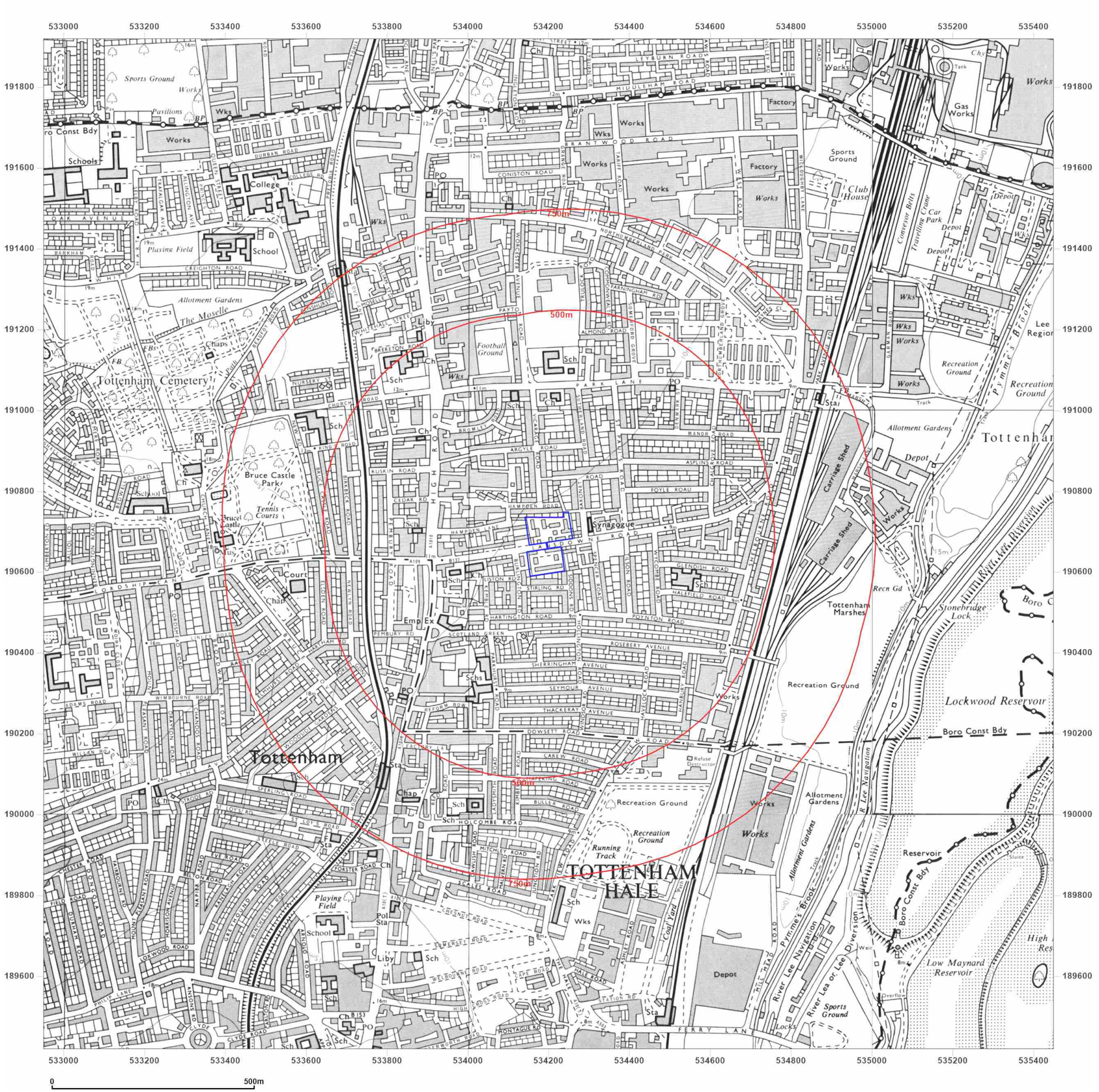

Groundsure INSIGHTS

Site Details:

ARUNDEL & BALDEWYNNE
LANSDOWNE ROAD,
TOTTENHAM, LONDON, N17
0LL

Client Ref: 1921836_-_PO2116503
Report Ref: GS-8098307
Grid Ref: 534199, 190669

Map Name: National Grid

Map date: **1974-1975**

Scale: 1:10,000

Printed at: 1:10,000

N
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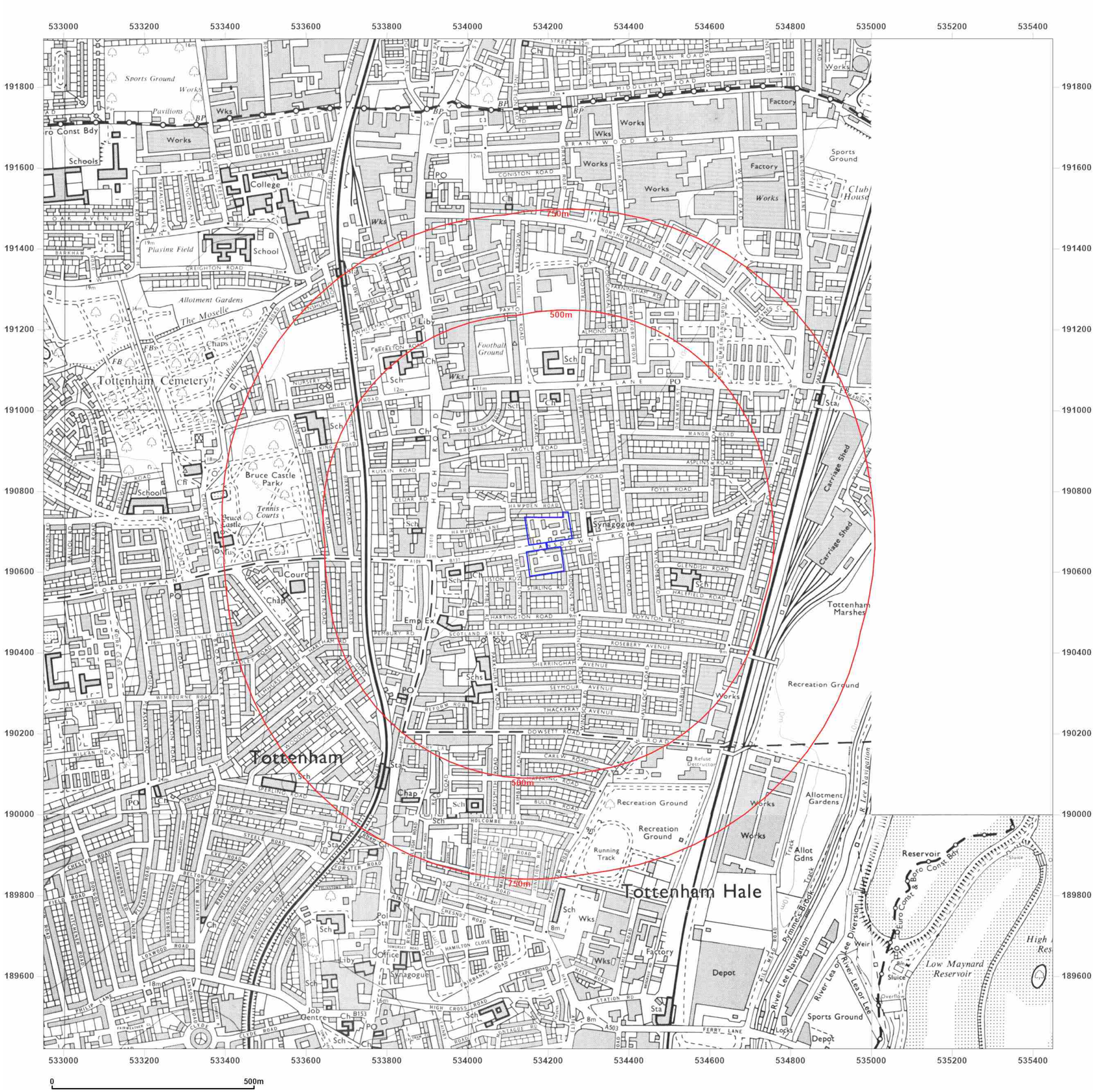
Surveyed 1973 Revised 1974 Edition N/A Copyright 1975 Levelled 1972	Surveyed 1973 Revised 1974 Edition N/A Copyright 1976 Levelled 1972
Surveyed 1974 Revised 1975 Edition N/A Copyright N/A Levelled N/A	Surveyed 1974 Revised 1975 Edition N/A Copyright N/A Levelled N/A

Powered by

Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 04 August 2021

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

ARUNDEL & BALDEWYNNE
LANSDOWNE ROAD,
TOTTENHAM, LONDON, N17
0LL

Client Ref: 1921836_-_PO2116503
Report Ref: GS-8098307
Grid Ref: 534199, 190669

Map Name: National Grid

Map date: **1982-1985**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1973
Revised 1982
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1981
Revised 1982
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1979
Revised 1985
Edition N/A
Copyright N/A
Levelled N/A

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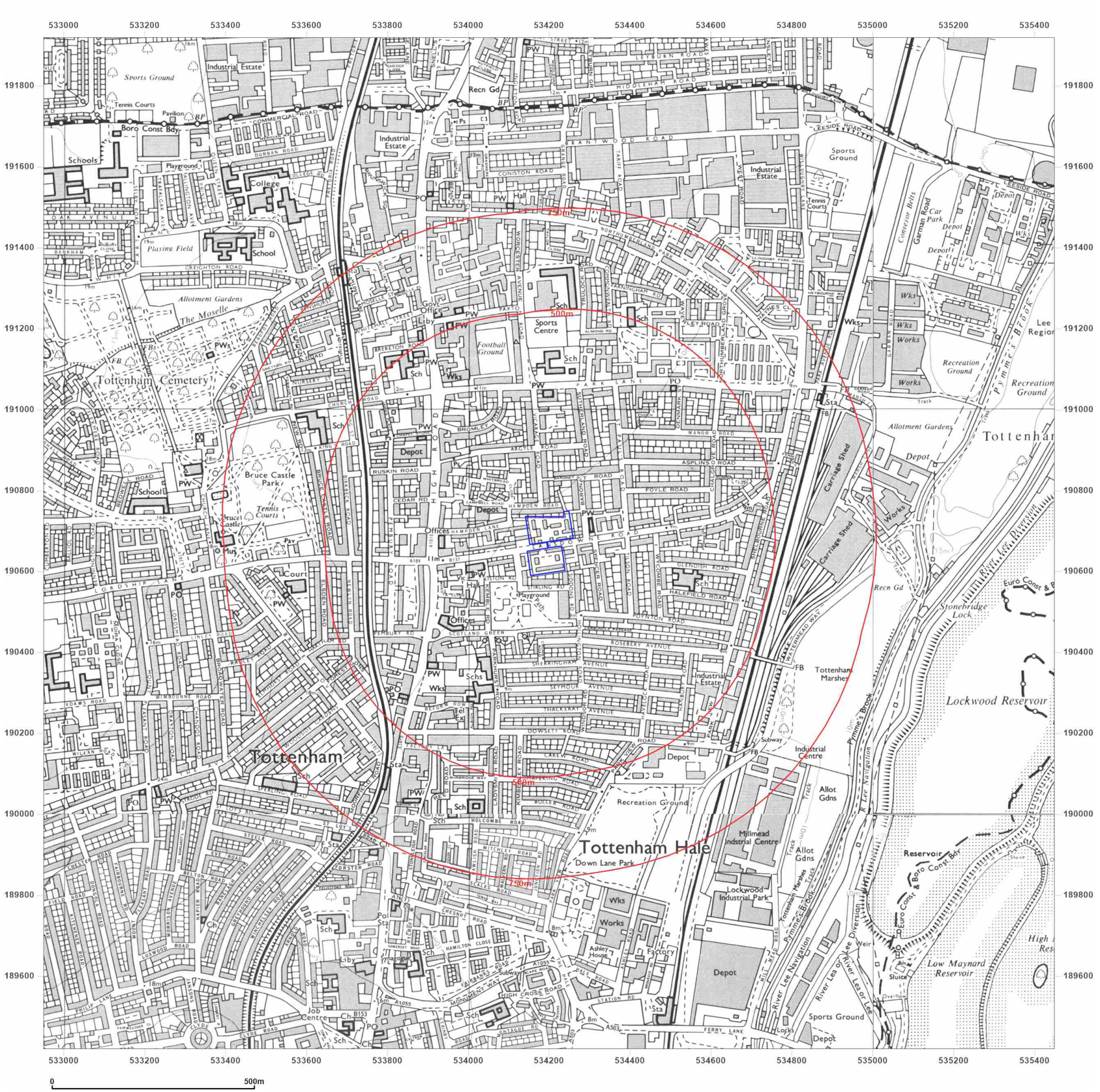
Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

ARUNDEL & BALDEWYNNE
LANSDOWNE ROAD,
TOTTENHAM, LONDON, N17
0LL

Client Ref: 1921836_-_PO2116503
Report Ref: GS-8098307
Grid Ref: 534199, 190669

Map Name: National Grid

Map date: **1989-1994**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1989
Revised 1991
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1973
Revised 1988
Edition N/A
Copyright 1990
Levelled N/A

Surveyed 1981
Revised 1989
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1989
Revised 1994
Edition N/A
Copyright N/A
Levelled N/A

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Map legend available at:
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Groundsure INSIGHTS

Site Details:

ARUNDEL & BALDEWYNNE
LANSDOWNE ROAD,
TOTTENHAM, LONDON, N17
0LL

Client Ref: 1921836_-_PO2116503
Report Ref: GS-8098307
Grid Ref: 534199, 190669

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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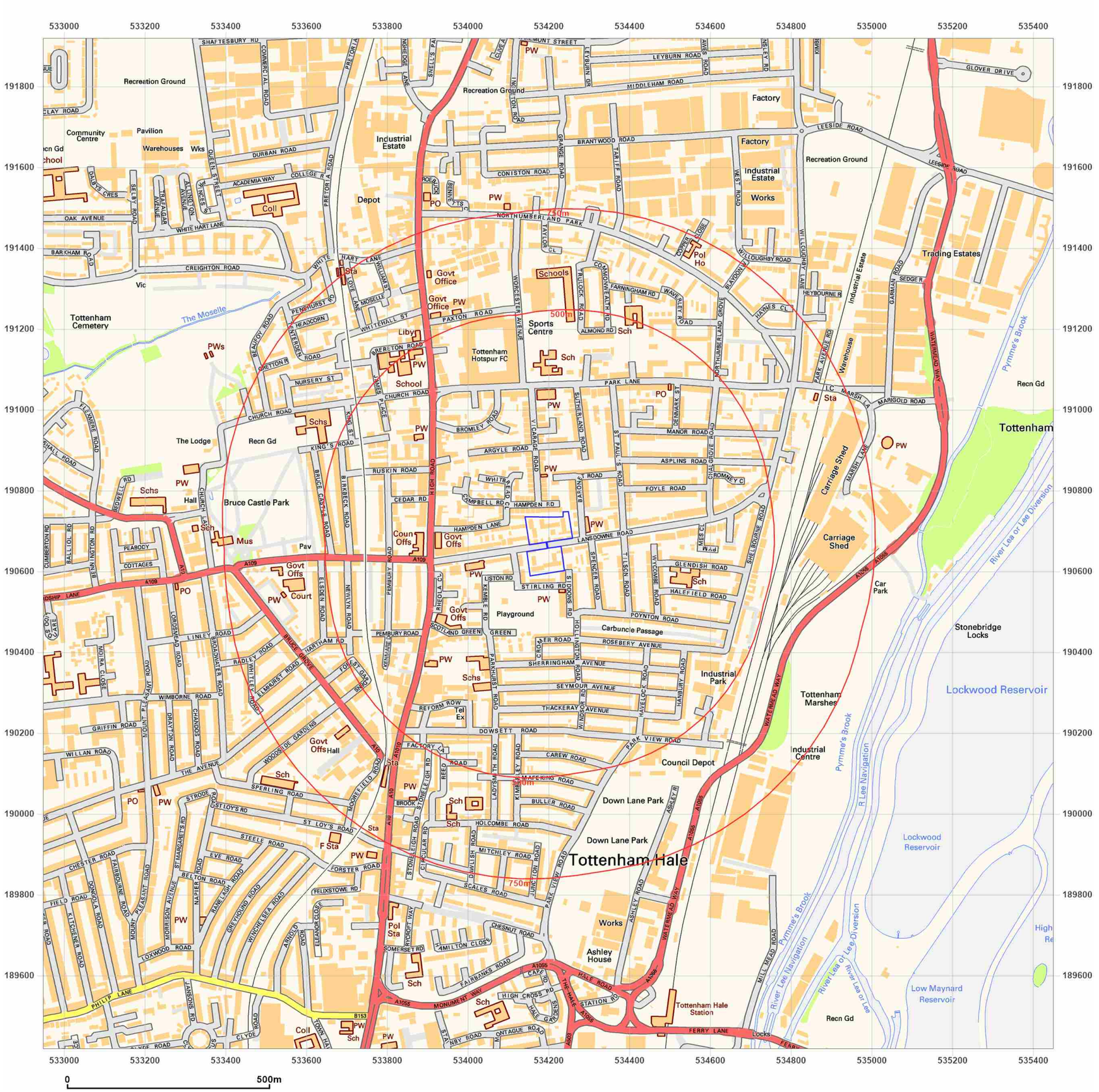
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 04 August 2021

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

ARUNDEL & BALDEWYNNE
LANSDOWNE ROAD,
TOTTENHAM, LONDON, N17
0LL

Client Ref: 1921836_-_PO2116503
Report Ref: GS-8098307
Grid Ref: 534199, 190669

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

Powered by

Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 04 August 2021

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

Groundsure INSIGHTS

Site Details:

ARUNDEL & BALDEWYNNE
LANSDOWNE ROAD,
TOTTENHAM, LONDON, N17
0LL

Client Ref: 1921836_-_PO2116503
Report Ref: GS-8098307
Grid Ref: 534199, 190669

Map Name: National Grid
Map date: **2021**
Scale: 1:10,000
Printed at: 1:10,000

N
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2021

Powered by OS

Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 04 August 2021

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

APPENDIX E
SUPPORTING DESK STUDY INFORMATION

Flood map for planning

Your reference	Location (easting/northing)	Created
Arundel	**534204/190706**	**19 Aug 2021 22:08**

Your selected location is in flood zone 2, an area with a medium probability of flooding.

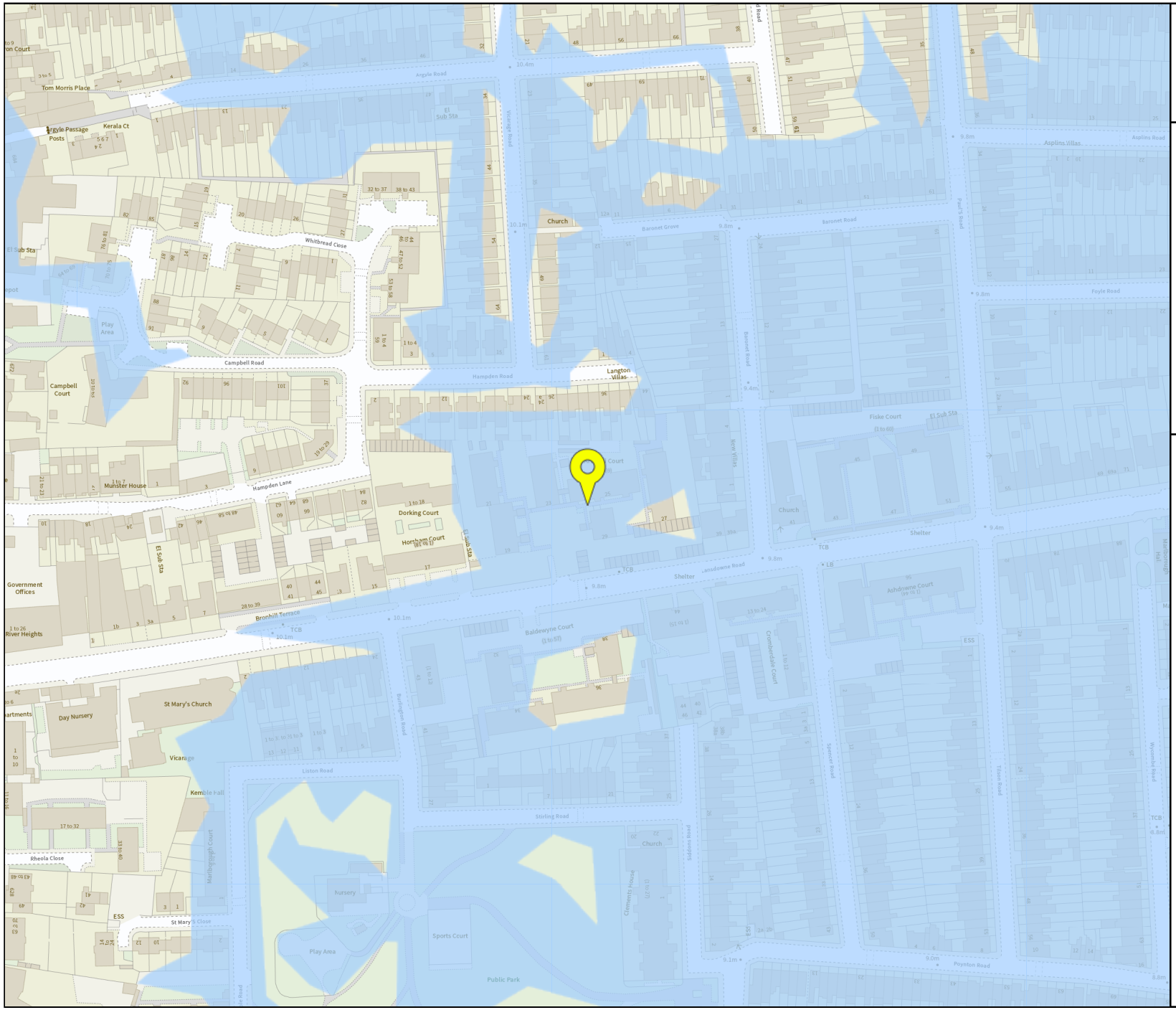
This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
Arundel

Location (easting/northing)
534204/190706

Scale
1:2500

Created
19 Aug 2021 22:08

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

STAGE 1 PRELIMINARY UXO RISK ASSESSMENT

REPORT REF: PRA-21-1554 | Revision: 0

Client: RSK
Project: Arundel Court and Baldewyne Court, Tottenham
Date: 09/08/2021

BRIMSTONE SITE INVESTIGATION
Suite 6, Delta House, Laser Quay,
Culpeper Close, Rochester, ME2 4HU
0207 117 2492
www.brimstoneuxo.com

INTRODUCTION

The Stage 1 Preliminary Risk Assessment is an initial screening assessment designed to highlight any sources of unexploded ordnance (UXO) with the potential to contaminate a given site.

The aim of the Stage 1 assessment is to identify or discount the need for further detailed research - a Stage 2 Detailed UXO Risk Assessment.

This desktop assessment has been researched and written by a dedicated Researcher / Risk Assessor and produced in accordance with the CIRIA C681 Guidelines: 'Unexploded Ordnance, a Guide for the Construction Industry' (published in 2009).

In preparation for this assessment, original wartime records, historic OS mapping and the *Brimstone UXO Sources Database* have been reviewed. The latter incorporates multiple datasets plotting the positions of a variety of domestic military sites and confirmed historic German bombing targets.

The Stage 1 Preliminary Risk Assessment considers the following:

1. The Proposed Works
2. Enemy Action during WWI and WWII
3. British / Allied Military Activity
4. Historic Site Occupancy
5. Risk Mitigating Factors

THE SITE

The Site comprises two parcels of land which will be referred to as Site A (in the north) and Site B (in the south) for the purposes of this report (the centre point between the two areas is situated on the National Grid Ref: TQ 34216 90669). The Site is located in Tottenham, within the London Borough of Haringey, approximately 670m south-west of Northumberland Park railway station.

Site A comprises six three-storey residential apartment blocks. Rows of garages, alongside hardstanding parking areas, are present in the south. Garden areas are located sporadically throughout the northern section. It is bound to the north by garden areas on Hampden Road, to the east by garden areas on Baronet Road, to the south by Lansdowne Road and to the west by structures on Lansdowne Road and Hampden Lane.

Site B comprises four three-storey residential apartment blocks. Rows of garages, alongside hardstanding parking areas, are present in the north. Garden areas are located sporadically throughout the southern and central sections. It is bound to the north by Lansdowne Road, to the east by residential structures on Lansdowne Road, to the south by garden areas on Stirling Road and to the west by garden areas and residential structures on Burlington Road.

THE PROPOSED WORKS

Development works will comprise the construction of residential structures. No further details are available at this stage.

ENEMY ACTION DURING WWI AND WWII

Potential Source of UXO	Significant?	Details
WWI German Bombing	✓	Tottenham was subject to at least two small scale raids during WWI.

WWII German Bombing	✓	British District Bombing Density Statistics	The Site was located within the WWII-era Municipal Borough of Tottenham, which sustained 101.2 bombs / 1,000 acres, a high bombing density.
		Evidence of bomb strikes / damage	Confirmed bombing incident approximately 190m east. Pre-WWII glass structures on Site A cleared by 1955. Structural alterations on Site B by 1955. Possible evidence of bomb damage.
		Local Bombing Decoy Sites	None within a significant distance. The closest was located approximately 13km north-west of the Site.
		Local German Bombing Targets	Luftwaffe target photography indicates that a water treatment works and reservoir, approximately 950m east, were identified as a primary target. Northumberland Park railway station, approximately 670m east, may have been identified as a target of oppotunity.
WWII German Cross Channel Artillery Shelling	×	n/a	
BRITISH / ALLIED MILITARY ACTIVITY			
Potential Source of UXO	**Significant?**	**Details**	
WWII Home Guard (HG) activity	×	Soldiers of the 25th, 27th and 30th (Enfield), 26th (Wood Green) and 28th (Hornsey) Middlesex HG Battalions may have been active locally during WWII. However, they are unlikely to have accessed the Site or utilised it in any significant way.	
Site requisitioned for wartime military use	×	n/a	
Existing or historic Army or RAF training area / weapons range	×	n/a	
Existing or historic military bases and other installations	×	n/a	
Existing or historic munitions or explosives factories	×	n/a	
Existing or historic military storage depots	×	n/a	
Existing or historic military defensive fortifications	×	n/a	
WWII light and / or heavy anti-aircraft (LAA and HAA) fire	✓	Numerous (<30) permanent HAA batteries were active within range of the Site during WWII. LAA guns may have defended Vulnerable Points within range of the Site. Luftwaffe activity in the region was frequent and intense. It is possible that an unexploded AA shell struck the Site.	
WWII pipe-mined locations and beach minefields	×	n/a	
SITE HISTORY			
What was the Site occupancy historically, especially during WWI and WWII?	During WWII, Site A comprised residential structures and garden areas on Lansdowne Road. Two glass structures were present in the north. Site B also comprised residential structures and garden areas on Lansdowne Road.		
RISK MITIGATING FACTORS			
Post-conflict ground works	By 1955, two glass structures had been cleared in the north of Site A. Minor structural alterations had occured on Site B. By 1971, the pre-WWII residential structures had been cleared from both Sites; Arundel Court was constructed in the north, while Baldewyne Court was built in the south, giving the Site its current confguration. Note, it appears that the accompanying garages, some of which have now been cleared, were constructed at the same time.		

Likelihood of UXO remaining	The risk associated with (any) very shallow buried UXO will have been largely mitigated. The risk associated with (any) shallow and deep buried UXO will have been partially mitigated.

CONCLUSIONS

German UXO:

- London was the most heavily bombed British city during WWII. The Site was situated relatively centrally and therefore suffered many indiscriminate bombing raids. It was also relatively close to identified Luftwaffe targets; a reservoir and water treatment works were located approximately 950m east.
- Consequently, the study area experienced a high bombing density, as indicated by the wartime figures. It is quite possible therefore that a UXB strike(s) occurred in the vicinity.
- However, a comparison of historical OS maps indicates that the Sites were partially occupied by structures which survived the war intact. Any evidence of a UXB strike within these likely frequently accessed Sites will therefore almost certainly have been observed and reported at the time. It must be noted that while minor clearance and structural alterations occurred on both Sites, no evidence to suggest that this was a result of bombing has been found.
- The possibility cannot be entirely discounted that the Sites themselves/adjacent structures suffered minor or moderate (but repairable) HE blast damage or fire damage due to incendiary bombs. Any such damage could have caused the Sites to be temporarily abandoned pending repairs.
- While any subsequent UXB strike to the Sites could then have fallen unnoticed, it is thought likely that a large UXB entry hole on the Sites could not have been overlooked by returning residents.

British / Allied UXO:

- No evidence of significant military activity specifically on Site has been found and none is likely to have occurred.
- It is possible that an unexploded British AA shell struck the Site during. Any such UXO incident would likely have been observed and reported at the time.

RECOMMENDATION(S)	
SI Works	At the time of writing, BSI was not made aware of any SI works.
Development Works	A Stage 2 Detailed Risk Assessment is not considered necessary prior to ground works commencing. However, the possibility of shallow buried UXO remaining on Site cannot be completely ruled out at desktop stage. Therefore, a **UXO Safety Awareness Briefing** to all personnel conducting ground works would be considered prudent.

APPENDIX F
SITE RECONNAISSANCE PHOTOGRAPHS

PHOTOGRAPHIC LOG		
Photo no. **1**	**Date:** 05/08/2021	
Description: View overlooking Arundel Court from Lansdowne Road		

Photo No. **2**	**Date:** 05/08/2021	
Description: View of current site compound with waste storage on Arundel Court site		

Photo No.	Date:	
3	05/08/2021	
Description: Assumed waste disposal storage at Arundel Court		

Photo No.	Date:	
4	05/08/2021	
Description: Electrical substation on western site boundary, Arundel Court		

Photo No.	Date:	
5	05/08/2021	
Description: View of Baldewyne Court		

Photo No.	Date:	
6	05/08/2021	
Description: Some waste storage at Baldewyne Court		

Photo No.	Date:	
7	05/08/2021	
Description: Garages present on the Baldewyne site		

APPENDIX G
TECHNICAL BACKGROUND

G1 Desk Study

Aquifer designation and Source protection zones

Principal aquifer: layers of rock or drift deposit that have high intergranular and/or fracture permeability (usually providing a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

Secondary A aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Secondary B aquifer: predominantly lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Secondary undifferentiated aquifer: it has not been possible to attribute either a category A or B to a rock type. In most cases this means that it was previously designated as both a minor and non-aquifer in different locations owing to the variable characteristics.

Unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA generally adopts a three-fold classification of source protection zones (SPZ) surround abstractions for public water supply. The Site is situated in an area defined as follows:

- Zone 1 or the 'inner protection zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time from any point below the water table to the source. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source
- Zone 2 or the 'outer protection zone' is defined by a 400-day travel time from a point below the water table to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants
- Zone 3 or the 'total catchment' is the area around the source within which all groundwater recharge is presumed to be discharged at the source.

Preliminary risk assessment methodology

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) contaminant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the

likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000)
- medium: chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**Highly likely**	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required
- high: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term
- moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term
- low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild
- very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.