

ADVISORY – GROUND SOLUTIONS

Etech Contract Services Ltd
Wythenshawe Sports Hub
Wythenshawe
Phase 1 Geo-Environmental Assessment

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Phase 1 Geo-Environmental Assessment

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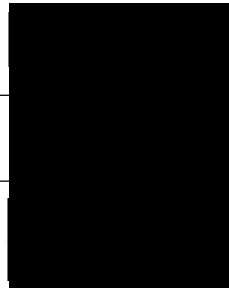
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EXECUTIVE SUMMARY

Executive Summary	
Site Address	Wythenshawe Park, Wythenshawe Road, Wythenshawe, Manchester.
Proposed Development	The proposed development brings together several existing and new facilities to form a new multi-sports hub in Wythenshawe Park. The works include the construction of a new single-storey pavilion to the east of the existing athletics track, the provision of new artificial grass pitches and 'MUGAs' to the south of the new building, a new skate area to the east of the existing pump track, and alterations / extension of the car park.
Current Site Use	Existing Park including car parking, Athletics track, pump track, cycling area and baseball pitches.
Site History	The site was undeveloped farmland until the 1950 when it was developed as playing fields. The athletics track was developed in the 1970s and the pump track was constructed in 2022.
Ground Conditions	<p>Information published by the BGS indicates that most of the site is underlain by superficial deposits comprising Glaciofluvial Sheet Deposits (sand and gravel) with Devensian Till (Diamicton) encroaching in the eastern / north east of the site. The superficial deposits overlie the Tarporley Siltstone Formation. (TSF). No Made Ground is mapped.</p> <p>The Environment Agency (EA) classifies the Glaciofluvial Sheet Deposits as a Secondary A Aquifer, the Devensian Till as a Secondary Undifferentiated Aquifer and the TSF as a Secondary B Aquifer.</p> <p>The closest surface water feature to the site is Baguley Brook which flows west along the southern boundary of the site. There are also a series of ponds circa 10m to 125m north / north east and 60m south east, c.970m south east, 1.2km east and 1.35km south east are all Designated Ancient Woodlands.</p>
Geotechnical Review	Based on the proposed development of a two storey pavilion, shallow strip foundations bearing on superficial deposits are likely to be suitable at the site, depending on the strength and depth of the soils. Foundations may need to be locally deepened if cohesive soils are present in the vicinity of existing trees.
UXO Assessment	<p>The detailed UXO assessment confirmed that due to the lack of evidence of bombing within or bordering the site the risk from German UXO is LOW.</p> <p>A HAA Battery was situated to the west of the site. The detailed assessment has acquired post-war aerial imagery, which shows an emplacement approximately 150m west of the site, however there is no observable evidence that the site itself was used as part of this military installation. It is not believed that any activities related to the Battery would have taken place within the site, although this cannot be confirmed.</p>
Environmental Review	Limited sources of potential contamination have been identified. Therefore, when considered in the context of the conceptual site model, the proposed development is considered to pose a low risk to human health. The risk posed to controlled waters is predominantly considered to be low.
Recommendations	<p>A ground investigation should be undertaken at the site to confirm ground conditions at the site, determine the ground gas regime, allow for in-situ and laboratory testing to quantify contaminant linkages and inform foundation design.</p> <p>The detailed UXO report recommended that for all intrusive works a Risk Management Plan is prepared, for all intrusive works, and that UXO awareness briefings are completed.</p>
This summary should be read in conjunction with BWB's full report (ref. WPK-BWB-EGT-XX-RP-LE-0001_DS) and reflects an assessment of the site based on information received by BWB at the time of production.	

CONTENTS

EXECUTIVE SUMMARY	iii
1. INTRODUCTION.....	1
Instruction	1
Objectives	1
Scope of Work.....	2
2. THE SITE	3
Site Location.....	3
Site Description	3
Site Walkover	4
Potential Constraints to Ground Investigation	4
Site Surroundings.....	4
3. ANTICIPATED GROUND CONDITIONS	6
4. SITE HISTORY	8
Historical Aerial Photography and Imagery	8
Operational / Company Records	9
Planning History	9
Internet Search / Anecdotal Information	9
Summary of Site History	9
5. REGULATORY SETTING.....	10
Permits Consents and Authorisations	10
Landfilling and Waste Management	10
6. GEOTECHNICAL APPRAISAL	11
7. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT	13
Introduction	13
Conceptual Site Model.....	13
8. CONCLUSION AND RECOMMENDATIONS	17
Conclusions	17
Recommendations.....	18
9. REFERENCES	19

FIGURES

Figure 2:1: Site Location Plan

Figure 2:2: Aerial Photograph

TABLES

Table 2:1: Surrounding Land Use

Table 3:1: Summary of Anticipated Ground Conditions

Table 4:1: Key Points of Development History

Table 4:2: Summary of Aerial Photography

Table 6:1: Ground Related Constraints & Opportunities

Table 7:1: Potential Sources of Contamination

Table 7:2: Relevant Potential Pathways and Receptors

Table 7:3: Preliminary Conceptual Site Model

APPENDICES

Appendix 1: Proposed Site Layout

Appendix 2: Site Photographs

Appendix 3: Groundsure Report

Appendix 4: Historical Mapping

Appendix 5: Preliminary UXO Report

Appendix 6: Detailed UXO Report

Appendix 7: Classification of Risk

1. INTRODUCTION

Instruction

- 1.1 BWB Consulting (BWB) was instructed by Etech Contract Services Ltd (the Client) to carry out a Phase 1 Geo-Environmental Assessment for the site at Wythenshawe Sports Hub, Wythenshawe. Details of the project brief are included in BWB proposal reference 20250123/P1/01/244550/RS/CRi, dated 23/01/2025.
- 1.2 The proposed development brings together several existing and new facilities to form a new multi-sports hub in Wythenshawe Park. The works include the construction of a new single-storey pavilion to the east of the existing athletics track, the provision of new artificial grass pitches and 'MUGAs' to the south of the new building, a new skate area to the east of the existing pump track, and alterations / extension of the car park.
- 1.3 The proposed development site layout, NPS-XX-00-D-A-0801 Rev P02, dated 24.09.2024, is provided as **Appendix 1**.

Objectives

- 1.4 This report has been completed to present pertinent information into the environmental risks and liabilities associated with the site. It has been completed to fulfil the requirements of a preliminary risk assessment in accordance with BS 10175:2011+A2:2017 '*Investigation of potentially contaminated sites, code of practice*' and EA Guidance on Risk Management of Land Contamination <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>.
- 1.5 The report has also been prepared with reference to land contamination technical guidance available through <https://www.gov.uk/government/collections/land-contamination-technical-guidance>.
- 1.6 The objectives of this report are to:
 - Assess historical activities at the site with respect to their potential impact on the site environment;
 - Characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities;
 - Assess historical and current surrounding land use in relation to known or potential off-site contamination issues that may impact the site;
 - Review existing site investigation and remediation information for the site, where available; and
 - Develop a preliminary Conceptual Site Model (CSM).

Scope of Work

1.7 The scope of work included:

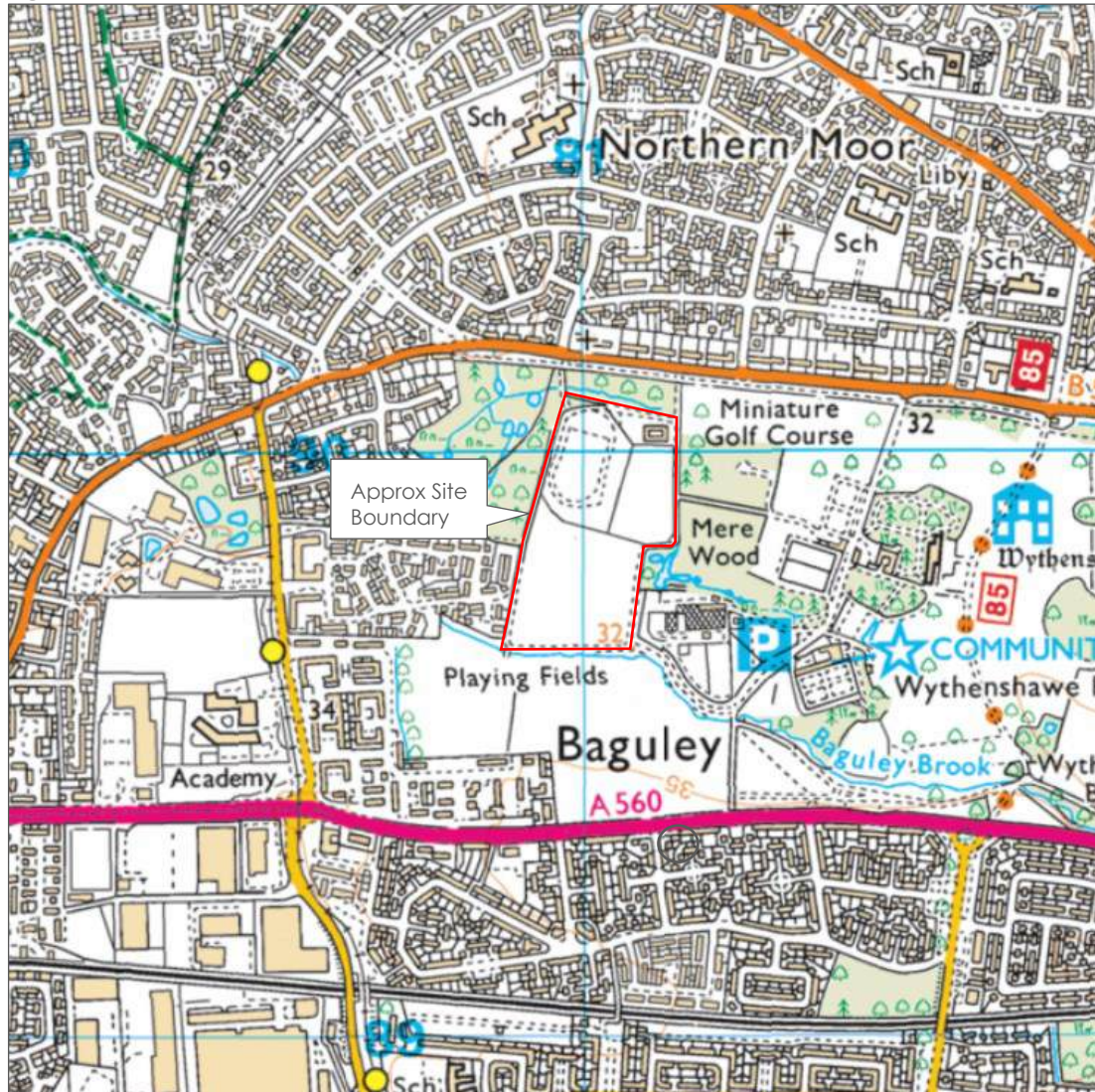
- A site visit to inspect the current site and immediate surroundings, identify potential hazards associated with ground conditions or contamination and to determine potential constraints with regards to ground investigation (photographs presented as **Appendix 2**);
- A review of the following information:
 - Groundsure report, reference GS-A61-P77-ADI-YMH (**Appendix 3**);
 - Historical Ordnance Survey Mapping (**Appendix 4**);
 - Historical aerial photographs (Google Earth) and other imagery (Groundsure);
 - British Geological Survey (BGS) 1:63,360 Scale, 'Stockport', Sheet 98, Drift, (1971);
 - British Geological Survey (BGS) 1:50,000 Scale, 'Stockport', Sheet 98, Solid, (1977);
 - BGS online geological maps and exploratory hole records (www.bgs.ac.uk);
 - MAGIC website (www.natureonthemap.naturalengland.org.uk/magicmap);
 - Mining Remediation Authority Interactive Map Viewer (<https://datamine-cauk.hub.arcgis.com/>);
 - Preliminary Unexploded Ordnance Risk Assessment, 1st Line Defence, reference PA21484-00 (**Appendix 5**); and
 - Detailed Unexploded Ordnance Risk Assessment, 1st Line Defence, reference DA21484-00 (**Appendix 6**).
- A summary of the key hazards or uncertainties that require additional investigation to further characterise the associated risks; and
- Production of a Geo-Environmental Assessment (this report), concluding in a qualitative assessment of the risks from contamination and ground-related constraints which may impact on the site.

2. THE SITE

Site Location

- 2.1 The site is located at Wythenshawe Sports Hub, in Wythenshawe, centred at National Grid Reference 381019, 389868. The approximate location of the site is shown below in **Figure 2:1**.

Figure 2:1: Site Location Plan



Site Description

- 2.2 The site is roughly rectangular in shape and is generally flat lying at an elevation of circa 32m above Ordnance Datum (AOD).

Site Walkover

- 2.3 A site walkover was completed on 10/02/2025 by a representative of BWB. Photographs from the walkover are presented in **Appendix 2**.
- 2.4 At the time of the walkover, the site comprised an existing public sports field. The site is accessed off Wythenshawe Road, via a tarmacked single lane drive to the north east of the site. Vehicular access into the remainder of the site is available via track off the south east corner of the car park; access is controlled by a locked gate.
- 2.5 An existing car park is located in the north east corner of the site. An existing disused building is located within the eastern portion of the car park. The building is a single storey brick build structure which is boarded up and in a poor state of repair. There is an inner courtyard which is accessed via a locked gate to the north of the building. A former tank is mounted on the roof on the eastern end of the building. It is understood that as part of the development this building will be demolished and the full area redeveloped for car parking.
- 2.6 The existing athletics track is located in the north west corner of the site. The track is segregated by a palisade fence. Storage containers and a temporary changing room are present to the north east of the track.
- 2.7 To the south of the car park on the eastern side of the site, there is an existing “learn to ride area” and “pump track” along with a picnic area complete with fixed tables and chairs. This area is to remain as part of the redevelopment of the site.
- 2.8 The remainder of the site comprises grassed playing fields. To the south these are utilised as baseball pitches.

Potential Constraints to Ground Investigation

- 2.9 There are several containers located within the footprint of the proposed pavilion, which will restrict / limit the locations of the boreholes.
- 2.10 An existing mains sewer runs south west to north east across the site.
- 2.11 The power line for the nearby Metrolink tram line runs along the eastern edge of site.
- 2.12 The pitch area on the south was noted to be very wet at the time of the walkover. Attendees from Manchester City Council suggested that this area is often wet and can flood.

Site Surroundings

- 2.13 The surrounding land uses at the time of the walkover survey are summarised in **Table 2:1**.

Table 2:1: Surrounding Land Use

Surrounding Land Use	
North	Woodland with Wythenshawe Road and residential housing beyond.
East	The wider Wythenshawe Park including Wythenshawe Park Horticultural Centre and Myerscough College.
South	Parkland with residential housing beyond.
West	Woodland with residential housing beyond.

2.14 An aerial photograph representative of the site and surroundings, dated 07/04/2023, is presented as **Figure 2:2**.

Figure 2:2: Aerial Photograph



3. ANTICIPATED GROUND CONDITIONS

- 3.1 The anticipated ground conditions for the site and controlled waters vulnerability is discussed within **Table 3:1**.

Table 3:1: Summary of Anticipated Ground Conditions

Anticipated Ground Conditions	
Geology	<p>Information published by the BGS indicates that most of the site is underlain by superficial deposits comprising Glaciofluvial Sheet Deposits (sand and gravel) with Devensian Till (Diamicton) encroaching in the eastern / north east of the site. The superficial deposits overlie principally overlie the Tarporley Siltstone Formation. (TSF). Over most of the site the TSF is recorded as Siltstone with Siltstone & Sandstone present along the northern edge (around the car park area). No Made Ground is mapped.</p> <p>The BGS Lexicon database describes the Glaciofluvial Sheet Deposits as "<i>Sand and gravel, locally with lenses of silt, clay or organic material; characteristic 'sandur' (sheet) and valley train form; of glaciofluvial origin</i>". Diamicton is an unsorted to poorly sorted sediment contains particles ranging in size from clay to boulders.</p> <p>The BGS Lexicon database describes the bedrock as "<i>Heterolithic, comprising interlaminated and interbedded siltstones, mudstones and sandstones in approximately equal proportions. The siltstones are micaceous and interlaminated with mudstones or sandstones; most of the mudstones appear structureless with a blocky habit. The sandstones are mostly very fine- to fine-grained, well sorted, and micaceous</i>".</p> <p>One historical borehole log, (ref: SJ89SW37), located approximately 100m north east of the site, indicated ground conditions to comprise topsoil to 0.30m, sand and gravel to 2.29m, clay to 5.49m, stoney clay to 8.23m, sand to 8.53m, stoney clay to 9.68m over red mudstone to 15.24m bgl.</p>
Hydrogeology	<p>The Environment Agency (EA) classifies the Glaciofluvial Sheet Deposits as a Secondary A Aquifer, the Devensian Till as a Secondary Undifferentiated Aquifer and the TSF as a Secondary B Aquifer.</p> <p>There are no groundwater abstractions or discharge consents within 500m of the site.</p> <p>The site is not indicated to be within, or within close proximity to, an EA groundwater Source Protection Zones.</p>
Surface Waters	<p>The closest surface water feature to the site is Baguley Brook which flows west along the southern boundary of the site. There are also a series of ponds circa 10m to 125m north / north east and 60m south east.</p> <p>The watercourse was classified as having a Moderate Ecological Rating, Chemical Fail and an Overall Moderate rating in 2019.</p> <p>There are no surface water abstractions or discharge consents within 500m of the site.</p> <p>There is one pollution incident located c.160m south east which related to waste material in containers from 2003; the incident is recorded to have had a Category 3 Minor Impact of water.</p> <p>The site does not fall within an EA flood Zone; however a Flood Zone 2/3 lies immediately south, associated with the Brook.</p>
Ground Gas & Radon	<p>The site is in an area where less than 1% of properties are affected by radon.</p> <p>No significant potential sources of ground gas been identified; however, limited Made Ground may be present within the developed area on site.</p>

Anticipated Ground Conditions	
Mining and Mineral Extraction	The site does not lie in an area where mining is known to have occurred.
Environmental Sensitivity	The wider Wythenshawe Park is designated as a Local Nature Reserve (LNR). Black Carr Wood, Black Field Wood and Round's Woods located c.970m south east, 1.2km east and 1.35km south east are all Designated Ancient Woodland. The site lies within a SSSI Impact Risk Zone. However, this is not relevant for the proposed development.

4. SITE HISTORY

- 4.1 Historical Ordnance Survey (OS) mapping for the site area has been reviewed. These maps and plans date from 1874 to 2025. The historical plans reviewed are provided in **Appendix 4**. The key points of the historical development of the site and surrounding area are summarised in **Table 4:1**. All distances quoted are approximate.

Table 4:1: Key Points of Development History

Dates	On Site	Off-Site
1874 - 1898	The Site comprised an undeveloped field.	Woodland was present to the east, north and north west of the site. A brook flowed west along the southern boundary. Withenshaw Road lies 80m north. In 1874 one pond was present c.10m north, three ponds were present c.50m north west, two ponds c.40m south east and two ponds c.10-40m east. By 1897 further ponds are present to the north / north east. The wider area was principally agricultural land with scattered houses. Wythenshawe Hall was located 450m east. A RAILWAY LINE was located c.650m south.
1905 - 1935	No significant change.	No significant change.
1938	No significant change.	Residential housing was present c.150m north and c.320m south. A building was shown (but not named) c.80m east; this is located in the vicinity of the current Horticultural centre.
1954-1955	The site was marked as Playing Fields.	Residential housing was shown immediately south of the Brook.
1960-1967	No significant change.	The ponds to the east have merged. Housing was now shown immediately north of Wythenshawe Road. A school and housing were present c.80m west. The land to the east was marked as Wythenshawe Park with a miniature golf course located immediately north east and a bowling green c.180m east. Wythenshawe Hall is marked as an art gallery and museum.
1977-1981	The running track was present in the north west of the site.	The houses to the south have been removed and the area was marked as playing fields. A WAREHOUSE and WORKS were present 500m to 800m south west.
1985-1988	No significant change.	The nursery is now marked "Horticultural Centre"
1990-1994	The site is marked as a park.	No significant change.
2001-2025	No significant change.	No significant change.

Historical Aerial Photography and Imagery

- 4.2 Aerial photographs/imagery included within the Groundsure report are present in **Appendix 3** summarised in **Table 4:2**.

Table 4.2: Summary of Aerial Photography

Date (Source)	Description
2000 (Google Earth)	The athletic track is located in the north west of the site, with two structures / temp building to the north east of the tack. A building is present in car park area in the north east. The remainder of the site comprised grassed fields.
2009 (Google Earth)	Further containers / temporary buildings are present to the north east of the track
2022 (Google Earth)	The pump track and cycle area have been constructed
2024 (Google Earth)	The temporary changing rooms for the athletics track have been constructed.

Operational / Company Records

- 4.3 No operational records have been made available for review as part of this assessment.

Planning History

- 4.4 The Manchester City Council Planning Portal was accessed on 10/02/2025 and indicated that 22 planning applications have been submitted for the wider Wythenshawe Park site, application relevant to the site itself included in 2012 an application to site 2no containers and a series of application from 2021-2024 relating to the construction of the pump track.

Internet Search / Anecdotal Information

- 4.5 Information from the Manchester City Council website ([About the park | Wythenshawe Park | Manchester City Council](#)) access on 10/02/25 indicates that the wider Wythenshawe Park is set in 109 hectares of open parkland in South Manchester. Wythenshawe Hall to the east of the site is a Grade II listed Building, as is the North Lodge and Statue of Oliver Cromwell. Wythenshawe Cycle Hub located immediately north east of the site was opened in September 2022, along with the Learn to Ride and Pump Track areas, which are located on site.

Summary of Site History

- 4.6 The site was undeveloped farmland until the 1950 when it was developed as playing fields. The athletics track was developed in the 1970s and the pump track was constructed in 2022.

5. REGULATORY SETTING

Permits Consents and Authorisations

- 5.1 A full listing of permits, consents and authorisations including discharge consents, pollution incidences and other environmental information, is included in the Groundsure report, presented in **Appendix 3**.
- 5.2 No significant features have been identified which are considered likely to have had a detrimental impact on the site.

Landfilling and Waste Management

- 5.3 A full listing of EA, BGS and Local Authority recorded landfills are provided in the Groundsure report presented in **Appendix 3**.
- 5.4 No significant facilities have been identified which are considered likely to have had a detrimental impact on the site.

6. GEOTECHNICAL APPRAISAL

- 6.1 The Groundsure report, site history, current site setting and geology setting have all been considered in order to provide an indication of the potential ground related constraints and opportunities in the context of the proposed development as set out in **Table 6:1**.

Table 6:1: Ground Related Constraints & Opportunities

Potential Constraint / Opportunity	Explanation	Potential Mitigation Options
Topsoil / Made Ground	Topsoil is expected to be present across most of the site. Made Ground or fill is expected to be present in the car park / disused building and in the vicinity of the developed areas i.e. the athletics track, learn to cycle area and pump track.	Topsoil and Made Ground may be suitable for reuse on site, subject to confirmation of chemical status and engineering properties via ground investigation, and confirmation of potential restrictions on reuse associated with waste management licencing.
Preliminary Foundation Solution	Based on the proposed single storey pavilion building, shallow strip foundations bearing onto the superficial deposits may be suitable at the site.	Ground investigation should be undertaken to confirm ground conditions at the site and allow for in-situ and laboratory testing to inform foundation design.
Buried Obstructions	Given the historical uses of the site there is a potential for buried obstructions such as services and former foundations, in the vicinity of the disused building. Also, a sewer is known to cross the site from SW to NE.	Buried obstructions may require removal from site within areas of proposed development.
Trees	Mature trees were noted on site, along the site boundaries and scattered around the site.	Foundations near new or existing trees may need to be locally deepened beyond the zone of influence of tree roots and/or heave precautions adopted.
Pyritic Geology	Ground conditions are not expected to be pyritic based on the geology.	As part of ground investigation works, appropriate testing should be undertaken to confirm assumptions relating to aggressive ground conditions.
Ground Subsidence Risks	The Groundsure Report indicates a very low to negligible risk on site associated with shrink/swell clays, running sands, collapsible deposits, landslides and dissolution of soluble rocks.	Ground conditions are predominantly non-plastic. However, ground investigation should seek to assess the plasticity of cohesive soils, where present.
Coal Mining	Coal is not expected to be present at the surface or at shallow depth across the site.	No further assessment is required.
Mineral Extraction	No known historical mineral abstraction has occurred in the immediate vicinity of the site.	No further assessment is required.

Potential Constraint / Opportunity	Explanation	Potential Mitigation Options
Earthworks	The proposed development is not expected to include any significant changes to site levels.	No further assessment is required.
Retaining Walls	No retaining walls were noted during the walkover.	No further assessment required.
Drainage and Soakaways	Soakaways may be a viable option at the site, depending on the extent of granular superficial deposits at the site.	Should soakaways be considered as part of the drainage strategy, it is recommended that infiltration testing in accordance with current guidance is undertaken.
Roads and Pavements	California Bearing Ratio (CBR) values should be sought for road, car park and pavement design.	In-situ testing should be undertaken to infer CBR values. Furthermore, geotechnical testing should be undertaken to provide consistency of results.
UXO	The preliminary UXO report indicates that during WWII the area sustained and overall low to moderate bombing density. However, the site was near a Heavy Anti-Aircraft (HAA) Battery. HAA batteries often comprised the battery as well as an associated camp and training area. It is therefore possible that small arms or land service ordnance may have been used within proximity to the site. Therefore, a detailed UXO report was obtained.	The Detailed Assessment confirmed that due to the lack of evidence of bombing within or bordering the site the risk from German UXO is LOW. A HAA Battery was situated to the west of the site. The detailed assessment has acquired post-war aerial imagery, which shows an emplacement approximately 150m west of the site, however there is no observable evidence that the site itself was used as part of this military installation. It is not believed that any activities related to the Battery would have taken place within the site, although this cannot be confirmed. Therefore, it is recommended that a Risk Management Plan is prepared and that UXO awareness briefings are completed prior to commencement of the works.

7. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Introduction

- 7.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm, and a pathway exists for a receptor to be exposed to the substance.
- 7.2 Three impact potentials exist for any given site, all of which need to be considered in a risk assessment, which are:
- The site impacting upon itself;
 - The site impacting on its surroundings; and
 - The surroundings impacting on the site.
- 7.3 The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the proposed development and plausible contaminant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study.
- 7.4 The assessment is qualitative and aimed to determine all likely contaminant linkages, with consideration of significance and allowing for uncertainties.
- 7.5 **Sources (S):** These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).
- 7.6 **Pathways (P):** A pathway is defined as a mechanism or route by which a contaminant comes into contact with or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.
- 7.7 **Receptors (R):** Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

Conceptual Site Model

- 7.8 Consideration has been given to the likely sources, pathways and receptors which may be present, based on the information in the previous sections. These are presented in **Table 7:1** and **Table 7:2** and further information about the risk classification scheme is included within **Appendix 7**, with reference to CIRIA C552 '*Contaminated land risk assessment - a guide to good practice*'.
- 7.9 A tabulated version of the Preliminary CSM based on the desk study and site observations is presented in **Table 7:3**.

Table 7.1: Potential Sources of Contamination

Location	Potential Source	Contaminants of Potential Concern (CoPC)
On-site	MADE GROUND associated with car park and building construction in the north east, the athletics track in the north west and the learn to ride and pump area to the east.	<ul style="list-style-type: none"> Heavy metals Inorganics, such as cyanides, sulphates and nitrates pH Asbestos Containing Materials (ACMs) Petroleum hydrocarbons Methane, carbon dioxide
Off-site	Potential MADE GROUND associated with development surrounding the site.	<ul style="list-style-type: none"> Heavy metals Inorganics, such as cyanides, sulphates and nitrates PAHs Petroleum hydrocarbons Methane, carbon dioxide
	Agricultural land use	<ul style="list-style-type: none"> Pesticides and herbicides

Table 7.2: Relevant Potential Pathways and Receptors

Receptors	Pathways
Human Health: <ul style="list-style-type: none"> Future site users (recreational) Neighbouring public (residential/recreational) Intrusive maintenance workers 	<ul style="list-style-type: none"> Dermal contact with soil or dust Incidental ingestion of soil and/or dust Inhalation of dust and/or fibres Ingestion of contaminated vegetables and/or soil attached to vegetables Inhalation of vapours Migration and accumulation of ground gas in enclosed spaces leading to inhalation or explosion
Controlled Waters: <ul style="list-style-type: none"> Groundwater (Secondary aquifers) Surface water (Brook on southern boundary, ponds within 50m) 	<ul style="list-style-type: none"> Leaching of soil contaminants Vertical and lateral migration Surface run-off
Ecology: <ul style="list-style-type: none"> Flora and Fauna Designated Ancient woodland immediately adjacent 	<ul style="list-style-type: none"> Lateral migration Uptake and accumulation
Property: <ul style="list-style-type: none"> Underground utilities Building structures 	<ul style="list-style-type: none"> Direct Contact Accumulation and explosion of gas

Table 7:3: Preliminary Conceptual Site Model

Source	Pathway	Receptor	Con	Prob	Risk	Potential Mitigation/Investigation Requirements
On-site sources as detailed in Table 7:1.	Dermal contact with, and incidental ingestion of soil and/or dust. Inhalation of dust and/or fibres.	Future site users (recreational)	Md	UI	L	Limited potential sources of contamination have been identified through this assessment. It is recommended that an intrusive ground investigation be completed to assess the extent of any potential contamination at the site.
		Intrusive maintenance workers	Md	UI	L	The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future site users (recreational)	Md	UI	L	Limited Made Ground is expected across the site but may be present in the vicinity of the car park and building and potentially infilled ponds in the immediate vicinity of site. The presence of the above indicates a potential risk from ground gases. Ground investigation should include the installation of ground gas monitoring wells to determine the risk posed from ground gases.
	Leaching and permeation through soil profile.	Groundwater: Underlying Secondary Aquifers	Md	UI	L	No groundwater or surface water data is currently available for the site. Ground investigation should seek to assess the risks to controlled waters associated with potential Made Ground.
	Vertical and lateral migration of contaminants.		Md	UI	L	
	Surface run-off.	Baguley Brook adjacent to southern boundary.	Md	UI	L	
	Direct contact.	Water utility pipes	Md	UI	L	Organic compounds in the shallow soils could taint the water supply. A ground investigation and subsequent laboratory analysis should be undertaken to inform the design of new services.

Source	Pathway	Receptor	Con	Prob	Risk	Potential Mitigation/Investigation Requirements
		Buried structures/ foundations.	Md	UI	L	Sulphates and low pH in the ground could accelerate the degradation of buried concrete structures (e.g. foundations). Ground investigation should include an assessment of the concrete design class.
Off-site sources as detailed in Table 7:1.	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future site users (recreational)	Md	UI	L	Ground gas monitoring should be completed as part of an intrusive ground investigation to characterise the ground gas regime at the site. Where possible, monitoring wells should be located along the site boundaries to delineate any potential contamination.
<p>VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low</p> <p>KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor, Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely</p>						
<p>Contaminant linkage Assessment Summary</p> <p>When considered in the context of the conceptual site model and the historical activities that have taken place, the proposed development is considered to pose a LOW risk to human health and controlled waters. It is recommended that a ground investigation be undertaken to quantify the identified potential contaminant linkages and assess likely mitigation measures.</p>						

8. CONCLUSION AND RECOMMENDATIONS

Conclusions

- 8.1 The site is roughly rectangular in shape and is generally flat lying at an elevation of circa 32m AOD. The site comprised an existing public sports field accessed off Wythenshawe Road via a tarmacked single lane drive to the north east of the site. An existing car park is located in the north east corner of the site with an existing disused building located within the eastern portion of the car park. An athletics track is located in the north west area of the site segregated by a palisade fence. Storage containers and a temporary changing room are present to north east of the track. To the south of the car park on the eastern side of the site, there is an existing "learn to ride area" and "pump track" along with a picnic area complete with fixed tables and chairs. The remainder of the site comprises grassed playing fields. To the south these are utilised as baseball pitches.
- 8.2 The site was undeveloped farmland until the 1950 when it was developed as playing fields. The athletics track was developed in the 1970s and the pump track was constructed in 2022.
- 8.3 Information published by the BGS indicates that most of the site is underlain by superficial deposits comprising Glaciofluvial Sheet Deposits (sand and gravel) with Devensian Till (Diamicton) encroaching in the eastern / north east of the site. The superficial deposits overlie the Tarporley Siltstone Formation. (TSF). Over most of the site the TSF is recorded as Siltstone with Siltstone & Sandstone present along the northern edge (around the car park area). No Made Ground is mapped.
- 8.4 The Environment Agency (EA) classifies the Glaciofluvial Sheet Deposits as a Secondary A Aquifer, the Devensian Till as a Secondary Undifferentiated Aquifer and the TSF as a Secondary B Aquifer.
- 8.5 The closest surface water feature to the site is Baguley Brook which flows west along the southern boundary of the site.
- 8.6 Limited sources of potential contamination have been identified. Therefore, when considered in the context of the conceptual site model, the proposed development is considered to pose a low risk to human health.
- 8.7 The risk posed to controlled waters is predominantly considered to be low due to the lack of identified contamination sources.
- 8.8 The Detailed UXO Assessment is ongoing. Currently, no evidence has been found to suggest that the site was subject to bombing during WWII. Therefore, no UXO Risk Mitigation works will be required for the ground investigation.
- 8.9 The Preliminary UXO Assessment identified a Heavy Anti-Aircraft Battery was situated to the west of the site. The detailed assessment has acquired post-war aerial imagery, which shows an emplacement approximately 150m west of the site, however there is no observable evidence that the site itself was used as part of this military installation. It is not believed that any activities related to the Battery would have taken place within the site, although this cannot be confirmed. Therefore, it is recommended that a Risk

Management Plan is prepared and that UXO awareness briefings are completed prior to commencement of the works.

Recommendations

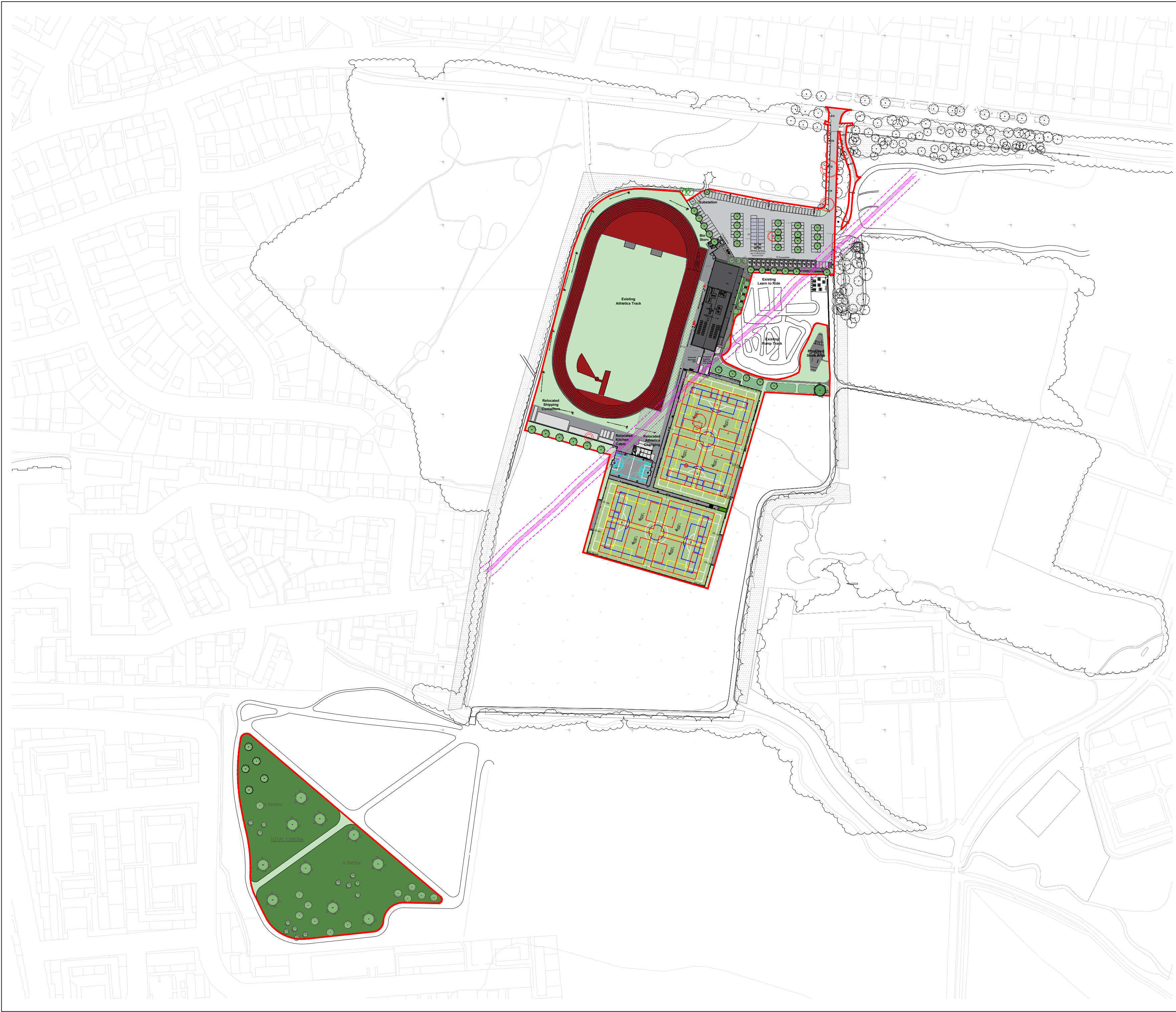
- 8.10 A ground investigation should be undertaken at the site to confirm ground conditions at the site, determine the ground gas regime, allow for in-situ and laboratory testing to quantify contaminant linkages and inform foundation design.
- 8.11 It is recommended that a Risk Management Plan is prepared and that UXO awareness briefings are completed prior to commencement of the works.

9. REFERENCES

1. BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of practice. British Standards Institution, 2017.
2. CIRIA C552 *Contaminated land risk assessment. A guide to good practice*. Rudland, D J, Lancefield, R M, Mayell, P N, 2001.
3. Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance. Department for Environment Food and Rural Affairs (DEFRA), 2012.
4. Land Contamination Risk Management. Environment Agency, 2020.
5. <https://www.gov.uk/government/collections/land-contamination-technical-guidance>.
6. The Control of Asbestos Regulations. Health and Safety Executive, 2012.

APPENDICES

Appendix 1: Proposed Site Layout



RESPONSIBILITY IS NOT ACCEPTED FOR OTHERS SCALING DIRECTLY FROM THIS DRAWING. DO NOT SCALE FROM THIS DRAWING, USE WRITTEN DIMENSIONS ONLY.

0 20m 50m 100m
1:2000
ORIGINAL SHEET SIZE **A2**

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KEY PLAN



Notes:

The site drawing is based on a combination of Ordnance Survey mapping and topographical survey. The initial topographical survey was carried out by BrightSurv Ltd in May 2023 and was updated in February 2025 to include the access road entrance. A further update to the topographical survey was completed in July 2025, extending coverage to the North-East of the site along Wythenshawe Road.

Landscaping coordinated with latest proposals.						
P11	NN	08.09.25	MR	08.09.25	RB	08.09.25
Building footprint adjusted in line with relocated positioning. Landscaping to be amended to suit - further coordination required.						
P10	NN	04.09.25	MR	04.09.25		
Building location amended outside of sewer exclusion zone. Landscaping to be amended to suit - further coordination required.						
P09	NN	28.08.25	MR	28.08.25		
REV	DRAWN	DATE	CHECKED	DATE	APPROVED	DATE



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CLIENT
Manchester City Council

PROJECT
Wythenshawe Park Sports Hub

TITLE
Proposed Site Plan

SCALE DISCIPLINE PROJECT NUMBER
1:2000 Architect 118165

DRAWING NUMBER REV CODE
NPS-XX-00-D-A-0803 **P11**

STATUS CODE	PURPOSE OF ISSUE	Drawn by	Approved by
S1	Information	NN	RB
		Checked by	
		MR	

Appendix 2: Site Photographs



Photo 1— Disused building in centre of existing car park



Photo 2— Access to athletics track.



Photo 3— Typical view of athletics track



Photo 4— Existing containers in vicinity of athletics track and sewer manholes.



Photo 5— Existing pump track (to be retained).



Photo 6— Typical view of field.

Appendix 3: Groundsure Report

Wythenshawe Park Sports Hub PO10631

Order Details

Date: 06/02/2025

Your ref: Wythenshawe Park Sports Hub PO10631

Our Ref: GS-A61-P77-ADI-YMH

Site Details

Location: 381019 389868

Area: 8.78 ha

Authority: [Manchester City Council](#) ↗



Summary of findings

[p. 2 >](#) **Aerial image**

[p. 9 >](#)

OS MasterMap site plan

[p.14 >](#) **Insight User Guide** ↗

Contact us with any questions at:

info@groundsure.com ↗

01273 257 755

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	1	4	5	-
16	1.2	Historical tanks	0	0	0	0	-
16 >	1.3 >	Historical energy features >	0	0	3	11	-
17	1.4	Historical petrol stations	0	0	0	0	-
17 >	1.5 >	Historical garages >	0	0	0	1	-
18	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
19 >	2.1 >	Historical industrial land uses >	0	2	6	8	-
20	2.2	Historical tanks	0	0	0	0	-
20 >	2.3 >	Historical energy features >	0	0	3	16	-
21	2.4	Historical petrol stations	0	0	0	0	-
22 >	2.5 >	Historical garages >	0	0	0	2	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
23	3.1	Active or recent landfill	0	0	0	0	-
23	3.2	Historical landfill (BGS records)	0	0	0	0	-
24	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
24	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
24	3.5	Historical waste sites	0	0	0	0	-
24	3.6	Licensed waste sites	0	0	0	0	-
24 >	3.7 >	Waste exemptions >	0	0	1	3	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
26 >	4.1 >	Recent industrial land uses >	0	0	3	-	-
27 >	4.2 >	Current or recent petrol stations >	0	0	0	1	-
27	4.3	Electricity cables	0	0	0	0	-
27	4.4	Gas pipelines	0	0	0	0	-
27	4.5	Sites determined as Contaminated Land	0	0	0	0	-



27	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
28	4.7	Regulated explosive sites	0	0	0	0	-
28	4.8	Hazardous substance storage/usage	0	0	0	0	-
28	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
28	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
28 >	4.11 >	<u>Licensed pollutant release (Part A(2)/B) ></u>	0	0	0	1	-
29	4.12	Radioactive Substance Authorisations	0	0	0	0	-
29	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
29	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
29	4.15	Pollutant release to public sewer	0	0	0	0	-
30	4.16	List 1 Dangerous Substances	0	0	0	0	-
30	4.17	List 2 Dangerous Substances	0	0	0	0	-
30 >	4.18 >	<u>Pollution Incidents (EA/NRW) ></u>	0	0	1	0	-
30	4.19	Pollution inventory substances	0	0	0	0	-
31	4.20	Pollution inventory waste transfers	0	0	0	0	-
31	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	<u>Hydrogeology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
32 >	5.1 >	<u>Superficial aquifer ></u>	Identified (within 500m)				
34 >	5.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
36 >	5.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
37	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
38	5.5	Groundwater vulnerability- local information	None (within 0m)				
39 >	5.6 >	<u>Groundwater abstractions ></u>	0	0	0	0	3
40 >	5.7 >	<u>Surface water abstractions ></u>	0	0	0	0	2
41	5.8	Potable abstractions	0	0	0	0	0
41	5.9	Source Protection Zones	0	0	0	0	-
41	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	<u>Hydrology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
42 >	6.1 >	<u>Water Network (OS MasterMap) ></u>	0	13	40	-	-



47 >	6.2 >	Surface water features >	0	6	6	-	-
47 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
47 >	6.4 >	WFD Surface water bodies >	1	0	0	-	-
48 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding >	On site	0-50m	50-250m	250-500m	500-2000m
49 >	7.1 >	Risk of flooding from rivers and the sea >	High (within 50m)				
50	7.2	Historical Flood Events	0	0	0	-	-
50	7.3	Flood Defences	0	0	0	-	-
50	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
50	7.5	Flood Storage Areas	0	0	0	-	-
51 >	7.6 >	Flood Zone 2 >	Identified (within 50m)				
52 >	7.7 >	Flood Zone 3 >	Identified (within 50m)				
Page	Section	Surface water flooding >					
53 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
55 >	9.1 >	Groundwater flooding >	Moderate (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
56	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
57	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
57	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
57	10.4	Special Protection Areas (SPA)	0	0	0	0	0
57	10.5	National Nature Reserves (NNR)	0	0	0	0	0
58 >	10.6 >	Local Nature Reserves (LNR) >	1	0	0	0	1
58 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	3
58	10.8	Biosphere Reserves	0	0	0	0	0
59	10.9	Forest Parks	0	0	0	0	0
59	10.10	Marine Conservation Zones	0	0	0	0	0
59 >	10.11 >	Green Belt >	0	0	0	0	3
59	10.12	Proposed Ramsar sites	0	0	0	0	0



60	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
60	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
60	10.15	Nitrate Sensitive Areas	0	0	0	0	0
60	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
61 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
62	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
63	11.1	World Heritage Sites	0	0	0	-	-
64	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
64	11.3	National Parks	0	0	0	-	-
64	11.4	Listed Buildings	0	0	0	-	-
64	11.5	Conservation Areas	0	0	0	-	-
65	11.6	Scheduled Ancient Monuments	0	0	0	-	-
65 >	11.7 >	Registered Parks and Gardens >	0	0	1	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
66 >	12.1 >	Agricultural Land Classification >	Urban (within 250m)				
67	12.2	Open Access Land	0	0	0	-	-
67	12.3	Tree Felling Licences	0	0	0	-	-
67	12.4	Environmental Stewardship Schemes	0	0	0	-	-
67	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
68 >	13.1 >	Priority Habitat Inventory >	0	16	16	-	-
70	13.2	Habitat Networks	0	0	0	-	-
70	13.3	Open Mosaic Habitat	0	0	0	-	-
70	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
71 >	14.1 >	10k Availability >	Identified (within 500m)				
72	14.2	Artificial and made ground (10k)	0	0	0	0	-
73 >	14.3 >	Superficial geology (10k) >	4	0	4	2	-

74	14.4	Landslip (10k)	0	0	0	0	-
75 >	14.5 >	Bedrock geology (10k) >	2	0	1	0	-
76	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
77 >	15.1 >	50k Availability >	Identified (within 500m)				
78	15.2	Artificial and made ground (50k)	0	0	0	0	-
78	15.3	Artificial ground permeability (50k)	0	0	-	-	-
79 >	15.4 >	Superficial geology (50k) >	2	0	3	0	-
80 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
80	15.6	Landslip (50k)	0	0	0	0	-
80	15.7	Landslip permeability (50k)	None (within 50m)				
81 >	15.8 >	Bedrock geology (50k) >	1	0	1	0	-
82 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
82	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes >	On site	0-50m	50-250m	250-500m	500-2000m
83 >	16.1 >	BGS Boreholes >	0	0	1	-	-
Page	Section	Natural ground subsidence >					
84 >	17.1 >	Shrink swell clays >	Very low (within 50m)				
85 >	17.2 >	Running sands >	Very low (within 50m)				
86 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
87 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
88 >	17.5 >	Landslides >	Very low (within 50m)				
89 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
91	18.1	BritPits	0	0	0	0	-
92 >	18.2 >	Surface ground workings >	1	25	47	-	-
94	18.3	Underground workings	0	0	0	0	0
95	18.4	Underground mining extents	0	0	0	0	-
95	18.5	Historical Mineral Planning Areas	0	0	0	0	-



95	18.6	Non-coal mining	0	0	0	0	0
95 >	18.7 >	JPB mining areas >	Identified (within 0m)				
96	18.8	The Coal Authority non-coal mining	0	0	0	0	-
96	18.9	Researched mining	0	0	0	0	-
96	18.10	Mining record office plans	0	0	0	0	-
96	18.11	BGS mine plans	0	0	0	0	-
97	18.12	Coal mining	None (within 0m)				
97	18.13	Brine areas	None (within 0m)				
97	18.14	Gypsum areas	None (within 0m)				
97	18.15	Tin mining	None (within 0m)				
97	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
98	19.1	Natural cavities	0	0	0	0	-
98	19.2	Mining cavities	0	0	0	0	0
98	19.3	Reported recent incidents	0	0	0	0	-
98	19.4	Historical incidents	0	0	0	0	-
Page	Section	Radon >					
100 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
102 >	21.1 >	BGS Estimated Background Soil Chemistry >	7	0	-	-	-
102	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
103	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
104	22.1	Underground railways (London)	0	0	0	-	-
104	22.2	Underground railways (Non-London)	0	0	0	-	-
104	22.3	Railway tunnels	0	0	0	-	-
104	22.4	Historical railway and tunnel features	0	0	0	-	-
104	22.5	Royal Mail tunnels	0	0	0	-	-
105	22.6	Historical railways	0	0	0	-	-



105	22.7	Railways	0	0	0	-	-
105	22.8	Crossrail 2	0	0	0	0	-
105	22.9	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 07/04/2023

Site Area: 8.78ha



Recent site history - 2019 aerial photograph



Capture Date: 22/04/2019

Site Area: 8.78ha



Recent site history - 2016 aerial photograph



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Capture Date: 21/04/2016

Site Area: 8.78ha



Recent site history - 2009 aerial photograph



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Capture Date: 24/06/2009

Site Area: 8.78ha



Recent site history - 2000 aerial photograph

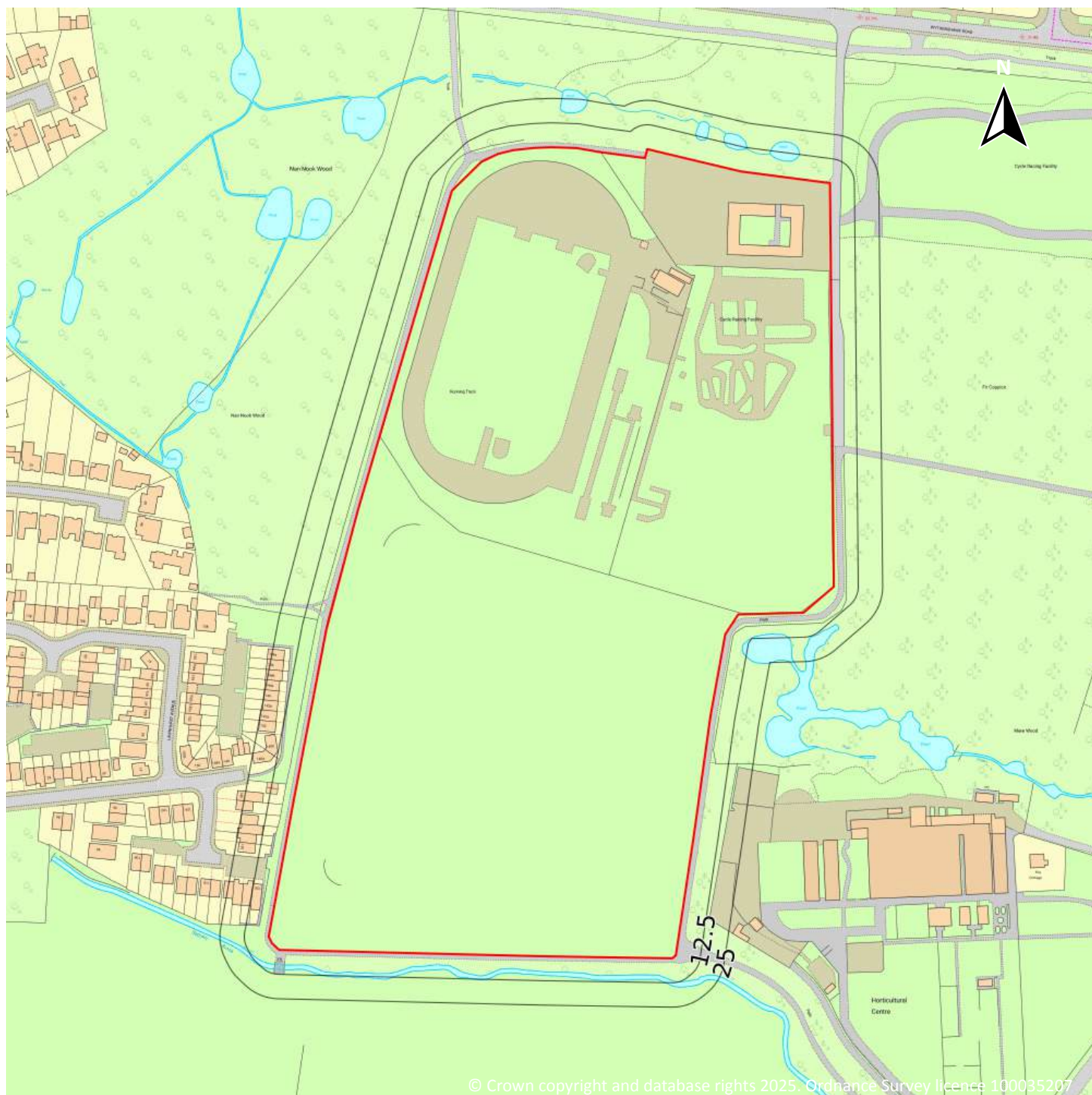


Capture Date: 27/06/2000

Site Area: 8.78ha



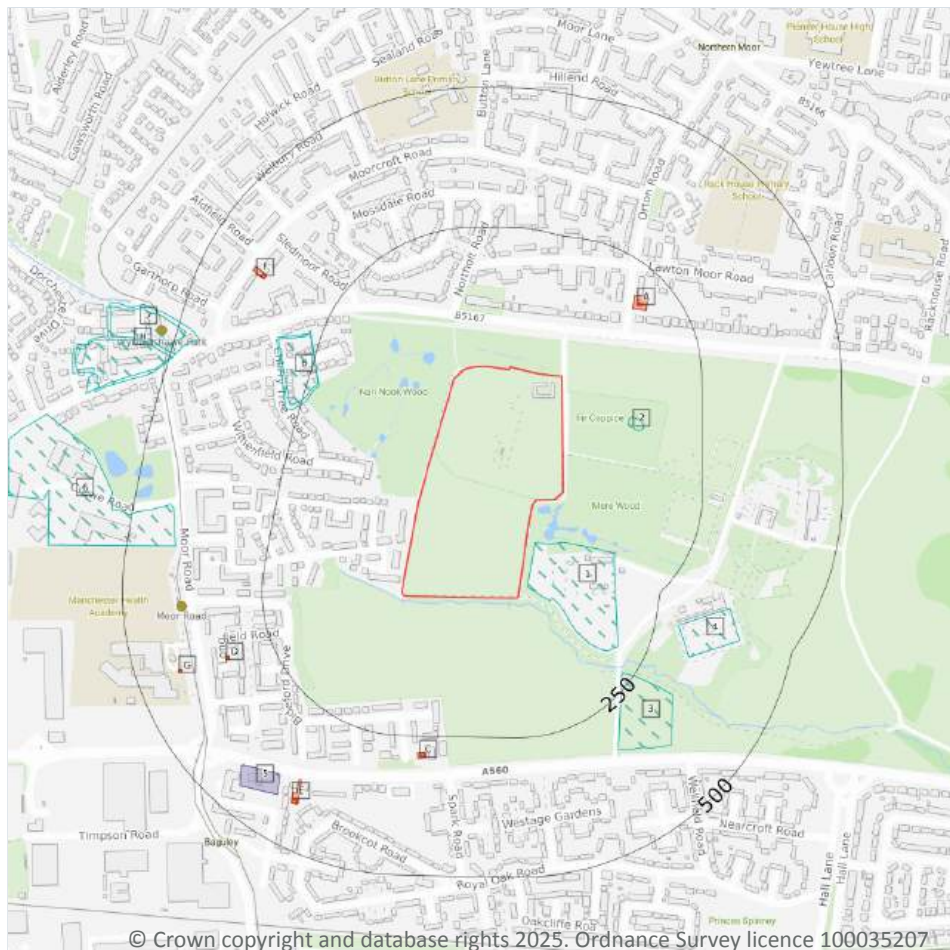
OS MasterMap site plan



Site Area: 8.78ha



1 Past land use



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

1.1 Historical industrial land uses

Records within 500m

10

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

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
1	14m S	Nursery	1967 - 1977	917503



ID	Location	Land use	Dates present	Group ID
2	118m NE	Refuse Heap	1989 - 1995	909087
B	228m NW	Nursery	1938	869055
3	231m SE	Nursery	1967	831516
B	231m NW	Nursery	1955 - 1966	938145
4	291m SE	Nursery	1967 - 1977	864317
6	413m W	Unspecified Works	1989 - 1995	948513
7	458m NW	Nursery	1955	918797
H	484m NW	Nursery	1938 - 1955	862472
H	494m W	Nursery	1938	911626

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

14

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

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
A	176m NE	Electricity Substation	1956	88205
A	186m NE	Electricity Substation	1990	74330



ID	Location	Land use	Dates present	Group ID
A	188m NE	Electricity Substation	1955	87230
C	278m S	Gas Governor	1992	75888
C	280m S	Gas Governor	1985	74017
D	329m SW	Electricity Substation	1972	72122
D	329m SW	Electricity Substation	1992	84821
E	378m SW	Electricity Substation	1972	75998
F	383m NW	Electricity Substation	1992	79910
F	384m NW	Electricity Substation	1955 - 1967	76663
E	412m SW	Electricity Substation	1985	90222
E	413m SW	Electricity Substation	1992	89731
G	418m SW	Electricity Transformer	1976	68793
G	418m SW	Electricity Substation	1987 - 1993	82791

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

1

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

Features are displayed on the Past land use map on [page 15 >](#)



ID	Location	Land use	Dates present	Group ID
5	390m SW	Garage	1972 - 1985	29699

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

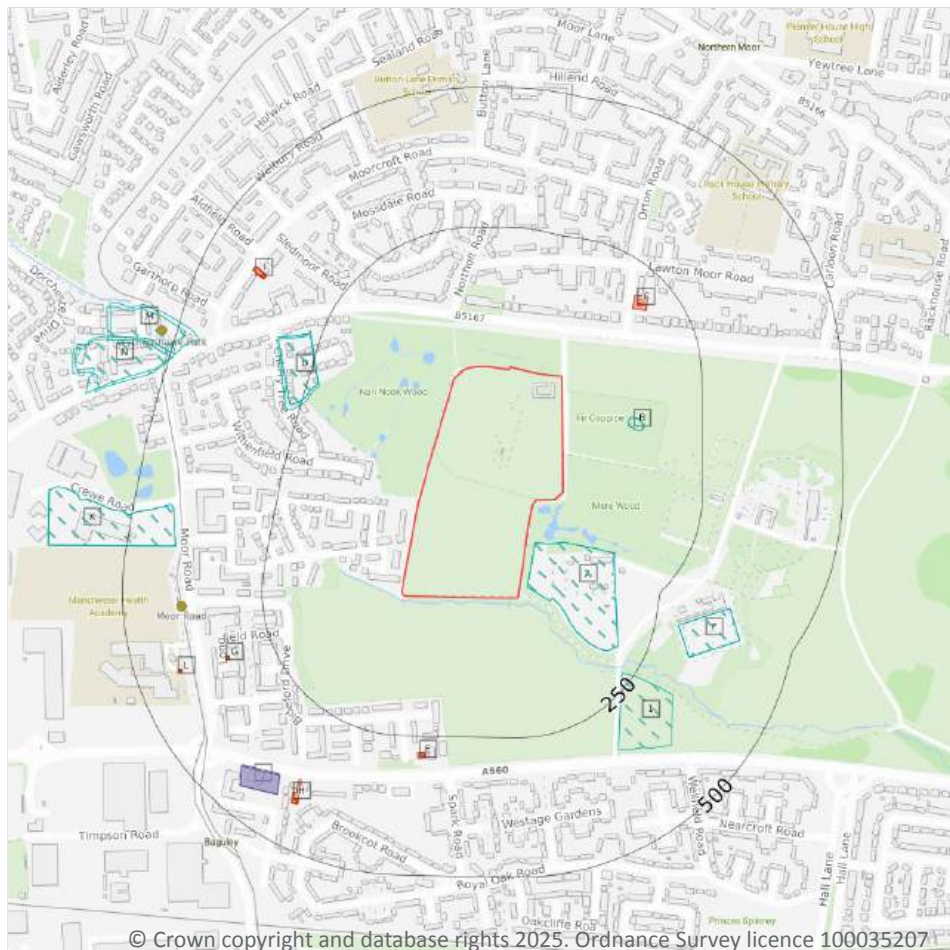
0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



2 Past land use - un-grouped



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

2.1 Historical industrial land uses

Records within 500m

16

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 19](#) >

ID	Location	Land Use	Date	Group ID
A	14m S	Nursery	1967	917503
A	14m S	Nursery	1977	917503
B	118m NE	Refuse Heap	1995	909087



ID	Location	Land Use	Date	Group ID
B	118m NE	Refuse Heap	1989	909087
D	228m NW	Nursery	1938	869055
1	231m SE	Nursery	1967	831516
D	231m NW	Nursery	1955	938145
D	231m NW	Nursery	1966	938145
F	291m SE	Nursery	1967	864317
F	291m SE	Nursery	1977	864317
K	413m W	Unspecified Works	1995	948513
K	413m W	Unspecified Works	1989	948513
M	458m NW	Nursery	1955	918797
M	484m NW	Nursery	1938	862472
N	491m NW	Nursery	1955	862472
N	494m W	Nursery	1938	911626

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

0

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

19

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 19](#) >



ID	Location	Land Use	Date	Group ID
C	176m NE	Electricity Substation	1956	88205
C	186m NE	Electricity Substation	1990	74330
C	188m NE	Electricity Substation	1955	87230
E	278m S	Gas Governor	1992	75888
E	280m S	Gas Governor	1985	74017
G	329m SW	Electricity Substation	1972	72122
G	329m SW	Electricity Substation	1992	84821
H	378m SW	Electricity Substation	1972	75998
I	383m NW	Electricity Substation	1992	79910
I	383m NW	Electricity Substation	1992	79910
I	384m NW	Electricity Substation	1955	76663
I	384m NW	Electricity Substation	1967	76663
I	384m NW	Electricity Substation	1955	76663
H	412m SW	Electricity Substation	1985	90222
H	413m SW	Electricity Substation	1992	89731
L	418m SW	Electricity Transformer	1976	68793
L	418m SW	Electricity Substation	1993	82791
L	418m SW	Electricity Substation	1987	82791
L	418m SW	Electricity Substation	1991	82791

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.



2.5 Historical garages

Records within 500m

2

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

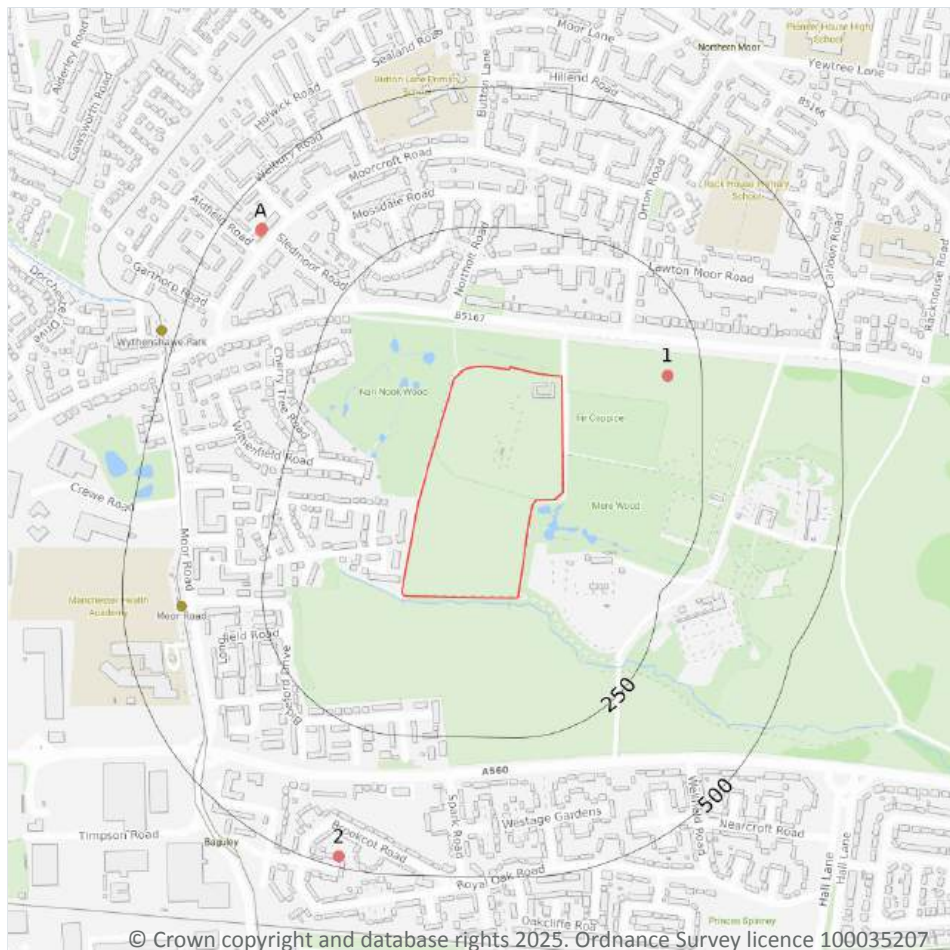
Features are displayed on the Past land use - un-grouped map on [page 19 >](#)

ID	Location	Land Use	Date	Group ID
J	390m SW	Garage	1972	29699
J	391m SW	Garage	1985	29699

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m**0**

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m**0**

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m**0**

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m**0**

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m**4**

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on [page 23](#) >

ID	Location	Site	Reference	Category	Sub-Category	Description
1	188m NE	-	WEX293494	Using waste exemption	Not on a farm	Use of waste in construction



ID	Location	Site	Reference	Category	Sub-Category	Description
A	436m NW	164, Moorcroft Road, Manchester, M23 0ah	WEX106655	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
A	437m NW	Moorcroft Pharmacy 164 Moorcroft Road Manchester M23 0ah	EPR/NE5547X B/A001	Treating waste exemption	Non- agricultural waste only	Sorting and de-naturing of controlled drugs for disposal
2	483m S	11, Kinsey Avenue, Manchester, M23 1dx	WEX315981	Storing waste exemption	Not on a farm	Storage of waste in a secure place

This data is sourced from the Environment Agency and Natural Resources Wales.



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- #### 4.1 Recent industrial land uses

3

Features are displayed on the Current industrial land use map on [page 26](#) >

ID	Location	Company	Address	Activity	Category
2	176m N	G C Flooring	169, Lawton Moor Road, Manchester, Greater Manchester, M23 0PW	Construction Completion Services	Construction Services
3	181m NE	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities
4	219m NW	Walker Signs	171, Wythenshawe Road, Manchester, Greater Manchester, M23 0AD	Signs	Industrial Products

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m

1

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on [page 26](#) >

ID	Location	Company	Address	LPG	Status
A	395m SW	SHELL	Altrincham Road, Baguley, Manchester, Greater Manchester, M23 9AA	Yes	Open

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m

0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m

0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m

0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m

0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.



This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m

0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m

0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m

1

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on [page 26 >](#)

ID	Location	Address	Details	
A	420m SW	Shell Baguley, Altrincham Road, Baguley, M23 9AA	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m

0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m

0

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m

0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m

0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m

1

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on [page 26 >](#)

ID	Location	Details	
1	162m SE	Incident Date: 08/07/2003 Incident Identification: 172036 Pollutant: Specific Waste Materials Pollutant Description: Containers	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m

0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



4.20 Pollution inventory waste transfers

Records within 500m**0**

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

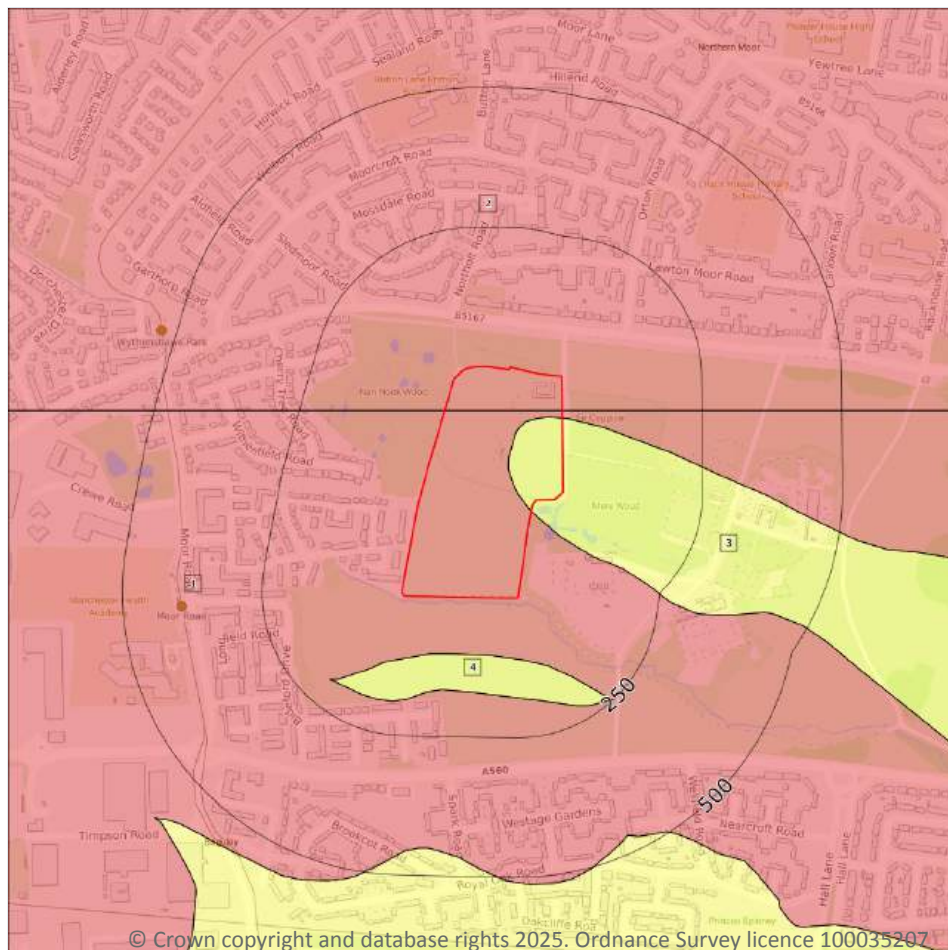
Records within 500m**0**

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



5 Hydrogeology - Superficial aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

4

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 32](#) >

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

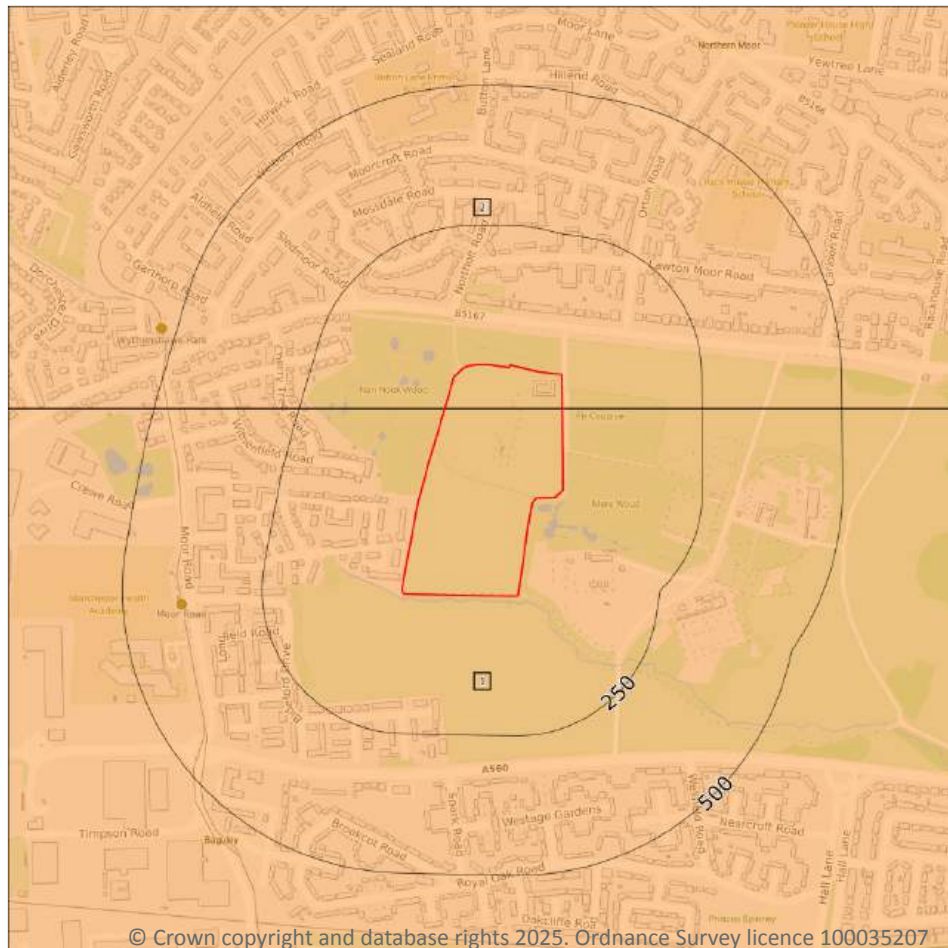


ID	Location	Designation	Description
3	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	102m S	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

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline**
- Search buffers in metres (m)**
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on [page 34](#) >

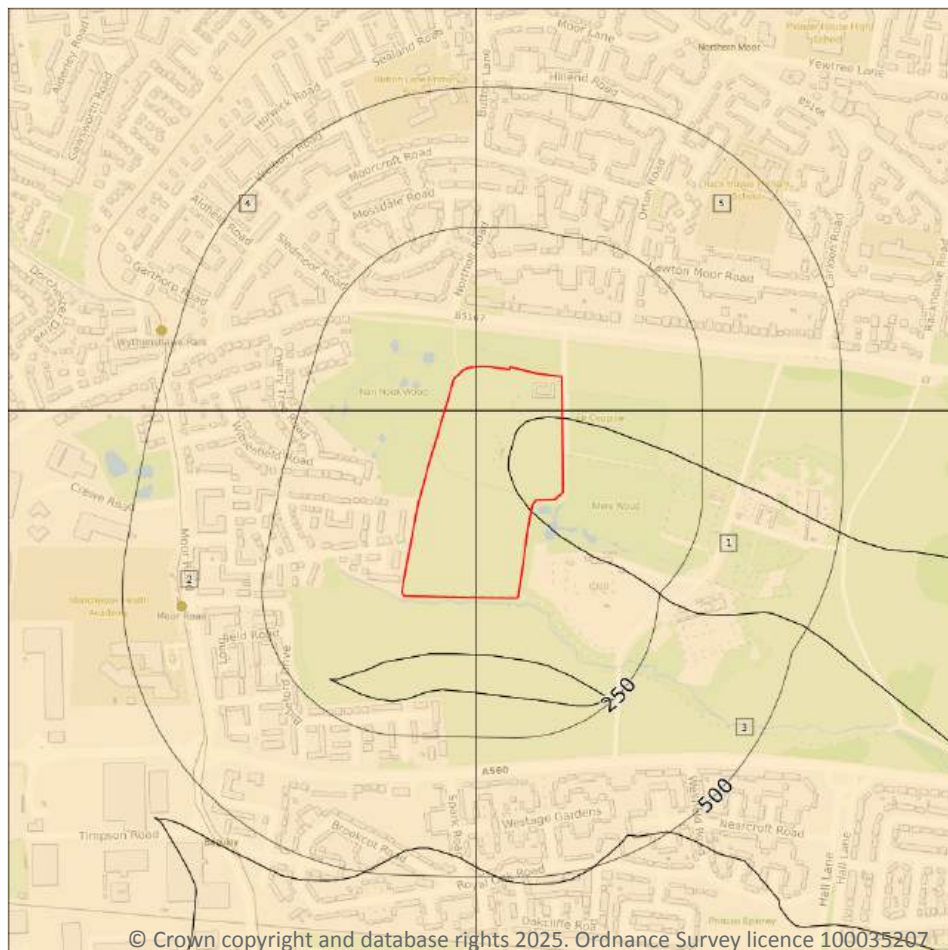
ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers



This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m

5

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on [page 36](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
3	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
4	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
5	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.



5.5 Groundwater vulnerability- local information

Records on site

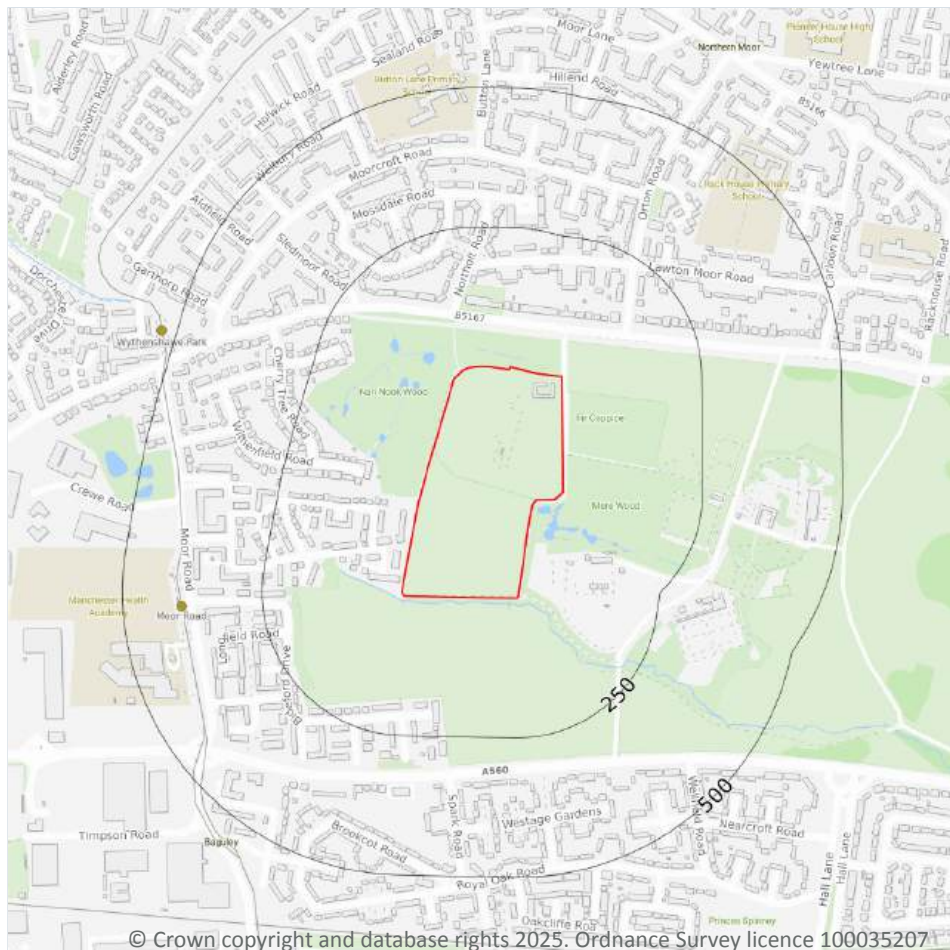
0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.



Abstractions and Source Protection Zones



- Site Outline
- Search buffers in metres (m)
- Source Protection Zone 1
Inner catchment
- Source Protection Zone 2
Outer catchment
- Source Protection Zone 3
Total catchment
- Source Protection Zone 4
Zone of Special Interest
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

3

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on [page 39](#) >

ID	Location	Details	
-	1670m N	Status: Historical Licence No: 2569015003 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: WELL AT NURSERY, RUTLAND LANE, SALE, CHESHIRE Data Type: Point Name: RILEY Easting: 380600 Northing: 391700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 25/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 25/01/1966 Version End Date: -
-	1865m N	Status: Historical Licence No: 2569015002 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "WELL AT PREMISES, 5 RUTLAND LANE, SALE, CHESH" Data Type: Point Name: ASTBURY Easting: 380600 Northing: 391900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/01/1966 Version End Date: -
-	1865m N	Status: Historical Licence No: 2569015002 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: WELL AT PREMISES, 5 RUTLAND LANE, SALE, CHESH Data Type: Point Name: ASTBURY Easting: 380600 Northing: 391900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/01/1966 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m

2

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on [page 39](#) >



ID	Location	Details	
-	1776m NE	Status: Historical Licence No: 2569015016 Details: Dust suppression Direct Source: Surface, Non-Tidal - North West Region Point: RIVER MERSEY AT TRAFFORD, MANCHESTER Data Type: Point Name: AMEC / ALFRED MCALPINE JV Easting: 382650 Northing: 391020	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/11/2003 Expiry Date: 31/12/2006 Issue No: 1 Version Start Date: 28/11/2003 Version End Date: -
-	1776m NE	Status: Historical Licence No: 2569015016 Details: General Washing/Process Washing Direct Source: Surface, Non-Tidal - North West Region Point: RIVER MERSEY AT TRAFFORD, MANCHESTER Data Type: Point Name: AMEC / ALFRED MCALPINE JV Easting: 382650 Northing: 391020	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/11/2003 Expiry Date: 31/12/2006 Issue No: 1 Version Start Date: 28/11/2003 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	0
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Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	0
----------------------------	----------

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

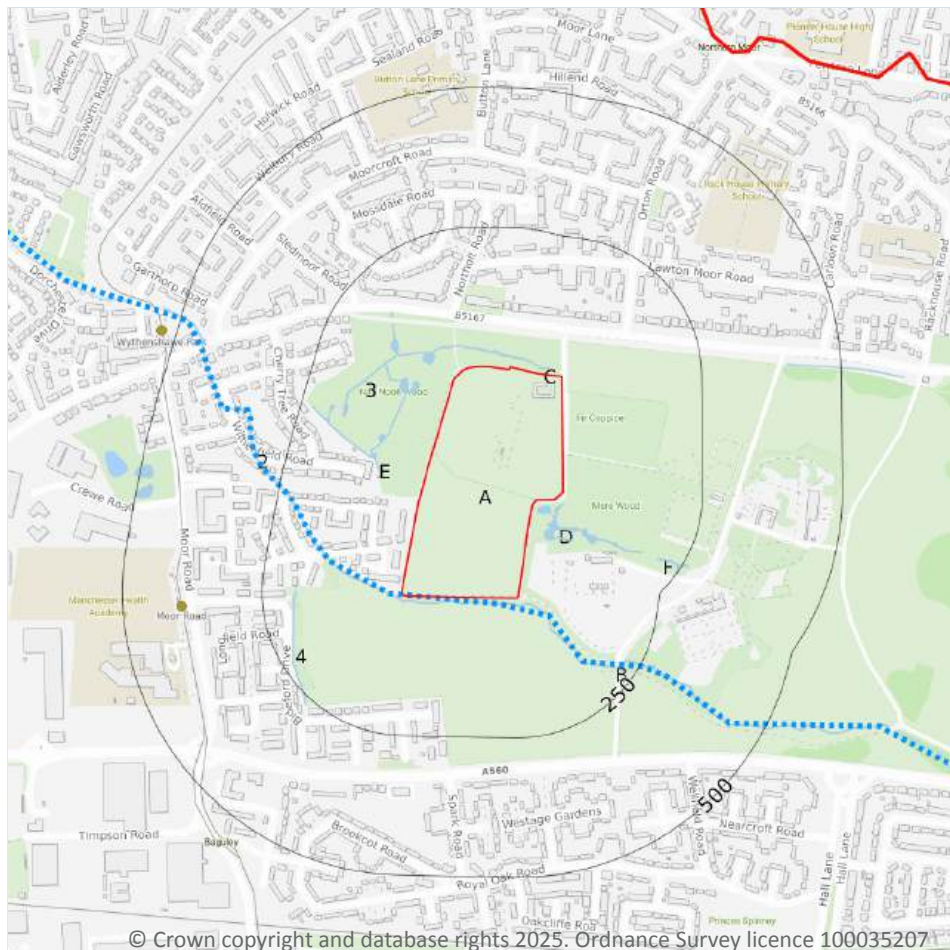
Records within 500m	0
----------------------------	----------

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.



6 Hydrology



- Site Outline
- ... Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ... WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- - - WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

53

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on [page 42 >](#)

ID	Location	Type of water feature	Ground level	Permanence	Name
B	7m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Baguley Brook



ID	Location	Type of water feature	Ground level	Permanence	Name
C	10m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	11m NE	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	12m NE	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	17m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	18m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	19m N	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	26m N	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	29m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	33m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	40m SE	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	43m N	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
C	47m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	57m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
C	61m N	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	67m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	68m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	70m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	70m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	74m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	74m SE	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	74m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	74m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	78m SE	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	79m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	84m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	88m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
C	90m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	94m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	96m W	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	101m W	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	101m W	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	103m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	105m SE	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
D	108m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	112m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	112m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
2	116m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Baguley Brook
3	126m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	130m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
C	156m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	169m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
4	187m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	192m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	192m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	194m W	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	194m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	195m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	196m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	207m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	222m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	244m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	244m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.



6.2 Surface water features

Records within 250m

12

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on [page 42 >](#)

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site

1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on [page 42 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River	Sinderland Brook (Fairywell Bk and Baguley Bk)	GB112069061270	Bollin Dean Mersey Upper	Mersey Upper

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified

1

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on [page 42 >](#)

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
1	On site	River	Sinderland Brook (Fairywell Bk and Baguley Bk)	GB112069061270 ↗	Moderate	Fail	Moderate	2019

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	1
------------------------	----------

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on [page 42 >](#)

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Weaver and Dane Quaternary Sand and Gravel Aquifers	GB41202G991700 ↗	Poor	Poor	Good	2019

This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding



- Site Outline
- Search buffers in metres (m)
- River and coastal flooding:
- High
- Medium
- Low
- Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

7.1 Risk of flooding from rivers and the sea

Records within 50m

9

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

Features are displayed on the River and coastal flooding map on [page 49 >](#)



Distance	Flood risk category
On site	N/A
0 - 50m	High

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	0
----------------------------	----------

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0
----------------------------	----------

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	0
----------------------------	----------

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	0
----------------------------	----------

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



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 Flood zone 2

 Flood zone 3

51

7.7 Flood Zone 3

Records within 50m

1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

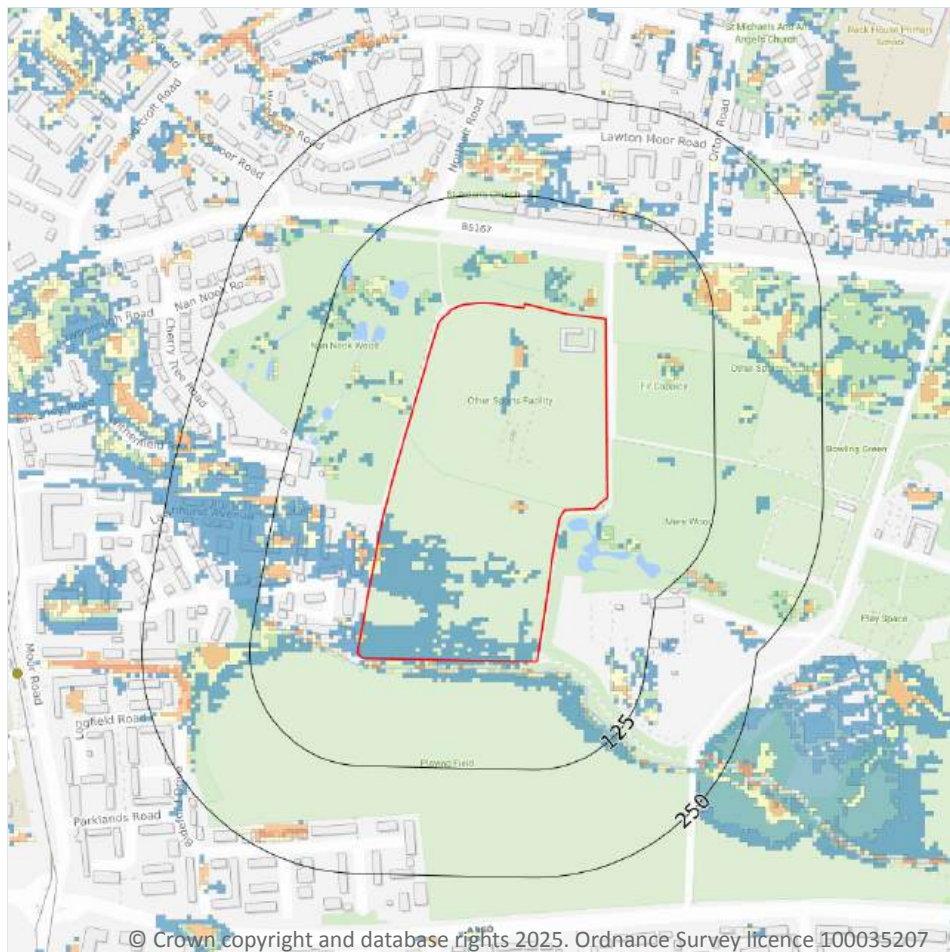
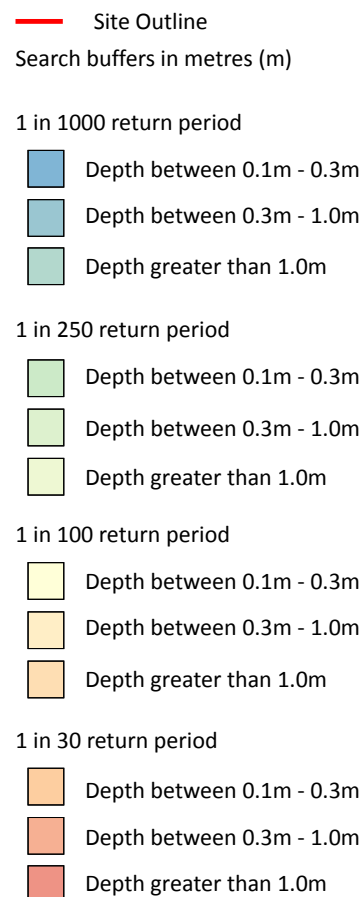
Features are displayed on the River and coastal flooding map on [page 49](#) >

Location	Type
2m S	Zone 3 - (Fluvial Models)

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.1m - 0.3m

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on [page 53](#) >

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

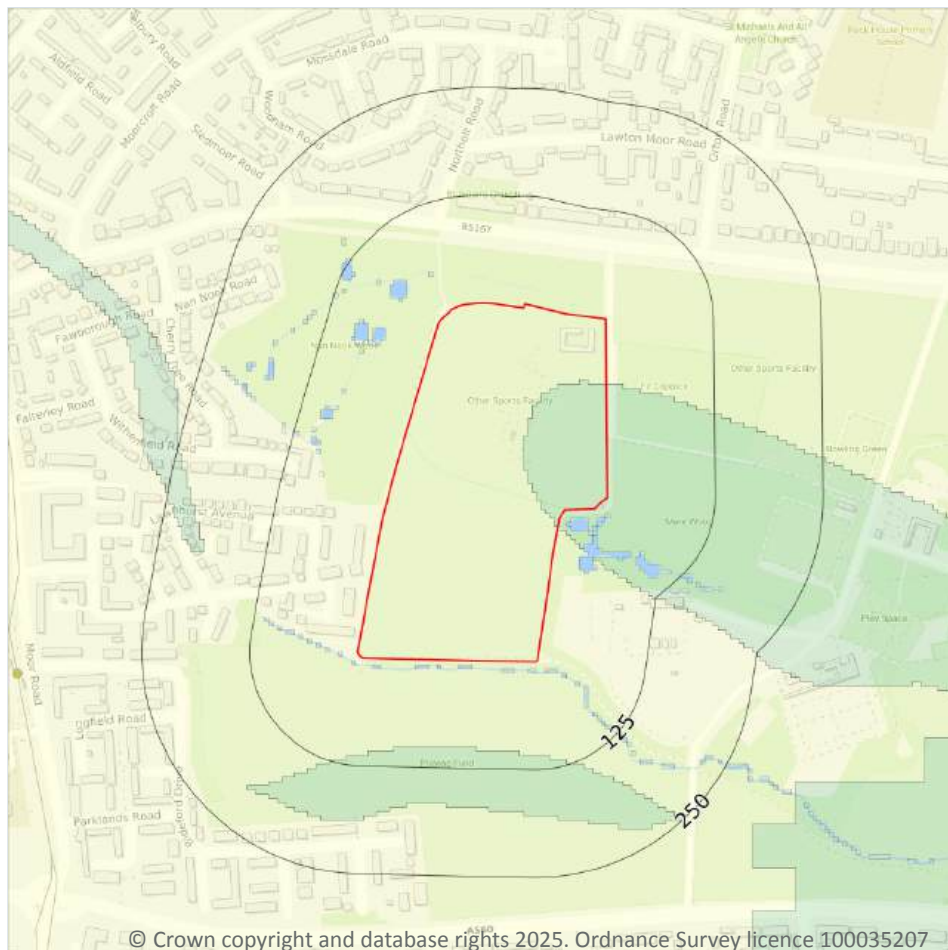
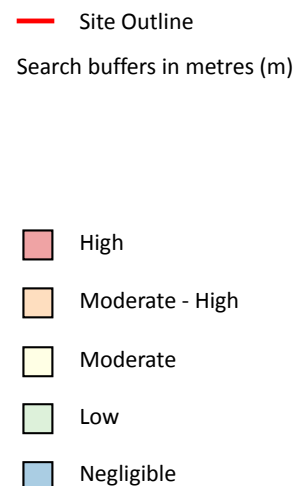
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Moderate

Highest risk within 50m

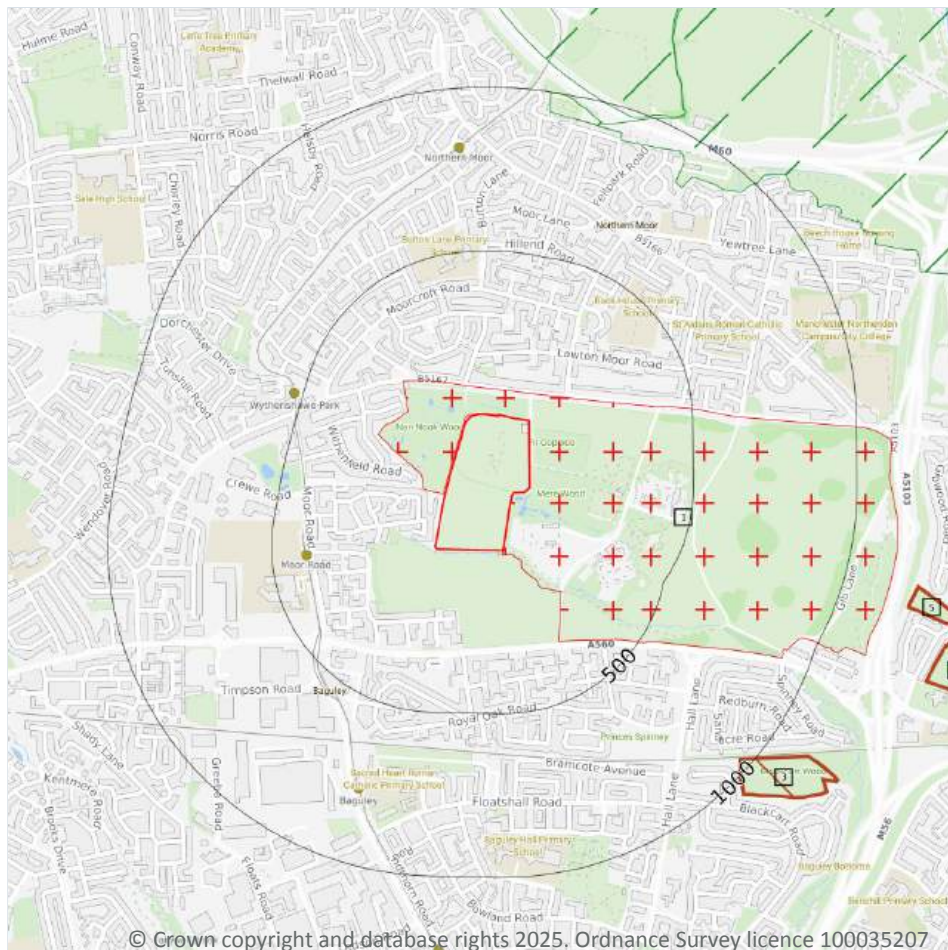
Moderate

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on [page 55 >](#)

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- + Local Nature Reserves (LNR)
- ▨ Designated Ancient Woodland
- ▨ Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m**0**

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m**0**

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m

2

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on [page 56 >](#)

ID	Location	Name	Data source
1	On site	Wythenshawe Park	Natural England
-	1845m NE	Chorlton Water Park	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m

3

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on [page 56 >](#)

ID	Location	Name	Woodland Type
3	967m SE	Black Carr Wood	Ancient & Semi-Natural Woodland
5	1213m E	Black Field Wood	Ancient & Semi-Natural Woodland
6	1349m SE	Round's Wood	Ancient & Semi-Natural Woodland

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m

0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.



10.9 Forest Parks

Records within 2000m**0**

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m**0**

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m**3**

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on [page 56 >](#)

ID	Location	Name	Local Authority name
2	851m NE	Merseyside and Greater Manchester Green Belt	Manchester
4	979m N	Merseyside and Greater Manchester Green Belt	Trafford
-	1880m S	Merseyside and Greater Manchester Green Belt	Manchester

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m**0**

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.



10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m**0**

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m**0**

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m**0**

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

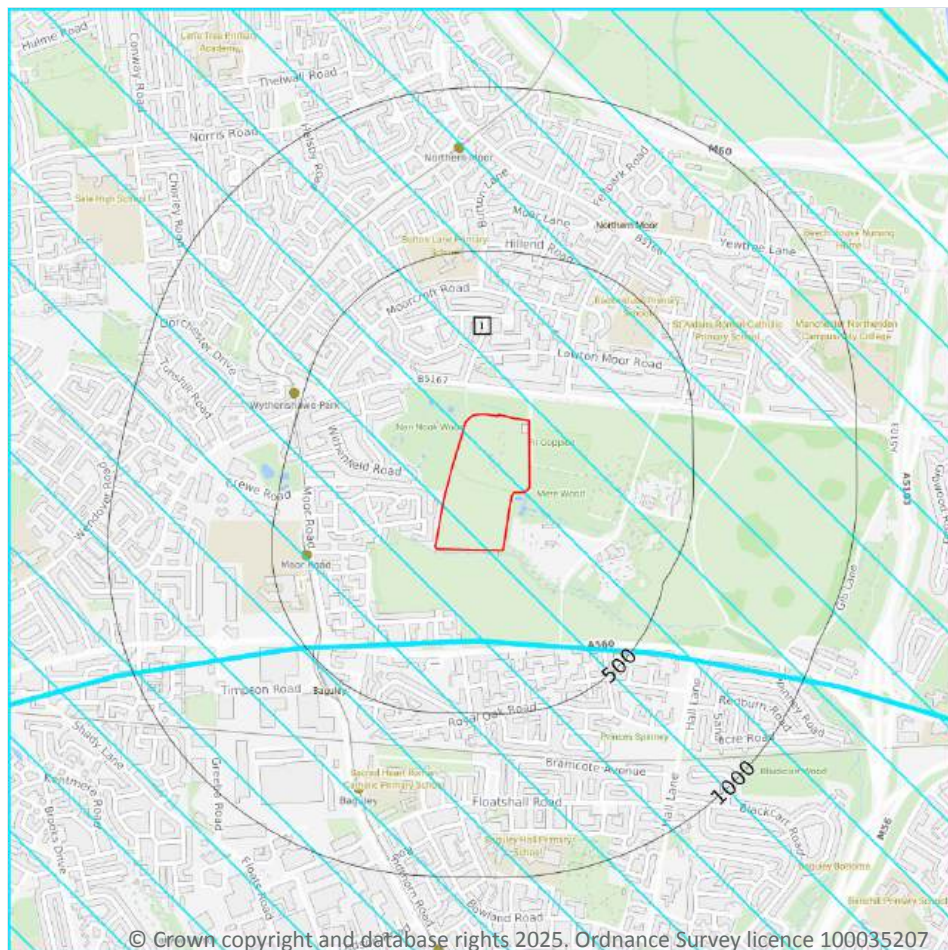
Records within 2000m**0**

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on [page 61](#) >

ID	Location	Type of developments requiring consultation
1	On site	<p>Infrastructure - Airports, helipads and other aviation proposals.</p> <p>Minerals, Oil and Gas - Oil & gas exploration/extraction.</p> <p>Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 4000m².</p> <p>Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.</p>

This data is sourced from Natural England.

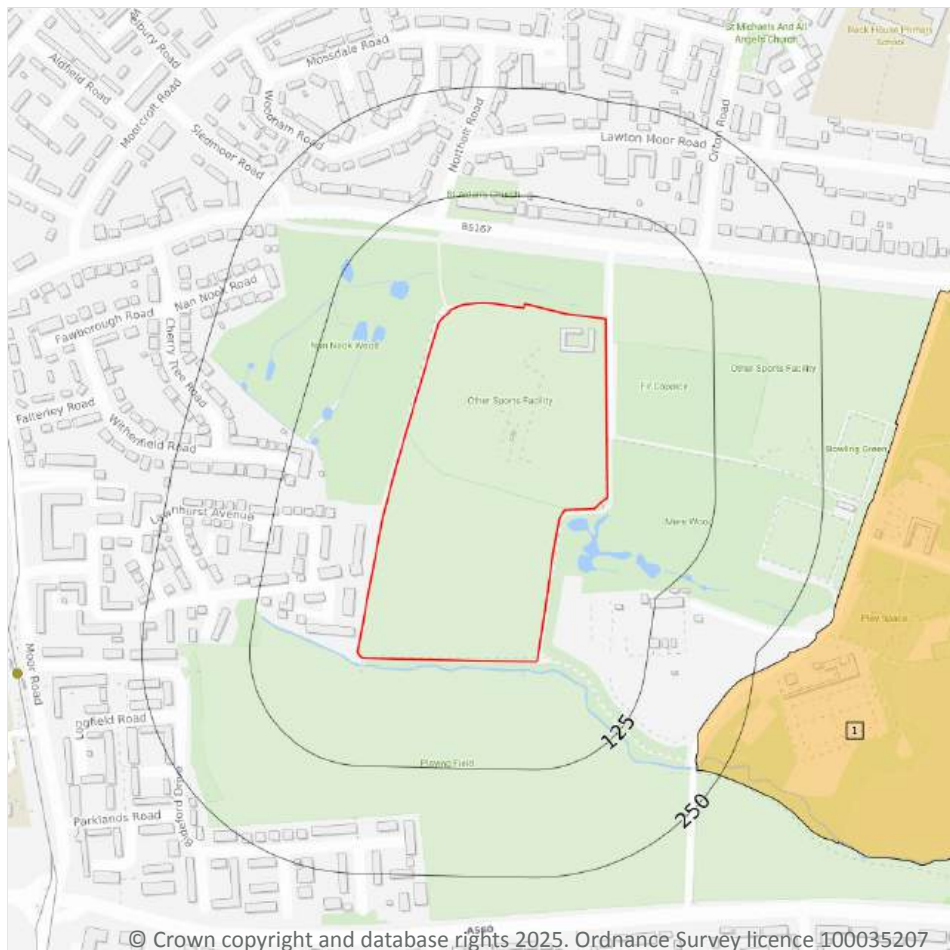
10.18 SSSI Units

Records within 2000m	0
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations



- Site Outline
- Search buffers in metres (m)
-  Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m**0**

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m**0**

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m**0**

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m**0**

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.



This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m

1

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

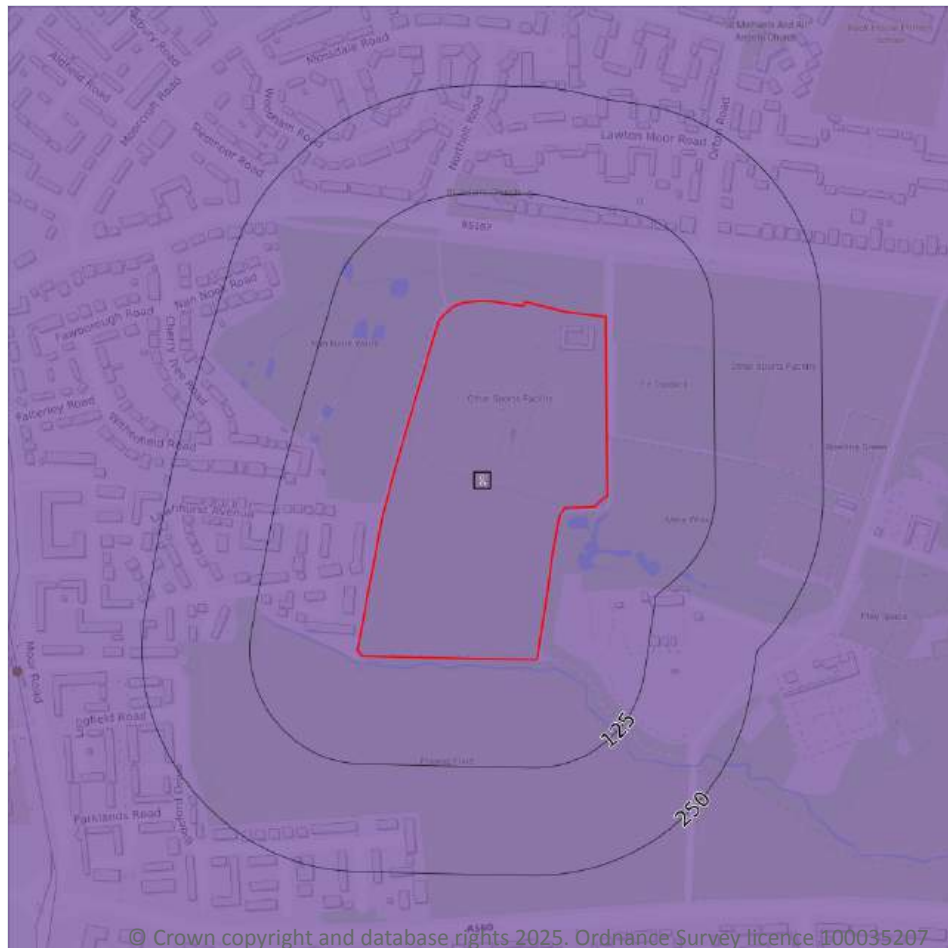
Features are displayed on the Visual and cultural designations map on [page 63](#) >

ID	Location	Name	Grade
1	204m SE	Wythenshawe Park	II

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

1

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on [page 66](#) >

ID	Location	Classification	Description
1	On site	Urban	Non-agricultural/no quality assigned

This data is sourced from Natural England.



12.2 Open Access Land

Records within 250m**0**

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m**0**

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m**0**

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

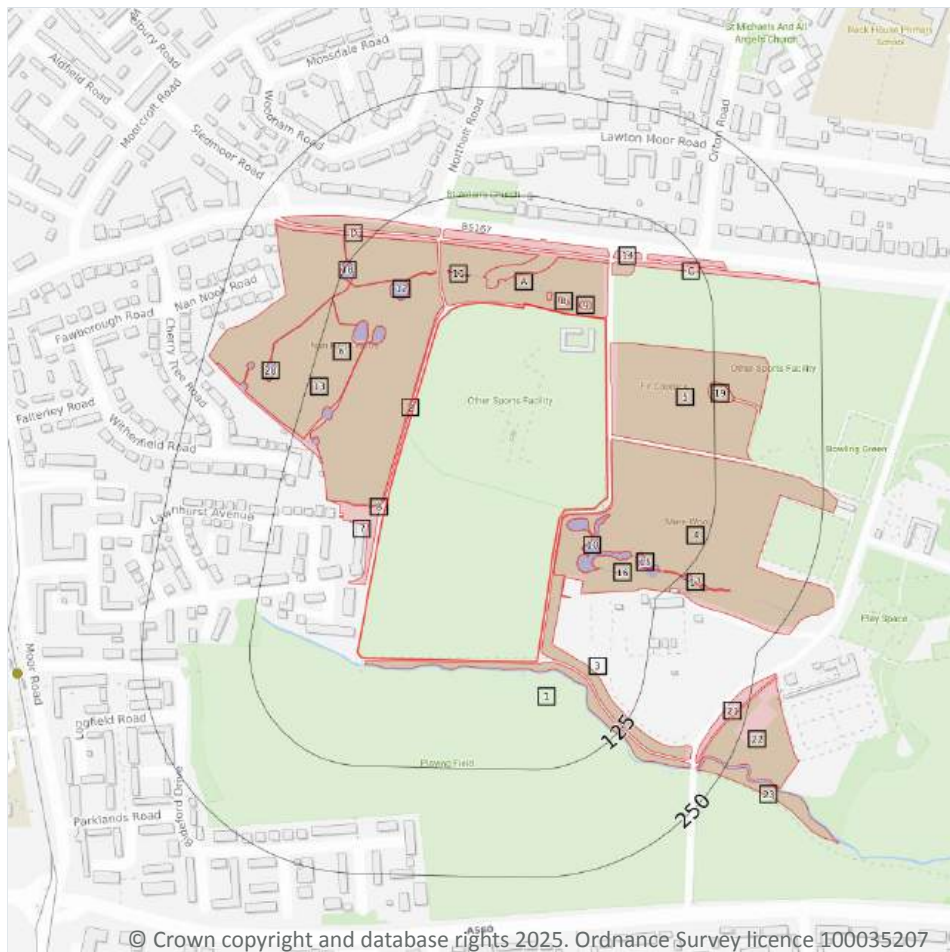
12.5 Countryside Stewardship Schemes

Records within 250m**0**

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations



- Site Outline
- Search buffers in metres (m)
- Priority Habitat Inventory
- Open Mosaic Habitat
- Limestone Pavement Orders
- Habitat Networks
 - Primary Habitat
 - Restorable Habitat
 - Associated Habitats
 - Habitat Restoration-Creation
 - Network Enhancement Zone 1
 - Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m

32

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on [page 68](#) >

ID	Location	Main Habitat	Other habitats
A	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
1	2m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	2m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	3m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)



ID	Location	Main Habitat	Other habitats
4	4m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
5	4m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
6	5m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
7	5m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
8	6m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
9	8m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
10	10m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	10m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	11m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	18m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
11	32m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
12	47m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
C	52m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
13	55m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	66m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
14	72m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
15	73m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
16	78m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
D	78m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
C	84m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
D	84m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
17	107m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
18	112m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
19	118m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
20	167m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
21	213m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
22	220m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
23	224m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.



13.2 Habitat Networks

Records within 250m

0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

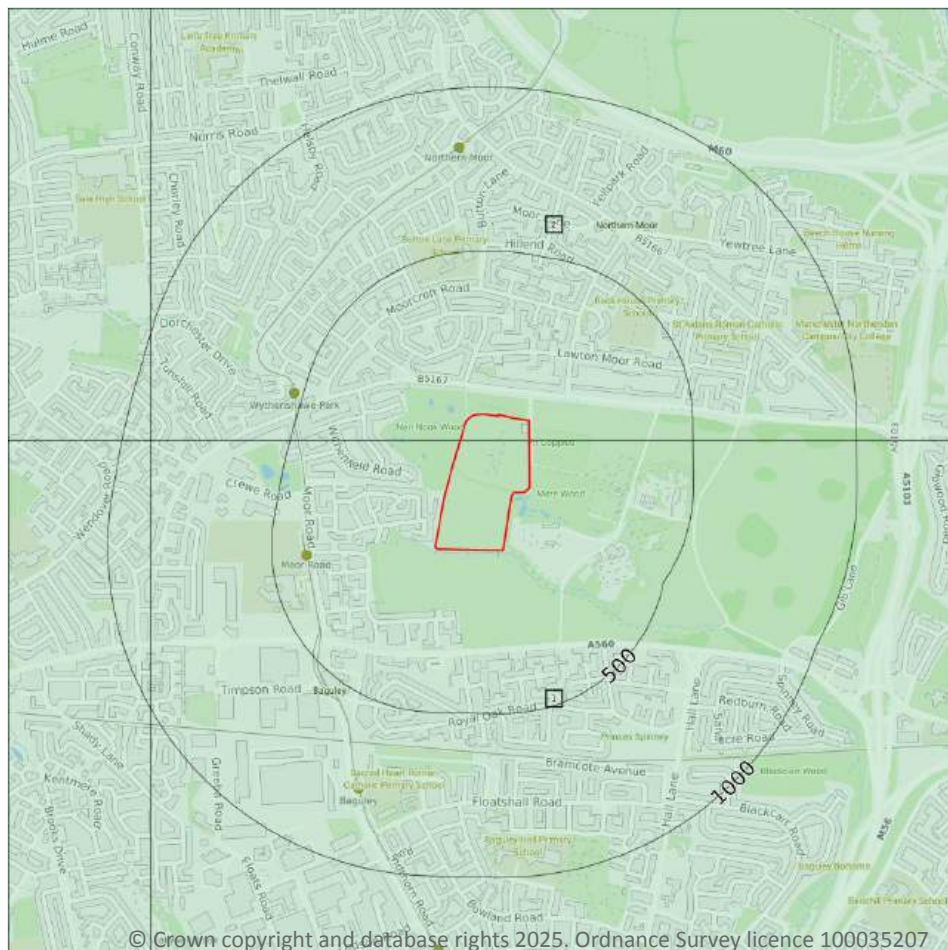
0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

2

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on [page 71](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	SJ88NW
2	On site	Full	Full	Full	No coverage	SJ89SW

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Artificial and made ground

14.2 Artificial and made ground (10k)

Records within 500m

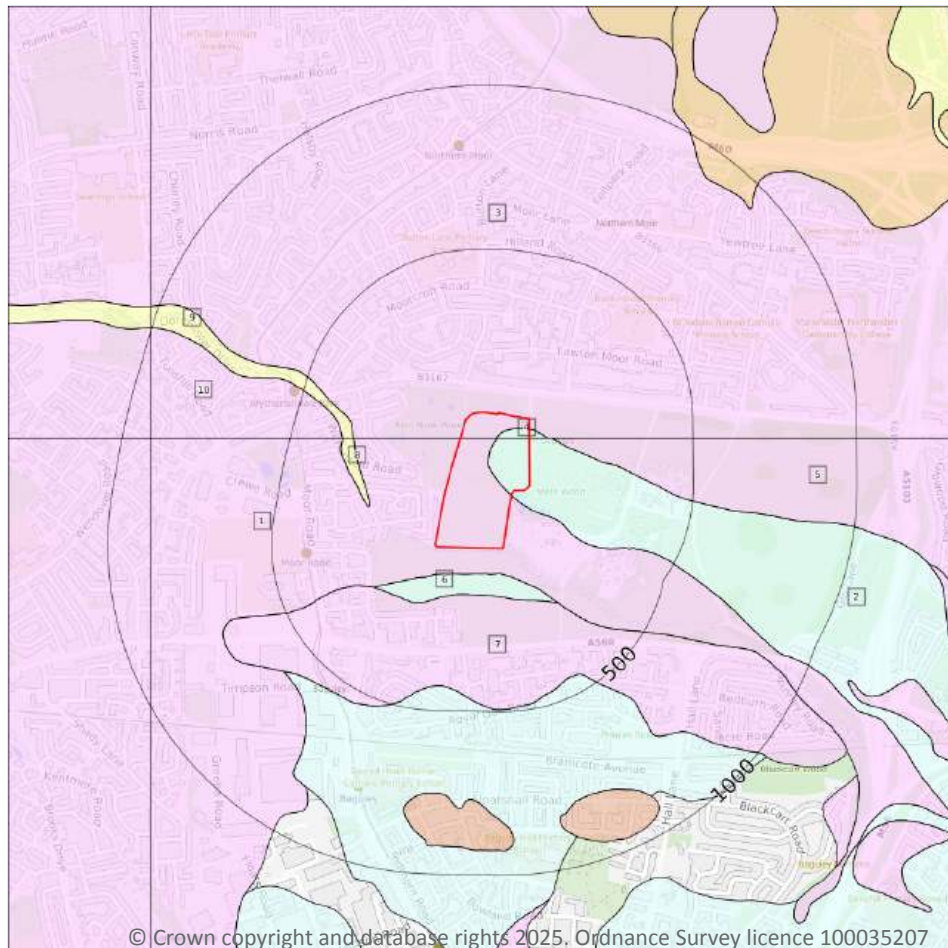
0

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

10

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 73](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	GFSDDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel
2	On site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
3	On site	GFSDDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel



ID	Location	LEX Code	Description	Rock description
4	On site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
5	72m NE	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel
6	78m S	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
7	143m S	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel
8	218m W	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
9	315m W	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
10	346m W	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

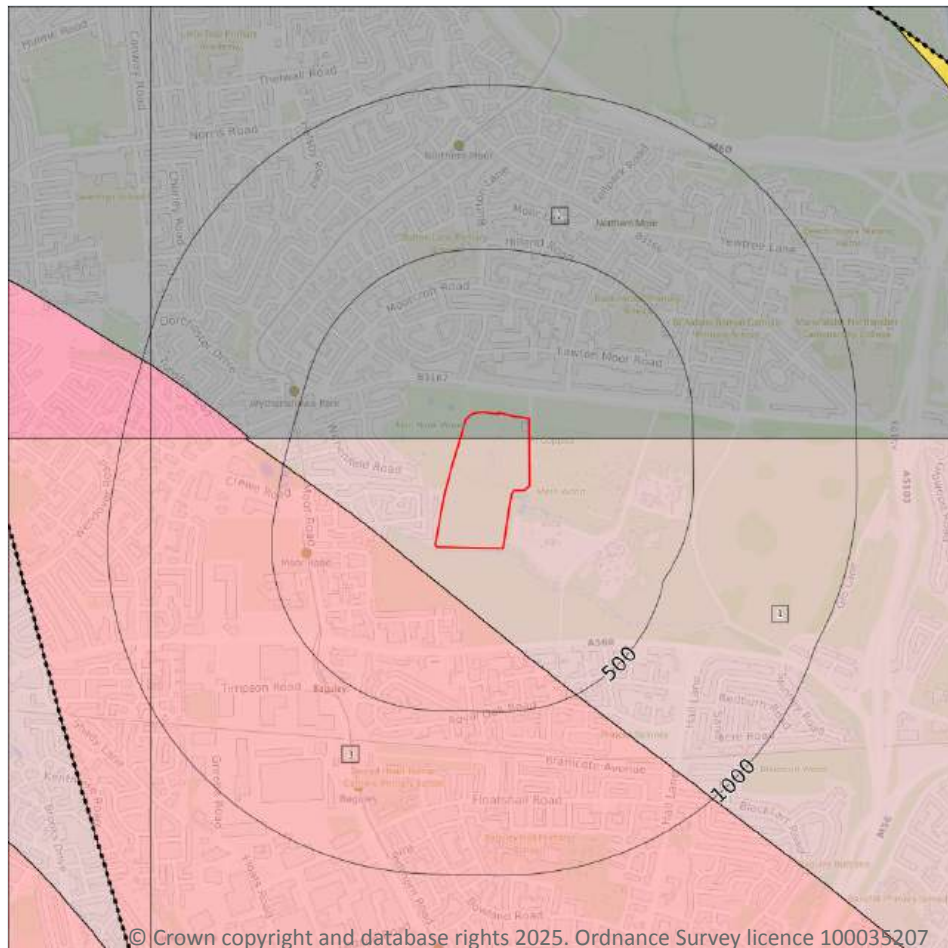
0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

3

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 75 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	TPSF-SISD	Tarporley Siltstone Formation - Siltstone And Sandstone	Anisian Age - Olenekian Age
2	On site	TPSF-SLST	Tarporley Siltstone Formation - Siltstone	Anisian Age - Olenekian Age
3	85m SW	BOM-MDST	Bollin Mudstone Member - Mudstone	Anisian Age

This data is sourced from the British Geological Survey.



14.6 Bedrock faults and other linear features (10k)

Records within 500m

0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline
Search buffers in metres (m)

☐ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on [page 77](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	Full	EW098_stockport_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground

15.2 Artificial and made ground (50k)

Records within 500m

0

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



[illegible]

Superficial geology (50k)
Please see table for more details.

79

ID	Location	LEX Code	Description	Rock description
4	166m S	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
5	198m W	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m **3**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	High	Low
On site	Intergranular	Very High	High
On site	Intergranular	Very High	High

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m **0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

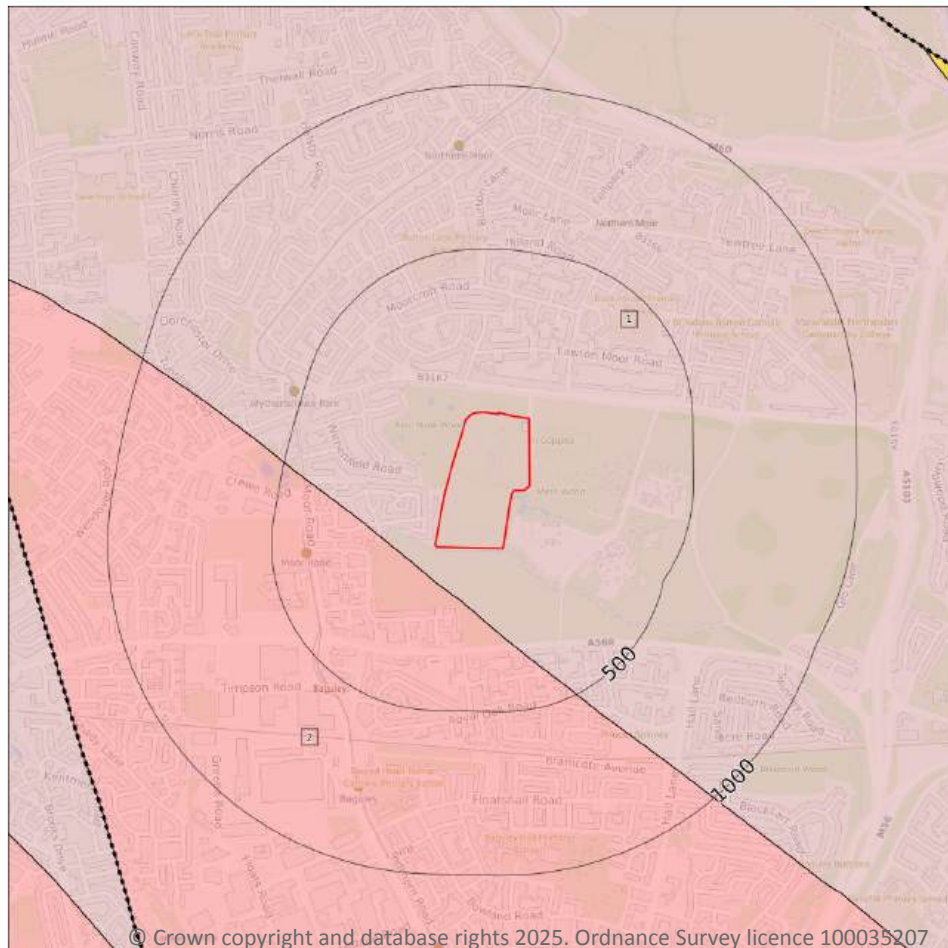
Records within 50m **0**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (50k)
- Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

2

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 81](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	TPSF-SIMS	TARPORLEY SILTSTONE FORMATION - SILTSTONE, MUDSTONE AND SANDSTONE	OLENEKIAN
2	85m SW	BOM-MDST	BOLLIN MUDSTONE MEMBER - MUDSTONE	ANISIAN

This data is sourced from the British Geological Survey.



15.9 Bedrock permeability (50k)

Records within 50m**2**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Moderate	Low
On site	Fracture	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

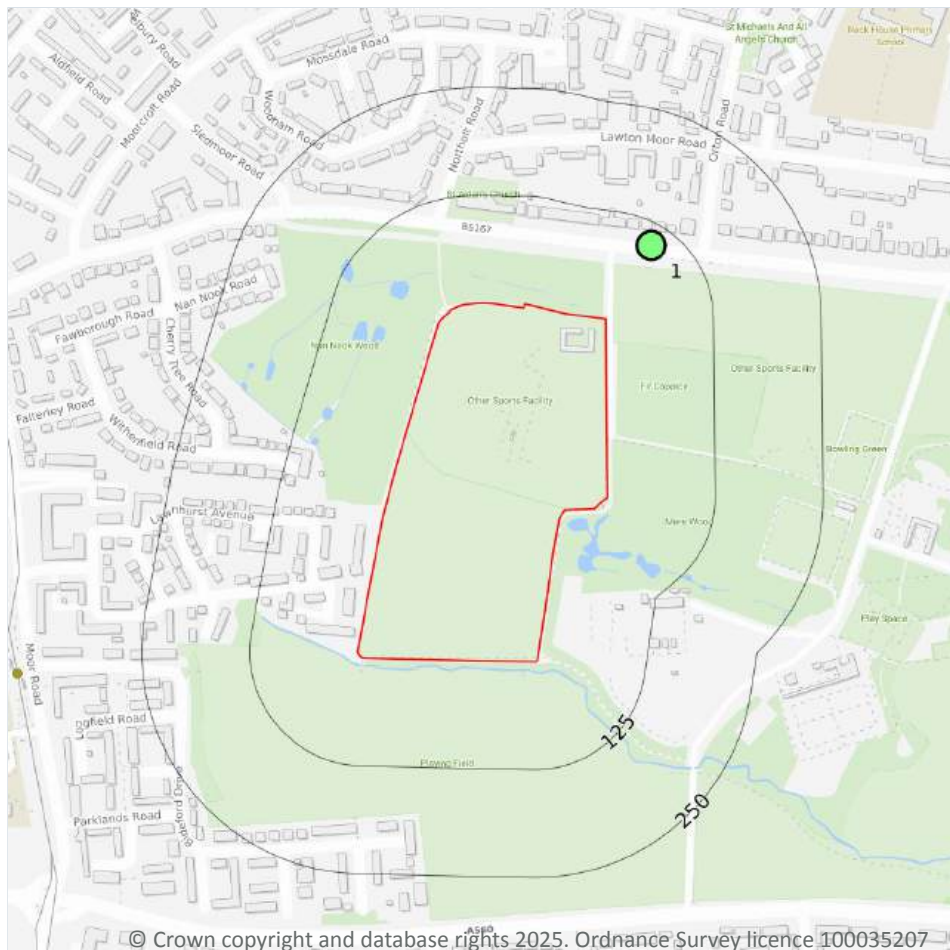
Records within 500m**0**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



16 Boreholes



- Site Outline
- Search buffers in metres (m)
- Confidential
 - 0 - 10m
 - 10 - 30m
 - 30m+
 - Unknown

16.1 BGS Boreholes

Records within 250m

1

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

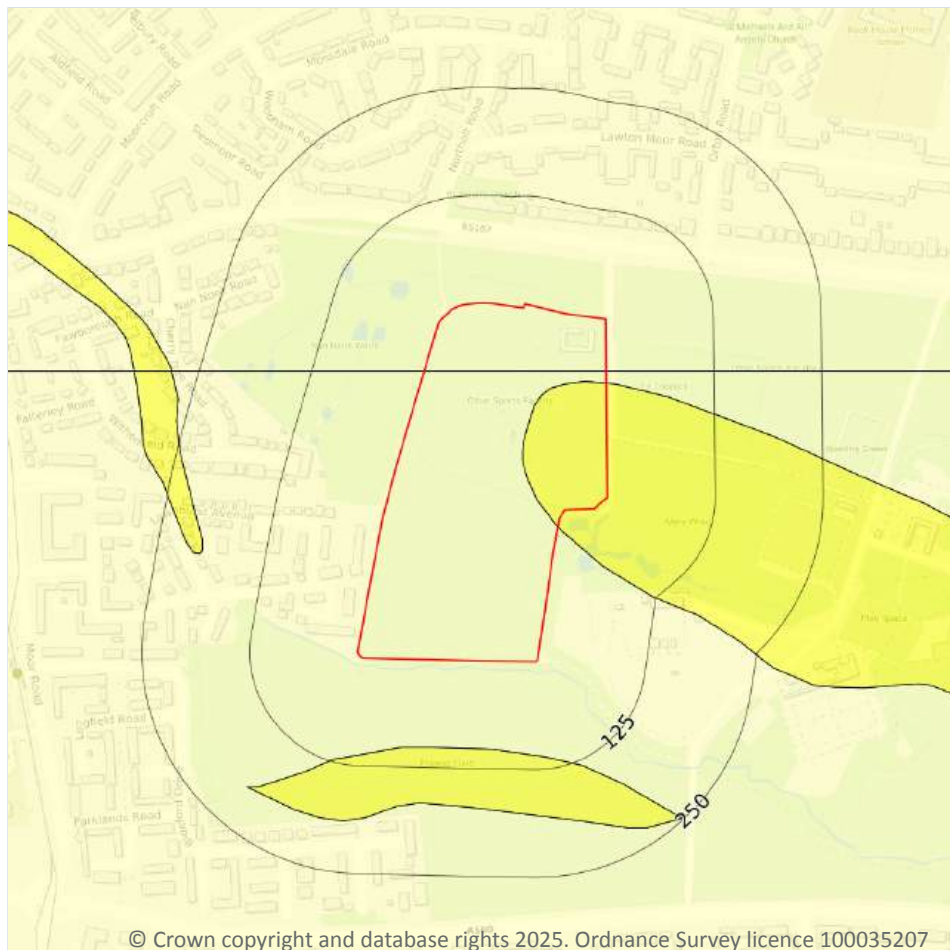
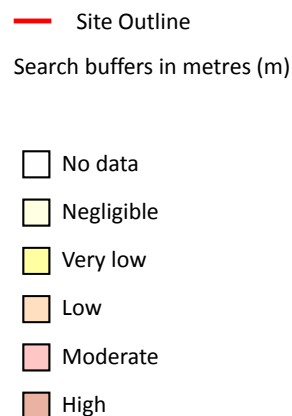
Features are displayed on the Boreholes map on [page 83](#) >

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	101m NE	381208 390146	WYTHENSHAW ROAD, NORTHENDEN. NO.7	15.24	N	864920 ↗

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

2

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

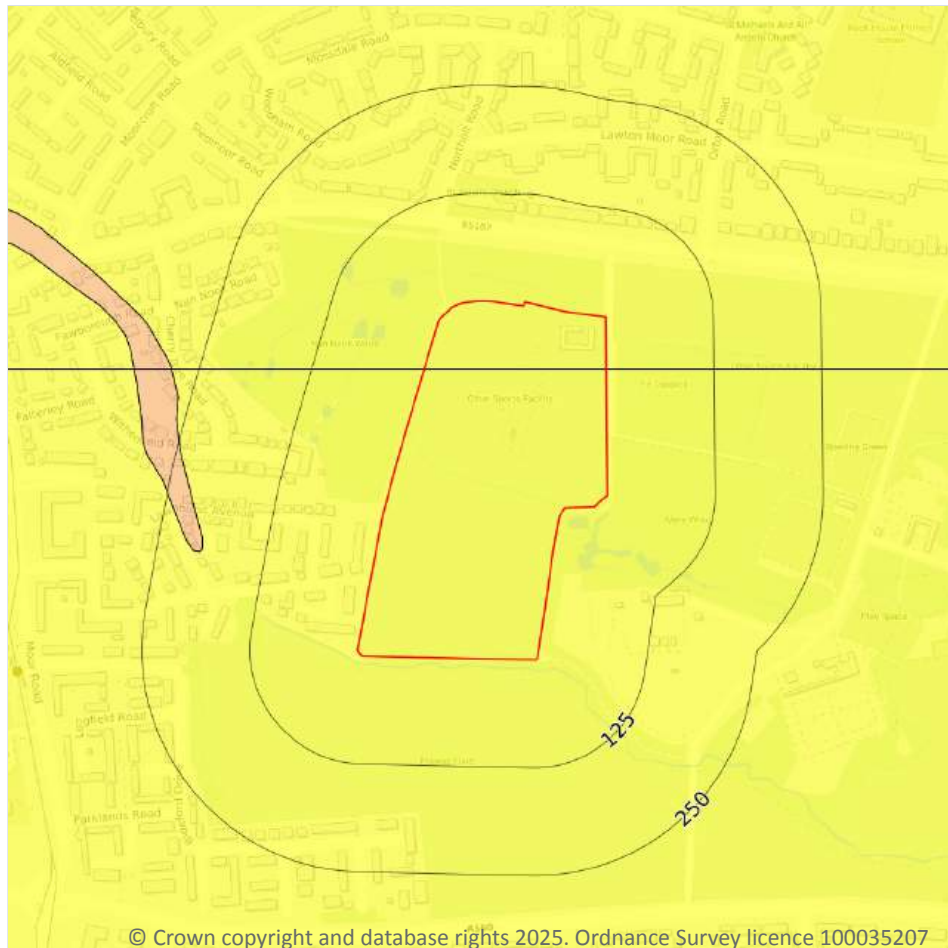
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 84 >](#)

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.2 Running sands

Records within 50m

1

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

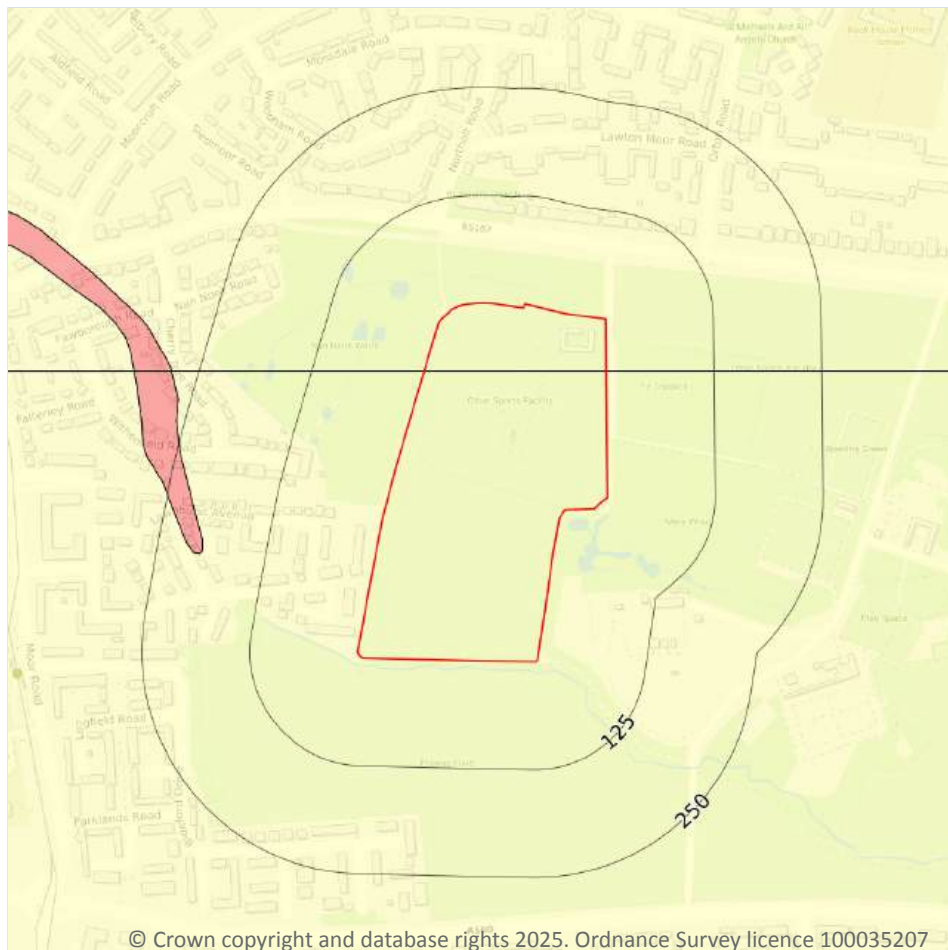
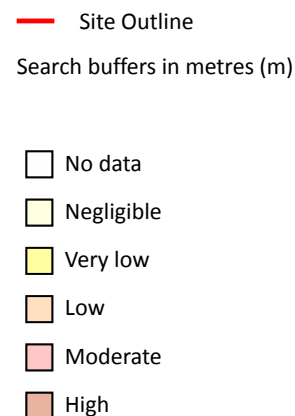
Features are displayed on the Natural ground subsidence - Running sands map on [page 85 >](#)

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

1

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

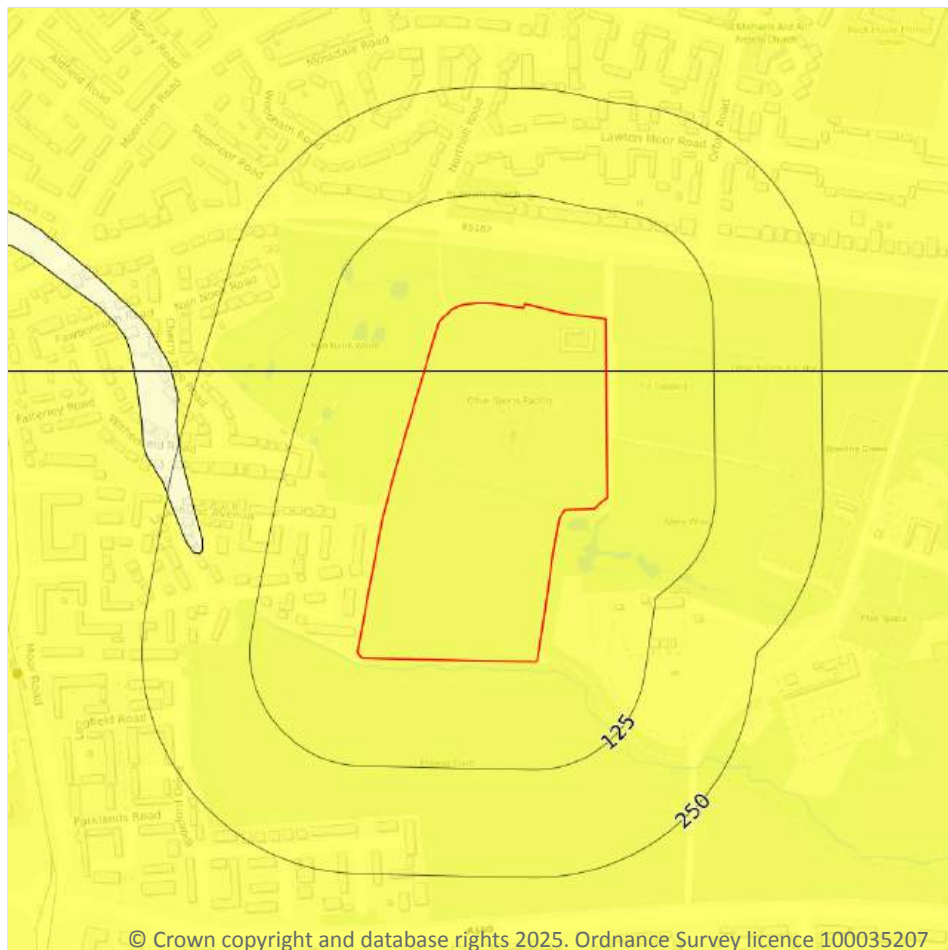
Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 86](#) >

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.4 Collapsible deposits

Records within 50m

1

The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

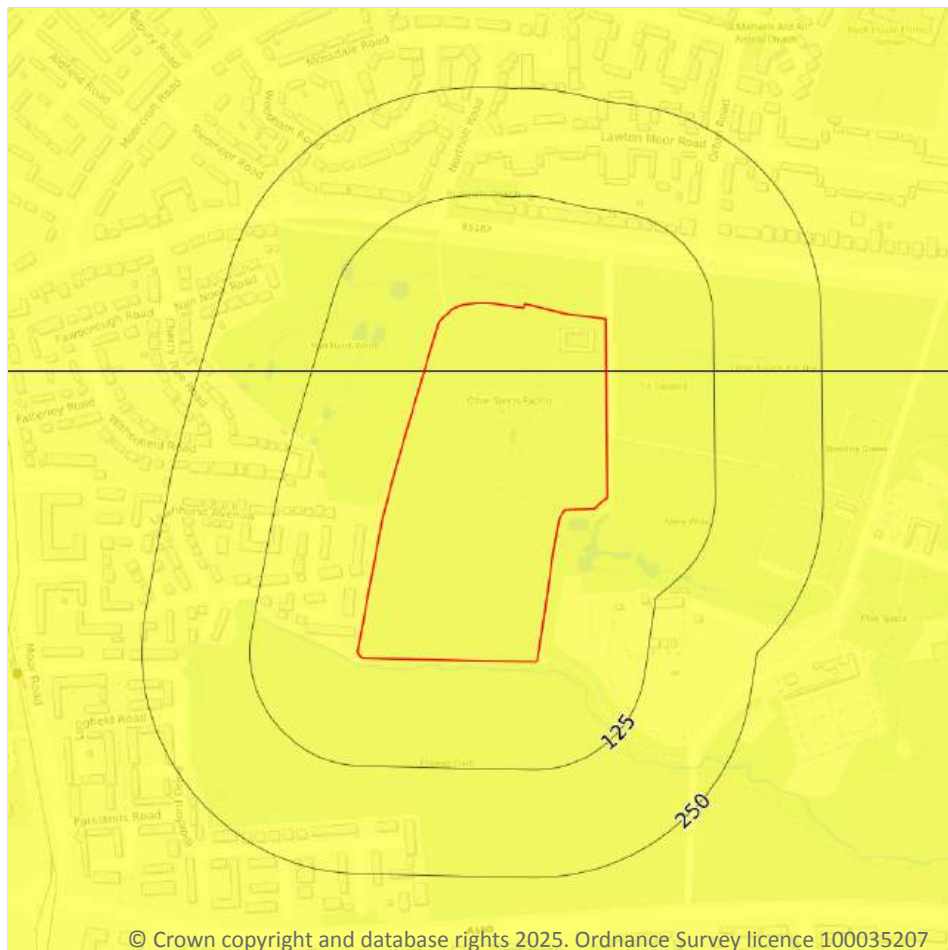
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 87 >](#)

Location	Hazard rating	Details
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.5 Landslides

Records within 50m

1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

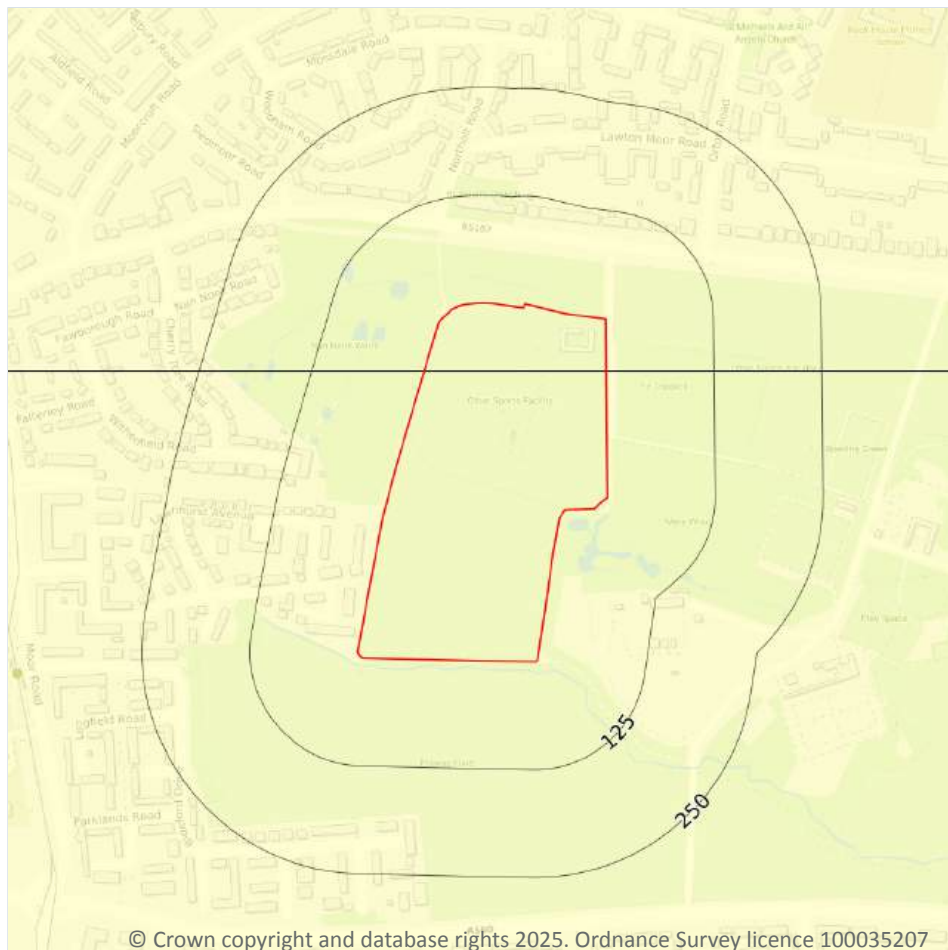
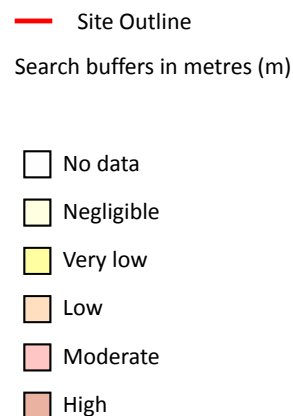
Features are displayed on the Natural ground subsidence - Landslides map on [page 88](#) >

Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on [page 89](#)

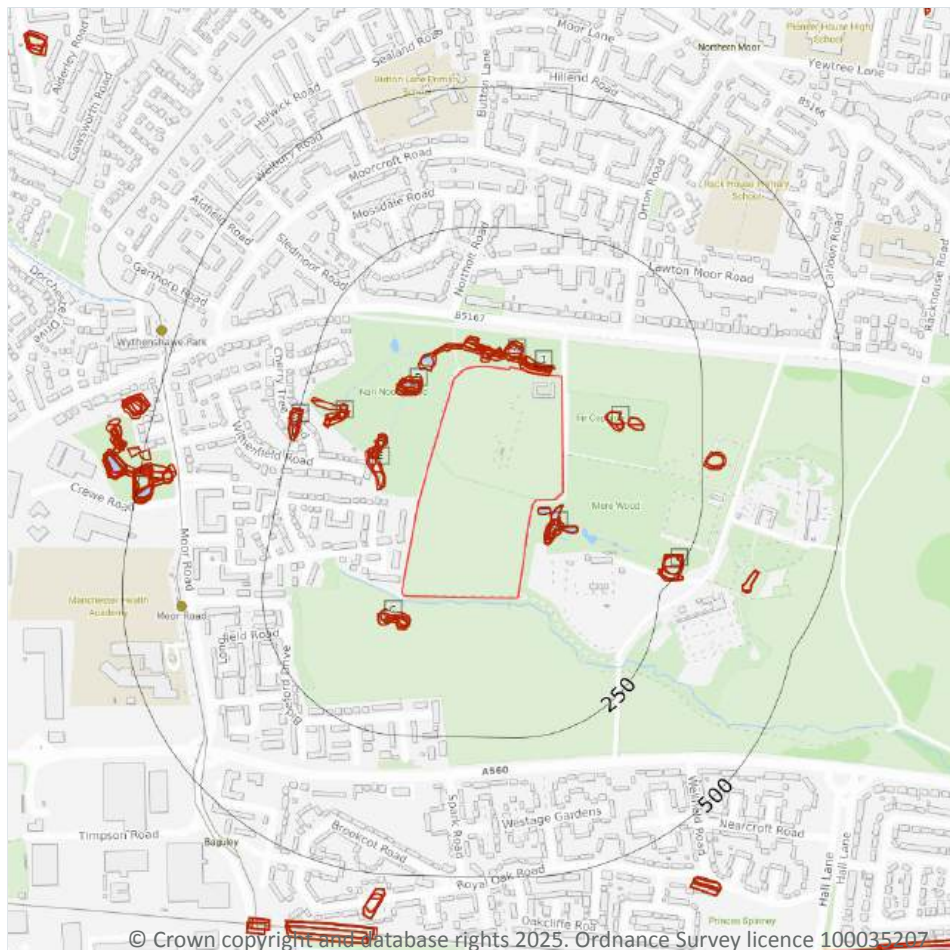
Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.



This data is sourced from the British Geological Survey.



18 Mining and ground workings



- Site Outline
- Search buffers in metres (m)
- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining
- Non Coal Mining
 - Sporadic underground mining of restricted extent possible
 - Localised small scale underground mining possible
 - Small scale mining possible
 - Underground mining known or likely within or in close proximity
 - Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m

0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m

73

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining and ground workings map on [page 91](#) >

ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Ponds	1938	1:10560
A	4m NE	Ponds	1955	1:10560
A	6m N	Ponds	1923	1:10560
A	6m N	Ponds	1916	1:10560
A	6m N	Ponds	1905	1:10560
1	10m NE	Ponds	1938	1:10560
B	12m SE	Ponds	1977	1:10000
B	12m SE	Ponds	1989	1:10000
B	12m SE	Ponds	1995	1:10000
B	12m SE	Ponds	1967	1:10560
A	17m N	Ponds	1938	1:10560
A	17m N	Ponds	1897	1:10560
B	31m SE	Ponds	1923	1:10560
B	31m SE	Ponds	1938	1:10560
B	31m SE	Ponds	1916	1:10560
B	31m SE	Ponds	1905	1:10560
C	31m SW	Ponds	1938	1:10560
B	31m SE	Ponds	1938	1:10560
B	31m SE	Ponds	1897	1:10560
B	33m SE	Pond	1954	1:10560
B	36m SE	Ponds	1911	1:10560
C	36m SW	Ponds	1954	1:10560
C	39m SW	Ponds	1923	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
C	39m SW	Ponds	1916	1:10560
C	39m SW	Ponds	1905	1:10560
C	41m SW	Ponds	1938	1:10560
D	51m NW	Ponds	1911	1:10560
D	52m NW	Ponds	1908	1:10560
D	52m NW	Ponds	1966	1:10560
D	52m NW	Ponds	1988	1:10000
D	52m NW	Ponds	1981	1:10000
D	53m NW	Ponds	1938	1:10560
D	53m NW	Ponds	1897	1:10560
D	53m NW	Ponds	1955	1:10560
D	55m NW	Ponds	1923	1:10560
D	55m NW	Ponds	1938	1:10560
D	55m NW	Ponds	1916	1:10560
D	55m NW	Ponds	1905	1:10560
E	67m W	Ponds	1954	1:10560
E	71m W	Ponds	1938	1:10560
F	76m NE	Ponds	1938	1:10560
F	80m NE	Ponds	1954	1:10560
E	86m NW	Ponds	1977	1:10000
E	86m NW	Ponds	1989	1:10000
E	86m NW	Ponds	1967	1:10560
E	88m W	Ponds	1995	1:10000
F	118m NE	Refuse Heap	1989	1:10000
F	118m NE	Refuse Heap	1995	1:10000
G	164m NW	Ponds	1977	1:10000
G	164m NW	Ponds	1989	1:10000
G	164m NW	Ponds	1995	1:10000



ID	Location	Land Use	Year of mapping	Mapping scale
G	164m NW	Ponds	1967	1:10560
G	166m NW	Ponds	1954	1:10560
G	168m NW	Ponds	1955	1:10560
G	169m NW	Ponds	1923	1:10560
G	169m NW	Ponds	1938	1:10560
G	169m NW	Ponds	1916	1:10560
G	169m NW	Ponds	1905	1:10560
H	214m E	Pond	1897	1:10560
H	214m E	Pond	1907	1:10560
H	217m E	Pond	1907	1:10560
H	217m E	Pond	1907	1:10560
H	219m SE	Pond	1923	1:10560
H	219m SE	Pond	1938	1:10560
H	219m SE	Pond	1916	1:10560
H	219m SE	Pond	1905	1:10560
H	219m E	Pond	1954	1:10560
I	241m W	Pond	1908	1:10560
I	241m W	Pond	1911	1:10560
I	242m W	Pond	1938	1:10560
I	244m W	Pond	1923	1:10560
I	244m W	Pond	1916	1:10560
I	244m W	Pond	1905	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m

0

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This data is sourced from Ordnance Survey/Groundsure.



18.4 Underground mining extents

Records within 500m

0

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m

0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

0

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site

1

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

Location	Details
On site	Whilst outside of an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) may have information such as mining plans and maps held within their archive that have occurred within 1km of this property. Please note, the plans held by JPB may also relate to non-mining records. Further details and a quote for services (if appropriate) can be obtained by emailing this report to enquiries.gs@jpb.co.uk ↗.

This data is sourced from Johnson Poole and Bloomer.



18.8 The Coal Authority non-coal mining

Records within 500m**0**

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m**0**

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m**0**

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m**0**

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.



18.12 Coal mining

Records on site	0
-----------------	---

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.13 Brine areas

Records on site	0
-----------------	---

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.14 Gypsum areas

Records on site	0
-----------------	---

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

Records on site	0
-----------------	---

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 Clay mining

Records on site	0
-----------------	---

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).



19 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m

0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m

0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m

0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

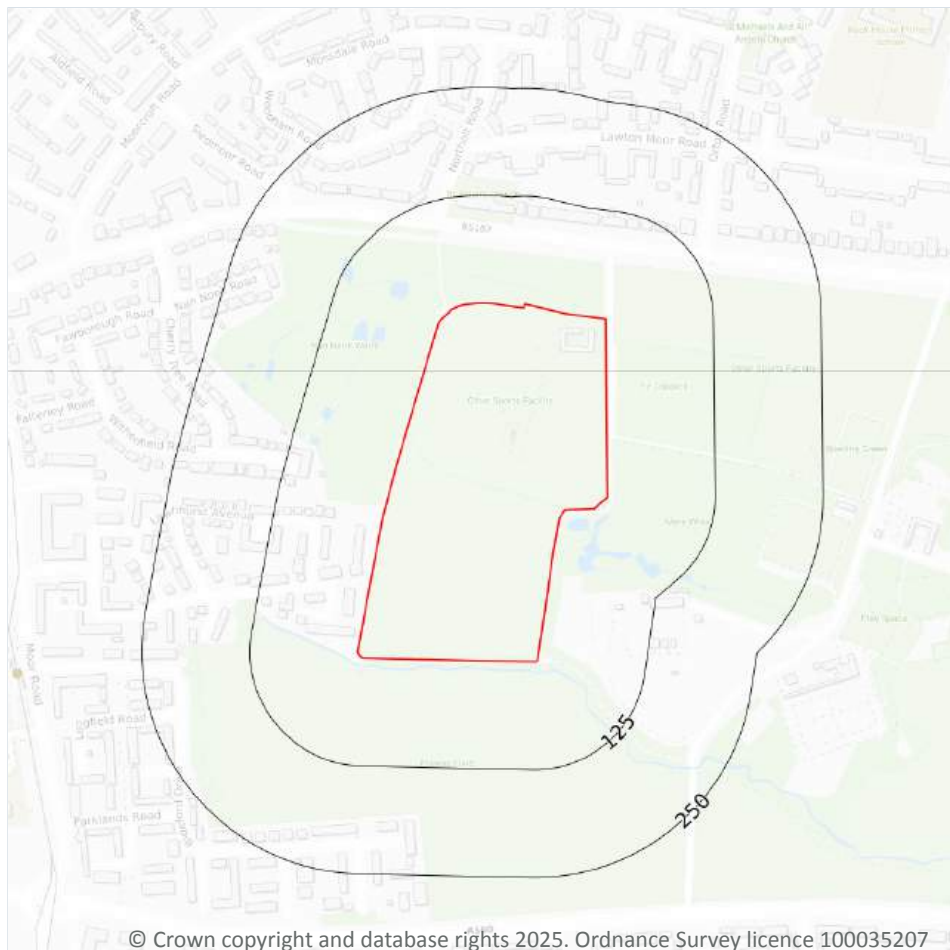
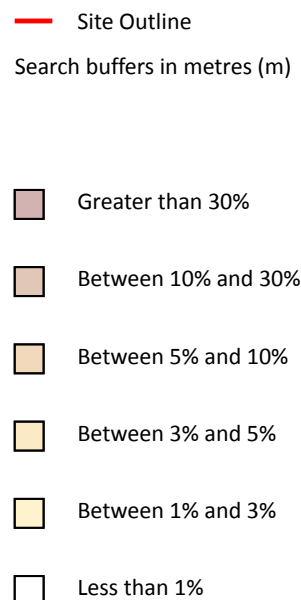
Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.



This data is sourced from Groundsure.



20 Radon



20.1 Radon

Records on site

1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on [page 100](#) >

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None



This data is sourced from the British Geological Survey and UK Health Security Agency.



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

7

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.



21.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



22 Railway infrastructure and projects

22.1 Underground railways (London)

Records within 250m**0**

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m**0**

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m**0**

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m**0**

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m**0**

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.



This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m

0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m

0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 2

Records within 500m

0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

22.9 HS2

Records within 500m

0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference> ↗.

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: www.groundsure.com/terms-and-conditions-april-2023/ ↗.



Appendix 4: Historical Mapping

Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1892

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1892
Revised 1892
Edition N/A
Copyright N/A
Levelled N/A

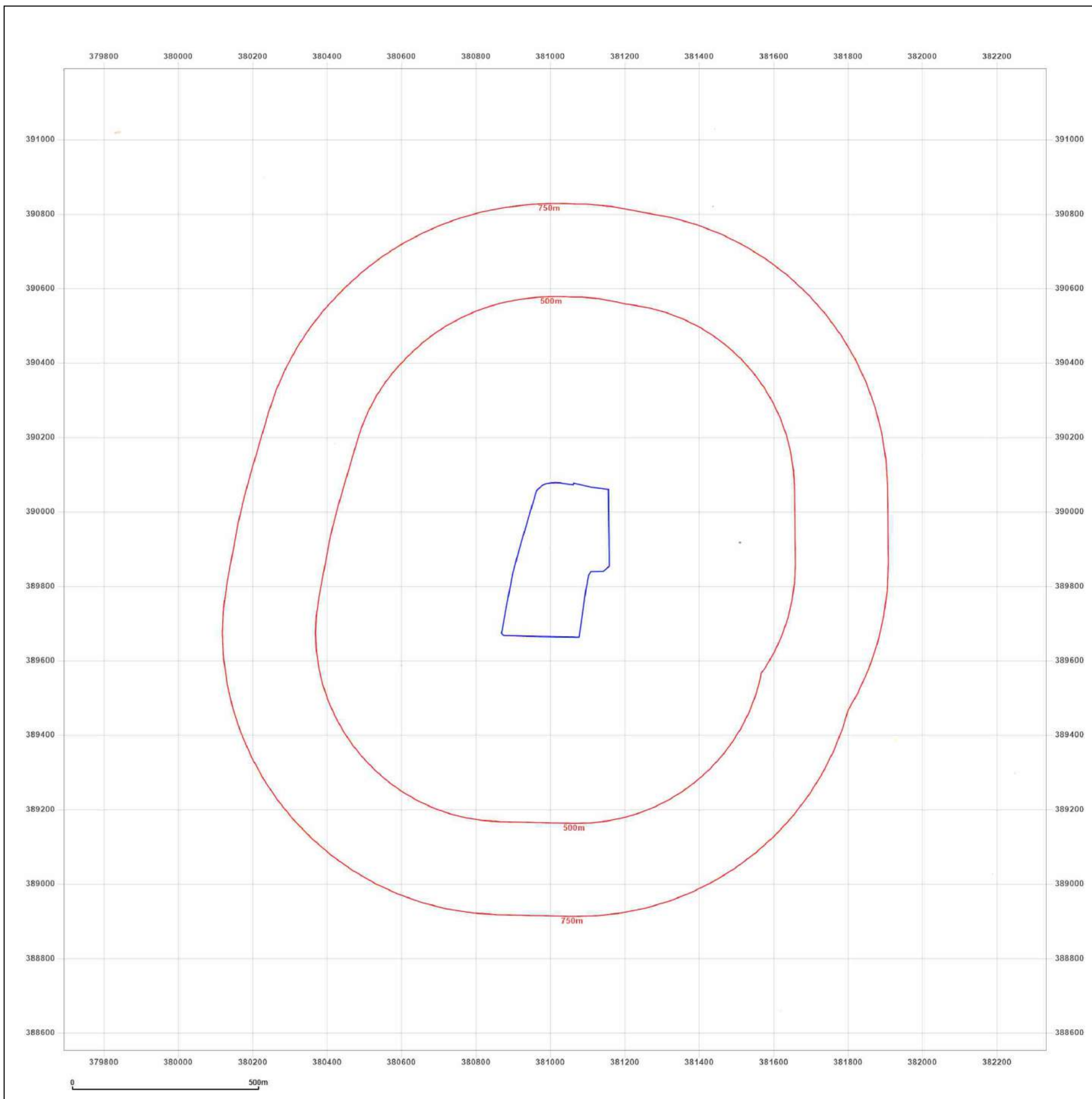


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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1897

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1876
Revised 1897
Edition N/A
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Surveyed 1876
Revised 1897
Edition N/A
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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1905

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1905
Edition N/A
Copyright N/A
Levelled N/A

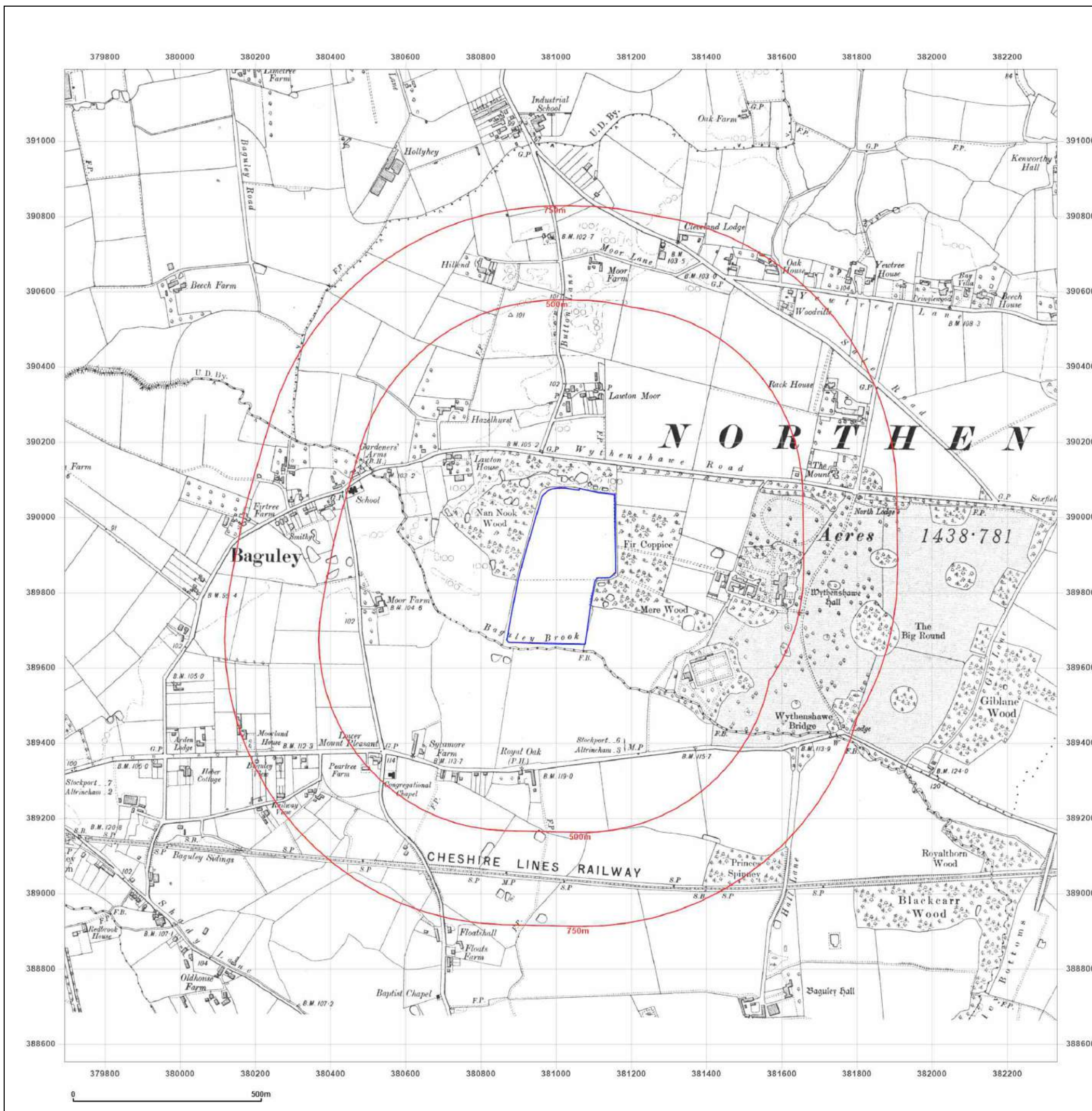


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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1907

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1907
Edition N/A
Copyright N/A
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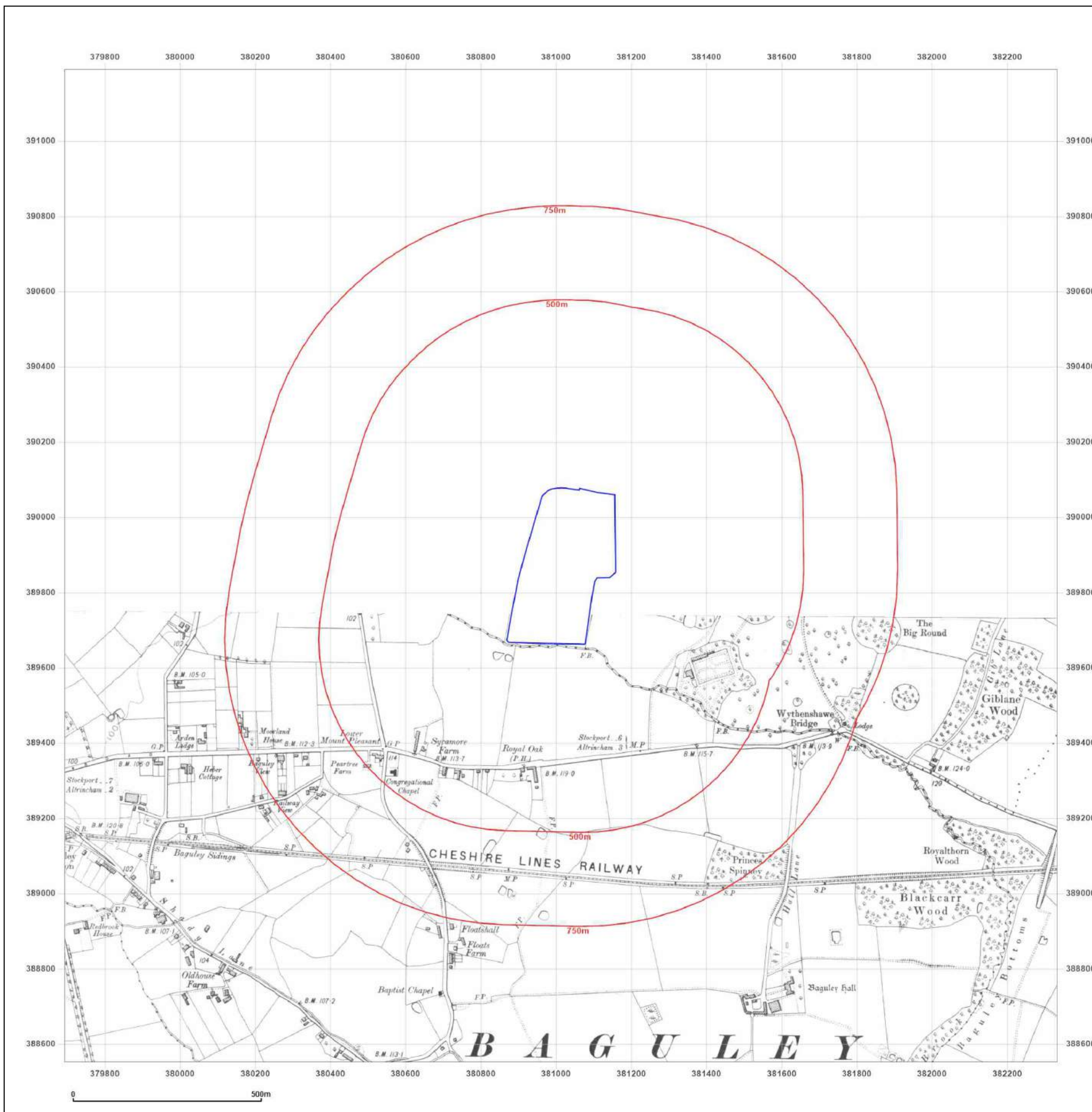


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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1907-1908

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
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Surveyed 1873
Revised 1907
Edition N/A
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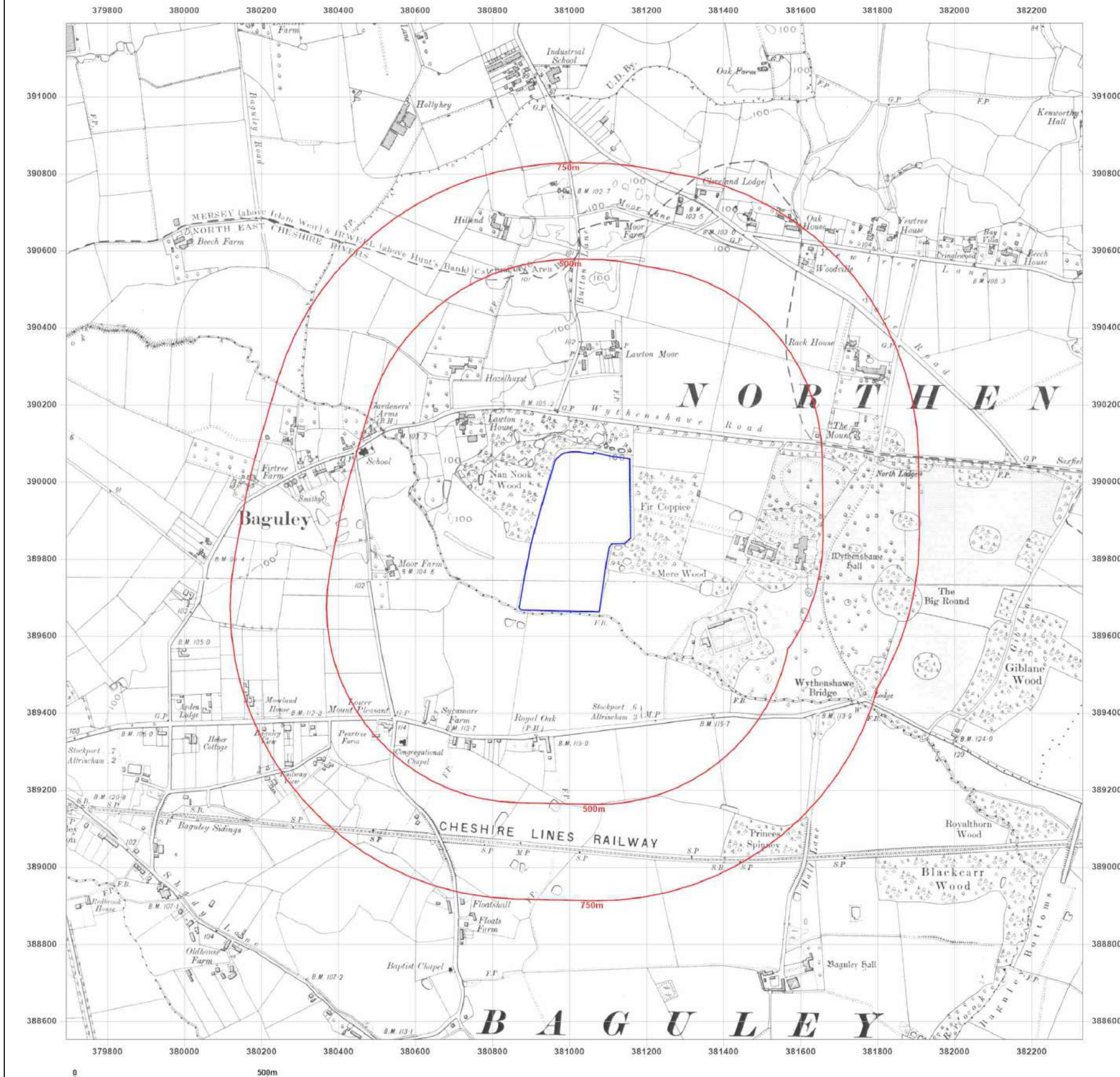


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Site Details:

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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1907-1911

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1911
Edition 1911
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Surveyed 1873
Revised 1907
Edition N/A
Copyright N/A
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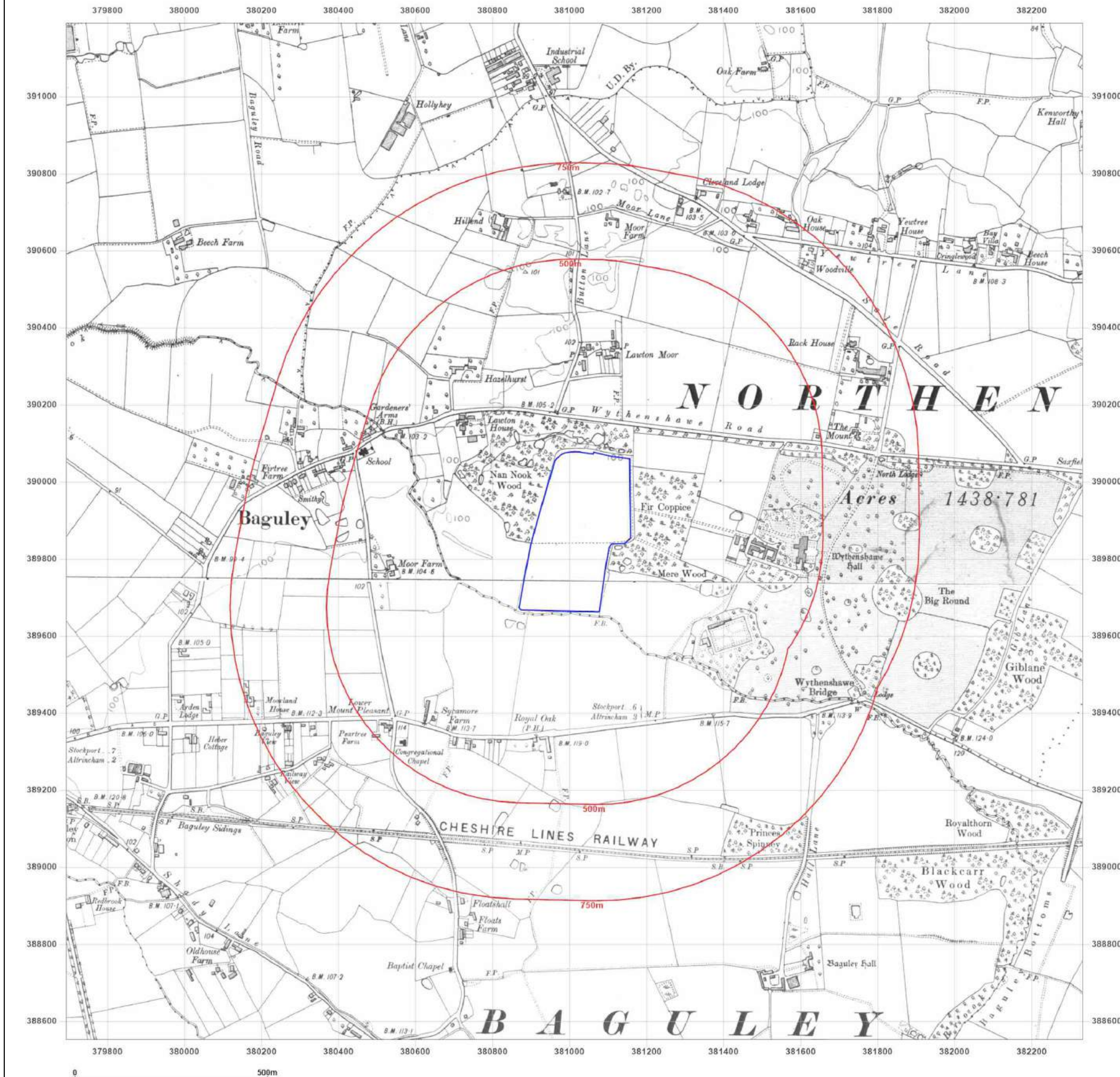


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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1916

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1916
Edition N/A
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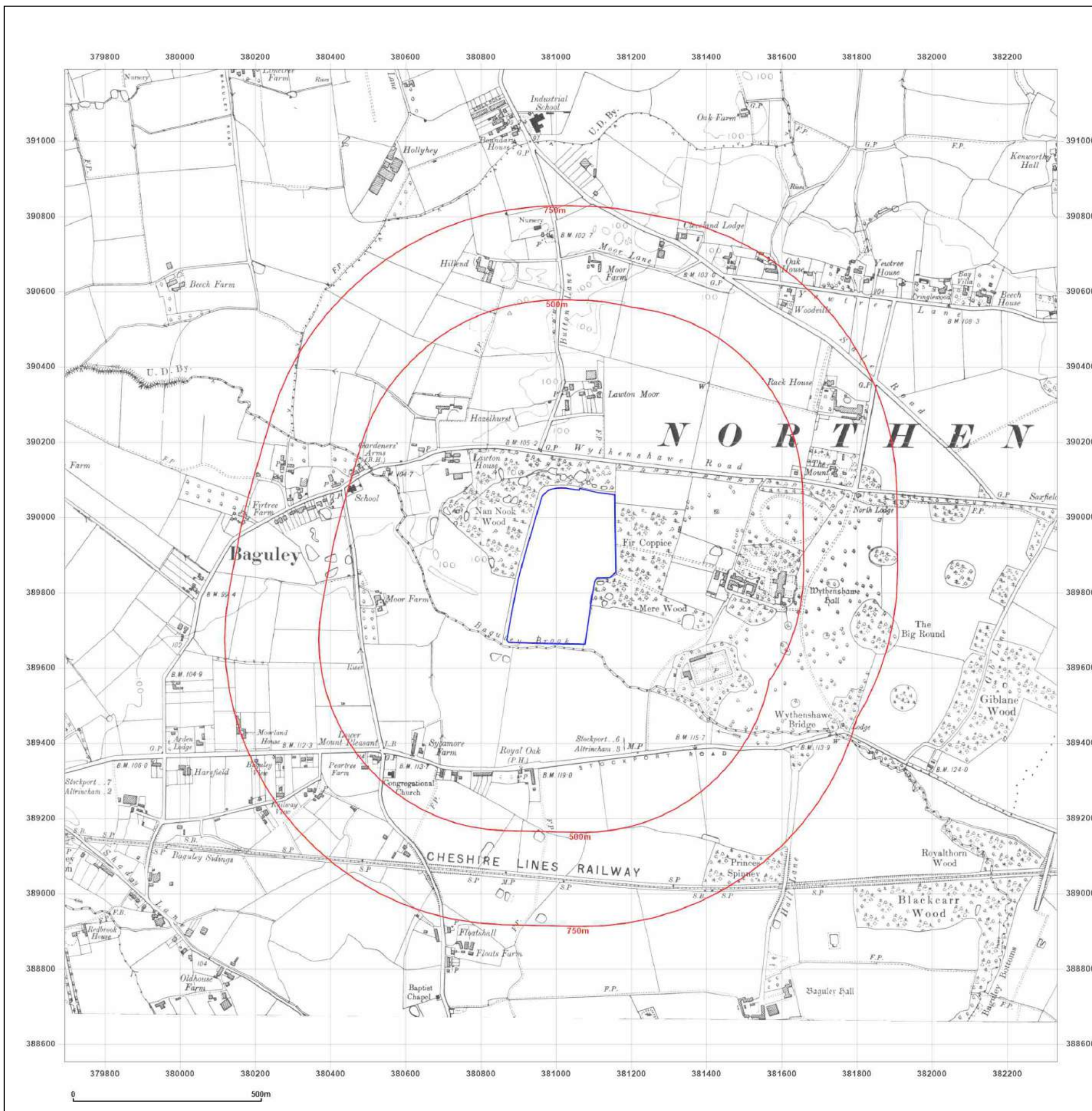


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Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1923

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1923
Edition N/A
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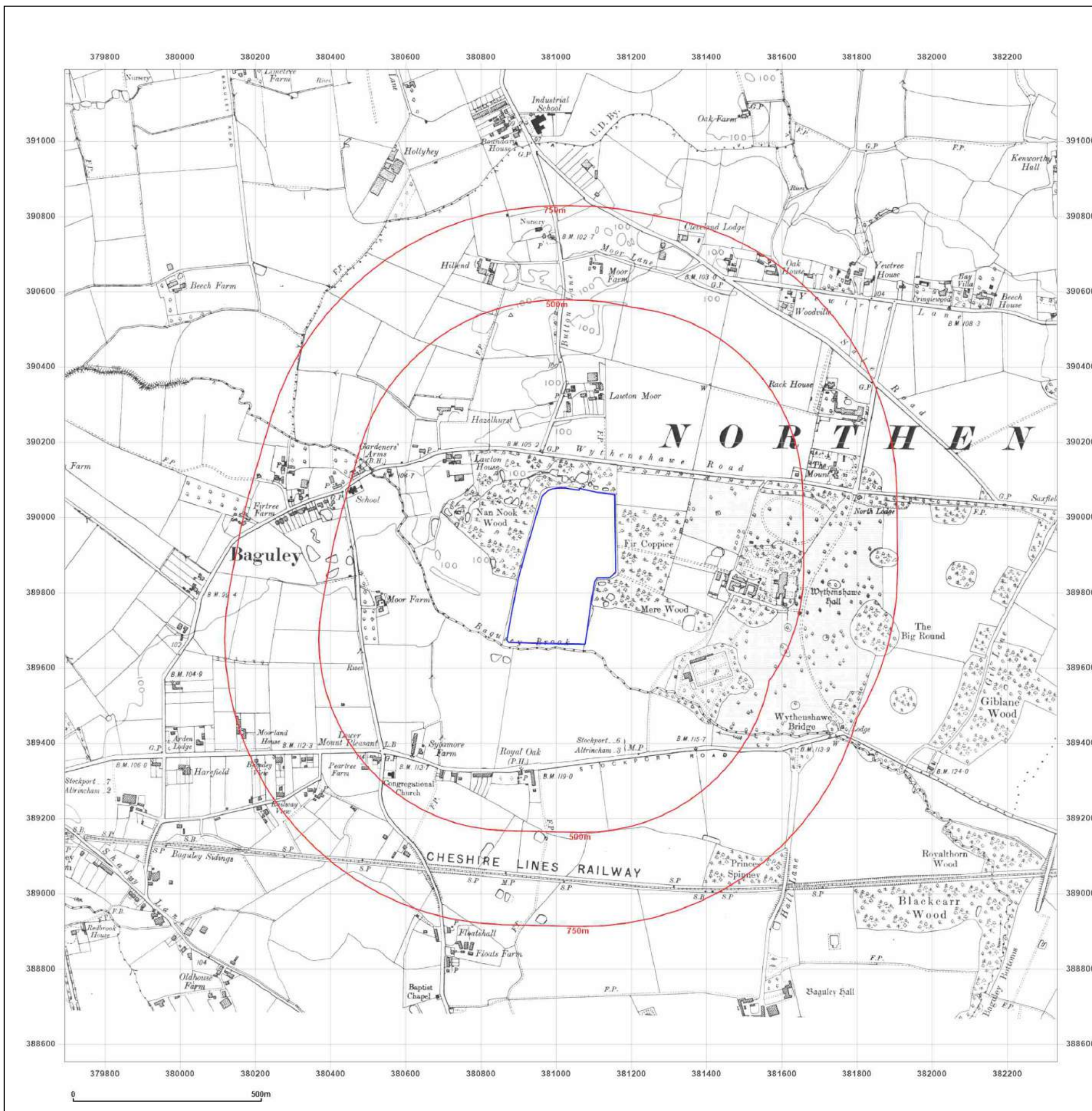


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Site Details:

Wythenshawe Park Sports Hub
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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1938
Edition N/A
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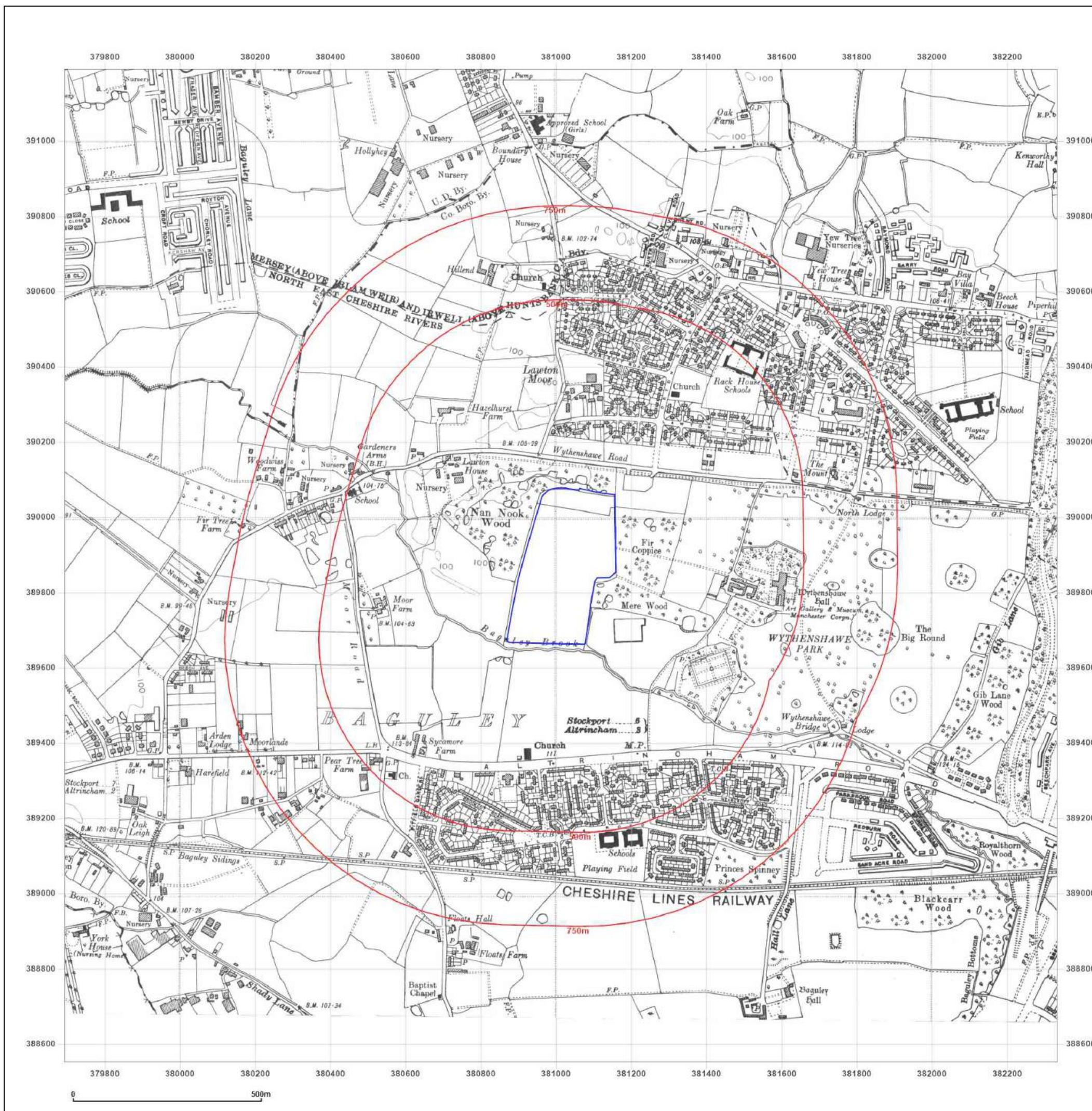


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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1873
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

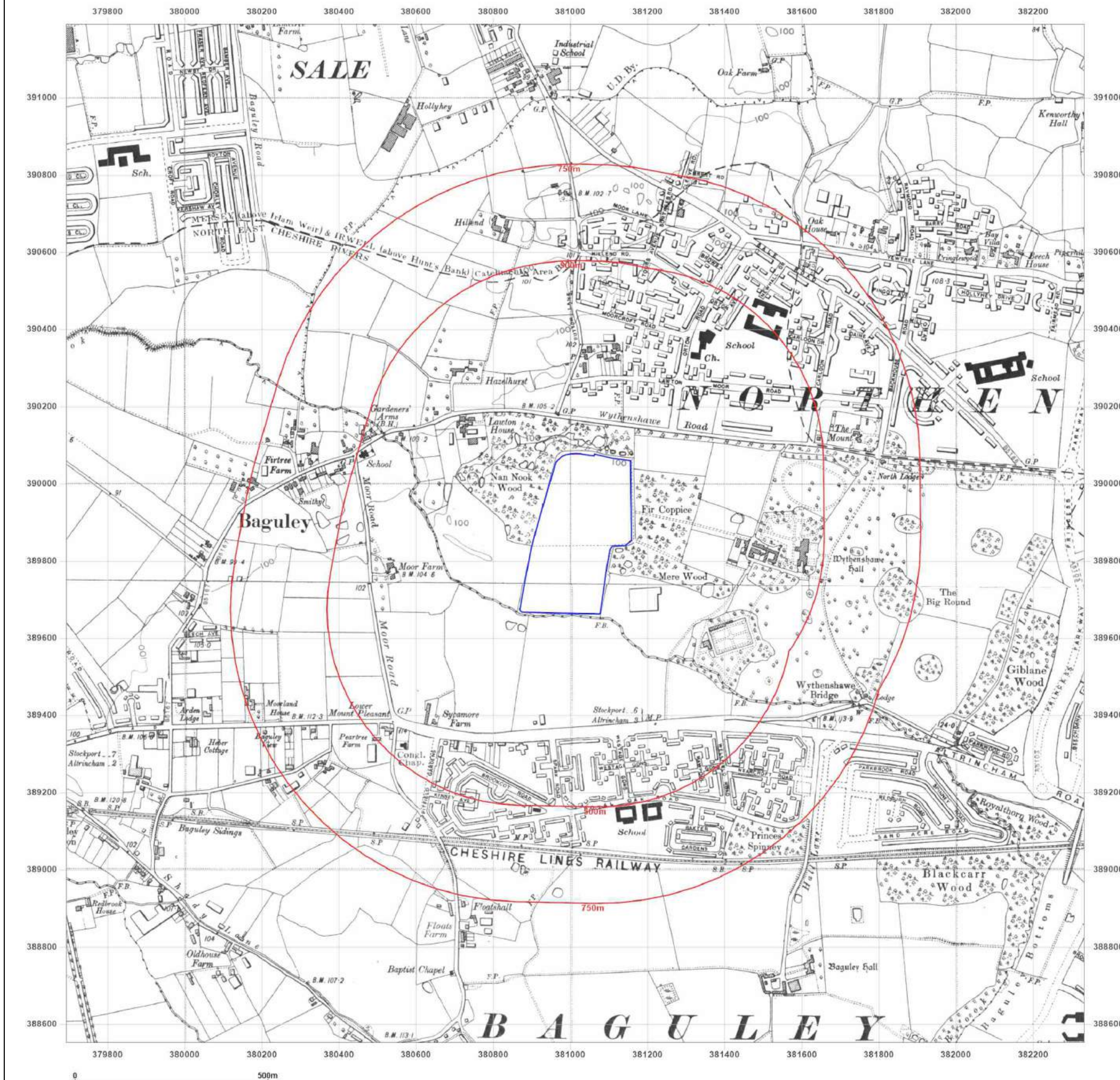


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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: National Grid

Map date: 1988-1990

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1989
Revised 1990
Edition N/A
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Surveyed 1985
Revised 1988
Edition N/A
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Levelled N/A

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

Surveyed 1984
Revised 1989
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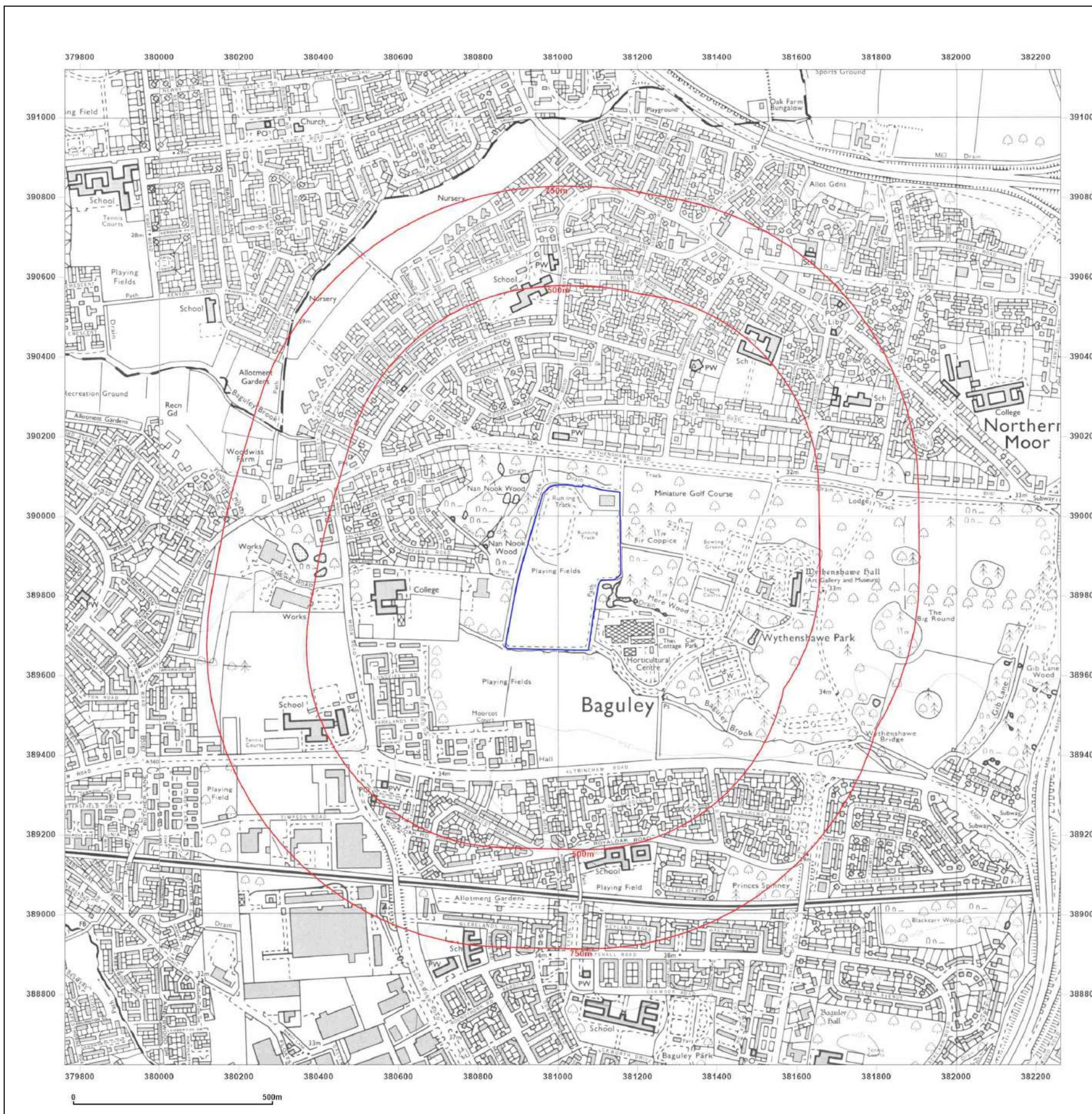


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Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



2001

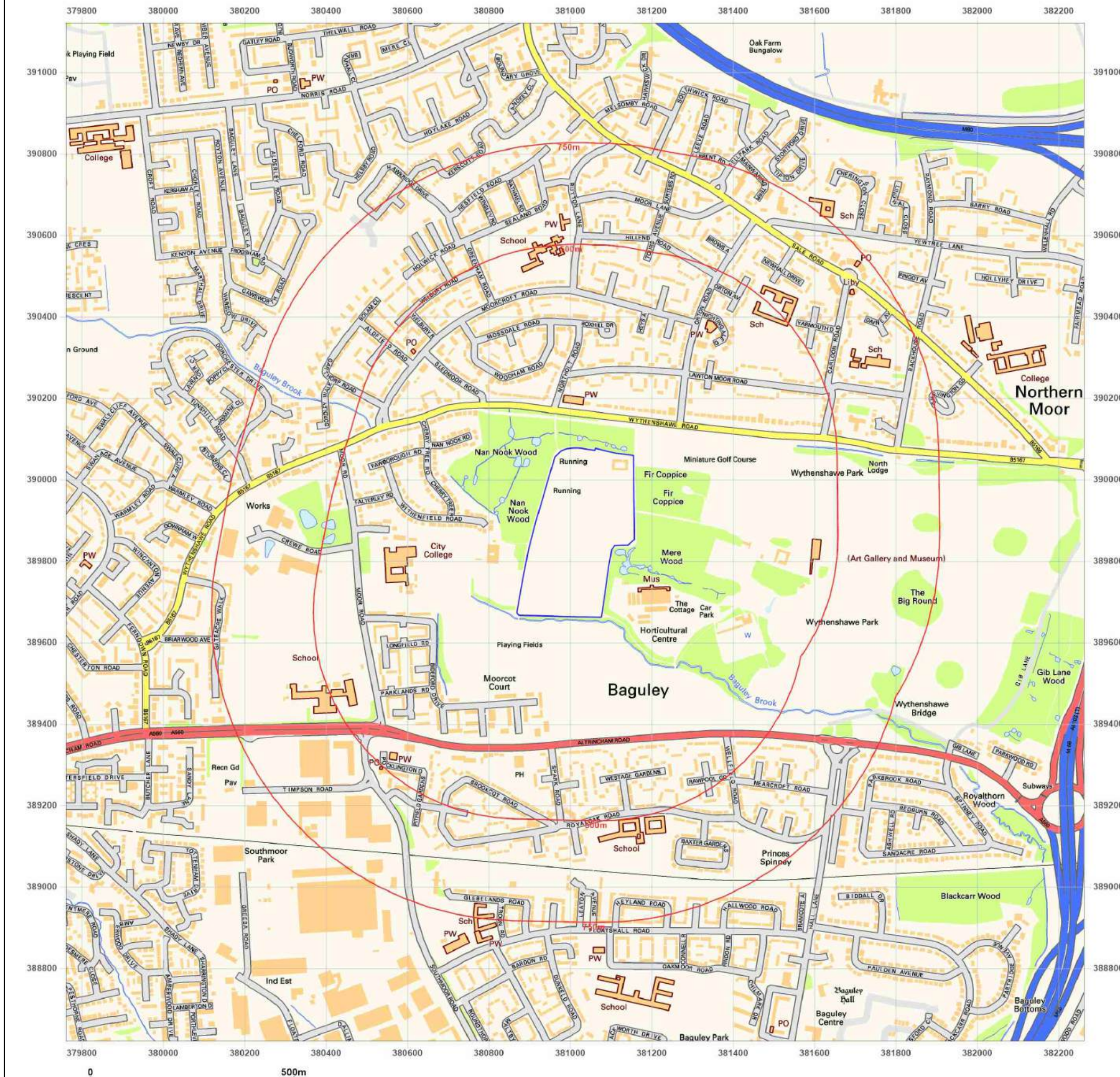


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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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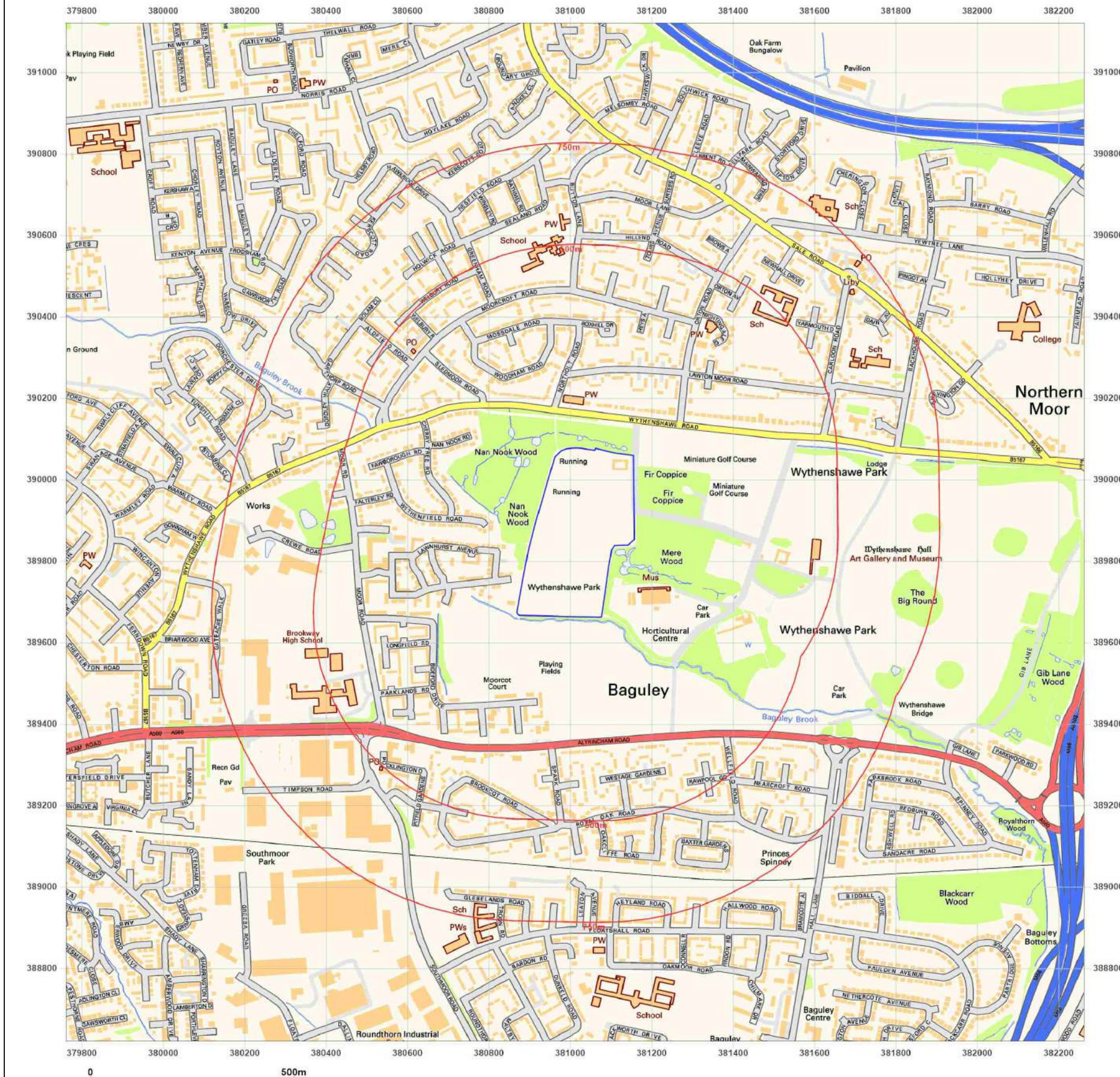


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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL
Grid Ref: 381012, 389871

Map Name: National Grid

Map date: 2025

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2025

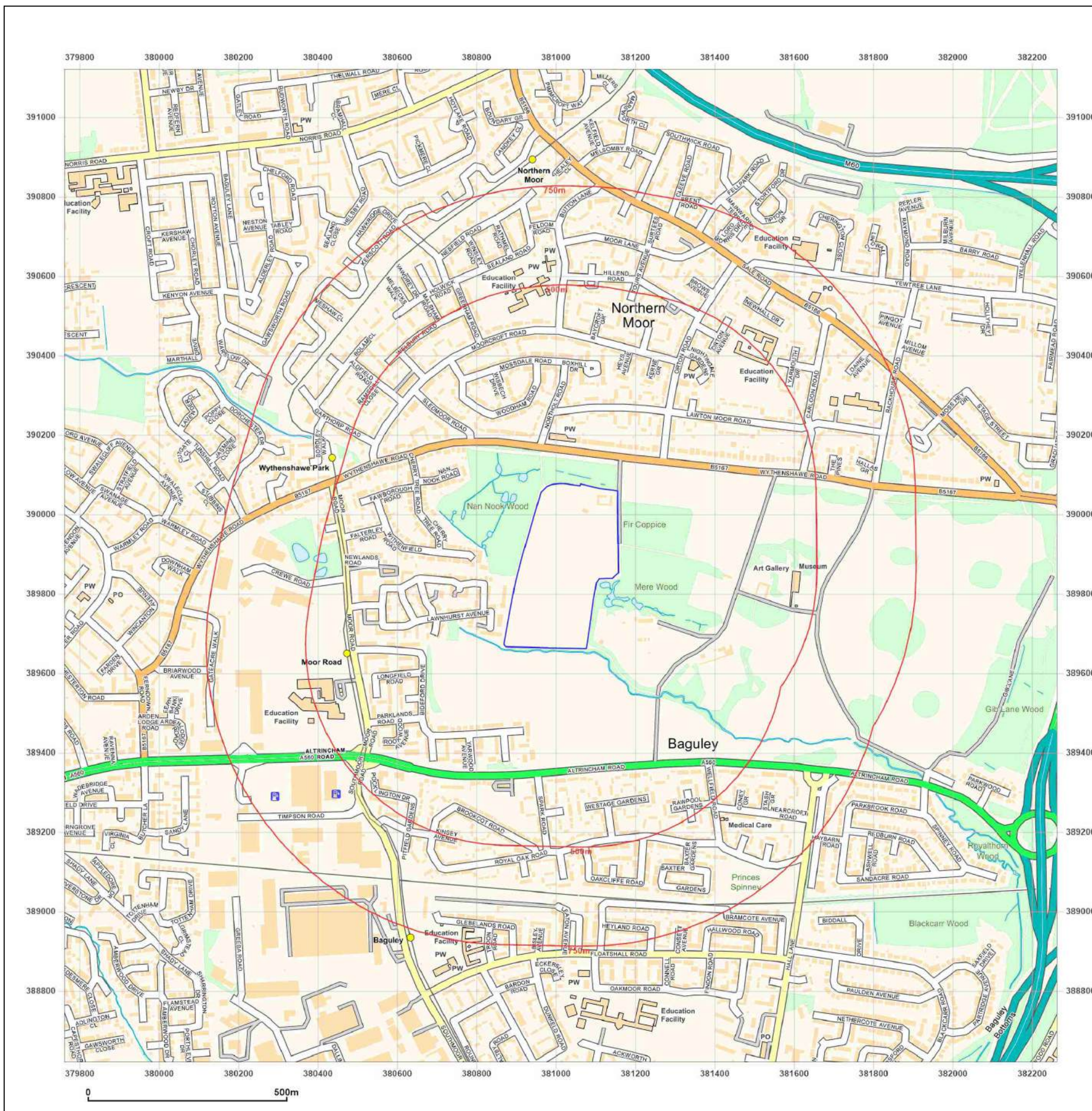


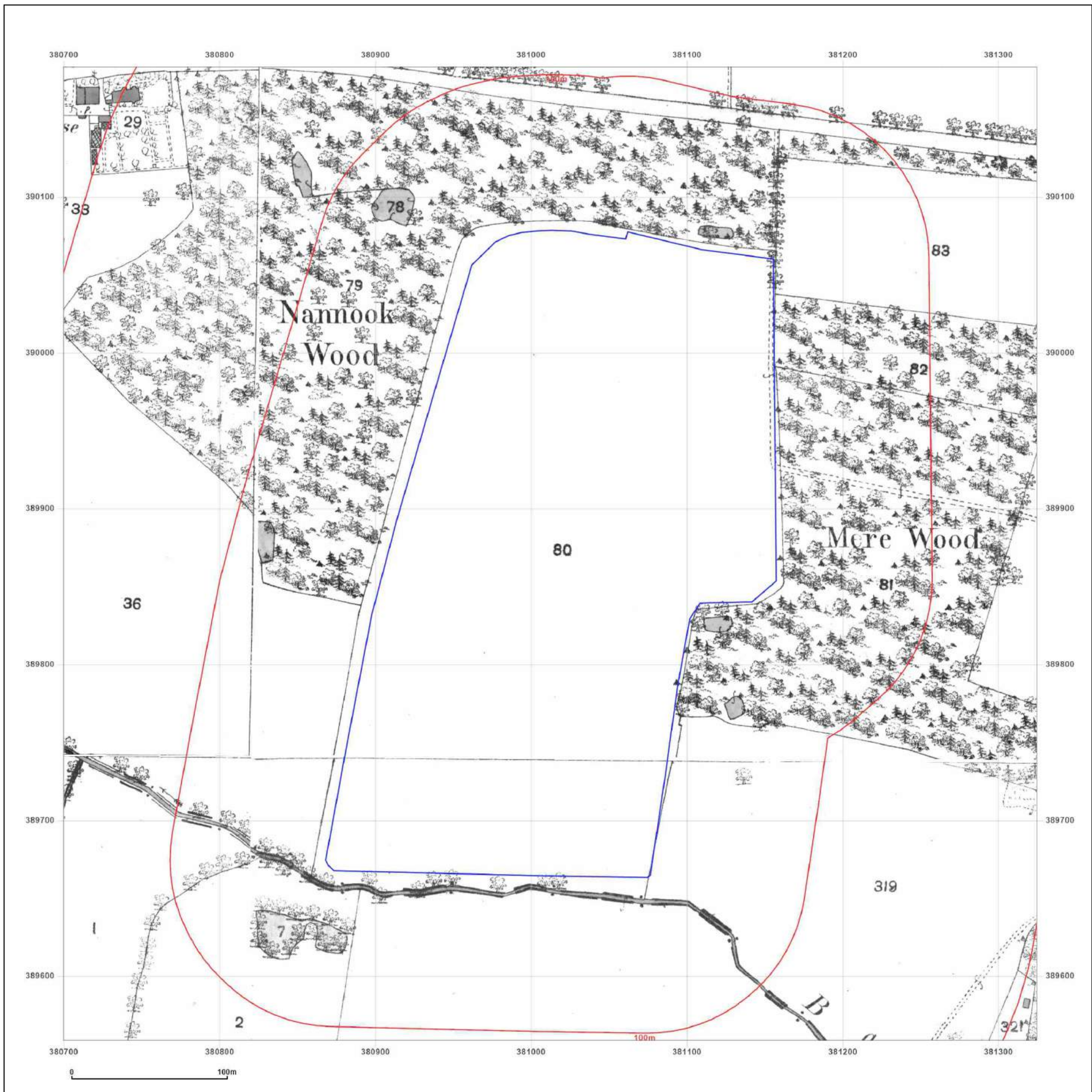
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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_2500
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1874-1876

Scale: 1:2,500

Printed at: 1:2,500



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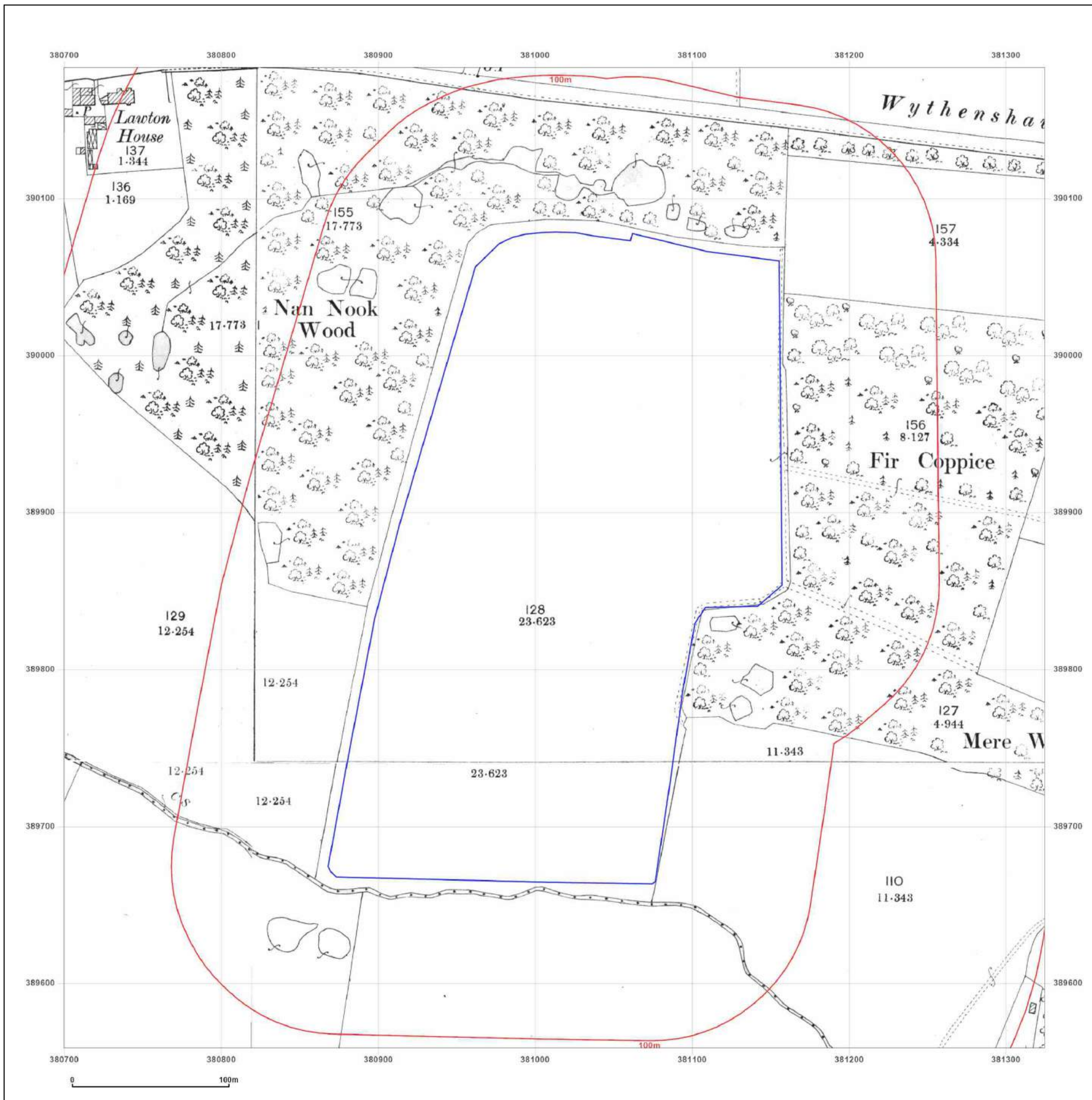


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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_2500
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1898

Scale: 1:2,500

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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_2500
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1910

Scale: 1:2,500

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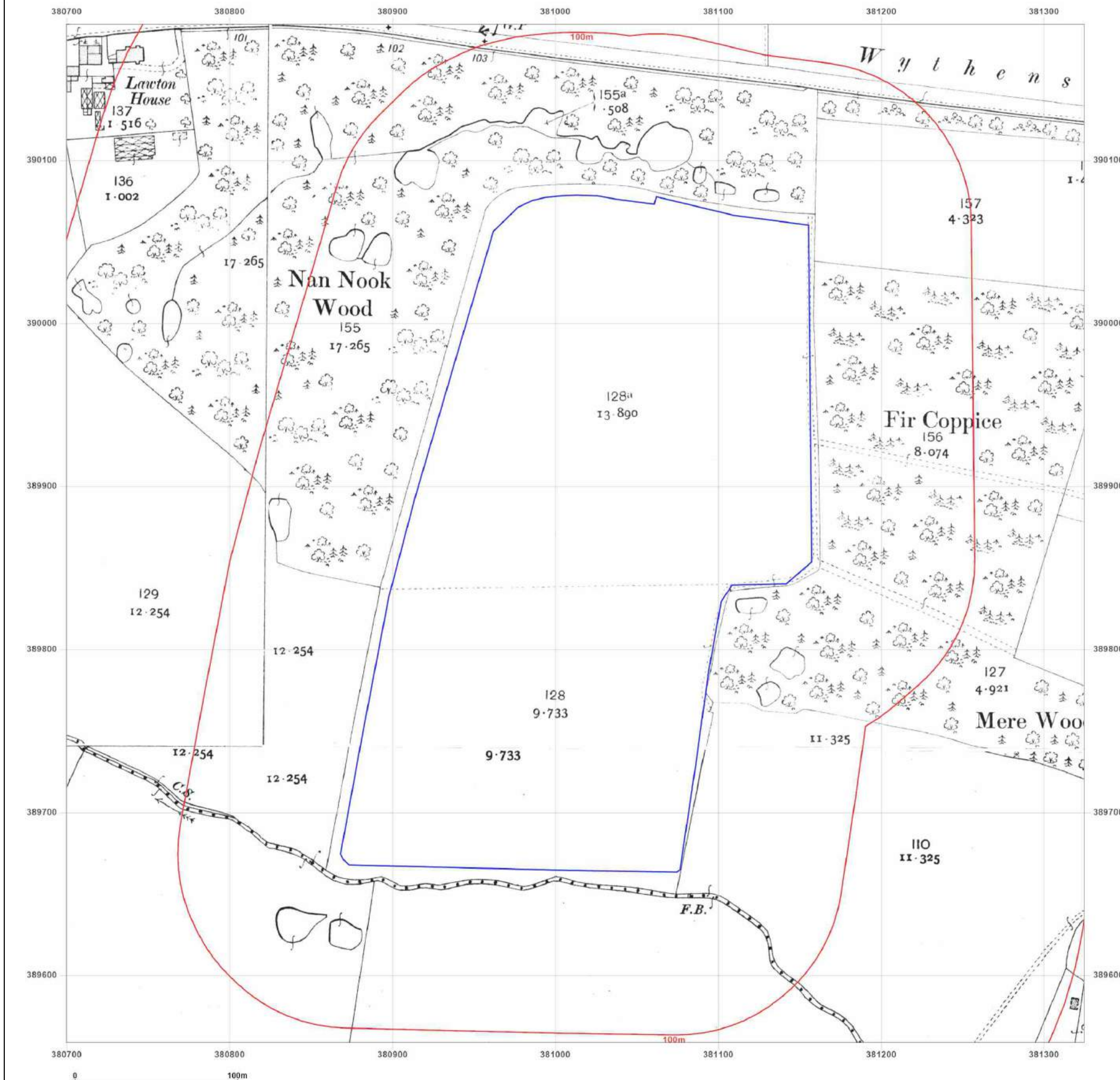


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Site Details:

Wythenshawe Park Sports Hub
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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_2500
Grid Ref: 381012, 389871

Map Name: County Series

Map date: 1922

Scale: 1:2,500

Printed at: 1:2,500



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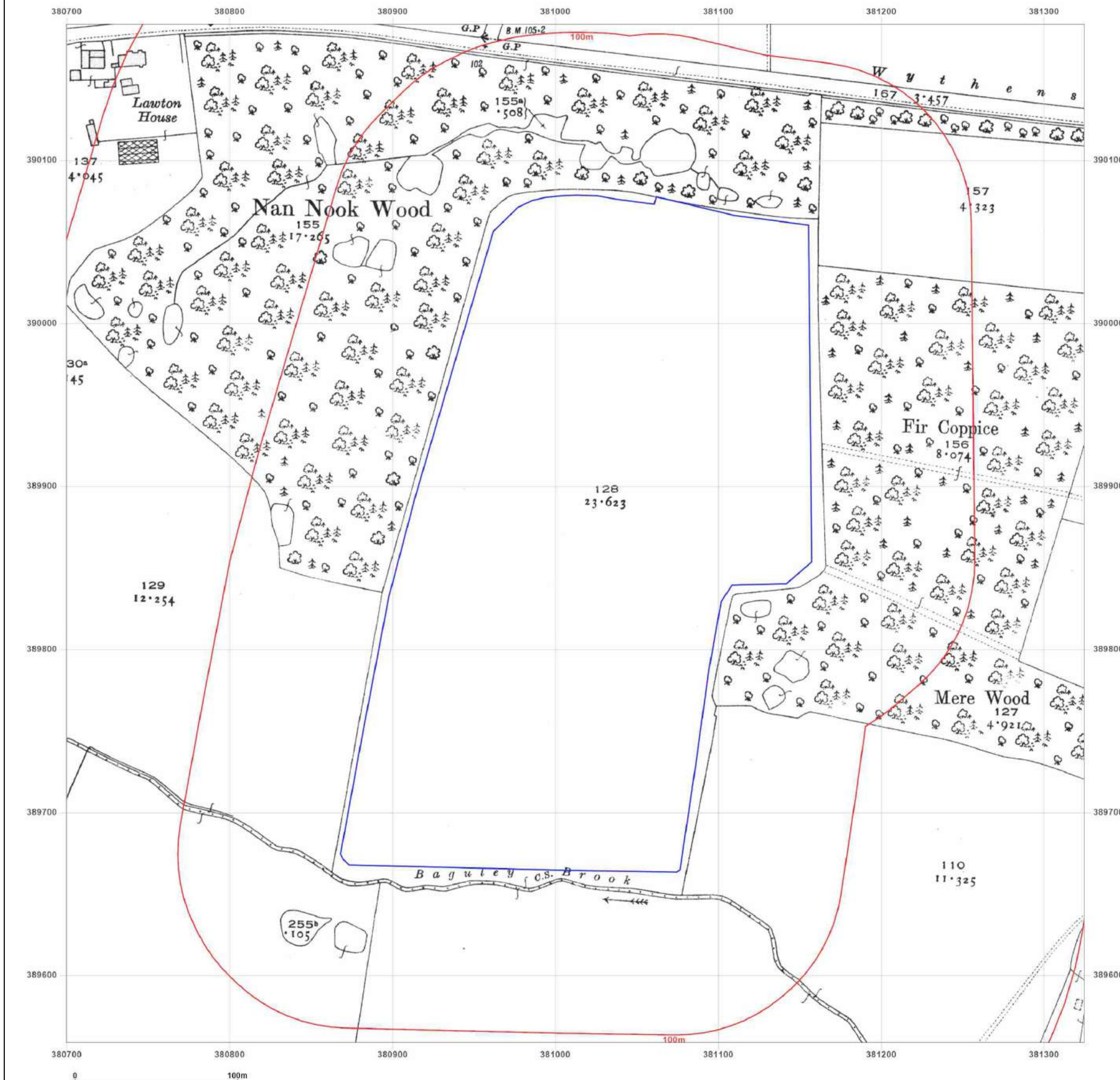


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Site Details:

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Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_2500
Grid Ref: 381012, 389871

Map Name: National Grid

Map date: 1955-1960

Scale: 1:2,500

Printed at: 1:2,500



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Edition 1956
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Edition 1960
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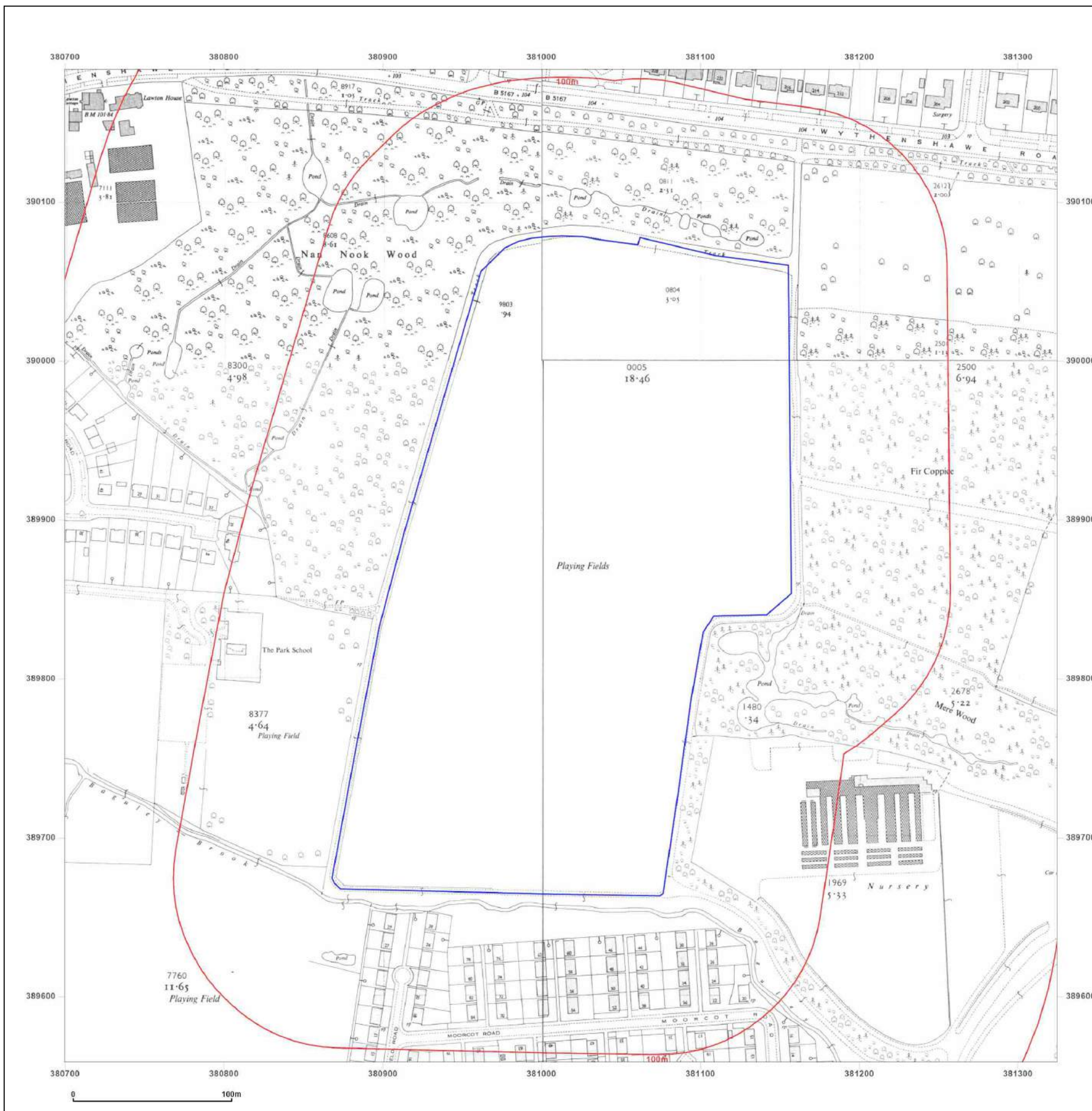


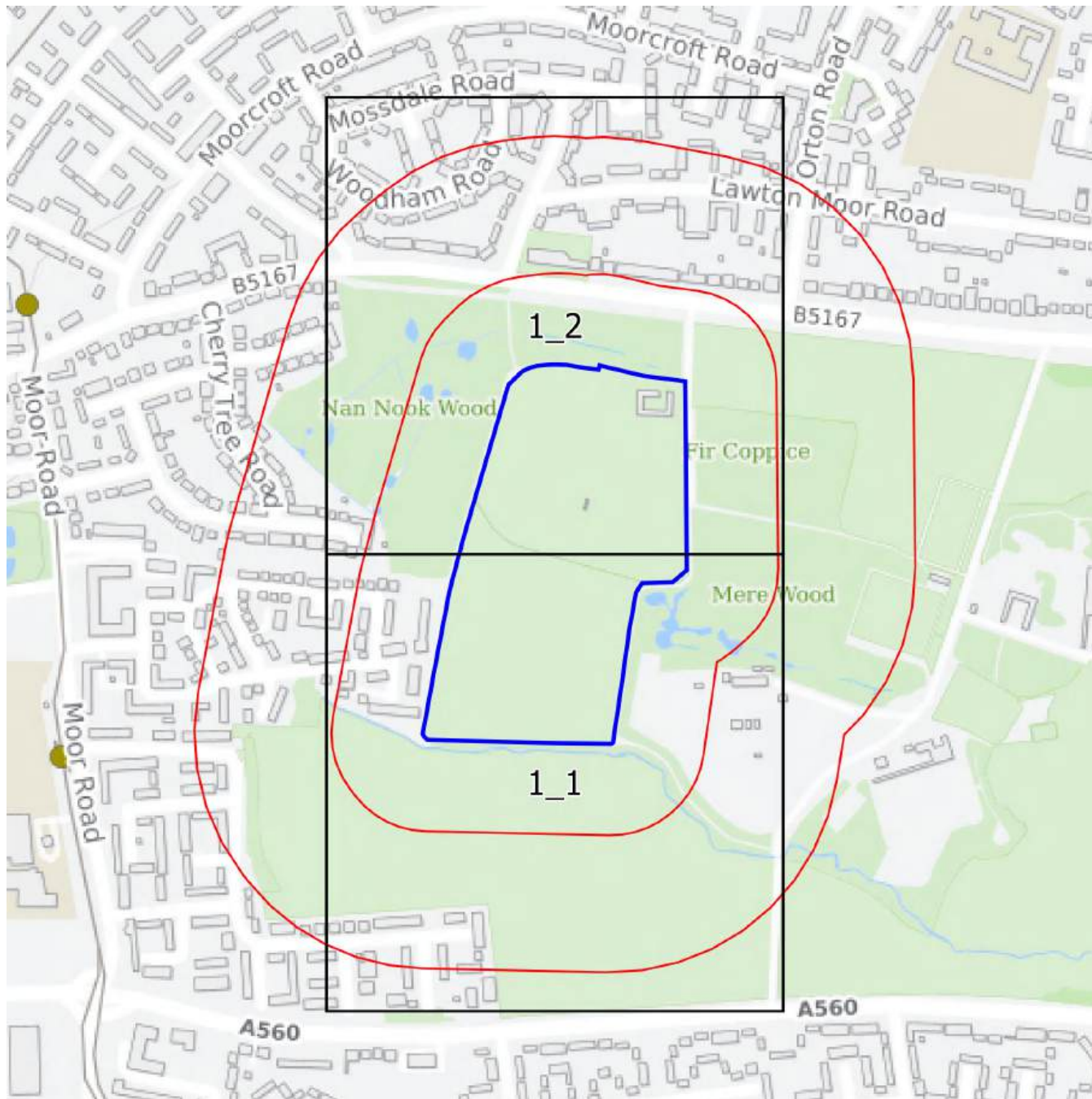
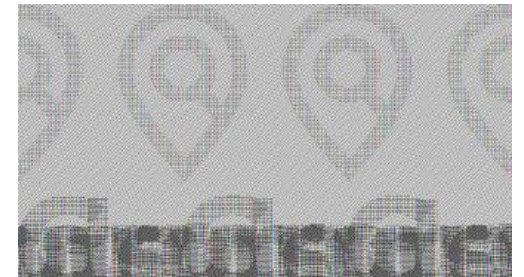
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1:1,250 Scale Grid Index



Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_1
Grid Ref: 381012, 389621

Map Name: National Grid

Map date: 1959

Scale: 1:1,250

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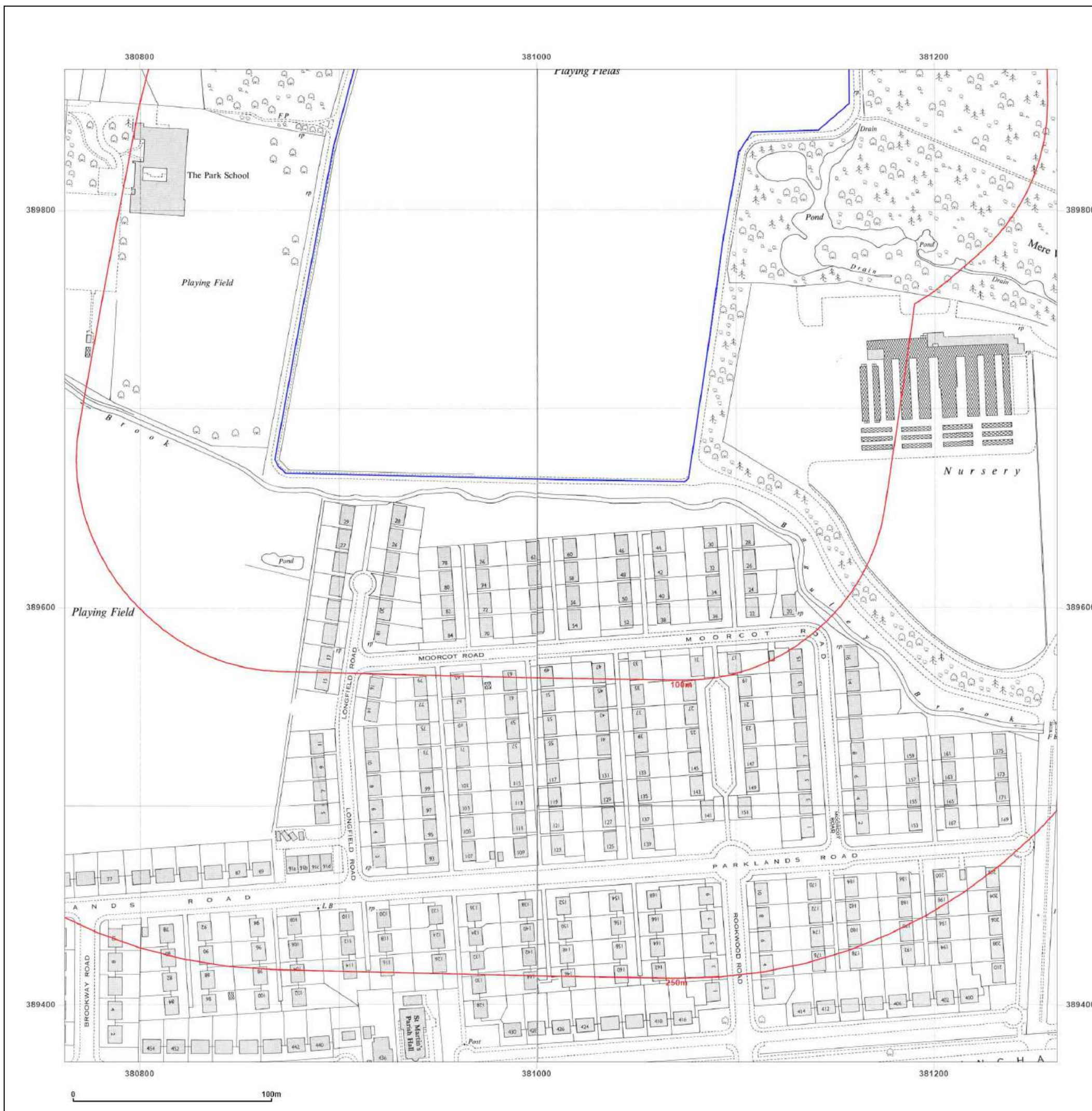


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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_1
Grid Ref: 381012, 389621

Map Name: National Grid

Map date: 1972-1977

Scale: 1:1,250

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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_1
Grid Ref: 381012, 389621

Map Name: National Grid

Map date: 1992

Scale: 1:1,250

Printed at: 1:2,000



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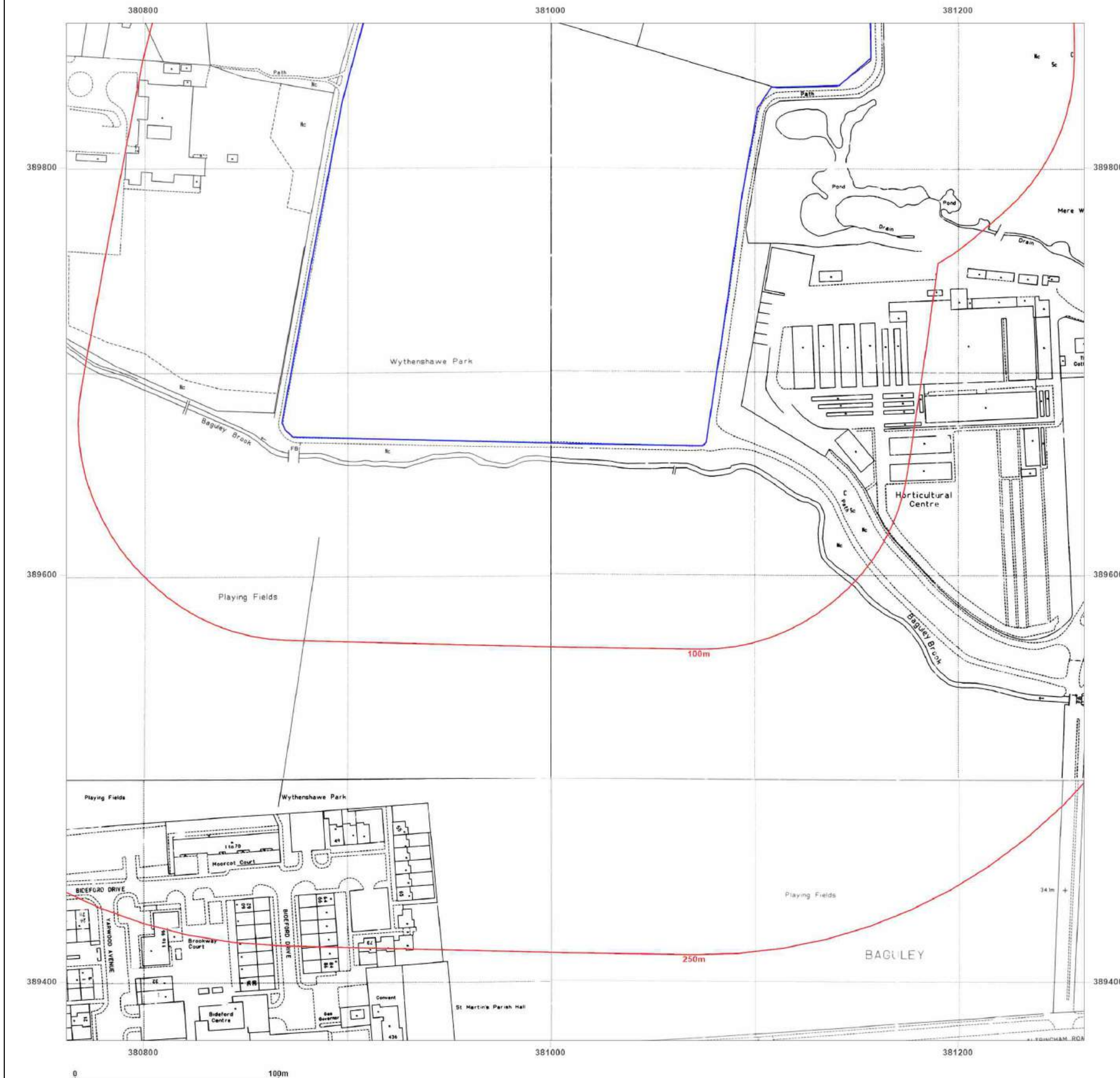


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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_1
Grid Ref: 381012, 389621

Map Name: National Grid

Map date: 1992

Scale: 1:1,250

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Edition N/A	Edition N/A
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Levelled N/A	Levelled N/A

Surveyed 1992	Surveyed N/A
Revised 1992	Revised N/A
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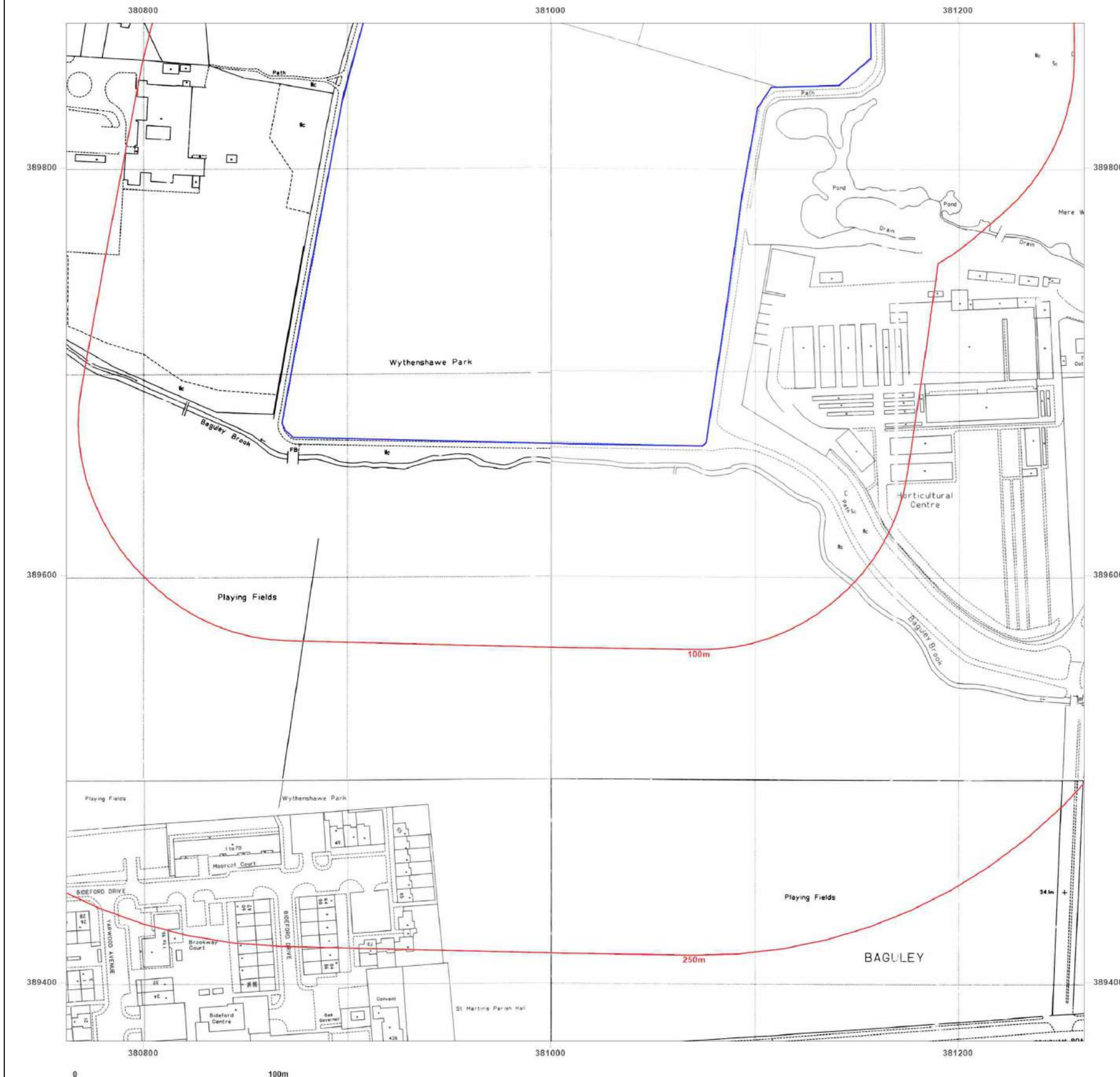


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Site Details:

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PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_2
Grid Ref: 381012, 390121

Map Name: National Grid

Map date: 1955

Scale: 1:1,250

Printed at: 1:2,000



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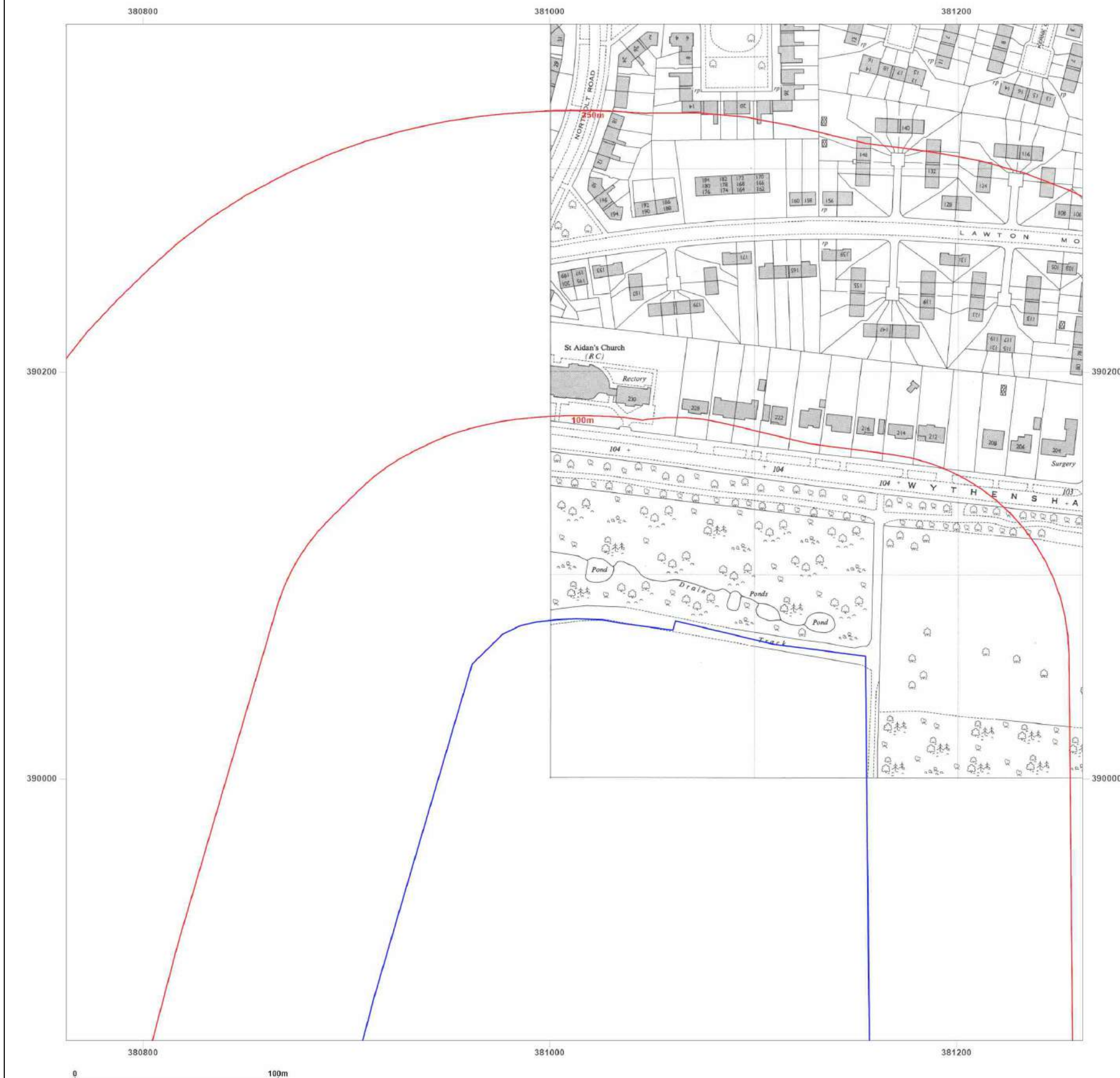


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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_2
Grid Ref: 381012, 390121

Map Name: National Grid

Map date: 1956

Scale: 1:1,250

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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_2
Grid Ref: 381012, 390121

Map Name: National Grid

Map date: 1955-1959

Scale: 1:1,250

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Site Details:

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PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_2
Grid Ref: 381012, 390121

Map Name: National Grid

Map date: 1967-1972

Scale: 1:1,250

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Site Details:

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PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_2
Grid Ref: 381012, 390121

Map Name: National Grid

Map date: 1985-1990

Scale: 1:1,250

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Site Details:

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PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_2
Grid Ref: 381012, 390121

Map Name: National Grid

Map date: 1992

Scale: 1:1,250

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Site Details:

Wythenshawe Park Sports Hub
PO10631

Client Ref: Wythenshawe Park Sports Hub PO10631
Report Ref: GS-66E-EIR-IR4-YVL_1250_1_2
Grid Ref: 381012, 390121

Map Name: National Grid

Map date: 1992

Scale: 1:1,250

Printed at: 1:2,000



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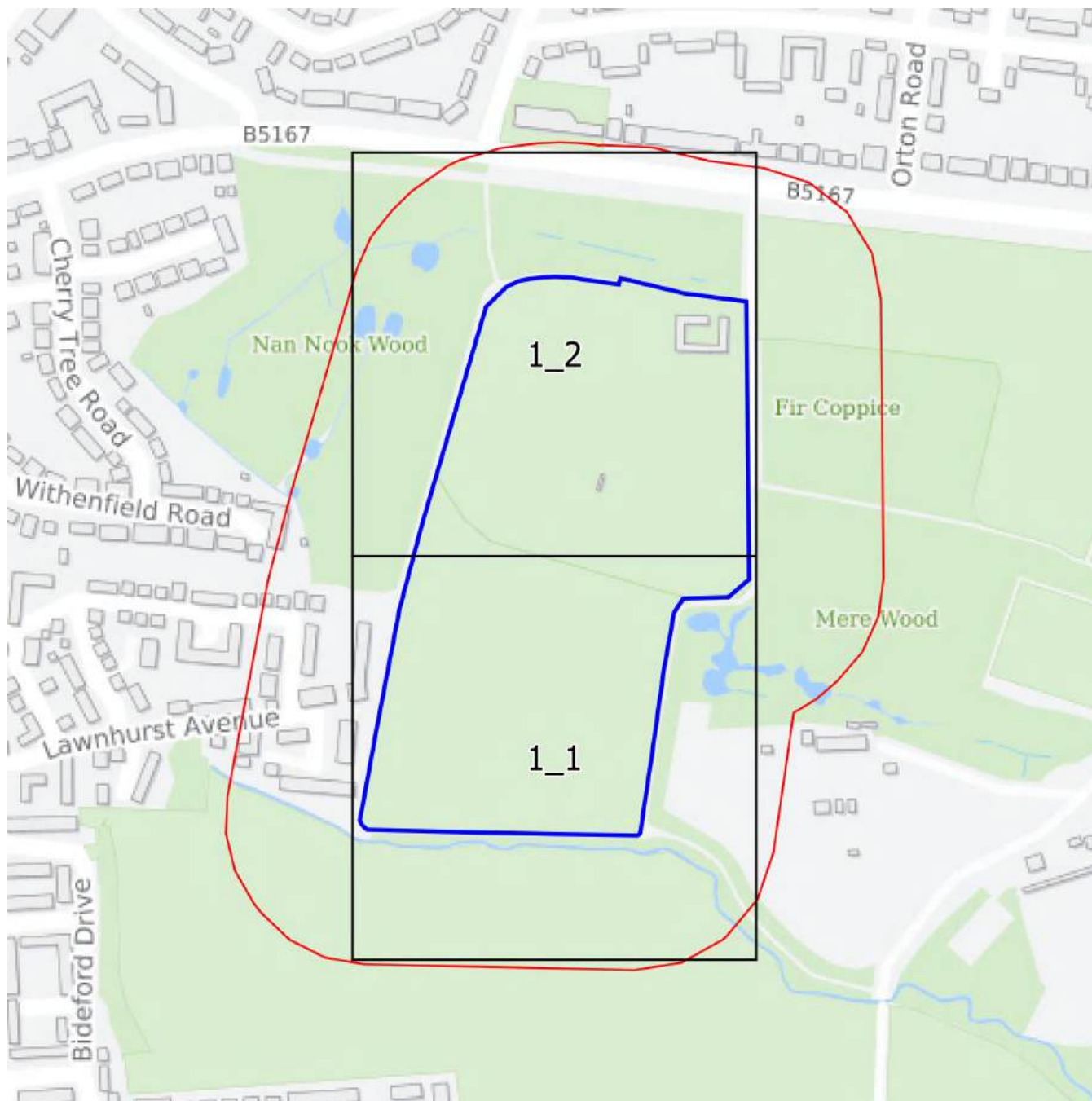
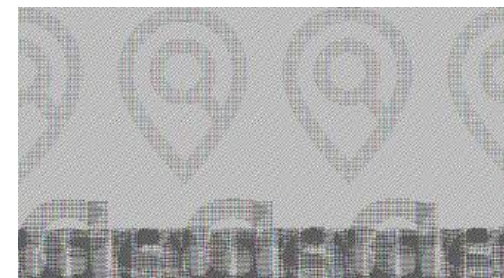
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Landline Scale Grid Index



Site Details:

Wythenshawe Park Sports Hub
PO10631

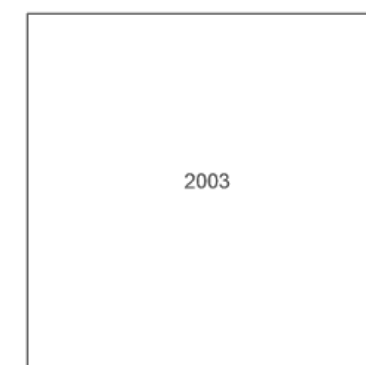
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Report Ref: GS-66E-EIR-IR4-YVL_Landline_1_1
Grid Ref: 381012, 389721

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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Site Details:

Wythenshawe Park Sports Hub
PO10631

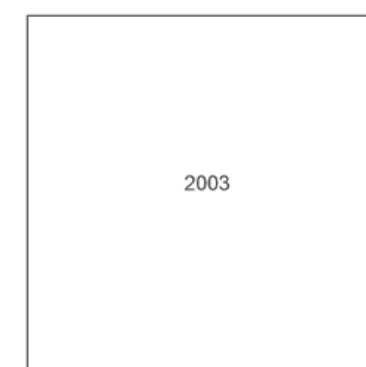
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Report Ref: GS-66E-EIR-IR4-YVL_Landline_1_2
Grid Ref: 381012, 390021

Map Name: LandLine

Map date: 2003

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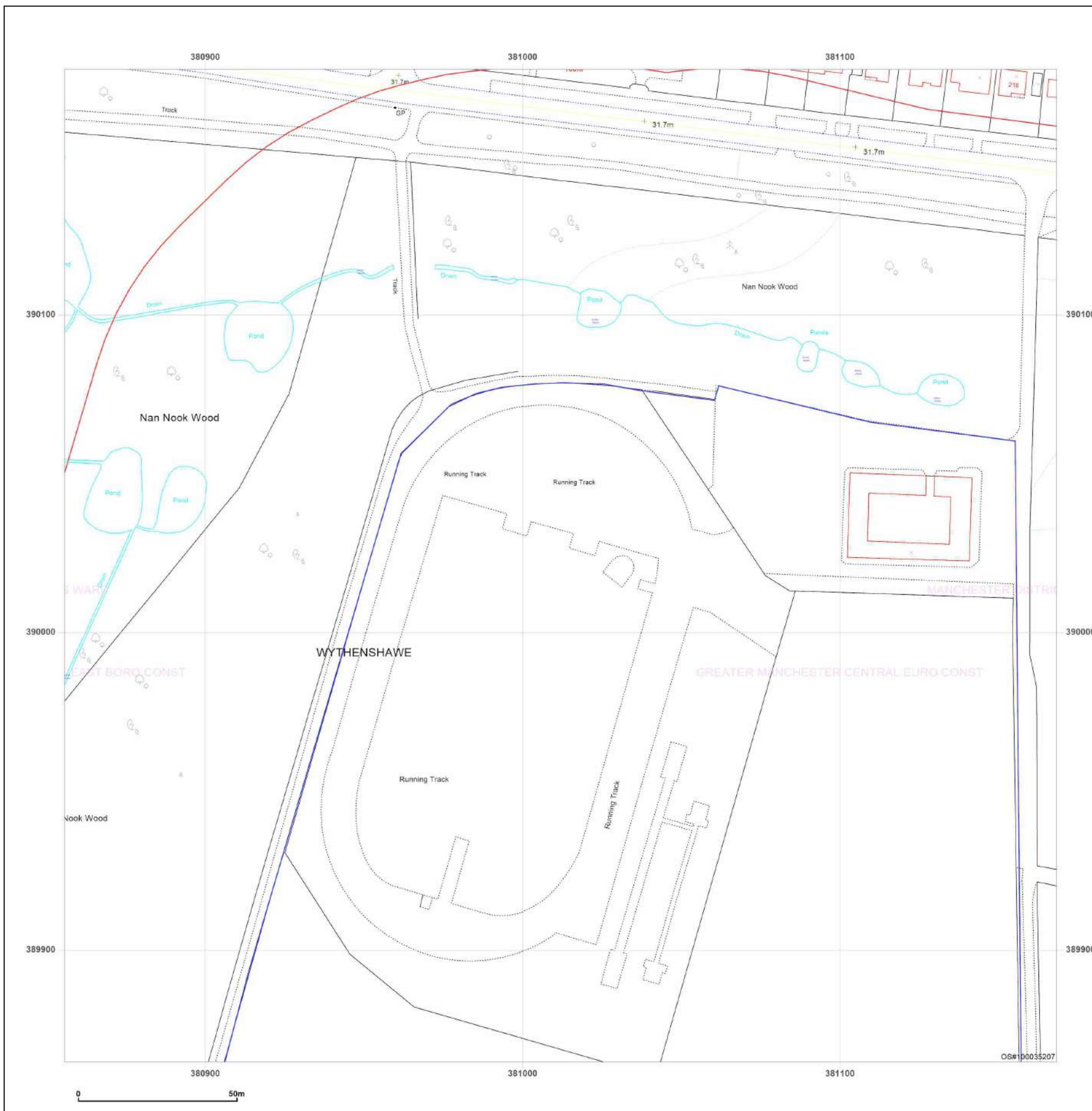


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Appendix 5: Preliminary UXO Report

Preliminary Unexploded Ordnance (UXO) Risk Assessment

Project Name	Wythenshawe Park
Client	BWB Consulting Limited
Site Address	Wythenshawe Park, Wythenshawe Road, Manchester M23 0PH
Report Reference	PA21484-00
Date	11 th February 2025
Author	HS
Quality Assurance	ERG

1st Line Defence

3 Maple Park, Essex Road, Hoddesdon. EN11 0EX

Tel +44 (0) 1992 245 020 Email info@1stlinedefence.co.uk

Web www.1stlinedefence.co.uk Company Reg No. 07717863



1ST LINE DEFENCE



Assessment Objective

This preliminary unexploded ordnance (UXO) risk assessment is a qualitative screening exercise to assess the likely potential of encountering UXO at the Wythenshawe Park site. The assessment involves the consideration of the basic factors that affect the potential for UXO to be present at a site as outlined in Stage One of the UXO risk management process.

Background

This assessment uses the sources of information available in-house to 1st Line Defence Ltd to enable the placement of a development site in context with events that may have led to the presence of German air-delivered or Allied military UXO. The report will identify any immediate necessity for risk mitigation or additional research in the form of a Detailed UXO Risk Assessment. It makes use of 1st Line Defence's extensive historical archives, library and unique geo-databases, as well as internet resources, and is researched and compiled by UXO specialists and graduate researchers.

The assessment directly follows CIRIA C681 guidelines "Unexploded Ordnance, a Guide for the Construction Industry". The document will therefore assess the following factors:

- Basic Site Data
- Previous Military Use
- Indicators of potential aerial delivered UXO threat
- Consideration of any Mitigating Factors
- Extent of Proposed Intrusive Works
- Any requirement for Further Work

It should be noted that the vast majority of construction sites in the UK will have a low or negligible risk of encountering UXO and should be able to be screened out at this preliminary stage. The report is meant as a common sense 'first step' in the UXO risk management process. The content of the report and conclusions drawn are based on basic, preliminary research using the information available to 1st Line Defence at the time this report was produced. It should be noted that the only way to entirely negate risk from UXO to a project would be to support the works proposed with appropriate UXO risk mitigation measures. It is rarely possible to state that there is absolutely 'no' risk from UXO to a project.

Site Boundary



Risk Assessment Considerations	
Site location and description/current use	<p>Comprising a large area of mostly open ground, the site is situated within Wythenshawe Park to the south-west of the city of Manchester.</p> <p>An expanse of open playing fields marked out as a baseball field comprises the southern section of the site, whilst an athletics track, BMX track, an area of hardstanding and associated access comprises the northern section of the site.</p> <p>The site is bound by woodland and Wythenshawe Road beyond to the north. Woodland and parkland binds the site to the east, whilst a lane and open fields binds the site to the south. A mixture of woodland and residential housing binds the site to the west.</p> <p>The site is approximately centred on the OS grid reference: SJ 80990 89993.</p>
Are there any indicators of current/historical military activity on/close to the site?	<p>In house geo-data sets indicate that the site was situated within close proximity to a HAA battery recorded within Nan Nook Wood.</p> <p>These batteries were often supported by an associated camp and often included training areas close-by to drill crews. A full assessment of any available records on this battery, as well as the acquisition of WWII-era aerial imagery would be required in order to fully ascertain the nature of this battery and any impact it may have had on the site.</p>
What was the pre- and post-WWII history of the site?	<p>Pre-war Ordnance Survey (OS) mapping indicates the site to comprise a large open field. No structures are indicated to have been situated on site, with the closest being residential properties to the north of Wythenshawe Road. The site is bound by woodland of <i>Nan Nook Wood</i> to the north and west of the site, whilst a <i>Fir Coppice</i> and <i>Mere Wood</i> binds the site to the east. <i>Baguley Brook</i> binds the site to the south.</p> <p>Post-war OS mapping indicates very little to have changed within the site, although some change can be seen to the south. Indeed, a large housing estate appears to have been constructed to the south of <i>Baguley Brook</i>. Other than this, no evident changes can be seen.</p>
Was the area subject to bombing during WWII?	<p>During WWII, the site was situated within the south of the County Borough of Manchester, which sustained an overall low-moderate density bombing campaign according to Home Office bombing statistics. Manchester was subject to 712 high explosive (HE) bombs, 18 parachute mines, seven oil bombs and one V-1 flying bomb; a total of 738 incidents across 27,255 acres resulting in an average of 27.1 items of ordnance recorded per 1,000 acres.</p> <p>A record of locations of aerial bombs dropped on the City of Manchester indicates the closest recorded incident to be situated approximately 225m to the north-east of the site within the grounds of Wythenshawe Park. An incendiary bomb is also plotted approximately 250m to the south-west of the site close to <i>Sycamore Farm</i>.</p>
Is there any evidence of bomb damage on/close to the site?	<p>OS mapping does not indicate any bomb damage within the site boundary or surrounding areas. It indicates that the site remains visually the same, whilst structures in the wider vicinity have remained built-up and developed. WWII-era aerial photography would be required in order to ascertain the precise condition of the site during wartime.</p>

To what degree would the site have been subject to access?	Owing to the lack of structures on site, the precise degree of access on site is hard to ascertain. No footpaths or access ways are recorded intersecting the site, and thus it is possible that access would have only been from seasonal agricultural access and thus it is possible that the site was not accessed for large periods of WWII. A lack of regular access increases the chances that items of UXO could have fallen unnoticed and unrecorded.
To what degree has the site been developed post-WWII?	Some development has been undertaken on site in post-war years, namely the construction of the athletics track, BMX track and associated hardstanding in the north of the site. The southern section of the site remains largely undeveloped.
What is the nature and extent of the intrusive works proposed?	The precise scope and extent of proposed works are not known at this stage.

Summary and Conclusions

During WWII, the site was situated within the south-west of the County Borough of Manchester, which sustained an overall low-moderate density bombing campaign according to Home Office bombing statistics. No evidence of bombing on site has been found at this preliminary stage. A record of locations of aerial bombs dropped on the City of Manchester indicates the closest recorded incident to be situated approximately 225m to the north-east of the site within the grounds of Wythenshawe Park. An incendiary bomb is also plotted approximately 250m to the south-west of the site close to *Sycamore Farm*.

Of concern is the presence of a HAA battery recorded to the immediate west of the site. HAA batteries often comprised the battery itself, as well as an associated camp and training area. Such training may have involved anything from marching drill to weapons marksmanship or combat exercises. If this was the case, it is possible that small arms or land service ordnance may have been used within close proximity to the site. Based on this it is recommended that further research be undertaken to positively identify the history and nature of this battery as well as any military history that could have led to the contamination of the site with UXO.

Recommendations

Given the findings of this preliminary report, it is recommended that **further research** is carried out in the form of a **Detailed UXO Risk Assessment**. This is recommended in order to better assess the exact extent of military activity in the area. Further research would involve the acquisition of any available written local records, WWII-era aerial imagery and other archival material, such as war office records, where available.

Prior to or in lieu of a Detailed Assessment, it is recommended that appropriate UXO Risk Mitigation Measures are provided for intrusive works proposed.

If the client has any anecdotal or empirical evidence of UXO risk on site, please contact 1st Line Defence.

This report has been prepared by 1st Line Defence Limited with all reasonable care and skill. The report contains historical data and information from third party sources. 1st Line Defence Limited has sought to verify the accuracy and comprehensiveness of this information where possible but cannot be held accountable for any inherent errors. Furthermore, whilst every reasonable effort has been made to locate and access all relevant historical information, 1st Line Defence cannot be held responsible for any changes to risk level or mitigation recommendations resulting from documentation or other information which may come to light at a later date.

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Appendix 6: Detailed UXO Report

Detailed Unexploded Ordnance (UXO) Risk Assessment

Project Name	Wythenshawe Park, Manchester
Client	BWB Consulting Ltd
Site Address	Wythenshawe Road, Manchester M23 9RW
Report Reference	DA21484-00
Date	27 th February 2025
Author	JA
Quality Assurance	HW
Final Check	ERG

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Executive Summary

Site Location and Description

The site is located within Wythenshawe Park, south-west Manchester. Recent aerial imagery shows the southern section of the site to comprise open playing fields marked out as a baseball field, whilst an athletics track, BMX track, and area of hardstanding and associated access comprises the northern section of the site.

The site is bound by woodland to the north, and Wythenshawe Road beyond this, with further woodland to the east and north-west. Open fields bind the site to the south, and residential housing is situated to the south-west of the site.

The site is approximately centred on the OS grid reference: **SJ 8099089993**.

Proposed Works

Information provided by the client indicates that ground investigation works are to comprise circa 8-10no dynamic sampling boreholes to between 2m and 5m bgl.

Geology and Bomb Penetration Depth

The British Geological Survey (BGS) map shows the site to be underlain by Tarporley Siltstone Formation, of the Triassic period. Superficial deposits include Glaciofluvial Sheet Deposits and Till, Devensian Deposits, both of the Quaternary period.

Site-specific geotechnical information was not available to 1st Line Defence at the time of the production of this report. An assessment of maximum bomb penetration depth can be made once such data becomes available, or by a UXO specialist during on-site support.

It should be noted that the maximum depth that a bomb could reach may vary across a site and will be largely dependent on the specific underlying geological strata and its density.

UXO Risk Assessment

1st Line Defence has assessed that there is an overall **Low Risk** from German and anti-aircraft unexploded ordnance at the site of proposed works. There is an assessed **Low-Medium Risk** from Allied unexploded ordnance.

The Risk from German Air-Delivered UXO

- During WWII the site was located within the County Borough of Manchester. According to official Home Office bombing statistics, this borough sustained an overall low-moderate density of bombing, with an average of 27.1 items of ordnance recorded per 1,000 acres. Manchester and the wider area were not targeted to the same extent as cities such as London and Birmingham although Manchester city centre and Salford were nonetheless subject to several major raids.
- No evidence has been found to suggest that the site was subject to any bombing during WWII. Available bomb maps and written records do not record any bombing within close proximity, with the closest strike recorded over 200m from the site. As well as this, no obvious signs of bombing are observable within available wartime aerial imagery of the site, such as destroyed structures, bomb craters or otherwise disturbed ground.
- During WWII, the site comprised an area of open, undeveloped land. This type of ground cover is not considered to have been conducive to the detection of evidence of UXO, as bomb entry holes could be as small as 20cm in diameter and easily overlooked in undeveloped areas. Furthermore, given its undeveloped nature, with a lack of any structures within or immediately bordering the site, it is not deemed likely that the site would have been subject to regular levels of access or observation. Evidence of UXO is less likely to be noticed and recorded within infrequently accessed areas.
- Despite this, there is not anticipated to be a significant risk of contamination, due to the lack of evidence of any bombing within or bordering the site. As such, the site has been assessed as **Low Risk** of contamination from items of German UXO.

The Risk from Allied UXO

- An in-house geo-dataset records the presence of a Heavy Anti-Aircraft Battery at Nan Nook Wood, Baguley, which was situated immediately north-west of the site. This is supported by wartime aerial imagery of the area, which shows the presence of a small HAA Battery camp to the west of the site. HAA Batteries were often accompanied by an associated camp for those operating the Battery, and it's possible that items of ordnance may have been present within these camps, most likely in the form of bullets. Evidence suggests that the gun was unarmed in 1942, however the exact duration of its operation could not be discerned.
- As well as this, wartime aerial imagery does show the presence of two potential trenches to the west of the site. No further information on these possible features has been found, and therefore it cannot be assessed if they are linked to Home Guard activities in the area, although it is thought likely that they are linked to the presence of the HAA Battery.
- Despite the presence of the HAA Battery to the west of the site, and the existence of potential trenches in proximity to the site, no evidence of any military activity within the site itself has been found. As such, the risk from items of Allied UXO is not considered significant, however UXO Awareness Briefings are strongly recommended as a minimum precaution.
- The conditions in which HAA or LAA projectiles may have fallen unnoticed within the site boundary are analogous to those regarding air delivered ordnance.

Post-WWII Redevelopment

- Some development has been undertaken on site in post-war years, namely the construction of the athletics track, BMX track and associated hardstanding in the north of the site. The southern section of the site remains largely undeveloped.
- The risk of UXO remaining is considered to be mitigated at the location of and down to the depth of any post-war redevelopment on site.

Recommended Risk Mitigation Measures

The following risk mitigation measures are recommended to support the proposed works at the Wythenshawe Park, Manchester site:

Activity	Recommended Risk Mitigation Measure
All Works	<ul style="list-style-type: none"> • UXO Risk Management Plan • Site Specific UXO Awareness Briefings to all personnel conducting intrusive works.

Glossary

Abbreviation	Definition
AA	Anti-Aircraft
AFS	Auxiliary Fire Service
AP	Anti-Personnel
ARP	Air Raid Precautions
DA	Delay-action
EOC	Explosive Ordnance Clearance
EOD	Explosive Ordnance Disposal
FP	Fire Pot
GM	G Mine (Parachute mine)
HAA	Heavy Anti-Aircraft
HE	High Explosive
IB	Incendiary Bomb
JSEODOC	Joint Services Explosive Ordnance Disposal Operation Centre
LAA	Light Anti-Aircraft
LCC	London County Council
LRRB	Long Range Rocket Bomb (V-2)
LSA	Land Service Ammunition
NFF	National Filling Factory
OB	Oil Bomb
PAC	Pilotless Aircraft (V-1)
PB	Phosphorous Bomb
PM	Parachute Mine
POW	Prisoner Of War
RAF	Royal Air Force
RCAF	Royal Canadian Air Force
RFC	Royal Flying Corps
RNAS	Royal Naval Air Service
ROF	Royal Ordnance Factory
SA	Small Arms
SAA	Small Arms Ammunition
SD2	Anti-personnel "Butterfly Bomb"
SIP	Self-Igniting Phosphorous
U/C	Unclassified bomb
UP	Unrotated Projectile (rocket)
USAAF	United States Army Air Force
UX	Unexploded
UXAA	Unexploded Anti-Aircraft
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
V-1	Flying Bomb (Doodlebug)
V-2	Long Range Rocket
WAAF	Women's Auxiliary Air Force
X	Exploded

Contents

Executive Summary	ii
Glossary	iv
Contents	v
Annexes	vii
Appendices	vii
1. Introduction	1
1.1. Background	1
2. Method Statement	2
2.1. Report Objectives	2
2.2. Risk Assessment Process	2
2.3. Sources of Information	2
3. Background to Bombing Records	3
3.1. General Considerations of Historical Research	3
3.2. German Bombing Records	3
3.3. Allied Records	3
4. UK Regulatory Environment and Guidelines	4
4.1. General	4
4.2. CDM Regulations 2015	4
4.3. The 1974 Health and Safety at Work etc. Act	4
4.4. CIRIA C681	4
4.5. Additional Legislation	4
5. The Role of Commercial UXO Contractors and The Authorities	5
5.1. Commercial UXO Specialists	5
5.2. The Authorities	5
6. The Site	6
6.1. Site Location	6
6.2. Site Description	6
7. Scope of the Proposed Works	6
7.1. General	6
8. Ground Conditions	6
8.1. General Geology	6
8.2. Site-Specific Geology	6
9. Site History	7
9.1. Introduction	7
9.2. Ordnance Survey Historical Maps	7
10. Introduction to German Air Delivered Ordnance	8
10.1. General	8
10.2. Generic Types of WWII German Air Delivered Ordnance	8
10.3. Failure Rate of German Air Delivered Ordnance	9
10.4. UXB Ground Penetration	9
10.4.1. The J-Curve Principle	9
10.4.2. WWII UXB Ground Penetration Studies	9
10.4.3. Site Specific Bomb Penetration Considerations	10

10.5.	V-Weapons	10
11.	The Likelihood of Contamination from German Air Delivered UXBs.....	11
11.1.	World War I	11
11.2.	World War II Bombing of the County Borough of Manchester	11
11.3.	WWII Home Office Bombing Statistics.....	12
11.4.	University of Manchester Bomb and Damage Map	12
11.5.	Interactive 'Christmas Blitz' Bomb Map	13
11.6.	Air Raid Damage Files.....	13
11.7.	WWII-Era Aerial Photography	13
11.8.	Abandoned Bombs.....	14
11.9.	Bomb Disposal Tasks	14
11.10.	Evaluation of German Air Delivered UXO Records	15
12.	Introduction to Allied Ordnance.....	16
12.1.	General.....	16
12.2.	Defending the UK From Aerial Attack.....	16
12.3.	Anti-Aircraft Artillery (AAA).....	17
12.4.	Land Service Ammunition.....	18
12.5.	Small Arms Ammunition.....	18
13.	The Likelihood of Contamination from Allied Ordnance.....	19
13.1.	Introduction	19
13.2.	Baguley Heavy Anti-Aircraft Battery	19
13.3.	WWII-Era Aerial Photography	19
13.4.	Evaluation of Contamination Risk from Allied UXO.....	20
14.	The Likelihood of UXO Contamination Summary.....	22
15.	The Likelihood that UXO Remains	23
15.1.	Introduction	23
15.2.	UXO Clearance.....	23
15.3.	Post-War Redevelopment.....	23
16.	The Likelihood of UXO Encounter	24
16.1.	Introduction	24
16.2.	Encountering Air Delivered Ordnance	24
16.3.	Land Service/Small Arms Ammunition Encounter	24
17.	The Likelihood of UXO Initiation.....	25
17.1.	Introduction	25
17.2.	Initiating Air Delivered Ordnance	25
17.3.	Land Service/Small Arms Ammunition Initiation.....	25
18.	Consequences of Initiation/Encounter.....	26
18.1.	Introduction	26
18.2.	Consequences of Detonation.....	26
19.	1st Line Defence Risk Assessment.....	27
19.1.	Risk Assessment Stages.....	27
19.2.	Assessed Risk Level.....	27
20.	Proposed Risk Mitigation Methodology	28
20.1.	General.....	28
	Bibliography	29

Annexes

List of Report Annexes	
Annex A	Site Location Maps
Annex B	Recent Aerial Photography
Annex C	Client Provided Site Plan
Annex D	Pre- and Post-WWII Historical Maps
Annex E	Example of UXO Entry Hole / The 'J-curve' Effect Principle
Annex F	Examples of UXO Incidents
Annex G	WWI Map of Air Raids and Naval Bombardments
Annex H	University of Manchester Library Bomb Mapping
Annex I	'Christmas Blitz' Interactive Map
Annex J	WWII-era RAF Aerial Photography of the Site
Annex K	WWII-era RAF Aerial Photography of the site – Allied Features Overlay

Appendices

List of Report Appendices	
Appendix i-iii	Examples of German Air-Delivered Ordnance
Appendix iv	Examples of Anti-Aircraft Projectiles
Appendix v-vii	Examples of Land Service Ammunition
Appendix viii	Examples of Small Arms Ammunition

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Detailed Unexploded Ordnance (UXO) Risk Assessment

Site: Wythenshawe Park, Manchester

Client: BWB Consulting Ltd

1. Introduction

1.1. Background

1st Line Defence has been commissioned by BWB Consulting Ltd to conduct a Detailed Unexploded Ordnance (UXO) Risk Assessment for the works proposed at Wythenshawe Park, Manchester.

Buried UXO can present a significant risk to construction works and development projects. The discovery of a suspect device during works can cause considerable disruption to operations as well as cause unwanted delays and expense.

UXO in the UK can originate from three principal sources:

1. Munitions resulting from wartime activities including German bombing in WWI and WWII, long range shelling, and defensive activities.
2. Munitions deposited as a result of military training and exercises.
3. Munitions lost, burnt, buried or otherwise discarded either deliberately, accidentally, or ineffectively.

This report will assess the potential factors that may contribute to the risk of UXO contamination. If an elevated risk is identified at the site, this report will recommend appropriate mitigation measures, in order to reduce the risk to as low as is reasonably practicable. Detailed analysis and evidence will be provided to ensure an understanding of the basis for the assessed risk level and any recommendations.

This report complies with the guidelines outlined in CIRIA C681, 'Unexploded Ordnance (UXO) A Guide for the Construction Industry.'

2. Method Statement

2.1. Report Objectives

The aim of this report is to conduct a comprehensive assessment of the potential risk from UXO at Wythenshawe Park, Manchester. The report will also recommend appropriate site and work-specific risk mitigation measures to reduce the risk from explosive ordnance during the envisaged works to a level that is as low as reasonably practicable.

2.2. Risk Assessment Process

1st Line Defence has undertaken a five-step process for assessing the risk of UXO contamination:

1. The likelihood that the site was contaminated with UXO.
2. The likelihood that UXO remains on the site.
3. The likelihood that UXO may be encountered during the proposed works.
4. The likelihood that UXO may be initiated.
5. The consequences of initiating or encountering UXO.

In order to address the above, 1st Line Defence has taken into consideration the following factors:

- Evidence of WWI and WWII German air delivered bombing as well as the legacy of Allied occupation.
- The nature and conditions of the site during WWII.
- The extent of post-war development and UXO clearance operations on site.
- The scope and nature of the proposed works and the maximum assessed bomb penetration depth.
- The nature of ordnance that may have contaminated the proposed site area.

2.3. Sources of Information

Every reasonable effort has been made to ensure that relevant evidence has been consulted and presented in order to produce a thorough and comprehensible report for the client. To achieve this the following, which includes military records and archive material held in the public domain, have been accessed:

- The National Archives and the University of Manchester Library.
- Historical mapping datasets.
- Historic England National Monuments Record.
- Relevant information supplied by BWB Consulting Ltd.
- Available material from 33 Engineer Regiment (EOD) Archive (part of 29 Explosive Ordnance and Disposal and Search Group).
- 1st Line Defence's extensive historical archives, library and UXO geo-datasets.
- Open sources such as published books and internet resources.

3. Background to Bombing Records

3.1. General Considerations of Historical Research

This desktop assessment is based largely upon analysis of historical evidence. Every reasonable effort has been made to locate and present significant and pertinent information. 1st Line Defence cannot be held accountable for any changes to the assessed risk level or risk mitigation measures, based on documentation or other data that may come to light at a later date, or which was not available to 1st Line Defence during the production of this report.

It is often problematic and sometimes impossible to verify the completeness and accuracy of WWII-era records. As a consequence, conclusions as to the exact location and nature of a UXO risk can rarely be quantified and are, to a degree, subjective. To counter this, a range of sources have been consulted, presented and analysed. The same methodology is applied to each report during the risk assessment process. 1st Line Defence cannot be held responsible for any inaccuracies or the incompleteness in available historical information.

3.2. German Bombing Records

During WWII, bombing records were generally gathered locally by the police, Air Raid Precaution (ARP) wardens and military personnel. These records typically contained information such as the date, the location, the amount of damage caused and the types of bombs that had fallen during an air raid. This information was made either through direct observation or post-raid surveys. The Ministry of Home Security Bomb Census Organisation would then receive this information, which was plotted onto maps, charts, and tracing sheets by regional technical officers. The collective record set (regional bomb census mapping and locally gathered incidents records) would then be processed and summarised into reports by the Ministry of Home Security Research and Experiments Branch. The latter were tasked with providing the government 'a complete picture of air raid patterns, types of weapons used and damage caused- in particular to strategic services and installations such as railways, shipyards, factories and public utilities.'

The quality, detail and nature of record keeping could vary considerably between provincial towns, boroughs and cities. No two areas identically collated or recorded data. While some local authorities maintained records with a methodical approach, sources in certain areas can be considerably more vague, dispersed, and narrower in scope. In addition, the immediate priority was mostly focused on assisting casualties and minimising damage at the time. As a result, some records can be incomplete and contradictory. Furthermore, many records were even damaged or destroyed in subsequent air raids. Records of raids that took place on sparsely or uninhabited areas were often based upon third party or hearsay information and are therefore not always reliable. Whereas records of attacks on military or strategic targets were often maintained separately and have not always survived.

3.3. Allied Records

During WWII, considerable areas of land were requisitioned by the War Office for the purpose of defence, training, munitions production and the construction of airfields. Records relating to military features vary and some may remain censored. Within urban environments datasets will be consulted detailing the location of munition production as well as wartime air and land defences. In rural locations it may be possible to obtain plans of military establishments, such as airfields, as well as training logs, record books, plans and personal memoirs. As with bombing records, every reasonable effort will be made to access records of, and ascertain any evidence of, military land use. However, there are occasions where such evidence is not available, as records may not be accessible, have been lost/destroyed, or simply were not kept in the first place.

4. UK Regulatory Environment and Guidelines

4.1. General

There is no formal obligation requiring a UXO risk assessment to be undertaken for construction projects in the UK, nor is there any specific legislation stipulating the management or mitigation of UXO risk. However, it is implicit in the legislation outlined below that those responsible for intrusive works (archaeology, site investigation, drilling, piling, excavation etc.) should undertake a comprehensive and robust assessment of the potential risks to employees and that mitigation measures are implemented to address any identified hazards.

4.2. CDM Regulations 2015

The Construction (Design and Management) Regulations 2015 (CDM 2015) define the responsibilities of parties involved in the construction of temporary or permanent structures.

The CDM 2015 establishes a duty of care extending from clients, principle designers, and contractors to those working on, or affected by, a project. Those responsible for construction projects may therefore be accountable for the personal or proprietary loss of third parties, if correct health and safety procedure has not been applied.

Although the CDM does not specifically reference UXO, the risk presented by such items is both within the scope and purpose of the legislation. It is therefore implied that there is an obligation for parties to:

- Provide an appropriate assessment of potential UXO risks at the site (or ensure such an assessment is completed by others).
- Put in place appropriate risk mitigation measures if necessary.
- Supply all parties with information relevant to the risks presented by the project.
- Ensure the preparation of a suitably robust emergency response plan.

4.3. The 1974 Health and Safety at Work etc. Act

All employers have a responsibility under the Health and Safety at Work etc. Act 1974 and the Management of Health and Safety at Work Regulations 1999, to ensure the health and safety of their employees and third parties, so far as is reasonably practicable and conduct suitable and sufficient risk assessments.

4.4. CIRIA C681

In 2009, the Construction Industry Research and Information Association (CIRIA) produced a guide to the risk posed by UXO to the UK construction industry (CIRIA C681). CIRIA is a neutral, independent and not-for-profit body, linking organisations with common interests and facilitating a range of collaborative activities that help improve the industry.

The publication provides the UK construction industry with a defined process for the management of risks associated with UXO from WWI and WWII air bombardment. It is also broadly applicable to the risks from other forms of UXO that might be encountered. It focuses on construction professionals' needs, particularly if there is a suspected item of UXO on site, and covers issues such as what to expect from a UXO specialist. The guidance also helps clients to fulfil their legal duty under CDM 2015 to provide designers and contractors with project specific health and safety information needed to identify hazards and risks associated with the design and construction work. This report conforms to this CIRIA guidance and to the various recommendations for good practice referenced therein. It is recommended that this document is acquired and studied where possible to allow a better understanding of the background to both the risk assessment process and the UXO issue in the UK in general.

4.5. Additional Legislation

In the event of a casualty resulting from the failure of an employer/client to address the risks relating to UXO, the organisation may be criminally liable under the Corporate Manslaughter and Corporate Homicide Act 2007.

5. The Role of Commercial UXO Contractors and The Authorities

5.1. Commercial UXO Specialists

The role of a UXO Specialist (often referred to as UXO Consultant or UXO Contractor) such as 1st Line Defence, is defined in CIRIA C681 as the provision of expert knowledge and guidance to the client on the most appropriate and cost-effective approach to UXO risk management at a site.

The principal role of UXO Specialists is to provide the client with an appropriate assessment of the risk posed by UXO for a specific project, and identify and carry out suitable methodology for the mitigation of any identified risks to reduce them to an acceptable level.

The requirement for a UXO Specialist should ideally be identified in the initial stages of a project, and it is recommended that this occur prior to the start of any detailed design. This will enable the client to budget for expenditure that may be required to address the risks from UXO, and may enable the project team to identify appropriate techniques to eliminate or reduce potential risks through considered design, without the need for UXO specific mitigation measures. The UXO Specialist should have suitable qualifications, levels of competency and insurances.

Please note 1st Line Defence has the capability to provide a complete range of required UXO risk mitigation services, in order to reduce a risk to as low as reasonably practicable. This can involve the provision of both ground investigation, and where appropriate, UXO clearance services.

5.2. The Authorities

The police have a responsibility to co-ordinate the emergency services in the event of an ordnance-related incident at a construction site. Upon inspection they may impose a safety cordon, order an evacuation, and call the military authorities Joint Services Explosive Ordnance Disposal Operation Centre (JSEODOC) to arrange for investigation and/or disposal. Within the Metropolitan Police Operational Area, SO15 EOD will be tasked to any discovery of suspected UXO. The request for Explosive Officer (Expo) support is well understood and practiced by all Metropolitan Boroughs. The requirement for any additional assets will then be coordinated by the Expo if required.

In the absence of a UXO specialist, police officers will usually employ such precautionary safety measures, thereby causing works to cease, and possibly requiring the evacuation of neighbouring businesses and properties.

The priority given to the police request will depend on the EOD teams' judgement of the nature of the UXO risk, the location, people and assets at risk, as well as the availability of resources. The speed of response varies; authorities may respond immediately or in some cases it may take several days for the item of ordnance to be dealt with. Depending on the on-site risk assessment the item of ordnance may be removed from the site and/or destroyed by a controlled explosion.

Following the removal of an item of UXO, the military authorities will only undertake further investigations or clearances in high-risk situations. If there are regular UXO finds on a site the JSEODOC may not treat each occurrence as an emergency and will recommend the construction company puts in place alternative procedures, such as the appointment of a commercial contractor to manage the situation.

6. The Site

6.1. Site Location

The site is located within Wythenshawe Park, south-west Manchester. The site is bound by woodland to the north, and Wythenshawe Road beyond this, with further woodland to the east and north-west. Open fields bind the site to the south, and residential housing is situated to the south-west of the site.

The site is approximately centred on the OS grid reference: **SJ 8099089993**.

Site location maps are presented in **Annex A**.

6.2. Site Description

Recent aerial imagery shows the southern section of the site to comprise open playing fields marked out as a baseball field, whilst an athletics track, BMX track, and area of hardstanding and associated access comprises the northern section of the site.

A recent aerial photograph and site plan are presented in **Annex B** and **Annex C** respectively.

7. Scope of the Proposed Works

7.1. General

Information provided by the client indicates that ground investigation works are to comprise circa 8-10no dynamic sampling boreholes to between 2m and 5m bgl.

8. Ground Conditions

8.1. General Geology

The British Geological Survey (BGS) map shows the site to be underlain by Tarporley Siltstone Formation, of the Triassic period. Superficial deposits include Glaciofluvial Sheet Deposits and Till, Devensian Deposits, both of the Quaternary period.

8.2. Site-Specific Geology

Site-specific geotechnical data was not provided by the client during the production of this report.

9. Site History

9.1. Introduction

The purpose of this section is to identify the composition of the site pre and post-WWII. It is important to establish the historical use of the site, as this may indicate the site's relation to potential sources of UXO as well as help with determining factors such as the land use, groundcover, likely frequency of access and signs of bomb damage.

9.2. Ordnance Survey Historical Maps

Relevant historical maps were obtained for this report and are presented in **Annex D**. See below for a summary of the site history shown on acquired mapping.

Pre-WWII		
Date	Scale	Description
1935	1:2,500	Pre-war OS mapping shows the site to comprise a large open field. No structures are indicated to have been situated on site, with the closest being residential properties to the north of Wythenshawe Road, approximately 170m north. The site is bound by woodland labelled <i>Nan Nook Wood</i> to the north and west, whilst woodland labelled <i>Fir Coppice</i> and <i>Mere Wood</i> binds the site to the east. <i>Baguley Brook</i> binds the site to the south, beyond which is open fields.

Post-WWII		
Date	Scale	Description
1956-60	1:2,500	Post-war OS mapping shows very little change within or bordering the site, although some change can be seen to the south, with the development of residential properties. The site itself remains open land.

10. Introduction to German Air Delivered Ordnance

10.1. General

During WWI and WWII, the UK was subjected to bombing which often resulted in extensive damage to city centres, docks, rail infrastructure and industrial areas. The poor accuracy of WWII targeting technology and the nature of bombing techniques often resulted in neighbouring areas to targets sustaining collateral damage.

In addition to raids which concentrated on specific targets, indiscriminate bombing of large areas also took place. This occurred most prominently in the London 'Blitz', though affected many other towns and cities. As discussed in the following sections, a proportion of the bombs dropped on the UK did not detonate as designed. Although extensive efforts were made to locate and deal with these UXBs at the time, many still remain buried and can present a potential risk to construction projects.

The main focus of research for this section of the report will concern German air delivered ordnance dropped during WWII, although WWI bombing will also be considered.

10.2. Generic Types of WWII German Air Delivered Ordnance

To provide an informed assessment of the hazards posed by any items of unexploded ordnance that may remain in situ on site, the table below provides information on the types of German air delivered ordnance most commonly used by the Luftwaffe during WWII. Images and brief summaries of the characteristics of these items of ordnance are listed in **Appendices i-iii**.

Generic Types of WWII German Air Delivered Ordnance		
Type	Frequency	Likelihood of Detection
High Explosive (HE) bombs	In terms of weight of ordnance dropped, HE bombs were the most frequently deployed by the Luftwaffe during WWII.	Although efforts were made to identify the presence of unexploded ordnance following an air raid, often the damage and destruction caused by detonated bombs made observation of UXB entry holes impossible. The entry hole of an unexploded bomb can be as little as 20cm in diameter and was easily overlooked in certain ground conditions (see Annex E). Furthermore, ARP documents describe the danger of assuming that damage, actually caused by a large UXB, was due to an exploded smaller bomb. UXBs therefore present the greatest risk to present-day intrusive works.
1kg Incendiary bombs (IB)	In terms of the number of weapons dropped, small IBs were the most numerous. Millions of these were dropped throughout WWII.	IBs had very limited penetration capability and in urban areas would often have been located in post-raid surveys. If they failed to initiate and fell in water, on soft vegetated ground, or bombed rubble, they could easily go unnoticed.
Large Incendiary bombs (IB)	These were not as common as the 1kg IBs, although they were more frequently deployed than PMs and AP bomblets.	If large IBs did penetrate the ground, complete combustion did not always occur and in such cases they could remain a risk to intrusive works.
Aerial or Parachute mines (PM)	These were deployed less frequently than HE and IBs due to size, cost and the difficulty of deployment.	If functioning correctly, PMs would generally have had a slow rate of descent and were very unlikely to have penetrated the ground. Where the parachute failed, mines would have simply shattered on impact if the main charge failed to explode. There have been extreme cases when these items have been found unexploded. However, in these scenarios, the ground was either extremely soft or the munition fell into water.
Anti-personnel (AP) bomblets	These were not commonly used and are generally considered to pose a low risk to most works in the UK.	SD2 bomblets were packed into containers holding between 6 and 108 submunitions. They had little ground penetration ability and should have been located by the post-raid survey unless they fell into water, dense vegetation or bomb rubble.

10.3. Failure Rate of German Air Delivered Ordnance

It has been estimated that 10% of WWII German air delivered HE bombs failed to explode as designed. Reasons for why such weapons might have failed to function as designed include:

- Malfunction of the fuze or gain mechanism (manufacturing fault, sabotage by forced labour or faulty installation).
- Many were fitted with a clockwork mechanism that could become immobilised on impact.
- Failure of the bomber aircraft to arm the bombs due to human error or an equipment defect.
- Jettisoning the bomb before it was armed or from a very low altitude. This most likely occurred if the bomber aircraft was under attack or crashing.

From 1940 to 1945, bomb disposal teams reportedly dealt with a total of 50,000 explosive items of 50kg, over 7,000 anti-aircraft projectiles and 300,000 beach mines. Unexploded ordnance is still regularly encountered across the UK, see press articles in **Annex F**.

10.4. UXB Ground Penetration

An important consideration when assessing the risk from a UXB is the likely maximum depth of burial. There are several factors which determine the depth that an unexploded bomb will penetrate:

- Mass and shape of bomb.
- Height of release.
- Velocity and angle of bomb.
- Nature of the ground cover.
- Underlying geology.

Geology is perhaps the most important variable. If the ground is soft, there is a greater potential of deeper penetration. For example, peat and alluvium are easier to penetrate than gravel and sand, whereas layers of hard strata will significantly retard and may stop the trajectory of a UXB.

10.4.1. The J-Curve Principle

J-curve is the term used to describe the characteristic curve commonly followed by an air delivered bomb dropped from height after it penetrates the ground. Typically, as the bomb is slowed by its passage through underlying soils, its trajectory curves towards the surface. Many UXBs are found with their nose cone pointing upwards as a result of this effect. More importantly, however, is the resulting horizontal offset from the point of entry. This is typically a distance of about one third of the bomb's penetration depth, but can be higher in certain conditions (see **Annex E**).

10.4.2. WWII UXB Ground Penetration Studies

During WWII the Ministry of Home Security undertook a major study on actual bomb penetration depths, carrying out statistical analysis on the measured depths of 1,328 bombs as reported by bomb disposal (BD) teams. Conclusions were drawn predicting the likely average and maximum depths of penetration of different sized bombs in different geological strata.

For example, the largest common German bomb (500kg) had a likely concluded penetration depth of 6m in sand or gravel but 11m in clay. The maximum observed depth for a 500kg bomb was 11.4m and for a 1,000kg bomb 12.8m. Theoretical calculations suggested that significantly greater penetration depths were probable.

10.4.3. Site Specific Bomb Penetration Considerations

When considering an assessment of the bomb penetration at the site of proposed works the following parameters should be used:

- WWII geology – Tarporley Siltstone Formation
- Impact angle and velocity – 10-15° from vertical and 270 metres per second.
- Bomb mass and configuration – The 500kg SC HE bomb, without retarder units or armour piercing nose (this was the largest of the common bombs used against Britain).

It has not been possible to determine maximum bomb penetration capabilities at this stage due to the limitations of site-specific geotechnical information provided for the purpose of this report. An assessment can be made once further information becomes available or by an UXO Specialist on-site.

10.5. V-Weapons

Hitler's 'V-weapon' campaign began from mid-1944. It used newly developed unmanned cruise missiles and rockets. The V-1, known as the flying bomb or pilotless aircraft, and the V-2, a long range rocket, were launched from bases in Germany and occupied Europe. A total of 9,251 V-1s and 1,115 V-2s were recorded in the United Kingdom.

Although these weapons caused considerable damage, their range was limited by their position of deployment across Europe and as a result the vast majority of V-weapon strikes were directed against targets in the south-east of England, predominantly in the London Boroughs and Home Counties. This limitation of capability meant targets in north-west England were generally too far to be considered for V-weapon strikes by the Luftwaffe. The risk from V-weapons is therefore considered negligible and will not be further addressed in this report.

11. The Likelihood of Contamination from German Air Delivered UXBs

11.1. World War I

During WWI Britain was targeted and bombed by Zeppelin Airships as well as Gotha and Giant fixed-wing aircraft. The objective of these raids was to unnerve the British public, to destroy strategic targets and to ultimately attempt to coerce Britain's capitulation from the war. A WWI map of air raids and naval bombardments across the UK was consulted, see **Annex G**. This source shows no bomb incidents within the general Manchester area.

WWI bombs were generally smaller and dropped from a lower altitude than those used in WWII. This resulted in limited UXB penetration depths. Aerial bombing was often such a novelty at the time that it attracted public interest and even spectators to watch the raids in progress. For these reasons there is a limited risk that UXBs passed undiscovered in the urban environment. When combined with the relative infrequency of attacks and an overall low bombing density, the risk from WWI UXBs is considered low and will not be further addressed in this report.

11.2. World War II Bombing of the County Borough of Manchester

The Luftwaffe's main objective for the attacks on Britain was to inhibit the country's economic and military capability. To achieve this they targeted airfields, depots, docks, warehouses, wharves, railway lines, factories, and power stations. As the war progressed the Luftwaffe bombing campaign expanded to include the indiscriminate bombing of civilian areas in an attempt to subvert public morale.

During WWII the site was located within the County Borough of Manchester, which sustained an overall low-moderate density of bombing, as represented by bomb density data figures below. Manchester and the wider area were not targeted to the same extent as cities such as London and Birmingham although Manchester city centre and Salford were nonetheless subject to several major raids. The first raid on the city was in September 1940, with the worst being in December 1940, often referred to as the 'Christmas Blitz', whereby the city was raided for two consecutive nights which resulted in an estimated 684 people losing their lives, and more than 2,000 being injured.¹ The nearest identifiable Luftwaffe targets to the site were the Gaythorn Gas Works and Salford Docks which were located approximately 10km north of the site.

Records of bombing incidents in the civilian areas of the district were typically collected by Air Raid Precautions wardens and collated by Civil Defence personnel. Some other organisations, such as port and railway authorities, maintained separate records. Records would be in the form of typed or hand written incident notes, maps and statistics. Bombing data was carefully analysed, not only due to the requirement to identify those parts of the country most needing assistance, but also in an attempt to find patterns in the Germans' bombing strategy in order to predict where future raids might take place.

Records of bombing incidents are presented in the following sections.

¹ <https://www.iwm.org.uk/history/the-manchester-blitz>

11.3. WWII Home Office Bombing Statistics

The following table summarises the quantity of German air delivered bombs (excluding 1kg incendiaries and anti-personnel bombs) dropped on the County Borough of Manchester between 1940 and 1945.

Record of German Ordnance Dropped on the County Borough of Manchester		
Area Acreage		27,255
Weapons	High Explosive bombs (all types)	712
	Parachute mines	18
	Oil bombs	7
	Phosphorus bombs	0
	Fire pots	0
	Pilotless aircraft (V-1)	1
	Long range rocket bombs (V-2)	0
Total		738
Number of Items per 1,000 acres		27.1
Source: Home Office Statistics		
This table does not include UXO found during or after WWII.		

Detailed records of the quantity and locations of the 1kg incendiary and anti-personnel bombs were not routinely maintained by the authorities as they were frequently too numerous to record. Although the risk relating to IBs is lesser than that relating to larger HE bombs, they were similarly designed to inflict damage and injury. Anti-personnel bombs were used in much smaller quantities and are rarely found today but are potentially more dangerous. Although Home Office statistics did not record these types of ordnance, both should not be overlooked when assessing the general risk to personnel and equipment.

11.4. University of Manchester Bomb and Damage Map

A local map showing bomb strikes and the extent of resulting bomb damage was obtained from the University of Manchester Library. This map was compiled during/following WWII by Manchester Council's City Architect's Department.

This map was created by the City Architects Department and plots the locations of bomb strikes in Manchester, including fire bombs, HE bombs, and land mines. The map also shows the extent of bomb damage in the city, categorised as 'demolished building' or 'partially damaged structure'.

The section showing the area of the site is described in the table below and presented in **Annex H**.

University of Manchester Library Bomb Map	
Date Range	Comments
1940-1945	No bomb strikes are recorded in the site. This map plots the closest recorded incident to be situated approximately 225m to the north-east of the site within the grounds of Wythenshawe Park. An incendiary bomb is also plotted approximately 250m to the south-west of the site close to <i>Sycamore Farm</i> .

11.5. Interactive 'Christmas Blitz' Bomb Map

A local bomb map, compiled by the Manchester Evening News and utilising data from the Commonwealth and War Graves Commission, was consulted during the production of this report. This map, named the Manchester Christmas Blitz Map, shows the locations of civilian deaths in Greater Manchester between 22nd and 24th December 1940. During this two day period, a reported 800 people were killed as a result of air raids.²

As this map only records bombs which resulted in fatalities, it is not considered a comprehensive account of Christmas bombing raids. No bomb strikes resulting in fatalities are recorded within or bordering the site. A section of the map showing the site and its surroundings is presented in **Annex I**.

11.6. Air Raid Damage Files

Written ARP Incident Records were obtained from The National Archives. This record was compiled by local Air Raid Precaution (ARP) personnel and volunteers during the war and records the location, date and time of bombing raids, as well as the types of bomb used and the damage caused.

This record set was checked, and no references to the site were found within it.

11.7. WWII-Era Aerial Photography

WWII-era aerial photography for the site area was obtained from the National Monuments Record Office (Historic England). This photography provides a record of the potential composition of the site during the war, as well as its condition immediately following the war (see **Annex J**). This section discusses the images in relation to any potential indicators of bombing, while the images will be analysed again in Section 13.3 in relation to any Allied features.

WWII-Era Aerial Photography	
Date	Description
10 th August 1945	This image shows the site to comprise open, undeveloped land. Woodland borders the site to the north-west, north and east, while further open land is situated to the south and south-west. No obvious signs of bombing are observable within this image, such as destroyed structures, bomb craters or otherwise disturbed ground.
9 th July 1946	This image, dated almost a year on from the previous, shows the site to remain open ground. Development of residential properties has begun to the south of the site. Again, no obvious signs of bombing are observable.

² <https://www.manchestereveningnews.co.uk/news/greater-manchester-news/manchester-blitz-bomb-sites-map-28327828>

11.8. Abandoned Bombs

A post air-raid survey of buildings, facilities, and installations would have included a search for evidence of bomb entry holes. If evidence of an entry hole was encountered, Bomb Disposal Officer Teams would normally have been requested to attempt to locate, render safe, and dispose of the bomb. Occasionally, evidence of UXBs was discovered but due to a relatively benign position, access problems, or a shortage of resources the UXB could not be exposed and rendered safe. Such an incident may have been recorded and noted as an 'abandoned bomb'.

Given the inaccuracy of WWII records, and the fact that these bombs were 'abandoned', their locations cannot be considered definitive or the lists exhaustive. The MoD states that 'action to make the devices safe would be taken only if it was thought they were unstable'. It should be noted that other than the 'officially' abandoned bombs, there will inevitably be UXBs that were never recorded.

1st Line Defence holds no records of officially registered abandoned bombs at or near the site of the proposed works.

11.9. Bomb Disposal Tasks

The information service from the Explosive Ordnance Disposal (EOD) Archive Information Office at 33 Engineer Regiment (now part of 29 EOD & Search Group) no longer processes commercial requests for information. It has therefore not been possible to include any updated official information regarding bomb disposal/clearance tasks with regards to this site. A database of known disposal/clearance tasks has been referred to which does not make reference to such instances occurring within the site of proposed works.

If any relevant information is received at a later date, BWB Consulting Ltd will be advised.

11.10. Evaluation of German Air Delivered UXO Records

German Air Delivered UXO Records Summary	
Factors	Conclusion
Density of Bombing <i>It is important to consider the bombing density when assessing the possibility that UXBs remain in an area. High bombing density could allow for error in record keeping due to extreme damage caused to the area.</i>	<p>During WWII the site was located within the County Borough of Manchester. According to official Home Office bombing statistics, this borough sustained an overall low-moderate density of bombing, with an average of 27.1 items of ordnance recorded per 1,000 acres. Manchester and the wider area were not targeted to the same extent as cities such as London and Birmingham although Manchester city centre and Salford were nonetheless subject to several major raids.</p> <p>No evidence has been found to suggest that the site was subject to any bombing during WWII. Available bomb maps and written records do not record any bombing within close proximity, with the closest strike recorded over 200m from the site.</p>
Damage <i>If buildings or structures on a site sustained bomb or fire damage, any resulting rubble and debris could have obscured the entry holes of unexploded bombs dropped during the same or later raids. Similarly, a high explosive bomb strike in an area of open agricultural land will have caused soil disturbance, increasing the risk that a UXB entry hole would be overlooked.</i>	<p>No obvious signs of bombing are observable within available wartime aerial imagery of the site, such as destroyed structures, bomb craters or otherwise disturbed ground.</p>
Ground Cover <i>The nature of the ground cover present during WWII would have a substantial influence on any visual indication that may indicate UXO being present.</i>	<p>During WWII, the site comprised an area of open, undeveloped land. This type of ground cover is not considered to have been conducive to the detection of evidence of UXO, as bomb entry holes could be as small as 20cm in diameter and easily overlooked in undeveloped areas.</p>
Access Frequency <i>UXO in locations where access was irregular would have a greater chance of passing unnoticed than at those that were regularly occupied. The importance of a site to the war effort is also an important consideration as such sites are likely to have been both frequently visited and subject to post-raid checks for evidence of UXO.</i>	<p>Given its undeveloped nature, with a lack of any structures within or immediately bordering the site, it is not deemed likely that the site would have been subject to regular levels of access or observation. Evidence of UXO is less likely to be noticed and recorded within infrequently accessed areas.</p>
Bomb Failure Rate	<p>There is no evidence to suggest that the bomb failure rate in the locality of the site would have been dissimilar to the 10% normally used.</p>
Abandoned Bombs	<p>1st Line Defence holds no records of abandoned bombs at or within the site vicinity.</p>
Bombing Decoy sites	<p>1st Line Defence could find no evidence of bombing decoy sites within the site vicinity.</p>
Bomb Disposal Tasks	<p>1st Line Defence could find no evidence of bomb disposal tasks within the site boundary and immediate area.</p>

12. Introduction to Allied Ordnance

12.1. General

Many areas across the UK may be at risk from Allied UXO because of both wartime and peacetime military use. Typical military activities and uses that may have led to a legacy of military UXO at a site include former minefields, home guard positions, anti-aircraft emplacements, training and firing ranges, military camps, as well as weapons manufacture and storage areas.

Although land formerly used by the military was usually subject to clearance before returned to civilian use, items of UXO are sometimes discovered and can present a potential risk to construction projects.

This section of the report discusses the generic types of Allied ordnance typically encountered on areas associated with former military activity.

12.2. Defending the UK From Aerial Attack

During WWII the War Office employed a number of defence tactics against the Luftwaffe from bombing major towns, cities, manufacturing areas, ports and airfields. These can be divided into passive and active defences (examples are provided in the table below).

Active Defences	Passive Defences
<ul style="list-style-type: none"> • Anti-aircraft gun emplacements to engage enemy aircraft. • Fighter aircraft to act as interceptors. • Rockets and missiles were used later during WWII. 	<ul style="list-style-type: none"> • Blackouts and camouflaging to hinder the identification of Luftwaffe targets. • Decoy sites were located away from targets and used dummy buildings and lighting to replicate urban, military, or industrial areas. • Barrage balloons forced enemy aircraft to greater altitudes. • Searchlights were often used to track and divert adversary bomber crews during night raids.

Active defences such as anti-aircraft artillery present a greater risk of UXO contamination than passive defences. Unexploded ordnance resulting from dogfights and fighter interceptors is rarely encountered and difficult to accurately qualify.

12.3. Anti-Aircraft Artillery (AAA)

During WWII three main types of gun sites existed: heavy anti-aircraft (HAA), light anti-aircraft (LAA) and 'Z' batteries (ZAA). If the projectiles and rockets fired from these guns failed to explode or strike an aircraft they would descend back to land. The table below provides further information on the operation and ordnance associated with these type of weapons.

Anti-Aircraft Artillery				
Item	Description			
HAA	These large calibre guns such as the 3.7" QF (Quick Firing) were used to engage high flying enemy bombers. They often fired large HE projectiles, which were usually initiated by integral fuzes, triggered by impact, area, time delay or a combination of aforementioned mechanisms.			
LAA	These mobile guns were intended to engage fast, low flying aircraft. They were typically rotated between locations on the perimeters of towns and strategically important industrial works. As they could be moved to new positions with relative ease when required, records of their locations are limited. The most numerous of these were the 40mm Bofors gun which could fire up to 120 x 40mm HE projectiles per minute to over 1,800m.			
Variations in HAA and LAA Ammunition	Gun type	Calibre	Shell Weight	Shell Dimensions
	3.0 Inch	76mm	7.3kg	76mm x 356mm
	3.7 Inch	94mm	12.7kg	94mm x 438mm
	4.5 Inch	114mm	24.7kg	114mm x 578mm
	40mm	40mm	0.9kg	40mm x 311mm
Z-AA	Rockets were commonly designed to destroy heavily armoured military vehicles (anti-tank weapon). The device contains an explosive head (warhead) that can be accelerated using internal propellants to an intended target. Anti-aircraft rocket batteries were also utilised as part of air defence measures.			

The conditions in which anti-aircraft projectiles may have fallen unnoticed within a site area are analogous to those regarding air delivered ordnance. Unexploded anti-aircraft projectiles could essentially have fallen indiscriminately anywhere within range of the guns. The chance of such items being observed, reported and removed during the war depends on factors such as land use, ground cover, damage and frequency of access – the same factors that govern whether evidence of a UXB is likely to have been noted. More information about these factors with regards to this particular site can be found in the German Air Delivered Ordnance section of this report.

Illustrations of Anti-Aircraft artillery, projectiles and rockets are presented at **Appendix iv**.

12.4. Land Service Ammunition

The term LSA covers items of ordnance that are propelled, placed, or thrown during land warfare. These items may be filled or charged with explosives, smoke, incendiary, or pyrotechnics and can be divided into five main groups:

Land Service Ammunition (LSA)	
Item	Description
Mortar Rounds	A mortar round is normally nosed-fused and fitted with its own propelling charge. Its flight is stabilised by the use of a fin. They are usually tear-drop shaped (though older variants are parallel sided), with a finned 'spigot tube' screwed or welded to the rear end of the body which houses the propellant charge. Mortars are either High Explosive or Carrier (i.e. smoke, incendiary, or pyrotechnic).
Grenades	A grenade is a short range weapon designed to kill or injure people. It can be hand thrown or fired from a rifle or a grenade launcher. Grenades either contain high explosive or smoke producing pyrotechnic compounds. The common variants have a classic 'pineapple' shape.
Projectiles	A projectile (or shell) is propelled by force, normally from a gun, and continues in motion using its kinetic energy. The gun a projectile is fired from usually determines its size. A projectile contains a fuzing mechanism and a filling. Projectiles can be high explosive, carrier or Shot (a solid projectile).
Rockets	Rockets were commonly designed to destroy heavily armoured military vehicles (anti-tank weapon). The device contains an explosive head (warhead) that can be accelerated using internal propellants to an intended target. Anti-aircraft rocket batteries were also utilised as part of air defence measures.
Landmines	A landmine is designed to be laid on or just below the ground to be exploded by the proximity or contact of a person or vehicle. Landmines were often placed in defensive areas of the UK to obstruct potential invading adversaries.

In the UK unexploded or partially exploded mortars and grenades are the most common items of LSA encountered, as they could be transported and utilised anywhere. They are mostly encountered in areas used for military training and are often found discarded on or near historical military bases.

Images of the most commonly found items of LSA are presented in **Appendices v - vii**.

12.5. Small Arms Ammunition

The most common type of ordnance encountered on land used by the military are items of Small Arms Ammunition (SAA). SAA refers to the complete round or cartridge designed to be discharged from varying sized hand-held weapons such as rifles, machine guns and pistols. SAA can include bullets, cartridge cases and primers/caps. Example images of the most SAA are presented in **Appendix viii**.

13. The Likelihood of Contamination from Allied Ordnance

13.1. Introduction

There are several factors that may serve to either affirm, increase, or decrease the level of risk within a site with a history of military usage. Such factors are typically dependent upon the proximity of the proposed area of works to training activities, munition productions and storage, as well as its function across the years.

This section will examine the history of the proposed site and assess to what degree, if any, the site could have become contaminated as a result of the military use of the surrounding area.

13.2. Baguley Heavy Anti-Aircraft Battery

An in-house geo-dataset records the presence of a Heavy Anti-Aircraft Battery at Nan Nook Wood, Baguley, which was situated immediately north-west of the site. This is supported by wartime aerial imagery of the area, discussed further in the following section, which shows the presence of a small HAA Battery camp to the west of the site. HAA Batteries were often accompanied by an associated camp for those operating the Battery, and it's possible that items of ordnance may have been present within these camps, most likely in the form of bullets. Evidence suggests that the gun was unarmed in 1942, however the exact duration of its operation could not be discerned.³

13.3. WWII-Era Aerial Photography

WWII-era aerial photography for the site area was obtained from the National Monuments Record Office (Historic England). This photography provides a record of the potential composition of the site during the war, as well as its condition immediately following the war (see **Annex K**). This section discusses the images in relation to Allied features, while the images have already been presented in Section 11.7 in relation to any potential indicators of bombing.

WWII-Era Aerial Photography	
Date	Description
10 th August 1945	This image shows the presence of a Heavy Anti-Aircraft Battery approximately 150m west of the site, alongside associated structures. As well as this, two instances of potential trenches can be seen, one within <i>Nan Nook Wood</i> immediately west of the site. No evidence of any military activity is present within the site itself.

³ https://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=1472919&resourceID=19191

13.4. Evaluation of Contamination Risk from Allied UXO

1st Line Defence has considered the following potential sources of Allied ordnance contamination:

Allied UXO Records Summary	
Sources of Allied UXO Contamination	Conclusion
Military Camps <i>Military camps present an elevated risk from ordnance simply due to the large military presence and likelihood of associated live ordnance training.</i>	Wartime aerial imagery shows the presence of a Heavy Anti-Aircraft Battery Camp, situated approximately 150m west of the site. This feature does not appear substantial, made up of just a few structures adjacent to the battery itself.
Anti-Aircraft Defences <i>Anti-Aircraft defences were employed across the country. Proximity to anti-aircraft defences increases the chance of encountering AA projectiles.</i>	Evidence suggests that a HAA Battery was situated approximately 150m west of the site. The conditions in which HAA or LAA projectiles may have fallen unnoticed within a site footprint are generally analogous to those regarding German air delivered ordnance.
Home Guard Activity <i>The Home Guard regularly undertook training and ordnance practice in open areas, as well as burying ordnance as part of anti-invasion defences.</i>	Evidence of Home Guard activity is often difficult to locate, owing to the ad-hoc nature of Home Guard activity within each local area. Such training was often conducted on a small scale at the discretion of individual commanders and as such was seldom recorded officially. As such, no positive evidence could be found to confirm the presence of HG units within proximity to the site. However, wartime aerial imagery does show the presence of two potential trenches to the west of the site. No further information on these possible features has been found, and therefore it cannot be assessed if they are linked to Home Guard activities in the area, although it is thought likely that they are linked to the presence of the HAA Battery.
Defensive Positions <i>Defensive positions suggest the presence of military activity, which is often indicative of ordnance storage, usage or disposal.</i>	There is no evidence of any pillbox, emplacement or other defensive features formerly located on or bordering the site footprint.
Training or firing ranges <i>Areas of ordnance training saw historical ordnance usage in large numbers, often with inadequate disposal of expended and live items. The presence of these ranges significantly impact on the risk of encountering items of ordnance in their vicinity.</i>	No evidence of training or firing ranges could be found within the site or surrounding area.
Defensive Minefields <i>Minefields were placed in strategic areas to defend the country in the event of a German invasion. Minefields were not always cleared with an appropriate level of vigilance.</i>	There is no evidence of defensive minefields affecting the site.

Ordnance Manufacture <i>Ordnance manufacture indicates an increased chance that items of ordnance were stored, or disposed of, within a location.</i>	No information of ordnance being stored, produced, or disposed of within the proposed site could be found.
Military Related Airfields <i>Military airfields present an elevated risk from ordnance simply due to the large military presence and likelihood of associated live ordnance training or bombing practice.</i>	The site was not situated within the perimeters or vicinity of a military airfield.

14. The Likelihood of UXO Contamination Summary

The following table assesses the likelihood that the site was contaminated by items of German air delivered and Allied ordnance. Factors such as the risk of UXO initiation, remaining, and encountering will be discussed later in the report.

UXO Contamination Summary	
Quality of the Historical Record	<p>The research has evaluated pre- and post-WWII Ordnance Survey maps, official Home Office bombing statistics, Manchester bomb and damage mapping, an interactive bomb plot map, air raid damage files, anecdotal and published sources, an in-house geo-dataset and wartime aerial imagery of the site.</p> <p>The record set is of generally adequate quality, with most record sets corroborating and providing suitable coverage of the site area. Further records were available covering bombing and damage to properties, however given the lack of structures within the site during WWII, these were not relevant for this report.</p>
German Air-Delivered Ordnance	<ul style="list-style-type: none"> During WWII the site was located within the County Borough of Manchester. According to official Home Office bombing statistics, this borough sustained an overall low-moderate density of bombing, with an average of 27.1 items of ordnance recorded per 1,000 acres. Manchester and the wider area were not targeted to the same extent as cities such as London and Birmingham although Manchester city centre and Salford were nonetheless subject to several major raids. No evidence has been found to suggest that the site was subject to any bombing during WWII. Available bomb maps and written records do not record any bombing within close proximity, with the closest strike recorded over 200m from the site. As well as this, no obvious signs of bombing are observable within available wartime aerial imagery of the site, such as destroyed structures, bomb craters or otherwise disturbed ground. During WWII, the site comprised an area of open, undeveloped land. This type of ground cover is not considered to have been conducive to the detection of evidence of UXO, as bomb entry holes could be as small as 20cm in diameter and easily overlooked in undeveloped areas. Furthermore, given its undeveloped nature, with a lack of any structures within or immediately bordering the site, it is not deemed likely that the site would have been subject to regular levels of access or observation. Evidence of UXO is less likely to be noticed and recorded within infrequently accessed areas. Despite this, there is not anticipated to be a significant risk of contamination, due to the lack of evidence of any bombing within or bordering the site. As such, the site has been assessed as Low Risk of contamination from items of German UXO.
Allied Ordnance	<ul style="list-style-type: none"> An in-house geo-dataset records the presence of a Heavy Anti-Aircraft Battery at Nan Nook Wood, Baguley, which was situated immediately north-west of the site. This is supported by wartime aerial imagery of the area, which shows the presence of a small HAA Battery camp to the west of the site. HAA Batteries were often accompanied by an associated camp for those operating the Battery, and it's possible that items of ordnance may have been present within these camps, most likely in the form of bullets. Evidence suggests that the gun was unarmed in 1942, however the exact duration of its operation could not be discerned. As well as this, wartime aerial imagery does show the presence of two potential trenches to the west of the site. No further information on these possible features has been found, and therefore it cannot be assessed if they are linked to Home Guard activities in the area, although it is thought likely that they are linked to the presence of the HAA Battery. Despite the presence of the HAA Battery to the west of the site, and the existence of potential trenches in proximity to the site, no evidence of any military activity within the site itself has been found. As such, the risk from items of Allied UXO is not considered significant, however UXO Awareness Briefings are strongly recommended as a minimum precaution. The conditions in which HAA or LAA projectiles may have fallen unnoticed within the site boundary are analogous to those regarding air delivered ordnance.

15. The Likelihood that UXO Remains

15.1. Introduction

It is important to consider the extent to which any explosive ordnance clearance (EOC) activities or extensive ground works have occurred on site. This may indicate previous ordnance contamination or reduce the risk that ordnance remains undiscovered.

15.2. UXO Clearance

1st Line Defence has found no evidence in the public domain or within internal records that any official ordnance clearance operations have taken place on site. Note however that we have not received confirmation of this fact from the 33 EOD Regiment Archive (now part of 29 EOD & Search Group). It should also be noted that in addition to 29 EOD & Search Group archival information, 1st Line Defence also do not currently have access to data that may be relevant including 5131(BD)SQN Archive, SD Training Technical Advisory Section (TAS) and MACA Records (bomb disposal callouts).

If such information is available at a later date, it is recommended that it be reviewed as it will assist with understanding both levels and types of contamination likely to be present, and may indicate risk reduction in certain areas.

15.3. Post-War Redevelopment

Some development has been undertaken on site in post-war years, namely the construction of the athletics track, BMX track and associated hardstanding in the north of the site. The southern section of the site remains largely undeveloped.

The risk of UXO remaining is considered to be mitigated at the location of and down to the depth of any post-war redevelopment on site. For example, the risk from deep buried UXO will only have been mitigated within the volumes of any post-war pile foundations or deep excavations for basement levels. The risk will however remain within virgin geology below and amongst these post-war works, down to the maximum bomb penetration depth.

16. The Likelihood of UXO Encounter

16.1. Introduction

For UXO to pose a risk at a site, there should be a means by which any potential UXO might be encountered on that site.

The likelihood of encountering UXO on the site of proposed works would depend on various factors, such as the type of UXO that might be present and the intrusive works planned on site. In most cases, UXO is more likely to be present below surface (buried) than on surface.

In general, the greater the extent and depth of intrusive works, the greater the risk of encountering. The most likely scenarios under which items of UXO could be encountered during construction works is during piling, drilling operations or bulk excavations for basement levels. The overall risk will depend on the extent of the works, such as the numbers of boreholes/piles (if required) and the volume of the excavations.

Generally speaking, the risk of encountering any type of UXO will be minimal for any works planned within the footprint and down to the depth of post-war foundations and excavations.

16.2. Encountering Air Delivered Ordnance

Since an air delivered bomb may come to rest at any depth between just below ground level and its maximum penetration depth, there is a chance that such an item (if present) could be encountered during shallow excavations (for services or site investigations) into the original WWII ground level as well as at depth.

16.3. Land Service/Small Arms Ammunition Encounter

Items of LSA and SAA are mostly encountered in areas previously used for military training. Such items could have been lost, burnt, buried or discarded during being in use by the military. Due to this, LSA are most likely to be encountered at relatively shallow depths – generally in the top 1m below ground level. Therefore, such items are most likely to be encountered during open excavation works. In some cases, there is the potential that LSA or SAA may be present on the surface of the ground – especially in areas with active military use or were recently in use by the MoD.

17. The Likelihood of UXO Initiation

17.1. Introduction

UXO does not spontaneously explode. Older UXO devices will require an external event/energy to create the conditions for detonation to occur. The likelihood that a device will function can depend on a number of factors including the type of weaponry, its age and the amount of energy it is struck with.

17.2. Initiating Air Delivered Ordnance

Unexploded bombs do not spontaneously explode. All high explosive filling requires significant energy to create the conditions for detonation to occur.

In recent decades, there have been a number of incidents in Europe where Allied UXBs have detonated, and incidents where fatalities have resulted. There have been several hypotheses as to the reason why the issue is more prevalent in mainland Europe – reasons could include the significantly greater number of bombs dropped by the Allied forces on occupied Europe, the preferred use by the Allies of mechanical rather than electrical fuzes, and perhaps just good fortune. The risk from UXO in the UK is also being treated very seriously in many sectors of the construction industry, and proactive risk mitigation efforts will also have affected the lack of detonations in the UK.

There are certain construction activities which make initiation more likely, and several potential initiation mechanisms must be considered:

UXB Initiation	
Direct Impact	Unless the fuze or fuze pocket is struck, there needs to be a significant impact e.g. from piling or large and violent mechanical excavation, onto the main body of the weapon to initiate a buried iron bomb. Such violent action can cause the bomb to detonate.
Re- starting the Clock	A small proportion of German WWII bombs employed clockwork fuzes. It is probable that significant corrosion would have taken place within the fuze mechanism over the last 70+ years that would prevent clockwork mechanisms from functioning. Nevertheless, it was reported that the clockwork fuze in a UXB dealt with by 33 EOD Regiment in Surrey in 2002 did re-start.
Friction Impact	The most likely scenario resulting in the detonation of a UXB is friction impact initiating the shock-sensitive fuze explosive. The combined effects of seasonal changes in temperature and general degradation over time can cause explosive compounds to crystallise and extrude out from the main body of the bomb. It may only require a limited amount of energy to initiate the extruded explosive which could detonate the main charge.

If already deleting LSA and SAA contamination, remove the LSA and SAA paragraphs below.

17.3. Land Service/Small Arms Ammunition Initiation

Items of LSA generally do not become inert or lose their effectiveness with age. Time can cause items to become more sensitive and less stable. This applies equally to items submerged in water or embedded in silts, clays, or similar materials. The greatest risk occurs when an item of ordnance is struck or interfered with. This is likely to occur when mechanical equipment is used or when unqualified personnel pick up munitions.

If left alone, an item of LSA will pose little/no risk of initiation. Therefore, if it is not planned to undertake construction/intrusive works at the site, the risk of initiation of any LSA that may be present would be negligible. Similarly, those accessing a contaminated area would be at minimal risk if they do not interfere with any UXO present on the ground. Clearly for many end uses, however, the presence of UXO anywhere on a site would not be acceptable as it could not be guaranteed that the items will not be handled, struck or otherwise affected, increasing the likelihood of initiation.

Items of SAA are much less likely to detonate than LSA or UXBs, but can be accidentally initiated by striking the casing, coming into contact with fire, or being tampered with/dismantled. It is likely that the detonation of an item of SAA would result in a small explosion, as the pressure would not be contained within a barrel. Detonation would only result in local overpressure and very minor fragmentation from the cartridge case.

18. Consequences of Initiation/Encounter

18.1. Introduction

The repercussions of the inadvertent detonation of UXO during intrusive ground works, or if an item or ordnance is interfered with or disturbed, are potentially profound, both in terms of human and financial cost. A serious risk to life and limb, damage to plant and total site shutdown during follow-up investigations are potential outcomes. However, if appropriate risk mitigation measures are put in place, the chances of initiating an item of UXO during ground works is comparatively low.

The consequences of encountering UXO can be particularly notable in the case of high-profile sites (such as airports and train stations) where it is necessary to evacuate the public from the surrounding area. A site may be closed for anything from a few hours to a week with potentially significant cost in lost time. It should be noted that even the discovery of suspected or possible item of UXO during intrusive works (if handled solely through the authorities), may also involve significant loss of production.

18.2. Consequences of Detonation

When considering the potential consequences of a detonation, it is necessary to identify the significant receptors that may be affected. The receptors that may potentially be at risk from a UXO detonation on a construction site will vary depending on the site specific conditions but can be summarised as follows:

- People – site workers, local residents and general public.
- Plant and equipment – construction plant on site.
- Services – subsurface gas, electricity, telecommunications.
- Structures – not only visible damage to above ground buildings, but potentially damage to foundations and the weakening of support structures.
- Environment – introduction of potentially contaminating materials.

19. 1st Line Defence Risk Assessment

19.1. Risk Assessment Stages

Taking into account the quality of the historical evidence, the assessment of the overall risk from unexploded ordnance is based on the following five considerations:

1. That the site was contaminated with unexploded ordnance.
2. That unexploded ordnance remains on site.
3. That such items will be encountered during the proposed works.
4. That ordnance may be initiated by the works operations.
5. The consequences of encountering or initiating ordnance.

19.2. Assessed Risk Level

1st Line Defence has assessed that there is an overall **Low Risk** from German and anti-aircraft unexploded ordnance at the site of proposed works. There is an assessed **Low-Medium Risk** from Allied unexploded ordnance.

Ordnance Type	Risk Level			
	Negligible	Low	Medium	High
German Unexploded HE Bombs		✓		
German 1kg Incendiary Bombs		✓		
Anti-Aircraft Artillery Projectiles		✓		
Allied Land Service and Small Arms Ammunition		✓		

Please note – although the risk from unexploded ordnance on this site has been assessed as 'Low' and 'Low-Medium', this does not mean there is 'no' risk of encountering UXO. This report has been undertaken with due diligence, and all reasonable care has been taken to access and analyse relevant historical information. By necessity, when dealing historical evidence, and when making assessments of UXO risk, various assumptions have to be made which we have discussed and justified throughout this report. Our reports take a common-sense and practical approach to the assessment of risk, and we strive to be reasonable and pragmatic in our conclusions.

It should however be stressed that if any suspect items are encountered during the proposed works, 1st Line Defence should be contacted for advice/assistance, and to re-assess the risk where necessary. The mitigation measures outlined in the next section are recommended as a minimum precaution to alert ground personnel to the history of the site, what to look out for, and what measures to take in the event that a suspect item is encountered. It should also be noted that the conclusions of this report are based on the scope of works outlined in the 'Proposed Works' section of this report. Should the scope of works change or additional works be proposed, 1st Line Defence should be contacted to re-evaluate the risk.

20. Proposed Risk Mitigation Methodology

20.1. General

The following risk mitigation measures are recommended to support the proposed works at Wythenshawe Park, Manchester:

Recommended Risk Mitigation Measures	
Activity	Recommended Risk Mitigation Measure
All Works	<ul style="list-style-type: none"> UXO Risk Management Plan It is recommended that a site-specific plan for the management of UXO risk be written for this site. This plan should be kept on site and be referred to in the event that a suspect item of UXO is encountered at any stage of the project. It should detail the steps to be taken in the event of such a discovery, considering elements such as communication, raising the alarm, nominated responsible persons etc. Contact 1st Line Defence for help/more information. Site Specific UXO Awareness Briefings to all personnel conducting intrusive works. As a minimum precaution, all personnel working on the site should be briefed on the basic identification of UXO and what to do in the event of encountering a suspect item. This should in the first instance be undertaken by a UXO Specialist. Posters and information on the risk of UXO can be held in the site office for reference.

In making this assessment and recommending these risk mitigation measures, if known, the works outlined in the 'Scope of the Proposed Works' section were considered. Should the planned works be modified or additional intrusive engineering works be considered, 1st Line Defence should be consulted to see if a re-assessment of the risk or mitigation recommendations is necessary.

1st Line Defence Limited

27th February 2025

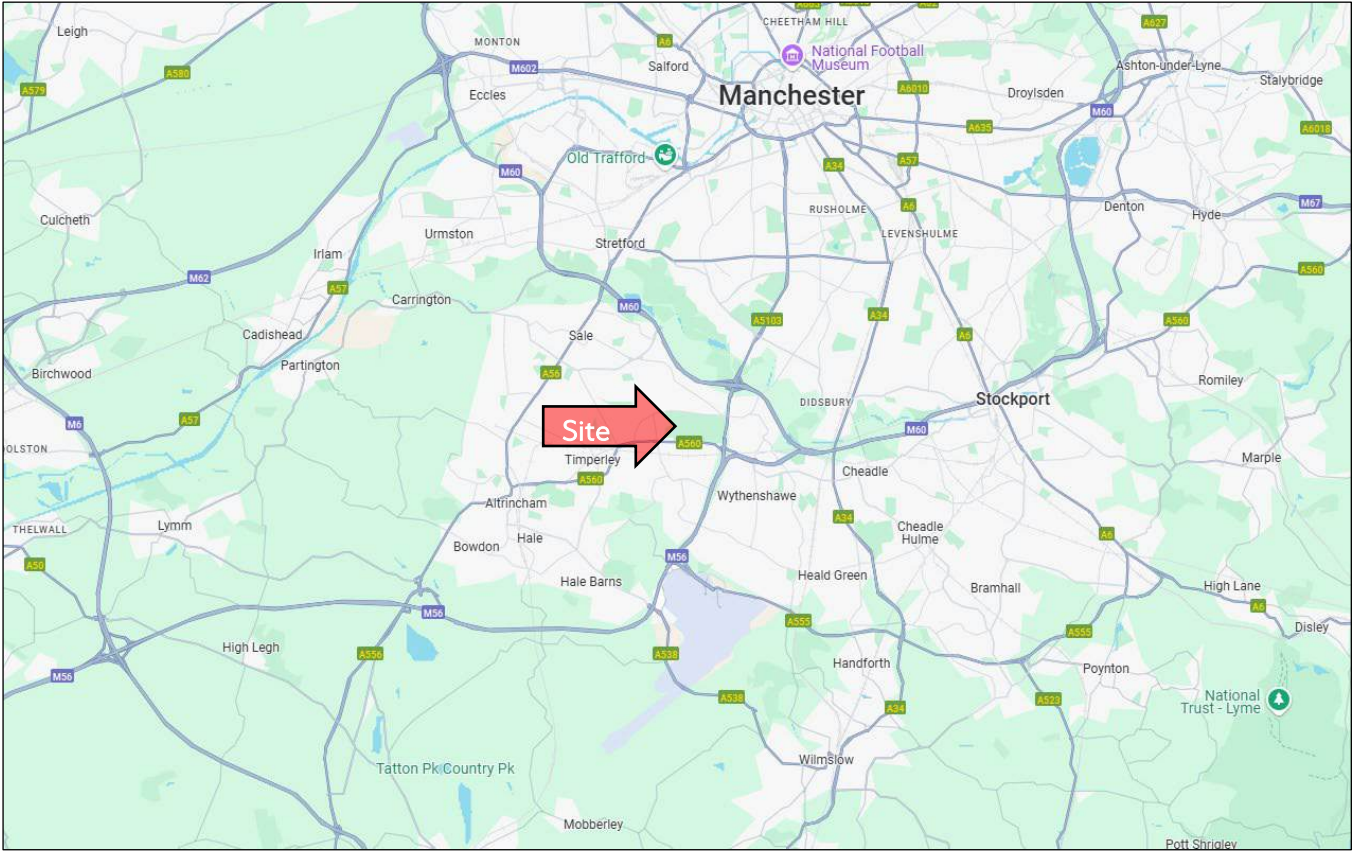
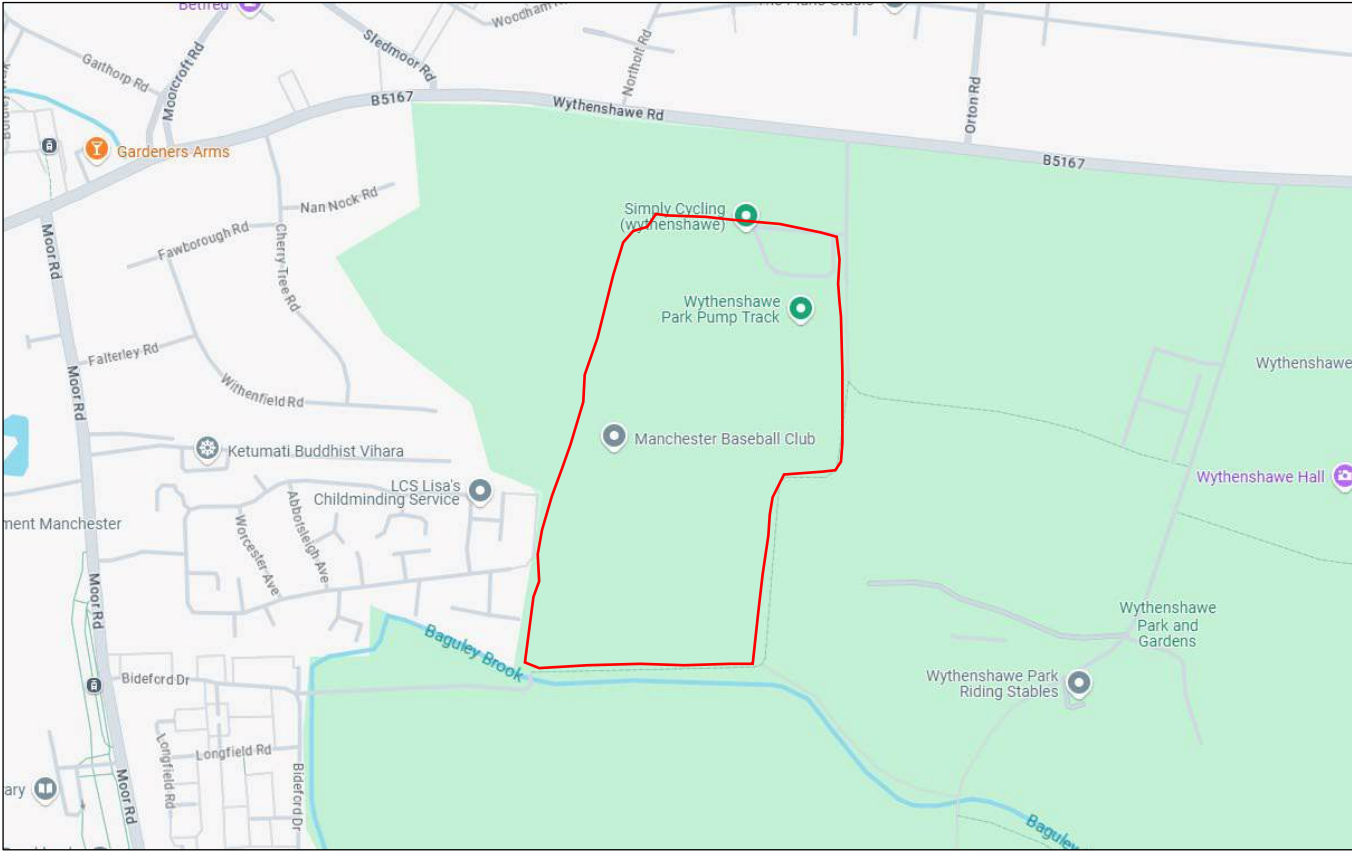
This Report has been produced in compliance with the Construction Industry Research and Information Association (CIRIA) C681 guidelines for the writing of Detailed UXO Risk Assessments.

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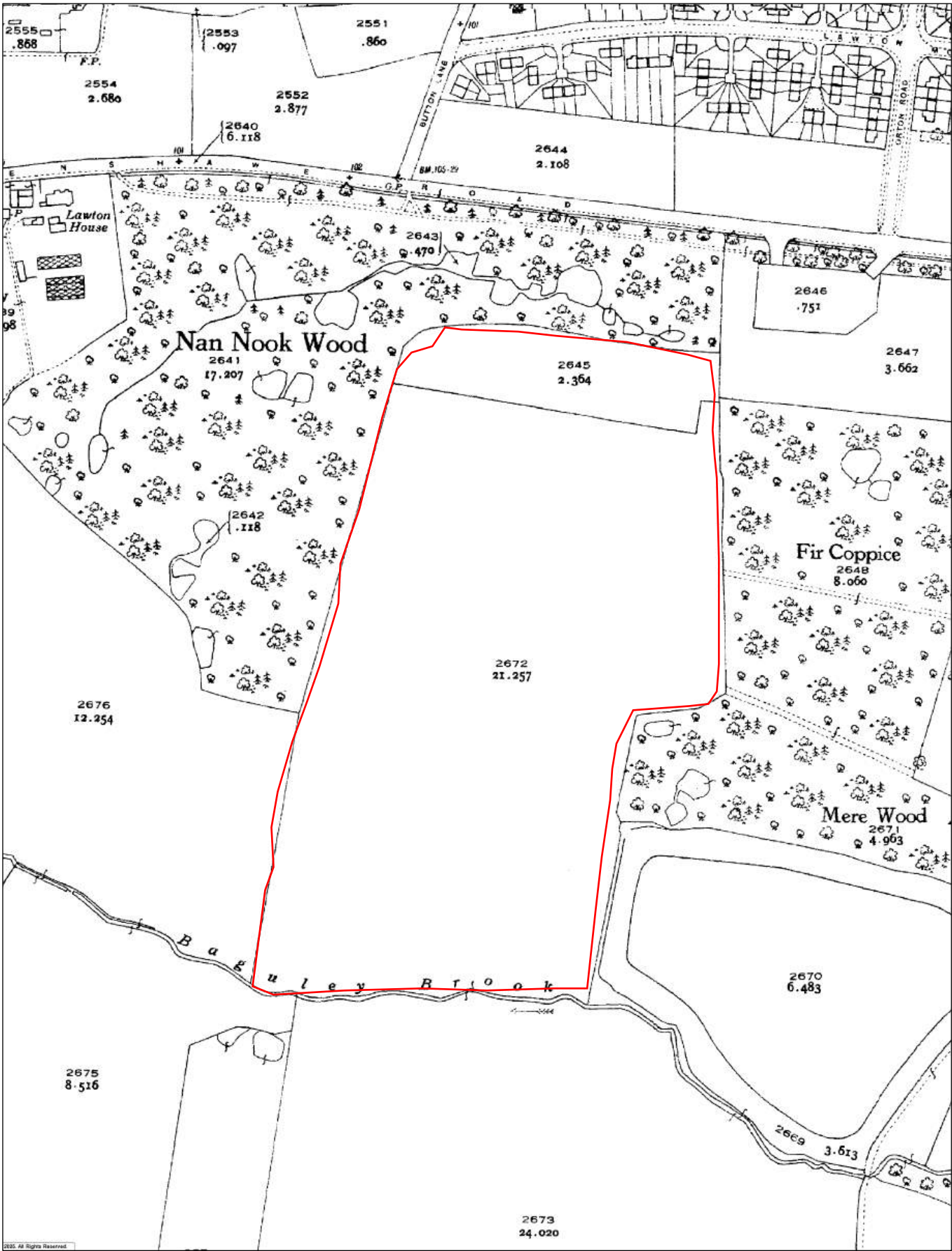
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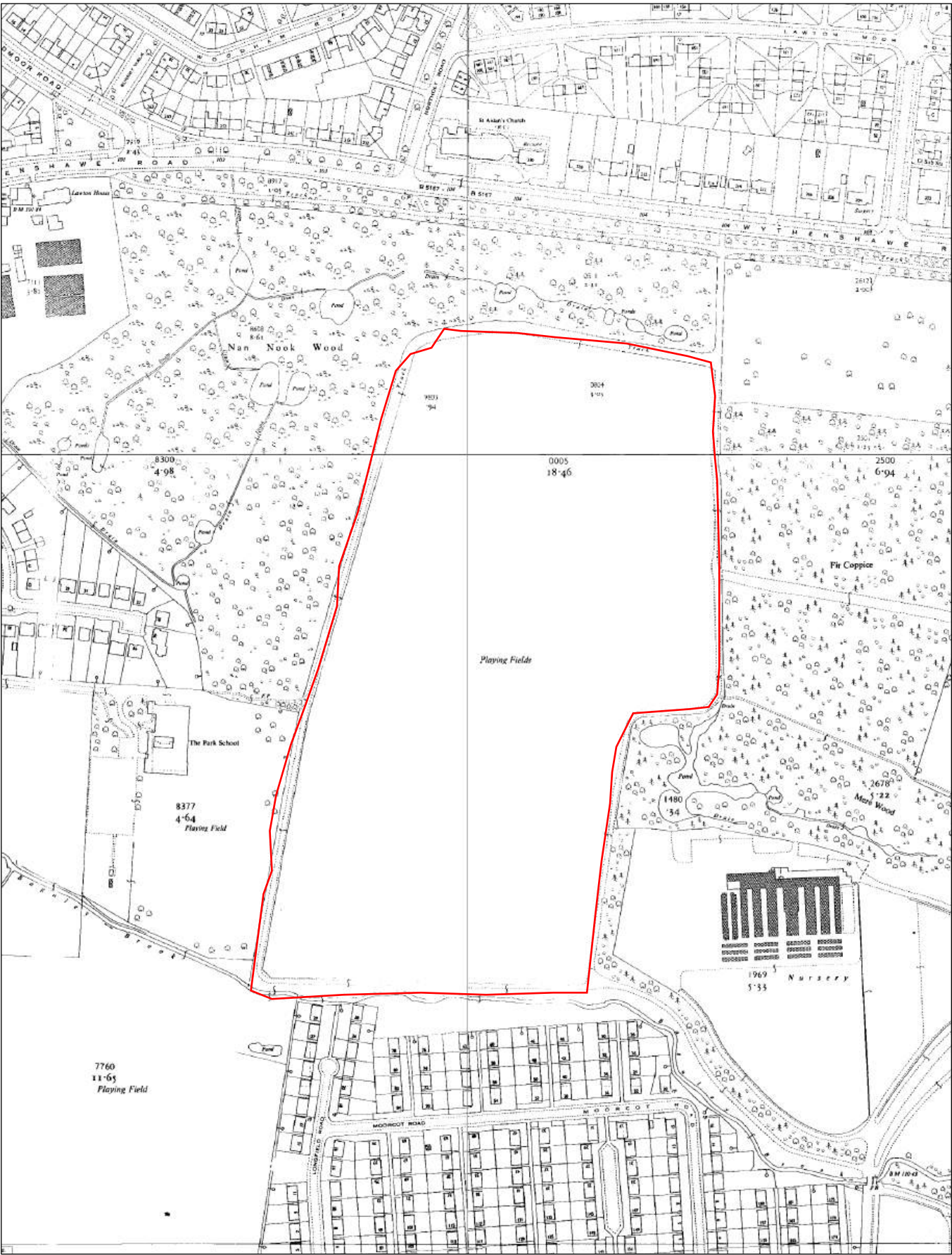
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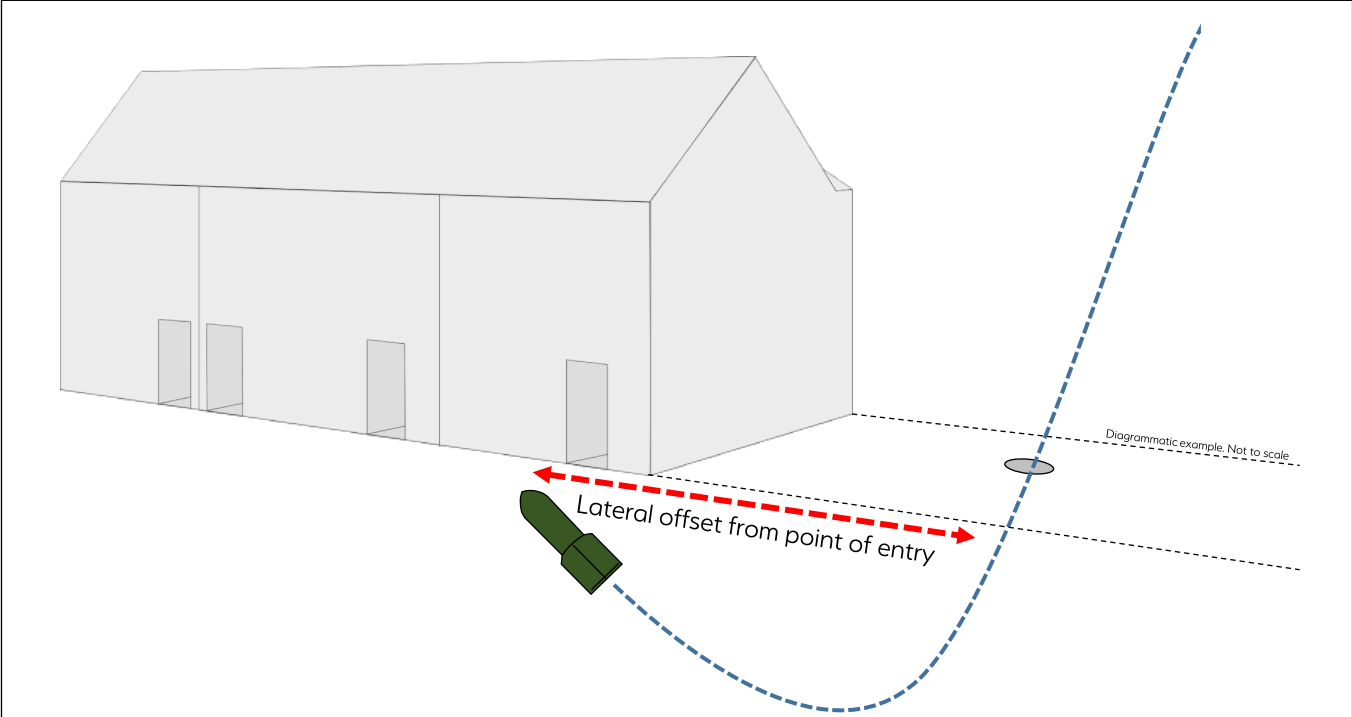












Top: J-curve Effect - Due to angle of entry, unexploded bombs would often end their trajectory at a lateral offset from point of entry, often ending up beneath adjacent extant structures/sites.

The photograph **above** shows a 250kg unexploded bomb found in Bermondsey in 2015, pointing upwards, demonstrating 'J-curve'.

One of the most common scenarios for UXO going unnoticed was when a UXB fell into a 'bomb site' (such as the area shown **Top Left**), the entry hole of the bomb obscured by any debris and rubble present. Note that the entry hole of a 50kg UXB could be as little as 20cm in diameter (**Left**).



BBC

NEWS

WW2 bomb found near London City Airport blown up



An unexploded World War Two bomb found near London City Airport has been detonated.

The 500kg device was discovered at the King George V Dock on Sunday during planned work at the airport.

It was closed and all flights were cancelled on Monday after an exclusion zone was put in place.

The detonation, which took place off Shoeburyness, Essex, was postponed on Tuesday because of high winds and dangerous conditions for divers.

The 1.5m-long German bomb - which was found in a bed of silt, 15m underwater - was carefully removed from the Thames and placed in a secure location a mile away from the coast of Essex.

500kg German HE Bomb, February 2018

BBC

NEWS

Exeter WW2 bomb is detonated after homes evacuated



More than 2,600 households and 12 university halls of residence were cleared before the 2,200lb (1,000kg) device **was destroyed** on Saturday.

Police said the blast left a crater about the size of a double-decker bus.

Police have reported large pieces of metal debris hitting buildings and said some properties in the 100m (330ft) exclusion zone had sustained "structural damage".



1000kg German HE bomb, February 2021

BBC

NEWS

Great Yarmouth: Huge blast after unplanned WW2 bomb detonation



A World War Two bomb found in Great Yarmouth has detonated while work was being done to defuse it, causing a huge blast that was heard for miles.

Army specialists were attempting to disarm it when there was an unplanned detonation at about 17:00 GMT.

People on social media said they heard a loud bang and felt buildings shake 15 miles (24km) away.

There have been no reports of injuries among the Army, emergency services or the public, Norfolk Police said.

Cordons were put in place when the bomb was first discovered close to two gas pipes on Tuesday, and work began to make it safe.

250kg German HE Bomb, February 2023

BBC

NEWS

Plymouth unexploded WW2 bomb: Thousands of people displaced



A 500kg (1,102lb) German World War Two bomb that forced the evacuation of thousands of people in Plymouth has been detonated at sea.

The unexploded device was **found in a garden** on St Michael Avenue on Tuesday, sparking four days of disruption.

On Friday police closed roads and rail and bus services were stopped as the bomb was transported 1.4 miles (2.3km) through the city's streets.

The device was taken by boat beyond the breakwater and detonated at 21:51 GMT.



500kg German HE Bomb, February 2024

BASF has confirmed that an explosive device, most likely a World War II-era bomb, caused the blast that left one person injured Tuesday at a plant construction site in Germany.

The explosion was reported at BASF's Ludwigshafen toluene diisocyanate (TDI) plant, which recently broke ground for a 300,000 metric tons per year TDI production plant and other construction to expand its facilities.



BASF Provides Some Details

Responding to a request from *PaintSquare News* for more information on Wednesday (Feb. 27), BASF's manager of media relations and corporate communications Europe, Ursula von Stetten, wrote in an email, "So here [are] the facts: The detonation took place at 10:00 a.m. One person was injured; the injury is not serious. He will be kept in the hospital for some days.

"Cause of the detonation was an explosive device, presumably a bomb deriving from the Second World War. The device detonated when grounding work was done. No details on [a] delay [are] available. At the moment, the exact circumstances of the incident are [being] evaluated."

1st March 2013

SPIEGEL ONLINE

Blast Kills One

World War II Bomb Explodes on German Motorway

A highway construction worker in Germany accidentally struck an unexploded World War II bomb, causing an explosion which killed him and wrecked several passing cars.



A World War II bomb has exploded during construction work on a German highway, killing one worker and injuring several motorists who were driving past, police said.

The worker had been cutting through the road surface near the south-western town of Aschaffenburg when his machine struck the bomb and triggered it. Police said they weren't sure yet what type of bomb it was. "The explosion seems to have been too small for it to have been an aircraft bomb," a police spokesman said.

23rd October 2006

WWII bomb injures 17 at Hattingen construction site



Seventeen people were injured on Friday when a construction crew unwittingly detonated a buried World War II-era bomb in Hattingen.

An excavator apparently drove over a 250-kilogramme (550 pound) American bomb, damaging surrounding buildings. Most of the injured suffered auditory trauma from the blast, and the excavator operator suffered injuries to his hands, police in the German state of North Rhine-Westphalia said.

"The hole was astoundingly small for such a large bomb full of so many explosives," Armin Gebhard, head of the Arnsberg department for military ordnance removal, told The Local. "But of course it damaged all the surrounding buildings too. We are really happy it wasn't worse."

19th September 2013

BBC NEWS

World War II bomb kills three in Germany



A special commission is investigating the causes of the explosion, while prosecutors are considering whether the team leader should face charges of manslaughter through culpable negligence, the BBC's Oana Lungescu reports from Berlin.

The blast happened an hour before the defusing operation was due to start.

Officials said the three men who died were experienced sappers, or combat engineers, who over 20 years had defused up to 700 bombs.

More than 7,000 people were immediately evacuated when the 500kg bomb was found. Several schools, a kindergarten and local companies remain closed.

2nd June 2010



June 2006

BBC

NEWS

Unexploded WW1 artillery shell found in Newark



An unexploded World War One artillery shell has been found in a river by a marina worker.

James Wilkinson, who works at Newark Marina in Nottinghamshire, was dredging the water at about 11.00 GMT when he uncovered the device.

A specialist bomb disposal unit carried out a controlled explosion to detonate the 18lb and 3in long "highly explosive" device.

Kirby residents react after grenade is detonated on housing estate



Residents react after wartime grenade 'with pin still in it' is detonated on housing estate

By George King

Essex Police officers were called to the Taylor Wimpey housing development in Thorpe Road, Kirby Cross, after the 70 plus-year-old hand grenade was discovered.

YORKSHIRE POST

Army called after unexploded WW2 shell found in village near Ilkley



Police have released photos of an old wartime mortar shell that was found in a rural Yorkshire village.

By Grace Newton

Army bomb disposal experts from the Royal Logistics Corps were called to Addingham, near Ilkley, yesterday to make the device safe.

Evening News

Police warning after discovery of unexploded mortar shell in Glossop moorland



This unexploded mortar shell was found on moorland above Glossop

The force said officers were alerted to the large metal shell on Saturday (February 20) by a member of the public.

It was identified by experts as an unexploded mortar shell, which the force described as 'very dangerous and unusual'.

Express & Star

Dozens more mortar shells found during work on Burntwood housing estate



A large number of mortar shells have been discovered on a building site in Burntwood forcing businesses to evacuate.

By Luke Bartlett

The shells were found by Staffordshire Police on the site near Milestone Way in Chase-town, and a 200m (656ft) cordon was soon after put in place.

Members of the public are being advised to stay away from the area near Morrisons supermarket while police deal with the shells.

Developers Taylor Wimpey and Baratt Homes were behind the plans to build 150 homes at Milestone Way.

SuffolkNews

Unexploded WW2 bomb found at Kenfig Pool, Bridgend



Bomb experts have been called to a south Wales nature reserve after an unexploded World War Two shell was discovered by a walker in Bridgend.

Dean Smith, 38, of Pyle, was walking near Kenfig Pool on Saturday when he saw a fin sticking out of the sand.

He reached down to pick it up, but ending up falling and landed with the 2ft-long (0.6m) bomb on top of him.

The site has been cordoned off by police and the Royal Logistics Corps will carry out a controlled explosion.

SwindonAdvertiser

Worker on old school site in Swindon finds buried explosives



At around 9.30am, the digger rubbed against the lid of something which was approximately 600mm below ground - and would have blown up instantly if broken.

AW Bombs are yellow phosphorous hand grenades in half pint clear glass bottles weighing 1.5lbs each, which ignite instantly once their liquid contents react with the outside air.

deadline.

Locals on Isle of Wight find 1ft long unexploded WW2 bomb



AN UNEXPLODED World War Two bomb has been discovered by locals on the Isle of Wight.

Bomb disposal experts were deployed to the B3323 in Shorwell, after police arrived and identified the dangerous device.

SuffolkNews

Icklingham mortar bomb is blown up by Army



Police had to guard an unexploded WW2 4in calibre mortar bomb overnight in a field near Icklingham until Army bomb disposal could blow it up on Tuesday.

The bomb had been found by farmworkers using a digger at about 2.50pm on Monday but by the time the Regiment Royal Logistic Corps 621 Squadron, 11 Explosive Ordnance Disposal, from Colchester, had examined it it was too dark to carry out a controlled explosion.

Army called as mortar discovered

An unexploded World War I mortar shell has been discovered at a house in Greater Manchester.

Police were called to the property on Rivington Road in Hale, Altrincham, on Tuesday morning by the man who found the device.

Officers sealed off the property put a cordon in place and closed neighbouring Chiltern Drive.

Army bomb disposal experts were called to the scene to make the device safe when they discovered it was empty.

The road has since reopened.

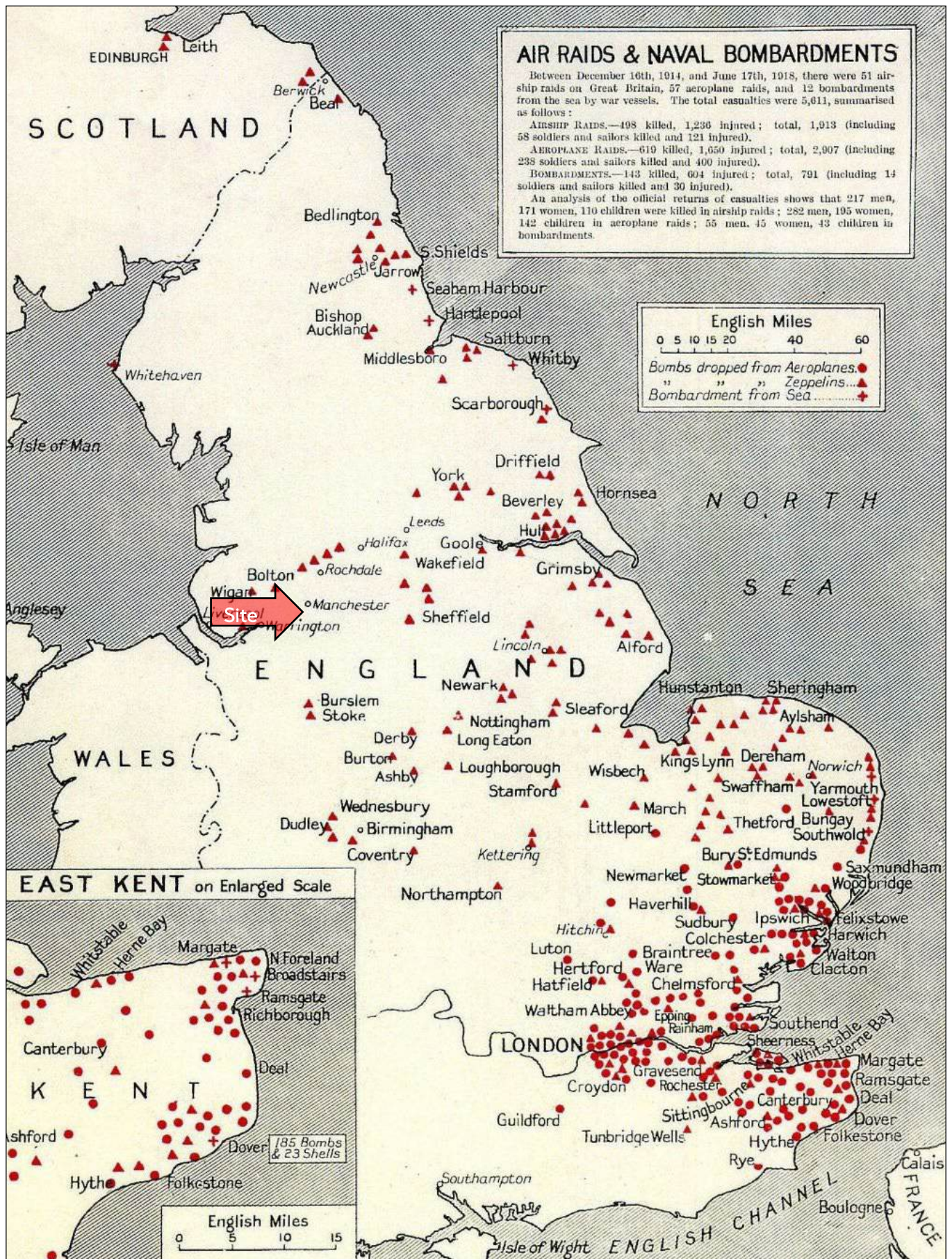
A Ministry of Defence (MoD) spokesman said: "It was a 4-inch WWI shell which turned out to be empty so it was not dangerous."

He added: "Apparently it's in good condition so they're planning on tidying it up and keeping it for the disposal team's collection."

Geoffrey Head, a former RAF armourer who lives opposite the property, said: "I learnt that the workmen who have been clearing the house had found it inside.

"I went over and had a look at it and I thought it was probably a very small artillery shell.

The 87-year-old added: "There was no indication as to whether or not it was activated but you can never be sure, so it was brought out and put in the garage."



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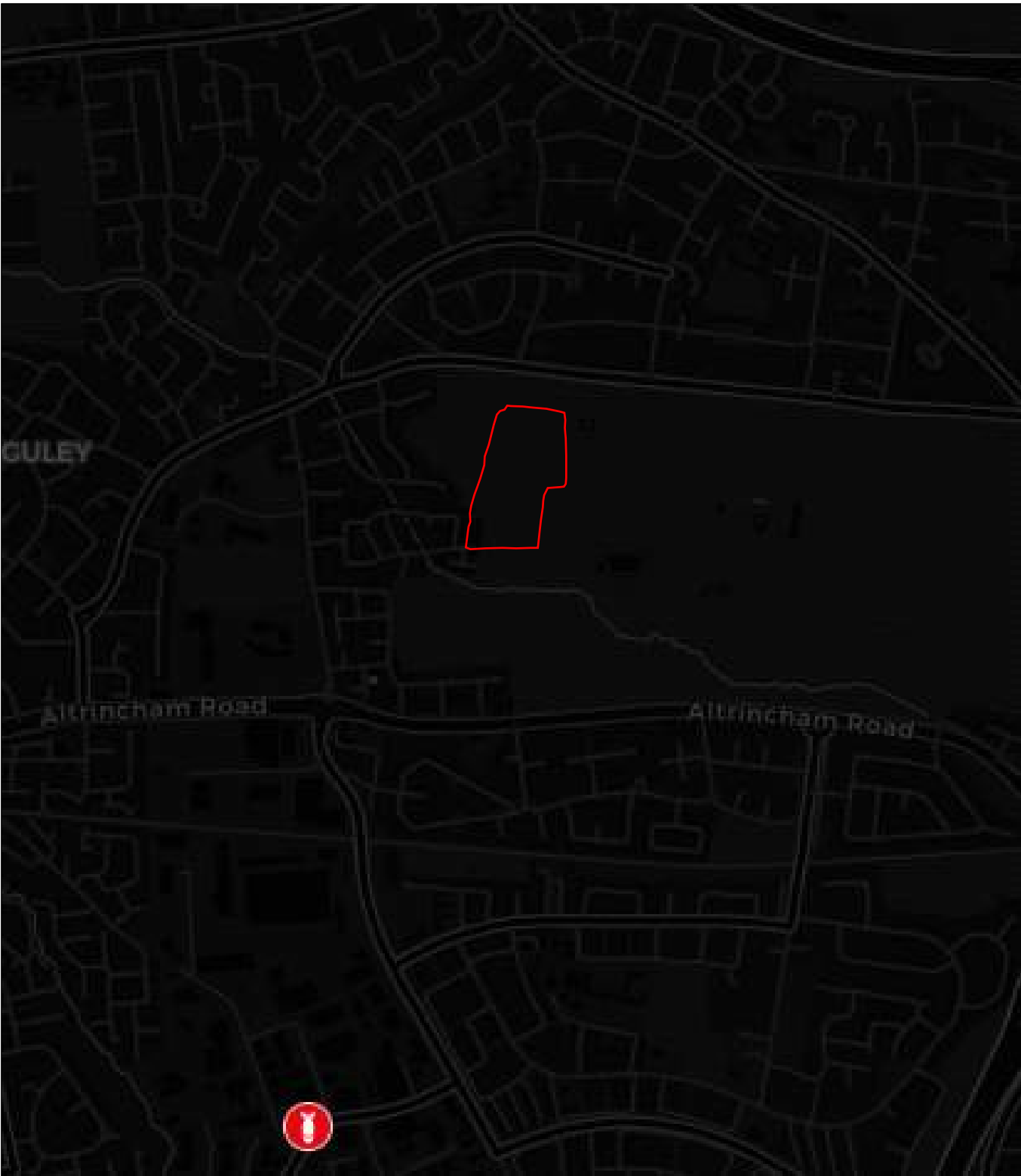
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Fire Bombs – Red Dots
High Explosives – Blue Dots
Mines – Green Dots



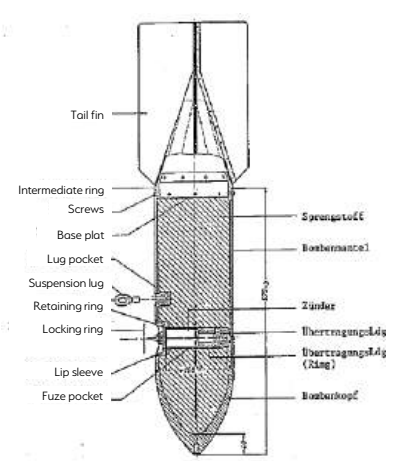
Bomb Incident Resulting in Fatality

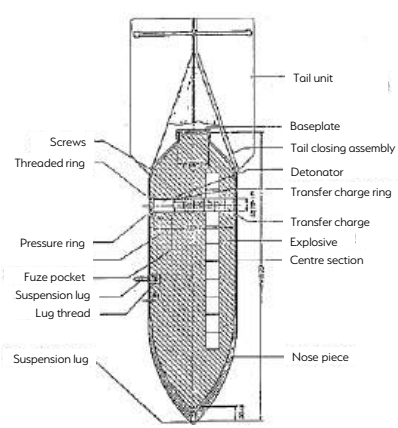


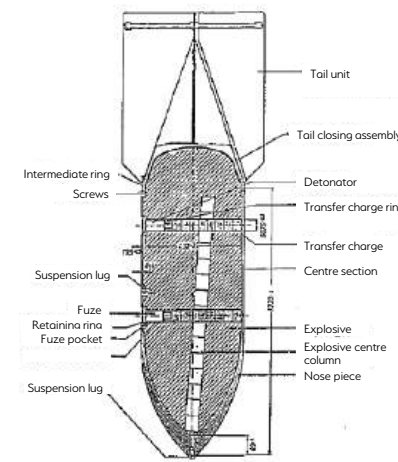






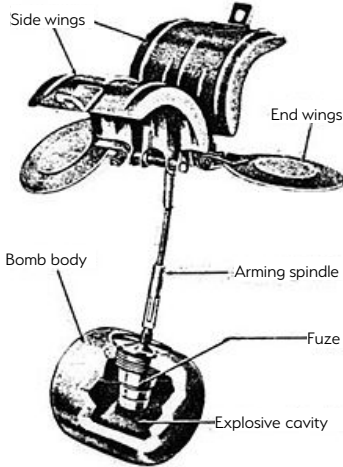
SC 50kg High Explosive Bomb		
Bomb Weight	40-54kg (88-119lb)	  
Explosive Weight	25kg (55lb)	
Fuze Type	Impact fuze/electro-mechanical time delay fuze	
Bomb Dimensions	1,090 x 280mm (42.9 x 11.0in)	
Body Diameter	200mm (7.87in)	
Use	Against lightly damageable materials, hangars, railway rolling stock, ammunition depots, light bridges and buildings up to three stories.	
Remarks	The smallest and most common conventional German bomb. Nearly 70% of bombs dropped on the UK were 50kg.	

SC 250kg High Explosive Bomb		
Bomb Weight	245-256kg (540-564lb)	  
Explosive Weight	125-130kg (276-287lb)	
Fuze Type	Electrical impact/mechanical time delay fuze	
Bomb Dimensions	1640 x 512mm (64.57 x 20.16in)	
Body Diameter	368mm (14.5in)	
Use	Against railway installations, embankments, flyovers, underpasses, large buildings and below-ground installations.	
Remarks	It could be carried by almost all German bomber aircraft and was used to notable effect by the Junkers Ju-87 Stuka (Sturzkampfflugzeug, or dive-bomber).	

SC 500kg High Explosive Bomb		
Bomb Weight	480-520kg (1,058-1,146lb)	  
Explosive Weight	250-260kg (551-573lb)	
Fuze Type	Electrical impact/mechanical time delay fuze	
Bomb Dimensions	1957 x 640mm (77 x 25.2in)	
Body Diameter	470mm (18.5in)	
Use	Against fixed airfield installations, hangars, assembly halls, flyovers, underpasses, high-rise buildings and below-ground installations.	
Remarks	40/60 or 50/50 Amatol TNT, Triolene. Bombs recovered with Triolene filling have cylindrical paper-wrapped pellets, 1-15/16in. in length and diameter.	

SD2 Anti-Personnel 'Butterfly Bomb'

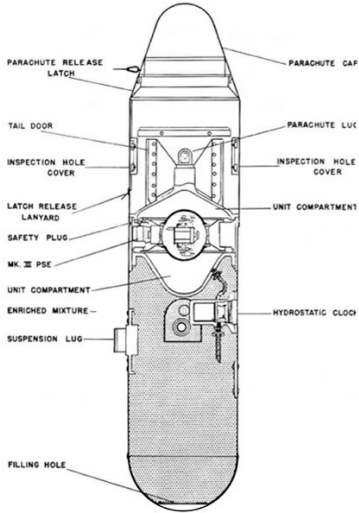
Bomb Weight	Approx. 2kg (4.41lb)
Explosive Weight	Approx. 7.5oz (225 grams) of Amatol surrounded by a layer of bituminous composition.
Fuze Type	41 fuze (time) , 67 fuze (clockwork time delay) or 70 fuze (anti-handling device)
Body Diameter	3in (7.62 cm) diameter, 3.1in (7.874) long
Use	Designed as an anti-personnel/fragmentation weapon. They were delivered by air, being dropped in containers of 23-144 sub-munitions that opened at a predetermined height, thus scattering the bombs.
Remarks	Quite rare. First used against Ipswich in 1940, but were also dropped on Kingston upon Hull, Grimsby and Cleethorpes in June 1943, amongst various other targets in UK. As the bombs fell the outer case flicked open via springs which caused four light metal drogues with a protruding 5 inch steel cable to deploy in the form of a parachute & wind vane, which armed the device as it span.





Parachute Mine (Luftmine B / LMB)

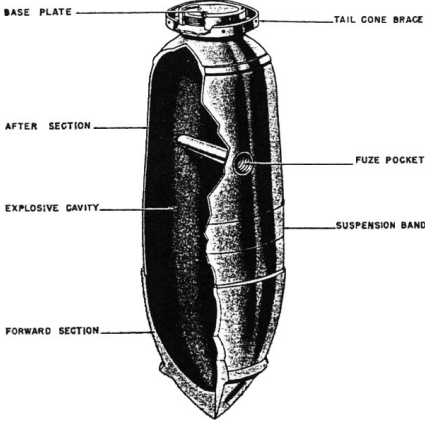
Bomb Weight	Approx. 990kg (2176lb)
Explosive Weight	Approx. 705kg (1,554lb)
Fuze Type	Impact/time delay/hydrostatic pressure fuze
Dimensions	2.64m x 0.64m (3.04m with parachute housing)
Use	Against civilian, military and industrial targets. Used as blast bombs and designed to detonate above ground level to maximise damage to a wider area.
Remarks	Deployed a parachute when dropped in order to control its descent. Had the potential to cause extensive damage within a 100m radius.



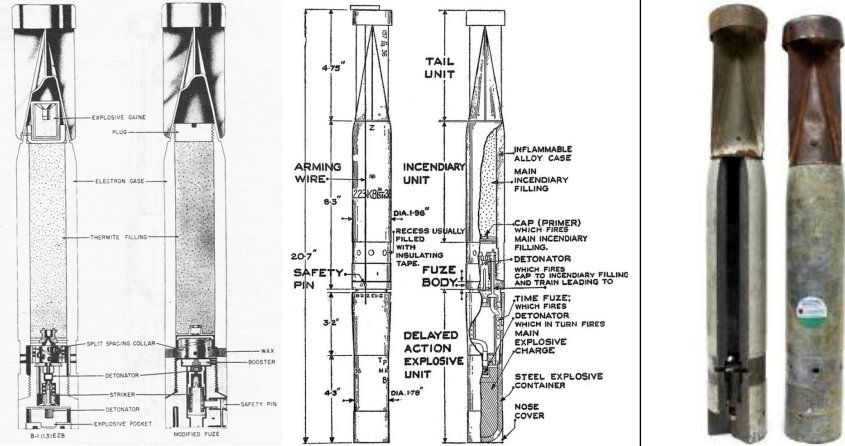


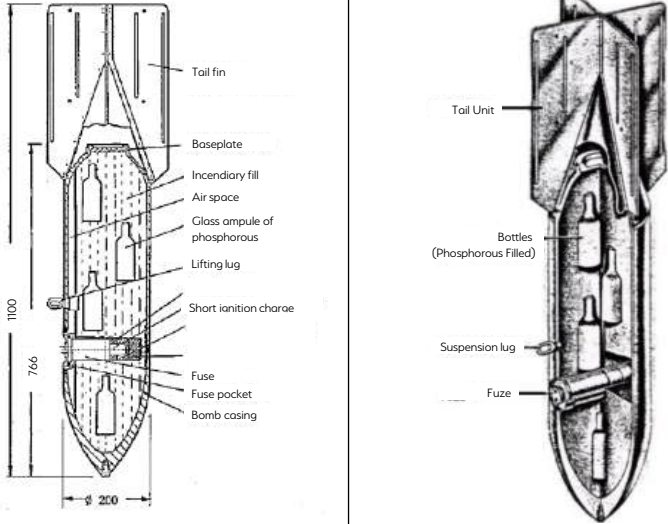
SC 1000kg High Explosive Bomb

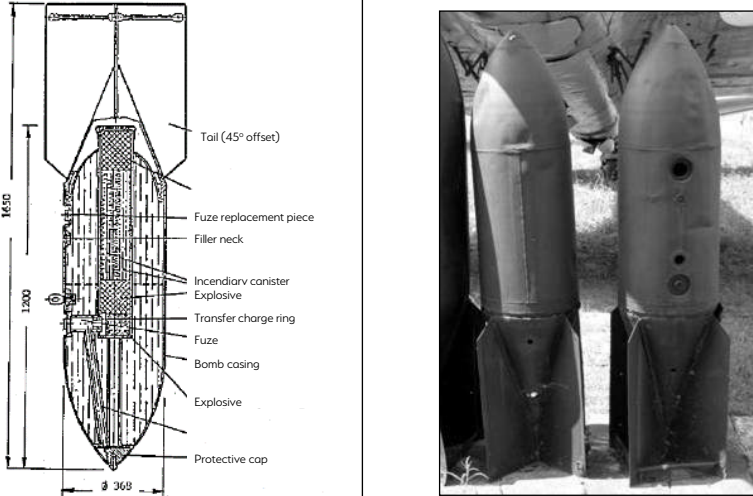
Bomb Weight	Approx. 993-1027kg (2,189-2,264lb)
Explosive Weight	Approx. 530-620kg (1168-1367lb)
Fuze Type	Electrical impact/mechanical time delay fuze.
Filling	Mixture of 40% amatol and 60% TNT, but when used as an anti-shipping bomb it was filled with Trialen 105, a mixture of 15% RDX, 70% TNT and 15% aluminium powder.
Bomb Dimensions	2800 x 654mm (110 x 25.8in)
Body Diameter	654mm (18.5in)
Use	SC-type bombs were General Purpose Bombs used primarily for general demolition work. Constructed of parallel walls with comparatively heavy noses, they are usually of three-piece welded construction.

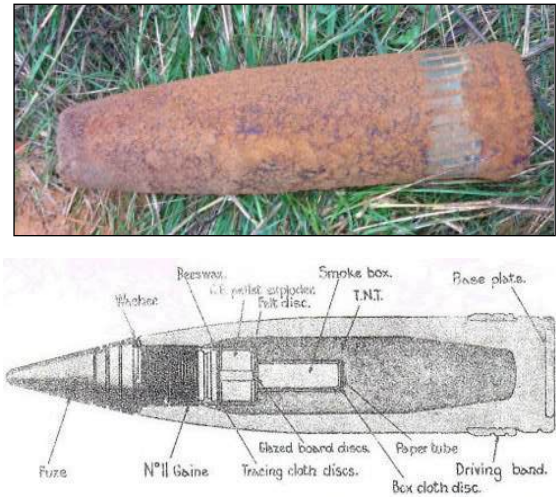


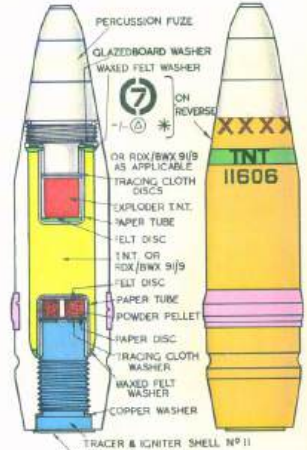


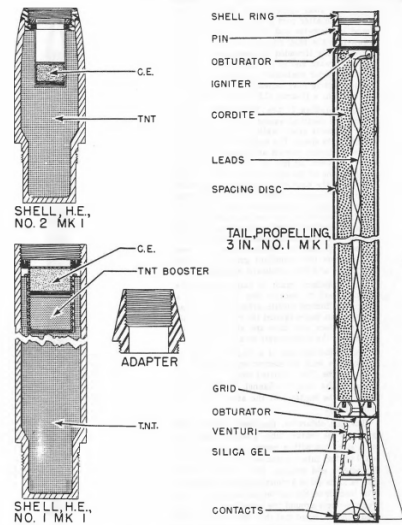
1kg Incendiary Bomb		
Bomb Weight	Approx. 1.0 - 1.3kg (2.2 and 2.9lb)	
Explosive Weight	Approx. 680g (1.5lb) Thermite 8-15gm Explosive Nitropenta	
Fuze Type	Impact fuze	
Bomb Dimensions	350 x 50mm (13.8 x 1.97in)	
Body Diameter	50mm (1.97in)	
Use	As incendiary – dropped in clusters on towns and industrial complexes.	
Remarks	Magnesium alloy case. Sometimes fitted with high explosive charge. The body is a cylindrical alloy casting threaded internally at the nose to receive the fuze holder and fuze.	

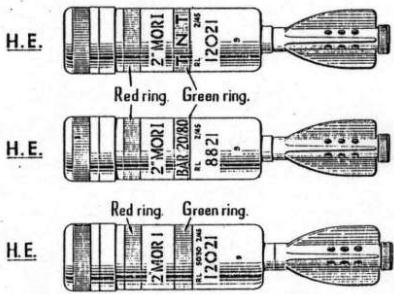
C50 A Incendiary Bomb		
Bomb Weight	Approx. 41kg (90.4lb)	
Explosive Weight	Approx. 0.03kg (0.066lb)	
Incendiary Filling	12kg (25.5lb) liquid filling with phosphor igniters in glass phials. Benzine 85%; Phosphorus 4%; Pure Rubber 10%	
Fuze Type	Electrical impact fuze	
Bomb Dimensions	1,100 x 280mm (43.2 x 8in)	
Use	Against any targets where an incendiary effect is required.	
Remarks	Early fill was a phosphorous/carbon disulphide incendiary mixture.	

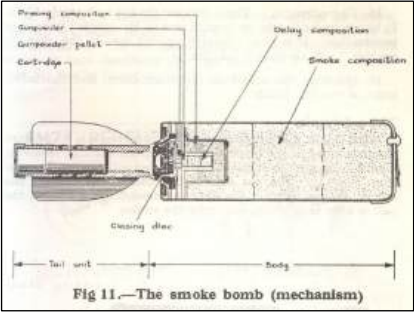
Flam C-250 Oil Bomb		
Bomb Weight	480-520kg (1,058-1,146lb)	
Explosive Weight	250-260kg (551-573lb)	
Fuze Type	Electrical impact/mechanical time delay fuze	
Bomb Dimensions	1957 x 640mm (77 x 25.2in)	
Body Diameter	470mm (18.5in)	
Use	Against fixed airfield installations, hangars, assembly halls, flyovers, underpasses, high-rise buildings and below-ground installations.	
Remarks	40/60 or 50/50 Amatol TNT, Triallene. Bombs recovered with Triallene filling have cylindrical paper-wrapped pellets, 1-15/16in. in length and diameter.	

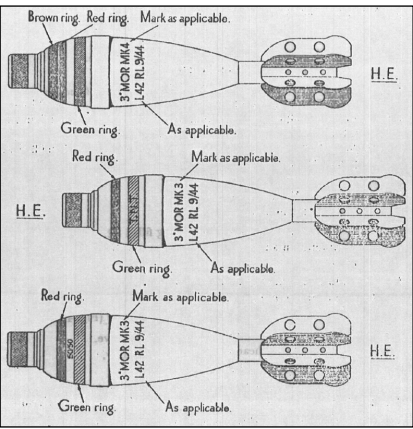
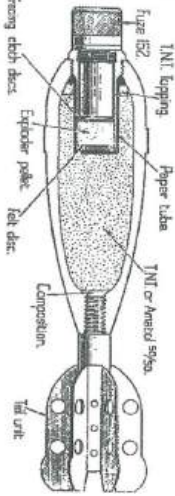
3.7 Inch QF Anti-Aircraft Projectile			
Projectile Weight	28lb (12.6 kg)		
Explosive Weight	2.52lbs		
Fuze Type	Mechanical Time Fuze		
Dimensions	3.7in x 14.7in (94mm x 360mm)		
Rate of Fire	10 to 20 rounds per minute		
Use	The 3.7in AA Mks 1-3 were the standard Heavy Anti-Aircraft guns of the British Army and were commonly used on the Home Front.		
Ceiling	30,000ft to 59,000ft		

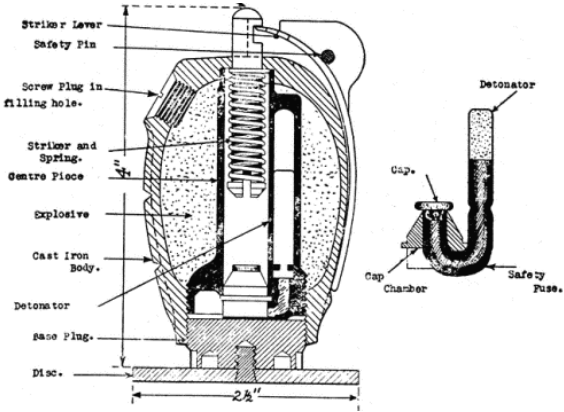
40mm Bofors Projectile			
Projectile Weight	1.96lb (0.86kg)		
Explosive Weight	300g (0.6lb)		
Fuze Type	Impact Fuze		
Rate of Fire	120 rounds per minute		
Projectile Dimensions	40 x 180mm		
Ceiling	23,000ft (7000m)		
Remarks	Light quick fire high explosive anti-aircraft projectile. Each projectile fitted with small tracer element. If no target hit, shell would explode when tracer burnt out. Designed to engage aircraft flying below 2,000ft.		

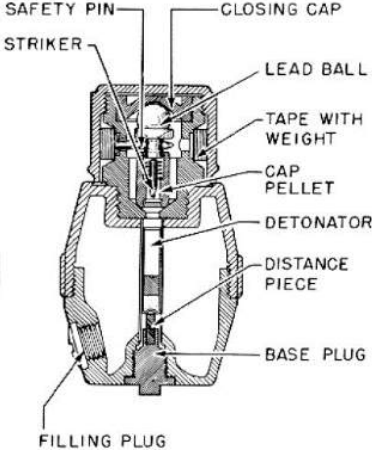
3in Unrotated Projectile (UP) Anti-Aircraft Rocket ("Z" Battery)			
HE Projectile Weight	3.4kg (7.6lb)		
Explosive Weight	0.96kg (2.13lb)		
Filling	High Explosive – TNT. Fitted with aerial burst fuzing		
Dimensions of projectile	236 x 83mm (9.29 x 3.25in)		
Remarks	As a short range rocket-firing anti-aircraft weapon developed for the Royal Navy. It was used extensively by British ships during the early days of World War II. The UP was also used in ground-based single and 128-round launchers known as Z Batteries. Shell consists of a steel cylinder reduced in diameter at the base and threaded externally to screw into the shell ring of the rocket motor.		

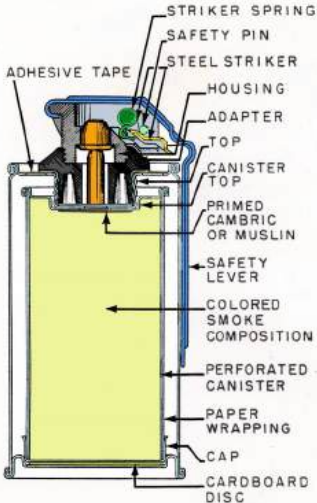
2 inch Mortar High Explosive		
Weight	Approx. 1.02kg (2.25lb)	<div><p>MARKINGS, BOMB, M.L. 2 INCH. MORTAR.</p></div> <div></div>
Maximum Range	460m (500yards)	
Filling	200g RDX/TNT	
Dimensions	51 x 290mm (2in x 11.4 in)	
Fuze Type	An impact fuze which detonates the fuze booster charge and in turn the high explosive charge.	
Use	It had greater range and firepower over hand and rifle grenades, and was used to attack targets behind cover with high explosive rounds.	
Identification	HE has a rounded edge to a flat back. Can either be a black body colour with red and yellow band or dark green with yellow band. Brass cap on top. Practice will have hole all the way through the top.	

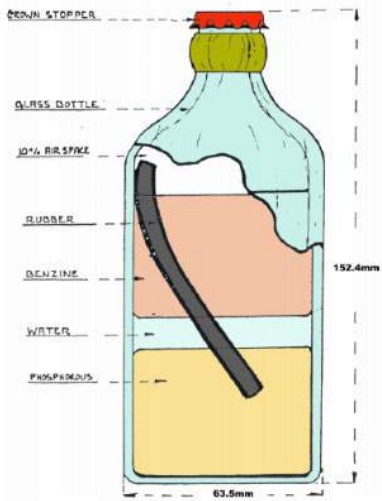
2 inch Mortar Smoke		
Weight	Approx. 910g (2lb)	<div><p>Fig 11.—The smoke bomb (mechanism)</p></div> <div></div>
Maximum Range	460m (500yards)	
Filling	White phosphorus and smoke fill	
Dimensions	51 x 290mm (2in x 11.4 in)	
Fuze Type	An impact fuze which initiates a bursting charge. This ruptures the mortar bomb's body and disperses the phosphorus filler.	
Identification	Smoke mortars have a recess and emission holes. May still see light green body paint. Look for stained ground around munition.	
Use	As a screening device for unit movement or to impair enemy field of vision.	

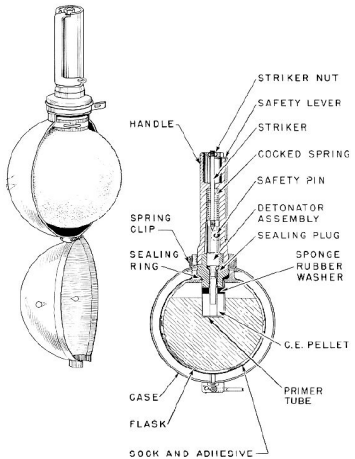
3 inch Mortar High Explosive		
Weight	Approx. 4.5kg (10lb)	<div></div> <div></div>
Maximum Range	1,460 (Mk1) – 2,560m (Mk2) (1,600 – 2,800yds)	
Dimensions	81mm (3in)	
Filling	Amatol	
Firing Mechanism	Drop, fixed striker	
Remarks	Fin-stabilised bomb fired by means of a charge consisting of a primary cartridge in the tail and four secondary cartridges.	
Identification	An old style mortar. Often no way of telling if HE or practice, so treat as HE.	

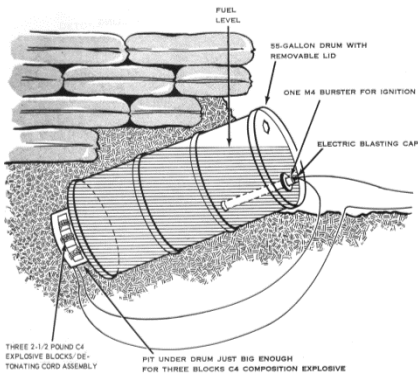
No. 36 'Mills' Grenade		
Weight	Approx. 765g filled (1lb 11.25oz)	
Explosive Weight	71g (2oz) filling.	
Fuze Type	4-7 second delay hand-throwing fuze. No. 6 Detonator	
Dimensions	95 x 61mm (4 x 2.4in)	
Use	Fragmentation explosive at approx. 30m range 100m range of damage.	
Remarks	First introduced in 1915, its classic grooved, cast-iron 'pineapple' design was designed to provide uniform fragmentation. The detonator is inserted before use after removing the base plug.	

No. 69 Grenade		
Weight	Approx. 383g (13.5oz)	
Fill Weight	93g (3.25 oz) of either Amatol, Baratol or Lyddite	
Fuze Type	'All-ways' fuze. Comprised of a safety cap, a weighted streamer attached to a steel ball bearing and a safety bolt designed to detonate from any point of impact.	
Dimensions	115 x 60mm (4.5 x 2.4 in)	
Use	A blast grenade for use as an offensive weapon. Detonator was inserted before use.	
Remarks	Introduced December 1940 and made from the plastic Bakelite as opposed to conventional metals. Detection is difficult due to this low metal content.	

No. 83 Smoke Grenade		
Weight	Approx. 680g (1.5lb)	
Explosive Weight	Approx. 170-200g. (6-7 oz)	
Fuze Type	Originally used a friction system using a match head composition. Later developed to a striker lever ignition system.	
Dimensions	Approx. 62 x 140mm (2.44 x 5.5 in)	
Use	Use as a target or landing zone marking device and as a screening method for troop / unit movement.	
Remarks	This basic design stayed relatively unchanged up to the 1980's. The letters CCC were often etched into the body of the grenade in the colour of the smoke.	

No. 76 Self Igniting Phosphorous (SIP) Grenade			
Weight	Approx. 1lb 3oz		
Filling	White Phosphorous and Benzene		
Design	The filling was contained in a ½ pint sized glass bottle with water and a strip of rubber. Over time the rubber dissolved to create a sticky which would self ignite when the bottle broke.		
Use	Originally intended as an anti-tank incendiary weapon deployed by hand. Designed to be produced cheaply without consuming materials needed to produce armaments on the front line.		
Remarks	The Home Guard hid caches of these grenades during the war. Not all locations were officially recorded and some caches were lost and encountered post-war. In all cases, the grenades are still found to be dangerous.		

No. 74 Grenade ("Sticky Bomb") Mk1			
Weight	Approx. 1.1kg (2.25lb)		
Filling	Approx. 600g Nobel's No.283 (Nitro-glycerine) (1.33lb)		
Design	A glass ball on the end of a Bakelite (plastic) handle. The inside of the ball would contain the explosive filling and the outside a very sticky adhesive coating.		
Use	An anti-tank grenade primarily issued to the home guard. It required the user to come in very close proximity of the target and smash the glass explosive container against it.		
Remarks	Timer fuze was located in the handle. This would explode after 3-6 secs.		

Flame Fougasse Bomb			
Weight	Various	 	
Filling	Initially a mixture of 40% petrol and 60% gas. Ammonal provided the propellant charge.		
Design	Usually constructed from a 40-gallon drum dug into a roadside and camouflaged.		
Use	As an improvised anti-tank bomb. When triggered the Fougasse could project a beam of burning sticky fuel in a fixed direction from up to 3m (10ft) wide and 27m (30yards) long.		
Remarks	A highly unorthodox weapon designed by the Petroleum Warfare Department to address a critical lack of weapons in 1940. 50,000 are estimated to have been distributed around the UK.		

Common WWII-era Aircraft Mounted Gun Ammunition



7.7x56R 13x64B 12.7x81SR 12.7x99 12.7x108 15x96 20x72RB 20x80RB 20x82 20x94 20x98R 20x101RB 20x110RB 20x110 20x125 23x152B 30x90RB

7.92x57 jap. 13mm MG 131 Bf109K FW190A8 MG 7,92mm Bf109E,F Bf110C Ju87

15mm MG 151 Bf109F

MgFF cannon Bf109E Bf110C Ju87

Mg 151 cannon 20mm FW190

ShVAK 20mm Il2, yak3 others

Ho-5 cannon 20mm jap.

Hispano 20mm cannon spitfire mkl1B

Ho-3 cannon 20mm Jap.

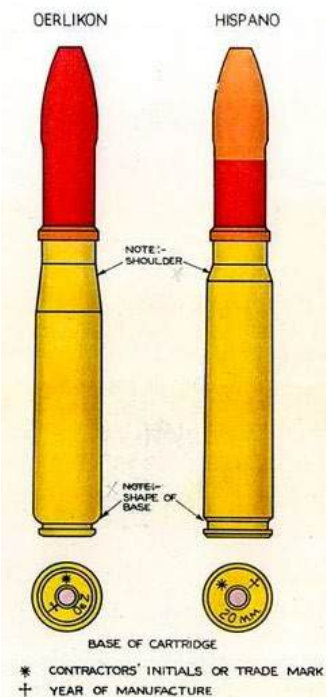
MK 108 canr Bf109G6,Me. others

VYa cannon yak il2

MK FW1

7,7mm spitfire MK1 Hurricane MK1 others

classic Browning P-40, P47, P51



OERLIKON HISPANO

NOTE:- SHOULDER

NOTE:- SHAPE OF BASE

BASE OF CARTRIDGE

* CONTRACTORS' INITIALS OR TRADE MARK

+ YEAR OF MANUFACTURE

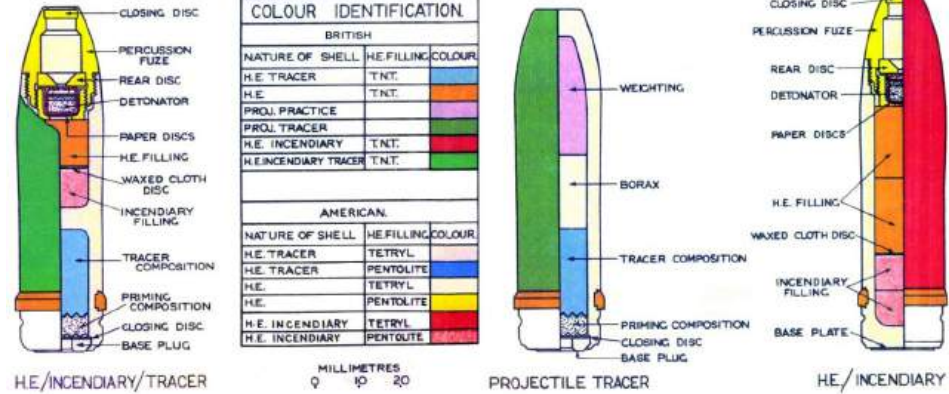
.303 British Rifle Ammunition

Bullet Diameter	7.92mm
Case length	56.44mm
Overall length	78.11mm
Type	Rifle Ammunition
Propellant	Originally black powder. Later Cordite followed by Nitrocellulose
Remarks	First produced in 1889 and still in use today, the .303inch cartridge has progressed through ten 'marks' which eventually extended to a total of around 26 variations.





20mm Oerlikon Cannon Rounds



CLOSING DISC

PERCUSSION FUZE

REAR DISC

DETONATOR

PAPER DISCS

H.E. FILLING

WAXED CLOTH DISC

INCENDIARY FILLING

TRACER COMPOSITION

PRIMING COMPOSITION

CLOSING DISC

BASE PLUG

H.E./INCENDIARY/TRACER

COLOUR IDENTIFICATION

BRITISH

NATURE OF SHELL H.E. FILLING COLOUR

H.E. TRACER T.N.T.

H.E. T.N.T.

PROJ. PRACTICE

PROJ. TRACER

H.E. INCENDIARY T.N.T.

H.E. INCENDIARY TRACER T.N.T.

AMERICAN

NATURE OF SHELL H.E. FILLING COLOUR

H.E. TRACER TETRIL

H.E. TRACER PENTOLITE

H.E. TETRIL

H.E. PENTOLITE

H.E. INCENDIARY TETRIL

H.E. INCENDIARY PENTOLITE

WEIGHTING

BORAX

TRACER COMPOSITION

PRIMING COMPOSITION

CLOSING DISC

BASE PLUG

PROJECTILE TRACER

CLOSING DISC

PERCUSSION FUZE

REAR DISC

DETONATOR

PAPER DISCS

H.E. FILLING

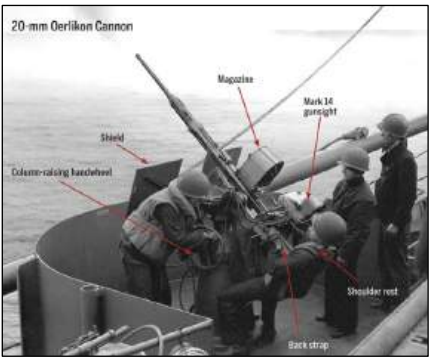
WAXED CLOTH DISC

INCENDIARY FILLING

BASE PLATE

H.E./INCENDIARY

MILLIMETRES 0 10 20



20-mm Oerlikon Cannon

Magazine

Shield

Column-raising handle

Mark 16 gunsight

Shoulder rest

Back strap

1st Line Defence

Unit 3, Maple Park
Essex Road, Hoddesdon
Hertfordshire EN11 0EX

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Appendix 7: Classification of Risk

