

Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: Provisional

Map date: 1965-1967

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1965
Edition N/A
Copyright N/A
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Surveyed 1966
Revised 1966
Edition N/A
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Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

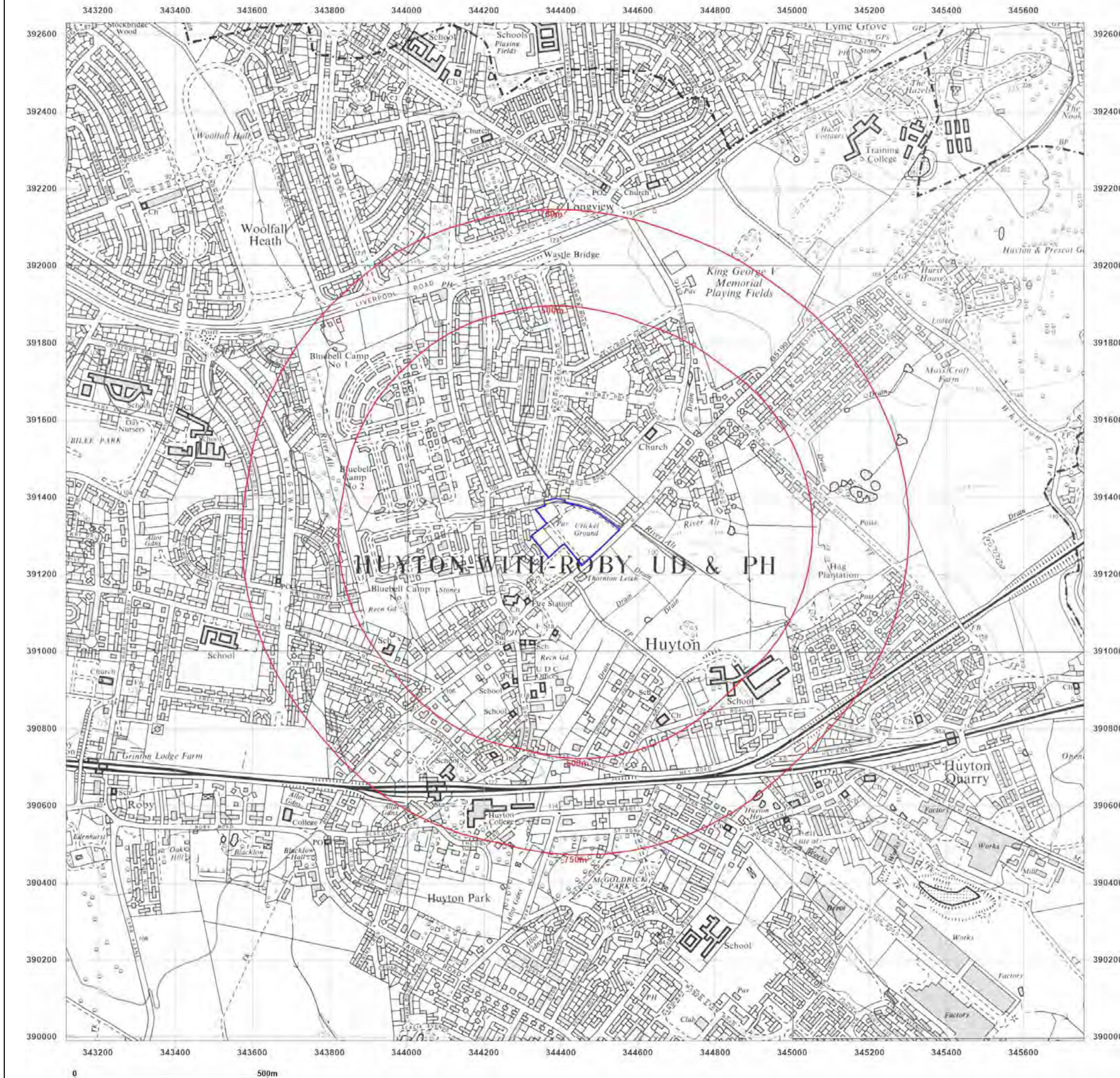


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Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 1989-1990

Scale: 1:10,000

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Edition N/A
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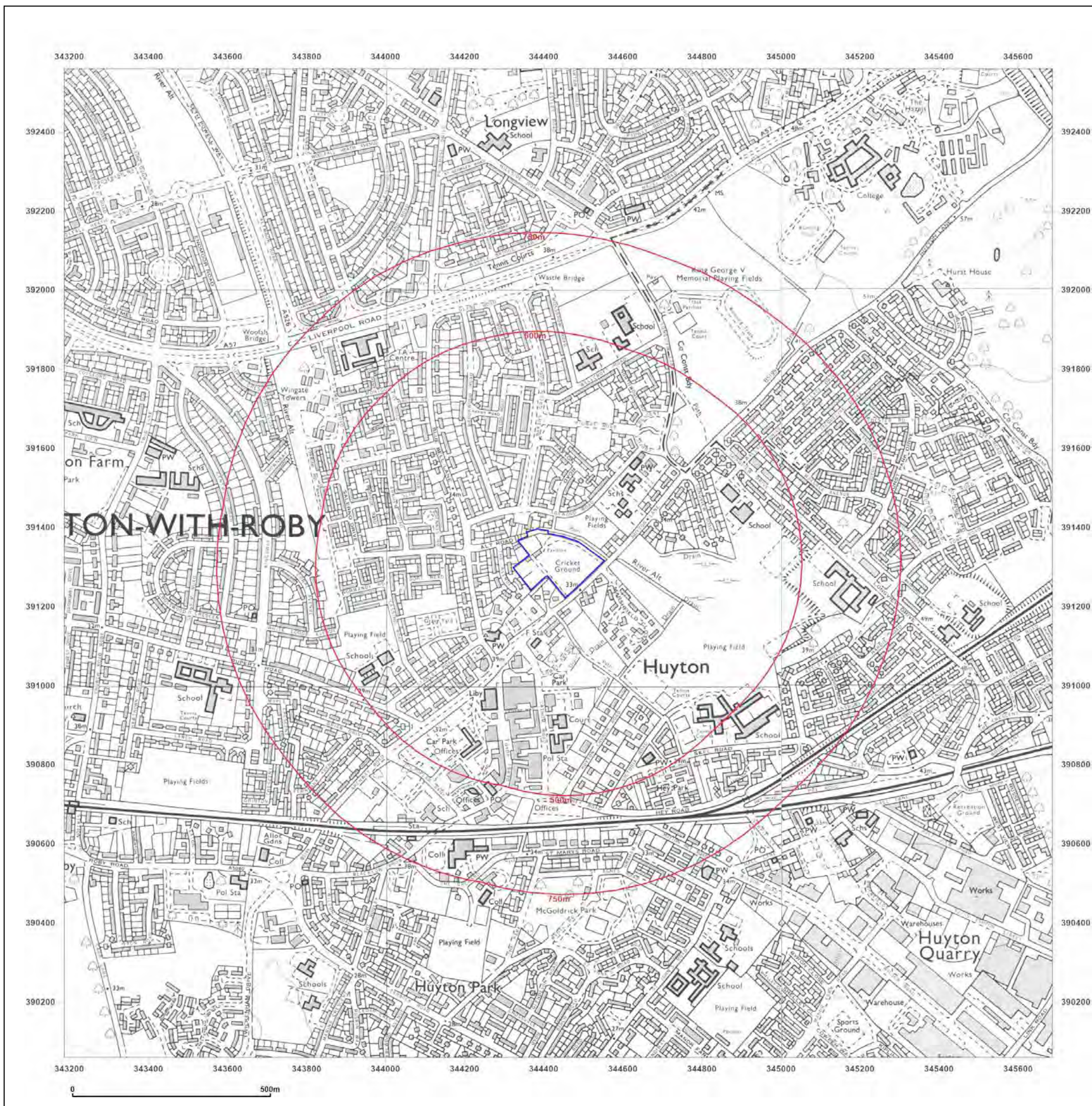


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Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

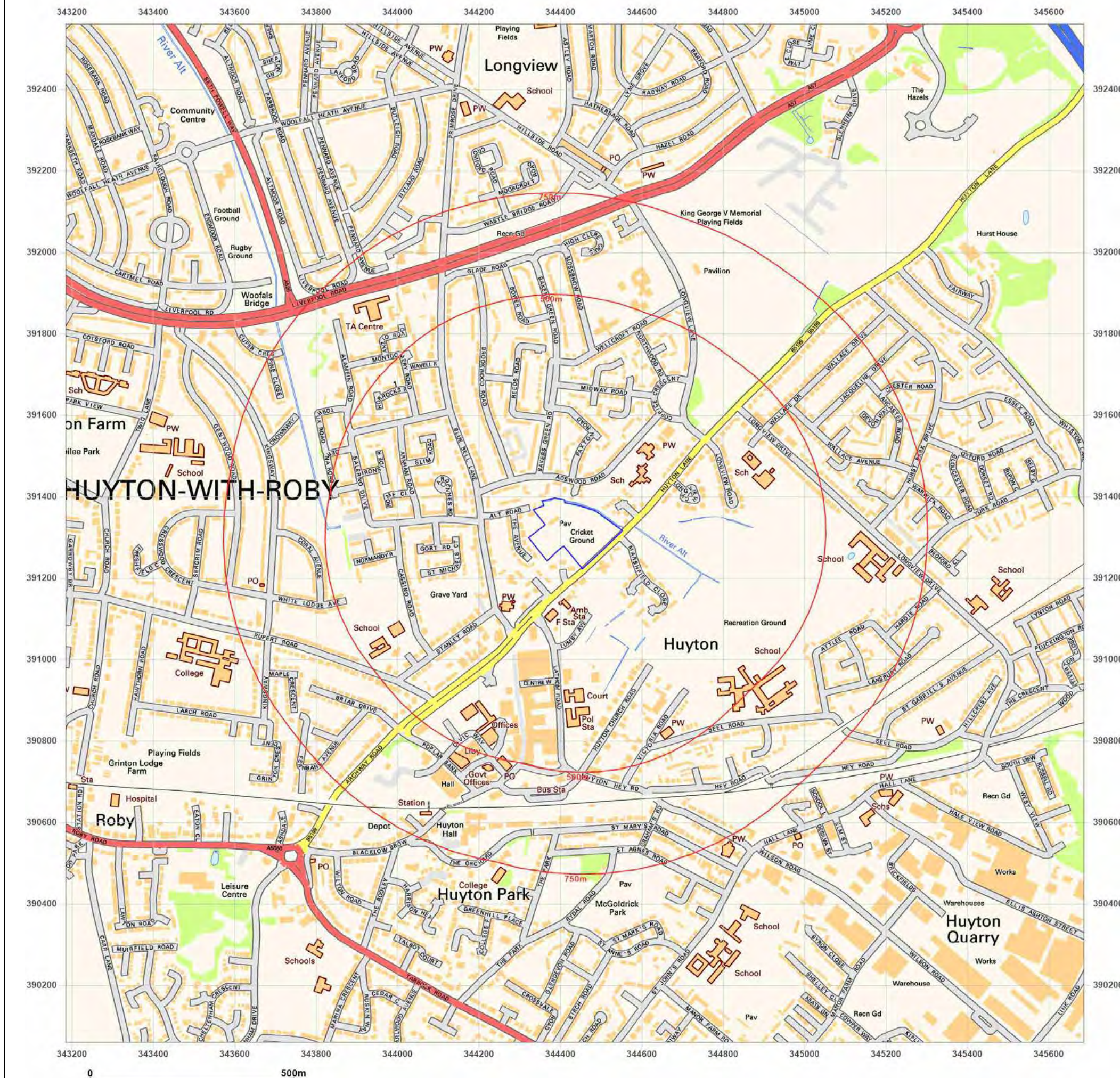


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Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

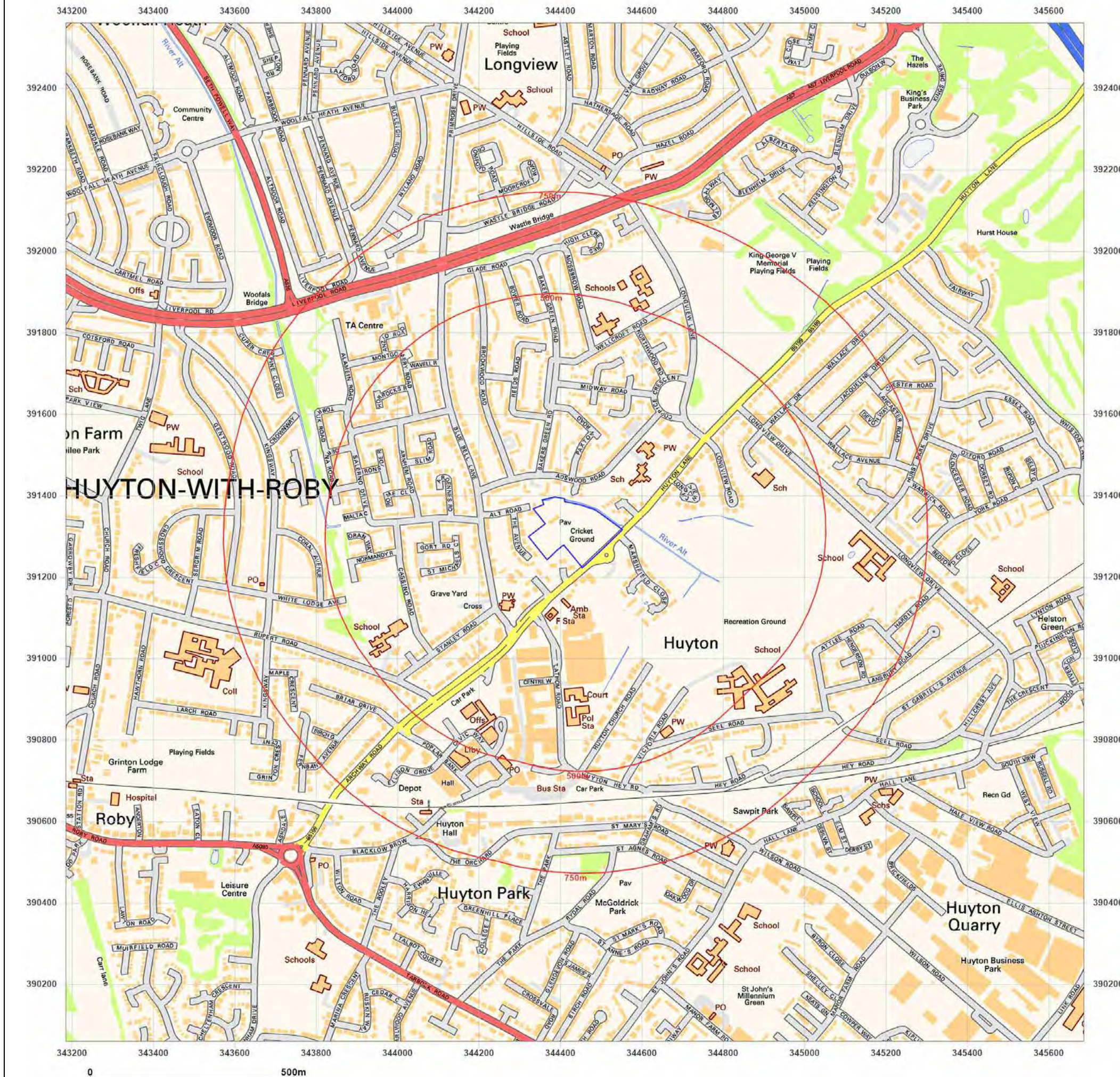


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Site Details:

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HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 2025

Scale: 1:10,000

Printed at: 1:10,000

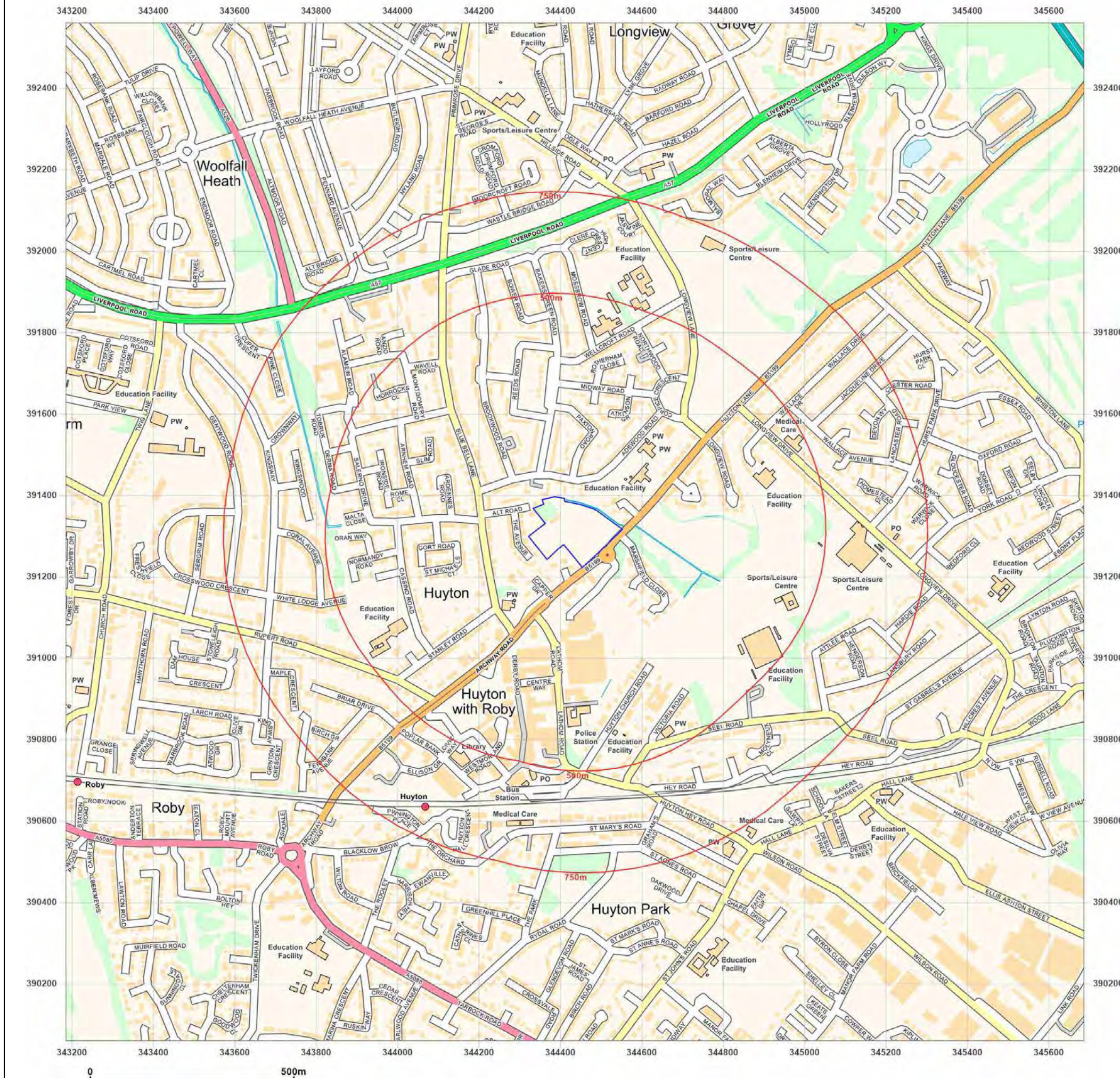


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APPENDIX 5

GROUNDSURE COMBINED ENVIRO + GEO INSIGHT REPORT

HUYTON CRICKET CLUB, HUYTON LANE, HUYTON, KNOWSLEY, L36 7XH

Order Details

Date: 08/04/2025
Your ref: 4334-080425/AS
Our Ref: GS-4A1-A5S-1K8-VTF

Site Details

Location: 344429 391316
Area: 2.26 ha
Authority: [Knowsley Metropolitan Borough Council](#)
↗



Summary of findings

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

[p. 9 >](#)

OS MasterMap site plan

[p.14 >](#) [Insight User Guide](#) ↗

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	0	13	7	-
16 >	1.2 >	Historical tanks >	0	0	1	16	-
17 >	1.3 >	Historical energy features >	0	0	6	13	-
18	1.4	Historical petrol stations	0	0	0	0	-
19	1.5	Historical garages	0	0	0	0	-
19	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
20 >	2.1 >	Historical industrial land uses >	0	0	13	7	-
21 >	2.2 >	Historical tanks >	0	0	1	19	-
22 >	2.3 >	Historical energy features >	0	0	13	25	-
24	2.4	Historical petrol stations	0	0	0	0	-
24	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
25	3.1	Active or recent landfill	0	0	0	0	-
25	3.2	Historical landfill (BGS records)	0	0	0	0	-
26	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
26	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
26	3.5	Historical waste sites	0	0	0	0	-
26	3.6	Licensed waste sites	0	0	0	0	-
26 >	3.7 >	Waste exemptions >	0	0	0	2	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
28 >	4.1 >	Recent industrial land uses >	0	0	6	-	-
29	4.2	Current or recent petrol stations	0	0	0	0	-
29	4.3	Electricity cables	0	0	0	0	-
29	4.4	Gas pipelines	0	0	0	0	-
29	4.5	Sites determined as Contaminated Land	0	0	0	0	-



30	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
30	4.7	Regulated explosive sites	0	0	0	0	-
30	4.8	Hazardous substance storage/usage	0	0	0	0	-
30	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
30	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
31	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
31	4.12	Radioactive Substance Authorisations	0	0	0	0	-
31	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
31	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
31	4.15	Pollutant release to public sewer	0	0	0	0	-
32	4.16	List 1 Dangerous Substances	0	0	0	0	-
32	4.17	List 2 Dangerous Substances	0	0	0	0	-
32 >	4.18 >	<u>Pollution Incidents (EA/NRW) ></u>	0	0	0	2	-
32	4.19	Pollution inventory substances	0	0	0	0	-
33	4.20	Pollution inventory waste transfers	0	0	0	0	-
33	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
34 >	5.1 >	<u>Superficial aquifer ></u>	Identified (within 500m)				
36 >	5.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
38 >	5.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
39	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
39	5.5	Groundwater vulnerability- local information	None (within 0m)				
40	5.6	Groundwater abstractions	0	0	0	0	0
41 >	5.7 >	<u>Surface water abstractions ></u>	0	0	0	0	2
41	5.8	Potable abstractions	0	0	0	0	0
42 >	5.9 >	<u>Source Protection Zones ></u>	0	0	1	0	-
42	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
43 >	6.1 >	<u>Water Network (OS MasterMap) ></u>	1	6	7	-	-



45 >	6.2 >	Surface water features >	0	2	1	-	-
45 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
45 >	6.4 >	WFD Surface water bodies >	1	0	0	-	-
46 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
47	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
47	7.2	Historical Flood Events	0	0	0	-	-
47	7.3	Flood Defences	0	0	0	-	-
48	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
48	7.5	Flood Storage Areas	0	0	0	-	-
49 >	7.6 >	Flood Zone 2 >	Identified (within 50m)				
50 >	7.7 >	Flood Zone 3 >	Identified (within 50m)				
Page	Section	Surface water flooding >					
51 >	8.1 >	Surface water flooding >	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
53 >	9.1 >	Groundwater flooding >	Low (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
54	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
55	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
55	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
55	10.4	Special Protection Areas (SPA)	0	0	0	0	0
55	10.5	National Nature Reserves (NNR)	0	0	0	0	0
56	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
56	10.7	Designated Ancient Woodland	0	0	0	0	0
56	10.8	Biosphere Reserves	0	0	0	0	0
56	10.9	Forest Parks	0	0	0	0	0
57	10.10	Marine Conservation Zones	0	0	0	0	0
57 >	10.11 >	Green Belt >	0	0	0	0	3
57	10.12	Proposed Ramsar sites	0	0	0	0	0



57	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
58	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
58	10.15	Nitrate Sensitive Areas	0	0	0	0	0
58 >	10.16 >	<u>Nitrate Vulnerable Zones ></u>	1	0	1	1	1
59 >	10.17 >	<u>SSSI Impact Risk Zones ></u>	1	-	-	-	-
60	10.18	SSSI Units	0	0	0	0	0
Page	Section	<u>Visual and cultural designations ></u>	On site	0-50m	50-250m	250-500m	500-2000m
61	11.1	World Heritage Sites	0	0	0	-	-
62	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
62	11.3	National Parks	0	0	0	-	-
62 >	11.4 >	<u>Listed Buildings ></u>	1	0	5	-	-
63 >	11.5 >	<u>Conservation Areas ></u>	0	1	1	-	-
63	11.6	Scheduled Ancient Monuments	0	0	0	-	-
63	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	<u>Agricultural designations ></u>	On site	0-50m	50-250m	250-500m	500-2000m
65 >	12.1 >	<u>Agricultural Land Classification ></u>	Urban (within 250m)				
66	12.2	Open Access Land	0	0	0	-	-
66	12.3	Tree Felling Licences	0	0	0	-	-
66	12.4	Environmental Stewardship Schemes	0	0	0	-	-
66	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	<u>Habitat designations ></u>	On site	0-50m	50-250m	250-500m	500-2000m
67 >	13.1 >	<u>Priority Habitat Inventory ></u>	0	1	0	-	-
68	13.2	Habitat Networks	0	0	0	-	-
68	13.3	Open Mosaic Habitat	0	0	0	-	-
68	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	<u>Geology 1:10,000 scale ></u>	On site	0-50m	50-250m	250-500m	500-2000m
69 >	14.1 >	<u>10k Availability ></u>	Identified (within 500m)				
70	14.2	Artificial and made ground (10k)	0	0	0	0	-
71	14.3	Superficial geology (10k)	0	0	0	0	-

71	14.4	Landslip (10k)	0	0	0	0	-
72	14.5	Bedrock geology (10k)	0	0	0	0	-
72	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
73 >	15.1 >	50k Availability >	Identified (within 500m)				
74	15.2	Artificial and made ground (50k)	0	0	0	0	-
74	15.3	Artificial ground permeability (50k)	0	0	-	-	-
75 >	15.4 >	Superficial geology (50k) >	1	0	0	0	-
76 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
76	15.6	Landslip (50k)	0	0	0	0	-
76	15.7	Landslip permeability (50k)	None (within 50m)				
77 >	15.8 >	Bedrock geology (50k) >	1	0	2	3	-
78 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
78 >	15.10 >	Bedrock faults and other linear features (50k) >	0	0	2	2	-
Page	Section	Boreholes >	On site	0-50m	50-250m	250-500m	500-2000m
79 >	16.1 >	BGS Boreholes >	0	0	20	-	-
Page	Section	Natural ground subsidence >					
81 >	17.1 >	Shrink swell clays >	Very low (within 50m)				
82 >	17.2 >	Running sands >	Very low (within 50m)				
83 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
84 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
85 >	17.5 >	Landslides >	Very low (within 50m)				
86 >	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
88	18.1	BritPits	0	0	0	0	-
89 >	18.2 >	Surface ground workings >	0	0	4	-	-
89	18.3	Underground workings	0	0	0	0	0
89	18.4	Underground mining extents	0	0	0	0	-
89	18.5	Historical Mineral Planning Areas	0	0	0	0	-

90	18.6	Non-coal mining	0	0	0	0	0
90	18.7	JPB mining areas	None (within 0m)				
90	18.8	The Coal Authority non-coal mining	0	0	0	0	-
90	18.9	Researched mining	0	0	0	0	-
91	18.10	Mining record office plans	0	0	0	0	-
91	18.11	BGS mine plans	0	0	0	0	-
91 >	18.12 >	Coal mining >	Identified (within 0m)				
91	18.13	Brine areas	None (within 0m)				
92	18.14	Gypsum areas	None (within 0m)				
92	18.15	Tin mining	None (within 0m)				
92	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
93	19.1	Natural cavities	0	0	0	0	-
93	19.2	Mining cavities	0	0	0	0	0
93	19.3	Reported recent incidents	0	0	0	0	-
93	19.4	Historical incidents	0	0	0	0	-
Page	Section	Radon >					
95 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
97 >	21.1 >	BGS Estimated Background Soil Chemistry >	2	0	-	-	-
97	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
97	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
98	22.1	Underground railways (London)	0	0	0	-	-
98	22.2	Underground railways (Non-London)	0	0	0	-	-
98	22.3	Railway tunnels	0	0	0	-	-
98	22.4	Historical railway and tunnel features	0	0	0	-	-
98	22.5	Royal Mail tunnels	0	0	0	-	-
99	22.6	Historical railways	0	0	0	-	-



99	22.7	Railways	0	0	0	-	-
99	22.8	Crossrail 2	0	0	0	0	-
99	22.9	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 28/09/2022

Site Area: 2.26ha



Recent site history - 2019 aerial photograph



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Capture Date: 22/04/2019

Site Area: 2.26ha



Recent site history - 2015 aerial photograph



Capture Date: 11/06/2015

Site Area: 2.26ha



Recent site history - 2005 aerial photograph



Capture Date: 02/09/2005

Site Area: 2.26ha



Recent site history - 2000 aerial photograph



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Capture Date: 21/07/2000

Site Area: 2.26ha



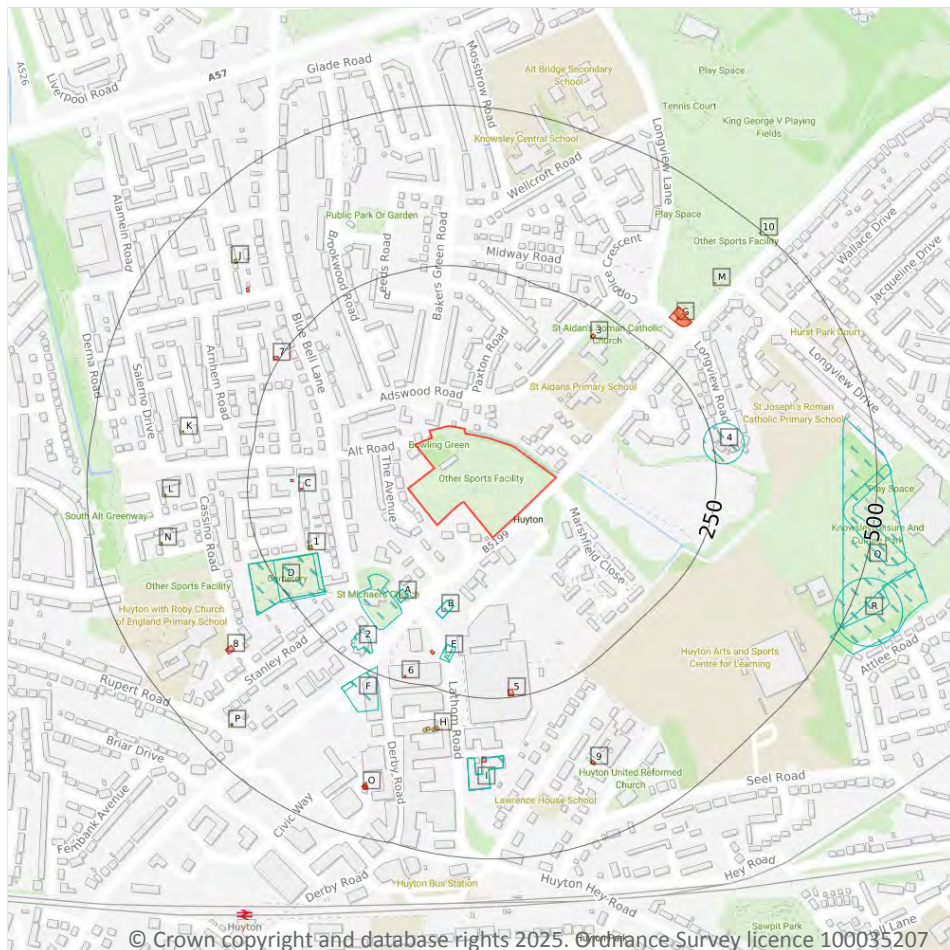
OS MasterMap site plan



Site Area: 2.26ha



1 Past land use



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

1.1 Historical industrial land uses

Records within 500m

20

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
A	113m SW	Fire Station	1956	927874



ID	Location	Land use	Dates present	Group ID
A	113m SW	Fire Station	1965	962927
A	114m SW	Grave Yard	1850	816743
B	118m S	Fire Station	1978	919810
B	118m S	Fire Station	1989	942117
D	173m SW	Grave Yard	1978	867736
D	173m SW	Grave Yard	1989	957511
E	179m S	Fire Station	1965	937641
D	180m SW	Grave Yard	1906	862799
E	180m S	Fire Station	1956	988355
2	198m SW	Brewery	1850	808339
4	235m E	Trial Shaft	1906	844697
F	239m SW	Police Station	1925	865985
F	278m SW	Police Station	1938	974984
I	340m S	Police Station	1989	914139
I	340m S	Police Station	1978	923691
Q	447m E	Unspecified Heap	1990	882949
Q	450m E	Unspecified Heap	1978	980418
R	476m E	Unspecified Pits	1956	924357
R	495m SE	Pits	1850	838166

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

17

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

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



ID	Location	Land use	Dates present	Group ID
1	174m W	Unspecified Tank	1951	116098
H	306m S	Unspecified Tank	1951 - 1960	143683
H	310m S	Unspecified Tank	1927	125731
H	311m S	Unspecified Tank	1951 - 1960	148147
H	314m S	Unspecified Tank	1927	138392
K	359m W	Unspecified Tank	1951	145724
K	360m W	Unspecified Tank	1951	133458
L	377m W	Unspecified Tank	1951	126803
L	377m W	Unspecified Tank	1951	155578
M	390m NE	Unspecified Tank	1951	114856
N	392m W	Unspecified Tank	1951	136772
N	392m W	Unspecified Tank	1951	130435
J	396m NW	Unspecified Tank	1951	116096
M	399m NE	Unspecified Tank	1951	126044
P	444m SW	Unspecified Tank	1970	128177
P	444m SW	Unspecified Tank	1951 - 1960	145759
10	495m NE	Unspecified Tank	1951	114855

This data is sourced from Ordnance Survey / Groundsure.

1.3 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, 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
C	164m W	Electricity Substation	1951	66106



ID	Location	Land use	Dates present	Group ID
C	179m W	Electricity Substation	1989	66110
E	195m S	Electricity Substation	1976 - 1989	85445
3	209m NE	Electricity Substation	1996	66255
5	238m S	Electricity Substation	1976 - 1999	90457
6	239m S	Electricity Substation	1951	66107
7	252m NW	Electricity Substation	1951	66261
G	305m NE	Electricity Substations	1987	68141
G	306m NE	Electricity Substation	1951	74805
G	313m NE	Electricity Substation	1993 - 1996	85867
I	341m S	Electricity Substation	1976 - 1999	74013
J	352m NW	Electricity Substation	1987 - 1997	74966
8	367m SW	Electricity Substation	1976 - 1989	74143
9	380m S	Electricity Substation	1993	66104
O	416m S	Electricity Substation	1993 - 1997	85340
O	419m S	Electricity Substation	1976	86585
O	420m S	Electricity Substation	1984	83846
O	421m S	Electricity Substation	1993	80179
O	421m S	Electricity Substation	1999	76791

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

0

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'.

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

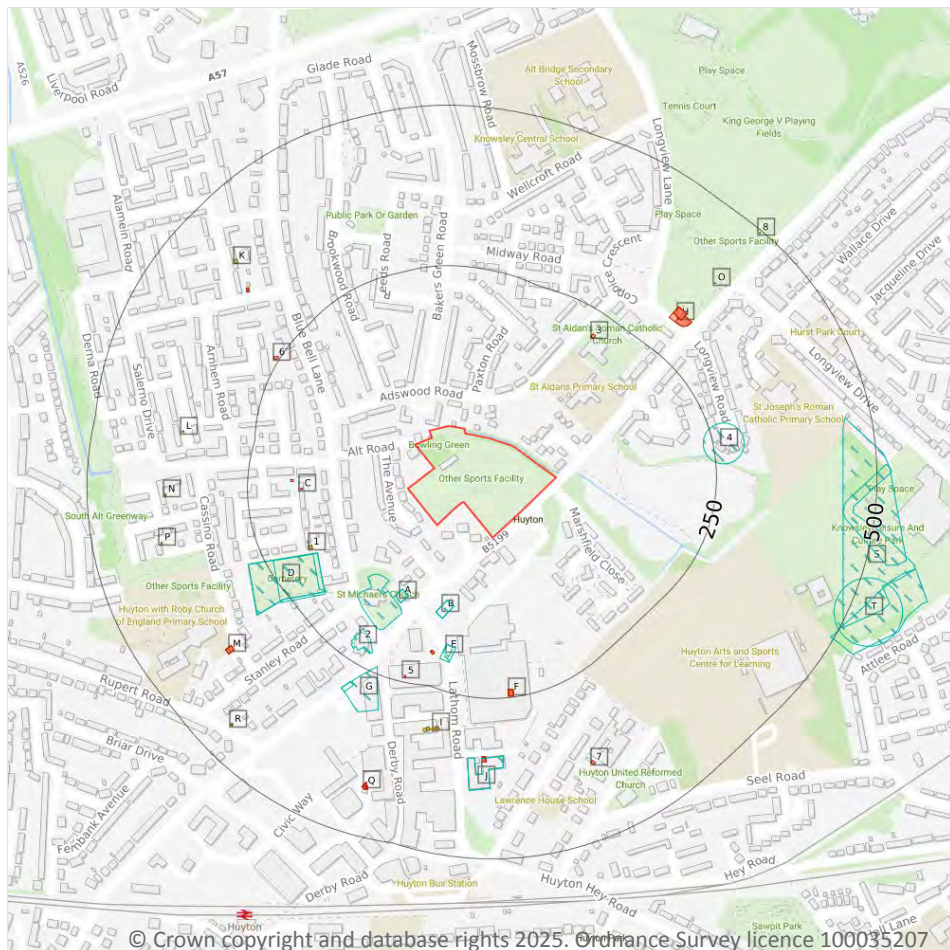
0

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 tanks
- Historical energy features

2.1 Historical industrial land uses

Records within 500m

20

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 20](#) >

ID	Location	Land Use	Date	Group ID
A	113m SW	Fire Station	1956	927874
A	113m SW	Fire Station	1965	962927
A	114m SW	Grave Yard	1850	816743



ID	Location	Land Use	Date	Group ID
B	118m S	Fire Station	1978	919810
B	118m S	Fire Station	1989	942117
D	173m SW	Grave Yard	1978	867736
D	173m SW	Grave Yard	1989	957511
E	179m S	Fire Station	1965	937641
D	180m SW	Grave Yard	1906	862799
E	180m S	Fire Station	1956	988355
2	198m SW	Brewery	1850	808339
4	235m E	Trial Shaft	1906	844697
G	239m SW	Police Station	1925	865985
G	278m SW	Police Station	1938	974984
J	340m S	Police Station	1978	923691
J	340m S	Police Station	1989	914139
S	447m E	Unspecified Heap	1990	882949
S	450m E	Unspecified Heap	1978	980418
T	476m E	Unspecified Pits	1956	924357
T	495m SE	Pits	1850	838166

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	20
----------------------------	-----------

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'.

Features are displayed on the Past land use - un-grouped map on [page 20 >](#)

ID	Location	Land Use	Date	Group ID
1	174m W	Unspecified Tank	1951	116098
I	306m S	Unspecified Tank	1960	143683
I	306m S	Unspecified Tank	1951	143683



ID	Location	Land Use	Date	Group ID
I	310m S	Unspecified Tank	1927	125731
I	311m S	Unspecified Tank	1960	148147
I	311m S	Unspecified Tank	1951	148147
I	314m S	Unspecified Tank	1927	138392
L	359m W	Unspecified Tank	1951	145724
L	360m W	Unspecified Tank	1951	133458
N	377m W	Unspecified Tank	1951	126803
N	377m W	Unspecified Tank	1951	155578
O	390m NE	Unspecified Tank	1951	114856
P	392m W	Unspecified Tank	1951	136772
P	392m W	Unspecified Tank	1951	130435
K	396m NW	Unspecified Tank	1951	116096
O	399m NE	Unspecified Tank	1951	126044
R	444m SW	Unspecified Tank	1960	145759
R	444m SW	Unspecified Tank	1951	145759
R	444m SW	Unspecified Tank	1970	128177
8	495m NE	Unspecified Tank	1951	114855

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

38

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 20 >](#)

ID	Location	Land Use	Date	Group ID
C	164m W	Electricity Substation	1951	66106
C	179m W	Electricity Substation	1989	66110
E	195m S	Electricity Substation	1989	85445



ID	Location	Land Use	Date	Group ID
E	195m S	Electricity Substation	1976	85445
3	209m NE	Electricity Substation	1996	66255
F	238m S	Electricity Substation	1976	90457
F	238m S	Electricity Substation	1984	90457
F	238m S	Electricity Substation	1995	90457
F	238m S	Electricity Substation	1997	90457
F	238m S	Electricity Substation	1993	90457
F	238m S	Electricity Substation	1999	90457
F	238m S	Electricity Substation	1993	90457
5	239m S	Electricity Substation	1951	66107
6	252m NW	Electricity Substation	1951	66261
H	305m NE	Electricity Substations	1987	68141
H	306m NE	Electricity Substation	1951	74805
H	313m NE	Electricity Substation	1996	85867
H	313m NE	Electricity Substation	1993	85867
J	341m S	Electricity Substation	1995	74013
J	341m S	Electricity Substation	1997	74013
J	341m S	Electricity Substation	1993	74013
J	341m S	Electricity Substation	1999	74013
J	341m S	Electricity Substation	1993	74013
J	341m S	Electricity Substation	1976	74013
J	342m S	Electricity Substation	1984	74013
K	352m NW	Electricity Substation	1997	74966
K	352m NW	Electricity Substation	1996	74966
K	352m NW	Electricity Substation	1987	74966
M	367m SW	Electricity Substation	1989	74143
M	368m SW	Electricity Substation	1976	74143
7	380m S	Electricity Substation	1993	66104



ID	Location	Land Use	Date	Group ID
Q	416m S	Electricity Substation	1995	85340
Q	416m S	Electricity Substation	1997	85340
Q	416m S	Electricity Substation	1993	85340
Q	419m S	Electricity Substation	1976	86585
Q	420m S	Electricity Substation	1984	83846
Q	421m S	Electricity Substation	1993	80179
Q	421m S	Electricity Substation	1999	76791

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

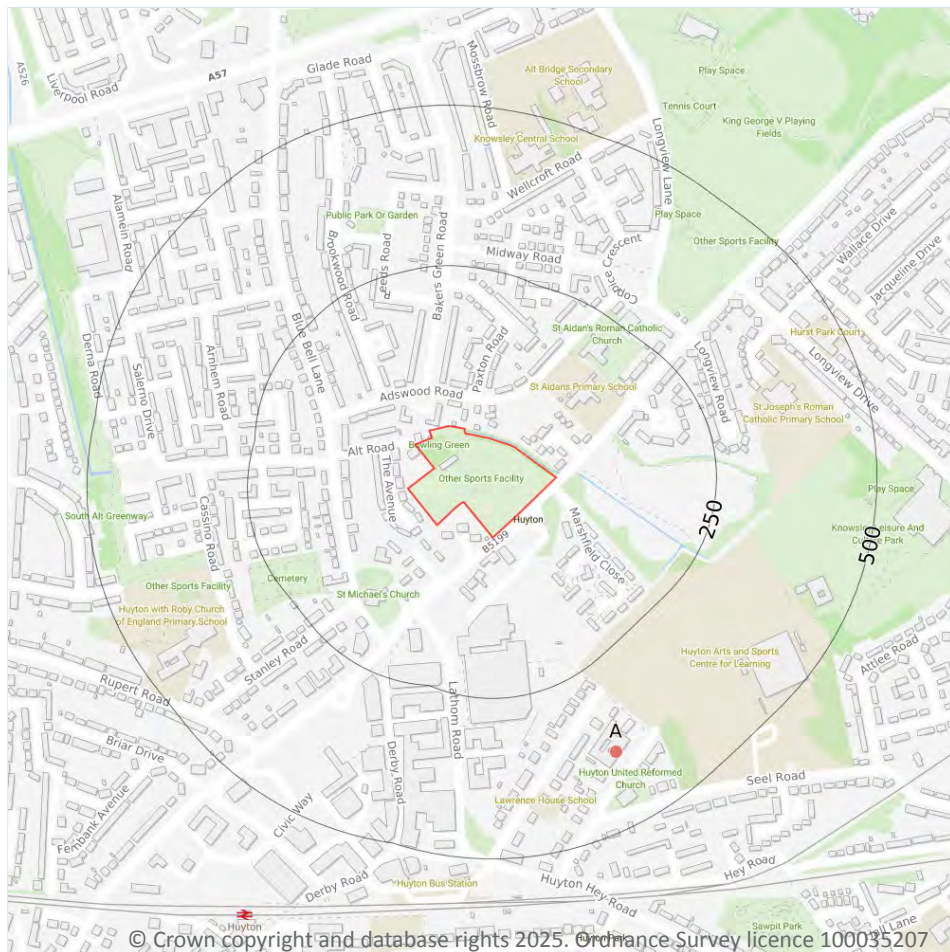
0

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'.

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**2**

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 25 >](#)

ID	Location	Site	Reference	Category	Sub-Category	Description
A	385m SE	Victoria Road, Huyton, Liverpool, L36 5sa	WEX316189	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal

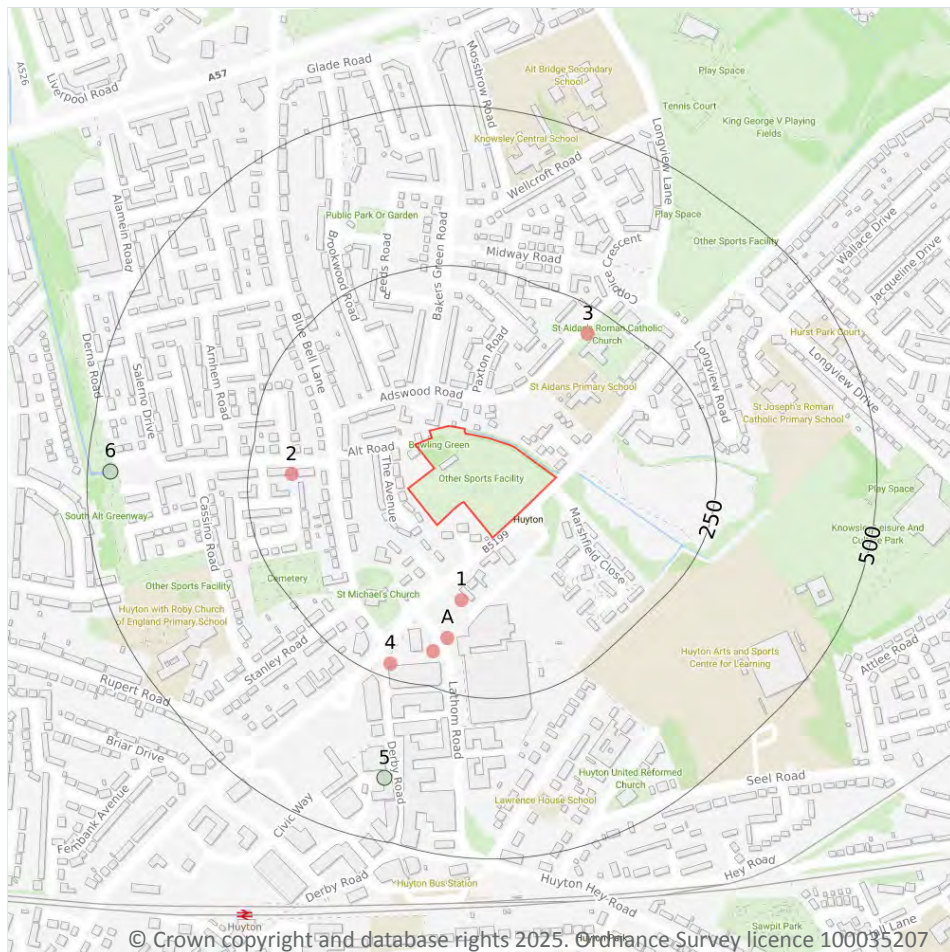


ID	Location	Site	Reference	Category	Sub-Category	Description
A	385m SE	Victoria Road, Huyton, Liverpool, L36 5sa	WEX187676	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal

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



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

6

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 28 >](#)

ID	Location	Company	Address	Activity	Category
1	107m S	Huyton Ambulance Station	Merseyside, L36	Ambulance and Medical Transportation Services	Health Support Services
A	170m S	Electricity Sub Station	Merseyside, L36	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
2	183m W	Electricity Sub Station	Merseyside, L36	Electrical Features	Infrastructure and Facilities
A	197m S	Electricity Sub Station	Merseyside, L36	Electrical Features	Infrastructure and Facilities
3	210m NE	Electricity Sub Station	Merseyside, L36	Electrical Features	Infrastructure and Facilities
4	227m SW	Electricity Sub Station	Merseyside, L36	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

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

Open, closed, under development and obsolete petrol stations.

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**0**

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.

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

2

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 28 >](#)

ID	Location	Details	
5	403m S	Incident Date: 14/05/2001 Incident Identification: 5417 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
6	464m W	Incident Date: 24/07/2014 Incident Identification: 1260219 Pollutant: Contaminated Water Pollutant Description: Other Contaminated Water	Water Impact: Category 2 (Significant) 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

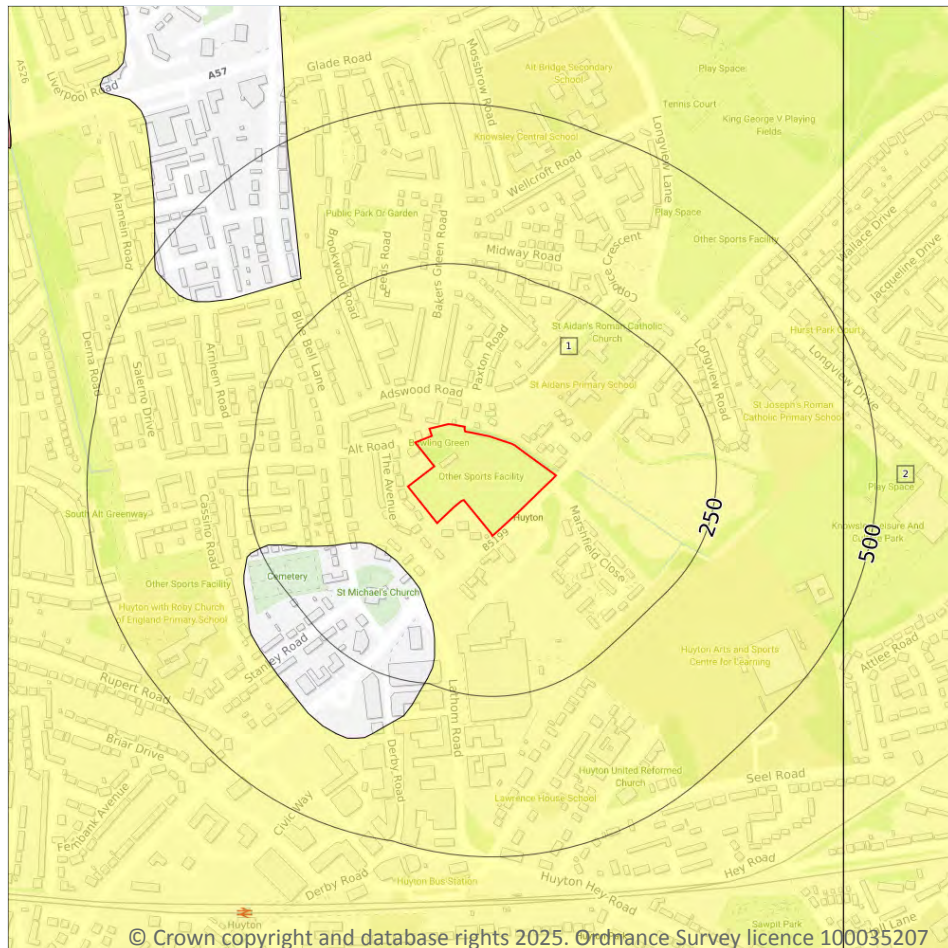
0

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

2

Aquifer status of groundwater held within superficial geology.

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

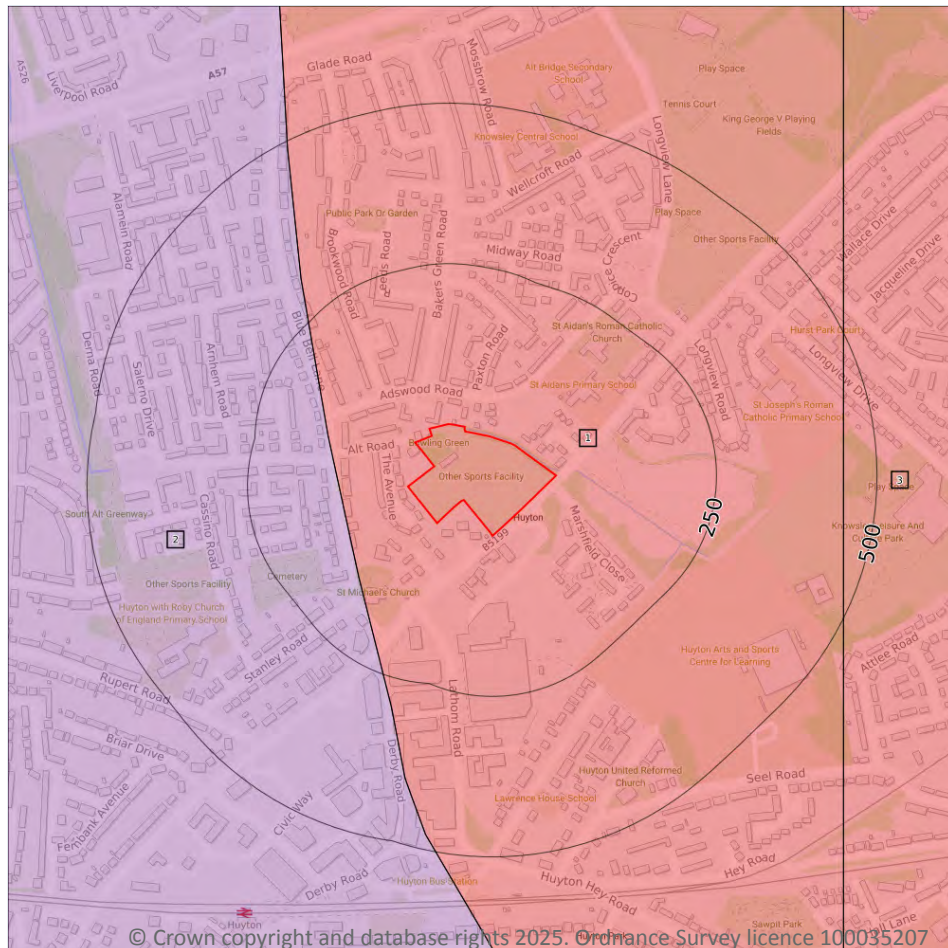
ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	448m E	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

3

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on [page 36](#) >

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	105m W	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

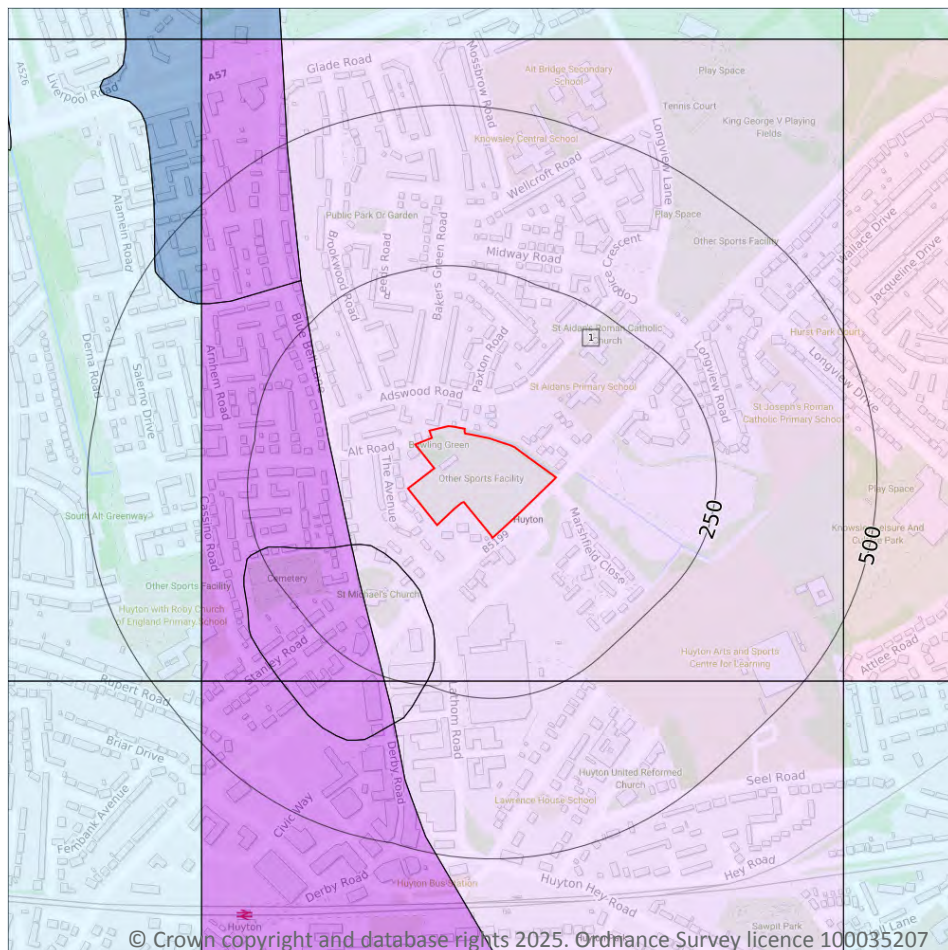


ID	Location	Designation	Description
3	448m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

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

1

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 38](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300- 550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: Low	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.

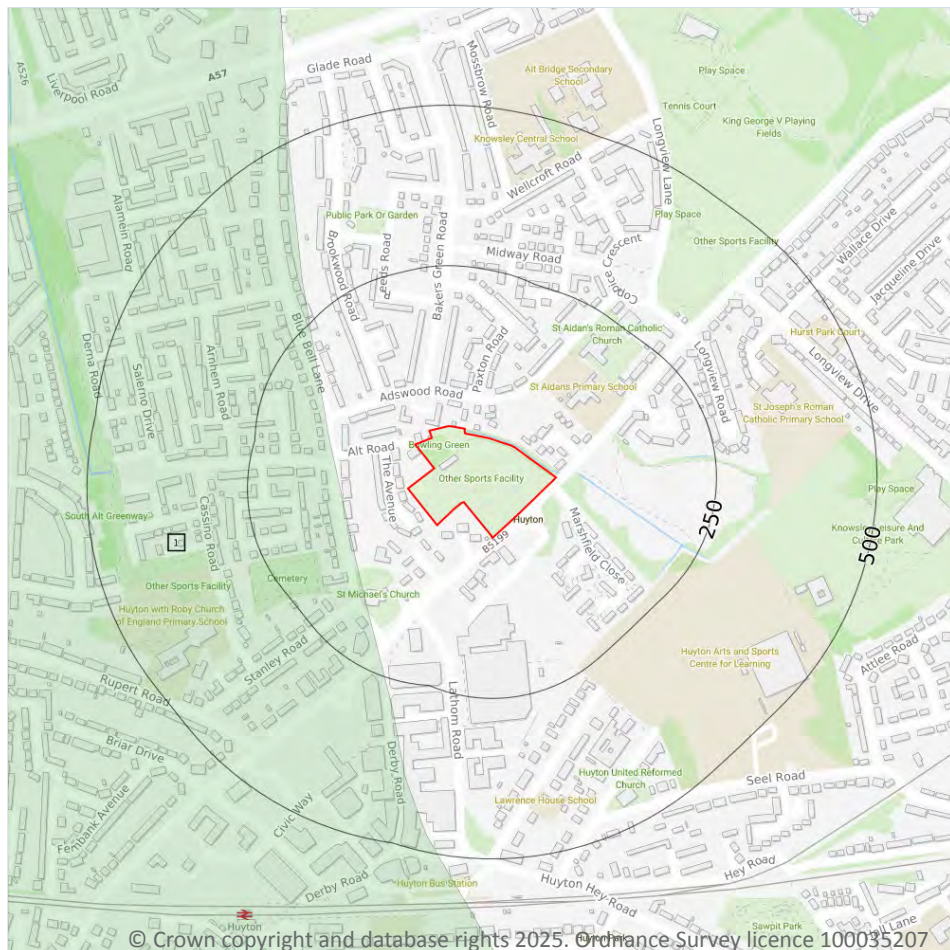
5.5 Groundwater vulnerability- local information

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

0

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.

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 40](#) >

ID	Location	Details	
-	1931m NE	Status: Historical Licence No: 2569028003 Details: Spray Irrigation - Direct Direct Source: "Surface, Non-Tidal - North West Region" Point: "LOGWOOD MILL BROOK AT LH'S PREMISES, PRESCOT, MERSEYSIDE" Data Type: Point Name: JAMES WHITAKER & SONS NURSERYMEN LTD Easting: 345900 Northing: 392700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 04/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1999 Version End Date: -
-	1931m NE	Status: Historical Licence No: 2569028003 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: LOGWOOD MILL BROOK AT LH'S PREMISES, PRESCOT, MERSEYSIDE Data Type: Point Name: JAMES WHITAKER & SONS NURSERYMEN LTD Easting: 345900 Northing: 392700	Annual Volume (m ³): 772.82 Max Daily Volume (m ³): 77.282 Original Application No: - Original Start Date: 04/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1999 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m

0

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

1

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination. Features are displayed on the Abstractions and Source Protection Zones map on [page 40](#) >

ID	Location	Type	Description
1	103m W	3	Total catchment

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

5.10 Source Protection Zones (confined aquifer)

Records within 500m

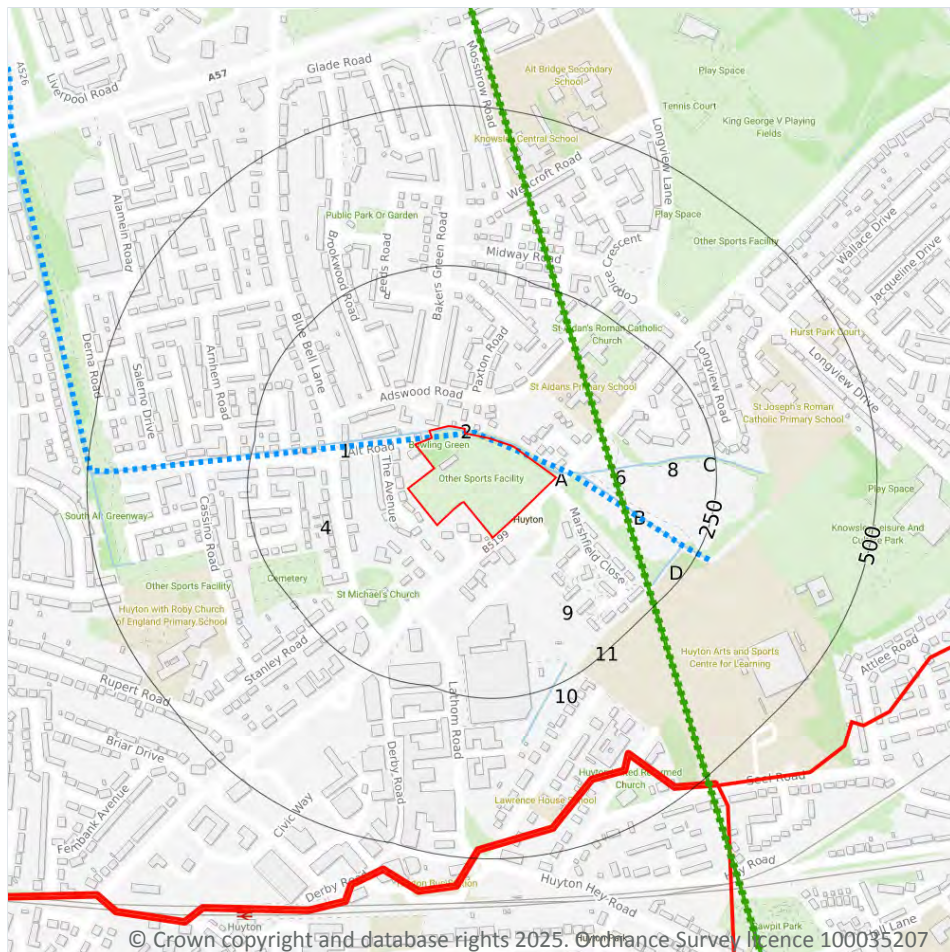
0

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

14

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 43](#) >

ID	Location	Type of water feature	Ground level	Permanence	Name
1	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Alt



ID	Location	Type of water feature	Ground level	Permanence	Name
A	4m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	5m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Alt
A	9m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	River Alt
A	33m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Alt
6	38m E	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
B	38m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Alt
8	141m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
9	146m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	202m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	220m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	223m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Alt
10	225m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
11	229m 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

3

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 43 >](#)

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 43 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
2	On site	River	Alt	GB112069060580	Alt	Alt and Crossens

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 43 >](#)

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
3	On site	River	Alt	GB112069060580 ↗	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 43](#) >

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
4	On site	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	GB41201G101700 ↗	Poor	Poor	Poor	2019

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



7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m

0

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).

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

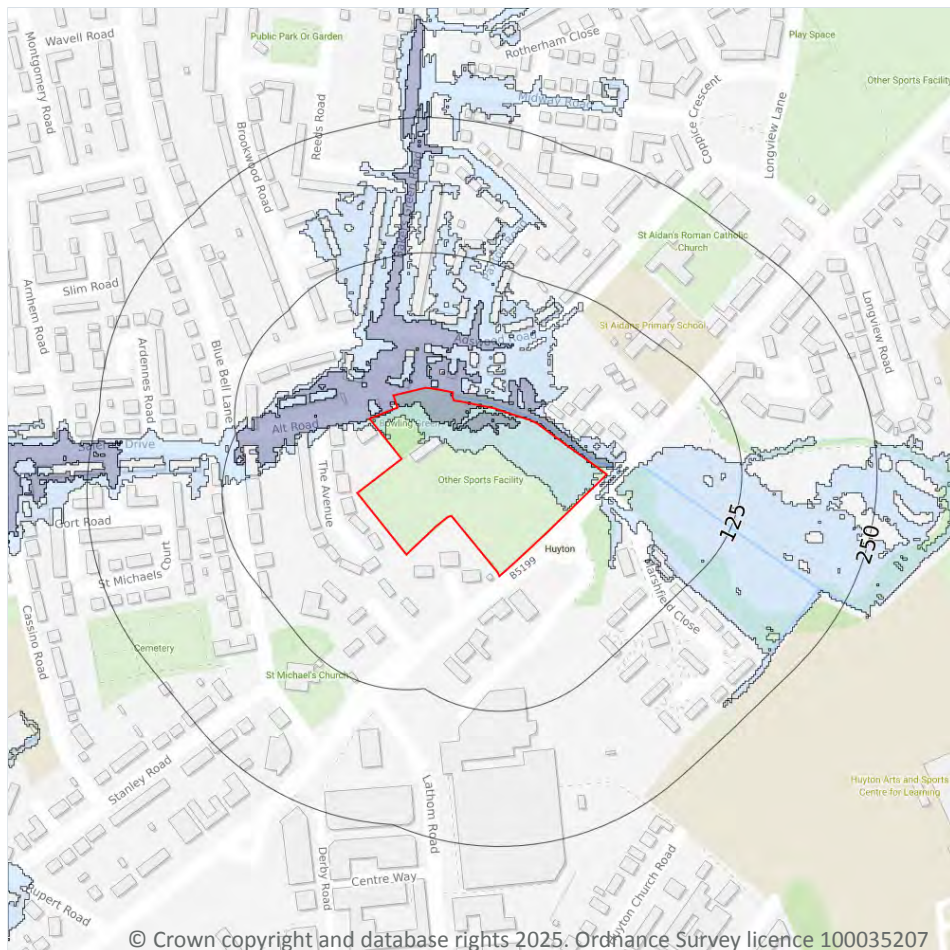
0

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.



River and coastal flooding - Flood Zones



- Site Outline
- Search buffers in metres (m)
- Flood zone 2
- Flood zone 3

7.6 Flood Zone 2

Records within 50m

1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on [page 47](#) >

Location	Type
On site	Zone 2 - (Fluvial /Tidal Models)

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



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.

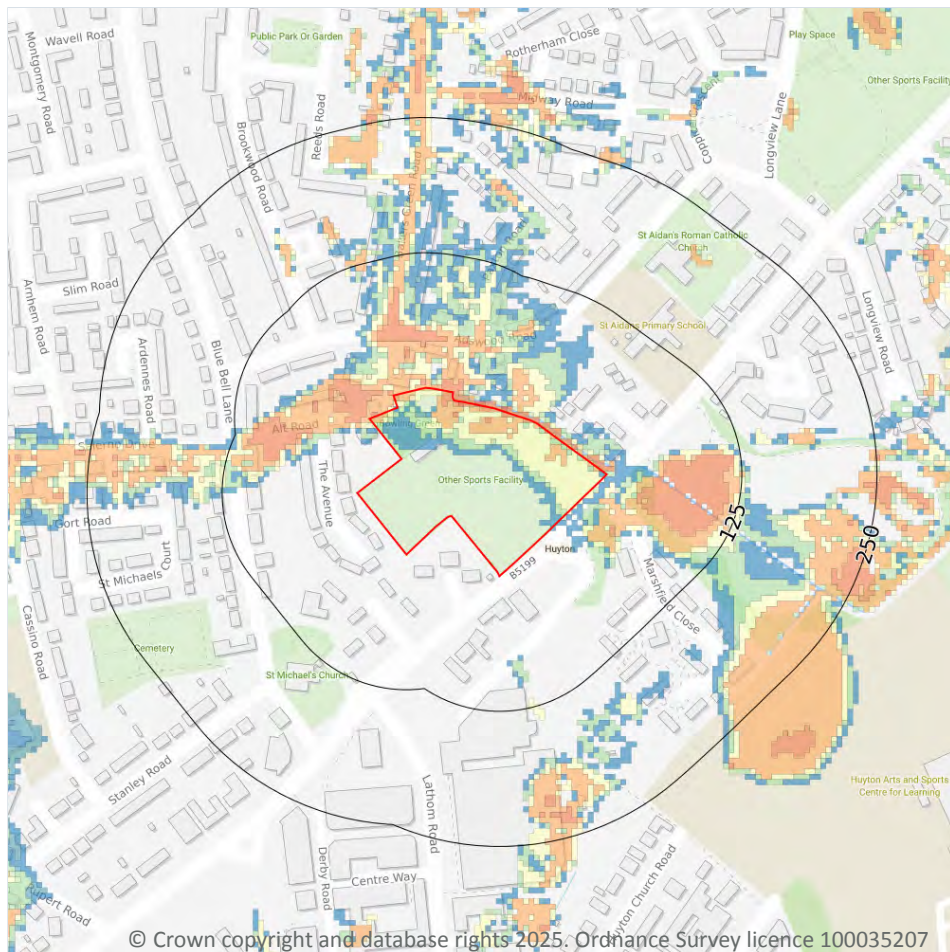
Features are displayed on the River and coastal flooding map on [page 47](#) >

Location	Type
On site	Zone 3 - (Fluvial /Tidal Models)

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



8 Surface water flooding



— Site Outline

Search buffers in metres (m)

1 in 1000 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site

1 in 30 year, Greater than 1.0m

Highest risk within 50m

1 in 30 year, Greater than 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 51](#) >

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.

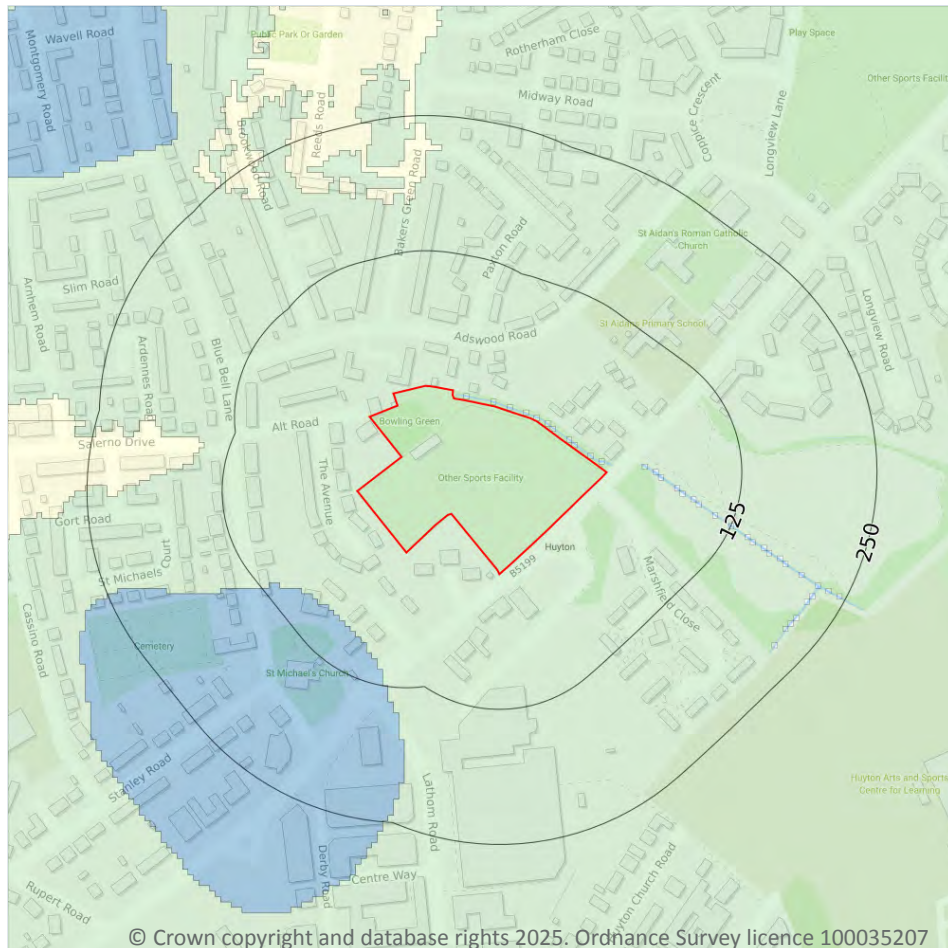
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Greater than 1.0m
1 in 250 year	Greater than 1.0m
1 in 100 year	Greater than 1.0m
1 in 30 year	Greater than 1.0m

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



— Site Outline
Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

Low

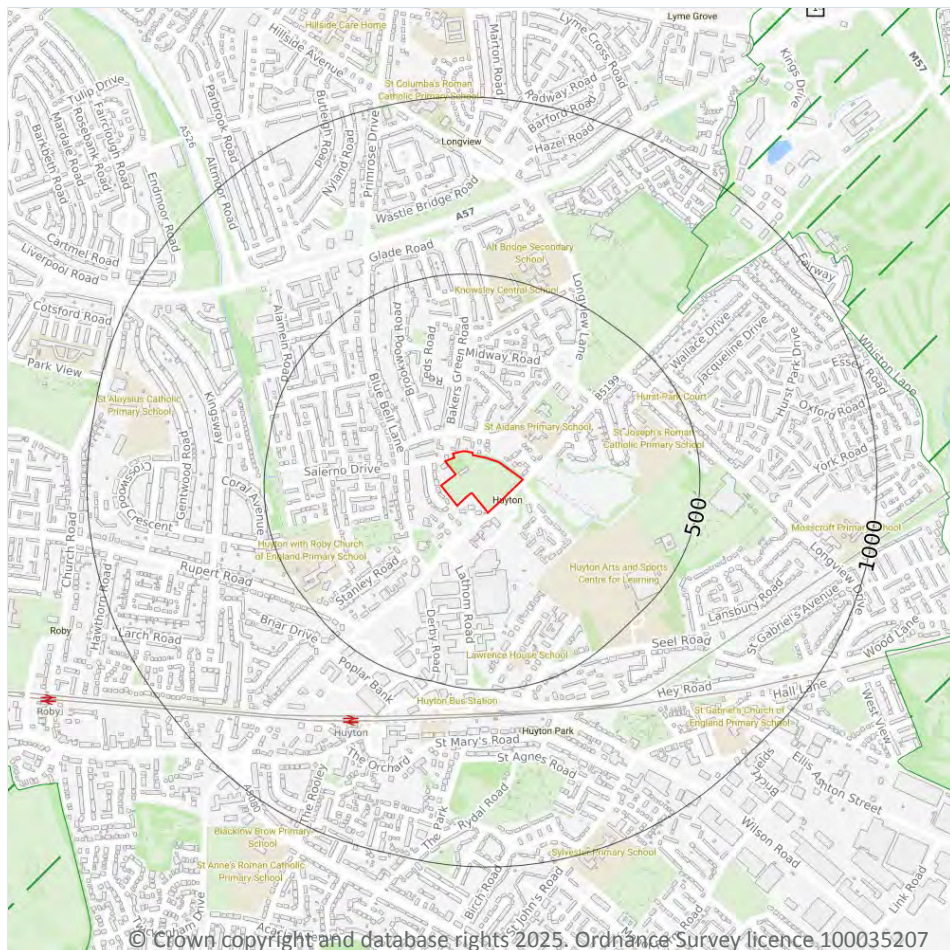
Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks 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 53](#) >

This data is sourced from Ambiantal Risk Analytics.



10 Environmental designations



— Site Outline
Search buffers in metres (m)
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

0

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.

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

10.7 Designated Ancient Woodland

Records within 2000m

0

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.

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 54](#) >

ID	Location	Name	Local Authority name
1	651m NE	Merseyside and Greater Manchester Green Belt	Knowsley
2	1371m SW	Merseyside and Greater Manchester Green Belt	Knowsley
-	1662m S	Merseyside and Greater Manchester Green Belt	Liverpool

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**4**

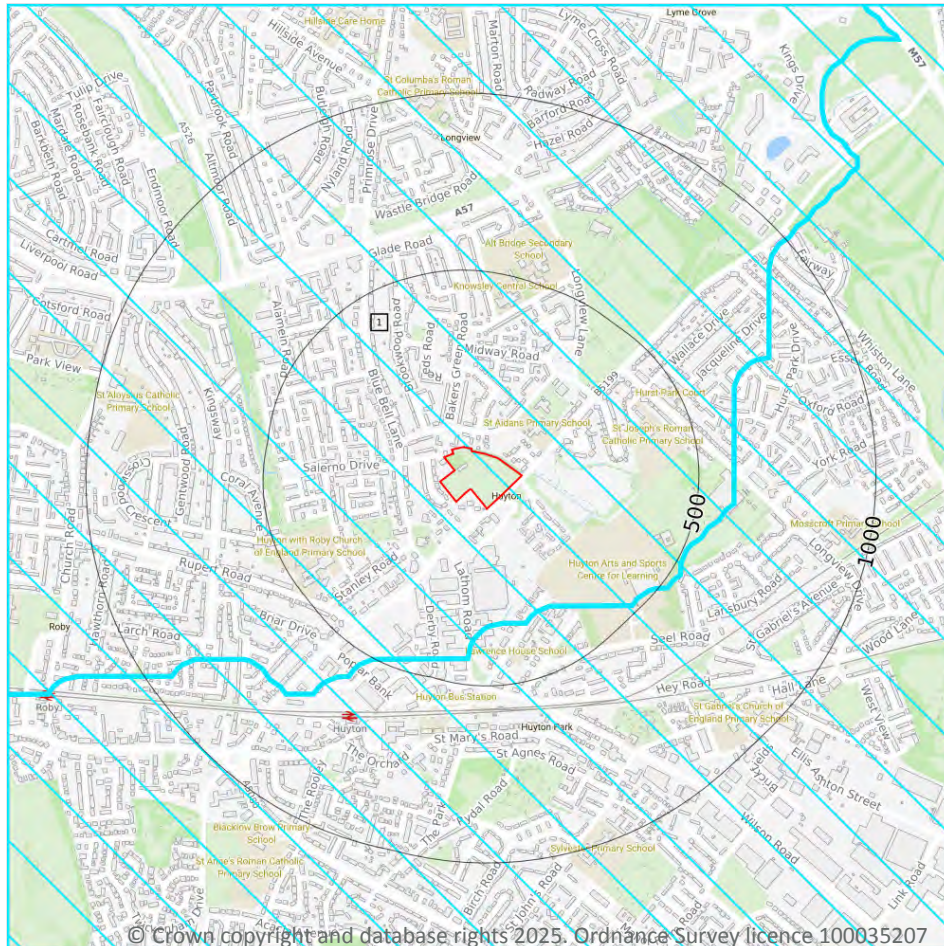
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	ALT NVZ	Surface Water	642	Existing
230m W	ALT NVZ	Surface Water	642	Existing
373m S	Dittton Brook (Halewood to Mersey Estuary) NVZ	Surface Water	640	Existing
699m SW	Dittton Brook (Halewood to Mersey Estuary) NVZ	Surface Water	640	Existing

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 59](#) >

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines. Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 4000m². 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. Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.

This data is sourced from Natural England.

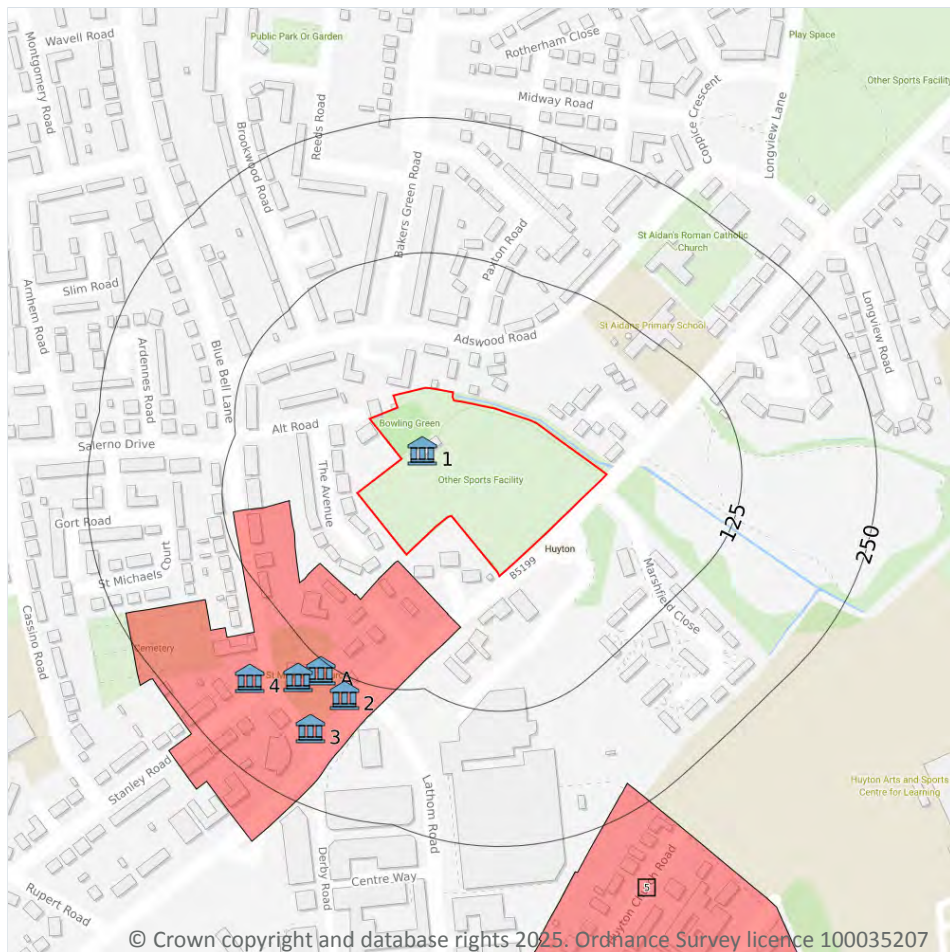
10.18 SSSI Units

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

6

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.

Features are displayed on the Visual and cultural designations map on [page 61](#) >

ID	Location	Name	Grade	Reference Number	Listed date
1	On site	Huyton Cricket And Bowling Club Pavilion	II	1471712	21/09/2020
A	133m SW	Monument To East Of North Aisle Of Church Of St Michael	II	1343445	19/03/1987
2	143m SW	Entrance Gateway To Church Of St Michael At North East Corner Of Churchyard	II	1199006	19/03/1987
A	151m SW	Church Of St Michael	II*	1075535	06/06/1951
3	184m SW	Entrance Gateway To Church Of St Michael At South Corner Of Churchyard	II	1075536	19/03/1987



ID	Location	Name	Grade	Reference Number	Listed date
4	185m SW	Village Cross	II	1343442	03/08/1981

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

11.5 Conservation Areas

Records within 250m	2
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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.

Features are displayed on the Visual and cultural designations map on [page 61](#) >

ID	Location	Name	District	Date of designation
A	10m SW	Huyton, St Michaels Church, Knowsley	Knowsley	1978
5	225m SE	Huyton, Church Road and Victoria Road, Knowsley	Knowsley	1978

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	0
----------------------------	----------

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.

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 65](#) >

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

1

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 67](#) >

ID	Location	Main Habitat	Other habitats
1	12m E	Good quality semi-improved grassland	Main habitat: GQSIG (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

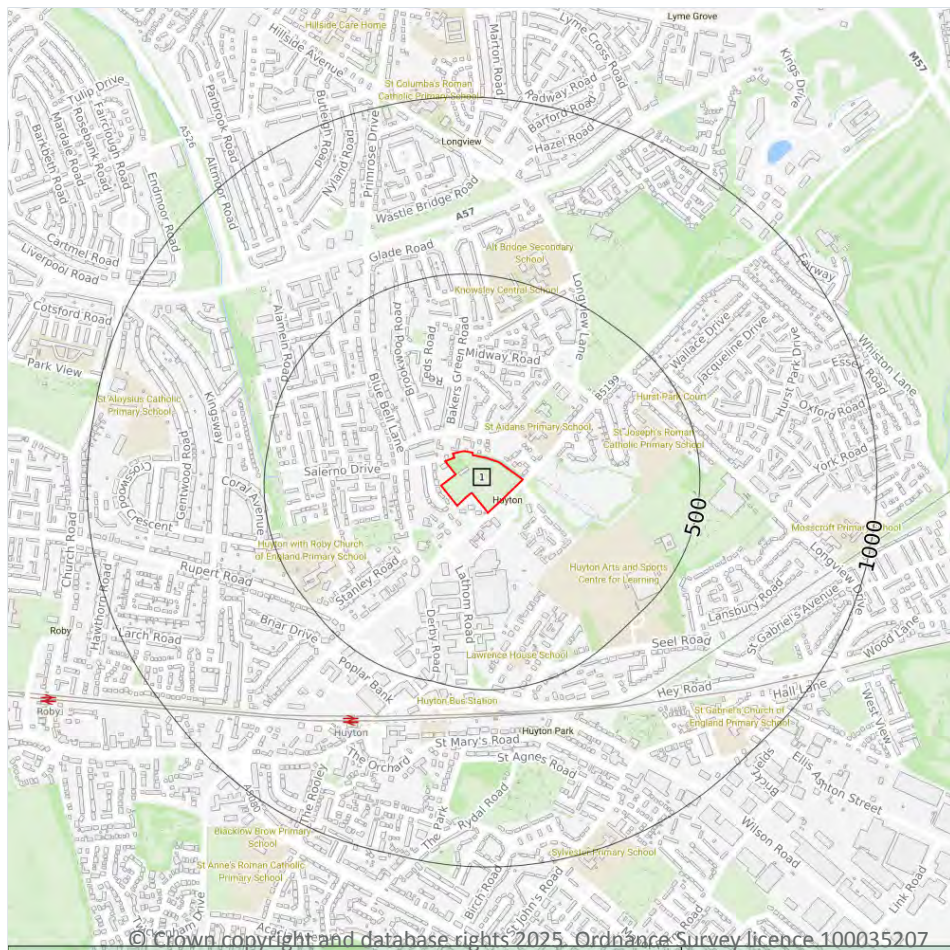
0

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

1

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 69](#) >

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

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

14.3 Superficial geology (10k)

Records within 500m

0

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.

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

14.5 Bedrock geology (10k)

Records within 500m

0

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.

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

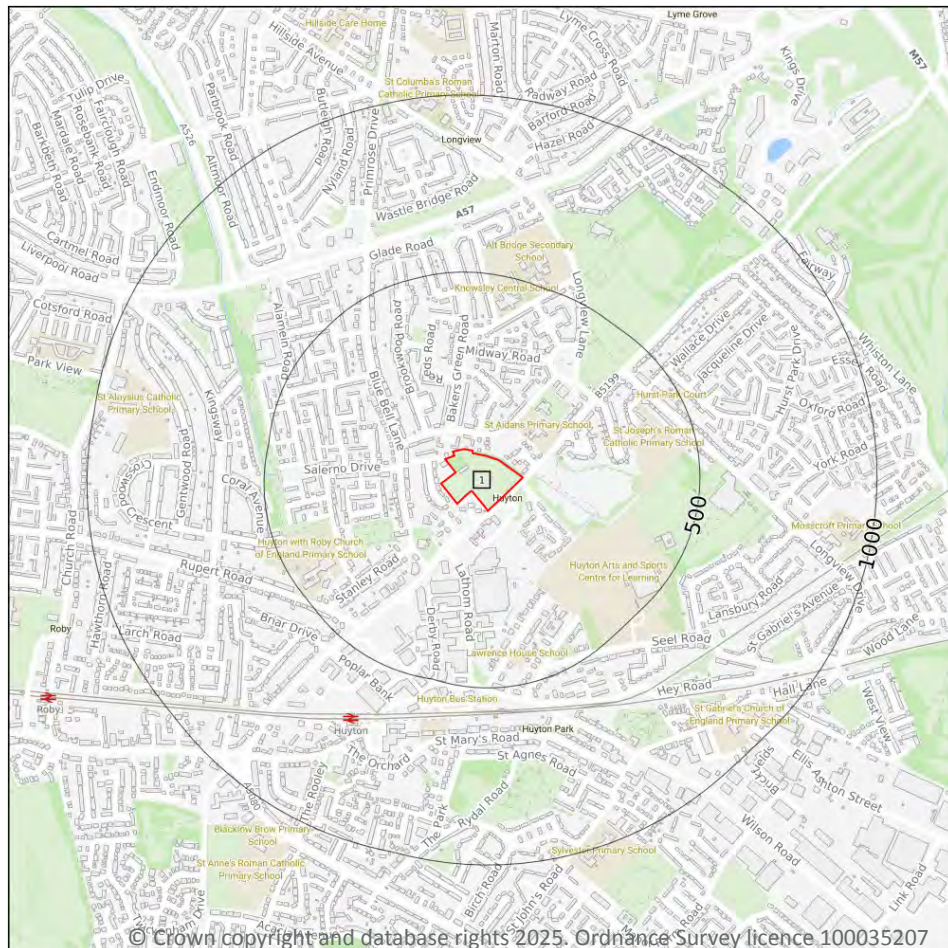
0

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 73](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW097_runcorn_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.



Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

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

15.4 Superficial geology (50k)

Records within 500m

1

Superficial geological deposits at 1:50,000 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 1:50,000 scale - Superficial map on [page 75 >](#)

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	TILL, DEVANSIAN	DIAMICTON

This data is sourced from the British Geological Survey.



15.5 Superficial permeability (50k)

Records within 50m**1**

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

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)

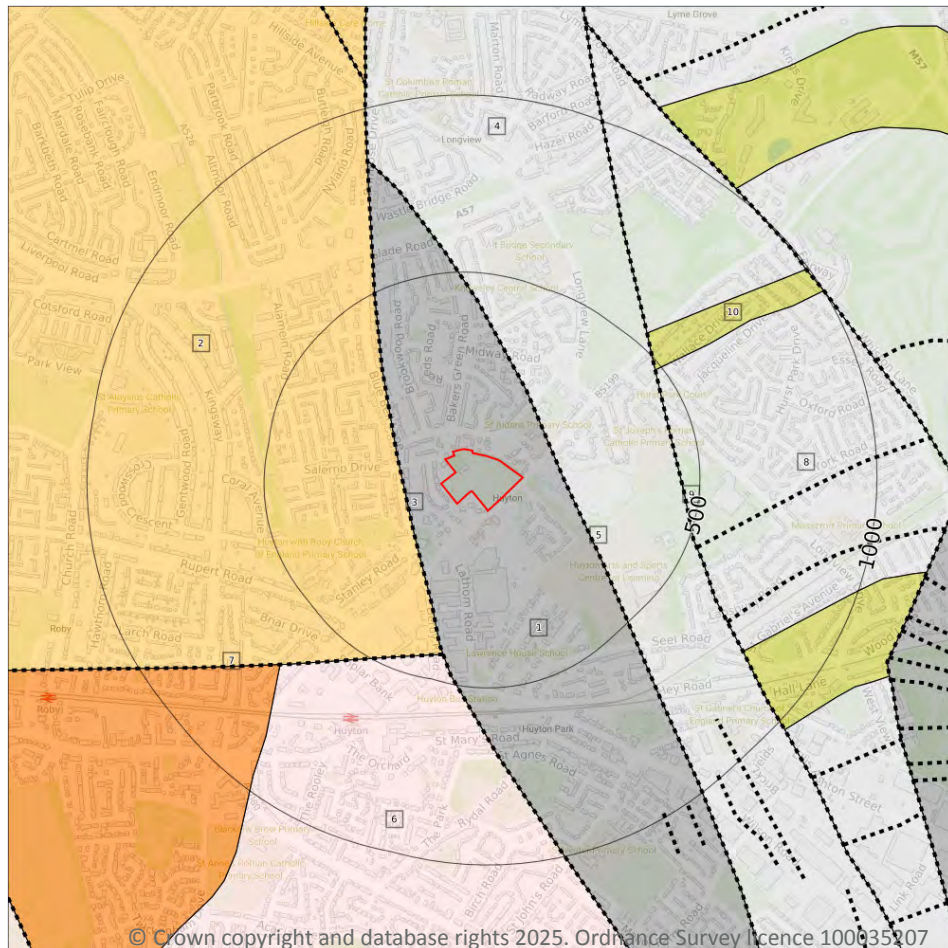
Records within 50m**0**

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

6

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 77](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
2	105m W	CHES-SDST	CHESTER FORMATION - SANDSTONE	OLENEKIAN
4	105m E	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
6	424m S	WLSF-SDST	WILMSLOW SANDSTONE FORMATION - SANDSTONE	-
8	433m E	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
10	482m NE	OL-SDST	OLD LAWRENCE ROCK - SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

1

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

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

4

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.

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

ID	Location	Category	Description
3	105m W	FAULT	Fault, inferred
5	105m E	FOSSIL_HORIZON	Marine band
7	424m S	FAULT	Fault, inferred
9	433m E	FAULT	Fault, inferred

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

20

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 79](#) >

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	72m S	344477 391155	LATHOM RD SITE 11	-	Y	N/A
2	84m S	344449 391139	LATHOM RD SITE 15	-	Y	N/A
3	84m SE	344517 391167	LATHOM RD SITE 7	-	Y	N/A

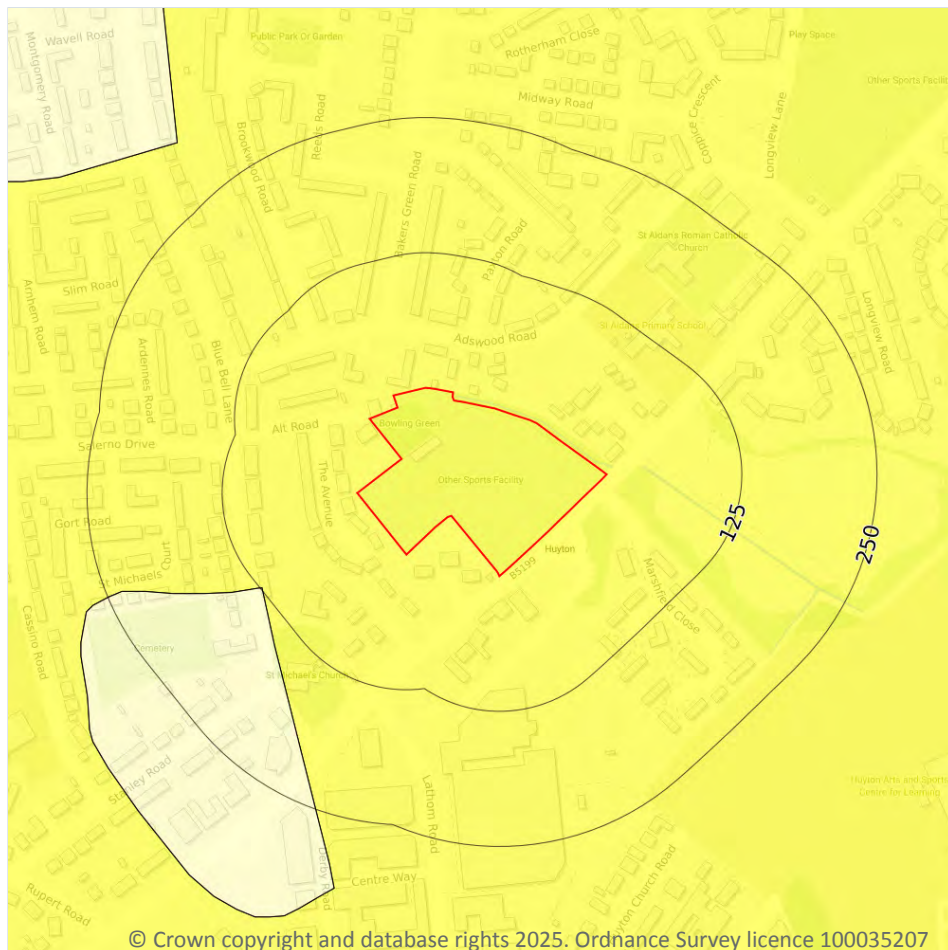


ID	Location	Grid reference	Name	Length	Confidential	Web link
A	118m S	344492 391112	LATHOM RD SITE 8	-	Y	N/A
4	119m SE	344537 391138	LATHOM RD SITE 5	-	Y	N/A
A	123m S	344470 391101	LATHOM RD SITE 12	-	Y	N/A
5	139m S	344391 391099	LATHOM RD SITE 20	-	Y	N/A
6	158m SE	344551 391099	LATHOM RD SITE 3	-	Y	N/A
7	159m S	344415 391069	LATHOM RD SITE 18	-	Y	N/A
8	166m S	344486 391060	LATHOM RD SITE 9	-	Y	N/A
9	173m S	344528 391067	LATHOM RD SITE 6	-	Y	N/A
B	174m S	344432 391050	LATHOM RD SITE 16	-	Y	N/A
B	184m S	344452 391039	LATHOM RD SITE 13	-	Y	N/A
10	194m S	344390 391040	LATHOM RD SITE 19	-	Y	N/A
11	213m SE	344588 391059	LATHOM RD SITE 1	-	Y	N/A
C	214m SE	344558 391037	LATHOM RD SITE 2	-	Y	N/A
C	224m S	344550 391021	LATHOM RD SITE 4	-	Y	N/A
12	225m S	344472 390999	LATHOM RD SITE 14	-	Y	N/A
13	227m S	344430 390997	LATHOM RD SITE 17	-	Y	N/A
14	230m S	344505 390999	LATHOM RD SITE 10	-	Y	N/A

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



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

17.1 Shrink swell clays

Records within 50m

1

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).

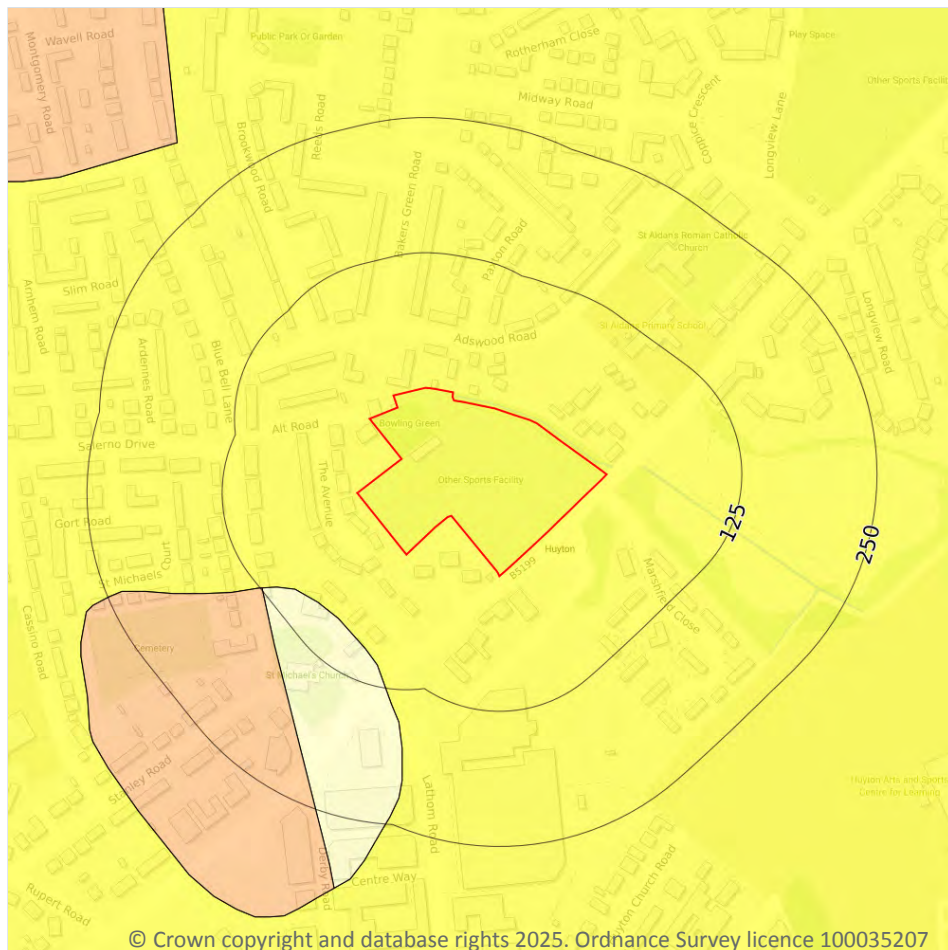
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 81 >](#)

Location	Hazard rating	Details
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 82](#) >

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.

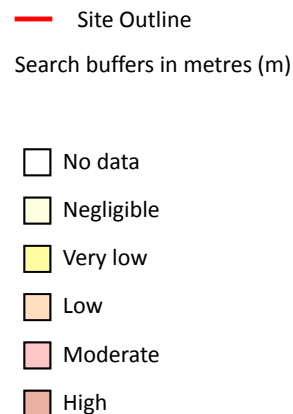
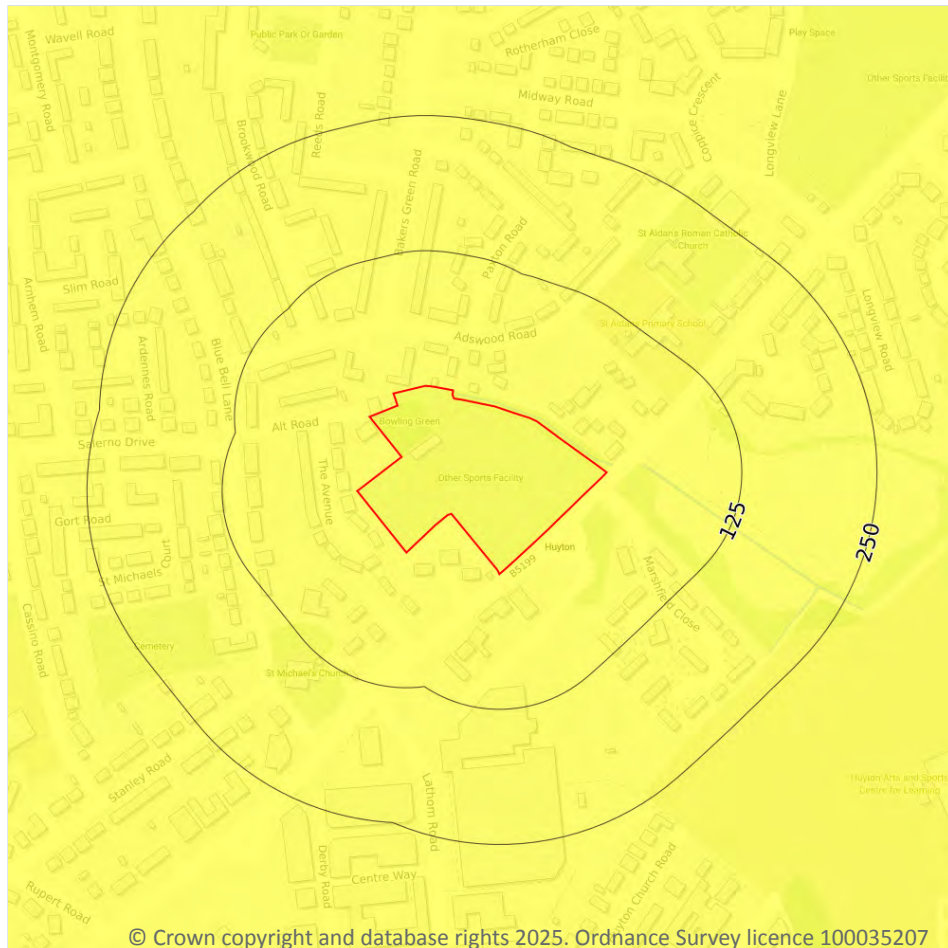


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 No data
 Negligible
 Very low
 Low
 Moderate
 High

83

Natural ground subsidence - Collapsible deposits



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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.

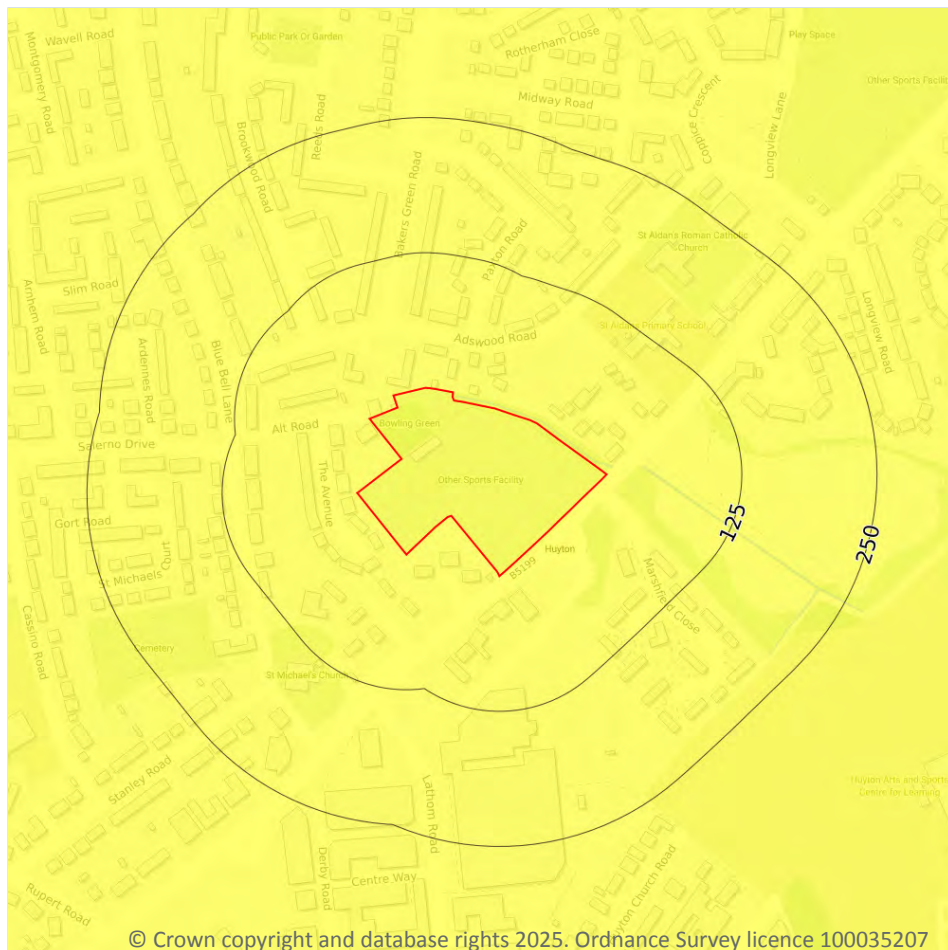
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 84 >](#)

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.

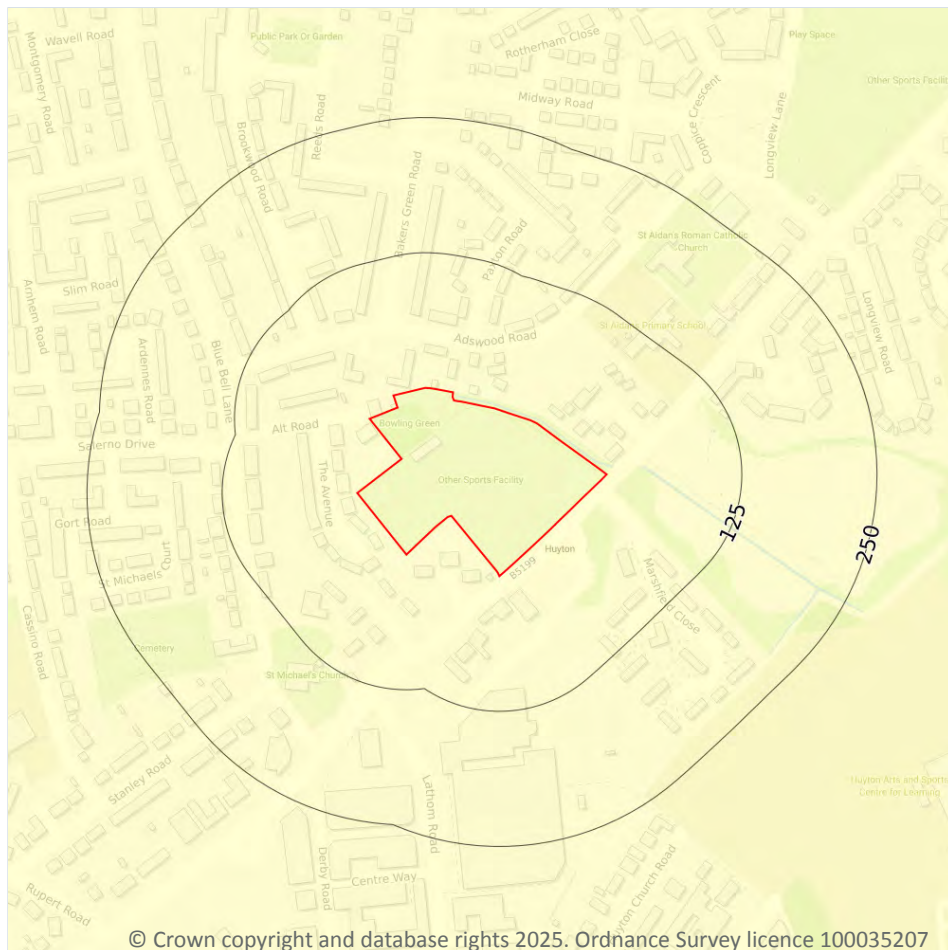
Features are displayed on the Natural ground subsidence - Landslides map on [page 85 >](#)

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



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

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 86](#)

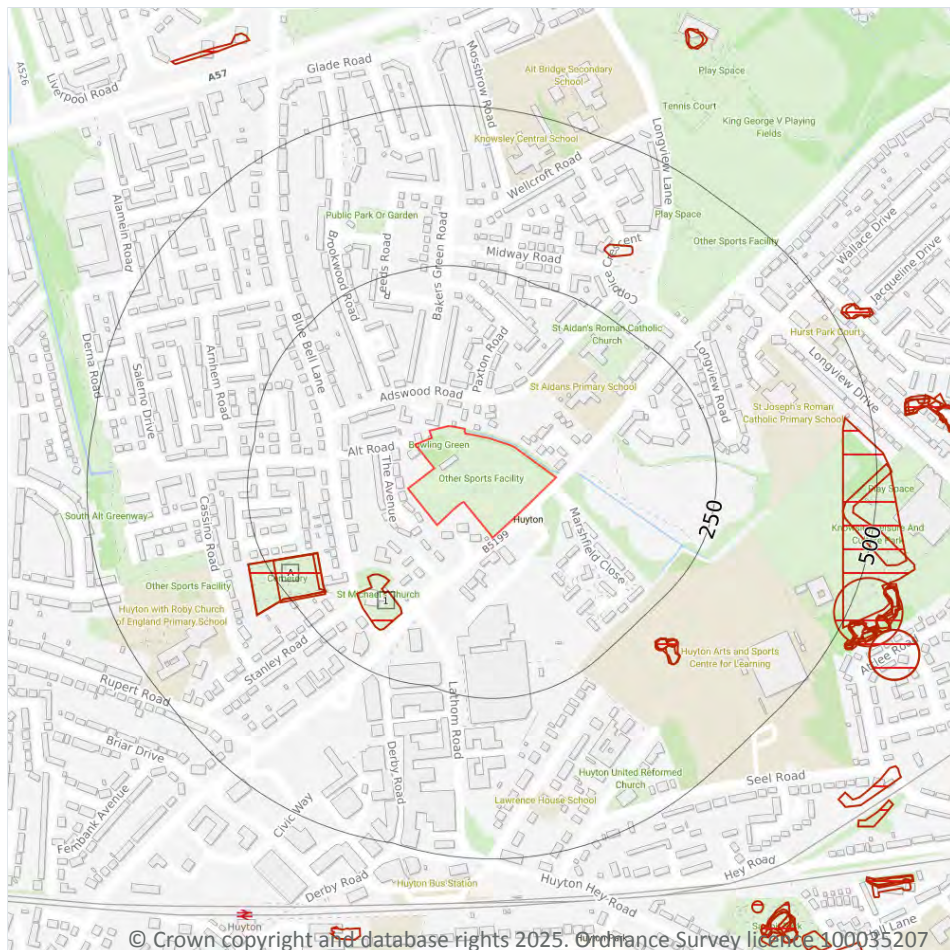
Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.



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

4

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 88 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
1	114m SW	Grave Yard	1850	1:10560
A	173m SW	Grave Yard	1978	1:10000
A	173m SW	Grave Yard	1989	1:10000
A	180m SW	Grave Yard	1906	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

0

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

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

1

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

Location	Details
On site	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.

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.

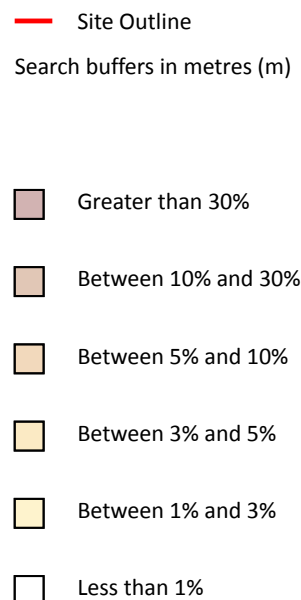
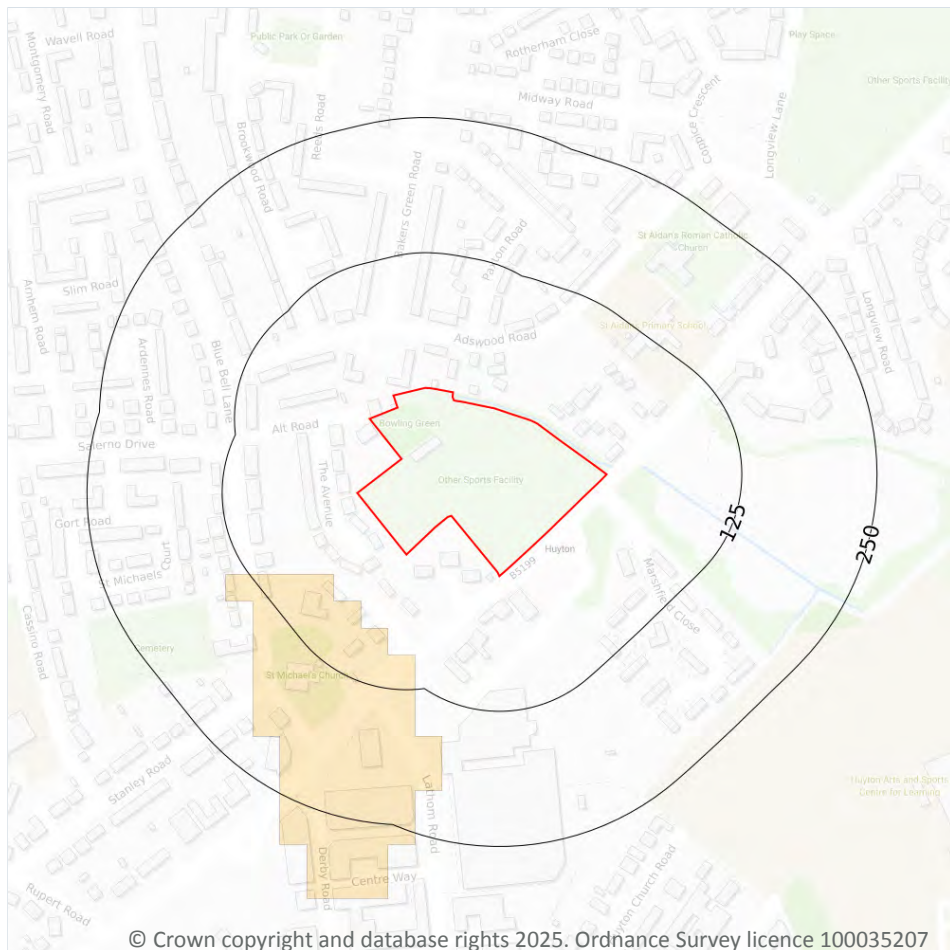
Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.



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 95 >](#)

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

2

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 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	2.2 - 3.0 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	15 - 30 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 6
ZETICA UXO RISK MAP AND PRELIMINARY UXO RISK ASSESSMENT REPORT

STAGE 1 PRELIMINARY UXO RISK ASSESSMENT

Report Ref: PRA-25-2701 | Author: WS | Reviewer: CB

Client: IGE Consulting
Project: Huyton Cricket Club, Knowsley
Date: 09/04/2025



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www.brimstoneuxo.com

INTRODUCTION

The Stage 1 Preliminary Risk Assessment aims to identify potential sources of unexploded ordnance (UXO) that may impact the site. The assessment determines if further investigation through a Stage 2 Detailed UXO Risk Assessment is necessary.

This desktop study follows the Construction Industry Research and Information Association (CIRIA) C681 Guidelines: ‘Unexploded Ordnance, a Guide for the Construction Industry’ (published in 2009). It incorporates multiple historical datasets, including available wartime records, Ordnance Survey (OS) mapping, aerial imagery and the Brimstone UXO Sources Database.

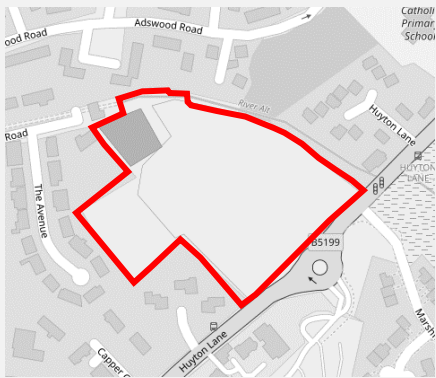
THE SITE

National Grid Ref: SJ 44426 91303 **What3Words:** worked.waters.proof

Location: Situated in Huyton, within the Metropolitan County of Merseyside, approximately 670m north-east of Huyton railway station.

Site Composition: Largely comprises open, undeveloped ground utilised as a cricket pitch. A pavilion / clubhouse structure is present in the west, with associated hardstanding in the north/. Mature vegetation is present in the north-west and south-west.

Surroundings: Bound to the north by residential structures on Adswood Road, to the east by Huyton Lane, and to the south and west by residential structures on The Garth and The Avenue respectively.



THE PROPOSED WORKS

Site Investigation (SI) Works	Brimstone was not made aware of any upcoming SI works occurring on Site.
Development Works	The proposed development will involve the enhancement of the existing structure on Site, with the Site returning to its original use as a cricket club. Brimstone was not made aware of any proposed intrusions or associated depths of intrusions at the time of writing.

SITE HISTORY

Pre-WWII	The Huyton Cricket club was established on Site in the 1860s, with the Site largely comprising open ground, with a pavilion in the west.
WWII-era	No significant changes appear to have taken place on Site.
Post-WWII	No significant changes appear to have taken place on Site. Maintenance of the open ground on Site may have disturbed ground to a very shallow (<1m bgl) depth.

ENEMY ACTION DURING WWI	
WWI German Bombing	Huyton experienced no air raids during WWI.
ENEMY ACTION DURING WWII	
British District Bombing Density Statistics	The Site is situated in the WWII-era Urban District of Huyton and Roby, which sustained 22.3 bombs / 1,000 acres, a low-to-moderate bombing density.
Evidence of Bomb Strikes	On 9 th /10 th January 1940, a high explosive (HE) bomb strike is recorded 'near Huyton Cricket Ground' within a bomb register covering Huyton, potentially on / within a close vicinity of the Site.
Evidence of Bomb Damage	No immediately obvious signs of bomb damage identified on Site or in the immediate surrounds i.e. cratering in open ground, structural damage / clearance.
Local Bombing Decoy Sites	None within a significant distance. The closest recorded decoy was approximately 4.7km north-west.
Local German Bombing Targets	The closest identifiable primary Luftwaffe target was an electrical engineering plant, approximately 2.3km north-east of the Site. Railway infrastructure approximately 620m south of the Site may have been identified as a target of opportunity.
BRITISH / ALLIED MILITARY ACTIVITY	
Potential Source of UXO	Details
WWII Home Guard (HG) Activity	Soldiers of the 86 th Liverpool (Stoneycroft) HG Battalion will have been active locally during WWII. The possibility that the Site was accessed by armed HG troops on patrol cannot be discounted at this stage due its open, undeveloped nature during WWII.
Historic or Current Military Activity	Huyton Camp is recorded approximately 140m north of the Site in an in-house data set. This is noted to have been a reinforcement camp in 1940; however, no further information regarding the nature of this camp, nor its exact location could be found at a preliminary stage. Further research is required to assess the likelihood of associated activity affecting the Site.
WWII Light and / or Heavy Anti-Aircraft (LAA and HAA) Batteries	19 permanent HAA batteries were active within range of the Site during WWII. LAA guns likely defended vulnerable points in the wider study area. Luftwaffe activity in the region was relatively frequent and as a result these guns would have fired a considerable amount of ordnance. It is possible that an unexploded AA shell struck the Site and penetrated to a shallow depth in the open ground.
UXO Finds	n/a
LIKELIHOOD OF UXB DETECTION	
Access Levels	Access levels are anticipated to have been largely infrequent owing to the Site's recreational and largely undeveloped nature, although this will have depended on seasonal usage and the landowner(s).

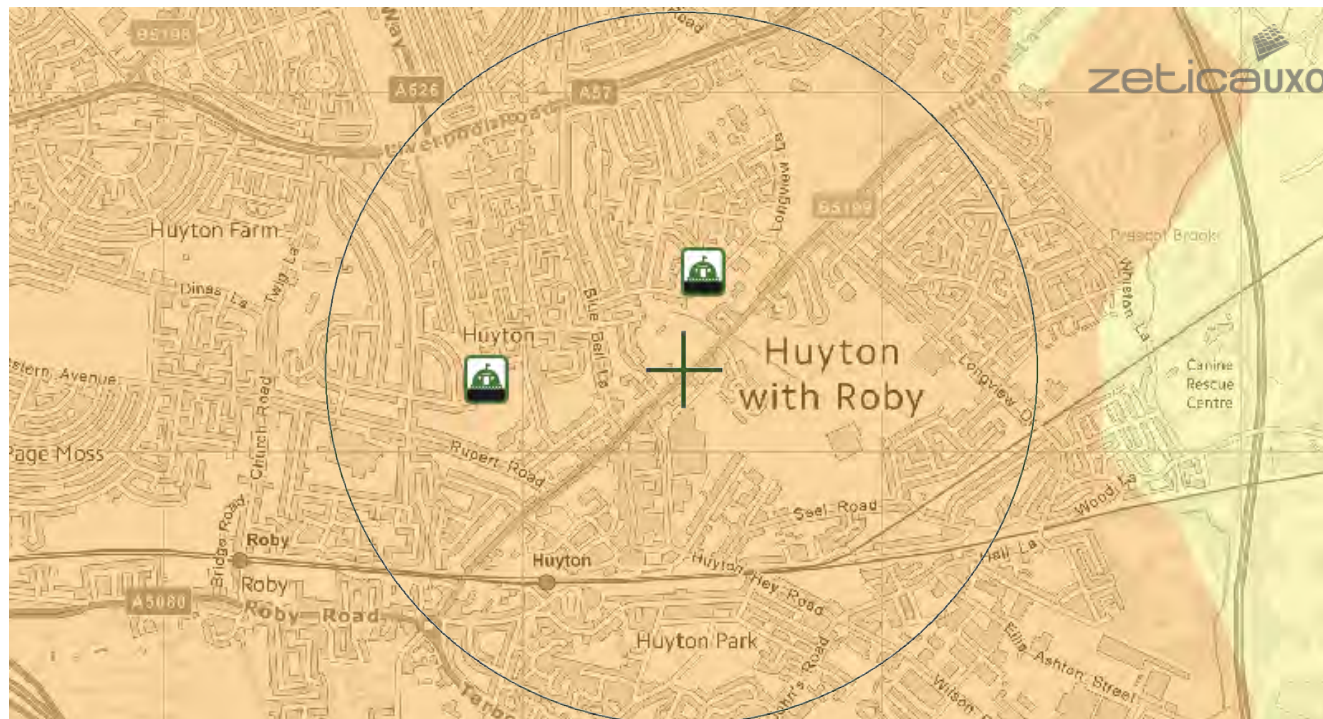
Ground Cover	The ground cover across the majority of the Site was likely uncondusive to the detection of UXBs. However, areas of conducive ground cover will have been present within the footprint of the structure and hardstanding in the west and north-west.
RISK MITIGATING FACTORS	
Likelihood of UXO Remaining	The risk associated with (any) very shallow buried UXO may have been partially mitigated. The risk associated with (any) shallow or deep buried UXO almost certainly remains unmitigated.
CONCLUSIONS	
German UXO: - Evidence of a high explosive bomb strike either on, or in close proximity to, the Site has been identified in available records. - Access levels are anticipated to have been predominantly infrequent on Site, and the ground cover across the majority of the Site likely presented conditions uncondusive to the visual detection of UXBs. - No significant post-WWII works appear to have taken place within the Site boundary; a majority of the Site is anticipated to have been subject to very shallow post-WWII disturbances only. - Based on the above, further research is recommended to better determine the likelihood of a UXB encounter during proposed works.	
British / Allied UXO: - Evidence has been found to suggest that a military camp was present approximately 140m north of the site in 1940. Information regarding this camp is scarce at the preliminary stage; further research is required into activity at the camp to assess likelihood of any associated activity leading to UXO contamination on Site. - It is possible that an unexploded British AA shell struck the Site during WWII. Any such UXO could have penetrated the ground on Site to shallow depths and may remain in situ.	
RECOMMENDATIONS	
SI Works	Brimstone was not made aware of any upcoming SI works occurring on Site.
Development Works	A Stage 2 Detailed Risk Assessment is recommended in order to further assess the risk to proposed works. In lieu of a Detailed UXO Assessment, Brimstone recommends on-Site support for any planned ground works.

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Location: L36 7XH,
Map Centre: 344412,391239



This map principally indicates a hazard from Unexploded Bombs (UXB) due to WWII bombardment. Other sources of Unexploded Ordnance (UXO) may be present. It should be noted that this map does not represent UXO risk and should not be reported as such when reproduced.

LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.

- Military**
- Industry**
- UXO find**
- Other**
- Transport**
- Docks**
- Luftwaffe targets**
- Utilities**
- Bombing decoy**
- Airfields**

How to use your Unexploded Bomb (UXB) risk map?

This map indicates the potential for UXBs to be present because of World War Two (WWII) bombing. It can be incorporated into a technical report, such as a Phase 1 Desk Study, or similar document as an indication of the potential for UXO encounter on a Site. Other sources of UXO may also be indicated, although note that these are not comprehensive and more detailed research is required to confirm their presence.

What if my Site is in a moderate or high density area?

We typically recommend that a detailed UXO desk study and risk assessment is undertaken for sites in an area with a moderate or high bombing density. Additionally, if your site is in close proximity to a strategic target, military establishment, airfield or bombing decoy, then [additional detailed research](#) is recommended.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirm that there is a low potential for UXO to be present on your site, then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

If you are unsure whether other sources of UXO may be present, you can request one of our [pre-desk study assessments \(PDSA\)](#) by emailing a site boundary and location to pdsa@zetica.com.

You should never plan site work or undertake a risk assessment using these maps alone. More detail is required, to include an assessment of the likelihood of a source of UXO hazard from other military activity not reflected on these maps.

If I have any questions, who do I contact?

tel: [+44 \(0\) 1993 886682](tel:+44201993886682) email: uxo@zetica.com web: www.zeticauxo.com

The information in this UXB risk map is derived from a range of sources and should be used with the [accompanying notes on our website](#).

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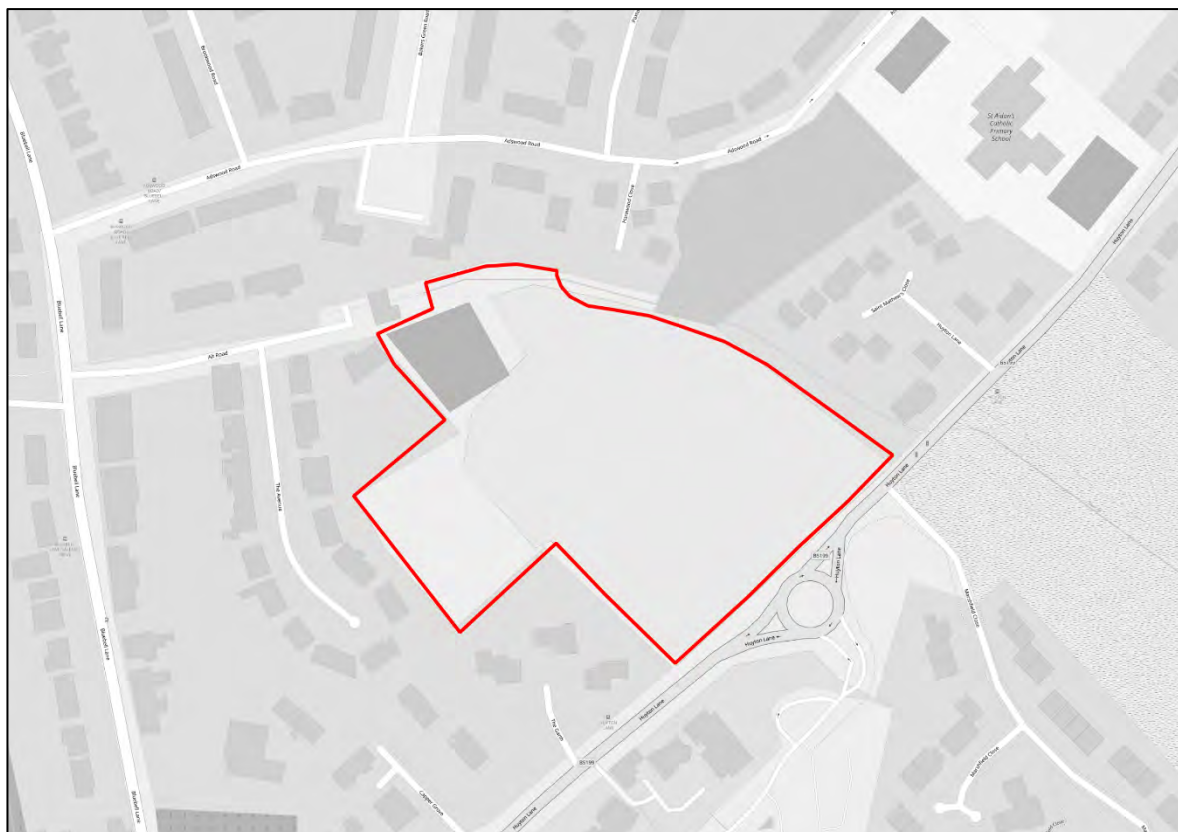


BRIMSTONE

**DETAILED UXO
RISK ASSESSMENT**

STAGE 2 DETAILED UXO RISK ASSESSMENT

Client:	IGE Consulting		
Project Ref:	IGE62R		
Site Name:	Huyton Cricket club, Knowlsey		
Report Ref:	DRA-25-1854-HuytonCricketClub,Knowsley-IGE62R		
Revision:	0		
Status:	Final		
Date:	9 th May 2025		
Author:	Will Slack	Senior Project Researcher	will.slack@brimstoneuxo.com
Reviewed By:	Chris Birch	Research Coordinator	chris.birch@brimstoneuxo.com
Authorised By:	Aaron Florence	Managing Director	





EXECUTIVE SUMMARY

RESULT: Brimstone concludes that unexploded ordnance (UXO) poses a **LOW-MODERATE RISK** to the proposed works.

THE SITE: The Site is located in Huyton, within the Metropolitan County of Merseyside, approximately 670m north-east of Huyton railway station. It is bound to the north by residential structures on Adswood Road, to the east by Huyton Lane, and to the south and west by residential structures on The Garth and The Avenue respectively.

The Site largely comprises undeveloped ground utilised as a cricket pitch. A pavilion / clubhouse structure is present in the west, with associated hardstanding in the north. Mature vegetation is present in the north-west and south-west.

Grid Reference: SJ 44426 91303

What3Words: worked.waters.proof.

THE PROPOSED WORKS: Brimstone was not made aware of any upcoming SI works occurring on Site.

The proposed development will involve the enhancement of the existing structure on Site, with the Site returning to its original use as a cricket club. Brimstone was not made aware of any proposed intrusions or associated depths of intrusions at the time of writing.

UXO RISK ASSESSMENT:

German UXO:

- The Merseyside conurbation was the second most heavily bombed urban area in Britain after London, largely due to the importance of Liverpool docks, the largest west-facing port in Britain during WWII. However, the Site was situated in the Urban District of Huyton-with-Roby, which was approximately 10km from the docks and experienced a low-to-moderate bombing density, according to official Home Office bombing statistics.
- Two sets of original ARP written records were consulted, indicating a relatively large number of bombs fell within the study area, although no references to bombing incidents occurring specifically on Site have been found. One of these, covering the whole of Lancashire, identifies ten bombing incidents occurring within a 1km radius of the Site, accounting for at least five HE bomb strikes, two incendiary bomb 'showers', one UXB and two AA shells. The other, specifically covering Huyton, recorded 14 bombing incidents, accounting for eleven HE bombs, one UXB, one incendiary bomb shower, and one unexploded AA shell within a 1km radius of the Site. The closest of these, an HE bomb strike, is recorded approximately 80m north of the Site. This fell as part of a likely stick of four HE bombs aligned from west to east.
- Huyton Cricket Club pavilion, in the north-west of the Site, is a Grade II listed building, and no evidence to suggest it sustained bomb damage could be found in any online history of the structure.¹ Indeed, post-WWII aerial photography from 1946 does not display any immediately obvious evidence of bomb damage occurring to this structure as well as across the remainder of the Site i.e. cratering within the undeveloped land. Wartime Huyton Cricket Club meeting minutes indicate that the Site was utilised as sports facilities during the war; however it cannot be completely ruled out that the Site may have been neglected during periods of the war, leading to vegetation on Site becoming overgrown. It is possible that changing environmental conditions have masked evidence of bomb damage in this open ground.

¹ https://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=3316636&resourceID=1970

- Furthermore, a majority of the Site likely experienced infrequent levels of access during night-time raids, although access was likely more frequent during the daytime, and during the summer months when cricket was being played. The north-western section of the Site, comprising the pavilion structures, likely experienced a higher degree of access than the undeveloped areas. Any potential unexploded bomb strike in this location would also have left incontrovertible evidence of its occurrence, and so would likely have been recorded and dealt with at the time. The open ground on Site appears well maintained in post-WWII aerial photography, and this was likely the case for a majority of the war. However, it is feasible that during the winter months when it was not being actively utilised as a cricket pitch it become unmaintained / overgrown.
- However, given the lack of evidence to suggest that the Site suffered from direct bomb strikes, the risk of encountering UXBs is not considered significantly elevated above the background risk for this area of the country. Despite this, due to the slightly elevated bombing density of the district, the potential for infrequent levels of access across much of the Site and the bombing incident recorded in close proximity to the Site, the risk of encountering UXBs on Site has been assessed as **Low-Moderate**.

British / Allied UXO:

- Evidence has been found to suggest that Huyton Camp was present approximately 200m west of the Site during WWII and in the post-war period. A plan of the camp itself, and a plan of Huyton showing War Department land, are presented at FIGURE 8 and FIGURE 9 respectively. This camp was initially utilised by the Auxiliary Military Pioneer Corps (AMPC), before being transferred to the US Army 1511th QA truck regiment in July 1942. It was also utilised as an internment / PoW camp.
- Army personnel often carried out training and manoeuvres in open ground within close proximity to their garrison or barracks, sometimes utilising live ordnance (typically comprising SAA or LSA). Furthermore, unwanted / superfluous ordnance was sometimes disposed of in nearby open ground. Official records of day-to-day activities of troops at Huyton Camp are not available, and so details about the type / location of training which took part during busy wartime periods are scarce. However, the Site comprised Huyton Cricket Club, a privately owned sports facility which was utilised by civilians throughout the war, as indicated by the club wartime meeting minutes.
- Furthermore, an entry in these meeting minutes indicate that the US troops stationed at the camp used the sports facilities on Site, such as the tennis courts and cricket pitch (which was adapted for baseball). Therefore, it is considered unlikely that the Site would have been accessed for activities utilising live ordnance, such as training or disposal. As no evidence has been found to suggest this occurred, and the Site does not consist of ground suitable for such use, the risk of encountering Allied UXO on Site has been assessed as **Low**.
- 22 permanent HAA batteries were active within range of the Site during WWII. LAA guns likely defended vulnerable points within the borough. Luftwaffe activity was relatively frequent over the wider area and therefore these guns would have expended a considerable quantity of ammunition. Consequently, it is possible than an unexploded AA shell struck the Site. As such, the risk of encountering an unexploded AA shell on Site is considered analogous with that of a German UXB, and has been assessed as **Low-Moderate**.

Likelihood of UXO Remaining and UXO Encounter:

- The risk associated with any shallow or deep buried German UXBs has likely not been mitigated at all across the Site. The risk associated with any very shallow buried UXBs / HAA shells will have likely been partially mitigated with the laying of hardstanding on previously undeveloped ground and general maintenance of the remaining open ground.



- Please note, the risk of a UXO encounter can be considered mitigated in the exact locations and down to the exact depths of any post-WWII intrusive works.

RECOMMENDED RISK MITIGATION MEASURES: The measures detailed below are recommended to mitigate the risk to ALARP level.

Risk Mitigation Measure	Recommendation
UXO Safety Awareness Briefings	Prior to all intrusive works commencing.

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QUALITY POLICY

Brimstone Site Investigation Ltd, known as Brimstone, is committed to the delivery of unexploded ordnance (UXO) risk mitigation services, including safe removal and disposal of explosive ordnance, in the UK and overseas. Since our incorporation in 2016 it has been our goal to provide unsurpassed and unbiased UXO risk mitigation services. Brimstone is a client-centric organisation, with the aim to provide the client the services they need, to the agreed requirement, in accordance with national and international standards or standard operating procedures.

We are committed to providing a safe, cost-effective, and quality service, underpinned by our core values:

- **Integrity:** We are unwavering in our commitment to providing pristine, unbiased counsel and superior services. Our ethical compass guides every interaction, ensuring we maintain the highest standards of conduct in all our endeavours.
- **Professionalism:** We embody professionalism at every level, conducting our business with unparalleled excellence. Our commitment to quality guarantees top-tier service and a seamless experience for every client.
- **Knowledge:** We are devoted to perpetual growth, consistently expanding our expertise to stay at the forefront of industry innovation and strategy. Our thirst for knowledge ensures we are equipped to lead and succeed in an evolving marketplace.
- **Innovation:** We champion innovation, continuously advancing our services and processes. Our pursuit of inventive strategies and pioneering solutions ensures we not only meet but exceed the evolving needs of our clients and the industry.

We are committed to the applicable requirements of the ISO 9001:2015 standards. We set and review quality monitoring objectives using the plan, do, check, act cycle to measure the performance of our quality management system. Brimstone wholly endorses the ethos of 'continual improvement efforts' and allocates resources to meet this requirement.

This policy applies to the whole of the Brimstone services and involves all personnel including the managing director. All personnel are responsible for helping manage quality, seeking improvement through constant review, and by encouraging supplier and subcontractor involvement. We are committed to achieving customer satisfaction using quality procedures, which will be operated to meet or exceed the applicable requirements of ISO 9001.



Aaron Florence
Founder and Managing Director
Brimstone Site Investigation Ltd.

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1 INTRODUCTION

1.1 Background

IGE Consulting (the Client) has commissioned Brimstone to carry out a Stage 2 Detailed Unexploded Ordnance Risk Assessment (DRA) of the proposed redevelopment works at the Huyton Cricket Club, Knowsley site (the Site).

1.2 Legislation

There are no regulations that specifically govern the UXO risk mitigation industry in the UK. However, there are two pieces of legislation that require consideration. It is industry best practice (and common sense) to frame your site in the context of UXO, and to put in place measures to protect people from risks. In 2009, CIRIA published Unexploded Ordnance (UXO) - A Guide for the Construction Industry C681. This publication, though not legally binding, provides the gold-standard framework to which UXO and construction companies operate.

1.2.1 Construction Design and Management Regulations (CDM) 2015

The regulations identify the client, the CDM coordinator, the designer, and the principal contractor as responsible parties. Under the regulations, responsible parties are held accountable for the way a construction project is managed and for the health and safety of workers. Responsible parties must:

- Provide an appropriate assessment of potential UXO risks, or ensure an assessment is completed by another party.
- Put in place appropriate risk mitigation measures if necessary.
- Supply all parties with information relevant to the risks.
- Ensure the preparation of an emergency response plan.

1.2.2 The Health and Safety at Work Act 1974

The Health and Safety at Work Act 1974 had a transformative impact on health and safety, saving thousands of lives since its enactment. Employers must consider their employees, workers not in their employment, and members of the public. The act places a duty on every employer 'as far as is reasonably practicable' to protect workers from risks. It also says that information must be provided about aspects of health and safety that affect their role.

1.3 Commercial Contractor and the Authorities

1.3.1 Commercial Contractors

If your site has been given a moderate or high-risk rating, then control measures will be recommended. The measures will be specific to the scope of works on site, usually in relation to the depth and extent of excavations, piling and similar activities. There are a range of different methods at Brimstone's disposal, including:

- Non-intrusive surveying (including drone surveying)
- Intrusive surveying
- Search and clear
- Watching brief
- Support to geotechnical investigations
- Target investigation
- Site-specific training packages
- Site safety briefings



Our UXO Engineers can assess suspicious items on site when they are found. This will avoid unnecessary site evacuations. If our engineer(s) decide the item is UXO, they will coordinate with the authorities, manage disruptions, and advise on control measures, such as evacuations and a cordon.

1.3.2 UK Authorities

If Brimstone is not on site and a suspicious item is found, the local police must be immediately called on the non-emergency number. Police will visit the site. They will then inform the Joint Services Explosive Ordnance Disposal (JSEOD) office, which will coordinate the callout of an army or navy response team.

A precautionary cordon will initially be put into effect, with possible evacuation of homes and businesses, road and rail closures. The cordon may be extended following the advice from JSEOD's response team.

To manage their resources, JSEOD triages incidents. A consideration of the type, size and location of the UXO is made. If an incident is not given a high priority rating, a team may not be available for up to two days following the initial report.

The use of JSEOD is under the Military Aid to Civil Authorities (MACA) framework, therefore the budget and personnel is limited, and there are no statutory obligations made of the MOD. Often the MOD will recommend involvement of a commercial UXO contractor to manage the ongoing risk – this is especially true of former airfields and training areas where contact with land service ammunition can be frequent.

1.4 UXO Risk in the UK

Fortunately, to the best of our knowledge, there has not been a single post-war incident in the UK where a construction worker has been killed or injured because of an item of UXO exploding. There have been cases in mainland Europe where UXO had been struck and then exploded, killing workers. In 2019, a WWII general purpose bomb spontaneously detonated in a field north of Frankfurt, Germany.

However, the incident in Frankfurt is not comparable to the UK, due to the way different countries manufactured ordnance. Bombs made in different countries have different associated hazards. British WWII bombs, for example, have a fuzing system which uses chemicals which makes them very unsafe. Please see **APPENDIX 1** for recent examples of UK UXO incidents.

Between 2013 and 2016 JSEOD responded to 7,500 callouts. These callouts range from falsely identified objects, inert objects, small items of UXO and large WWII German unexploded bombs (UXBs). Each year the construction industry inadvertently unearths UXO; often this goes unreported. UXO contamination comes from three main sources:

- **Enemy action:** during WWI and WWII the air forces of Germany, and to a lesser extent Italy, bombed targets throughout the UK. The German navy bombarded several coastal targets in eastern England during WWI and then in WWII German long-range artillery on the French coast bombarded parts of Kent.
- **Allied military activity:** during WWI and WWII several Allied nations used the UK as a staging area for military action in the European Theatre; predominantly the US and Canada.
- **UK military activity:** domestic British Army, Royal Air Force (RAF) and Royal Navy (RN) training activities during peacetime and conflict as well as anti-aircraft gun and rocket batteries during WWI and WWII.

1.5 UXO Detonations

A detonation is a violent chemical reaction which creates a huge volume of gas. This reaction appears to happen instantaneously – the velocity of the shockwave moving is up to 9,000m per second. This chemical reaction is started using a small amount of very sensitive explosives called primary explosives. These types of explosives are highly sensitive to shock, friction, heat, and spark. As the explosive charge undergoes high order decomposition (detonation), the brisance, or shattering effect, causes the casing to splinter, projecting razor-sharp shrapnel across long distances.

The blast wave effect and the shrapnel effect can cause significant damage. Calculating safety distances is a complex process. As a rule of thumb, in open ground, a 250kg explosive charge (as would be found inside a typical 500kg bomb) would require an omnidirectional safety distance of at least 1.6km.

Bombs work by amplifying the explosive charge from the sensitive primary explosive through to the main charge or fill of the item. This process is called an explosive train, if any link in that chain is broken, the item will fail to function as intended. This can be due to mechanical, electrical, or manufacturing tolerances or faults. Amongst other reasons, detonation of UXO could occur under the following circumstances:

- **UXO body impact:** A substantial impact onto the main body of a UXO; borehole rigs, piling rigs, jack hammers and mechanical excavator buckets.
- **Fuse impact:** Environmental conditions during decades of burial can result in the primary explosives located in the fuse pocket to crystallise and become shock sensitive. It would then take a relatively small impact or friction impact to cause the fuse to function and detonate the UXO.
- **Re-starting a timer:** A small proportion of German WWII bombs used clockwork fuses. In 2002, an Army EOD Engineer reported that the clockwork fuse in a UXB re-started. Decades of burial causes substantial corrosion in WWII German UXBs and therefore an incident such as this is extremely rare.

2 ASSESSMENT METHODOLOGY

2.1 Introduction

This assessment has been produced in accordance with the relevant CIRIA guidelines; *Unexploded Ordnance (UXO) - A Guide for the Construction Industry C681* (published in 2009). CIRIA C681 is a publication which originated from round table best practice discussions from industry leaders.

2.2 Source, Pathway, Receptor, Consequence Risk Model

The Source, Pathway, Receptor, Consequence (SPRC) risk model can be applied to buried UXO as follows:

- **Sources:** UK and Allied UXO sources include military firing ranges, bases, storage depots, munitions factories, anti-aircraft batteries, amongst others. There are many wartime causes of UXO contamination. The source for enemy contamination is overwhelmingly from WWII German air raids.
- **Pathways:** the pathway describes how the UXO reaches receptors. Usually, UXO is buried and therefore pathways can be any activity which involve breaking ground. Examples include ground investigation works, site enabling works and excavations.
- **Receptors:** receptors are the people, assets and infrastructure that can be adversely affected by UXO exposure. This includes site personnel, plant, equipment, buildings, the general public, and the environment.
- **Consequence:** the consequences of an inadvertent UXO detonation are catastrophic. They include injury and loss of life, as well as damage to property. Fortunately, the likelihood of UXO detonating is low, even when it is uncovered during works. However, another consequence to consider is delays to works, which itself can be a risk.

2.3 Assessment Structure

In accordance with CIRIA C681 this assessment addresses the following considerations in the appropriate order:

- The likelihood that the site was contaminated with UXO.
- The type of UXO that could have contaminated the site, and their associated hazards.
- The likelihood that UXO remains on the site.

- Theoretical bomb penetration depths.
- The likelihood that UXO will be uncovered during the proposed works.
- Risk rating and risk mapping (as appropriate).
- Risk mitigation recommendations.

2.4 Information Sources

To complete this risk assessment, Brimstone has gathered information from a wide range of sources. Brimstone's research team has completed detailed historical research, including access of original archived records. The list below is a general list of information sources that are consulted during the research process. For Site-specific sources consulted for this risk assessment, please refer to **APPENDIX 5**.

- The National Archives,
- Local archive centres,
- Ministry of Defence,
- The Council for British Archaeology,
- Groundsure mapping services,
- Historical aerial photography (Historic England, Britain from Above, NCAP),
- Google open-source mapping,
- The British Geological Survey,
- Open sources; published book, articles, web resources,
- Site-specific information supplied by the Client,
- Brimstone's library and historical database, and
- Brimstone's former armed forces employees.

2.5 As Low as Reasonably Practicable Principle

The ALARP (as low as reasonably practicable) principle corresponds to the actions that should be taken to reduce risks. The term 'ALARP' is in the Health and Safety at Work Act 1974, which says that risks must be controlled in a reasonable way.

Infinite time, effort and money could be spent trying to eliminate risk entirely. HSE uses the example that spending £1m to prevent five employees bruising their knees is disproportionate, whereas spending the same amount to prevent an explosion which could kill 150 people is proportionate.

Using this principle, Brimstone aims to reduce client costs by recommending strategies that are proportionate to the assessed risks, if any elevated risk is found at all.

2.6 Risk Tolerances

The Brimstone risk assessment process divides UXO risk into two tolerances:

- **Tolerable:** Low Risk and Low-Moderate Risk ratings are tolerable. Where the risk cannot be completely discounted, it may be a useful strategy to opt for a low-cost measure, such as a UXO safety briefing from a qualified UXO engineer.
- **Intolerable:** Moderate, Moderate-High, and High-Risk ratings are intolerable. Proactive risk mitigation measures should be put in place. Various strategies are at Brimstone's disposal to meet your project-specific needs.

2.7 Reliance and Limitations

This report has been prepared using published information and information provided by the Client. Brimstone is not liable for any information which has become available following the publication of this report. No third-party liability or duty of care is extended. Any third-party using information contained in this assessment do so at their own risk.

3 THE PROJECT

3.1 The Site

The Site is located in Huyton, within the Metropolitan County of Merseyside, approximately 670m north-east of Huyton railway station. It is bound to the north by residential structures on Adswood Road, to the east by Huyton Lane, and to the south and west by residential structures on The Garth and The Avenue respectively.

The Site largely comprises undeveloped ground utilised as a cricket pitch. A pavilion / clubhouse structure is present in the west, with associated hardstanding in the north. Mature vegetation is present in the north-west and south-west.

Grid Reference: SJ 44426 91303

What3Words: worked.waters.proof

FIGURE 1: Site Location Maps

FIGURE 2: Recent Aerial Photograph

3.2 The Proposed Works

Brimstone was not made aware of any upcoming SI works occurring on Site.

The proposed development will involve the enhancement of the existing structure on Site, with the Site returning to its original use as a cricket club. Brimstone was not made aware of any proposed intrusions or associated depths of intrusions at the time of writing.

FIGURE 3: Existing Site Plan

4 SITE HISTORY

4.1 Site Introduction

Site-specific history can be assessed by reviewing historical mapping, historical aerial photography and by carrying out additional Site-specific research where appropriate. Below are descriptions of a selection of records relevant to the Site:

4.2 Mapping

The below table describes the composition of the Site, structural changes in pre- and post-WWII Ordnance Survey (OS) editions, and relevant points of interest. All maps were retrieved from National Library Scotland (NLS) online database and the Landmark Promap OS database.

Period	Map Date	Map Scale	Review
Pre-WWI	1845	1:10,560	The entire Site comprises an area of undeveloped ground, potentially utilised agriculturally. Additional open ground is present to the north, south and west, with Huyton Lane to the east.

	1889	1:2,500	Whilst the Site remains as open ground, it is now labelled as a Cricket Ground. An associated pavilion has been constructed in the north-west.
	1906	1:2,500	An additional small structure has been constructed to the south-west of the pavilion. No other changes appear to have taken place on Site.
Pre-WWII	1925	1:2,500	An additional small structure has been constructed directly north-east of the main pavilion.
	1938	1:2,500	FIGURE 4.1: No significant changes appear to have taken place within the Site boundary. Residential structures are now present approximately 10m west of the Site, on The Avenue.
Post-WWII	1952-53	1:2,500	FIGURE 4.2: No significant developments appear to have taken place on Site. The open ground in the north-west of the Site is now utilised as a Bowling Green, with tennis courts now present in the south-west.
	1965-66	1:1,250	No significant changes appear to have taken place on Site.

4.3 Photography/Aerial Photography

The below table describes the composition of the Site visible in post-WWII aerial photography, including areas of possible structural clearance, damage and other possible features of note. All photographs were retrieved from Historic England's (HE) Royal Air Force (RAF) Photography Archive.

Period	Photo Date	Review
Post-WWII	26 th March 1946	FIGURE 5.1: This vertical image, displaying the entire Site, was taken approximately a year after the end of WWII. The composition of the Site matches that of WWII-era OS mapping, largely comprising undeveloped ground used as sports pitches, with a pavilion and two smaller ancillary structures in the north. No immediately obvious signs of bomb damage, such as cratering in the open ground, structural clearance or roofing repairs, are visible on Site, or in the immediate surrounds. A majority of the open ground on Site, comprising a cricket pitch, appears very well maintained. Ground disturbances are visible directly north of the Site; however, these works are anticipated to be related to the residential development of the area, and are therefore unrelated to wartime activity. Although, it should be noted that any evidence of bomb damage in this area would likely have been infilled as part of these works.

	9th March 1948	FIGURE 5.2: This vertical image, displaying the wider Site area, was taken approximately three years after the end of WWII. No changes to the Site are visible; however, the residential development north of the Site has been largely completed. Huyton Camp, utilised mainly as a PoW / internment camp, is visible approximately 200m west of the Site, and an anti-aircraft camp and battery is visible approximately 380m north-east of the Site.
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4.4 Additional Site-Specific History

Some sites will have been occupied by landmarks or significant buildings historically and in such cases specific written histories including significant wartime details are occasionally available in the public domain. No such information was available.

5 UXO RISK - GERMAN BOMBING

5.1 WWI Bombing History

5.1.1 Britain during WWI

During World War I (WWI), an estimated 9,000 German bombs were dropped on London, Eastern England and South-Eastern England during some 51 Zeppelin airship raids and 52 fixed-wing aircraft raids. London suffered the worst of the bombing with an estimated 250 tonnes of HE and incendiary bombs recorded across the Capital, over half of which fell on the City of London district.

The WWI bombing campaign waged by Germany was on a far smaller scale than the WWII campaign, in terms of the number of raids, the weight of ordnance dropped during each attack and the size of the bombs used. When coupled with the fact that most WWI-bombed locations have since been redeveloped, German WWI UXB finds are extremely rare. Furthermore, most air raids took place during daylight hours and as it was the first time Britain had experienced strategic aerial bombardment, the raids often attracted public interest and even spectators, increasing the chances of any UXBs being reported.

5.1.2 Site Specific

A collection of written reports describing each air raid in the region was reviewed (I. Castle, 2024). No evidence that Huyton was targeted by enemy bombing during WWI was uncovered.

5.2 WWII Bombing History

5.2.1 Liverpool

During WWII, Liverpool was home to the second largest port complex in the UK – the largest west facing port - and a Royal Navy base. As such, its destruction became a primary objective for the Luftwaffe. The city and its long stretch of docks were subjected to a concentrated bombing campaign which resulted in Liverpool becoming the second most heavily bombed area in Britain, behind London. The scale of these raids also led to extensive bomb damage in neighbouring Bootle, Wallasey and Birkenhead.

The first major air raid on Liverpool took place on 28th August 1940. 160 bombers dropped 350 tons of HE bombs, 30 HE parachute mines and 3,000 incendiary bombs. There were 50 raids during the first three months of the Luftwaffe campaign on the city. In September and October, Liverpool was subject to a raid almost every other night. Most of these were minor, conducted by just a few aircraft; however, several attacks were executed by approximately 300 aircraft and lasted over ten hours.

The Christmas Blitz of 1940 was a series of three consecutive night raids, which were the heaviest attacks so far. Between 20th and 22nd December, 365 people were killed. Another heavy attack, aimed at the docks specifically, on 9th January was the only raid of that month.

Another period of devastation was known as the May Blitz of 1941, consisting of a seven-night bombardment. 500 roads were closed due to damage, over 6,500 homes were completely demolished and a further 190,000 sustained damaged. It involved 681 bombers dropping 870 tonnes of HE bombs and over 112,000 1kg incendiaries, the latter starting numerous fires throughout Merseyside. As a result of this assault, 70 out of 140 berths in Liverpool's docks were put out of action.

The May Blitz marked the end of concentrated raids over Merseyside. A few small-scale attacks followed with the final bombs falling on the night of 10th January 1942, the eightieth air raid over the city.

5.2.2 Site Specific

The Luftwaffe's primary aiming point for indiscriminate large-scale air raids (Liverpool Docks), which the majority of bombing in the region was focussed on, is situated some 9km to the west. The Site would have therefore not been vulnerable to inaccurate overspill bombing.

No identified primary or secondary targets were present in the immediate vicinity. Huyton railway station, approximately 650m south-west, as well as the internment camp and prisoner of war camp, later a base for American servicemen, approximately 200m west may have been identified as a target of opportunity.

5.2.3 Bombing Decoy Sites

In mid-1940 bombing decoys were introduced. The decoys used either:

- A system of lighting to simulate an urban area or a military airfield's runway,
- Deliberately started fires to simulate a previously bombed target,
- Dummy buildings and vehicles to simulate a military facility.

792 static decoy sites were built at 593 locations in Britain. They were estimated to have drawn at least 5% of the total weight of bombs away from their intended targets. No decoys were operational within a significant radius of the Site during WWII. The closest was approximately 4.7km to the north-west.

5.3 WWII Bombing Records

5.3.1 Introduction

The bomb census recorded the location and type of bomb strikes to help with intelligence gathering and planning. It was compiled using information recorded by ARP wardens. These records were gathered by the Ministry of Home Security to calculate bombing density within administrative areas.

The bomb census was unreliable in the early stages of the war, though by 1941 procedures had been standardised. The quality of the census records also depended on where in the UK the records were produced. Some records are held at the National Archives and some are held at local borough archives.

Relevant records held at the National Archives, Merseyside Fire and Rescue Service, Liverpool Central Library & Record Office, Kirkby Library and the Lancashire Archives were obtained for this risk assessment.

5.3.2 Bombing Density Statistics

The table below records the Ministry of Home Security's bombing density calculation for the Urban District of Huyton with Roby. It gives a breakdown of the types of large German bombs reported and is understood to not include UXBs.

Admin Area	Huyton with Roby
Area Acreage	3,053
High Explosive Bombs (all types/weights)	64
High Explosive Parachute Mines	4
Flam (Oil) Bombs	0
40kg Phosphorus Incendiary Bombs (IBs)	0
40kg 'Fire Pot' IBs	0
V1 Flying Bomb	0
V2 Long Range Rocket	0
Total (excluding V-Weapons and 1kg / 2kg IBs)	68
Bombs Per 1,000 Acres	22.3

1kg / 2kg incendiary bombs and 2kg anti-personnel (AP) bombs were often too numerous to record accurately and therefore are not included in the above figures.

5.3.3 Lancashire ARP Bomb Map

Brimstone has reviewed a countywide map for WWII-era Lancashire, held at Lancashire Archives. This small-scale map covers all boroughs / districts throughout the WWII-era county aside from County Boroughs and relates to a set of written ARP incident records (discussed in the following section). Each plot point on the map is thought to represent one incident; due to the size of the plot point, the precise location of each incident is not discernible. A relevant section of the map is displayed at **FIGURE 6**.

- Nine bombing incidents are recorded within a 1km radius of the Site.
- Whilst discerning the exact locations of bomb strikes is not possible due to the large plot sizes, the closest incident appears to be approximately 100m north of the Site.

5.3.4 Lancashire ARP Incident Records

Brimstone has reviewed a collection of written ARP incident records for WWII-era Lancashire, related to the bomb map discussed in the previous section and held at Lancashire Archives. Details provided include the date, location, type of ordnance dropped and comments on damage and evacuation. It should be noted that due to the small-scale of the related map and the large plot points, precise locations could not always be discerned, and a number of the entries provide general areas only, and so do not have a corresponding map number. Records in proximity (an approximate 1km radius) to the Site have been transcribed in the table below.

ID	Date / Time	Location <i>relative to the Site</i>	Bomb(s)	Remarks
65	31/08/1940 12:07	Huyton, Blue Bell Lane <i>Approximately 120m west of the Site.</i>	Several HEs	Slight damage to property



n/a	14/10/1940 02:47	Huyton, Primrose Drive. <i>Approximately 700m north-west of the Site.</i>	UXAA	n/a
269	24/09/1940 14:30	Huyton, rear of St Aloysius R.C. School <i>Approximately 900m west of the Site.</i>	UXB	In field 150yds rear of school
n/a	16/10/1940 18:00	Huyton, Primrose Drive <i>Approximately 700m north-west of the Site.</i>	AA	n/a
351	19/10/1940 20:20	Huyton (near Liverpool) <i>Approximately 850m south of the Site.</i>	IBs	In grounds of Huyton College
395	26/10/1940 17:30	Huyton, Blue Bell Lane <i>Approximately 580m north of the Site.</i>	UXAA	Midway between Blue Bell Lane and R. ALT, 200yds South side of Liverpool Road
457	19/11/1940 23:15	Huyton <i>Approximately 380m south-east of the Site.</i>	HE	No casualties
768	10/01/1941	Huyton <i>Approximately 610m south-west of the Site.</i>	HE	LMS Railway line 100yds East of Huyton damaged
n/a	10/01/1941 21:15	Huyton Roby <i>No precise location given.</i>	IBs AA Shells	n/a
1219	13/10/1941 01:14	Huyton <i>Approximately 540m north-west of the Site.</i>	HE	On land between farm and Blue Bell Lane

5.3.5 Lancashire UXB Register

Brimstone has reviewed a collection of written incident records recording the location of UXBs in WWII-era Lancashire, held at Lancashire Archives. These records provide the date, general location and action taken of each incident, but not the type of UXB discovered. It should be noted that the locations relative to the Site below are approximate based on the information available; the precise location of each incident could not be confidently determined. Records in proximity to the Site (approximate 1km radius) have been transcribed in the table below.

Date	Location <i>relative to the Site</i>	Bombs	Action Taken
26/10/1940	Huyton, in field between Prison and Blue Bell Lane, 200yds south of Liverpool Road. <i>Approximately 450m north-west of the Site.</i>	UXAA	Reported by police 26/07/1940. Reported to Region 27/10/1940
13/04/1941	Huyton, in field south of Long View Drive. <i>Approximately 550m east of the Site.</i>	UXAA	Removed 18/04/1941
07/05/1941	Huyton <i>No exact location specified.</i>	UXAA	Removed 10/05/1941
08/05/1941	Huyton, enclosure of the Alien Internment Camp. <i>Approximately 230m west of the Site.</i>	UXAA	Removed 10/05/1941

5.3.6 Liverpool Bomb Census Map Tracings

Brimstone has reviewed a collection of original tracings of bomb census maps for the County Borough of Liverpool, held at the National Archives. It should be noted that as this source consists of tracings, infrastructure and roadways are often not visible. As such, it is difficult to accurately plot the precise location of the Site. Additionally, some dates and types of ordnance dropped are not included / specified. Relevant maps are displayed at **FIGURE 7**.

- Four 250kg HE bomb strikes are recorded approximately 550m north of the start, falling in what appears to be a bomb stick, aligned from west to east.
- No additional incidents are recorded within a significant distance of the Site.

5.3.7 Huyton Air Raid Warnings and Bomb Damage Register

Brimstone has reviewed a register of bombing incidents leading to bomb damage within Huyton, held at Knowsley Archives. The entries in the register detail the location of the incident, the types of bombs involved, and provide a comment as to the extent of the damage. The latest entry in the register is in November 1941, indicating that this source is not comprehensive. Note, the entries are handwritten and some are illegible. The entries identified within an approximate 1km radius of the site are presented below and on an overlay at **FIGURE 7**.

ID	Date	Location <i>relative to the Site</i>	Bomb(s)	Remarks
1	31/08/1940	73, 75 Blue Bell Lane <i>Approximately 200m north-west of the Site.</i>	1 x HE	HE bomb in back garden
2		100yds North of Cricket Ground. <i>Approximately 80m north of the Site.</i>	1 x HE	In field, no damage
3		10 Long View Crescent <i>Approximately 230m east of the Site.</i>	1 x HE	In back garden, damage caused to rear of houses
4		Hag Plantation, SW of Long View Drive <i>Approximately 560m south-east of the Site.</i>	1 x HE	No damage
5	24/09/1940	150yds rear of St Aloysius School, Twig Lane <i>Approximately 840m north-west of the Site.</i>	1 x UXHE	No damage
6	19/11/1940	Playing fields Huyton Hill School <i>Approximately 280m south-east of the Site.</i>	1 x HE	In playing fields, little damage caused
7	10/01/1941	Rear of North side of Westmorland Road <i>Approximately 380m south-west of the Site.</i>	1 x HE	Considerable number of damaged windows
8		In gardens between Archway Road and Stanley Road <i>Approximately 400m south-west of the Site.</i>	1 x HE	Damage to surrounding property
9		Rupert Road senior school <i>Approximately 840m south-west of the Site.</i>	IBs	Gas main damaged

10		Railway 100yds East of Huyton Station <i>Approximately 610m south-west of the Site.</i>	1 x HE	On land between farm and Blue Bell Lane
11	21/03/1941	Between Seel Road and Hay Road railway bridges <i>Approximately 780m south-east of the Site.</i>	1 x HE	Windows and sheds broken, bomb exploded below ground
12	23/03/1941	5yds south of 70 Longview Drive <i>Approximately 540m east of the Site.</i>	1 x UXAA	n/a
13	13/10/1941	Pine Close <i>Approximately 700m north-west of the Site.</i>	1 x HE	Damage to roof and ceilings at number 11, direct hit on River Alt
14		Field west of Blue Bell Lane <i>Approximately 530m north-west of the Site.</i>	1 x HE	No damage

5.3.8 Huyton Bombing Incident Register 9th/10th January 1940

Brimstone has reviewed a bombing incident register for Huyton, covering an air raid on the 9th/10th January 1940, held at Knowsley Archives. This register notes the type and number of bombs dropped; however, it is not specific regarding the exact locations of bombs dropped, often giving vague street names only. It details the broader extent of the damage caused by the raid, which consisted of 87 houses slightly damaged, with eight being demolished, damage to the railway line and gas mains, and two fatal casualties.

The incidents thought to be within a 1km radius of the Site have been transcribed below. Note, due to the vague locational information available, it is not practical for Brimstone to plot these incidents on a bomb map.

Location <i>relative to the Site</i>	Bombs
Westmorland Road. <i>Approximately 380m south-west of the Site.</i>	1 x HE
Rear of Archway Road. <i>Approximately 690m south-west of the Site.</i>	1 x HE
Seel Road <i>Approximately 560m south-east.</i>	2 x HE
Ellis Ashton Street <i>Approximately 890m south-east of the Site.</i>	4 x HE

Near Huyton Cricket Ground
No precise location given; the Cricket Ground is on Site

1 x HE

5.3.9 Abandoned Bomb Register

Due to the overstretched bomb disposal units during WWII, many bombs were intentionally left undisturbed. UXBs were triaged based on where they were and how big they were. If they didn't pose a significant risk, they were 'abandoned'. The locations of these bombs were recorded on the abandoned bomb register.

The abandoned bomb register is a public record document held at the Parliamentary Archives of the House of Commons, from which Brimstone has obtained a copy. The register should not be relied on for completeness or accuracy. The closest abandoned bomb is recorded approximately 6.7km south of the Site.

5.3.10 Secondary Source / Anecdotal Evidence

A search of online resources, as well as a review of local history publications was carried out with the intention of locating any eyewitness accounts of local bombing incidents. However, no such evidence was found.

5.4 Likelihood of UXB Contamination

Where detailed bombing records exist, it is possible to predict whether any UXBs could be found on a site. This likelihood is discussed in the following table:

Density of Bombing	
Number of Air Raids in the Vicinity:	A comparison of the bombing incident records confirms that at least eight air raids affected the study area.
Intensity of these Air Raids:	All bombs dropped locally were likely part of small or medium scale bombing raids, a majority of which were carried out at night.
Bomb Strike Positions	
Closest Bomb Strikes	HE bombs: 80m north. 1kg / 2kg IBs: 840m south-west.
Alignment of recorded Bomb Strikes:	One potential bomb stick has been identified; this bomb stick is recorded approximately 80m north of the Site. Given the close proximity of this stick, and the number of incidents recorded in the vicinity, there may have been multiple occasions during which a UXB (unobserved and unplotted) could have been released over and landed within the Site boundary. For most small IB spreads (covering a wide area) it is impossible to correctly identify the aircraft's flightpath and thus bomb-stick alignment. Furthermore, such bombs were significantly affected by the wind, further hampering analysis.
Bomb Failure Rate	
Evidence to suggest that the generally accepted failure rate of 10% differs in the vicinity of the Site:	None.
UXBs recorded in close proximity to the Site:	Closest plotted UXB strike to the Site is approximately 900m south-west.

5.5 Likelihood of Subsequent UXB Detection

A range of circumstances determine whether a UXB strike location would have been identified, during and after the war. This is discussed in the following table. This includes level of access to the Site during WWII, bomb damage, as well as the ground cover during WWII. This is discussed in the following tables.

Historic Access
A UXB falling on a site which was frequently accessed would have had a better chance of being found. ARP Wardens actively searched for UXBs in heavily bombed residential areas. The importance of a site or nearby buildings and infrastructure was also a factor. Many industrial facilities had fire watchers tasked with extinguishing incendiary bombs and reporting UXBs.
As a majority of the air raids in the immediate vicinity likely occurred during the hours of darkness, there is a greater probability that any UXB strike to the Site could have occurred unobserved as residents / employees were inside. Furthermore, no evidence of fire watchers providing night-time observation in the vicinity was found, although it is likely that these were present at Huyton Camp, 200m west of the Site. These factors decrease the likelihood that any UXB fall would have been witnessed and reported. As the structures on Site do not appear to have been subject to any damage, it is thought that these would have been subject to at least a degree of access throughout WWII. Even if they had been temporarily evacuated, it is not thought likely that a UXB entry hole would have been overlooked by returning employees. Indeed, analysis of the wartime Huyton Cricket Club wartime meeting minutes suggest that the club was active as a sports facility throughout WWII. However, whilst the areas of undeveloped ground on Site were utilised intermittently during the daytime for sports, they were likely not accessed frequently during the hours of darkness. Furthermore, during the winter months when cricket was not played at the club, the Site may have experienced intermittent levels of access. Therefore, it is conceivable that a UXB to these areas could have occurred unnoticed.
Bomb Damage
As the bombing campaign continued, damaged areas became vulnerable to unreported UXBs. Bomb site wreckage or soil disturbance at a bomb crater could obscure evidence of a subsequent UXB strike.
No evidence of bomb damage, such as cratering in the open ground or structural clearance / roofing repairs to structures, is visible on Site in post-WWII aerial photography. The same can be said for the wider Site area. Although ground disturbances are visible to the north of the Site, this is related to a housing development rather than military activity. Despite this, it should be noted that these works may be obscuring previous evidence of bombing, with cratering likely being infilled before foundation development started.

Ground Cover Type

A UXB which falls on open field could easily go unnoticed, whereas a UXB dropped on a hard-surfaced car park would have been easily observed.

Any UXB strike to the structures on Site would have caused incontrovertible evidence of its incidence as it passed the structures and into the ground beneath. The same can be said for the majority of neighbouring structures and roads to the south and west, where (assuming no cratering) a HE UXB entry hole would have been persistent and easily recognisable.

Grassy areas were present on Site during WWII. Whilst aerial photography indicates that these areas were well maintained, and the utilisation of these areas as sports pitches indicate they likely remained well maintained, it remains more likely that a UXB strike to these areas could go unnoticed comparatively to the structures. A UXB strike to these areas could feasibly leave little evidence of its occurrence, with the entry hole filling in over time.

6 WWII GERMAN BOMBS

6.1 Bombs Dropped on the UK

Nazi Germany used different types of ordnance against the UK for different effects. Some types were designed to cause fires, others for their destructive blast effect and other for their penetration capability. Each type of ordnance was fitted with at least one fuze. For some bombs multiple fuzes were used. Many different types of fuzes were available for use – each with its own set of associated hazards.

Data sheets on those bombs most likely to be encountered today are included at **APPENDIX 2**.

- **HE bombs – moderate NEQ (net explosive quantity):** the most common types of HE bombs dropped were the SC (general purpose - GP) and SD (semi-armour piercing - SAP) series of bombs. The NEQ is between 30-50%. SAP bombs are engineered to attack light fortifications, whereas GP bombs are used in a mixed destructive blast and anti-personnel fragmentation role. 70% of bombs dropped on the UK were the 50kg type.
- **HE bombs – high NEQ:** blast bombs and parachute mines have bodies made of thin steel, allowing for larger HE charges. These were designed to detonate above ground, maximising the blast effect. Parachute mines were weapons slowed by parachutes and designed to detonate without penetrating the ground. Although, in some marshland areas, partially buried parachute mines have been observed. Consequently, it is highly unlikely that any unexploded blast bombs remain buried in the UK today.
- **HE bombs – low NEQ:** The PC series were armour piercing bombs used against heavy fortifications and reinforced bunkers. They were not commonly used over the UK.
- **Small incendiary bombs:** The 1kg and 2kg incendiaries were the most dropped bomb. Up to 620 x 1kg incendiaries could be packed into the largest container unit, which opened at a pre-determined height scattering its payload over a wide area. These small bombs could fully penetrate soft ground due to their small diameter. Variants of the 1kg and 2kg incendiary bombs contained a small HE charge designed for an anti-personnel role, and to increase its incendiary effect.
- **Large incendiary bombs - Thick skinned:** The C50 has a thick body and contained a mixture of incendiary liquids and white phosphorus. Another version of the C50 had a white phosphorus fill. The C50 'firepot' contained thermite incendiary containers (aka firepots) and a small HE charge.

- **Large incendiary bombs - Thin skinned:** The Flam 250 and Flam 500 models had thin steel bodies designed to break up on impact, spreading their oil-incendiary mixture, which was ignited by a small HE charge. Consequently, it is highly unlikely that any unexploded Flam bombs remain buried in the UK today. Their unreliability meant withdrawal from frontline use by January 1941.
- **Submunitions:** The SD2 'butterfly' bomb was a 2kg submunition dropped on several British cities and towns. It contained a 225gram HE charge. SD2s had no ground penetration ability so the vast majority were recovered at the time. However, SD2s are still found across Britain today.
- **V1 flying bombs and V2 rockets:** In the final year of WWII Germany began using pilotless weapons against England. Both V Weapons had 1,000kg HE warheads. Due to their light-body construction, they had no penetration ability, and any impact left a noticeable debris field. As such, there is negligible risk from unexploded V Weapons today.

6.2 Bomb Failures

Records from September 1940 to July 1941 show that an average of 84 UXBs were dropped on civilian targets each day. Around 8% of these were time delay bombs – designed to strike the ground and start a predetermined countdown which could last days.

There is a generally accepted 10% failure rate for WWII German HE bombs. This is estimated from records gathered by bomb disposal units. These statistics do not account for UXBs that went by unnoticed.

Failures can happen for different reasons, including:

- Equipment or human error in arming the bombs before release,
- Failure of a mechanism within the fuze (out of tolerance),
- Jettisoning payloads if the bomber was under attack or crashing, or
- Partially functioned bombs (e.g. cracks in the cast TNT).

6.3 Bomb Ground Penetration

6.3.1 Introduction

Using data gathered during WWII by the Ministry of Home Security, estimations can be made about how deep a bomb is likely to penetrate the ground. Over one thousand incidents were reported by the bomb disposal units to support this research. Further tests were carried out, dropping bombs of different sizes into chalk and measuring the depths they reached. This research is held at the National Archives. The estimates are:

Bomb weight (kg)	Ground Type (m)									
	Sand		Gravel		Chalk		Clay		Sandstone	
	Average	Max.	Average	Max.	Average	Max.	Average	Max.	Average	Max.
50	2.8	7.8	2.8	7.8	3.5	7.7	4.0	9.1	2.7	6.0
250	4.8	13.7	4.8	13.7	6.0	13.1	6.8	15.8	4.6	10.4
500	6.0	17.3	6.0	17.3	7.6	16.4	8.7	19.8	5.8	13.1
1,000	7.6	21.9	7.6	21.9	9.6	20.7	10.9	24.9	7.3	16.5

Different layers of geology affect penetration depths. For example, 1m of made ground, then 1m of gravel before reaching clay – as is many areas of London – is not easily calculated from the data above.

When calculating how deep a bomb could have reached, we must make three assumptions:

- **Impact velocity:** German bombing raids were carried out at altitudes in excess of 5,000m. The velocity of impact is roughly 313ms^{-1} (not accounting for resistance). It is the same velocity regardless of mass.

- **Impact angle:** strike angles of 10 to 15 degrees to the vertical. It must be assumed that the bomb was stable at the moment of ground penetration.
- **Bomb design:** Some larger German bombs were occasionally fitted with 'kopfrings' - a metal ring, triangular in cross section, fitted around the nose of the bomb to help prevent penetration. It must be assumed that no 'kopfrings' were fitted.

6.3.2 The J-Curve Effect

During WWII, Bomb Disposal Units (BDUs) reported that most buried UXBs were found horizontal or upturned. This observation confirmed the 'J-curve effect'. As an HE bomb penetrates the ground, slightly offset from the vertical, its passage underground creates a 'J' shape.

This is relevant because the J-curve effect results in a horizontal offset between the buried UXB and its point of entry. This distance is estimated to be one third of the theoretical penetration depth. A low altitude attack, meaning a low impact angle, could produce an even greater offset, of up to 15m.

6.3.3 Site Specific Geology

BGS Mapping	Superficial Deposits: Till, Devensian (Diamicton)	Bedrock Deposits: Pennine Middle Coal Measures Formation (Mudstone, Siltstone and Sandstone)
SI Data	No recent SI data was provided by the Client. However, local BGS borehole logs were available. The closest BGS SI through the same mapped geology as the Site is located approximately 1km north-east of the Site (BGS ID: 165782). This SI (January 1996) encountered the following ground conditions: - 0.70m of made ground (sandy silty clay, gravel, brick fragments) - 1.40m of firm light brown sandy silty clay - 2.95m of firm to stiff brown sandy silty clay - 2.95m of grey-blue moderately weathered mudstone - 5.30m of mudstone - 2.23m of grey sandy mudstone - 5.28m of grey sandy mudstone with thin hard bands	

6.3.4 Site Specific Maximum Bomb Penetration Depth

During WWII, the Luftwaffe dropped many different types of HE bomb. The SC (general purpose) series was by far the most numerous and of this series, the SC 500 model (weighing 500kg) was the largest of the most commonly deployed and therefore this will be used as the benchmark weapon for the Site-specific bomb penetration depth calculations.

In order to calculate the most likely maximum depth to which a bomb would penetrate, Brimstone has taken the average of the average and maximum figures for the predominant Site-specific geology (clay) in the table above. This gives a likely maximum bomb penetration depth of 14.25m below WWII ground level for a 500kg bomb. However, given the presence of mudstone at 5.05m bgl it is not possible to calculate an exact figure.

Note, the Ministry of Home Security data indicates that the maximum bomb penetration depth could be down to 19.8m for a 500kg bomb, or 24.9m for a 1,000kg bomb; however, in line with the ALARP principle, it is not considered to be a likely scenario that a bomb would penetrate so deeply. Furthermore, while evidence indicates that a 1800kg HE bomb could penetrate to over 30m, these types of bombs were not dropped frequently. For example, War Office statistics confirm that between October 1940 and May 1941 the majority of HE UXBs (>90%) were either 50kg or 250kg, with the 500kg bombs making up most of the remaining 10%.

7 UXO RISK - BRITISH/ALLIED ACTIVITY

7.1 Introduction

The table below lists potential sources of UXO (excluding enemy action). Those which are potentially relevant to the Site are discussed in the subsequent section(s).

Potential UXO Source	Potentially Significant
Army or RAF training areas / ranges	✗
Military bases and other installations	✗
Munitions and explosives factories	✗
Military storage depots	✗
Defensive fortifications	✗
Wartime site requisitions	✗
WWII defensive mining (landmines)	✗
WWII Home Guard activity	✗
Wartime anti-aircraft fire	✓

7.2 Potential Sources of UXO

7.2.1 Introduction

Research has not located any evidence of significant British or Allied army, RAF or Royal Navy activity specifically on Site and none is likely to have occurred historically. The only likely potential source of British UXO contamination is therefore WWII AA artillery fire.

However, as identified at a preliminary stage, Huyton Camp was present within a close proximity to the Site. This will be discussed in further detail below.

7.2.2 Huyton Camp

Huyton Camp, also known as Blue Bell Camp, was present approximately 200m west of the Site during WWII. As identified at the preliminary stage, an in-house geodata set records part of this camp as being approximately 130m north of the Site, although no further evidence to corroborate the location of the camp in this area has been found. Indeed, available mapping of the camp has been obtained from Knowsley Archives, displayed at **FIGURES 8** and **9**, indicating that the main camp was present to the west of the Site. Whilst not possible to confidently confirm, it is possible that the camp north of the Site has been mis-plotted, and instead represents an army camp visible 340m north-east of the Site (highlighted at **FIGURE 4.2**).

Blue Bell Camp was initially used as an Auxiliary Military Pioneer Corps (AMPC) training camp, before housing the US Army 1511th QA Truck Regiment from July 1942. It was also utilised as a prisoner of war / internment camp. The AMPC was originally intended to be a non-combat unit, focusing mainly on light engineering work including the building of anti-aircraft emplacements, airfields and the Mulberry harbours in the build up to D-Day. Although, many of the AMPC companies were utilised in combat roles throughout the war.²

² <https://www.nam.ac.uk/explore/royal-pioneer-corps#:~:text=Second%20World%20War,previous%20pioneer%20unit%20had%20achieved.>

Army personnel often carried out training and manoeuvres in open ground within close proximity to their garrison or barracks, sometimes utilising live ordnance. Official records of day-to-day activities of troops at Huyton Camp could not be located during the production of this assessment, and so details about the type of training which took part during wartime are scarce. However, despite comprising an area of open ground, the Site was owned privately by Huyton Cricket Club during the war, and no evidence has been found to suggest that the Site was requisitioned by the military.

Indeed, Huyton Cricket Club committee meeting minutes from WWII indicate correspondence with the general in charge of the US army camp, negotiating access for troops to the tennis courts on Site. Furthermore, the cricket pitch on Site was modified slightly, to allow American personnel to play baseball. No mentions to the open ground being used for anything other than sporting activities has been identified, and no mention of ordnance being present on Site was found. One mention was made to shrapnel being removed from the Site within the committee minutes; however, this could have feasibly come from a bomb landing hundreds of metres away and is not sufficient or explicit evidence of bombing occurring on Site. It should also be noted that large areas of open ground were present to the north and north-east of the Site; these would be considered far more ideal locations for training to take place, rather than a privately owned sports facility.

Therefore, despite the relatively close proximity of a large military camp, it is thought unlikely that the Site was accessed by armed troops for training purposes, or to dispose of ordnance. Indeed, no evidence of this occurring has been found within consulted sources, and as such the risk of encountering associated UXO during the planned development works is not considered elevated.

7.2.3 WWII Anti-Aircraft Fire

Anti-Aircraft (AA) Command was a British Army command established in 1939 to defend the UK during the anticipated German bombing campaign. It controlled the Territorial Army AA artillery and searchlight units. From 1940 to 1945 BDUs dealt with 7,000 unexploded AA shells in Britain. There were three main types of AA battery used for home defence (see below). Data sheets on these AA defences are included at **APPENDIX 3**.

- **Heavy Anti-Aircraft (HAA):** large-calibre guns (3.7" and 4.5") for engaging high-altitude bomber formations. Hundreds of permanent batteries were constructed in and around major cities and military bases during the 1930s. Some 2,000 of these guns were available during the Blitz. Each gun could fire between 10 and 20 rounds per minute and consequently HAA batteries could expend large quantities of shells during each engagement.

British time fuses were poorly manufactured during WWII, and this led to high failure rate for HAA shells, up to 30%. Unexploded HAA shells had the potential to land up to 27km from their battery, although more typically landed within a 15km radius.

- **Light Anti-Aircraft (LAA):** smaller calibre guns for engaging dive bombers and low altitude intruders. As such, they were mostly used to defend specific industrial and military targets which were subject to precision bomber attack. LAA guns were either .303" calibre machine guns or 20mm and 40mm calibre cannon. The latter were fitted with simply impact fuses and small incendiary or HE bursting charges.

The 40mm Bofors gun could fire 120 x HE shells / minute to a ceiling of 1,800m. Each shell was designed to self-destruct if it didn't strike an aircraft, however, inevitably some failed and fell back to earth.

- **Z (Rocket) Batteries:** a Z-Battery comprised a grid formation of 64 rocket projectors which fired 2" and later 3" Unrotated Projectile (UP) rockets to a maximum altitude of 5,800m; a ground range of some 9,000m. They were deployed in cities all around the UK from 1941 and proved to be an effective addition to the existing AA guns.

The rockets measured 0.9m (2") and 1.8m (3") in length with four stabilising fins at the base and were fitted with 3.5kg or 8.2kg HE warheads. The larger warhead had an effective airborne blast radius of up to 20m. Some variants deployed a form of aerial mine described as a "small yellow bomb" which was designed to detach from the rocket at height and descend on a parachute with the objective of becoming snagged on target aircraft and then detonating.

Unlike bombs which were designed to strike the ground, AA projectiles and rockets were designed to function in the air. Due to their shape, and centre of gravity they would often not strike the ground nose first. This coupled with the lower mass of AA UXO resulted in shallower ground penetration depths, compared to UXBs. Although, in very soft conditions, unexploded AA projectiles have been found deeper than 1.5m bgl.

22 permanent HAA batteries were active within range of the Site during WWII. LAA guns likely defended vulnerable points within the borough. Luftwaffe activity was relatively frequent over the wider area and therefore these guns would have expended a considerable quantity of ammunition. Consequently, it is possible than an unexploded AA shell struck the Site.

8 UXO RISK MITIGATING CIRCUMSTANCES

8.1 Introduction

Works on a UXO contaminated site could result in the partial or complete removal of UXO risk. Construction or earthworks may have uncovered any UXO contamination, which would then have been reported and removed by the authorities. A site may have been subject to an explosive ordnance clearance (EOC) task conducted by the armed forces. EOC tasks involve surveying, subsequent target investigation and removal of UXO. Although the effectiveness of historic EOC tasks will have often been unsatisfactory.

8.2 Explosive Ordnance Clearance Tasks

The division of EOC tasks has been complex throughout British military history. It used to be the case that anything under the water level would be dealt with by navy units, and anything on land would be dealt with by army units. In recent years, RAF Explosive Ordnance Disposal (EOD) capability has been discontinued, and now only the Royal Navy and the British Army have EOD units. In the army, the Royal Logistics Corps and Royal Engineer EOD units have been amalgamated to form 29 EOD & Search Group. Often taskings are assigned to either the naval or army elements based on where in the country the threat is and the nature of the threat.

Brimstone has access to a database of historic EOC tasks. This database is only complete up until the early 2000s and therefore does not include recent EOC tasks. No such database for the RAF and Royal Navy EOD units is easily accessible. A search of this database has not resulted in any Army EOC tasks in the vicinity of the Site.

UXO encounters on civilian land are often reported in the media and therefore a web search of local media outlets was also carried out. No recent incidents within close proximity to the Site were identified.

8.3 Ground Works

No post-conflict ground works requiring shallow (1-2m bgl) or deep (>2m bgl) excavations are anticipated to have taken place on Site. The Site has kept its WWII-era composition, although a small area of hardstanding has been laid in the north. The laying of this hardstanding, and general maintenance of the open ground, has likely disturbed ground at very shallow (<1m bgl) depths across the Site.

8.4 Deductions

The risk associated with any shallow or deep buried German UXBs has likely not been mitigated at all across the Site. The risk associated with any very shallow buried UXBs / HAA shells will have likely been partially mitigated with the laying of hardstanding on previously undeveloped ground and general maintenance of the remaining open ground.

Please note, the risk of a UXO encounter can be considered mitigated in the exact locations and down to the exact depths of any post-WWII intrusive works.

9 CONCLUSION

9.1 Accuracy of Historical Records

Occasionally, the accuracy of some historical records can prove to be poor when compared with other sources of information. One significant consequence of this can be the possibility of unrecorded German bomb strikes in the study area. No such inconsistencies were noted within the records consulted for this report.

9.2 The Risk of UXO Contamination on Site

9.2.1 Key Findings – German UXO Risk

- The Merseyside conurbation was the second most heavily bombed urban area in Britain after London, largely due to the importance of Liverpool docks, the largest west-facing port in Britain during WWII. However, the Site was situated in the Urban District of Huyton-with-Roby, which was approximately 10km from the docks and experienced a low-to-moderate bombing density, according to official Home Office bombing statistics.
- Two sets of original ARP written records were consulted, indicating a relatively large number of bombs fell within the study area, although no references to bombing incidents occurring specifically on Site have been found. One of these, covering the whole of Lancashire, identifies ten bombing incidents occurring within a 1km radius of the Site, accounting for at least five HE bomb strikes, two incendiary bomb ‘showers’, one UXB and two AA shells. The other, specifically covering Huyton, recorded 14 bombing incidents, accounting for eleven HE bombs, one UXB, one incendiary bomb shower, and one unexploded AA shell within a 1km radius of the Site. The closest of these, a HE bomb strike, is recorded approximately 80m north of the Site. This fell as part of a likely stick of four HE bombs aligned from west to east.
- Huyton Cricket Club pavilion, in the north-west of the Site, is a Grade II listed building, and no evidence to suggest it sustained bomb damage could be found in any online history of the structure.³ Indeed, post-WWII aerial photography from 1946 does not display any immediately obvious evidence of bomb damage occurring to this structure as well as across the remainder of the Site i.e. cratering within the undeveloped land. Wartime Huyton Cricket Club meeting minutes indicate that the Site was utilised as sports facilities during the war; however it cannot be completely ruled out that the Site may have been neglected during periods of the war, leading to vegetation on Site becoming overgrown. It is possible that changing environmental conditions have masked evidence of bomb damage in this open ground.

³ https://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=3316636&resourceID=1970

- Furthermore, a majority of the Site likely experienced infrequent levels of access during night-time raids, although access was likely more frequent during the daytime, and during the summer months when cricket was being played. The north-western section of the Site, comprising the pavilion structures, likely experienced a higher degree of access than the undeveloped areas. Any potential unexploded bomb strike in this location would also have left incontrovertible evidence of its occurrence, and so would likely have been recorded and dealt with at the time. The open ground on Site appears well maintained in post-WWII aerial photography, and this was likely the case for a majority of the war. However, it is feasible that during the winter months when it was not being actively utilised as a cricket pitch it become unmaintained / overgrown.
- However, given the lack of evidence to suggest that the Site suffered from direct bomb strikes, the risk of encountering UXBs is not considered significantly elevated above the background risk for this area of the country. Despite this, due to the slightly elevated bombing density of the district, the potential for infrequent levels of access across much of the Site and the bombing incident recorded in close proximity to the Site, the risk of encountering UXBs on Site has been assessed as **Low-Moderate**.

9.2.2 Key Findings - British UXO Risk

- Evidence has been found to suggest that Huyton Camp was present approximately 200m west of the Site during WWII and in the post-war period. A plan of the camp itself, and a plan of Huyton showing War Department land, are presented at **FIGURE 8** and **FIGURE 9** respectively. This camp was initially utilised by the Auxiliary Military Pioneer Corps (AMPC), before being transferred to the US Army 1511th QA truck regiment in July 1942. It was also utilised as an internment / PoW camp.
- Army personnel often carried out training and manoeuvres in open ground within close proximity to their garrison or barracks, sometimes utilising live ordnance (typically comprising SAA or LSA). Furthermore, unwanted / superfluous ordnance was sometimes disposed of in nearby open ground. Official records of day-to-day activities of troops at Huyton Camp are not available, and so details about the type / location of training which took part during busy wartime periods are scarce. However, the Site comprised Huyton Cricket Club, a privately owned sports facility which was utilised by civilians throughout the war, as indicated by the club wartime meeting minutes.
- Furthermore, an entry in these meeting minutes indicate that the US troops stationed at the camp used the sports facilities on Site, such as the tennis courts and cricket pitch (which was adapted for baseball). Therefore, it is considered unlikely that the Site would have been accessed for activities utilising live ordnance, such as training or disposal. As no evidence has been found to suggest this occurred, and the Site does not consist of ground suitable for such use, the risk of encountering Allied UXO on Site has been assessed as **Low**.
- 22 permanent HAA batteries were active within range of the Site during WWII. LAA guns likely defended vulnerable points within the borough. Luftwaffe activity was relatively frequent over the wider area and therefore these guns would have expended a considerable quantity of ammunition. Consequently, it is possible than an unexploded AA shell struck the Site. As such, the risk of encountering an unexploded AA shell on Site is considered analogous with that of a German UXB, and has been assessed as **Low-Moderate**.

9.3 Site-Specific UXO Hazards

Different types of UXO pose differing types of hazard, depending on their structural design, Net Explosive Quantity (NEQ), fill type and likely contamination depth. The table below lists the main types of UXO most often encountered on urban UK sites and their relative hazard levels.

UXO Type	NEQ (NEQ Range)	Likely Burial Depth	Hazard Posed
WWII German General Purpose HE Bombs	25kg - 220kg (most commonly deployed bomb weights)	Deep burial (>2m)	HIGH
WWII British Heavy Anti-Aircraft Shells (HAA Shells)	1.1kg - 1.7kg	Shallow burial (1-2m)	MODERATE-HIGH
WWII British Land Service Ammunition (LSA)	<2kg	Shallow burial (1-2m)	
WWII German 2kg Incendiary / HE Bombs (IBs)	680g incendiary hazard + ~500g explosive hazard	Shallow burial (1-2m)	
WWII German 1kg IBs	680g (incendiary, not explosive hazard)	Shallow burial (1-2m)	MODERATE
WWII British Light Anti-Aircraft Shells (LAA Shells)	4g - 70g	Very shallow burial (<1m)	LOW-MODERATE
Small Arms Ammunition (SAA)	<1g	Very shallow burial (<1m)	LOW
Inert/Practice Item	0g	Very shallow burial (<1m)	

9.4 The Likelihood of UXO Encounter

9.4.1 Introduction

This report assesses the risk of UXO in relation to the proposed works, not simply the risk that UXO remains buried on Site. The likelihood of UXO encounter during intrusive ground works will vary depending on the type of UXO and the type of construction methods employed during the project. With increased soil disturbance i.e. more excavations, the likelihood of encountering UXO increases.

Within an area of elevated UXO contamination likelihood, the sub-surface volume of potential UXO contamination will comprise the natural soil / geology in between WWII ground level and the maximum bomb penetration depth. Therefore, any intrusions into this layer will be at risk of UXO encounter.

Any post-WWII fill material deposited on a site is unlikely to be contaminated with UXO and therefore the risk of encountering UXO on such a site could vary with depth.

In the wake of the initial nine-month Blitz, many cities and towns were left with vast quantities of bomb site rubble that required removal and relocation. This material was put to use for in a variety of ways, for example >750,000 tons of London's rubble was used to build runways for new RAF and USAAF airfields and much of Liverpool's rubble was used to create and maintain sea / flood defences throughout Merseyside.

It is quite possible that unexploded British AA projectiles and German 1kg incendiaries were overlooked during removal, resulting in UXO contaminated fill material ending up on otherwise low UXO risk sites, possibly many miles from any high bombing density areas.

9.4.2 German UXBs

Although most German UXBs came to rest several metres below WWII ground level, these weapons can be found at any level between just below WWII ground level and the maximum bomb penetration depth. There are a number of reasons why these heavy bombs might be found at surprisingly shallow depths.

- **Tip and run:** When enemy aircraft had to take evasive action to escape RAF fighter intercepts or AA defences, they often dropped their bomb loads from a reduced height, potentially resulting in extreme J-curve effect.
- **Deflection:** the shape of German bomb nose sections meant they were susceptible to deflection when striking surface or shallow sub-surface obstacles, occasionally resulting in shallow burial or even UXBs skidding across hardstanding.
- **Aircraft Crash Site:** if an aircraft was unable to dump its bomb load before impacting the ground, due to mechanical fault, any externally fitted bombs could have become buried on impact.

German 1kg / 2kg incendiaries were cylindrical and approximately 50mm in diameter. They had tail sections, and so landed nose first. Within soft ground this could result in full penetration of the bomb below the surface. Such UXBs are usually found close to the surface.

9.4.3 British / Allied UXO

The nature of British/Allied military activity involving LSA and SAA and the smaller size of these munitions (in relation to German HE bombs) indicates that any resulting UXO contamination on a site will be limited to shallow depths, usually within 1.5m of the surface, notwithstanding added material to raise the ground level.

Domestic military LSA and SAA contamination will either be the result of expending blinds (dud ammunition) which bury into the ground on impact or munitions purposefully buried, for a number of reasons. Either way, these types of UXO are all found at shallow depth.

9.4.4 Deductions

A slightly elevated likelihood of UXO contamination (German) and likelihood of that UXO remaining up to the present day has been identified across the entire Site. Therefore, all the proposed works may potentially be exposed to a UXO encounter, although the risk is not considered elevated enough to warrant active mitigation works on Site, in line with the ALARP principle.

10 OVERALL RISK RATING

Ratings for the likelihood of UXO contaminating the Site, remaining within the Site up to the present day and being encountered during the proposed works, inform the overall risk rating. Please refer to the UXO hazard table presented in **Section 9.3** for a breakdown of the most common hazards and their associated risk. The colour of each respective type of hazard indicates the associated risk, as defined within the aforementioned table. The UXO risk to the proposed works has been assessed as **Low-Moderate**.

Risk Table					
Risk Zone	UXO Type (Hazard)	Likelihood of UXO Contamination	Likelihood of UXO Remaining	Likelihood of UXO Encounter	Overall Risk Rating
Low-Moderate	WWII German GP HE Bombs	Low-Moderate	Moderate-High	Moderate	LOW-MODERATE
	HAA Shells	Low-Moderate	Moderate	Moderate-High	
	LSA	Low	n/a		LOW
	German 2kg IBs	Low	n/a		
	German 1kg IBs	Low	n/a		
	LAA Shells	Low	n/a		
	SAA	Low	n/a		

11 RISK MITIGATION RECOMMENDATIONS

Brimstone has identified a slightly elevated UXO risk to the proposed works. The measures detailed below are recommended to mitigate the risk to ALARP level.

Risk Mitigation Measure	Recommendation
UXO Safety Awareness Briefings: To all personnel conducting intrusive works on Site. An essential part of the Health & Safety Plan for a site. Conforms to the requirements of CDM2015.	Prior to all intrusive works commencing.

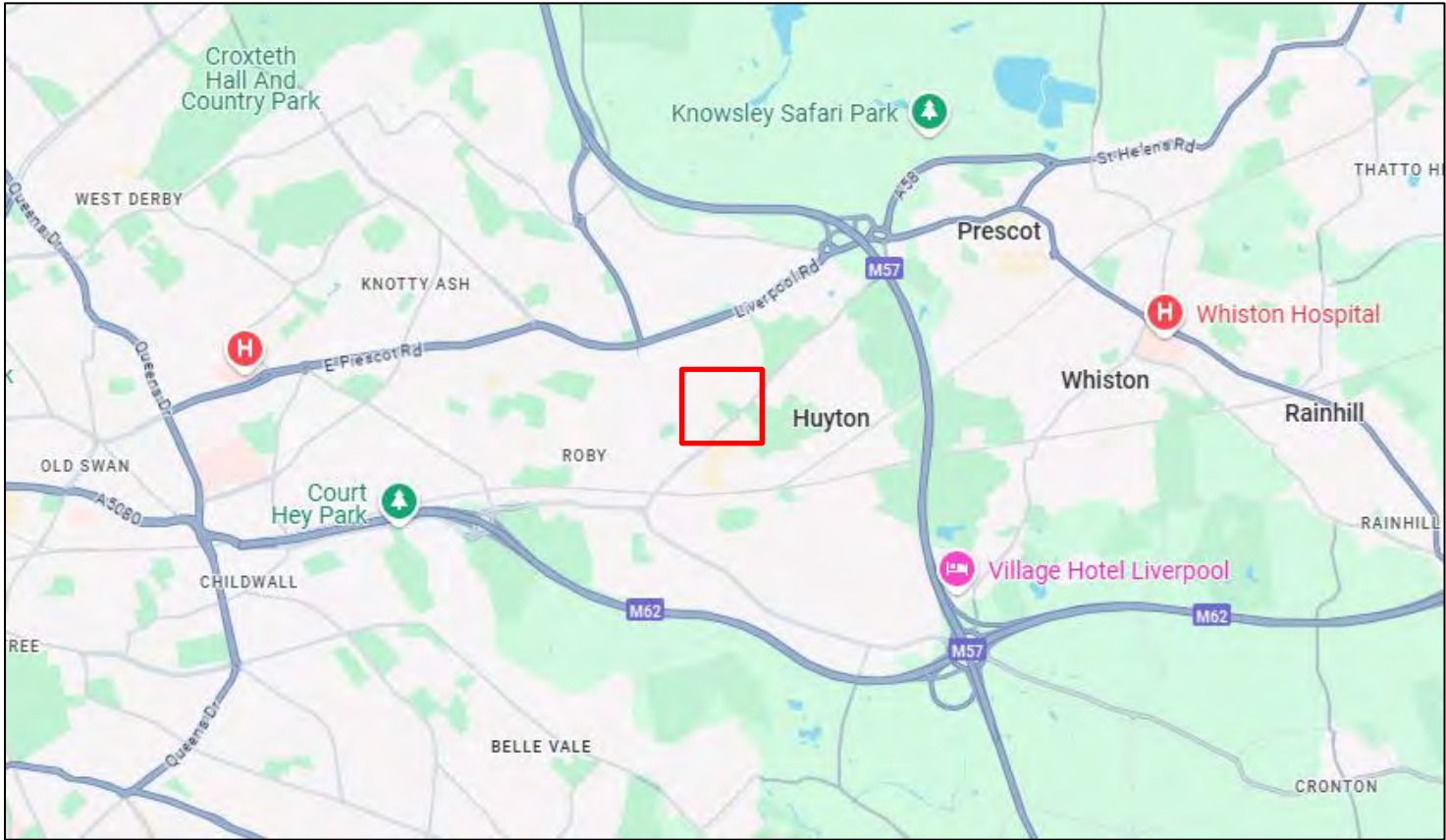
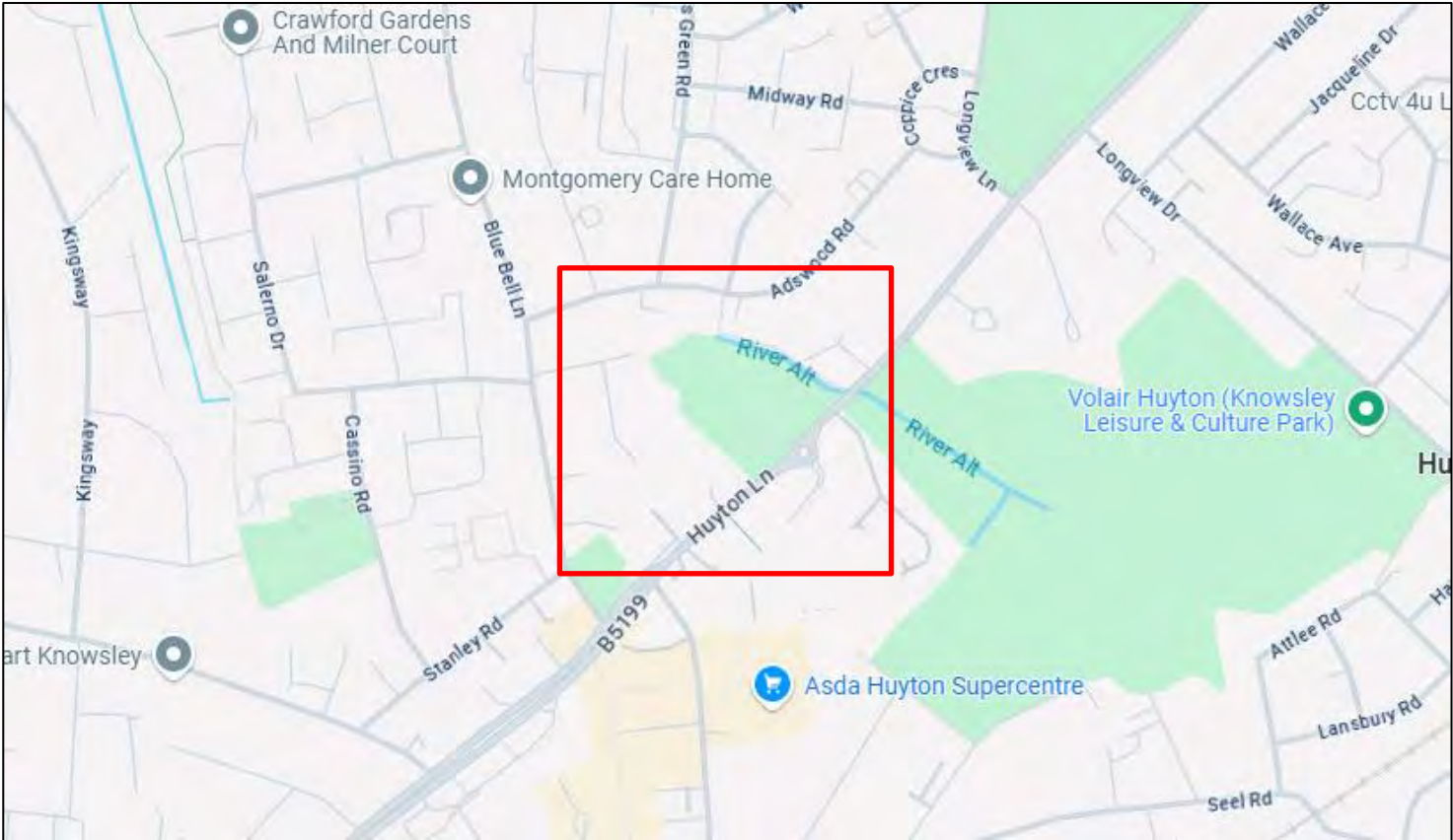
FIGURES: 1 - 9



Title:

Site Location Maps

FIGURE: 1



Project: Huyton Cricket Club, Knowsley

Client: IGE Consulting

Report Ref: DRA-25-1854

General Site Location:  Info Source: Google (open-source)



Innovation Centre Medway
Maidstone Road
Chatham
ME5 9FD

+44 (0) 207 117 2492
www.brimstoneuxo.com
enquire@brimstoneuxo.com



Title:

Recent Aerial Photograph

FIGURE: 2



Project:	Huyton Cricket Club, Knowsley	
Client:	IGE Consulting	
Report Ref:	DRA-25-1854	
Approx. Site Boundary: 	Info Source:	Google (open-source)

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Title:

Historical OS Mapping - 1938

FIGURE: 3.1



Project:	Huyton Cricket Club, Knowsley	
Client:	IGE Consulting	
Report Ref:	DRA-25-1854	
Approx. Site Boundary: 	Info Source:	Landmark Maps

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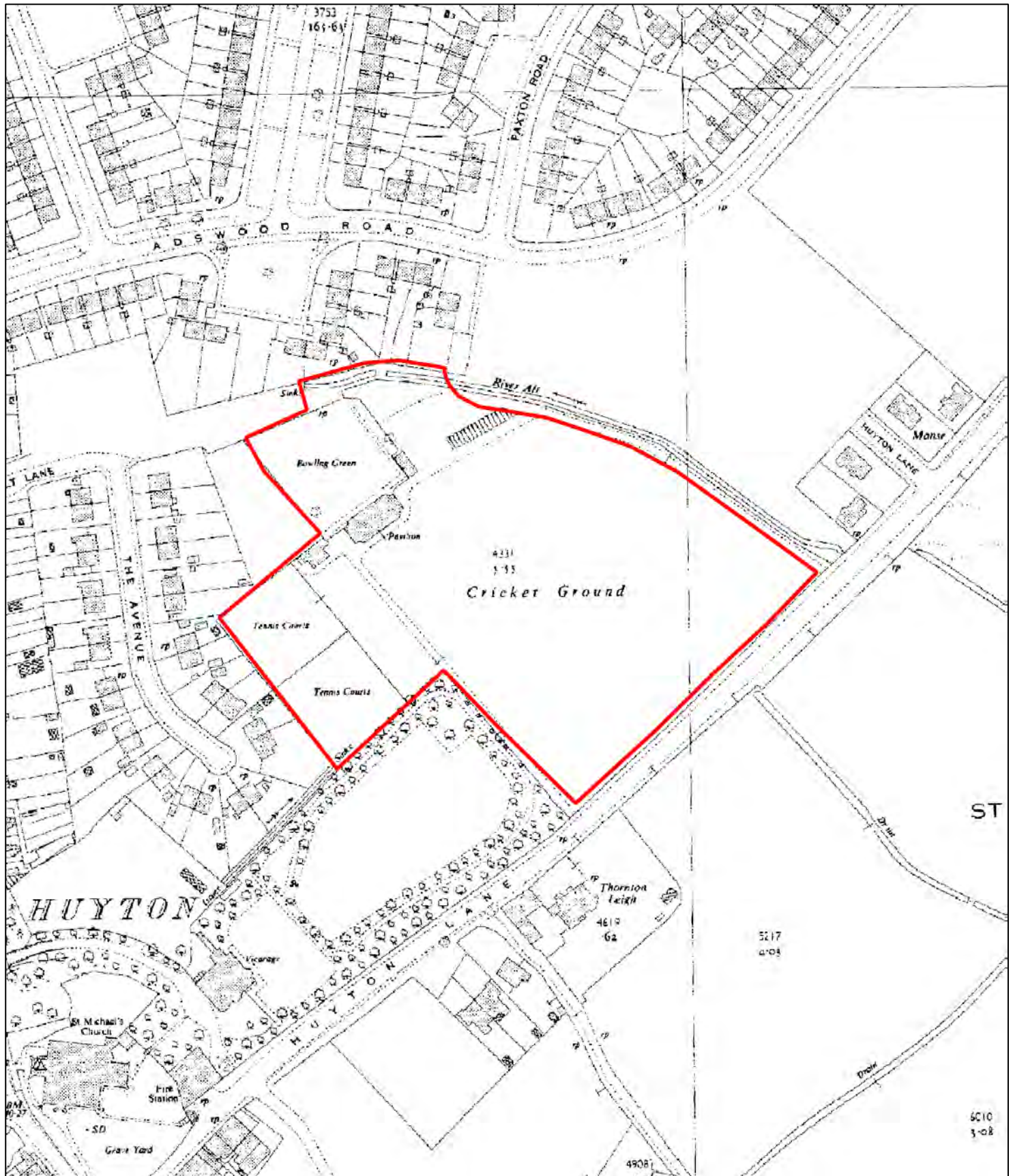
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Title:

Historical OS Mapping – 1952-1953

FIGURE: 3.2



Project:	Huyton Cricket Club, Knowsley	
Client:	IGE Consulting	
Report Ref:	DRA-25-1854	
Approx. Site Boundary: 	Info Source:	Landmark Maps

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Title:

Historical Aerial Photography – 26th March 1946

FIGURE: 4.1



Project:	Huyton Cricket Club, Knowsley	
Client:	IGE Consulting	
Report Ref:	DRA-25-1854	
Approx. Site Boundary: 	Info Source:	Historic England

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