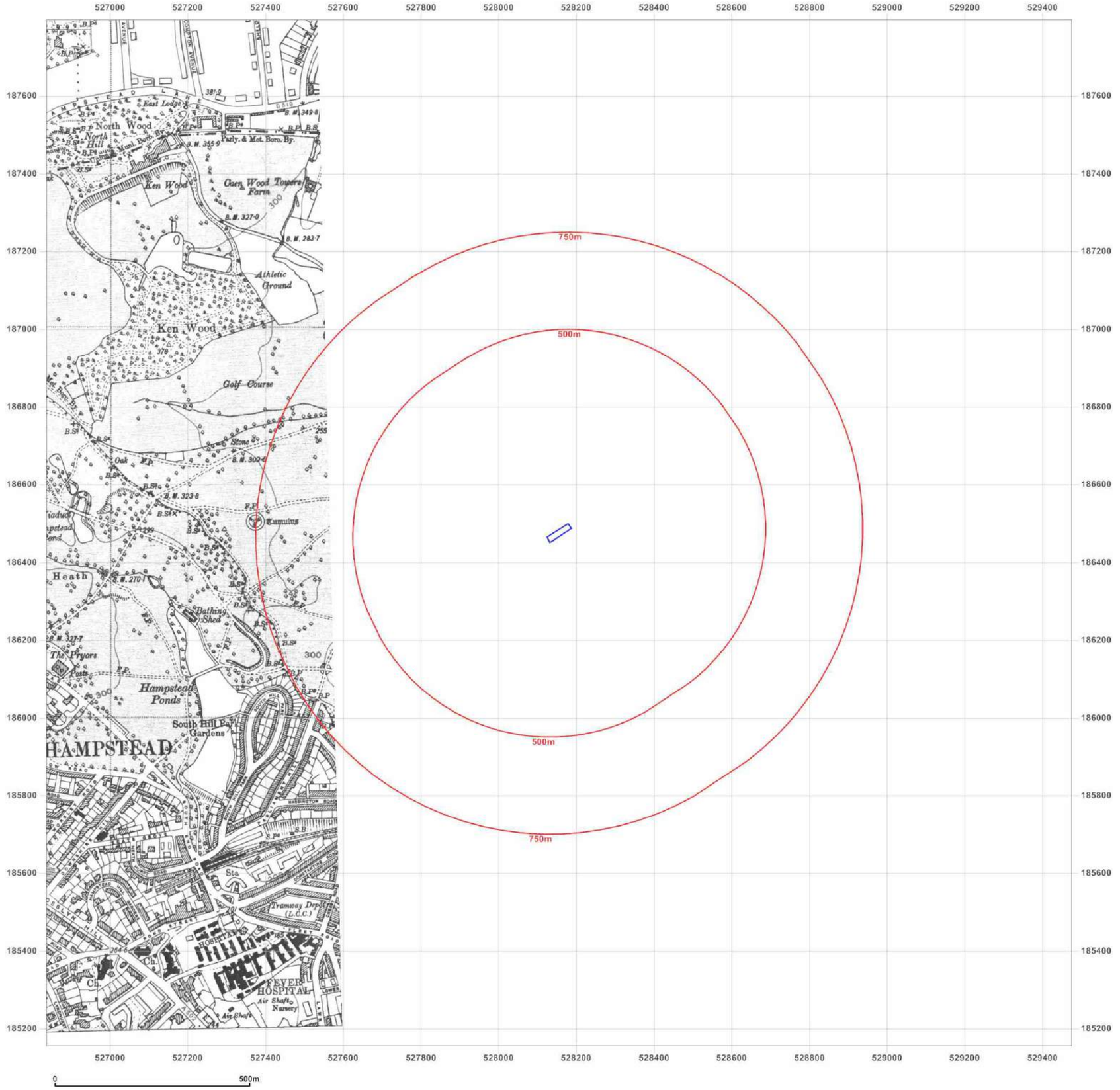

Groundsure INSIGHTS

Site Details:

11, HIGHGATE WEST HILL,
LONDON, N6 6JR

Client Ref: 11_Highgate_West_Hill_
Report Ref: GS-6973592
Grid Ref: 528155, 186475

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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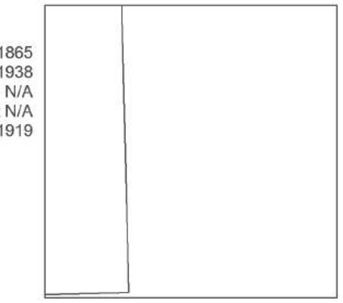
Surveyed 1865
Revised 1938
Edition N/A
Copyright N/A
Levelled 1919



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Production date: 17 August 2020

Map legend available at:
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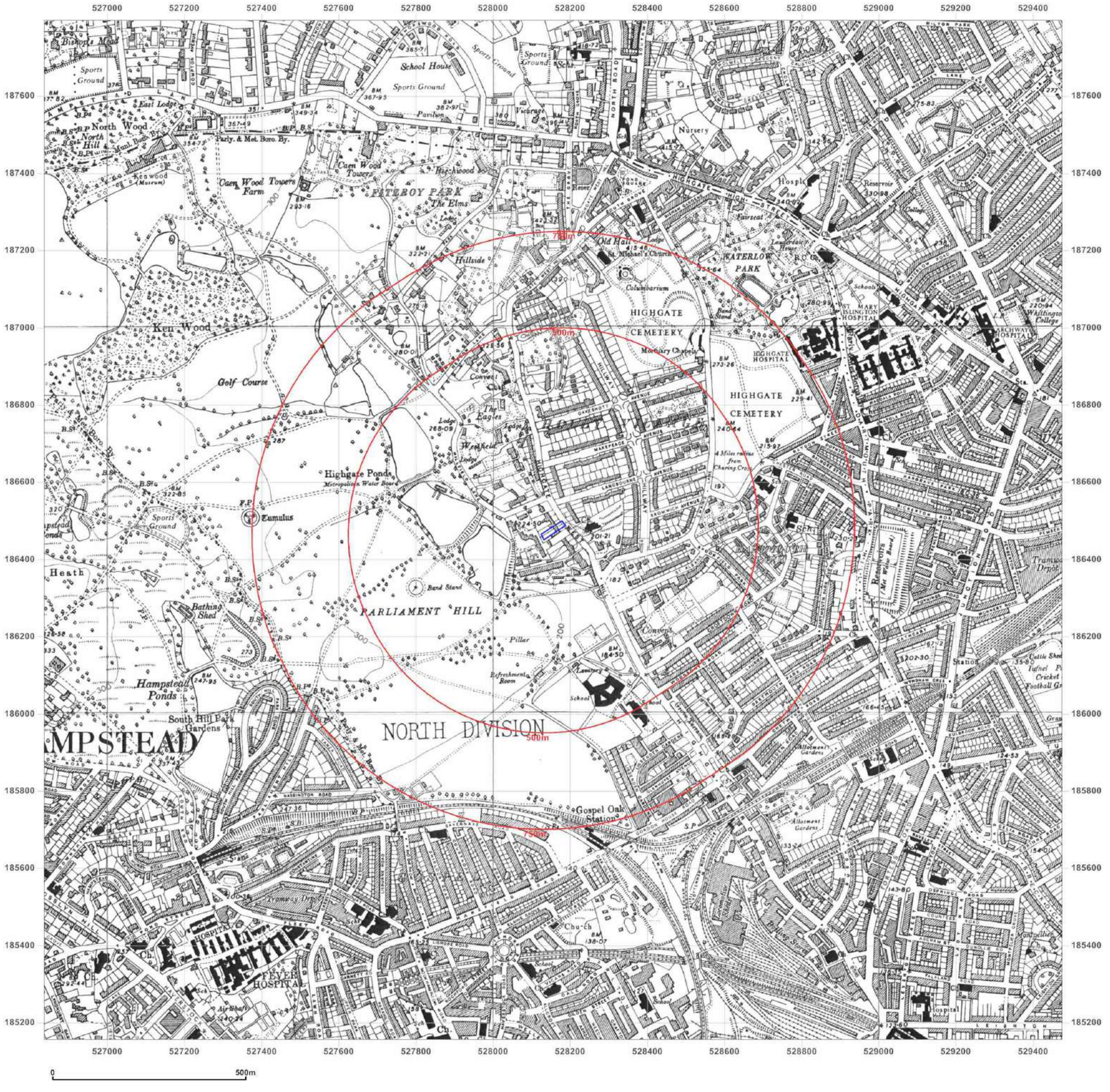

Groundsure INSIGHTS

Site Details:

11, HIGHGATE WEST HILL,
LONDON, N6 6JR

Client Ref: 11_Highgate_West_Hill_
Report Ref: GS-6973592
Grid Ref: 528155, 186475

Map Name: Provisional

Map date: **1951**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed N/A
Revised 1949
Edition 1951
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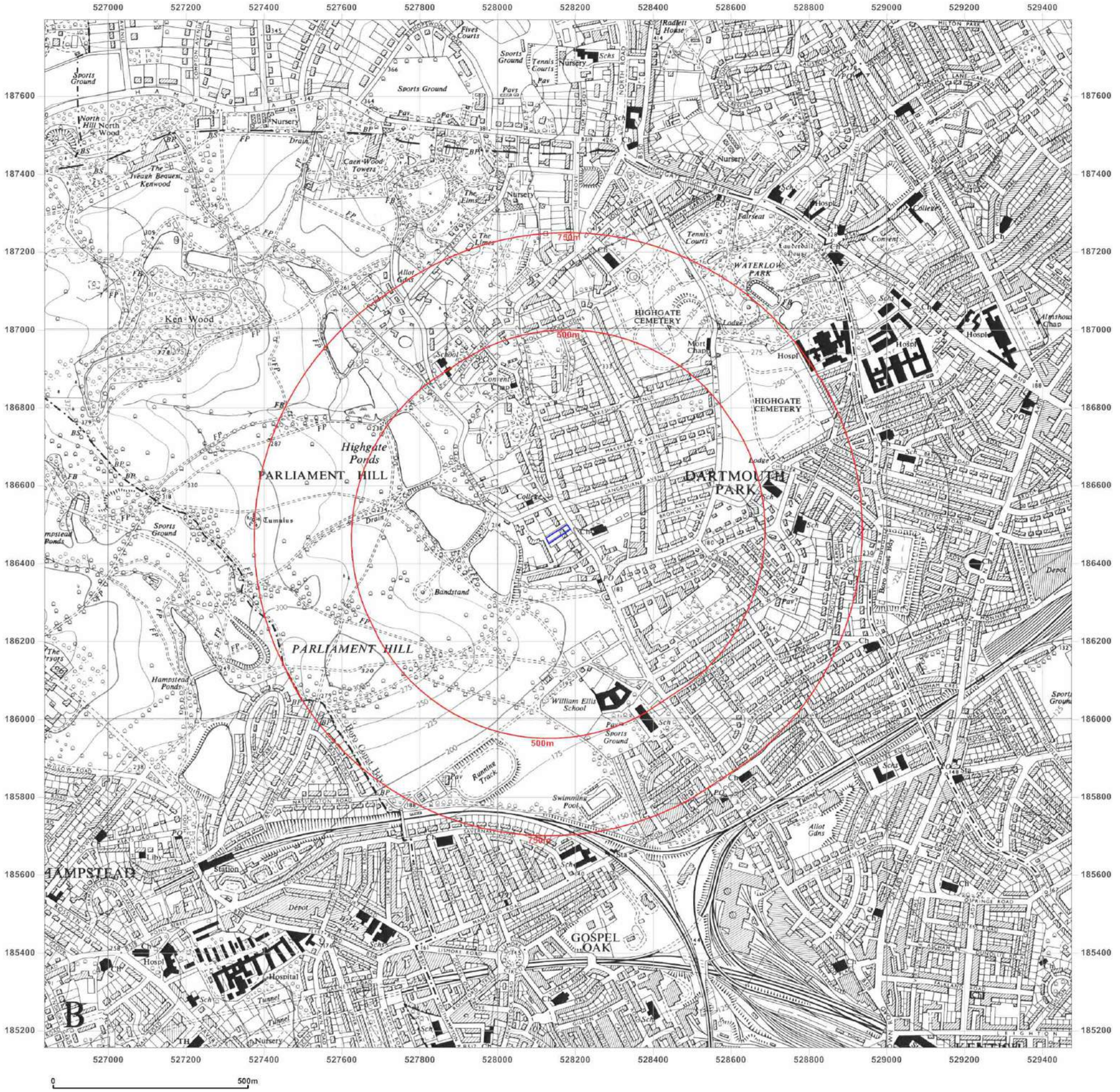

Groundsure INSIGHTS

Site Details:

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Client Ref: 11_Highgate_West_Hill_
Report Ref: GS-6973592
Grid Ref: 528155, 186475

Map Name: Provisional

Map date: **1958**

Scale: 1:10,560

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Revised 1958
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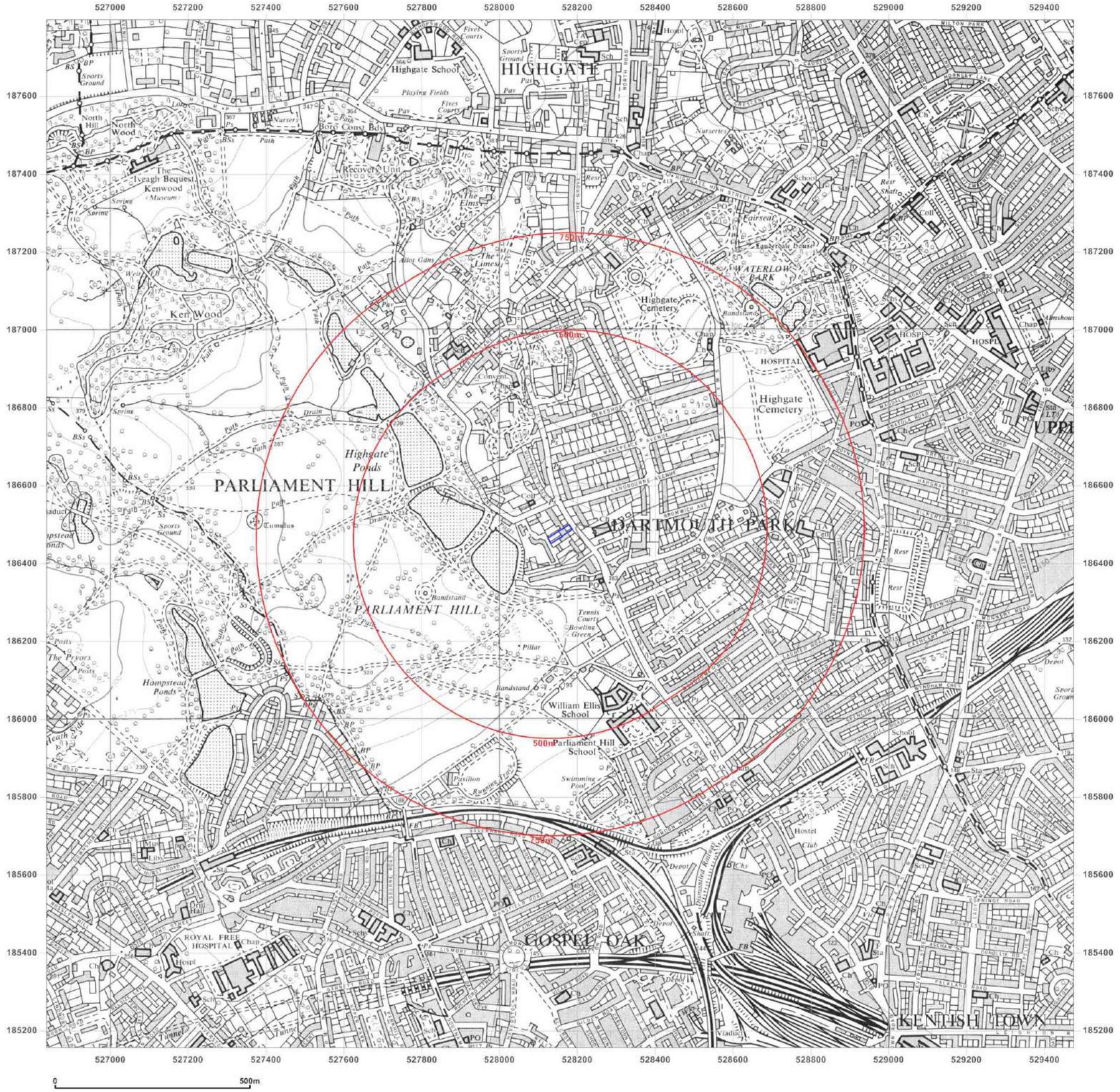

Groundsure INSIGHTS

Site Details:

11, HIGHGATE WEST HILL,
LONDON, N6 6JR

Client Ref: 11_Highgate_West_Hill_
Report Ref: GS-6973592
Grid Ref: 528155, 186475

Map Name: Provisional

Map date: **1965**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1965
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Groundsure INSIGHTS

Site Details:

11, HIGHGATE WEST HILL,
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Client Ref: 11_Highgate_West_Hill_
Report Ref: GS-6973592
Grid Ref: 528155, 186475

Map Name: National Grid

Map date: **1974**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1974
Revised 1974
Edition N/A
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Groundsure INSIGHTS

Site Details:

11, HIGHGATE WEST HILL,
LONDON, N6 6JR

Client Ref: 11_Highgate_West_Hill_
Report Ref: GS-6973592
Grid Ref: 528155, 186475

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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Groundsure INSIGHTS

Site Details:

11, HIGHGATE WEST HILL,
LONDON, N6 6JR

Client Ref: 11_Highgate_West_Hill_
Report Ref: GS-6973592
Grid Ref: 528155, 186475

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

N W E S

2010

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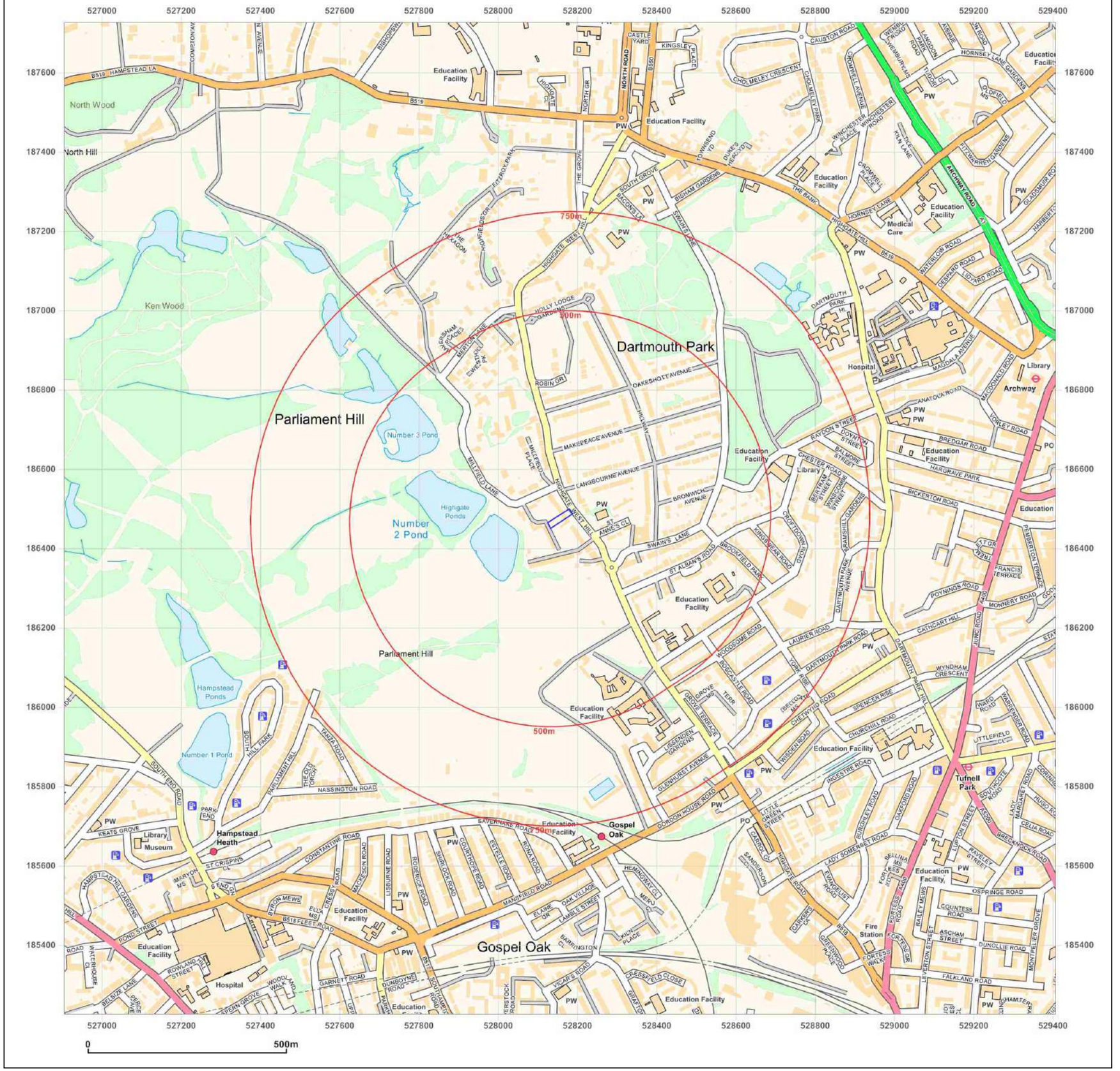

Groundsure INSIGHTS

Site Details:

11, HIGHGATE WEST HILL,
LONDON, N6 6JR

Client Ref: 11_Highgate_West_Hill_
Report Ref: GS-6973592
Grid Ref: 528155, 186475

Map Name: National Grid

Map date: **2020**

Scale: 1:10,000

Printed at: 1:10,000

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2020

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Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

11, HIGHGATE WEST HILL, LONDON, N6 6JR

Order Details

Date: 17/08/2020

Your ref: 11_Highgate_West_Hill_

Our Ref: GS-6973593

Client: Ground and Project Consultants Ltd

Site Details

Location: 528155 186475

Area: 0.1 ha

Authority: London Borough of Camden

Contact us with any questions at:
info@groundsure.com
08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	Historical industrial land uses	0	0	3	17	-
15	1.2	Historical tanks	0	0	5	2	-
16	1.3	Historical energy features	0	0	1	7	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	3	1	-
17	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
18	2.1	Historical industrial land uses	0	0	3	29	-
20	2.2	Historical tanks	0	0	6	3	-
20	2.3	Historical energy features	0	0	2	17	-
21	2.4	Historical petrol stations	0	0	0	0	-
22	2.5	Historical garages	0	0	4	1	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
23	3.1	Active or recent landfill	0	0	0	0	-
23	3.2	Historical landfill (BGS records)	0	0	0	0	-
24	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
24	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
24	3.5	Historical waste sites	0	0	0	0	-
24	3.6	Licensed waste sites	0	0	0	0	-
24	3.7	Waste exemptions	0	0	3	1	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
26	4.1	Recent industrial land uses	0	0	2	-	-
27	4.2	Current or recent petrol stations	0	0	0	0	-
27	4.3	Electricity cables	0	0	0	0	-
27	4.4	Gas pipelines	0	0	0	0	-
27	4.5	Sites determined as Contaminated Land	0	0	0	0	-

27	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
28	4.7	Regulated explosive sites	0	0	0	0	-
28	4.8	Hazardous substance storage/usage	0	0	0	0	-
28	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
28	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
28	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
29	4.12	Radioactive Substance Authorisations	0	0	0	0	-
29	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
29	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
29	4.15	Pollutant release to public sewer	0	0	0	0	-
29	4.16	List 1 Dangerous Substances	0	0	0	0	-
30	4.17	List 2 Dangerous Substances	0	0	0	0	-
30	**4.18**	**Pollution Incidents (EA/NRW)**	0	0	0	1	-
30	4.19	Pollution inventory substances	0	0	0	0	-
30	4.20	Pollution inventory waste transfers	0	0	0	0	-
31	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
32	5.1	Superficial aquifer	None (within 500m)				
33	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
34	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
35	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
35	5.5	Groundwater vulnerability- local information	None (within 0m)				
36	**5.6**	**Groundwater abstractions**	0	0	0	0	5
38	5.7	Surface water abstractions	0	0	0	0	0
38	**5.8**	**Potable abstractions**	0	0	0	0	2
39	5.9	Source Protection Zones	0	0	0	0	-
39	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
40	**6.1**	**Water Network (OS MasterMap)**	0	0	3	-	-

41	**6.2**	**Surface water features**	0	0	2	-	-
41	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
42	6.4	WFD Surface water bodies	0	0	0	-	-
42	6.5	WFD Groundwater bodies	0	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
43	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
43	7.2	Historical Flood Events	0	0	0	-	-
43	7.3	Flood Defences	0	0	0	-	-
43	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
44	7.5	Flood Storage Areas	0	0	0	-	-
45	7.6	Flood Zone 2	None (within 50m)				
45	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
46	8.1	Surface water flooding	Negligible (within 50m)				
Page	Section	Groundwater flooding					
47	**9.1**	**Groundwater flooding**	Negligible (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
48	**10.1**	**Sites of Special Scientific Interest (SSSI)**	0	0	0	0	2
49	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
49	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
49	10.4	Special Protection Areas (SPA)	0	0	0	0	0
49	10.5	National Nature Reserves (NNR)	0	0	0	0	0
50	**10.6**	**Local Nature Reserves (LNR)**	0	0	0	0	3
50	**10.7**	**Designated Ancient Woodland**	0	0	0	0	5
51	10.8	Biosphere Reserves	0	0	0	0	0
51	10.9	Forest Parks	0	0	0	0	0
51	10.10	Marine Conservation Zones	0	0	0	0	0
51	10.11	Green Belt	0	0	0	0	0
51	10.12	Proposed Ramsar sites	0	0	0	0	0

52	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
52	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
52	10.15	Nitrate Sensitive Areas	0	0	0	0	0
52	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
53	**10.17**	**SSSI Impact Risk Zones**	1	-	-	-	-
54	**10.18**	**SSSI Units**	0	0	0	0	3
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
56	11.1	World Heritage Sites	0	0	0	-	-
57	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
57	11.3	National Parks	0	0	0	-	-
57	**11.4**	**Listed Buildings**	0	4	8	-	-
58	**11.5**	**Conservation Areas**	1	2	0	-	-
58	11.6	Scheduled Ancient Monuments	0	0	0	-	-
59	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
60	**12.1**	**Agricultural Land Classification**	Urban (within 250m)				
61	12.2	Open Access Land	0	0	0	-	-
61	12.3	Tree Felling Licences	0	0	0	-	-
61	12.4	Environmental Stewardship Schemes	0	0	0	-	-
61	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
62	**13.1**	**Priority Habitat Inventory**	0	0	23	-	-
63	**13.2**	**Habitat Networks**	1	0	5	-	-
64	13.3	Open Mosaic Habitat	0	0	0	-	-
64	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
65	**14.1**	**10k Availability**	Identified (within 500m)				
66	**14.2**	**Artificial and made ground (10k)**	0	0	0	1	-
67	14.3	Superficial geology (10k)	0	0	0	0	-

67	14.4	Landslip (10k)	0	0	0	0	-
68	**14.5**	**Bedrock geology (10k)**	1	0	1	0	-
69	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
70	**15.1**	**50k Availability**	Identified (within 500m)				
71	**15.2**	**Artificial and made ground (50k)**	0	0	0	1	-
72	15.3	Artificial ground permeability (50k)	0	0	-	-	-
73	15.4	Superficial geology (50k)	0	0	0	0	-
73	15.5	Superficial permeability (50k)	None (within 50m)				
73	15.6	Landslip (50k)	0	0	0	0	-
73	15.7	Landslip permeability (50k)	None (within 50m)				
74	**15.8**	**Bedrock geology (50k)**	1	0	1	0	-
75	**15.9**	**Bedrock permeability (50k)**	Identified (within 50m)				
75	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
76	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence					
77	**17.1**	**Shrink swell clays**	Moderate (within 50m)				
78	**17.2**	**Running sands**	Very low (within 50m)				
79	**17.3**	**Compressible deposits**	Negligible (within 50m)				
80	**17.4**	**Collapsible deposits**	Very low (within 50m)				
81	**17.5**	**Landslides**	Very low (within 50m)				
82	**17.6**	**Ground dissolution of soluble rocks**	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
83	18.1	Natural cavities	0	0	0	0	-
84	18.2	BritPits	0	0	0	0	-
84	**18.3**	**Surface ground workings**	0	0	16	-	-
85	**18.4**	**Underground workings**	0	0	0	0	6
85	18.5	Historical Mineral Planning Areas	0	0	0	0	-

85	18.6	Non-coal mining	0	0	0	0	0
86	18.7	Mining cavities	0	0	0	0	0
86	18.8	JPB mining areas	None (within 0m)				
86	18.9	Coal mining	None (within 0m)				
86	18.10	Brine areas	None (within 0m)				
86	18.11	Gypsum areas	None (within 0m)				
87	18.12	Tin mining	None (within 0m)				
87	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
88	**19.1**	**Radon**	Less than 1% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
89	**20.1**	**BGS Estimated Background Soil Chemistry**	2	0	-	-	-
89	**20.2**	**BGS Estimated Urban Soil Chemistry**	2	4	-	-	-
90	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-

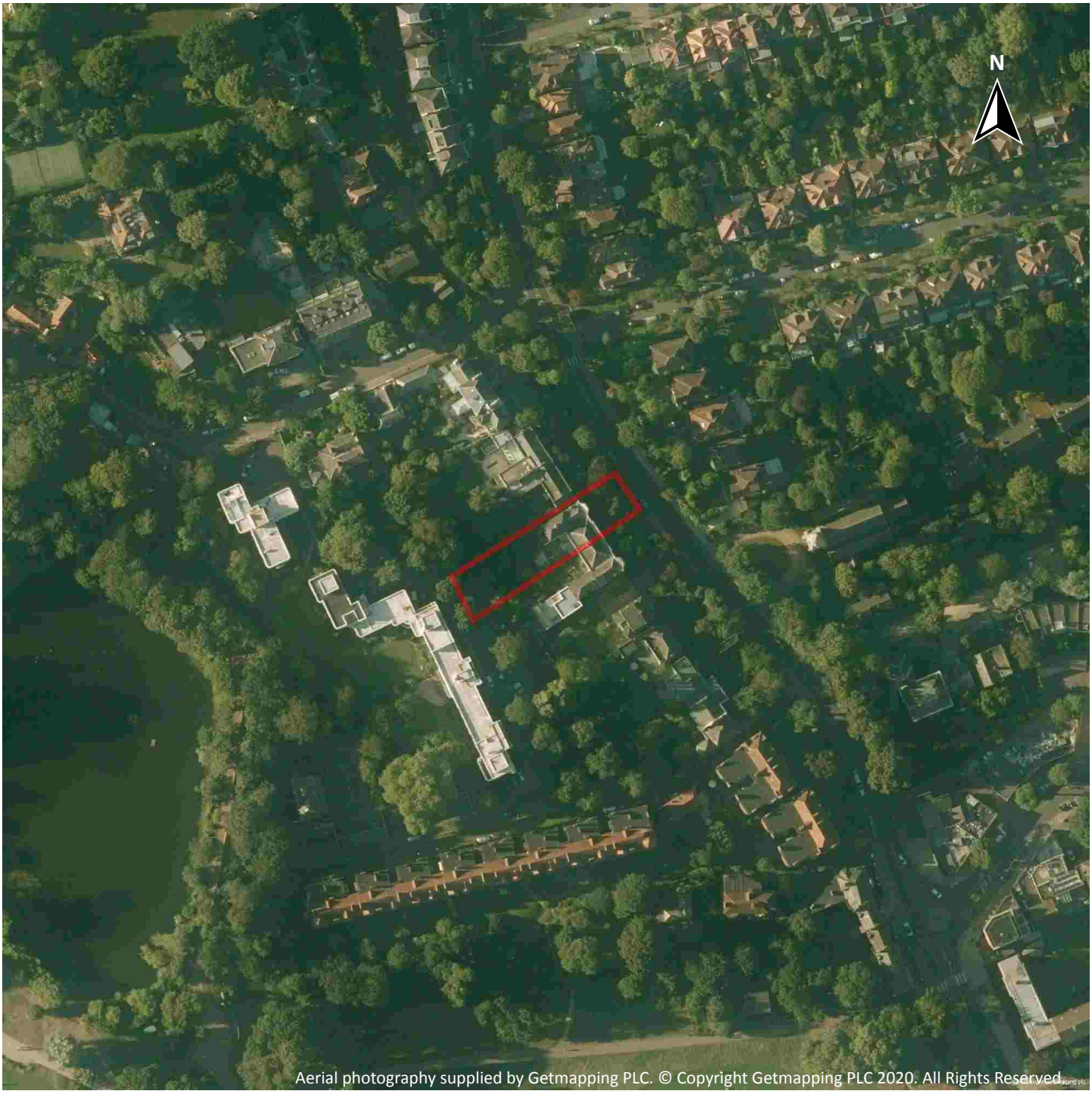
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
91	21.1	Underground railways (London)	0	0	0	-	-
91	21.2	Underground railways (Non-London)	0	0	0	-	-
91	21.3	Railway tunnels	0	0	0	-	-
91	21.4	Historical railway and tunnel features	0	0	0	-	-
91	21.5	Royal Mail tunnels	0	0	0	-	-
92	21.6	Historical railways	0	0	0	-	-
92	21.7	Railways	0	0	0	-	-
92	21.8	Crossrail 1	0	0	0	0	-
92	21.9	Crossrail 2	0	0	0	0	-
92	21.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 29/06/2019

Site Area: 0.1ha

Recent site history - 2016 aerial photograph



Capture Date: 12/08/2016

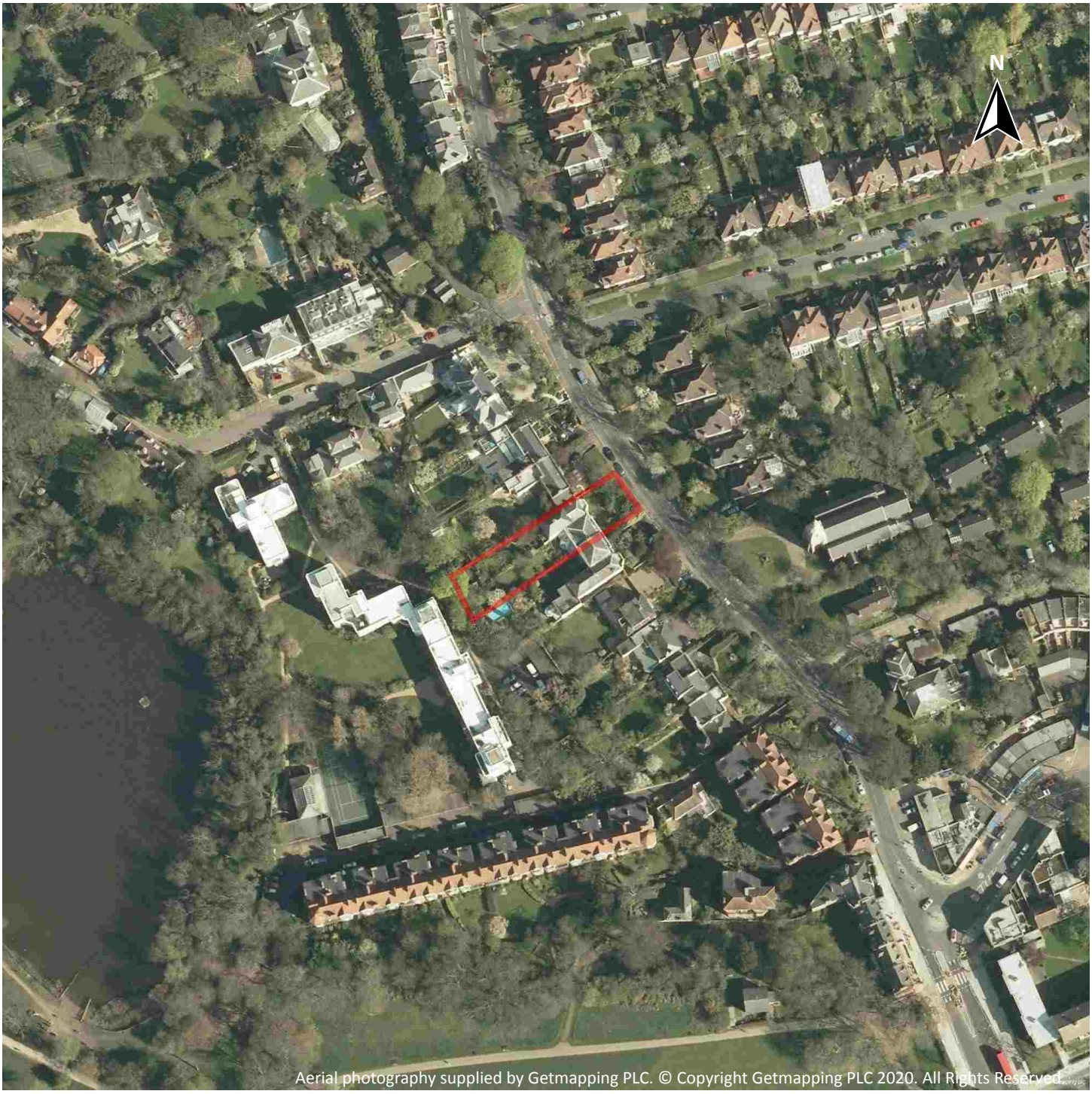
Site Area: 0.1ha

Recent site history - 2014 aerial photograph

Capture Date: 04/05/2014

Site Area: 0.1ha

Recent site history - 2008 aerial photograph



Capture Date: 15/04/2008

Site Area: 0.1ha

Recent site history - 1999 aerial photograph

Capture Date: 04/09/1999

Site Area: 0.1ha

OS MasterMap site plan

Site Area: 0.1ha

1 Past land use

Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

1.1 Historical industrial land uses

Records within 500m	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 14**

ID	Location	Land use	Dates present	Group ID
1	88m E	Unspecified Ground Workings	1949	2133658

ID	Location	Land use	Dates present	Group ID
D	227m N	Unspecified Tank	1894	2154686
2	240m NW	Unspecified Heap	1869	2136552
E	251m W	Bathing Shed	1894	2165382
E	281m W	Boat House	1920 - 1938	2283459
G	367m E	Cemetery	1974 - 1996	2238536
4	372m NE	Unspecified Tank	1869	2154680
G	386m E	Cemetery	1920 - 1949	2193712
G	388m E	Cemetery	1958 - 1965	2281955
G	388m E	Cemetery	1879 - 1894	2179960
G	388m E	Cemetery	1869	2225394
H	409m NE	Cemetery	1920 - 1996	2261094
H	411m NE	Cemetery	1879	2201583
H	411m NE	Cemetery	1869	2288298
H	413m NE	Cemetery	1894	2235187
I	437m N	Nursery	1879	2197280
I	437m N	Nursery	1869	2283506
I	438m N	Nursery	1894	2173239
J	467m NW	Rifle Range	1938	2164794
J	473m NW	Miniature Rifle Range	1920	2158040

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**7**

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 un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

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

ID	Location	Land use	Dates present	Group ID
A	69m NW	Unspecified Tank	1896	364744
A	72m NW	Unspecified Tank	1915	364743
B	104m SE	Unspecified Tank	1915	364746
B	104m SE	Unspecified Tank	1936	364745
D	229m N	Unspecified Tank	1896 - 1915	382461
5	432m NE	Unspecified Tank	1951 - 1952	398011
6	457m NW	Unspecified Tank	1870	364759

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**8**

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 un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

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

ID	Location	Land use	Dates present	Group ID
D	234m N	Electricity Substation	1977 - 1991	279390
F	314m NE	Electricity Substation	1952 - 1968	259425
F	315m NE	Electricity Substation	1951 - 1977	260995
F	323m NE	Electricity Substation	1991	244886
7	461m NW	Electricity Substation	1977 - 1996	262468
K	472m E	Electricity Substation	1951 - 1977	280402
K	473m E	Electricity Substation	1983 - 1991	265814
8	474m SE	Electricity Substation	1975 - 1991	261739

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 un-grouped 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	4

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 un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

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

ID	Location	Land use	Dates present	Group ID
C	157m E	Garage	1968	76028
C	158m E	Garage	1991	80429
C	158m E	Garage	1963	78072
3	307m SE	Garage	1952	73346

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

2.1 Historical industrial land uses

Records within 500m	32

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 18**

ID	Location	Land Use	Date	Group ID
1	88m E	Unspecified Ground Workings	1949	2133658
D	227m N	Unspecified Tank	1894	2154686
2	240m NW	Unspecified Heap	1869	2136552

ID	Location	Land Use	Date	Group ID
E	251m W	Bathing Shed	1894	2165382
E	281m W	Boat House	1938	2283459
E	286m W	Boat House	1920	2283459
G	367m E	Cemetery	1974	2238536
G	367m E	Cemetery	1996	2238536
4	372m NE	Unspecified Tank	1869	2154680
G	386m E	Cemetery	1920	2193712
G	388m E	Cemetery	1965	2281955
G	388m E	Cemetery	1949	2193712
G	388m E	Cemetery	1958	2281955
G	388m E	Cemetery	1938	2193712
G	388m E	Cemetery	1879	2179960
G	388m E	Cemetery	1869	2225394
G	390m E	Cemetery	1894	2179960
H	409m NE	Cemetery	1920	2261094
H	411m NE	Cemetery	1879	2201583
H	411m NE	Cemetery	1869	2288298
H	413m NE	Cemetery	1894	2235187
H	415m NE	Cemetery	1938	2261094
H	417m NE	Cemetery	1965	2261094
H	417m NE	Cemetery	1974	2261094
H	417m NE	Cemetery	1996	2261094
H	417m NE	Cemetery	1949	2261094
H	417m NE	Cemetery	1958	2261094
J	437m N	Nursery	1869	2283506
J	437m N	Nursery	1879	2197280
J	438m N	Nursery	1894	2173239
L	467m NW	Rifle Range	1938	2164794

ID	Location	Land Use	Date	Group ID
L	473m NW	Miniature Rifle Range	1920	2158040

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	**9**

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 18**

ID	Location	Land Use	Date	Group ID
A	69m NW	Unspecified Tank	1896	364744
A	72m NW	Unspecified Tank	1915	364743
B	104m SE	Unspecified Tank	1915	364746
B	104m SE	Unspecified Tank	1936	364745
D	229m N	Unspecified Tank	1896	382461
D	232m N	Unspecified Tank	1915	382461
I	432m NE	Unspecified Tank	1952	398011
I	432m NE	Unspecified Tank	1951	398011
5	457m NW	Unspecified Tank	1870	364759

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**19**

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

Features are displayed on the Past land use - un-grouped map on **page 18**

ID	Location	Land Use	Date	Group ID
D	234m N	Electricity Substation	1977	279390

ID	Location	Land Use	Date	Group ID
D	235m N	Electricity Substation	1991	279390
F	314m NE	Electricity Substation	1952	259425
F	314m NE	Electricity Substation	1968	259425
F	315m NE	Electricity Substation	1977	260995
F	315m NE	Electricity Substation	1951	260995
F	315m NE	Electricity Substation	1951	260995
F	323m NE	Electricity Substation	1991	244886
K	461m NW	Electricity Substation	1977	262468
K	462m NW	Electricity Substation	1991	262468
K	462m NW	Electricity Substation	1996	262468
M	472m E	Electricity Substation	1952	280402
M	472m E	Electricity Substation	1968	280402
M	473m E	Electricity Substation	1983	265814
M	473m E	Electricity Substation	1991	265814
M	473m E	Electricity Substation	1977	280402
M	473m E	Electricity Substation	1951	280402
N	474m SE	Electricity Substation	1991	261739
N	475m SE	Electricity Substation	1975	261739

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	**5**

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

Features are displayed on the Past land use - un-grouped map on **page 18**

ID	Location	Land Use	Date	Group ID
C	157m E	Garage	1968	76028
C	158m E	Garage	1991	80429
C	158m E	Garage	1991	80429
C	158m E	Garage	1963	78072
3	307m SE	Garage	1952	73346

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill

3.1 Active or recent landfill

Records within 500m	0

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

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

3.2 Historical landfill (BGS records)

Records within 500m	0

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

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

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

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

3.4 Historical landfill (EA/NRW records)

Records within 500m	0

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

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

3.5 Historical waste sites

Records within 500m	0

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

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

3.6 Licensed waste sites

Records within 500m	0

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

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

3.7 Waste exemptions

Records within 500m	4

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

Features are displayed on the Waste and landfill map on **page 23**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	181m SE	M Simmonds Chemist 4 Swains Lane London N6 6QS	EPR/UE5286WL/A001	Treating waste exemption	Non-Agricultural Waste Only	Sorting and de-naturing of controlled drugs for disposal

ID	Location	Site	Reference	Category	Sub-Category	Description
A	184m SE	4, SWAINS LANE, LONDON, N6 6QS	WEX128770	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
A	200m SE	M Simmonds Chemist 4 Swains Lane London N6 6QS	EPR/SF0505GS /A001	Treating waste exemption	Non-Agricultural Waste Only	Sorting and de-naturing of controlled drugs for disposal
1	493m SE	Parliament hill school, highgate road london, london, nw5 1rl	WEX127734	Using waste exemption	Not on a farm	Use of waste in construction

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

4 Current industrial land use

4.1 Recent industrial land uses

Records within 250m	2

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 26**

ID	Location	Company	Address	Activity	Category
1	193m SE	West Hill House	6a, Swains Lane, London, Greater London, N6 6QS	Business Parks and Industrial Estates	Industrial Features
2	235m N	Electricity Sub Station	Greater London, N6	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	1

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

Features are displayed on the Current industrial land use map on **page 26**

ID	Location	Details	
3	286m W	Incident Date: 22/07/2004 Incident Identification: 252851 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Algae	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

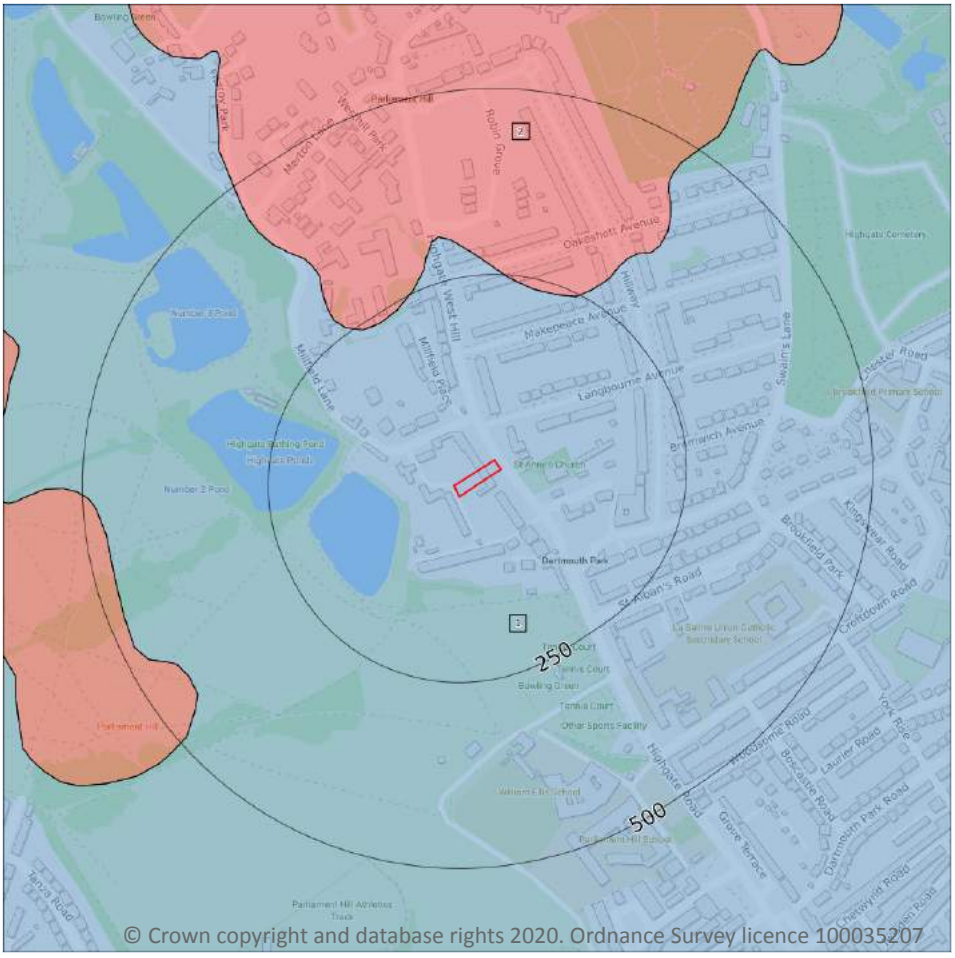
5.1 Superficial aquifer

Records within 500m	0

Aquifer status of groundwater held within superficial geology.

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

Bedrock aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m	2

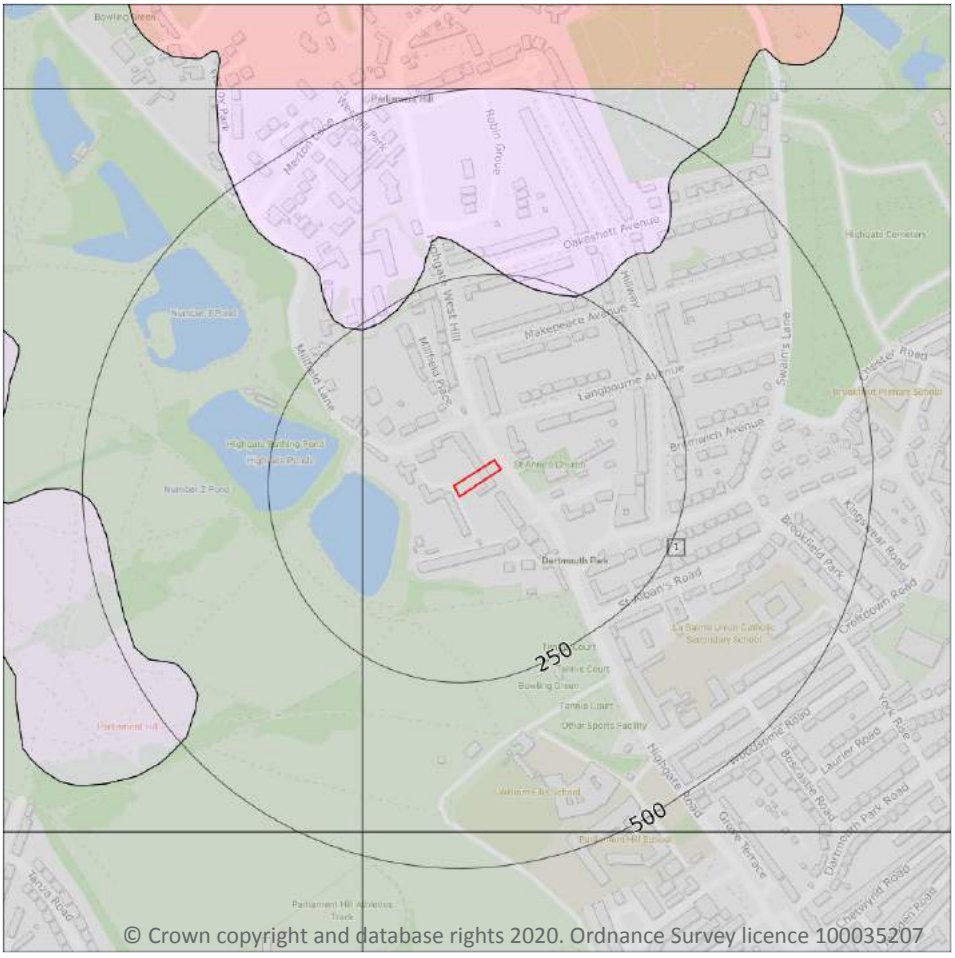
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 33**

ID	Location	Designation	Description
1	**On site**	**Unproductive**	**These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow**
2	236m N	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



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 34**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	**Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: Low Infiltration value: 40-70% Dilution value: 300-550mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed**

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
- 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	5

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 36**

ID	Location	Details	
-	1874m S	Status: Historical Licence No: 28/39/39/0091 Details: Laundry Use Direct Source: THAMES GROUNDWATER Point: TWO BORES AT KENTISH TOWN SPORTS CENTRE, PRINCE OF WALES ST Data Type: Point Name: GREENWICH LEISURE LTD Easting: 528800 Northing: 184700	Annual Volume (m^3): 94506 Max Daily Volume (m^3): 1813.8 Original Application No: - Original Start Date: 13/06/1966 Expiry Date: - Issue No: 101 Version Start Date: 05/04/2012 Version End Date: -
-	1874m S	Status: Historical Licence No: 28/39/39/0091 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: TWO BORES AT KENTISH TOWN SPORTS CENTRE, PRINCE OF WALES ST Data Type: Point Name: GREENWICH LEISURE LTD Easting: 528800 Northing: 184700	Annual Volume (m^3): 94506 Max Daily Volume (m^3): 1813.8 Original Application No: - Original Start Date: 13/06/1966 Expiry Date: - Issue No: 101 Version Start Date: 05/04/2012 Version End Date: -
-	1874m S	Status: Historical Licence No: 28/39/39/0091 Details: Process Water Direct Source: THAMES GROUNDWATER Point: TWO BORES AT KENTISH TOWN SPORTS CENTRE, PRINCE OF WALES ST Data Type: Point Name: GREENWICH LEISURE LTD Easting: 528800 Northing: 184700	Annual Volume (m^3): 94506 Max Daily Volume (m^3): 1813.8 Original Application No: - Original Start Date: 13/06/1966 Expiry Date: - Issue No: 101 Version Start Date: 05/04/2012 Version End Date: -
-	1874m S	Status: Active Licence No: 28/39/39/0091 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: KENTISH TOWN SPORTS CENTRE, PRINCE OF WALES ST Data Type: Point Name: GREENWICH LEISURE LIMITED Easting: 528800 Northing: 184700	Annual Volume (m^3): 17,997 Max Daily Volume (m^3): 604.60 Original Application No: - Original Start Date: 13/06/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/05/2012 Version End Date: -

ID	Location	Details	
-	1874m S	Status: Active Licence No: 28/39/39/0091 Details: Process Water Direct Source: THAMES GROUNDWATER Point: KENTISH TOWN SPORTS CENTRE, PRINCE OF WALES ST Data Type: Point Name: GREENWICH LEISURE LIMITED Easting: 528800 Northing: 184700	Annual Volume (m^3): 17,997 Max Daily Volume (m^3): 604.60 Original Application No: - Original Start Date: 13/06/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/05/2012 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m	**0**

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.

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

5.8 Potable abstractions

Records within 2000m	**2**

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.

Features are displayed on the Abstractions and Source Protection Zones map on **page 36**

ID	Location	Details	
-	1874m S	Status: Historical Licence No: 28/39/39/0091 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: TWO BORES AT KENTISH TOWN SPORTS CENTRE, PRINCE OF WALES ST Data Type: Point Name: GREENWICH LEISURE LTD Easting: 528800 Northing: 184700	Annual Volume (m^3): 94506 Max Daily Volume (m^3): 1813.8 Original Application No: - Original Start Date: 13/06/1966 Expiry Date: - Issue No: 101 Version Start Date: 05/04/2012 Version End Date: -

ID	Location	Details	
-	1874m S	Status: Active Licence No: 28/39/39/0091 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: KENTISH TOWN SPORTS CENTRE, PRINCE OF WALES ST Data Type: Point Name: GREENWICH LEISURE LIMITED Easting: 528800 Northing: 184700	Annual Volume (m^3): 17,997 Max Daily Volume (m^3): 604.60 Original Application No: - Original Start Date: 13/06/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/05/2012 Version End Date: -

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

5.9 Source Protection Zones

Records within 500m	0

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

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

5.10 Source Protection Zones (confined aquifer)

Records within 500m	0

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

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

6 Hydrology

Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	3

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 40**

ID	Location	Type of water feature	Ground level	Permanence	Name
A	141m W	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	Highgate Ponds

ID	Location	Type of water feature	Ground level	Permanence	Name
2	160m W	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	Highgate Ponds
B	183m W	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	Highgate Ponds

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	**2**

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 40**

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 40**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**Coastal Catchment**	**Not part of a river WB catchment**	**128**	**Land area part of London Management Catchment draining to the Tidal Thames**	**London**

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

6.4 WFD Surface water bodies

Records identified	0

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.

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

6.5 WFD Groundwater bodies

Records on site	0

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.

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 Sea (RoFRaS)

Records within 50m	0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; 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).

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

7.6 Flood Zone 2

Records within 50m	0

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.

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

7.7 Flood Zone 3

Records within 50m	0

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.

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

8 Surface water flooding

8.1 Surface water flooding

Highest risk on site	**Negligible**
Highest risk within 50m	**Negligible**

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.

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	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding

Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

9.1 Groundwater flooding

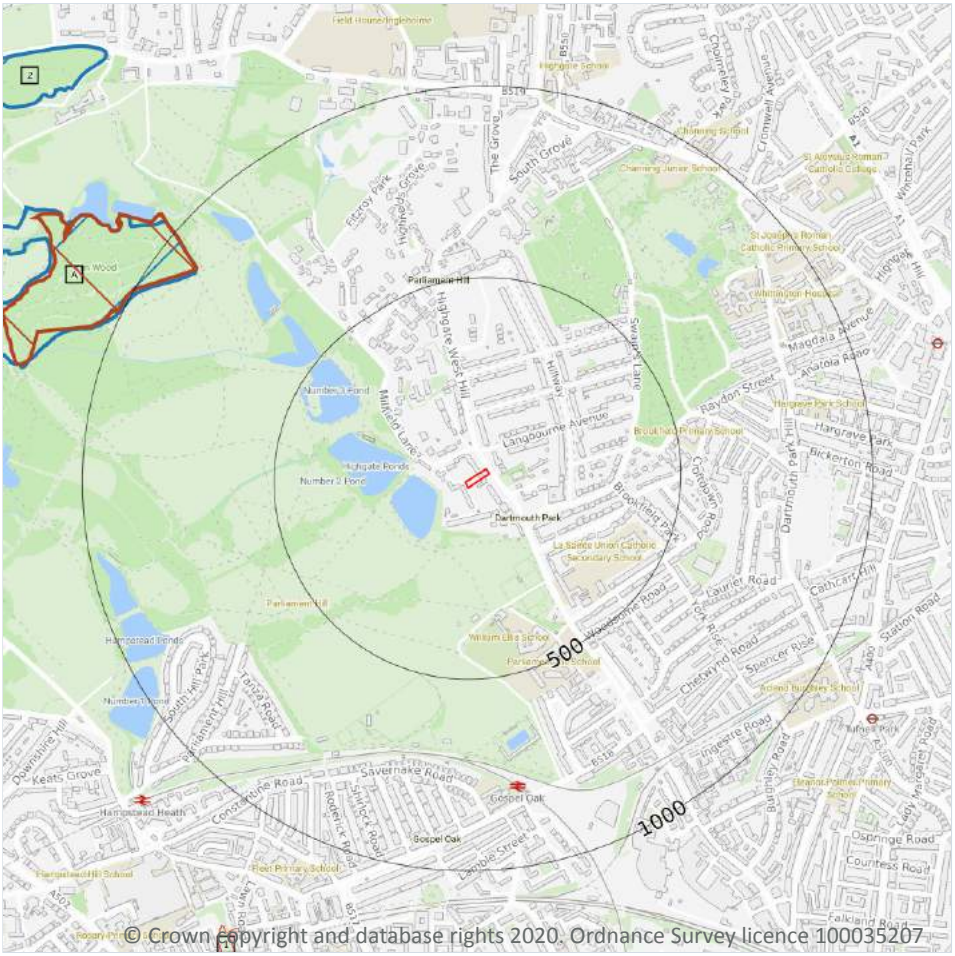
Highest risk on site	**Negligible**
Highest risk within 50m	**Negligible**

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 47**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

Local Nature Reserves (LNR)

Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	**2**

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.

Features are displayed on the Environmental designations map on **page 48**

ID	Location	Name	Data source
A	893m NW	Hampstead Heath Woods	Natural England

ID	Location	Name	Data source
2	1452m NW	Hampstead Heath Woods	Natural England

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	3

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

Features are displayed on the Environmental designations map on **page 48**

ID	Location	Name	Data source
1	1298m SW	Belsize Wood	Natural England
-	1602m NE	Parkland Walk	Natural England
-	1869m N	Queen's Wood	Natural England

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

10.7 Designated Ancient Woodland

Records within 2000m	5

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

Features are displayed on the Environmental designations map on **page 48**

ID	Location	Name	Woodland Type
A	897m NW	KEN WOOD	Ancient & Semi-Natural Woodland
-	1681m NW	BISHOPS WOOD	Ancient & Semi-Natural Woodland
-	1767m N	QUEENS WOOD	Ancient & Semi-Natural Woodland
-	1869m N	QUEENS WOOD	Ancient & Semi-Natural Woodland
-	1979m NW	Unknown	Ancient & Semi-Natural Woodland

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

10.8 Biosphere Reserves

Records within 2000m	0

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

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

10.9 Forest Parks

Records within 2000m	0

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

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

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

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

10.11 Green Belt

Records within 2000m	0

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

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

10.12 Proposed Ramsar sites

Records within 2000m	0

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

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

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

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

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

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

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

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

This data is sourced from Natural England.

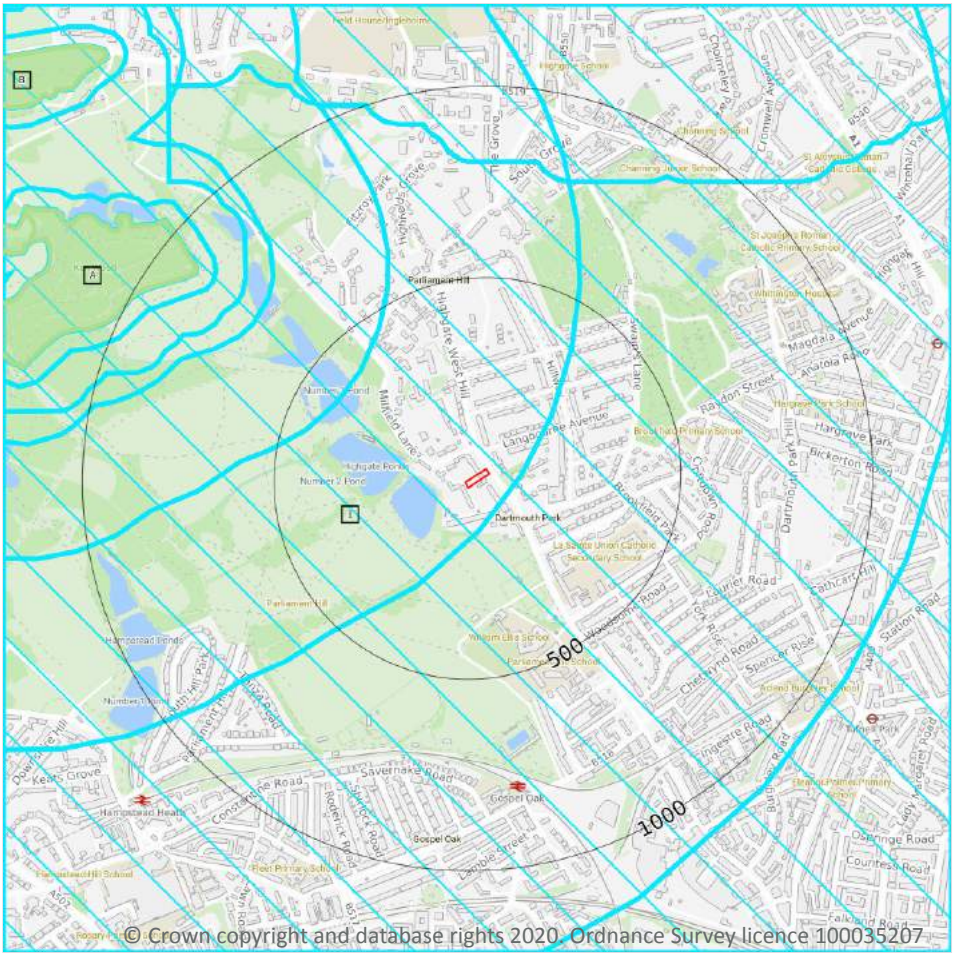
10.16 Nitrate Vulnerable Zones

Records within 2000m	0

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

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

SSSI Impact Zones and Units



Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

Not recorded

Favourable

Unfavourable - Recovering

Unfavourable - No change

Unfavourable - Declining

Partially destroyed

Destroyed

10.17 SSSI Impact Risk Zones

Records on site	1

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

Features are displayed on the SSSI Impact Zones and Units map on **page 53**

ID	Location	Type of developments requiring consultation
1	On site	**Infrastructure - Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Residential - Residential development of 100 units or more. Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas. Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons > 200m² & manure stores > 250t). Combustion - General combustion processes >20MW 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. Composting - Any composting proposal with more than 500 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	**3**

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.

Features are displayed on the SSSI Impact Zones and Units map on **page 53**

ID: A
Location: 893m NW
SSSI name: Hampstead Heath Woods
Unit name: 2
Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Lowland mixed deciduous woodland	Favourable	18/05/2018

ID: 13
Location: 1298m NW
SSSI name: Hampstead Heath Woods
Unit name: 1
Broad habitat: Fen, Marsh And Swamp - Lowland
Condition: Favourable
Reportable features:

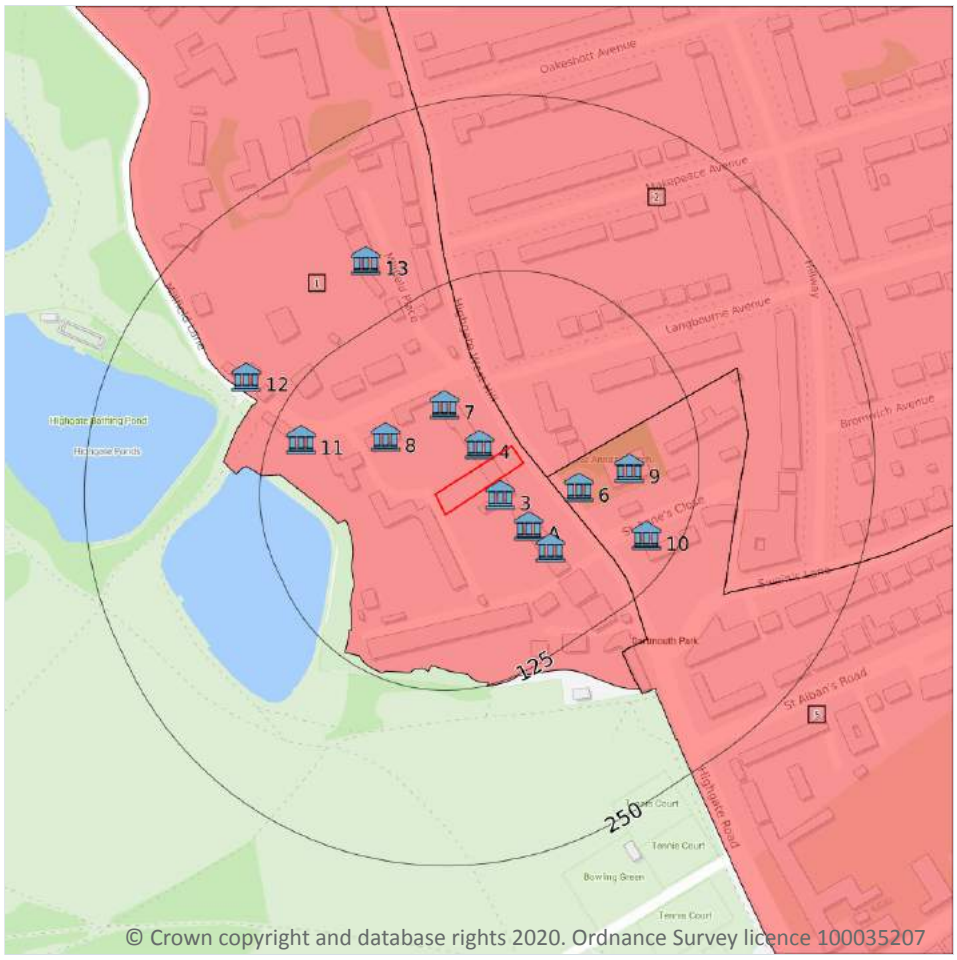
Feature name	Feature condition	Date of assessment
Spring/flush fen (lowland)	Favourable	18/05/2018

ID: B
Location: 1452m NW
SSSI name: Hampstead Heath Woods
Unit name: 2
Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Lowland mixed deciduous woodland	Favourable	18/05/2018

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	12

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 56**

ID	Location	Name	Grade	Reference Number	Listed date
3	10m SE	10 And 11, Highgate West Hill, Camden, London, N6	II	1379022	14/05/1974
4	13m NW	12 And 13, Highgate West Hill, Camden, London, N6	II	1379024	14/05/1974
A	39m SE	8, Highgate West Hill, Camden, London, N6	II	1379021	14/05/1974
6	43m SE	War Memorial At The Church Of St Anne, Camden, London, N6	II	1431821	05/01/2016
7	50m NW	14, Highgate West Hill, Camden, London, N6	II	1379025	14/05/1974

ID	Location	Name	Grade	Reference Number	Listed date
8	54m NW	5, Millfield Lane, Camden, London, N6	II	1322112	14/05/1974
A	61m SE	6 And 7, Highgate West Hill, Camden, London, N6	II	1379020	14/05/1974
9	76m E	Church Of St Anne, Camden, London, N6	II	1379061	10/06/1954
10	102m SE	107-108, Highgate West Hill, Camden, London, N6	II	1379059	14/05/1974
11	103m W	Millfield Cottage, Camden, London, N6	II	1322114	14/05/1974
12	159m NW	Kenwood Cottage, Camden, London, N6	II	1322113	14/05/1974
13	167m NW	The White House, Camden, London, N6	II	1322115	14/05/1974

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

11.5 Conservation Areas

Records within 250m	**3**

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 56**

ID	Location	Name	District	Date of designation
1	**On site**	**Highgate Village**	**Camden**	**01/05/1968**
2	6m NE	Holly Lodge Estate	Camden	01/06/1992
5	20m SE	Dartmouth Park	Camden	01/04/1978

This data is sourced from English Heritage, 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 English Heritage, 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 English Heritage, 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	2

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 60**

ID	Location	Classification	Description
1	**On site**	**Non Agricultural**	-
2	**On site**	**Urban**	-

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.

This data is sourced from Natural England.

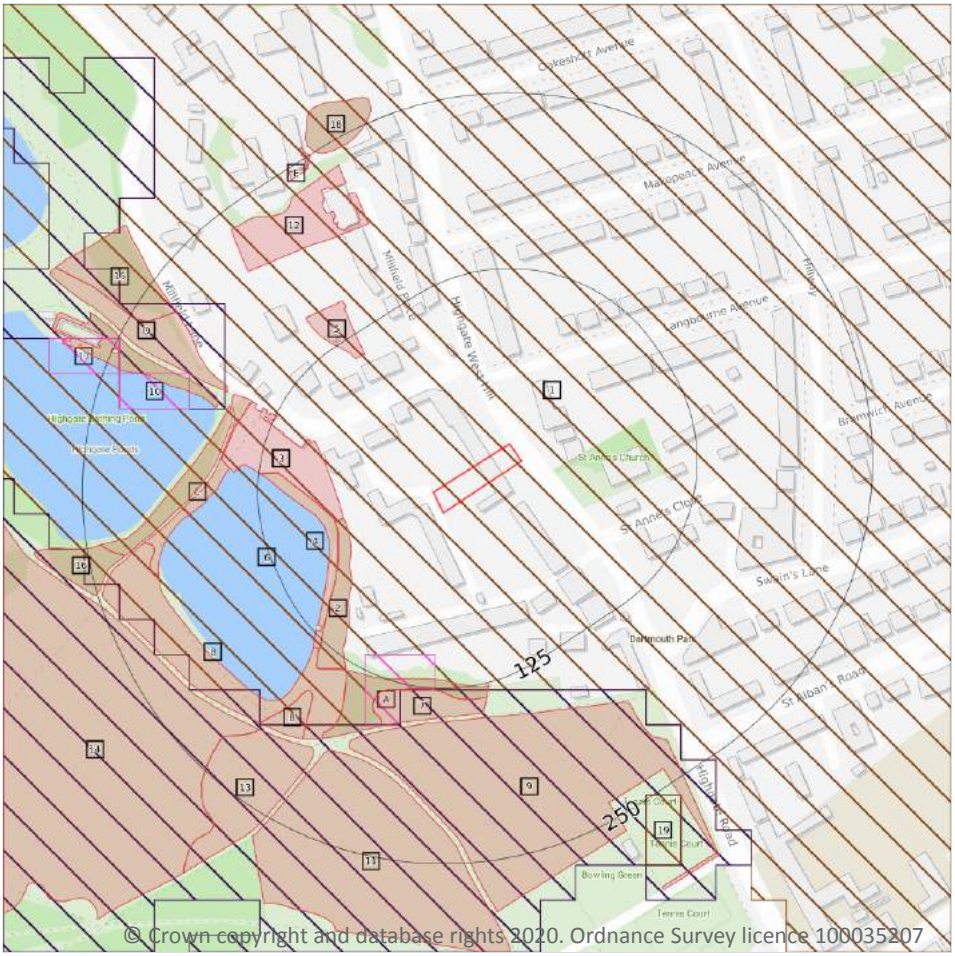
12.5 Countryside Stewardship Schemes

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	23

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 62**

ID	Location	Main Habitat	Other habitats
2	66m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
3	67m W	No main habitat but additional habitats present	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
4	73m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)

ID	Location	Main Habitat	Other habitats
5	109m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	119m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
6	125m W	Good quality semi-improved grassland	Main habitat: GQSIG (INV > 50%)
7	126m S	Good quality semi-improved grassland	Main habitat: GQSIG (INV > 50%)
8	131m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
C	144m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
9	148m S	Lowland heathland	Main habitat: LHEAT (INV > 50%); GQSIG (INV > 50%)
C	152m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
B	158m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
D	163m NW	Lowland heathland	Main habitat: LHEAT (INV > 50%); GQSIG (INV > 50%)
D	166m W	Good quality semi-improved grassland	Main habitat: GQSIG (INV > 50%)
11	185m S	Lowland heathland	Main habitat: LHEAT (INV > 50%); GQSIG (INV > 50%)
12	186m NW	No main habitat but additional habitats present	Main habitat: DWOOD (INV > 50%)
13	192m SW	Lowland heathland	Main habitat: LHEAT (INV > 50%); GQSIG (INV > 50%)
14	202m SW	Lowland heathland	Main habitat: LHEAT (INV > 50%); GQSIG (INV > 50%)
15	224m NW	Deciduous woodland	Main habitat: LHEAT (INV > 50%); DWOOD (INV > 50%); GQSIG (INV > 50%)
16	225m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
E	242m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
E	243m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
18	243m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	**6**

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.

Features are displayed on the Habitat designations map on **page 62**

ID	Location	Type	Habitat
1	**On site**	**Network Enhancement Zone 2**	**Not specified**
A	101m S	Associated Habitats	Other associated habitats
B	126m S	Primary Habitat	Lowland heathland
10	184m W	Associated Habitats	Other associated habitats
17	239m W	Associated Habitats	Other associated habitats
19	247m SE	Network Enhancement Zone 2	Not specified

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.

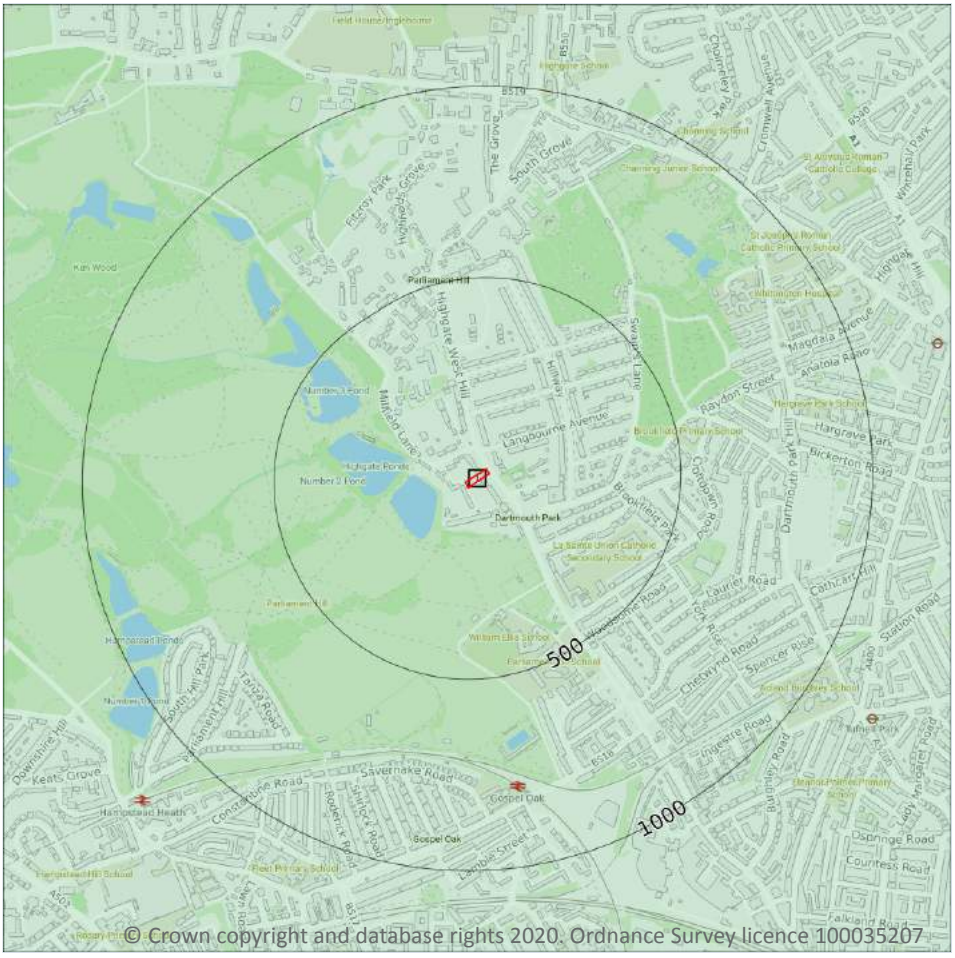
13.4 Limestone Pavement Orders

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

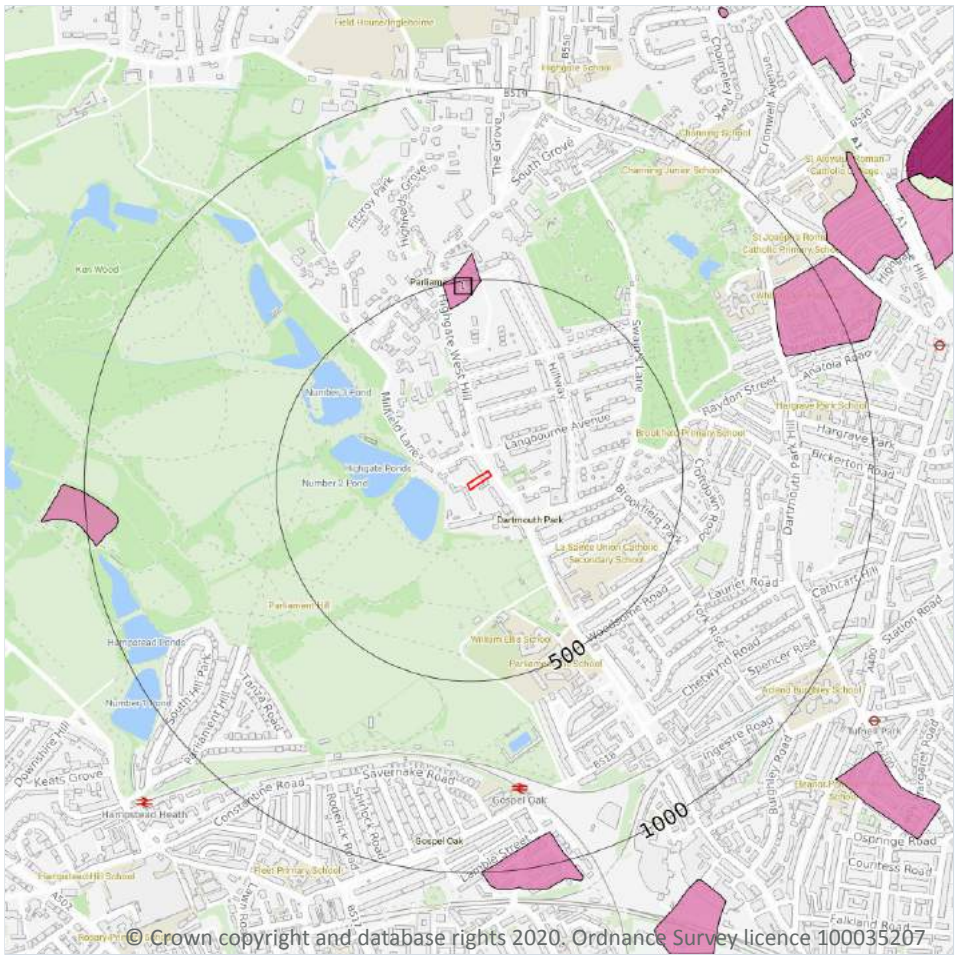
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 65**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**TQ28NE**

This data is sourced from the British Geological Survey.

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



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Site Outline

Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m	1

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.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 66**

ID	Location	LEX Code	Description	Rock description
1	434m N	WGR-UKNOWN	Worked Ground (Undivided)	Unknown/unclassified Entry

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.

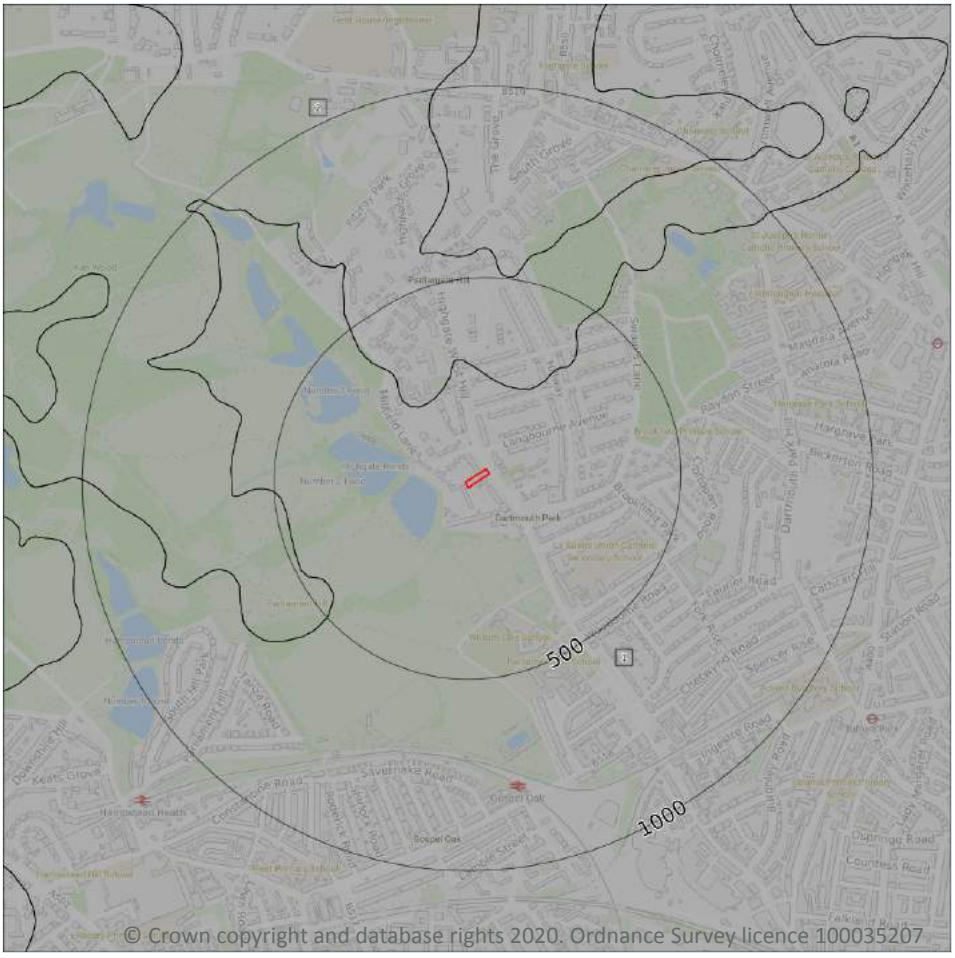
14.4 Landslip (10k)

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



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

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

14.5 Bedrock geology (10k)

Records within 500m	2

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

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 68**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**LC-CLAY**	**London Clay Formation - Clay**	**Eocene Epoch**
2	223m N	CLGB-SDST	Claygate Member - Sandstone	Eocene Epoch

This data is sourced from the British Geological Survey.

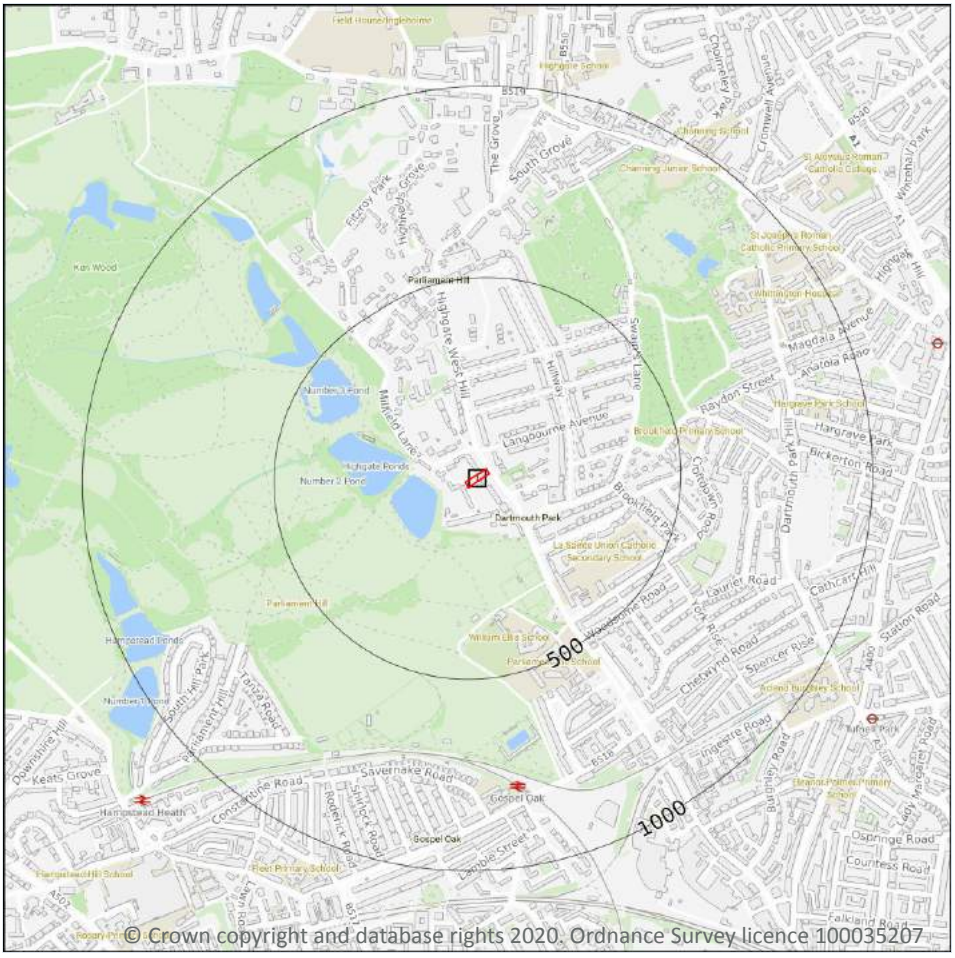
14.6 Bedrock faults and other linear features (10k)

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

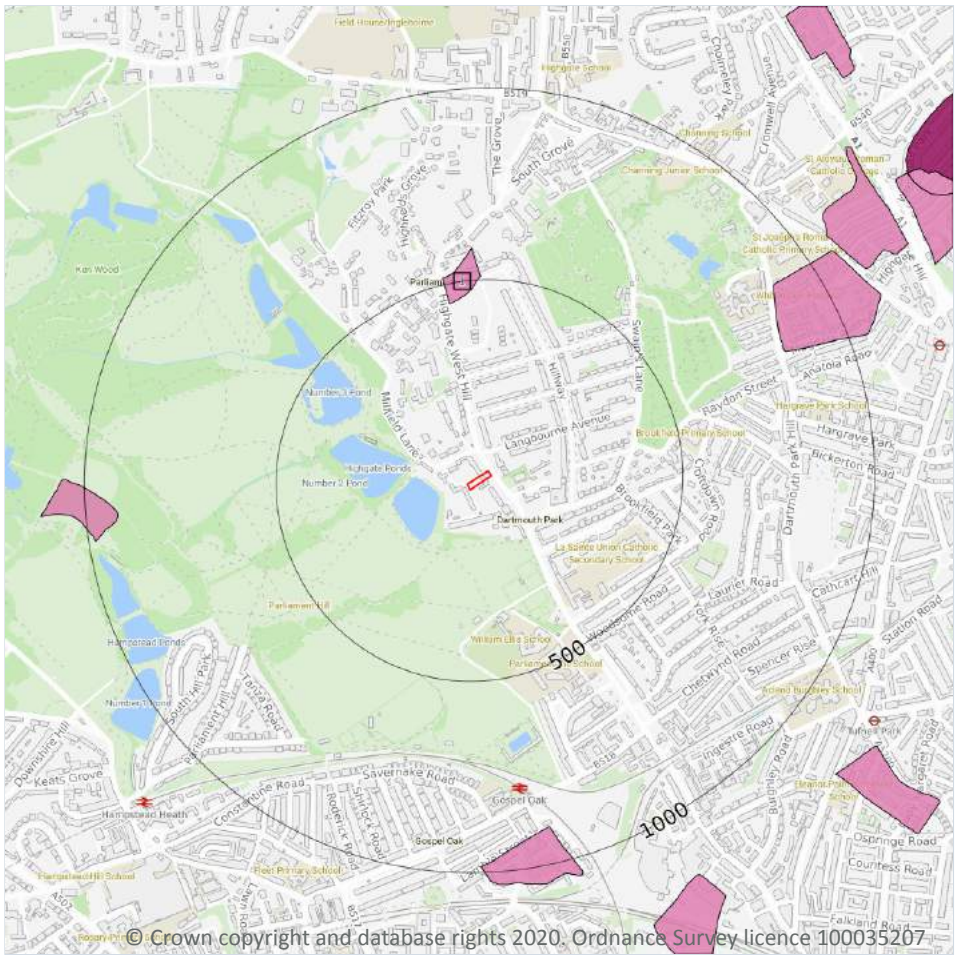
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 70**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**EW256_north_london_v4**

This data is sourced from the British Geological Survey.

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



Site Outline

Search buffers in metres (m)

- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m	1

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.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 71**

ID	Location	LEX Code	Description	Rock description
1	447m N	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID

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

15.4 Superficial geology (50k)

Records within 500m	0

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.

This data is sourced from the British Geological Survey.

15.5 Superficial 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 superficial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0

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

This data is sourced from the British Geological Survey.

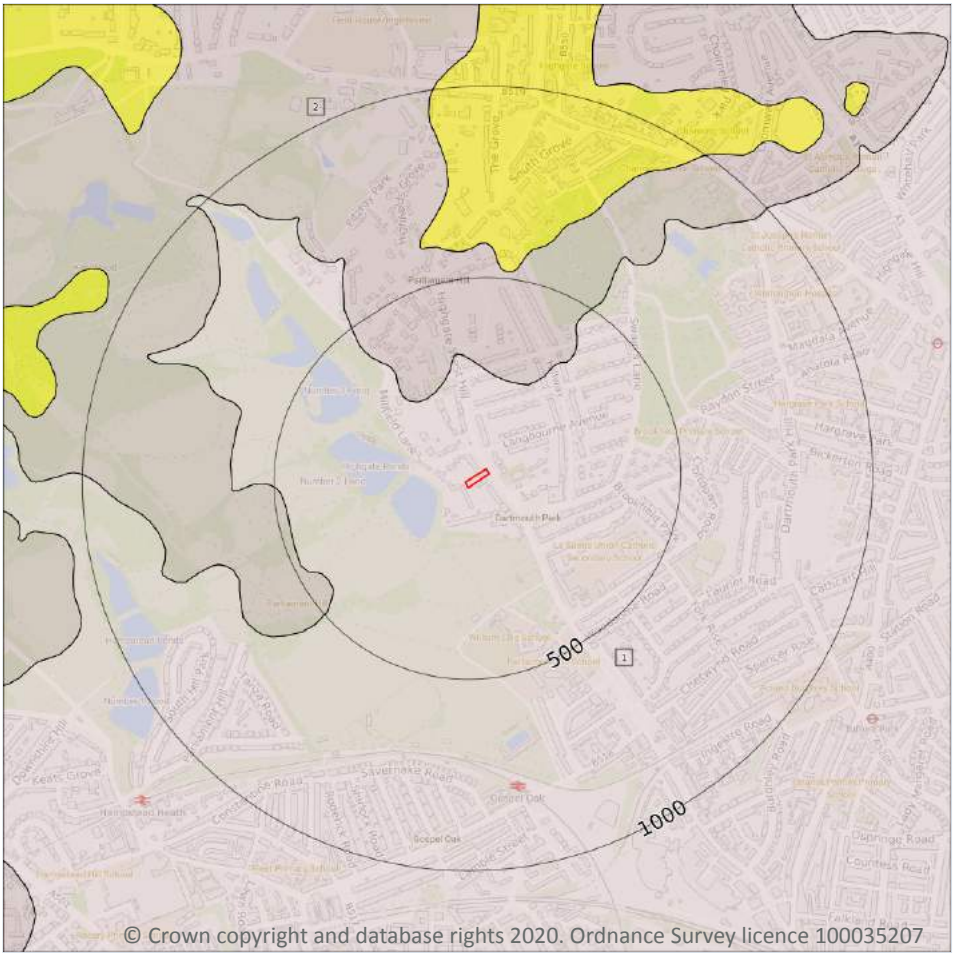
15.7 Landslip permeability (50k)

Records within 50m	0

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

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

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

15.8 Bedrock geology (50k)

Records within 500m **2**

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 74**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**LC-XCZS**	**LONDON CLAY FORMATION - CLAY, SILT AND SAND**	**YPRESIAN**
2	236m N	CLGB-XCZS	CLAYGATE MEMBER - CLAY, SILT AND SAND	YPRESIAN

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	**Mixed**	**Moderate**	**Very Low**

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	0

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

This data is sourced from the British Geological Survey.

16 Boreholes

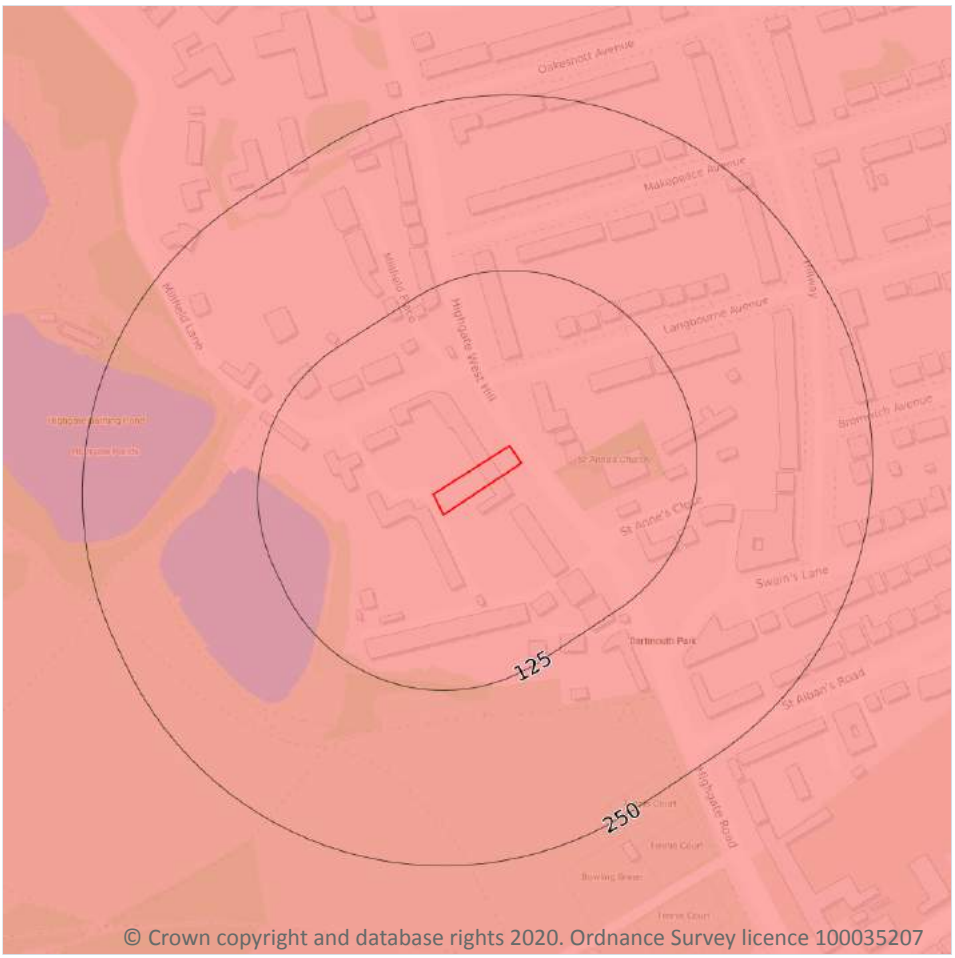
16.1 BGS Boreholes

Records within 250m	0

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.

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

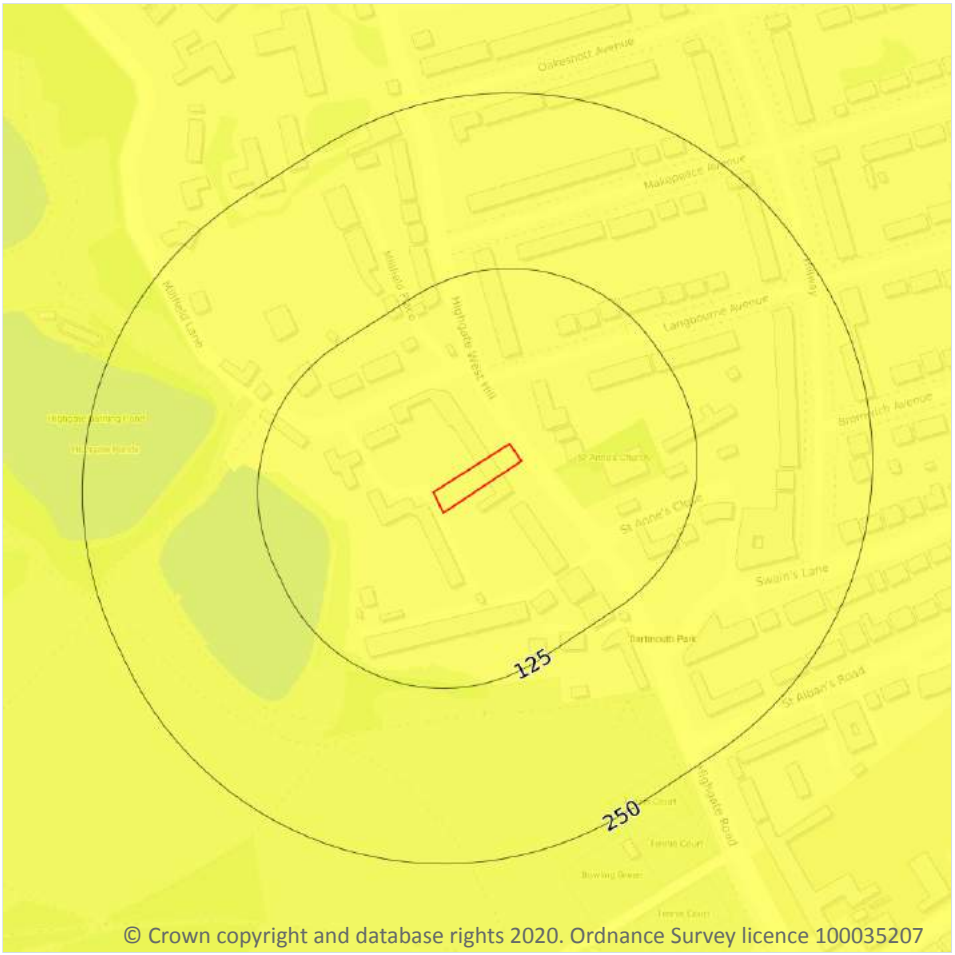
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 77**

Location	Hazard rating	Details
On site	**Moderate**	**Ground conditions predominantly high 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 78**

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits

Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m	1

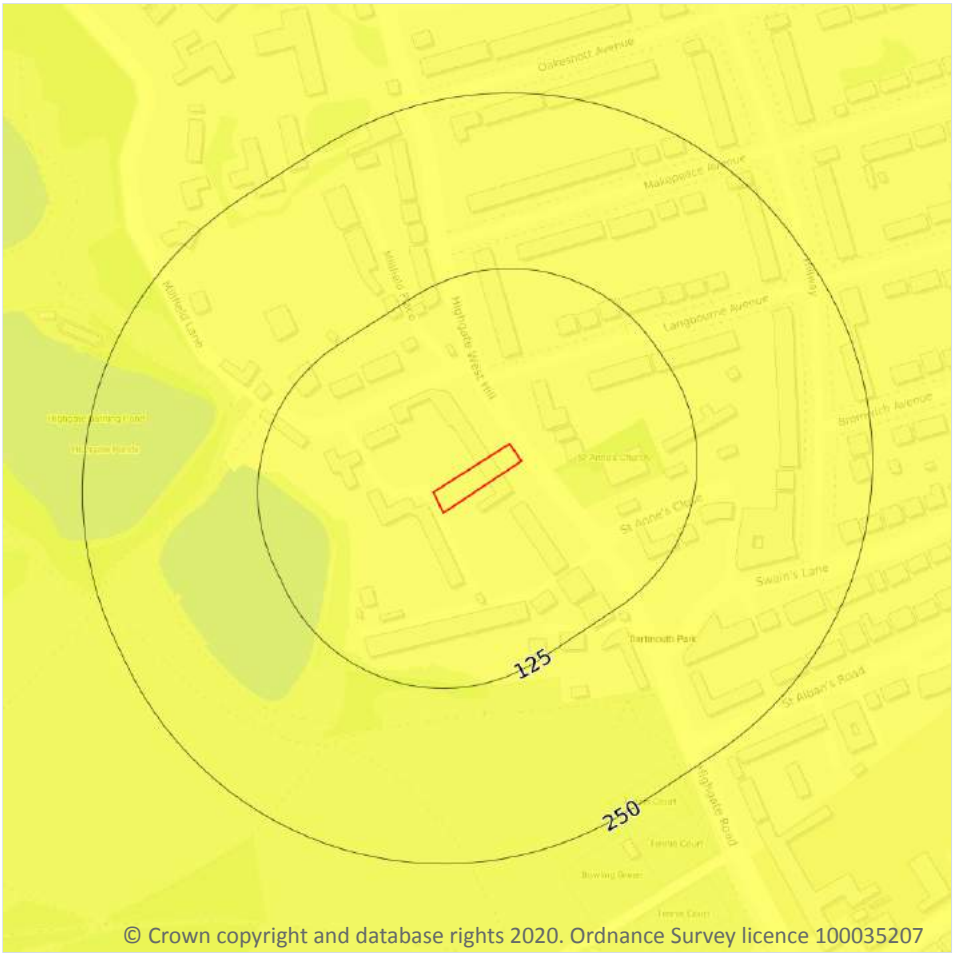
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 79**

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m	1

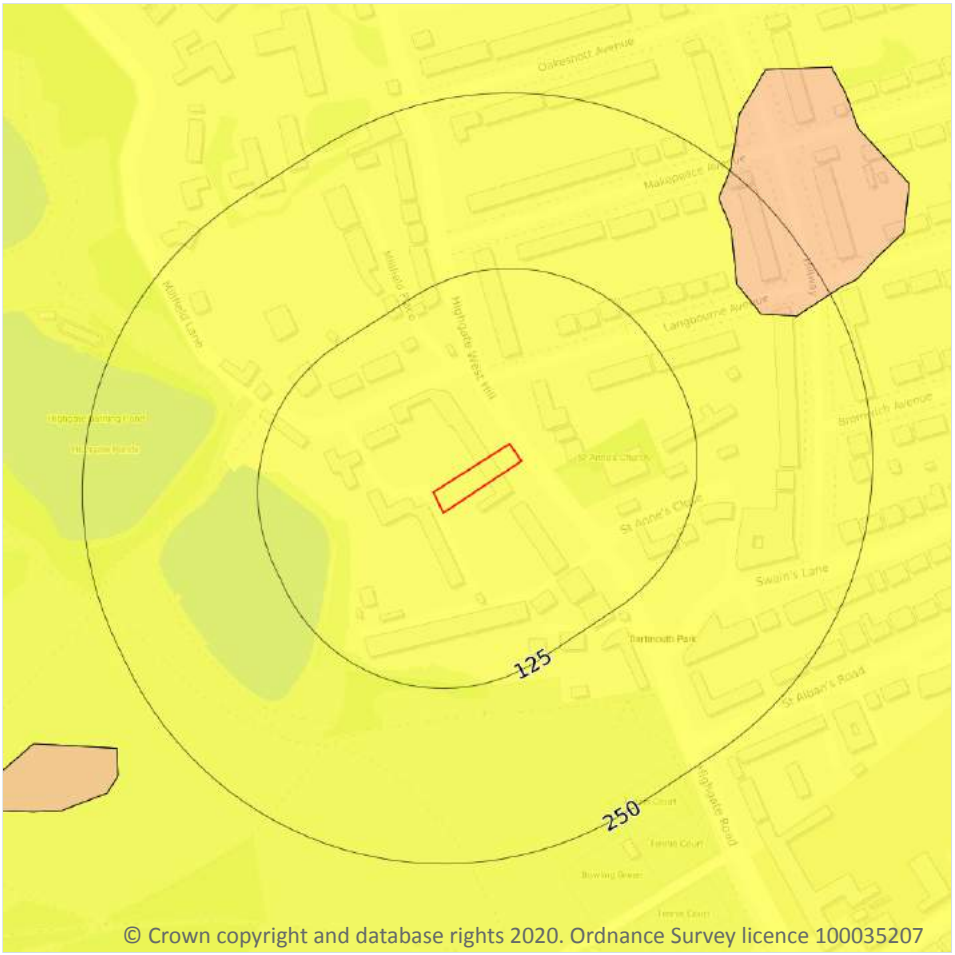
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 80**

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 81**

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 82**

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, ground workings and natural cavities

Site Outline

Search buffers in metres (m)

Natural cavities (Area)

Natural cavities (Point)

BritPits

Surface ground workings

Underground workings

Historical Mineral Planning Areas

Mining Cavities

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 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 Peter Brett Associates (PBA).

18.2 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.

18.3 Surface ground workings

Records within 250m	16

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, ground workings and natural cavities map on **page 83**

ID	Location	Land Use	Year of mapping	Mapping scale
A	77m SW	Ponds	1869	1:10560
A	77m SW	Ponds	1879	1:10560
A	80m W	Pond	1894	1:10560
B	80m W	Ponds	1938	1:10560
B	81m W	Ponds	1965	1:10560
B	81m W	Ponds	1974	1:10000
B	81m W	Ponds	1996	1:10000
B	81m W	Ponds	1958	1:10560
B	85m W	Ponds	1949	1:10560
1	88m E	Unspecified Ground Workings	1949	1:10560
A	88m W	Ponds	1920	1:10560
C	159m W	Ponds	1869	1:10560
C	159m W	Ponds	1879	1:10560
C	165m W	Ponds	1894	1:10560
2	172m W	Ponds	1920	1:10560
3	240m NW	Unspecified Heap	1869	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	6

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 83**

ID	Location	Land Use	Year of mapping	Mapping scale
-	882m SE	Tunnel	1965	1:10560
-	882m SE	Tunnel	1974	1:10000
-	882m SE	Tunnel	1958	1:10560
-	896m SE	Tunnel	1965	1:10560
-	896m SE	Tunnel	1974	1:10000
-	896m SE	Tunnel	1958	1:10560

This is data is sourced from Ordnance Survey/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 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 Peter Brett Associates (PBA).

18.8 JPB mining areas

Records on site	0

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

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	0

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

This data is sourced from the Coal Authority.

18.10 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.

18.11 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

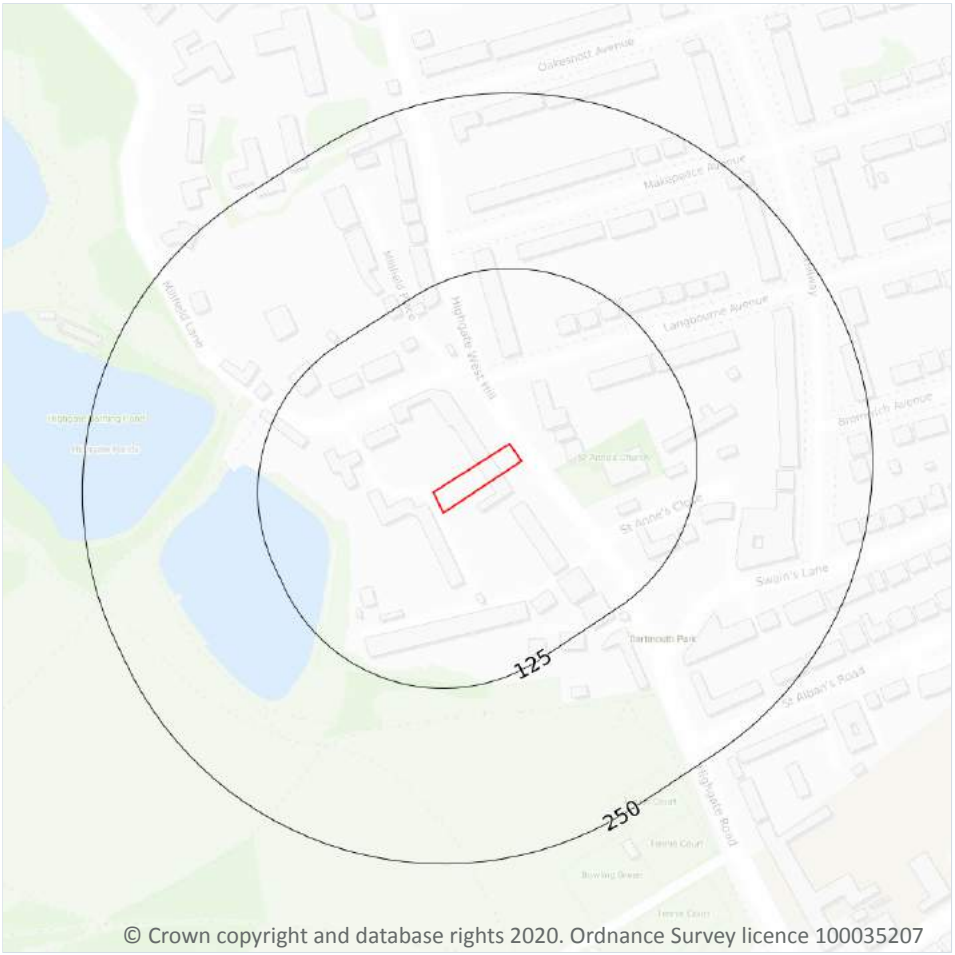
18.13 Clay mining

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 Radon



Site Outline

Search buffers in metres (m)

Greater than 30%

Between 10% and 30%

Between 5% and 10%

Between 3% and 5%

Between 1% and 3%

Less than 1%

19.1 Radon

Records on site	1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 88**

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

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 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 km^2. 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 km^2; 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	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**
On site	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m	6

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 km^2).

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/kg)
On site	**15**	**2.6**	**208**	**143**	**0.4**	**95**	**55**	**22**	**19**
On site	**15**	**2.6**	**210**	**144**	**0.4**	**101**	**54**	**22**	**20**
14m E	15	2.6	210	144	0.5	92	53	23	19
18m NE	16	2.8	198	136	0.4	100	53	23	21
24m W	15	2.6	213	146	0.4	97	55	22	20
42m NW	15	2.6	214	147	0.4	100	55	22	20

This data is sourced from the British Geological Survey.

20.3 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 km^2.

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects

21.1 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.

21.2 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.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 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.

21.5 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.

21.6 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.

21.7 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.

21.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 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.

21.10 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: https://www.groundsure.com/terms-and-conditions-jan-2020/.

Appendix C

Ground Investigation Report

FACTUAL GROUND INVESTIGATION REPORT

for the site at

11 Highgate West Hill, Highgate, London N6 6JR

on behalf of

GROUND AND PROJECT CONSULTANTS LIMITED

Report Reference: GWPR3834/October 2020			Status: FINAL
Issue:	Prepared By:	Checked By:	Verified By:
V1.01 October 2020			
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File Reference: Ground and Water/Project Files/ GWPR3834 11 Highgate West Hill, Highgate, London N6 6JR			

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1.0 INTRODUCTION

1.1 General

Ground and Water Limited were instructed by Ground and Project Consultants Ltd on Tuesday 25th August 2020, to undertake a Ground Investigation at 11 Highgate West Hill, Highgate, London N6 6JR (the site). The scope of the investigation was originally detailed within the Ground and Water Limited fee proposal ref. GWQ5616, dated 25th June 2020 and revised fee proposal ref. GWQ5616Rev2, dated 26th August 2020.

1.2 Aims of the Investigation

Ground and Water Limited understood the aim of the investigation was to provide the client with factual information relating to local ground conditions underlying the site to assist the preparation and design of the proposed development. The factual information is presented in this report.

A site investigation was undertaken to extract a series of soil samples representative of underlying ground conditions and preform in-situ and laboratory testing to inform foundation design of the proposed development.

A Desk Study or full-scale contamination and geotechnical assessment were not considered part of the remit of this Factual Report. The techniques adopted for the investigation were selected in conjunction with the anticipated ground conditions, limited historical development and scale of the proposed development.

1.3 Conditions and Limitations

This factual report has been prepared based on the terms, conditions and limitations outlined within Appendix A.

2.0 SITE SETTING

2.1 Site Location

The site occupied a total area of approximately ~800m^2 and was formed of a roughly rectangular shaped plot of land, orientated from east to west. The site was located in the Greater London area within an urban residential setting, approximately 900m south of central Highgate. Detached or Semi-detached large period properties neighbour the site to the north and south along Highgate West Hill and rear garden back onto rear gardens of properties of West Hill Close along its western boundary. Parkland of Hamstead Heath was ~200m west, Gospel Oak underground station ~800m south and Swain's Lane ~380m east. The site was located north of the River Thames under the Camden local authority within the residential area of Greater London, N6 6JR.

The approximate National Grid Reference for the centre of the site is TQ 28166 86475. A site location plan is provided within Figure 1. A plan showing the site development area is given within Figure 2.

2.2 Site Description

The site comprised a semi-detached 2 storey period property accessed from Highgate West Hill. The property was on a raised elevation ~2 – 3m above street level with stepped access and retaining walls forming the front facing eastern boundary. The enclosed front garden was largely soft landscaped and featured a number of mature trees and shrubbery. An existing cellar occupied part of the total building footprint underneath one of the two front reception rooms. A small conservatory provided access onto an enclosed rear garden at the rear of the property which had areas of hard and soft landscaping.

An aerial view of the site with a general indication of the proposed site boundaries is presented as Figure 3.

2.3 Proposed Development

Based on planning application 2019/5729/L submitted to Camden Borough Council on 13th November 2019, the proposed development was understood to comprise the demolition of an existing conservatory and erection of a single storey rear extension with partially glazed roof. A plan of the proposed development is presented as Figure 4.

2.4 Geology

The BGS Geological Map for the North London area (North London, Sheet No. 256, Bedrock and Superficial 1:50,000) indicated that the site was located on bedrock stratum of the London Clay Formation. No artificial ground or superficial deposits were recorded within 500m of the site.

London Clay Formation

The London Clay Formation comprises stiff grey fissured clay, weathering to brown near surface. Concretions of argillaceous limestone in nodular form (Claystones) occur throughout the formation. Crystals of Gypsum (Selenite) are often found within the weathered part of the London Clay Formation, and precautions against sulphate attack to concrete are sometimes required. The lowest part of the formation is a sandy bed with black rounded gravel and occasional layers of sandstone and is known as the Basement Bed.

British Geological Record

A representative BGS borehole record ~650m east of the site (TQ28NE150) noted brick fill Made Ground to a depth of 2.50m bgl underlain by bedrock of the London Clay Formation to the base of borehole at a depth of 15.00m bgl. The London Clay Formation was described as stiff fissured

mottled brown grey silty clay with occasional gypsum crystals to 6.50m bgl then becoming very stiff fissured grey silty clay to the base of the borehole. No groundwater strikes were recorded. A groundwater strike was recorded in historical borehole TQ28NE14, located ~450m south of the site, at a depth of 56.6m bgl within the London Clay Formation.

2.5 Hydrogeology and Hydrology

A study of the aquifer maps on the Department for Environment, food and Rural Affairs (DEFRA) and Environment Agency (EA) websites revealed the site to be underlain with an **Unproductive Aquifer** comprising the bedrock deposits of the London Clay Formation. No designation was given for superficial deposits, due to their likely absence.

Unproductive Strata are rock layers with low permeability that have negligible significance for water supply or river base flow. These were formerly classified as non-aquifers.

Examination of the Defra records showed that the site did not fall within a Groundwater Source Protection Zone as classified in the Policy and Practice for the Protection of Groundwater.

The nearest surface water feature to the site was a succession of public ponds within Hampstead Heath Parkland. The closest pond feature was Highgate No1. Pond ~100m west and Men's Bathing Pond ~200m west of the site boundary.

From analysis of hydrogeological and topographical maps, the site was noted to be located on the edge of a Heath at an elevation of ~110m above ordnance datum. This elevation attributed to a groundwater table at a depth of ~56.00m bgl (based on historical BGS borehole records) within the London Clay Formation. The site was topographically located in a depression between Hampstead Heath (west) and Highgate (east) with a considered groundwater flow direction to the southeast towards Regents Canal and the River Thames. Though the groundwater table is considered to be relatively low, the presence of perched water may be present at shallower depths, within any Topsoil/Made Ground strata and above more cohesive layers such as silty clays of the London Clay Formation.

Examination of the Government Flood Map for Planning website showed the site was in a **Flood Zone 1,** i.e. an area with a **very low** probability of flooding.

2.6 Radon

BRE 211 (2015) Map 5 of the London, Sussex and West Kent area revealed the site was located within an area where mandatory protection measures against the ingress of radon were **unlikely** to be required. The site was in an area where a risk assessment was **not required**.

Further investigation using www.ukradon.org showed that the site was located within the lowest band of radon potential where basic protection measures against the ingress of Radon were **unlikely** to be required as less than 1% of homes were above the action line. The nearest recording of elevated radon potential was located some ~7.0km east where a maximum radon potential of 1-3%.

3.0 FIELDWORK

3.1 Scope of Works

Site works were undertaken on Wednesday 9th September 2020 and comprised the drilling of 1No. demountable windowless sampler borehole to a depth of 8.45m bgl, referenced BH1. In-situ Standard Penetration Tests (SPTs) were undertaken at 1.00m bgl intervals to the base of the borehole. On completion, the borehole was installed with a ground gas/ groundwater monitoring standpipe with a response zone between 1.00m – 5.00m bgl.

Other works included the hand-digging of 6No. trial pits (TP/FE0 – TP/FE2 and TP/FE4 – TP/FE6) to expose existing foundation and party wall structures to the rear of the property and existing basement. Foundation and Party Wall section drawings have been reported separately to this factual report and have been provided in Appendix E for reference.

Prior to any intrusive works taking place, the area was scanned with a Cable Avoidance Tool (C.A.T. scanner and, where underground services and drainage were suspected or positively identified, the exploratory position was relocated to a safer position. As a further precautionary measure, a hand-dug pit was excavated to 1.20m bgl discounting the possible risk of striking any potential or undetectable shallow services.

The approximate borehole location is shown within the trial hole location plan presented as Figure 5, the full trial hole logs are presented as Appendix B.

Upon completion of the intrusive works, with the exception of those with monitoring standpipes, trial holes were reverse backfilled with arisings excavated during the drill, compacted, and made good, in relation to the surrounding environs.

3.2 Sampling Procedures

A number of disturbed samples (D) were recovered from the trial hole arisings at depths shown in the trial hole records. Soil samples were generally retrieved from shallow ground, each change of strata and at approximately 1.00m intervals during broad homogenous soil horizons.

Selected disturbed samples were submitted for geotechnical testing purposes.

4.0 ENCOUNTERED GROUND CONDITIONS

4.1 Soil Conditions

The trial hole was logged by Chris Gordon of Ground and Water Limited, generally in accordance with BS EN 14688 'Geotechnical Investigation and Testing – Identification and Classification of Soil'.

The ground conditions encountered within the trial hole constructed on the site conform to those anticipated from the geological mapping. A shallow capping of Made Ground overlay bedrock deposits of the London Clay Formation. Limited Made Ground deposits may be indicative of historical development and localised redevelopment of the site. The ground conditions encountered during the investigation are described in this section. The trial hole logs are presented as Appendix B and a trial hole location plan is presented as Figure 5.

For the purposes of discussion, the succession of conditions encountered in the trial hole in descending order can be summarised as follows:

Reworked Topsoil
Topsoil
Made Ground - Granular
Made Ground - Cohesive
Weathered London Clay Formation
London Clay Formation

Summary of Strata Encountered (Full logs provided within Appendix B)			
Strata	**Top Depth (m bgl)**	**Base Depth (m bgl)**	**Thickness (m)**
HARDSTANDING: CONCRETE PAVERS (TP0, TP1 & TP4 – TP6).	GL – 0.15	0.05 – 0.22	0.05 – 0.10
MADE GROUND: SHARP SAND (TP4 – TP6 only).	0.05	0.10	0.05
MADE GROUND: REWORKED TOPSOIL: (TP1 & TP2 only). Dark brown gravelly silty coarse SAND. Gravel is angular to rounded fine to medium flint, brick, slate and concrete.	GL	0.15 – 0.30	0.15
MADE GROUND (BH1, TP0, TP1, TP2 & TP4): Dark greyish brown or brown slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint, brick and concrete.	GL – 0.70	0.40 – 2.70	0.20 – 2.00
TOPSOIL: (BH1 only): Dark grey and brown slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is angular to subrounded fine to coarse flint.	0.20	1.20	1.00
WEATHERED LONDON CLAY FORMATION: (BH1, TP2 & TP4): Multicoloured mottled silty CLAY with rare selenite crystals and occasional sand lenses. OR Multicoloured mottled bluish grey sandy or gravelly CLAY. Sand is fine to medium. Gravel is occasional angular to subrounded fine flint (TP0, TP1, TP2 & TP5).	*0.10 – 1.20	*0.40 – 7.00	5.80
LONDON CLAY FORMATION: (BH1 only) Dark greyish brown silty clay with frequent fine selenite crystals.	1.20	>8.45	>1.40

**Depth is taken from the surface of the trial hole excavation in a basement structure so below actual ground level.*

4.2 Roots Encountered

Fresh roots were observed in all external trial hole locations (BH1, TP0 – TP2 to a maximum penetrable depth of 1.70m bgl within the cohesive Weathered London Clay Formation.

It should be noted that the chance of determining actual depth of root penetration through a narrow diameter borehole is low and the maximum root penetration depth was not reached in the trial pit (TP0 – TP2); no roots were encountered in any internal basement trial holes (TP4 – TP6). Roots may be found to greater depths at other locations within the site boundaries, particularly where established boarder vegetation and mature tree are in proximity.

4.3 Groundwater Conditions

A groundwater strike was recorded in BH1 at 3.00m bgl and in all internal basement trial holes (TP4 – TP6) at 0.25m bgl. Groundwater noted in these locations was considered isolated perched water trapped within granular veins of the underlying impermeable strata.

It should be noted that the site investigation was conducted during the summer months where groundwater levels were falling to their annual low and the long-term groundwater elevation may well increase later in the year in response to seasonal fluctuations.

Isolated perched groundwater may be encountered in shallow Made Ground deposits, particularly after a period of prolonged or intense precipitation where surface water may infiltrate and perch on top of the impermeable underlying London Clay bedrock. Groundwater identified in published historic borehole logs reported groundwater levels of 56.60m bgl.

4.4 Obstructions

Buried concrete 0.07m thick was noted in TP1 approximately 0.15m bgl underlying shallow reworked topsoil deposits. No other artificial or natural sub-surface obstructions were noted during the intrusive works.

4.5 Ground Gas & Groundwater Monitoring

In order to assess the ground-gas risk and groundwater conditions on-site, a combined ground-gas/groundwater monitoring standpipe was installed within BH1 to a depth of 5.00m bgl, with a response zone between 1.00 – 5.00m bgl. Ground-gas and groundwater monitoring was undertaken on Wednesday 30th September 2020 using a LMSXi landfill gas analyser. The results of the monitoring round can be seen tabulated below.

Ground-gas Monitoring from Wells										
Date	**Trial Hole**	**O_2 (%)**	**LEL (%)**	**CH_4 (%)**	**CO_2 (%)**	**H2S (ppm)**	**CO (ppm)**	**Flow Rate (litre/hr)**	**Groundwater (m bgl)**	**PID (ppm)**
Date: 30/09/2020 Time: 13:00 Weather: Cloudy light winds, 12°C, 15mph winds Pressure: 1000mb, falling from 1009mb over the past 48 hours	Atmosphere	20.5	0.0	0.0	0.0	0.0	0.0	0.0	-	-
	BH1	19.9	0.0	0.0	1.5	0.0	0.0	0.0	1.50	0.3

A review of the monitoring round identified no abnormalities or indication of potential ground gas contamination. The groundwater level was at 1.50m which is considered to be isolated perched water trapped within granular veins of the underlying impermeable strata. The monitoring record data sheet is presented as Appendix D.

5.0 IN-SITU AND LABORATORY GEOTECHNICAL TESTING

5.1 In-Situ Geotechnical Testing

5.1.1 Standard Penetration Tests (SPTs)

Standard Penetration tests (SPTs) were undertaken in BH1 covering depth intervals of approximately 1.00m. The results of the SPT's have not been amended to account for hammer efficiency, rod lengths and overburden pressure in accordance with Eurocode 7. The test results are presented in the borehole logs within Appendix B.

Cable Percussion Boreholes provide samples of the ground for assessment, but they do not give any engineering data. The standard penetration test (SPT) is an in-situ dynamic penetration test designed to provide information on the geotechnical engineering properties of soil. The test uses a thick-walled sample tube, with an outside diameter of 50 mm and an inside diameter of 35 mm, and a length of around 610 mm. This is driven into the ground at the bottom of a borehole by blows from a slide hammer with a weight of 63.5 kg falling a distance of 762 mm. The sample tube is driven 150 mm into the ground and then the number of blows needed for the tube to penetrate each 75 mm up to a depth of 450 mm is recorded. The sum of the number of blows is termed the "standard penetration resistance" or the "N-value". Cohesive soils of the London Clay Formation were classified based on the table below.

Undrained Shear Strength from Field Inspection/ SPT Results Cohesive Soils (EN ISO 14688-2:2004 & Stroud (1974))		
Classification	**Undrained Shear Strength (kPa)**	**Field Indications**
Extremely High	>300	-
Very High	150 – 300	Brittle or very tough
High	75 – 150	Cannot be moulded in the fingers
Medium	40 – 75	Can be moulded in the fingers by strong pressure
Low	20 – 40	Easily moulded in the fingers
Very Low	10 – 20	Exudes between fingers when squeezed in the fist
Extremely Low	<10	-

An interpretation of the in-situ geotechnical testing results is given in the table below.

Interpretation of In-situ Geotechnical Testing Results in BH1				
Strata	**SPT "N" Blow Counts**	**Equivalent Undrained Shear Strength (kPa) Cohesive Soils**	**Soil Type**	**Trial Hole/s**
			Cohesive (Undrained Shear Strength)	
Weathered London Clay Formation	6 - 21	30 - 105	**Very Low / Low** to **High**	BH1 (1.20 – 6.45m bgl)
London Clay Formation	17 -20	85 - 100	**High**	BH1 (7.00m – 8.45m bgl)

It must be noted that field measurements of undrained shear strength are dependent on a number of variables including disturbance of sample, method of investigation and also the size of specimen or test zone etc.

5.2 Laboratory Geotechnical Testing

A programme of geotechnical laboratory testing, scheduled by Ground and Water Limited and carried out by K4 Soils Laboratory and DETS Limited, was undertaken on samples recovered from the London Clay Formation. The results of the tests are presented as Appendix C.

The test procedures used were generally in accordance with the methods described in BS1377:2016/2018. Details of the specific tests used in each case are given below.

Standard Methodology for Laboratory Geotechnical Testing		
Test	**Standard**	**Number of Tests**
Atterberg Limit Tests	BS1377:2016: Part 2: Clauses 3.2, 4.3 & 5	5
Water Soluble Sulphate and pH test	BS1377:2018: Part 3: Clause 5	1
BRE Special Digest 1 (incl. pH, Total Sulphate, W/S Sulphate, Total Chlorine, W/S Chlorine, Total Sulphur, Ammonium as NH4, W/S Nitrate, W/S Magnesium)	BRE Special Digest 1 "Concrete in Aggressive Ground (BRE, 2005).	2

5.2.1 Atterberg Limit Tests

The results of the Atterberg Limit Tests are based on five cohesive samples of the London Clay Formation.

Atterberg Limit Tests Results Summary							
Stratum/Depth	**Moisture Content (%)**	**Passing 425 µm sieve (%)**	**Modified PI (%)**	**Soil Class**	**Consistency Index (Ic)**	**Volume Change Potential**	
						BRE	**NHBC**
Weathered London Clay Formation (BH1/1.50m bgl)	32	100	36	CH	Stiff	Medium	Medium
Weathered London Clay Formation (BH1/3.00m bgl)	32	100	38	CH	Stiff	Medium	Medium
Weathered London Clay Formation (BH1/5.00m bgl)	31	100	36	CH	Stiff	Medium	Medium
London Clay Formation (BH1/7.00m bgl)	29	100	40	CH	Stiff	High	High
London Clay Formation (BH1/8.00m bgl)	31	100	38	CH	Stiff	Medium	Medium

NB: NP – Non-plastic
BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results)
Soil Classification based on British Soil Classification System.
Consistency Index (Ic) based on BS EN IS0 14688-2:2018.

5.2.2 Comparison of Soil's Moisture Content with Index Properties

5.2.2.1 Liquidity Index Analyses

The results of the Atterberg Limit tests undertaken on five cohesive samples of the London Clay Formation are further calculated to determine the Liquidity Index of the samples. This gives an indication as to whether the samples recovered showed a moisture deficit and their degree of consolidation. The results are tabulated overleaf. The test results are presented as Appendix C.

Liquidity Index Calculations Summary					
Stratum/Trial Hole/Depth	**Moisture Content (%)**	**Plastic Limit (%)**	**Modified Plasticity Index (%)**	**Liquidity Index**	**Result**
Weathered London Clay Formation (BH1/1.50m bgl) Lab description: Brown slightly mottled bluish grey silty CLAY.	32	29	36.00	0.08	Heavily Overconsolidated
Weathered London Clay Formation (BH1/3.00m bgl) Lab description: Brown slightly mottled bluish grey silty CLAY.	32	28	38.00	0.11	Heavily Overconsolidated
Weathered London Clay Formation (BH1/5.00m bgl) Lab description: Brown slightly mottled bluish grey silty CLAY with scattered selenite crystals.	31	30	36.00	0.03	Heavily Overconsolidated
London Clay Formation (BH1/7.00m bgl) Lab description: Brown slightly mottled dark grey silty CLAY with scattered selenite crystals.	29	29	40.00	0.00	Heavily Overconsolidated
London Clay Formation (BH1/8.00m bgl) Lab description: Brown slightly mottled dark grey silty CLAY with scattered selenite crystals.	31	28	38.00	0.08	Heavily Overconsolidated

The results indicated that cohesive samples were representative of heavily overconsolidated silty clay of the London Clay Formation and was well distributed along the length of the borehole to a maximum depth of 8.00m bgl.

Liquidity Index testing revealed no evidence of moisture deficit in any of the five tested samples of the London Clay Formation.

5.2.2.2 Liquid Limit

A comparison of the soil moisture content and the liquid limit can be seen tabulated below.

Moisture Content vs. Liquid Limit				
Strata/Trial Hole/Depth/Soil Description	**Moisture Content (MC) (%)**	**Liquid Limit (LL) (%)**	**40% Liquid Limit (LL)**	**Result**
Weathered London Clay Formation (BH1/1.50m bgl) Lab description: Brown slightly mottled bluish grey silty CLAY.	32	65	26.0	MC > 0.4 x LL (No Significant Moisture Deficit)
Weathered London Clay Formation (BH1/3.00m bgl) Lab description: Brown slightly mottled bluish grey silty CLAY.	32	66	26.4	MC > 0.4 x LL (No Significant Moisture Deficit)
Weathered London Clay Formation (BH1/5.00m bgl) Lab description: Brown slightly mottled bluish grey silty CLAY with scattered selenite crystals.	31	66	26.4	MC > 0.4 x LL (No Significant Moisture Deficit)
London Clay Formation (BH1/7.00m bgl) Lab description: Brown slightly mottled dark grey silty CLAY with scattered selenite crystals.	29	69	27.6	MC > 0.4 x LL (No Significant Moisture Deficit)
London Clay Formation (BH1/8.00m bgl) Lab description: Brown slightly mottled dark grey silty CLAY with scattered selenite crystals.	31	66	26.4	MC > 0.4 x LL (No Significant Moisture Deficit)

Results of the above table recorded **no potential significant moisture deficit** in all five tested samples of the London Clay Formation. Testing results were consistent along the full borehole profile to a maximum depth of 8.00m bgl. Root penetration was relatively shallow to a maximum depth of 1.70m bgl and penetrating the underlying London Clay by ~0.20m bgl therefore was not considered a risk to potential water uptake.

5.2.4 Sulphate and pH Tests

Water Soluble Sulphate and pH tests were undertaken from one sample of Weathered London Clay Formation within BH1/4.00m bgl. The water-soluble sulphate concentration was found to be 2,370mg/l. A pH of 7.32 was recorded within the sample.

5.2.5 BRE Special Digest 1

In accordance with BRE Special Digest 1 'Concrete in Aggressive Ground' (BRE, 2005) two samples were scheduled for laboratory testing from the London Clay Formation (BH1/2.00m bgl and BH1/7.50m bgl) which were analysed to determine parameters for concrete specification. The laboratory results are presented as Appendix C and a summary is tabulated below.

Determinand	Unit	Weathered London Clay Formation (BH1/2.00m bgl)	London Clay Formation (BH1/7.50m bgl)
pH	-	7.6	7.2
Ammonium as NH_4	mg/kg	5.1	10
Total Sulphur	%	0.11	2.52
Chloride (water soluble)	mg/kg	23	113
Magnesium (water soluble)	mg/l	11	170
Nitrate (water soluble)	mg/kg	<3	<3
Sulphate (water soluble)	mg/l	102	3,310
Sulphate (total)	mg/kg	1,132	25,210

APPENDIX A
Conditions and Limitations

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared based on information, data and materials which were available at the time of writing. Accordingly, any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must consider any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist. It was not part of the scope of this report to comment on environment/contaminated land considerations.

The conclusions and recommendations relate to 11 Highgate West Hill, Highgate, London N6 6JR.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit,

borehole or window sampler borehole implies the specific technique used to produce a trial hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

APPENDIX B
Trial Hole Logs

Percussion Drilling Log

Project Name: 11 Highgate West Hill	Client: Ground and Project Consultants Ltd	Date: 09/09/2020
Location: 11 Highgate West Hill, Highgate, London N6 6JR	Contractor: KDS Drillers	
Project No. : GWPR3834	Crew Name: Borehole Solutions Ltd.	Drilling Equipment: Modular Window Sampler

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH1	CP		CG	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.25	D		0.20			MADE GROUND: Dark greyish brown silty slightly sandy slightly gravelly clay with frequent root. Sand is fine to medium-grained. Gravel is angular to subrounded fine to coarse flint (85%) and brick (15%). Roots <1 - 10mm.
		0.50	D					TOPSOIL: Dark grey and brown silty slightly sandy slightly gravelly CLAY with frequent roots. Sand is fine to medium-grained. Gravel is angular to subrounded fine to coarse flint. Roots <1 - 5mm.
		0.80	D					
		1.20	D		1.20			Light brown mottled bluish grey silty fissured CLAY. WEATHERED LONDON CLAY FORMATION.
		1.20	SPT	N=6 (1,1/1,1,2,2)				
		1.50	D					*Roots no longer present.*
		2.00	D					
		2.00	SPT	N=9 (1,1/2,2,2,3)				*Rare fine selenite crystals.*
		2.50	D					*Occasional lenses of orangish brown fine-grained sand.*
	▼	3.00	D					
		3.00	SPT	N=21 (3,3/3,5,6,7)				
		3.50	D					*Claystone banding.*
		4.00	D					
		4.00	SPT	N=13 (1,2/3,3,3,4)				
		4.50	D					
		5.00	D					*Occasional fine selenite crystals.*
		5.00	SPT	N=18 (2,3/4,4,5,5)				
		5.50	D					
		6.00	D					
		6.00	SPT	N=15 (3,3/3,3,4,5)				
		6.50	D					*Frequent fine selenite crystals.*
		7.00	D		7.00			*Occasional fine selenite crystals.*
		7.00	SPT	N=17 (3,3/4,4,4,5)				Dark greyish brown silty fissured CLAY with frequent fine selenite crystals. LONDON CLAY FORMATION.
		7.50	D					
		8.00	D					
		8.00	SPT	N=20 (3,4/5,5,5,5)				
					8.45			End of Borehole at 8.450m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Goundwater strike at 3.00m bgl. Borehole terminated at 8.45m bgl as the targeted depth was reached. Borehole installed with monitoring standpipe to 5.00m bgl. Root proven to a maximum penetration depth of 1.70m bgl.

Trial Pit Log

Project Name: 11 Highgate West Hill	Client: Ground and Project Consultants Ltd	Date: 09/09/2020
Location: 11 Highgate West Hill, Highgate, London N6 6JR	Contractor: KDS Drillers	
Project No. : GWPR3834	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP/FE0	TP		CG	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Concrete tiles.
		0.30	D					MADE GROUND: Dark brown slightly silty sandy gravelly clay. Sand is fine to coarse-grained. Gravel is angular to rounded fine to medium flint (20%), brick (40%) and concrete (40%) with frequent roots <1mm.
		0.50	D					
		0.80	D		0.84			
					0.90			Dark orangish brown mottled grey gravelly CLAY. Gravel is angular to subrounded fine flint. WEATHERED LONDON CLAY FORMATION.
								End of Borehole at 0.900m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
0.50	0.50	Stable.					

Remarks

No groundwater encountered. Excavation terminated at 0.90m bgl as the foundation base was proven. Trial pit was reverse backfilled and compacted with arisings on completion. Root were proven to a maximum depth of 0.84m bgl. Membrane placed under concrete.

Trial Pit Log

Project Name: 11 Highgate West Hill	Client: Ground and Project Consultants Ltd	Date: 09/09/2020
Location: 11 Highgate West Hill, Highgate, London N6 6JR	Contractor: KDS Drillers	
Project No. : GWPR3834	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP/FE1	TP		CG	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			MADE GROUND: REWORKED TOPSOIL: Dark brown silty gravelly coarse-grained sand. Gravel is angular to rounded fine to medium flint (80%), brick (15%) concrete (3%) and slate (2%) with frequent roots <1 - 5mm.
					0.22			MADE GROUND: Concrete.
		0.30	D					MADE GROUND: Dark brown sandy gravelly clay. Sand is fine to coarse-grained. Gravel is angular to subrounded fine to medium flint (85%), brick (10%) and concrete (5%) with frequent roots <1 - 5mm.
		0.50	D					
					0.60			Dark orangish brown mottled grey gravelly CLAY with frequent roots. Gravel is angular to subrounded fine flint. Roots <1 - 5mm. WEATHERED LONDON CLAY FORMATION.
		0.80	D					
		1.00	D		1.00			End of Borehole at 1.000m

1 2 3 4 5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
0.50	0.50	Stable.					

Remarks

No groundwater encountered. Excavation terminated at 1.00m bgl as the foundation base was proven. Trial pit was reverse backfilled and compacted with arisings on completion. The maximum depth penetration of the roots was not proven at the trial pit base.

Trial Pit Log

Project Name: 11 Highgate West Hill	Client: Ground and Project Consultants Ltd	Date: 09/09/2020
Location: 11 Highgate West Hill, Highgate, London N6 6JR	Contractor: KDS Drillers	
Project No. : GWPR3834	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP/FE2	TP		CG	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	D		0.30			MADE GROUND: REWORKED TOPSOIL: Dark brown silty gravelly coarse-grained sand. Gravel is angular to rounded fine to medium flint (80%), brick (10%), concrete (5%) and slate (5%) with frequent roots <1 - 10mm.
		0.50	D					MADE GROUND: Dark brown sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded fine to medium flint (90%), brick (5%) concrete (5%) with frequent roots <1 - 5mm.
		0.80	D		0.80			Dark brown mottled bluish grey fissured CLAY with frequent roots <1 - 5mm. WEATHERED LONDON CLAY FORMATION.
		1.00	D					
					1.20			End of Borehole at 1.200m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
0.50	0.50	Stable.					

Remarks

No groundwater encountered. Excavation terminated at 1.20m bgl as the foundation base was proven. Trial pit was reverse backfilled and compacted with arisings on completion. The maximum depth penetration of the roots was not proven at the trial pit base.

Trial Pit Log

Project Name: 11 Highgate West Hill	Client: Ground and Project Consultants Ltd	Date: 09/09/2020
Location: 11 Highgate West Hill, Highgate, London N6 6JR	Contractor: KDS Drillers	
Project No. : GWPR3834	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP/FE4	TP		CG	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.30	D		0.05			MADE GROUND: Concrete Pavers.
					0.10			MADE GROUND: Sharp Sand.
					0.20			MADE GROUND: Dark reddish brown sandy gravel with occasional clay lenses. Sand is fine to coarse-grained. Gravel is frequent angular to subrounded fine to medium brick (60%) and concrete (40%).
					0.40			Dark brown mottled grey silty fissured CLAY with occasional sand lenses. WEATHERED LONDON CLAY FORMATION.
								End of Borehole at 0.400m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
0.50	0.50	Stable.					

Remarks

Groundwater strike at 0.25m bgl Excavation terminated at 0.40m bgl as the foundation base was proven. Trial pit was reverse backfilled and compacted with arisings on completion. Membrane placed under concrete. No roots were encountered.

Trial Pit Log

Project Name: 11 Highgate West Hill	Client: Ground and Project Consultants Ltd	Date: 09/09/2020
Location: 11 Highgate West Hill, Highgate, London N6 6JR	Contractor: KDS Drillers	
Project No. : GWPR3834	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP/FE5	TP		CG	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.30	D		0.05			MADE GROUND: Concrete Pavers.
					0.10			MADE GROUND: Sharp Sand.
								Dark greyish brown to brown sandy CLAY. Sand is fine to medium-grained. WEATHERED LONDON CLAY FORMATION.
					0.40			End of Borehole at 0.400m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
0.50	0.50	Stable.					

Remarks

Groundwater strike at 0.25m bgl and water seepage from above ground wall. Excavation terminated at 0.40m bgl as the foundation base was proven. Trial pit was reverse backfilled and compacted with arisings on completion. Membrane placed under concrete. No roots were encountered.

Trial Pit Log

Project Name: 11 Highgate West Hill	Client: Ground and Project Consultants Ltd	Date: 09/09/2020
Location: 11 Highgate West Hill, Highgate, London N6 6JR	Contractor: KDS Drillers	
Project No. : GWPR3834	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP/FE6	TP		CG	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			MADE GROUND: Concrete Pavers.
					0.10			MADE GROUND: Sharp Sand.
	▼	0.30	D					Light orangish brown to brown sandy CLAY. Sand is fine to medium-grained. WEATHERED LONDON CLAY FORMATION.
					0.40			End of Borehole at 0.400m

1
2
3
4
5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
0.50	0.50	Stable.					

Remarks

Groundwater strike at 0.25m bgl Excavation terminated at 0.40m bgl as the foundation base was proven. Trial pit was reverse backfilled and compacted with arisings on completion. Membrane placed under concrete. No roots were encountered.

APPENDIX C
Geotechnical Laboratory Test Results

Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No.	Project Name	Programme	
28832	11 Highgate West Hill	Samples received	25/09/2020
		Schedule received	23/09/2020
Project No.	Client	Project started	28/09/2020
GWPR3834	Ground & Water Ltd	Testing Started	08/10/2020

Hole No.	Sample				Soil Description	NMC	Passing 425µm	LL	PL	PI	Remarks
	Ref	Top m	Base m	Type		%	%	%	%	%	
BH1	-	1.50	-	D	Brown slightly mottled bluish grey silty CLAY	32	100	65	29	36	
BH1	-	3.00	-	D	Brown slightly mottled bluish grey silty CLAY	32	100	66	28	38	
BH1	-	5.00	-	D	Brown slightly mottled bluish grey silty CLAY with scattered selenite crystals	31	100	66	30	36	
BH1	-	7.00	-	D	Brown slightly mottled dark grey silty CLAY with scattered selenite crystals	29	100	69	29	40	
BH1	-	8.00	-	D	Brown slightly mottled dark grey silty CLAY with scattered selenite crystals	31	100	66	28	38	

Test Methods: BS1377: Part 2: 1990:
Natural Moisture Content : clause 3.2
Atterberg Limits: clause 4.3 and 5.0

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved
Initials **J.P**
Date: 09/10/2020

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results
Tested in accordance with BS1377 : Part 3 : 2018, Clause 7.6 & Clause 12

Job No.	Project Name	Programme	
28832	11 Highgate West Hill	Samples received	25/09/2020
		Schedule received	23/09/2020
Project No.	Client	Project started	28/09/2020
GWPR3834	Ground & Water Ltd	Testing Started	

Hole No.	Sample				Soil description	Dry Mass passing 2mm	SO4 Content	pH	Remarks
	Ref	Top	Base	Type					
		m	m			%	mg/l		
BH1	-	4.00	-	D	Brown sandy silty CLAY with scattered selenite crystals	100	2370	7.32	

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved
Initials J.P
Date: 09/10/2020

2519 Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) MSF-5-R29

Chris Gordon
Ground & Water Ltd
2 The Long Barn
Norton Farm
Selborne Road
Alton
Hampshire
GU34 3NB

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 20-11116

Site Reference:	11 Highgate West Hill
Project / Job Ref:	GWPR3834
Order No:	GWPR3834
Sample Receipt Date:	24/09/2020
Sample Scheduled Date:	24/09/2020
Report Issue Number:	1
Reporting Date:	05/10/2020

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 20-11116	**Date Sampled**	22/09/20	22/09/20			
Ground & Water Ltd	**Time Sampled**	None Supplied	None Supplied			
Site Reference: 11 Highgate West Hill	**TP / BH No**	BH1	BH1			
Project / Job Ref: GWPR3834	**Additional Refs**	None Supplied	None Supplied			
Order No: GWPR3834	**Depth (m)**	2.00	7.50			
Reporting Date: 05/10/2020	**DETS Sample No**	501147	501148			

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.6	7.2			
Total Sulphate as SO_4	mg/kg	< 200	NONE	1132	25210			
Total Sulphate as SO_4	%	< 0.02	NONE	0.11	2.52			
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	102	3310			
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.10	3.31			
Total Sulphur	%	< 0.02	NONE	0.04	0.97			
Ammonium as NH_4	mg/kg	< 0.5	NONE	5.1	10			
Ammonium as NH_4	mg/l	< 0.05	NONE	0.51	1			
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	23	113			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	11.3	56.5			
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS	< 3	< 3			
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS	< 1.5	< 1.5			
W/S Magnesium	mg/l	< 0.1	NONE	11	170			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Sample Descriptions
DETS Report No: 20-11116
Ground & Water Ltd
Site Reference: 11 Highgate West Hill
Project / Job Ref: GWPR3834
Order No: GWPR3834
Reporting Date: 05/10/2020

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
501147	BH1	None Supplied	2.00	13.4	Light brown clay
501148	BH1	None Supplied	7.50	13.1	Brown sandy clay

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 20-11116

Ground & Water Ltd

Site Reference: 11 Highgate West Hill

Project / Job Ref: GWPR3834

Order No: GWPR3834

Reporting Date: 05/10/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

APPENDIX D
Ground Gas & Groundwater Monitoring Sheet

Job No:	GWPR3834
Site name:	Highgate West Hill
Operator:	AS

Date:		**30/09/2020**	
Time:	**13:00**	**to**	**13:30**
Visit No:	1	**of**	**1**

	GAS CONCENTRATIONS								VOLATILES		FLOW DATA			WELL AND WATER DATA	
Monitoring Point	Methane (%v/v)		Carbon dioxide (%v/v)		Carbon monoxide (ppm)	Hydrogen sulphide (ppm)	Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Water level (m bgl)	Depth of well (m bgl)
	Peak	Steady	Peak	Steady	Peak	Peak	Min	Steady			Peak	Steady			
Ambient air	0.0	0.0	0.0	0.0	0.0	0.0	20.5	20.5	-	-	-	-	-	-	-
BH1	0.0	0.0	1.5	1.5	0.0	0.0	19.9	19.9	0.3	-	0.00	0.00	0.00	1.50	4.80
Max	**0**	**0**	**1.5**	**1.5**	**0**	**0**	**20.5**	**20.5**	**0.3**	**0**	**0**	**0**	**0**	**1.5**	
Min	**0**	**0**	**0**	**0**	**0**	**0**	**19.9**	**19.9**	**0.3**	**0**	**0**	**0**	**0**	**1.5**	

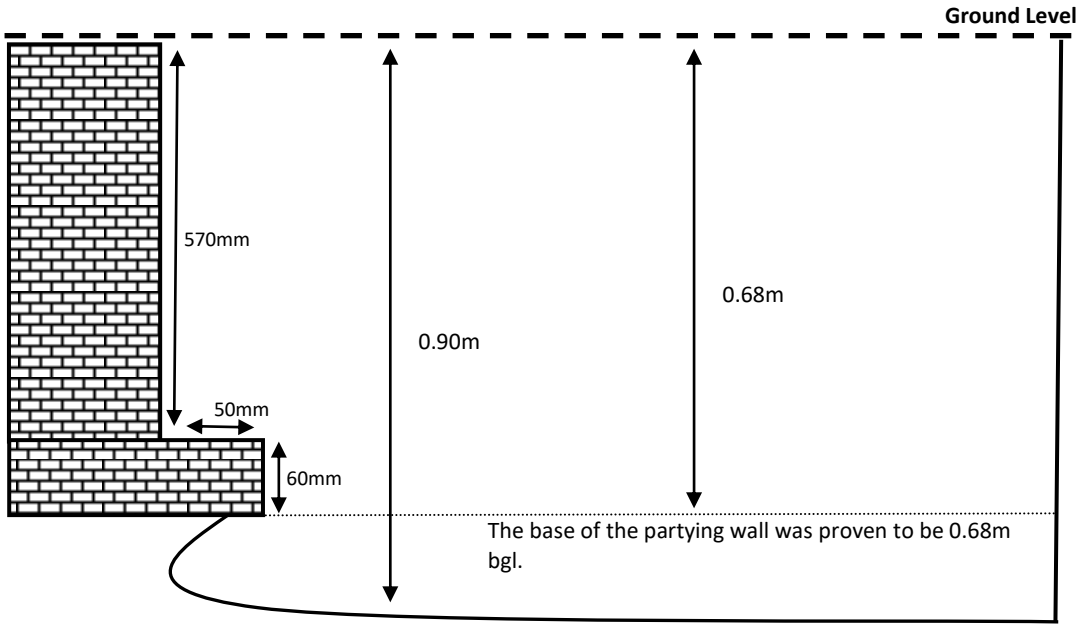
METEOROLOGICAL AND SITE INFORMATION:

State of ground:		Dry	X	Wet		Snow		Frozen		Hardstanding
Wind:		Calm	X	Moderate		Strong				
Cloud cover:		None	X	Cloudy		Overcast				
Preciptation:	X	None		Moderate		Heavy				
Official Barometric Pressure (mbar):				Before		After				
Official Pressure Trend:	1000	Falling		Steady		Rising	(Preceding 3 hours of monitoring)			

Ground gas Analyser: Gas Data GFM-436

APPENDIX D
Foundation and Party Wall Exposure Drawings

Partying Wall Exposure – Wall A



MADE GROUND (GL – 0.10m bgl): TILES/ CONCRETE
Membrane

MADE GROUND (0.10 – 0.84m bgl): Dark brown slightly silty sandy gravelly CLAY. Sand is fine to coarse-grained. Gravel is angular to rounded fine to medium flint (20%), brick (40%) and concrete (40%) with frequent rootlets. Roots live micro scaled <1mm.

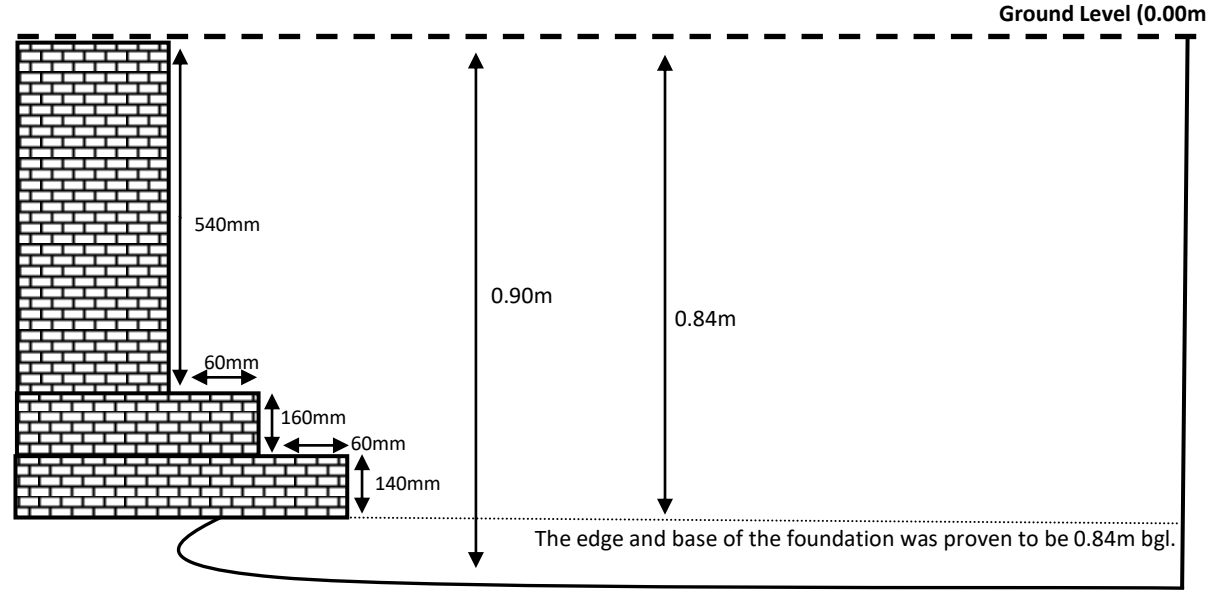
WEATHERED LONDON CLAY FORMATION: (0.84 – 0.90m bgl) Orangish brown mottled grey gravelly CLAY. Gravel is angular to subrounded fine flint.

Brick

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR		**Figure 1**
Client: Ground and Project Consultants Ltd	**Date:** September 2020	ground&water
Trial Pit Foundation Exposure: TP/FE0	**Ref:** GWPR3834	

Foundation Exposure – Wall B



MADE GROUND (GL – 0.10m bgl): TILES/ CONCRETE
Membrane

MADE GROUND (0.10 – 0.84m bgl): Dark brown slightly silty sandy gravelly CLAY. Sand is fine to coarse-grained. Gravel is angular to rounded fine to medium flint (20%), brick (40%) and concrete (40%) with frequent rootlets. Roots live micro scaled <1mm.

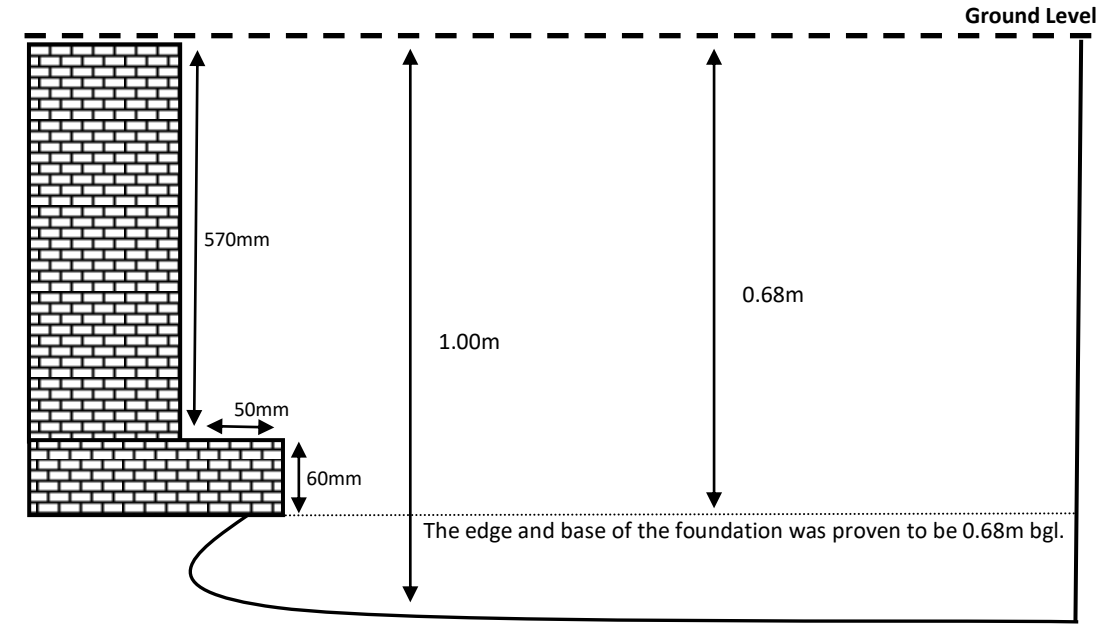
WEATHERED LONDON CLAY FORMATION: (0.84 – 0.90m bgl) Orangish brown mottled grey gravelly CLAY. Gravel is angular to subrounded fine flint.

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR	**Figure 1**
Client: Ground and Project Consultants Ltd	**Date:** September 2020
Trial Pit Foundation Exposure: TP/FE0	**Ref:** GWPR3834

ground&water

Partying Wall Exposure – Wall A



MADE GROUND (GL – 0.15m bgl): REWORKED TOPSOIL Dark brown silty gravelly coarse-grained sand. Gravel is angular to rounded fine to medium flint (80%), brick (15%) concrete (3%) and slate (2%) with frequent rootlets. Roots live micro scaled <1mm.

MADE GROUND (0.15 – 0.22m bgl): CONCRETE

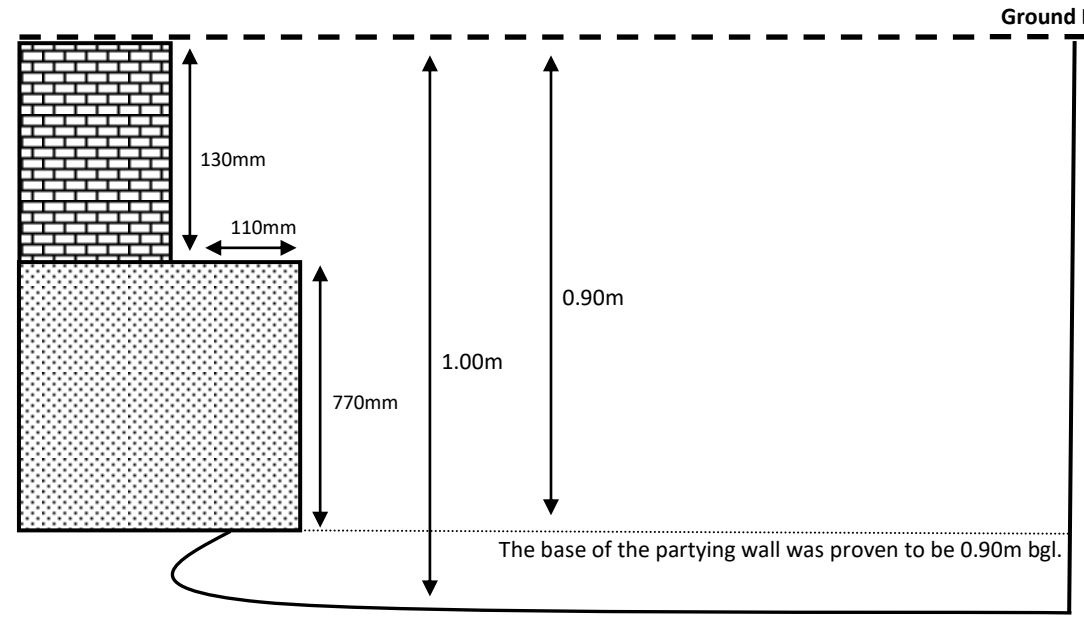
MADE GROUND (0.22 – 0.60m bgl): Dark brown sandy gravelly clay. Sand is fine to coarse-grained. Gravel is angular to subrounded fine to medium flint (85%), brick (10%) and concrete (5%) with frequent rootlets. Roots live micro scaled <1mm.

WEATHERED LONDON CLAY FORMATION: (0.60 – 1.00m bgl) Dark orangish brown mottled grey gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine flint. Roots live micro scaled <1mm.

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR		**Figure 2**
Client: Ground and Project Consultants Ltd	**Date:** September 2020	ground&water
Trial Pit Foundation Exposure: TP/FE1	**Ref:** GWPR3834	

Foundation Exposure – Wall B



MADE GROUND (GL – 0.15m bgl): REWORKED TOPSOIL Dark brown silty gravelly coarse-grained sand. Gravel is angular to rounded fine to medium flint (80%), brick (15%) concrete (3%) and slate (2%) with frequent rootlets. Roots live micro scaled <1mm.

MADE GROUND (0.15 – 0.22m bgl): CONCRETE

MADE GROUND (0.22 – 0.60m bgl): Dark brown sandy gravelly clay. Sand is fine to coarse-grained. Gravel is angular to subrounded fine to medium flint (85%), brick (10%) and concrete (5%) with frequent rootlets. Roots live micro scaled <1mm.

WEATHERED LONDON CLAY FORMATION: (0.60 – 1.00m bgl) Dark orangish brown mottled grey gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine flint. Roots live micro scaled <1mm.

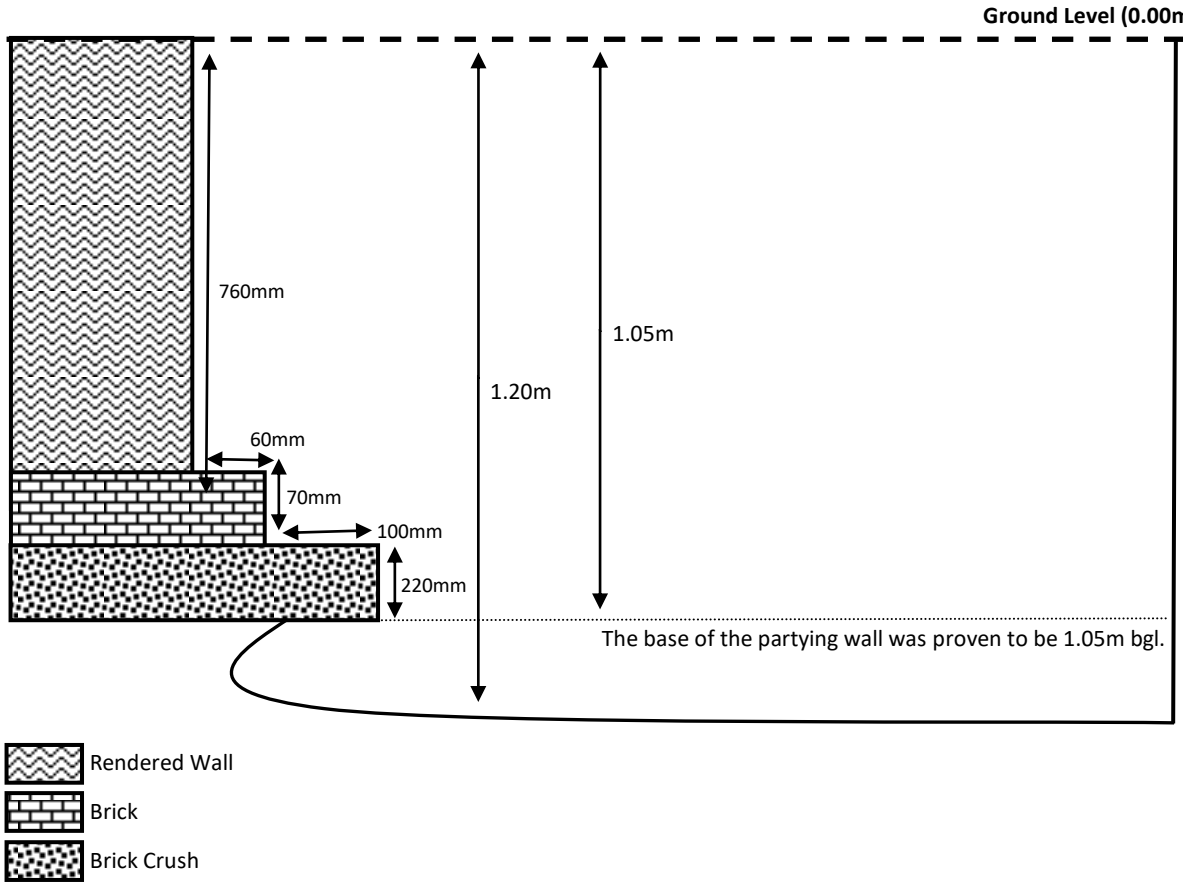
Brick

Concrete

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR		**Figure 2**
Client: Ground and Project Consultants Ltd	**Date:** September 2020	ground&water
Trial Pit Foundation Exposure: TP/FE1	**Ref:** GWPR3834	

Partying Wall Exposure – Garden Wall



REWORKED TOPSOIL: (GL – 0.30m bgl) Dark brown silty gravelly coarse-grained SAND. Gravel is angular to rounded fine to medium flint (80%), brick (15%) concrete (3%) and slate (2%) with frequent rootlets. Roots live micro scaled <10mm.

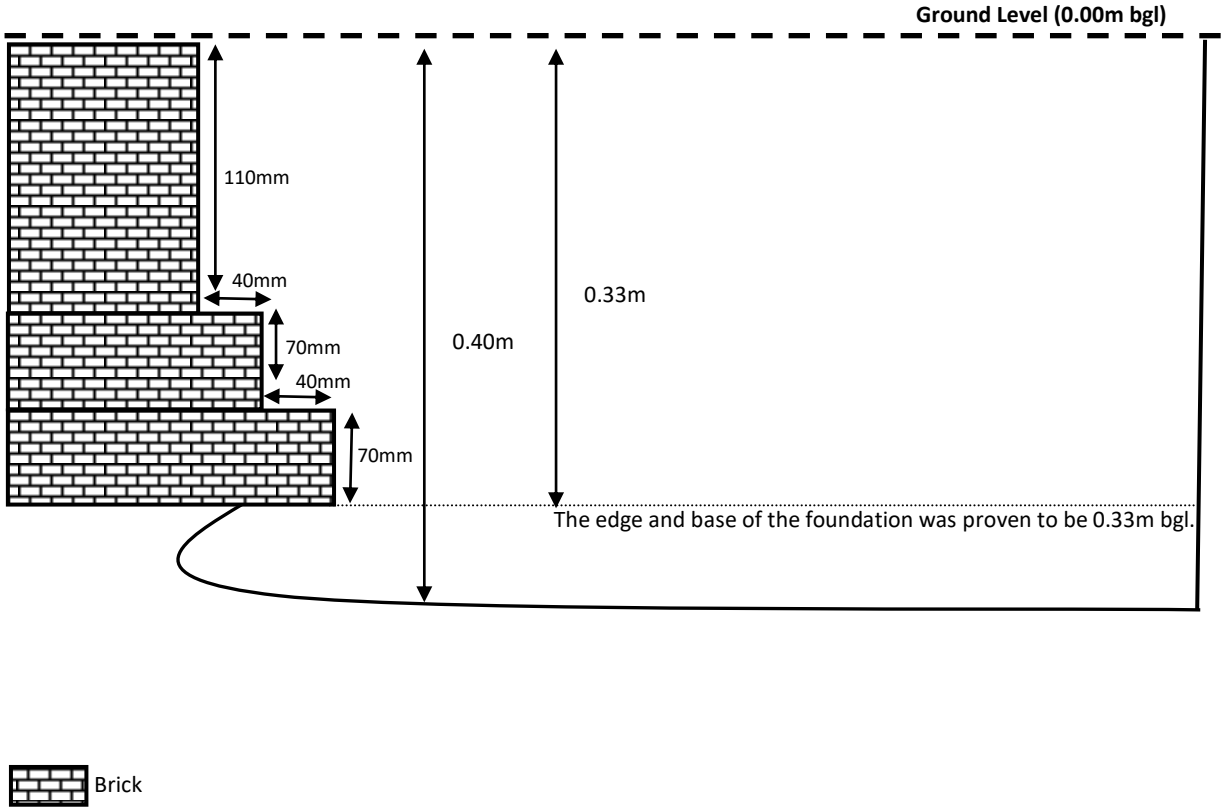
MADE GROUND (0.30 – 0.80m bgl): Dark brown sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded fine to medium flint (90%), brick (5%) concrete (5%) with frequent rootlets. Roots live micro scaled <5mm.

WEATHERED LONDON CLAY FORMATION: (0.80 – 1.20m bgl) Dark brown mottled bluish grey CLAY with frequent rootlets. Roots live micro scaled <5mm.

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR		**Figure 3**
Client: Ground and Project Consultants Ltd	**Date:** September 2020	ground&water
Trial Pit Foundation Exposure: TP/FE2	**Ref:** GWPR3834	

Foundation Exposure – Wall A



MADE GROUND (GL – 0.05m bgl): CONCRETE PAVERS

MADE GROUND (0.05 – 0.10m bgl): SHARP SAND
Membrane

MADE GROUND (0.10 – 0.20m bgl): Dark reddish brown sandy gravel with occasional clay lenses. Sand is fine to coarse-grained Gravel is frequent angular to subrounded fine to medium brick (60%) and concrete (40%).

WEATHERED LONDON CLAY FORMATION: (0.20 – 0.40m bgl) Dark brown mottled grey silty CLAY with occasional sand lenses.

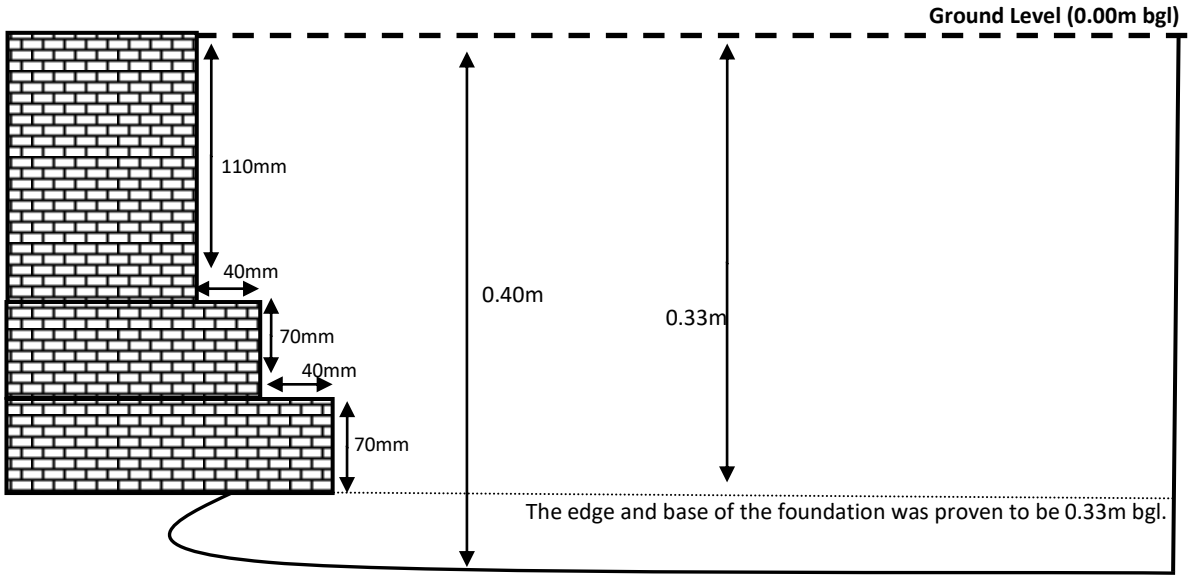
NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR	
Client: Ground and Project Consultants Ltd	**Date:** September 2020
Trial Pit Foundation Exposure: TP/FE4	**Ref:** GWPR3834

Figure 4

ground&water

Foundation Exposure – Wall B



MADE GROUND (GL – 0.05m bgl): CONCRETE PAVERS

MADE GROUND (0.05 – 0.10m bgl): SHARP SAND
Membrane

MADE GROUND (0.10 – 0.20m bgl): Dark reddish brown sandy gravel with occasional clay lenses. Sand is fine to coarse-grained Gravel is frequent angular to subrounded fine to medium brick (60%) and concrete (40%).

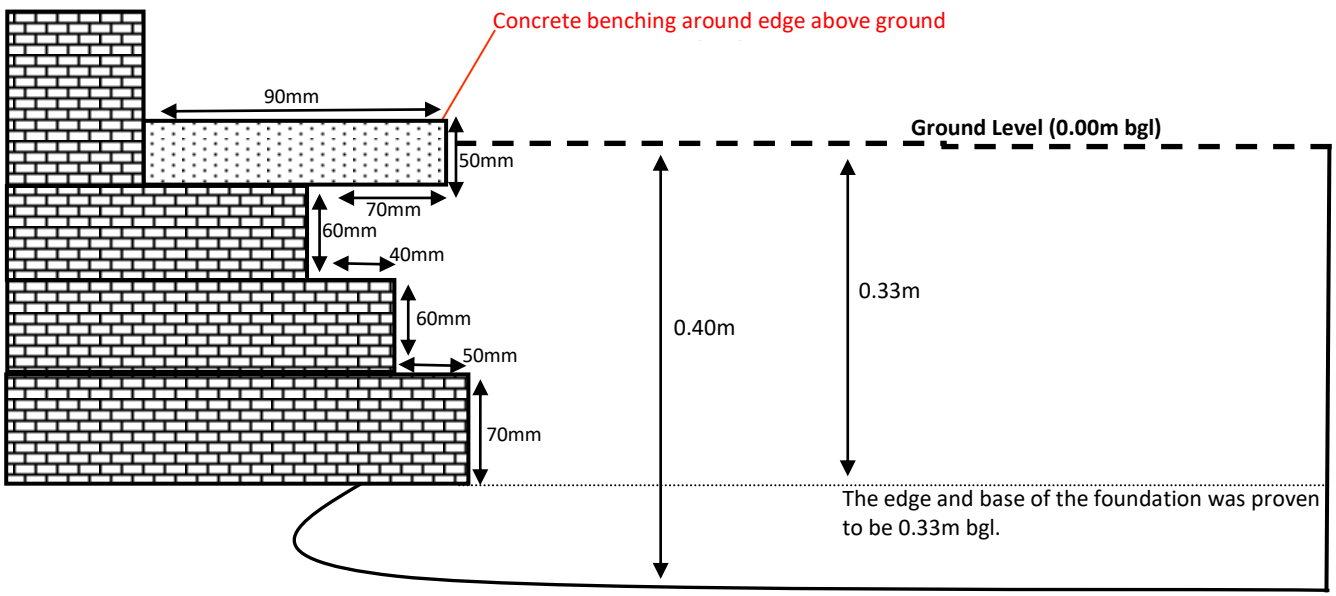
WEATHERED LONDON CLAY FORMATION: (0.20 – 0.40m bgl) Dark brown mottled grey silty CLAY with occasional sand lenses.

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR	**Figure 4**
Client: Ground and Project Consultants Ltd	**Date:** September 2020
Trial Pit Foundation Exposure: TP/FE4	**Ref:** GWPR3834

ground&water

Foundation Exposure – Wall A



MADE GROUND (GL – 0.05m bgl): CONCRETE PAVERS

MADE GROUND (0.05 – 0.10m bgl): SHARP SAND
Membrane

WEATHERED LONDON CLAY FORMATION: (0.10 – 0.40m bgl) Dark greyish brown to brown sandy CLAY. Sand is fine to medium-grained.

Concrete

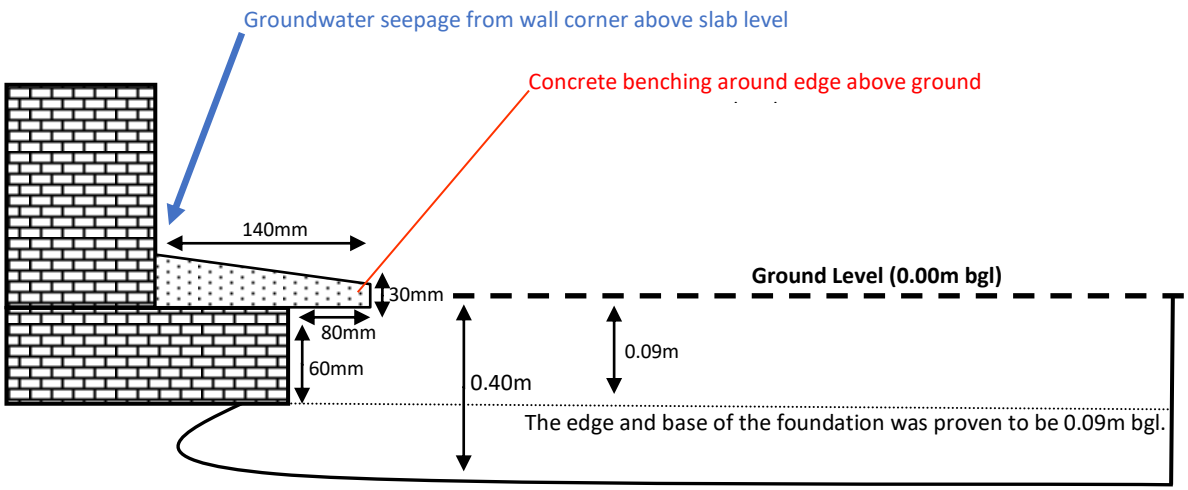
Brick

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR	**Figure 5**
Client: Ground and Project Consultants Ltd	**Date:** September 2020
Trial Pit Foundation Exposure: TP/FE5	**Ref:** GWPR3834

ground&water

Foundation Exposure – Wall B



MADE GROUND (GL – 0.05m bgl): CONCRETE PAVERS

MADE GROUND (0.05 – 0.10m bgl): SHARP SAND
Membrane

WEATHERED LONDON CLAY FORMATION: (0.10 – 0.40m bgl) Dark greyish brown to brown sandy CLAY. Sand is fine to medium-grained.

Concrete

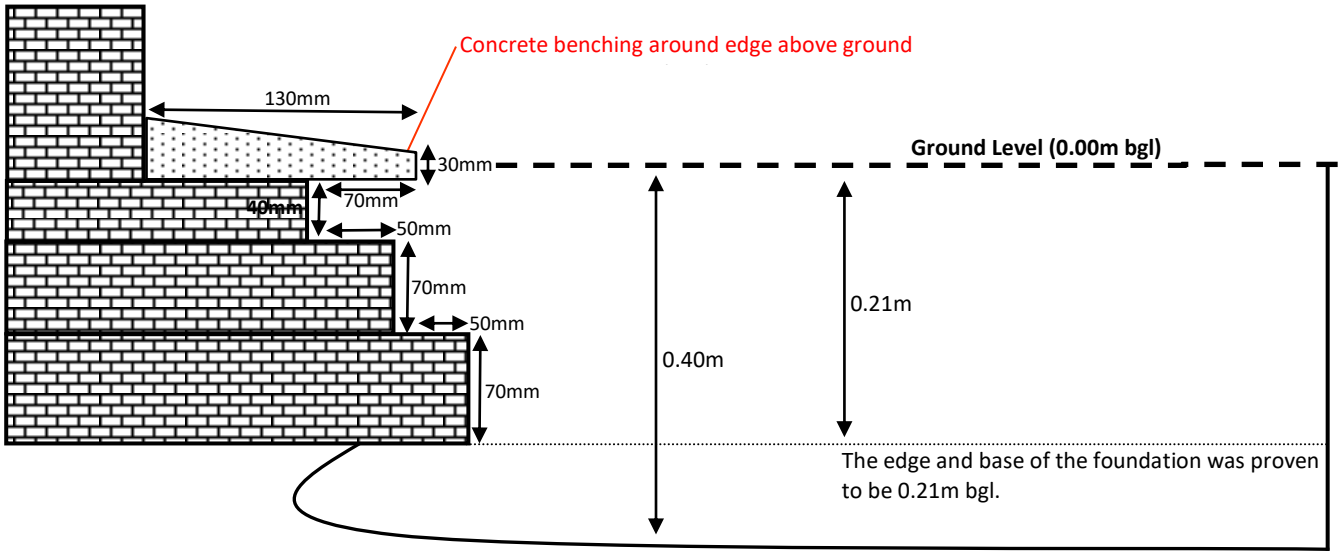
Brick

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR	**Figure 5**
Client: Ground and Project Consultants Ltd	**Date:** September 2020
Trial Pit Foundation Exposure: TP/FE5	**Ref:** GWPR3834

ground&water

Foundation Exposure – Wall A



MADE GROUND (GL – 0.05m bgl): CONCRETE PAVERS

MADE GROUND (0.05 – 0.10m bgl): SHARP SAND
Membrane Layer

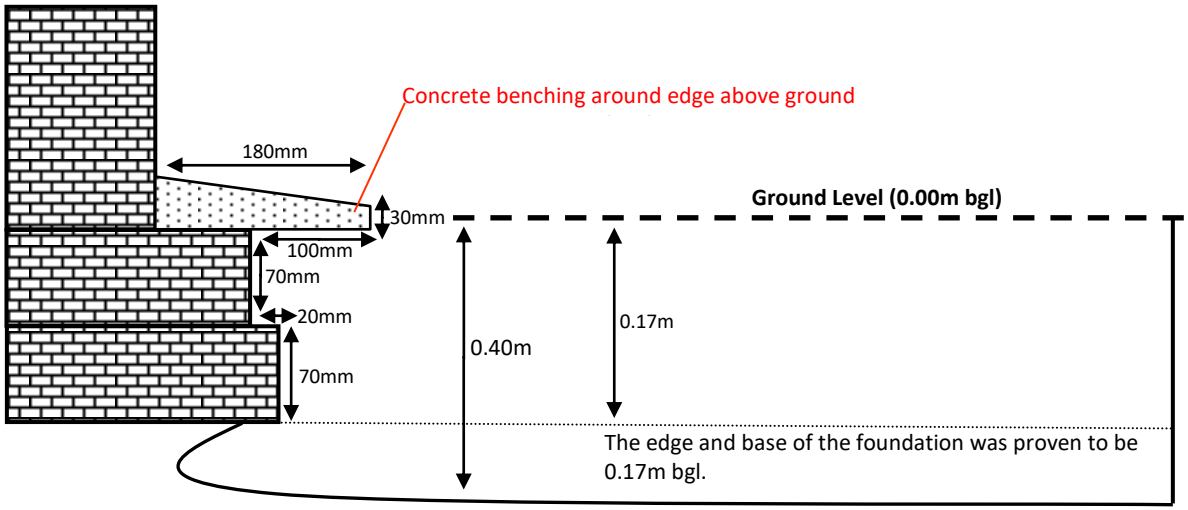
WEATHERED LONDON CLAY FORMATION: (0.10 – 0.40m bgl) Light orangish brown sandy CLAY. Sand is fine to medium-grained.

Concrete
Brick

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR		**Figure 6**
Client: Ground and Project Consultants Ltd	**Date:** September 2020	ground&water
Trial Pit Foundation Exposure: TP/FE6	**Ref:** GWPR3834	

Foundation Exposure – Wall B



Concrete

Brick

MADE GROUND (GL – 0.05m bgl): CONCRETE PAVERS

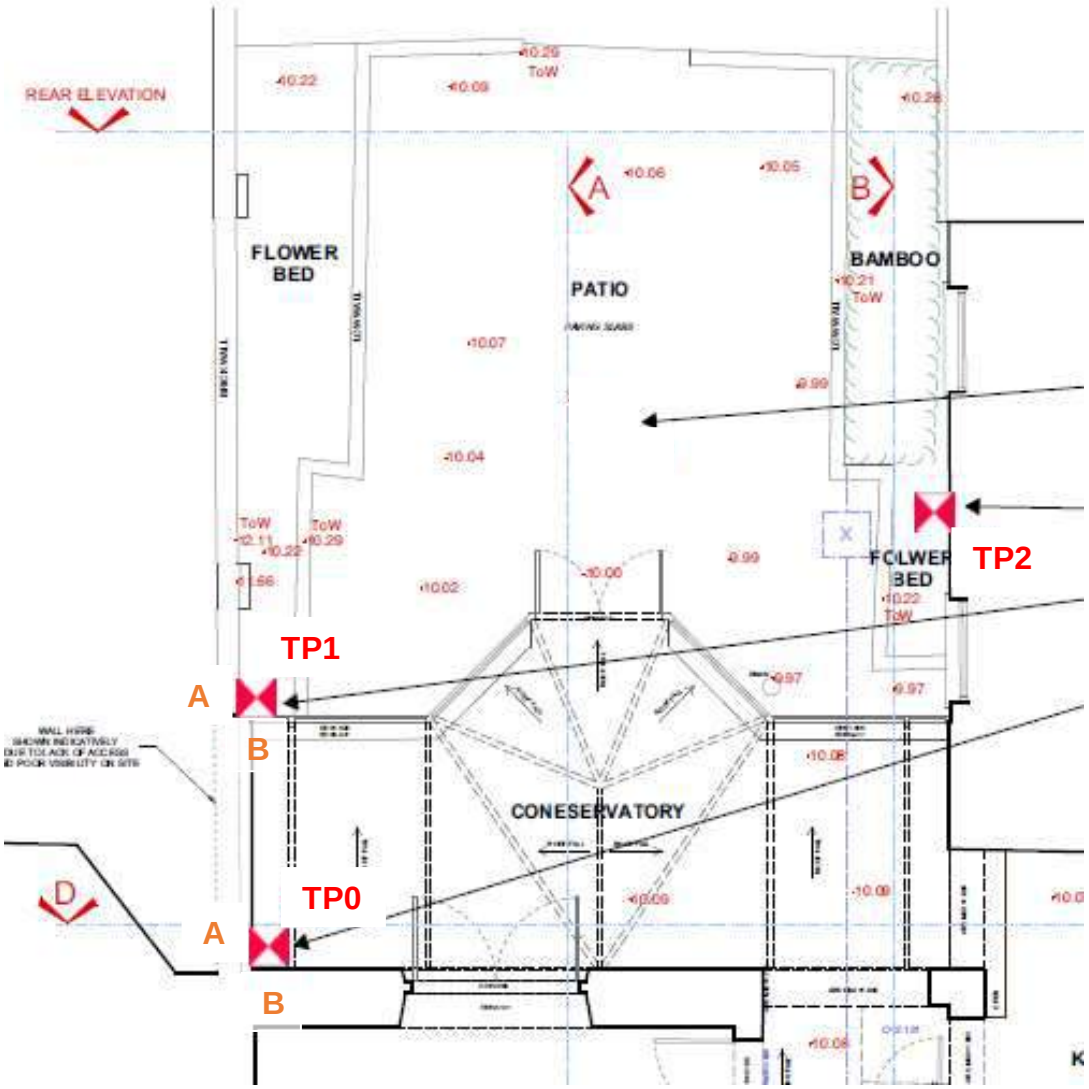
MADE GROUND (0.05 – 0.10m bgl): SHARP SAND
Membrane Layer

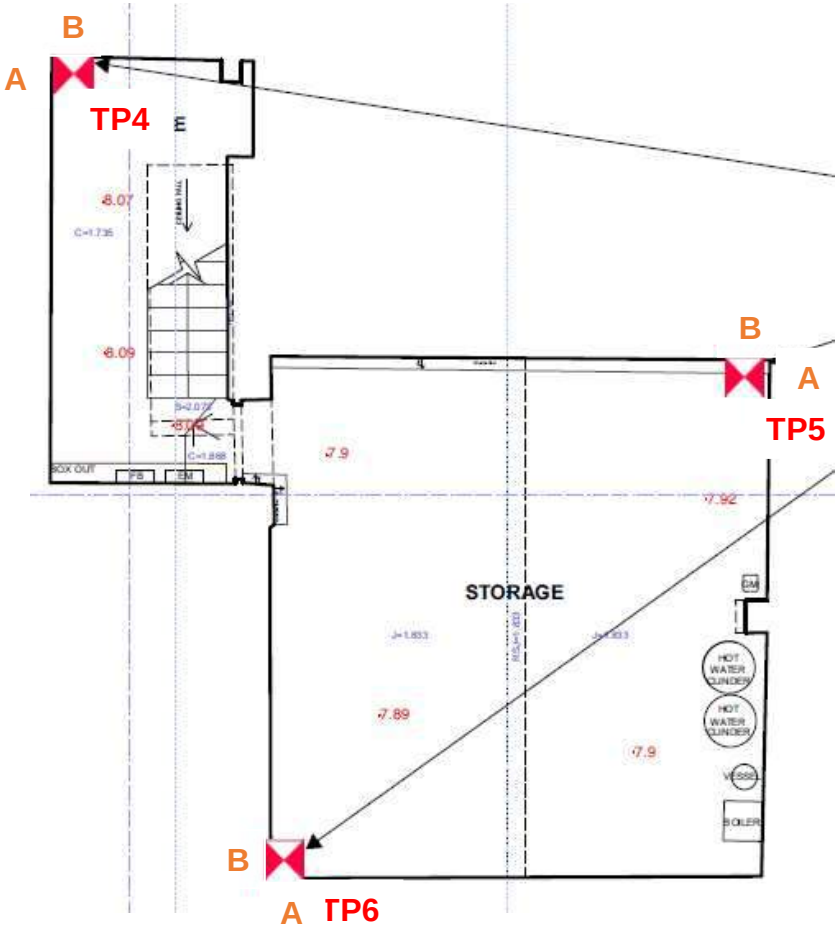
WEATHERED LONDON CLAY FORMATION: (0.10 – 0.40m bgl) Light orangish brown sandy CLAY. Sand is fine to medium-grained.

NOT TO SCALE

Project: 11 Highgate West Hill, Highgate, London N6 6JR	**Figure 6**
Client: Ground and Project Consultants Ltd	**Date:** September 2020
Trial Pit Foundation Exposure: TP/FE6	**Ref:** GWPR3834

ground&water





Not to Scale

Project: 11 Highgate West Hill, Highgate, London N6 6JR		**Figure 7**
Client: Ground and Project Consultants Ltd	**Date:** September 2020	ground&water
Trial Hole Location Plan	**Ref:** GWPR3834	

Not to Scale

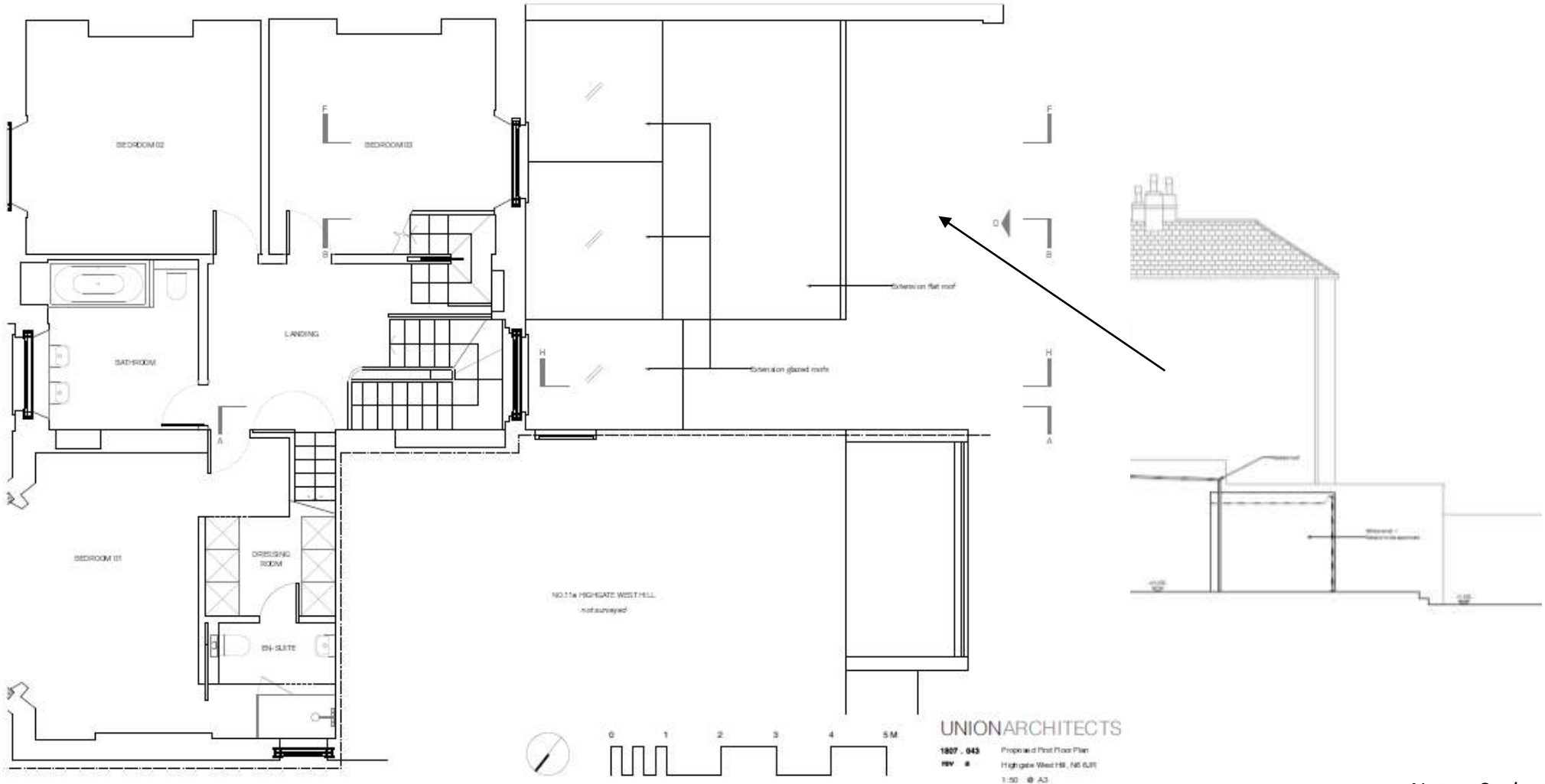
Project: **11 Highgate West Hill, Highgate, London N6 6JR**		**Figure 1**
Client: **Ground and Project Consultants Limited**	**Date:** **October 2020**	
Site Location Plan	**Ref:** **GWPR3834**	

Not to Scale

Project: **11 Highgate West Hill, Highgate, London N6 6JR**		**Figure 2**
Client: **Ground and Project Consultants Limited**	**Date:** **October 2020**	
Site Location Plan	**Ref:** **GWPR3834**	

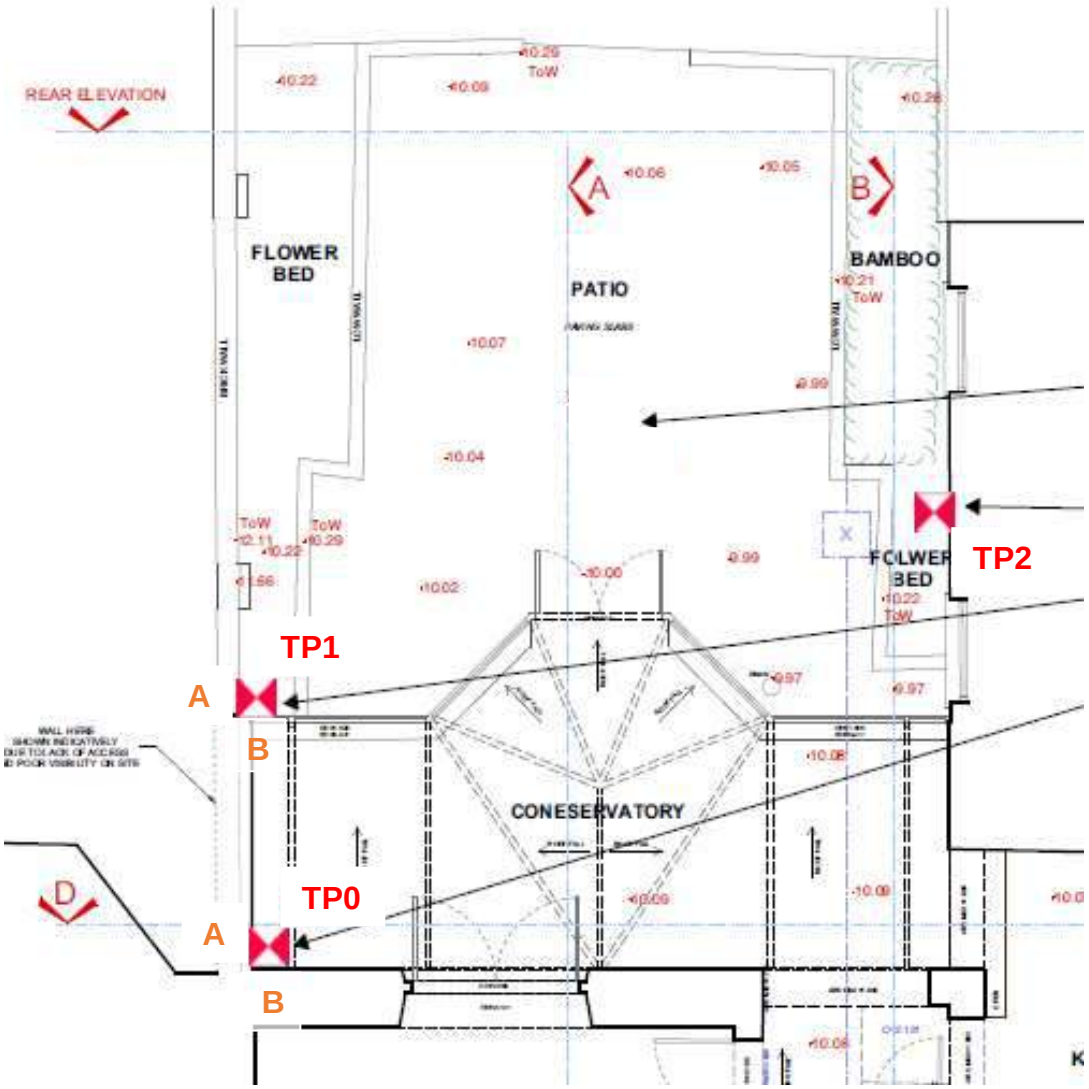
Not to Scale

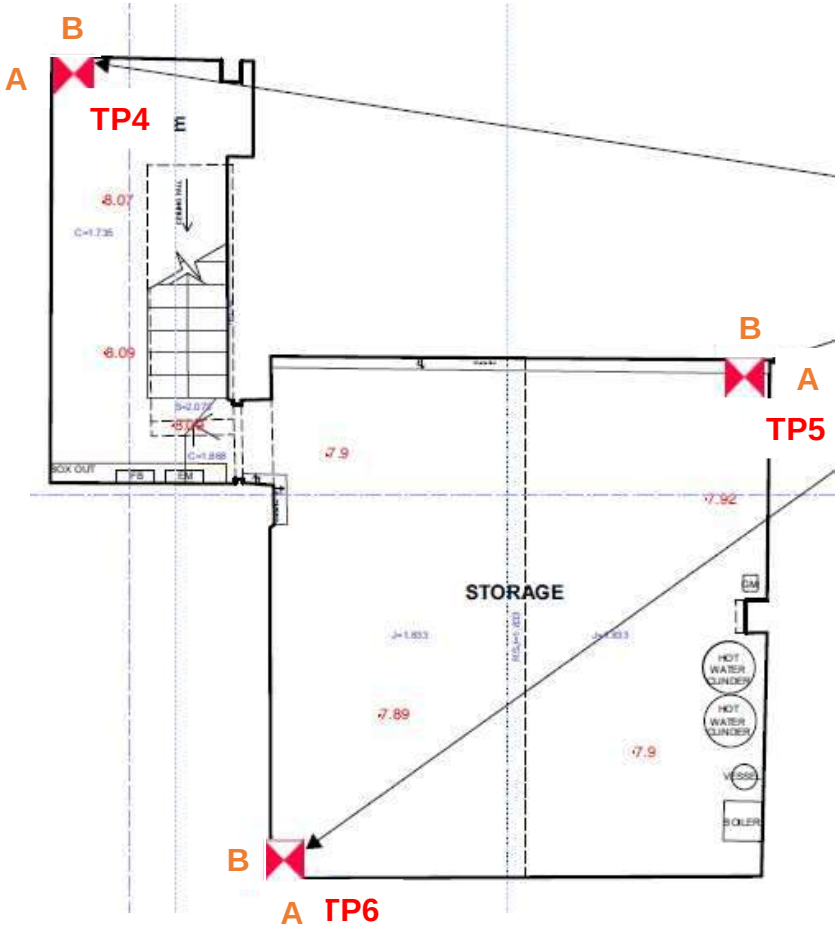
Project: **11 Highgate West Hill, Highgate, London N6 6JR**		**Figure 3**
Client: **Ground and Project Consultants Limited**	**Date:** **October 2020**	
Site Location Plan	**Ref:** **GWPR3834**	



Not to Scale

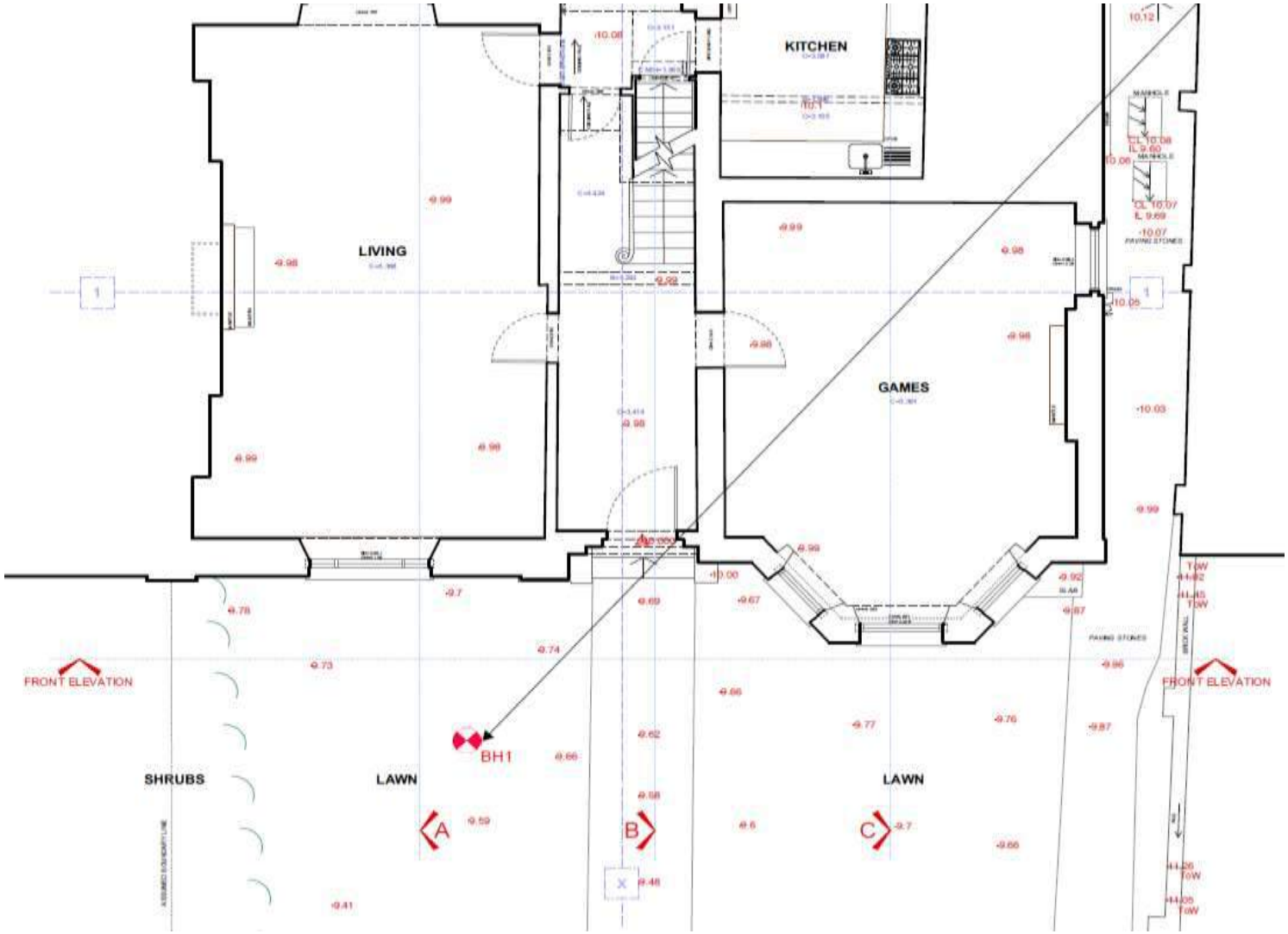
Project: **11 Highgate West Hill, Highgate, London N6 6JR**		**Figure 4**
Client: **Ground and Project Consultants Limited**	**Date:** **October 2020**	
Site Location Plan	**Ref:** **GWPR3834**	





Not to Scale

Project: 11 Highgate West Hill, Highgate, London N6 6JR		**Figure 5**
Client: Ground and Project Consultants Ltd	**Date:** October 2020	
Trial Hole Location Plan	**Ref:** GWPR3834	



Not to Scale

Project: **11 Highgate West Hill, Highgate, London N6 6JR**		**Figure 5**
Client: **Ground and Project Consultants Ltd**	**Date:** **October 2020**	
Trial Hole Location Plan	**Ref:** **GWPR3834**	