	LONDON CLAY FORMATION	CLAY AND SILT

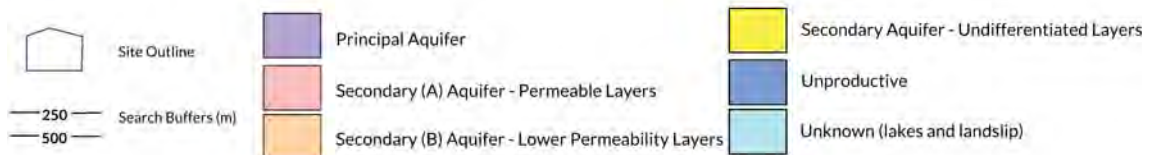
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

# 6 Hydrogeology and Hydrology

## 6a. Aquifer Within Superficial Geology



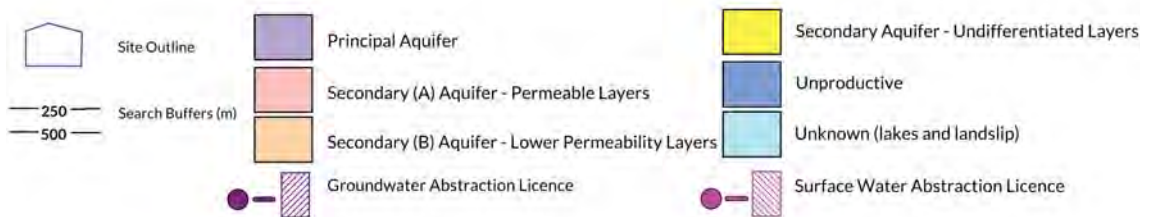
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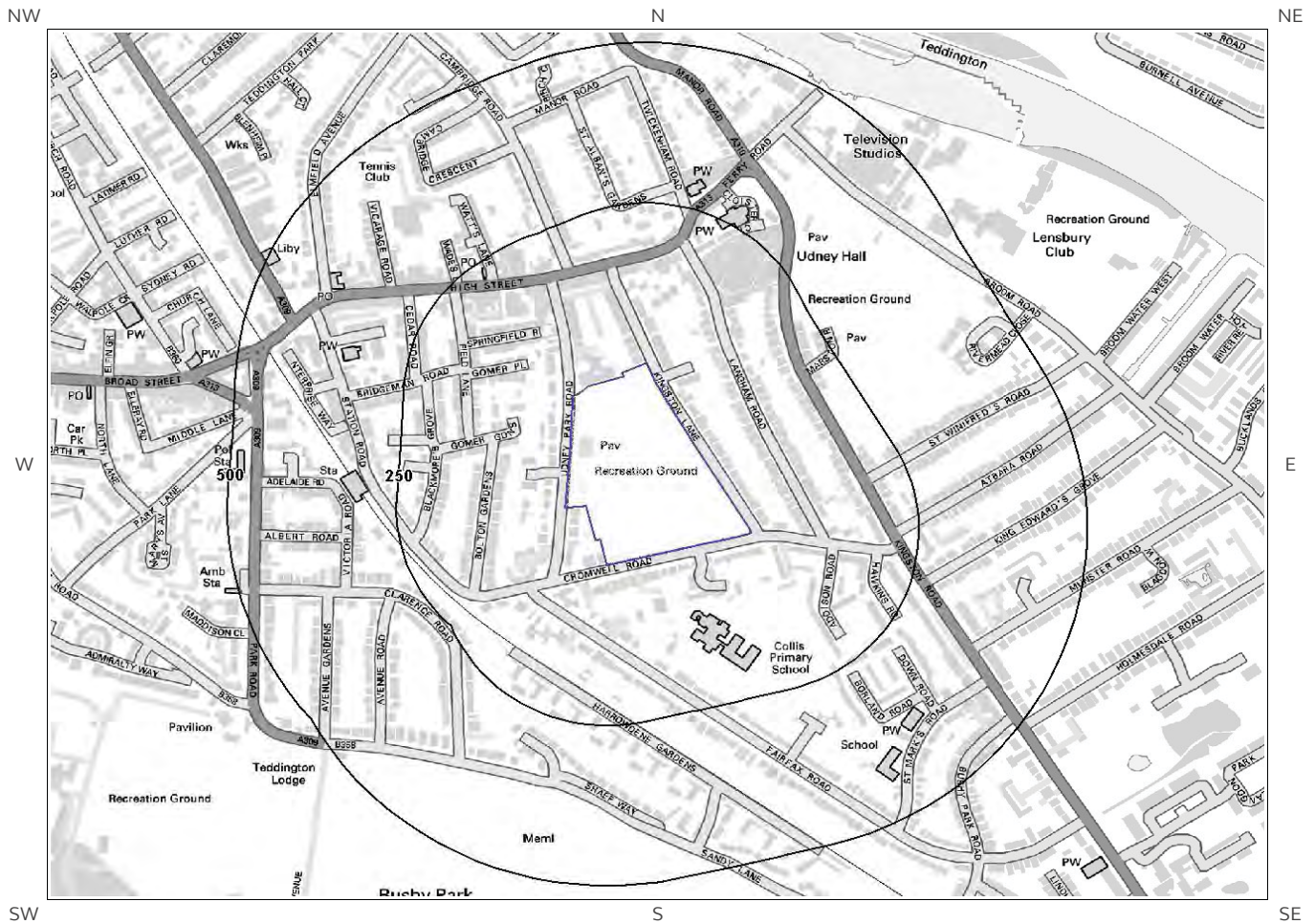
# 6b. Aquifer Within Bedrock Geology and Abstraction Licenses



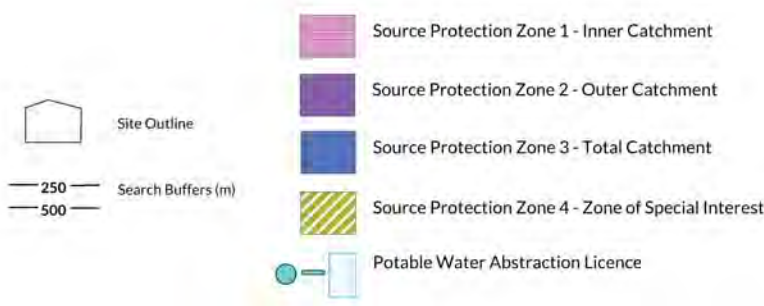
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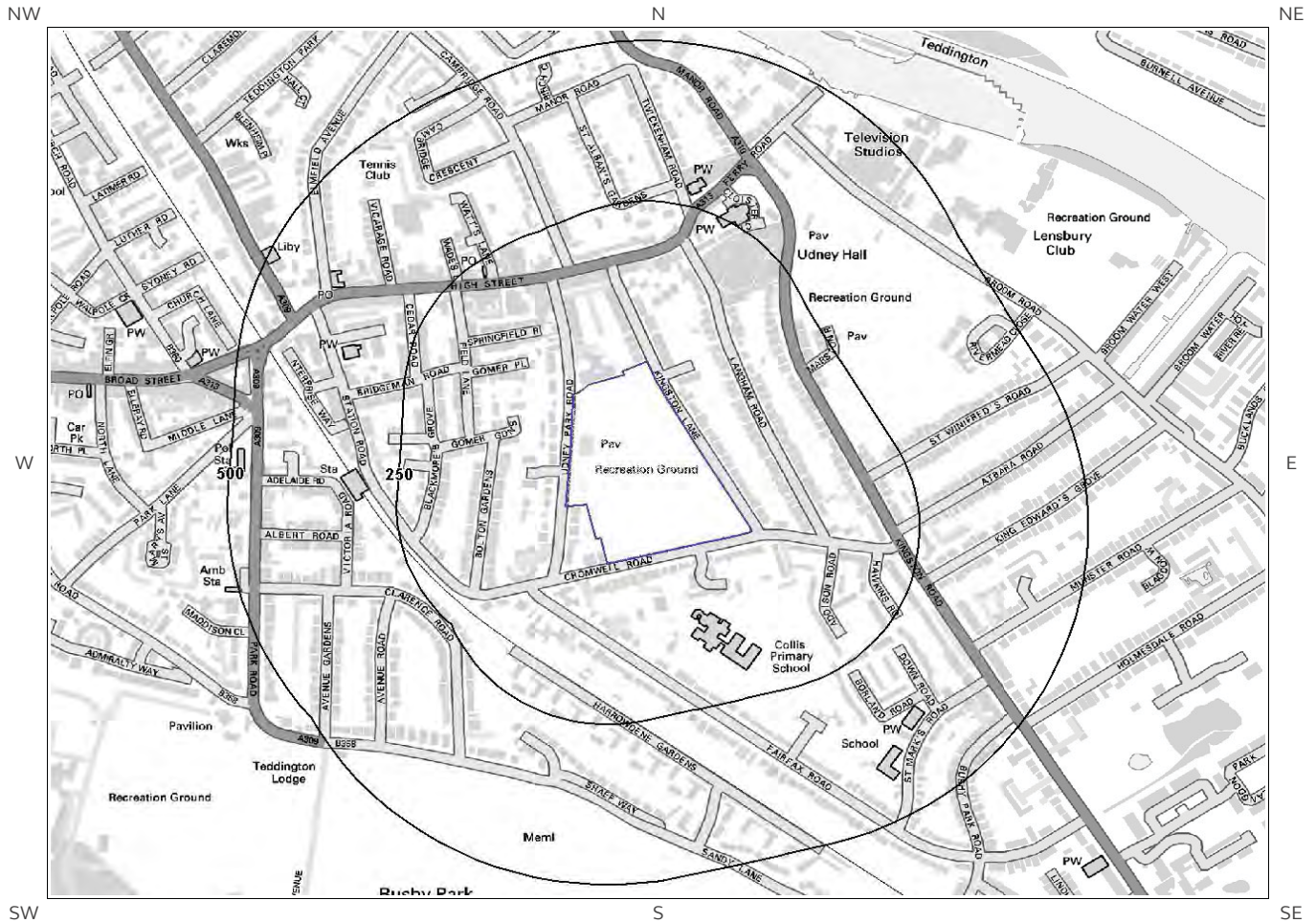
# 6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



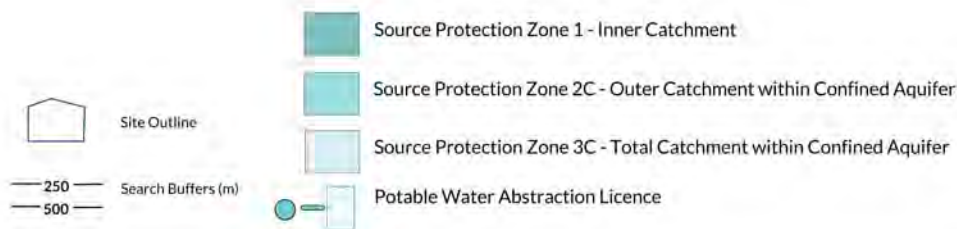
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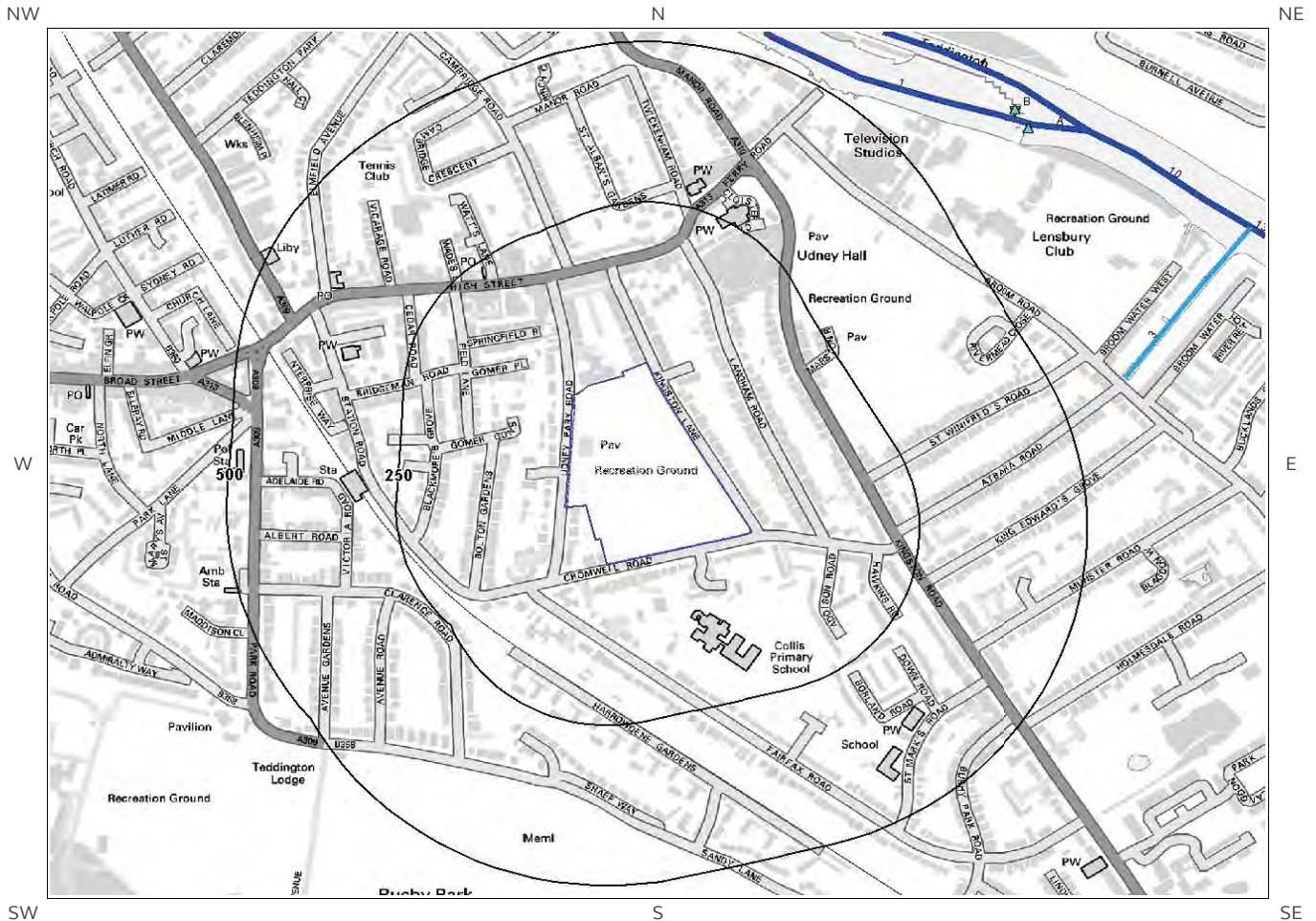
# 6d. Hydrogeology – Source Protection Zones within confined aquifer



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# 6e. Hydrology – Detailed River Network and River Quality



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# 6. Hydrogeology and Hydrology

## 6.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property?  
Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
4	355	N	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

## 6.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

## 6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site?

Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
3A	325	NE	516680 171240	Status: Historical Licence No: 28/39/34/0010 Details: Spray Irrigation - Direct Direct Source: Thames Groundwater Point: Borehole 'a' At Lensbury Club, Teddington Data Type: Point Name: THE CATHOLIC EDUCATION SERVICE Annual Volume (m <sup>3</sup> ): 3000 Max Daily Volume (m <sup>3</sup> ): 45.45 Original Application No: - Original Start Date: 22/12/2000 Expiry Date: - Issue No: 1 Version Start Date: 1/4/2008 Version End Date:
4A	325	NE	516680 171240	Status: Historical Licence No: 28/39/34/0010 Details: Spray Irrigation - Direct Direct Source: Thames Groundwater Point: Borehole 'a' At Lensbury Club, Teddington Data Type: Point Name: THE CATHOLIC EDUCATION SERVICE Annual Volume (m <sup>3</sup> ): 3000 Max Daily Volume (m <sup>3</sup> ): 45.45 Original Application No: - Original Start Date: 22/12/2000 Expiry Date: - Issue No: 1 Version Start Date: 1/4/2008 Version End Date:
5B	621	NE	517020 171260	Status: Historical Licence No: 28/39/34/0007 Details: Spray Irrigation - Direct Direct Source: Thames Groundwater Point: Borehole 'b' At Lensbury Club, Teddington Data Type: Point Name: LENSBUURY LIMITED Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1986 Expiry Date: - Issue No: 101 Version Start Date: 22/12/2000 Version End Date:
6B	621	NE	517020 171260	Status: Historical Licence No: 28/39/34/0007 Details: Spray Irrigation - Direct Direct Source: Thames Groundwater Point: Borehole 'b' At Lensbury Club, Teddington Data Type: Point Name: LENSBUURY LIMITED Annual Volume (m <sup>3</sup> ): 7000 Max Daily Volume (m <sup>3</sup> ): 100 Original Application No: - Original Start Date: 28/11/1986 Expiry Date: - Issue No: 102 Version Start Date: 23/11/2001 Version End Date:
7B	623	NE	517024 171257	Status: Historical Licence No: 28/39/34/0007 Details: Spray Irrigation - Direct Direct Source: Thames Groundwater Point: Borehole At Lensbury Club, Teddington Data Type: Point Name: LENSBUURY LIMITED Annual Volume (m <sup>3</sup> ): 6000 Max Daily Volume (m <sup>3</sup> ): 100 Original Application No: NPS/WR/009225 Original Start Date: 28/11/1986 Expiry Date: - Issue No: 103 Version Start Date: 1/4/2013 Version End Date:

## 6.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site?

Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1573	SE	517752 169665	Status: Historical Licence No: TH/039/0033/002 Details: Non-Evaporative Cooling Direct Source: Thames Surface Water - Non Tidal Point: River Thames At Former Kingston Power Station Data Type: Point Name: NHP Leisure Development Limited	Annual Volume (m <sup>3</sup> ): 4800000 Max Daily Volume (m <sup>3</sup> ): 13200 Application No: NPS/WR/010963 Original Start Date: 6/6/2012 Expiry Date: 31/3/2036 Issue No: 2 Version Start Date: 5/10/2012 Version End Date:
Not shown	1573	SE	517752 169665	Status: Active Licence No: TH/039/0033/002 Details: Heat Pump Direct Source: Thames Surface Water - Non Tidal Point: River Thames At Former Kingston Power Station Data Type: Point Name: Kingston Heights Energy Management Company Limited	Annual Volume (m <sup>3</sup> ): 4800000 Max Daily Volume (m <sup>3</sup> ): 13200 Application No: NPS/WR/019092 Original Start Date: 6/6/2012 Expiry Date: 31/3/2036 Issue No: 3 Version Start Date: 5/5/2015 Version End Date:

## 6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site?

No

Database searched and no data found.

## 6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site?

No

Database searched and no data found.

## 6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site? No

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

## 6.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
499	SW	Major Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.

## 6.9 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? Yes

### 6.9.1 Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
21B	674	NE	517000 171400	River Name: Thames (se Area) Reach: Hogsmill - Teddington End/Start of Stretch: End of Stretch NGR	C	C	B	B	B

## 6.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Chemical Quality Grade				
					2005	2006	2007	2008	2009
22A	673	NE	517020 171370	River Name: Thames Reach: Hogsmill - Teddington End/Start of Stretch: Sample Point NGR	A	A	B	B	B
23B	674	NE	517000 171400	River Name: Thames Reach: Hogsmill - Teddington End/Start of Stretch: End of Stretch NGR	A	A	B	B	B

## 6.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? No

Database searched and no data found.

## 6.11 Surface Water Features

Are there any surface water features within 250m of the study site? No

Database searched and no data found.

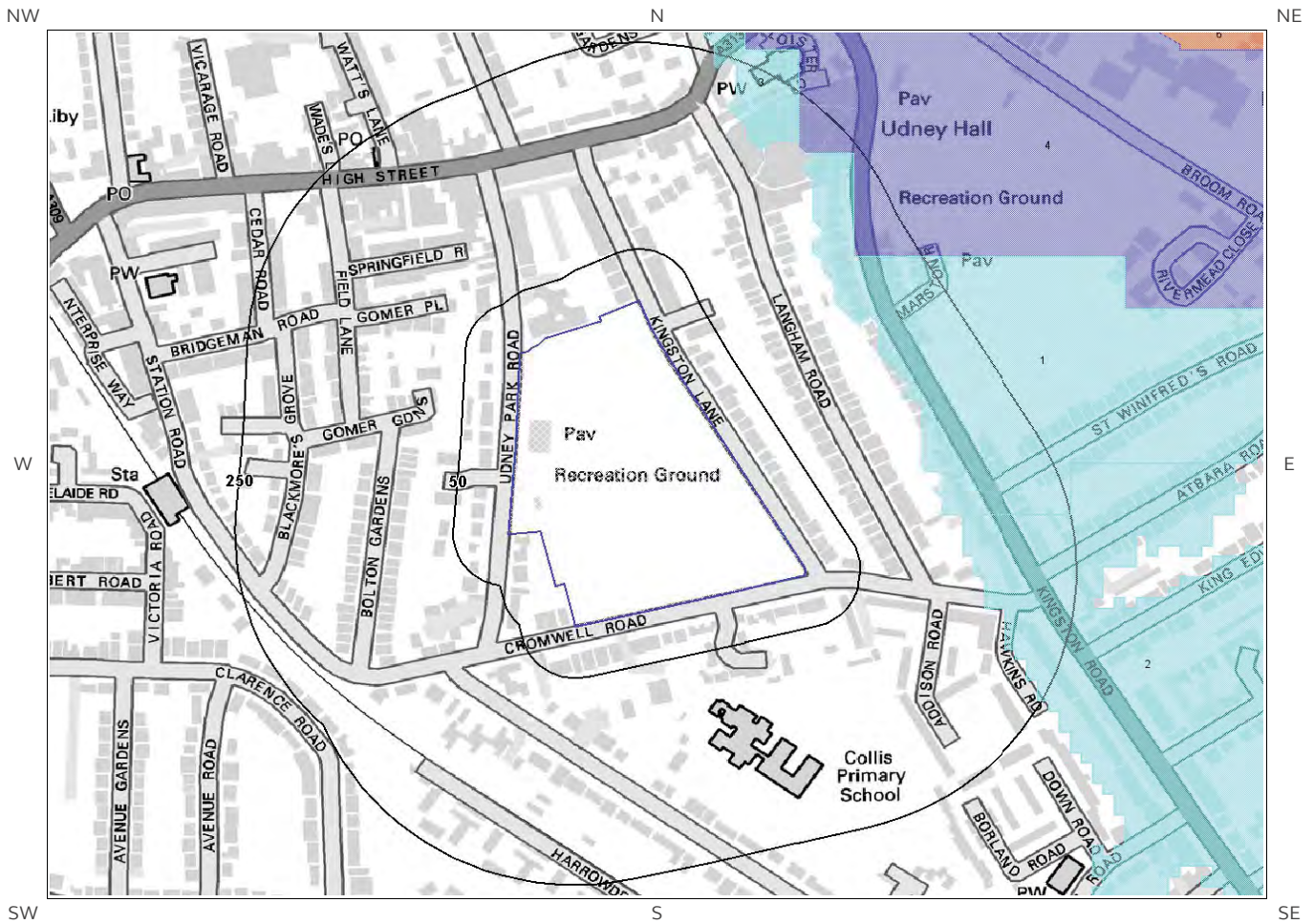
# 7a. Environment Agency Flood Map for Planning (from rivers and the sea)



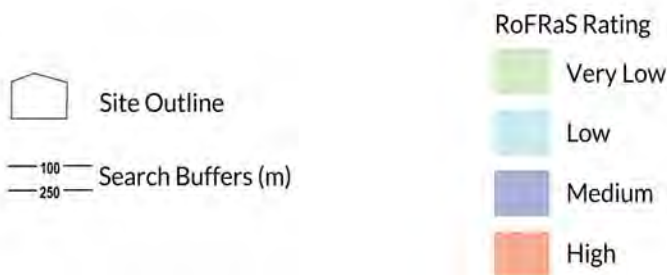
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# 7b. Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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# 7 Flooding

## 7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency Zone 2 floodplain? Yes

Environment Agency Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

ID	Distance (m)	Direction	Update	Type
1	134	NE	01-Jul-2016	Zone 2 - (Fluvial /Tidal Models)
2	198	NE	01-Jul-2016	Zone 2 - (Fluvial /Tidal Models)

---

## 7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency Zone 3 floodplain? Yes

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

ID	Distance (m)	Direction	Update	Type
1	220	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
2	221	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
	222	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
	222	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
	223	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
	223	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
	223	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
	223	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
	224	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
	224	NE	01-Jul-2016	Zone 3 - (Fluvial Models)



224	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
225	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
225	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
226	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
226	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
226	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
227	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
230	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
230	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
243	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
245	NE	01-Jul-2016	Zone 3 - (Fluvial Models)
250	NE	01-Jul-2016	Zone 3 - (Fluvial Models)

---

### 7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

What is the highest risk of flooding onsite? Very Low

The Environment Agency RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

---

### 7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? No  
Database searched and no data found.

---

### 7.5 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? Yes

---

### 7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

## 7.7 Groundwater Flooding Susceptibility Areas

7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Superficial Deposits Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

---

7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

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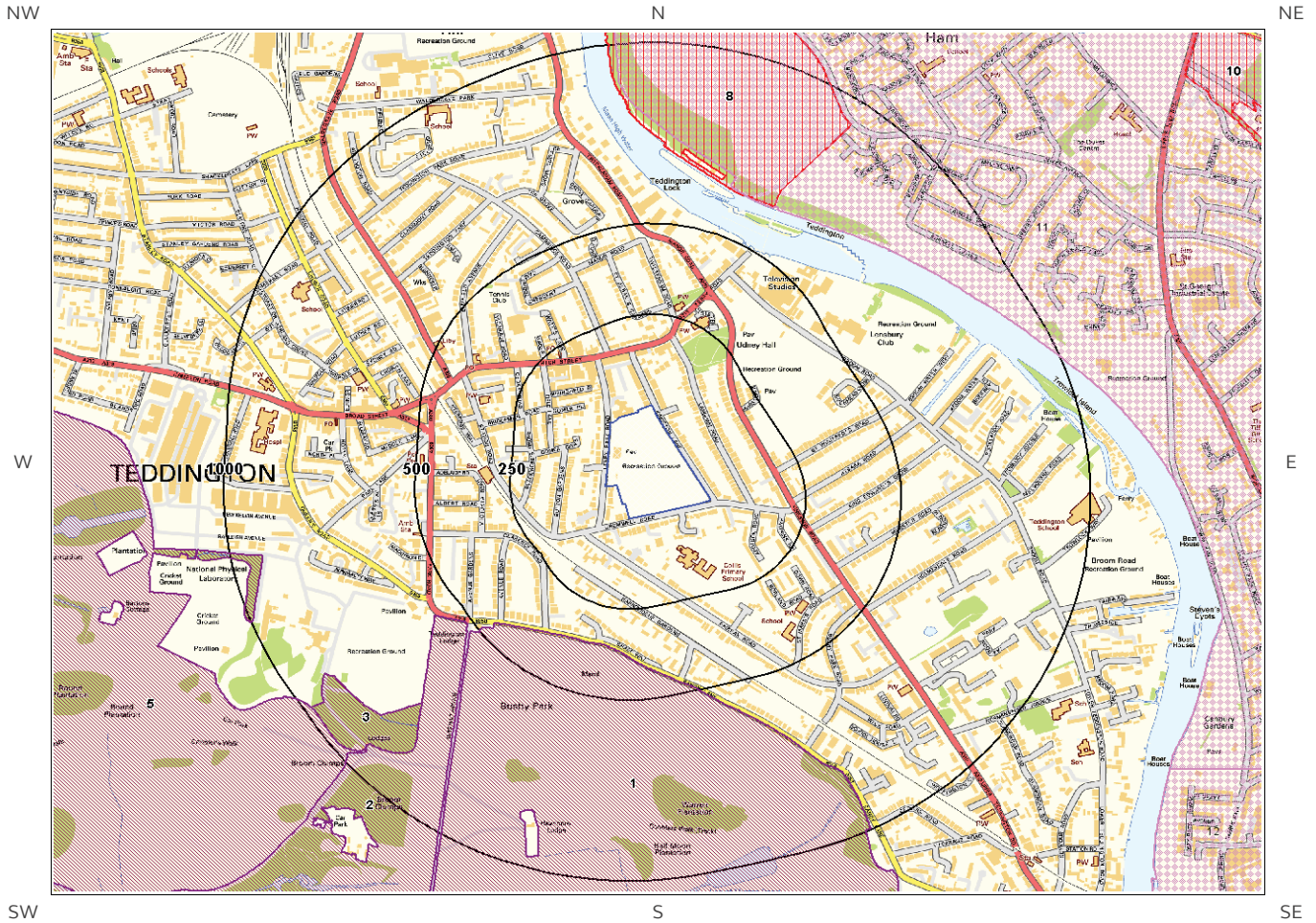
## 7.8 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? Moderate

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

# 8. Designated Environmentally Sensitive Sites Map



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# 8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site? Yes

## 8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

7

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SSSI Name	Data Source
1	354	S	Bushy Park and Home Park	Natural England
2	514	SW	Bushy Park and Home Park	Natural England
3	744	SW	Bushy Park and Home Park	Natural England
4	918	W	Bushy Park and Home Park	Natural England
5	934	SW	Bushy Park and Home Park	Natural England
Not shown	1648	SE	Bushy Park and Home Park	Natural England
Not shown	1741	W	Bushy Park and Home Park	Natural England

## 8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

## 8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

#### 8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

#### 8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

#### 8.6 Records of Ancient Woodland within 2000m of the study site:

0

Database searched and no data found.

#### 8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

3

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
8	624	N	Ham Lands	Natural England
Not shown	1344	N	Ham Lands	Natural England
10	1671	NE	Ham Common, Richmond, London	Natural England

#### 8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

#### 8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

### 8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

### 8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

### 8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

### 8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

3

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
11	624	NE	Existing	DEFRA
12	1416	SE	Existing	DEFRA
Not shown	1935	SE	Existing	DEFRA

### 8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

# 9. Natural Hazards Findings

## 9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our [website](#). The following information has been found:

### 9.1.1 Shrink Swell

What is the maximum Shrink-Swell\* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

### 9.1.2 Landslides

What is the maximum Landslide\* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

### 9.1.3 Soluble Rocks

What is the maximum Soluble Rocks\* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

\* This indicates an automatically generated 50m buffer and site.

### 9.1.4 Compressible Ground

What is the maximum Compressible Ground\* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

---

**Hazard**

No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

---

### 9.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks\* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

---

**Hazard**

Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

---

### 9.1.6 Running Sand

What is the maximum Running Sand\* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

---

**Hazard**

Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

---

## 9.2 Radon

### 9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

---



---

\* This indicates an automatically generated 50m buffer and site.



### 9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing

ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

# 10. Mining

## 10.1 Coal Mining

Are there any coal mining areas within 75m of the study site?

No

Database searched and no data found.

---

## 10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary?

No

Database searched and no data found.

---

## 10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site?

No

Guidance: No Guidance Required.

---

# Contact Details

**Groundsure Helpline**  
Telephone: 08444 159 000  
info@groundsure.com

**British Geological Survey Enquiries**

Kingsley Dunham Centre  
Keyworth, Nottingham NG12 5GG  
Tel: 0115 936 3143.  
Fax: 0115 936 3276.  
Email:

Web:[www.bgs.ac.uk](http://www.bgs.ac.uk)

BGS Geological Hazards Reports and general geological enquiries:  
[enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)

**Environment Agency**

National Customer Contact Centre, PO Box 544  
Rotherham, S60 1BY  
Tel: 08708 506 506

Web:[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

Email:[enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

**Public Health England**

Public information access office  
Public Health England, Wellington House  
133-155 Waterloo Road, London, SE1 8UG  
[www.gov.uk/phe](http://www.gov.uk/phe)

Email:[enquiries@phe.gov.uk](mailto:enquiries@phe.gov.uk)

Main switchboard: 020 7654 8000

**The Coal Authority**

200 Lichfield Lane  
Mansfield  
Notts NG18 4RG  
Tel: 0345 7626 848  
DX 716176 Mansfield 5  
[www.coal.gov.uk](http://www.coal.gov.uk)

**Ordnance Survey**

Adanac Drive, Southampton  
SO16 0AS  
Tel: 08456 050505

**Local Authority**

Authority: London Borough of Richmond upon Thames  
Phone: 08456 122 660

Web: <http://www.richmond.gov.uk/>

Address: Civic Centre, 44 York Street, Twickenham, Middlesex, TW1

**Gemapping PLC**

Virginia Villas, High Street, Hartley Witney,  
Hampshire RG27 8NW  
Tel: 01252 845444



Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England who retain the Copyright and Intellectual Property Rights for the data.

PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028].

This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

## Standard Terms and Conditions

### 1 Definitions

In these terms and conditions unless the context otherwise requires:

**“Beneficiary”** means the person or entity for whose benefit the Client has obtained the Services.

**“Client”** means the party or parties entering into a Contract with Groundsure.

**“Commercial”** means any building or property which is not Residential.

**“Confidential Information”** means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

**“Support Services”** means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

**“Contract”** means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

**“Third Party Data Provider”** means any third party providing Third Party Content to Groundsure.

**“Data Reports”** means reports comprising factual data with no accompanying interpretation.

**“Fees”** has the meaning set out in clause 5.1.

**“Groundsure”** means Groundsure Limited, a company registered in England and Wales under number 03421028.

**“Groundsure Materials”** means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

**“Intellectual Property”** means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

**“Mapping”** means a map, map data or a combination of historical maps of various ages, time periods and scales.

**“Order”** means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.

**“Ordnance Survey”** means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

**“Order Website”** means the online platform through which Orders may be placed by the Client and accepted by Groundsure.

**“Report”** means a Risk Screening Report or Data Report for Commercial or Residential property.

**“Residential”** means any building or property used as or intended to be used as a single dwelling.

**“Risk Screening Report”** means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.

**“Services”** means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.

**“Site”** means the area of land in respect of which the Client has requested Groundsure to provide the Services.

**“Third Party Content”** means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.

**“User Guide”** means the user guide, as amended from time to time, available upon request from Groundsure and on the website ([www.Groundsure.com](http://www.Groundsure.com)) and forming part of this Contract.

### 2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 Groundsure agrees to provide the Services in accordance with the Contract.

2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure. Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

### 3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

### 4 Reliance

4.1 The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

### 5 Fees and Disbursements

5.1 Groundsure shall charge and the Client shall pay fees at the rate and

frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

## 6 Intellectual Property and Confidentiality

### 6.1 Subject to

(i) full payment of all relevant Fees and

(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.

6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

## 7. Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of Groundsure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or

subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 Groundsure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

## 8 Groundsure's right to suspend or terminate

8.1 If Groundsure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, Groundsure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 Groundsure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

## 9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

- (a) supplied to the Client's specification(s) and in any event
- (b) by their nature cannot be returned.

## 10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

## 11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

## 12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.

12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.

12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond Groundsure's reasonable control.

In the event that Groundsure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then Groundsure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 Groundsure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner. In the event you are not satisfied with Groundsure's complaints handling process or you are unable to resolve the complaint, at your discretion you may refer the complaint to The Property Ombudsman Scheme at the following URL/email: website [www.tpos.co.uk](http://www.tpos.co.uk) or email: [admin@tpos.co.uk](mailto:admin@tpos.co.uk)

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law. © Groundsure Limited June 2013

## **PRELIMINARY UNEXPLODED ORDNANCE RISK ASSESSMENT**





## Preliminary Unexploded Ordnance Risk Assessment



Project: Teddington Playing Fields, Greater London

Prepared for: Ruddlesden geotechnical

Ref: 16325

Report prepared by Dynasafe BACTEC Limited and FIND Mapping Limited

Report reference: 501957

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# Preliminary Unexploded Ordnance Threat Assessment

## Teddington Playing Fields, Greater London

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# 1 Executive Summary

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- 1 **Has a potential unexploded ordnance (UXO) risk been identified at the site in question?**

**YES**

Indicative British / Allied UXO Risk

**MEDIUM**

Indicative German UXO Risk

**HIGH**

- 2 **Does the site in question require further research to clarify the unexploded ordnance (UXO) risk to future ground works?**

**YES**

- 3 **Dynasafe BACTEC's recommendation:**

**A Stage 2 Detailed Unexploded Ordnance Desktop Threat Assessment of the site is carried out.**

To request a quotation please call Dynasafe BACTEC Limited on 01322 284 550

If you order the recommended Stage 2 Detailed Desktop Threat Assessment, you will be refunded the fee for this BombRisk Preliminary Threat Assessment.

## 2 Introduction

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### About Dynasafe BACTEC Limited

Since 1991, Dynasafe BACTEC Limited has supported the UK construction industry by assessing the risk of encountering items of unexploded ordnance (UXO) during intrusive works. Dynasafe BACTEC's specialist advice provides essential information for threat assessments, improving safety and enhancing reputations, helping contractors avoid costly delays.

Dynasafe BACTEC holds the following accreditations: Occupational Health & Safety Management Systems (OHAS 18001:2007), Environmental Management Systems (ISO 14001:2004) and Quality Management Systems (ISO 9001:2008).

The risk of encountering UXO on most sites in the UK is low. However, where a site is at increased risk it is necessary to take measures to mitigate that risk. The factors affecting UXO threat assessment are based upon the history and previous usage of a site and its surroundings.

In 2009, the Construction Industry Research and Information Association (CIRIA) established a set of guidelines to assist industry professionals.

CIRIA recommends a four stage risk management process:

- **Preliminary threat assessment**
- **Detailed threat assessment**
- **Risk mitigation**
- **Implementation**

The preliminary threat assessment enables a non-UXO specialist to place a site in context and to identify whether a more detailed assessment is necessary. The assessment is based upon data obtained from desktop reviews of the site's history and its proximity to potential indicators of UXO contamination.

There are two principal groups of onshore UXO in the UK:

- **British / Allied Army, Air Force and Navy activities – domestic military activity**
- **Enemy bombing during WWI and WWII – aerial bombing and naval bombardment**

These two groups comprise many potential UXO risk contributing sources within the UK, the most significant of which are listed below. Georeferenced databases containing this information are used by BombRisk.com to identify areas of potentially elevated UXO risk.

- **Historic army, navy and air-force facilities**
- **Explosives / ammunition factories**
- **Munitions storage depots**
- **Historic military training areas and firing ranges**

- **British army explosive ordnance clearance tasks / recces**
- **WWII heavy anti-aircraft batteries**
- **WWII anti-invasion defensive fortifications**
- **Miscellaneous WWII pipe mined locations**
- **WWII prisoner of war camps**
- **WWII German bombing density statistics**
- **WWII bombing decoy sites**
- **Press articles regarding UXO finds**
- **Locations of Dynasafe BACTEC UXO finds**
- **Locations of Dynasafe BACTEC desktop threat assessments**
- **Locations of Dynasafe BACTEC on-site support services**

### **About FIND Mapping Limited**

Established in 2006, FIND Mapping Limited is a pioneering web mapping and spatial data technology company offering online mapping and consultancy services. FIND technology powers the generation of this report.

[www.findmaps.co.uk](http://www.findmaps.co.uk) provides detailed mapping and a wealth of data sets to hundreds of the UK's top property, environmental and design/build companies.

FIND's consultancy services provide bespoke internet mapping solutions to a range of businesses enabling them to manage their spatial data more effectively.

While working closely with a wide range of reputable data providers including Ordnance Survey and the Environment Agency, FIND works independently of these organisations. A similar arm's-length relationship is maintained in terms of software and hardware providers. This enables the team at FIND to offer truly independent advice.

## 3 Methodology

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**Dynasafe BACTEC Limited and FIND have compiled a geo-referenced database of potential sources of UXO risk within the UK. From this information a range of risk zones have been defined.**

The weighting of these zones is based upon the influence of all relevant factors. A WWII-era RAF airfield, for example, has a far greater zone of influence than a single WWII-era Anti-Aircraft Battery, as it would have covered a larger area, housed a much greater quantity / variety of munitions, seen more domestic troop training activities and would have been a more likely target for enemy bombers.

An online Preliminary Automated UXO Threat Assessment will determine an indicative level of UXO risk relating to a site. Note that these risk levels could be subject to change following the completion of any Detailed Desktop Threat Assessment for the same site.

The assessment will list all factors contributing to this weighting and will also give appropriate recommendations for further action, if considered necessary.

## 4 Search Results

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### London during WWII

As a Capital city, London was an obvious target for the Luftwaffe. The city was home to the British government, the largest docks system in the UK and numerous historic and cultural monuments.

The night time “carpet bombing” Blitz on London began on 7th September 1940 with concentrated attacks coming to an end in May 1941 as the Luftwaffe was diverted east to prepare for ‘Operation Barbarossa’; the invasion of the Soviet Union. By the end of the war London had become the most heavily bombed city in Britain. Between 1940 and 1945 there were a total of 71 ‘major’ air raids on the city, resulting in an estimated 190,000 bombs dropped; approximately 18,000 tons. This left some 29,000 people dead.

During 1942 and 1943 there were a number of minor intruder raids carried out by small formations of fighter bombers and then between January and May 1944 the Luftwaffe returned to London in mass, for Operation Steinbock, a series of large Blitz style raids.

From mid-1944 the “V-weapon” (for Vengeance) campaign, using unmanned cruise missiles and rockets carrying 1,000kg warheads, represented Hitler’s final attempt to reverse Germany’s imminent defeat. The V1 (Flying Bomb or Doodlebug) and the V2 (Long Range Rocket) were launched from bases in Germany and occupied Europe. Totals of 2,419 V1s and 517 V2s were recorded in the London Civil Defence region.

The map included at the end of this report shows the high explosive bombs recorded falling in the region of the site on the available bomb census mapping for the area. Please note that this information comes from a single source and should not be considered definitive in its accuracy or coverage.

### Dynasafe BACTEC Limited's UXO Source Database

Within 10km of the site the following potential sources of explosive ordnance have been recorded:

<b>Source</b>	<b>Number within 10km</b>
Military Airfield Sites	2
Bombing Decoy Sites	1
Abandoned Bombs	13
Press Articles regarding UXO Finds	2
WWII Defence Related Positions & Pillboxes	71
Historic Army Camps	7
Prisoner of War Camps	5
Heavy Anti-Aircraft Batteries	7
Army Explosive Ordnance Clearance Tasks/Recces	19
Sites Related to the Manufacture of Explosives and Explosive Ordnance	7
Dynasafe BACTEC Desk-top Threat Assessments	41
Military Training Areas and Firing Ranges	None recorded
Pipe Mined WWII Airfields	None recorded
Miscellaneous WWII Pipe Mined Locations	None recorded
Dynasafe BACTEC Unexploded Ordnance Finds	None recorded
Dynasafe BACTEC On-Site Support Services	None recorded

Of these sources, the following are deemed the most significant:

#### Abandoned Bombs

<b>Description</b>	<b>Approximate distance (km) from site</b>
1 x 50kg HE. Near Fairfax Level Crossing, over Bushy Park Road, Twickenham	0.7

An Abandoned Bomb (AB) is a suspected unexploded WWII bomb or anti-aircraft projectile recorded during 1940-1945, but not definitively located/removed at the time.

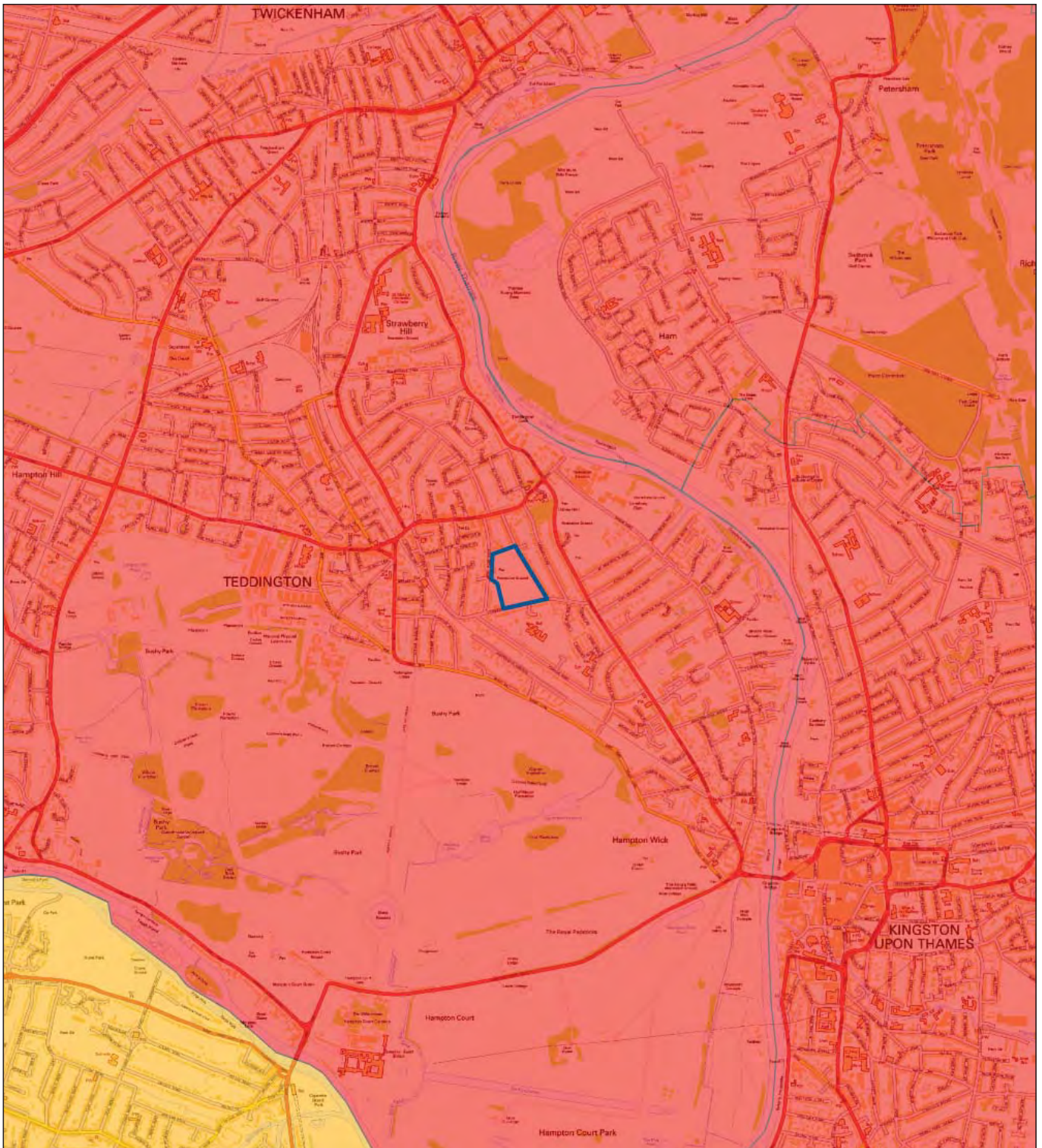
A typical post-air raid survey of buildings, facilities and installations included a search for evidence of bomb entry holes. Where entry holes were identified, a bomb disposal team would usually be called upon to locate, render safe and dispose of any unexploded bomb (UXB). However, when the position of a UXB



was considered relatively benign, where access was problematic or resources short, the UXB may not have been exposed and rendered safe. Such incidents were noted AB.

Given the inaccuracy of WWII records the location of ABs cannot be considered definitive. The geographic location of ABs must therefore be regarded as approximate.

# 5 Risk of UXO based on WWII German bombing density



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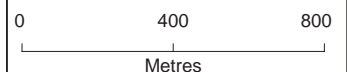
**BombRisk.com**

Dynasafe BACTEC Limited



- NEGLIGIBLE
- LOW
- MEDIUM
- HIGH

1:20000



# 6 Risk of UXO based on WWII German bomb strikes

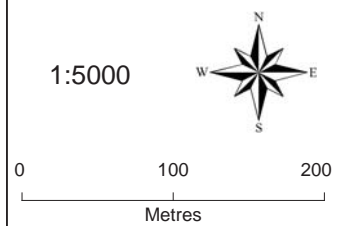


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 BOMB STRIKES WITH BUFFER



# 7 Conclusions

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## Risk Levels and Recommendation

### Indicative British / Allied UXO Risk

#### **MEDIUM**

There are potential sources of British / Allied UXO recorded in Dynasafe BACTEC's historical database in proximity to the site. It is recommended that further research is undertaken to determine more about these potential sources and how they may have affected the site. Given the proximity of these sources, the risk on site from UXO is considered to be Medium.

### Indicative German UXO Risk

#### **HIGH**

Historical records indicate that the borough within which the site was situated during WWII sustained an overall high density of bombing. Furthermore, a bomb strike(s) was recorded within 50m of the site on the London ARP Bomb Census Maps.

Given these factors, this preliminary assessment has identified a High risk from German unexploded bombs at this site.

## Conclusion

This preliminary assessment has resulted in an overall High risk from UXO. Dynasafe BACTEC would recommend that a Detailed UXO Threat Assessment Desk Top Study is undertaken for this site.

Detailed assessments are conducted offline by Dynasafe BACTEC's researchers and use information such as historical mapping, WWII-era aerial photography, written air-raid precaution records and where necessary local archive research to fully qualify the risk on site. Land use, changes to building layout during WWII and post war redevelopment will also have an impact on any remaining level of risk from UXO. It is often possible to 'zone' sites into different risk categories. The lead time for a detailed assessment will vary between 3-10 working days dependent upon the complexity of the site and the additional site specific information required.

For a quotation, or more information, please contact Dynasafe BACTEC on 01322 284 550.

[www.bombrisk.com](http://www.bombrisk.com)



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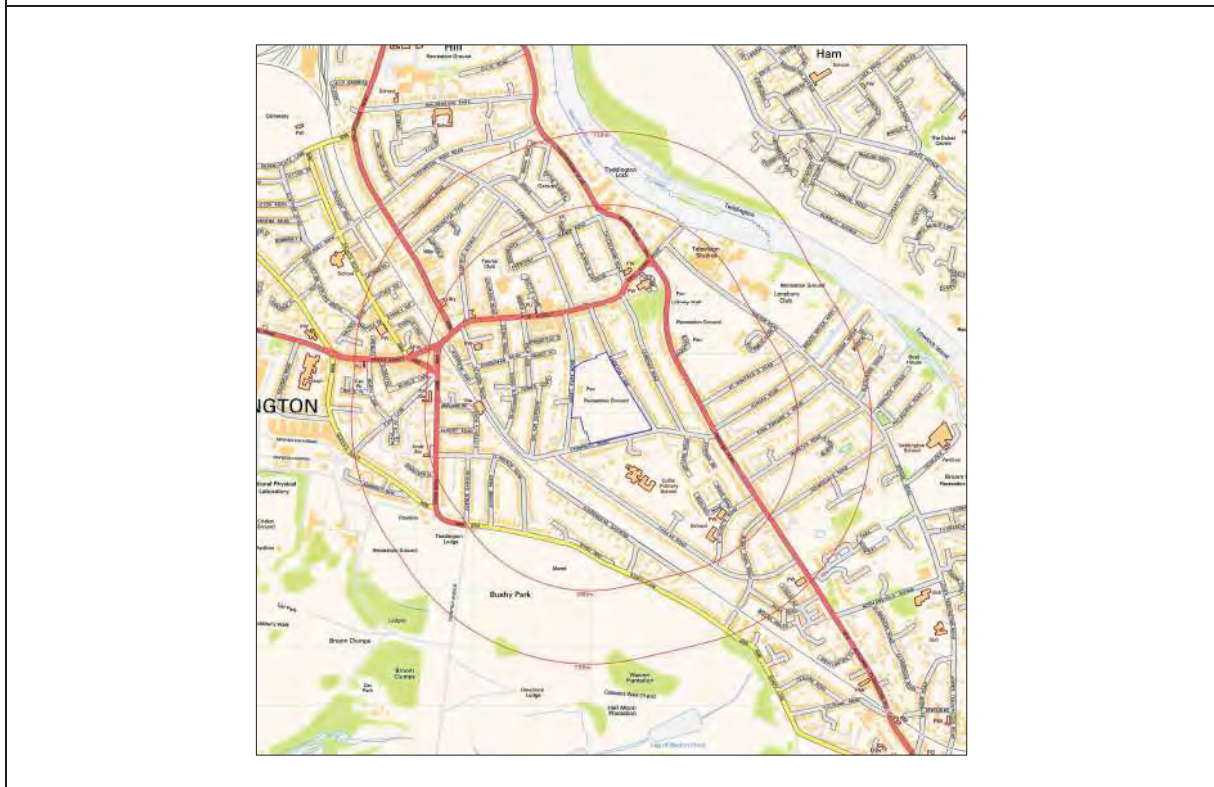
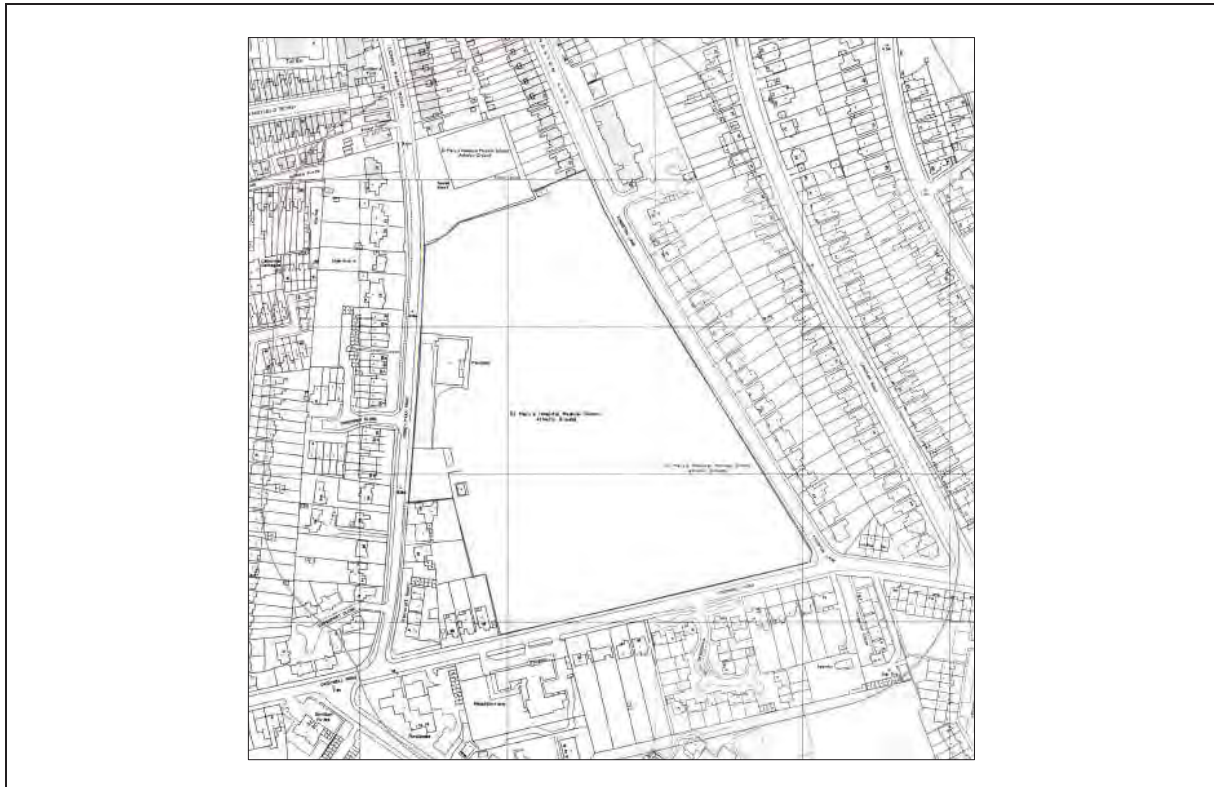
## **APPENDIX C**

### **SITE PLANS**



## SITE LOCATION PLAN





### Site Location Plan

Dwg. No. 16325/01





## AERIAL PHOTOGRAPH





**Aerial Photograph**

Dwg. No.  
16325/AP

