



Clever Clowns Nursery, Wythenshawe

Phase 1 Geo-Environmental Investigation

For: Stockport Development Ltd & Wythenshawe Community Housing Group

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REVISIONS

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1.0 INTRODUCTION

This Phase 1 Geo-Environmental Investigation report has been prepared by IGE Consulting Ltd on behalf of Eden Planning c/o Stockport Developments Limited & Wythenshawe Community Housing Group. It supports a full planning application submitted to Manchester City Council which seeks permission for:

“Demolition of the existing building, and the erection of a three-storey apartment block comprising 20 apartments, together with access, parking, landscaping, drainage, and all other associated works”.

This report should be read in conjunction with the wider planning submission.

Instructions to proceed were received in October 2023. Phase 1 desk study work was undertaken in October and November 2023.

1.1 Site Location and Description

The site is located to the north of Greenbrow Road within the suburb of Wythenshawe, located to south of Manchester City Centre. The site comprises the former Clever Clowns Day Nursery which ceased operating in December 2022. The site therefore lies vacant.

The existing building is two storeys with a pitched roof. It is constructed out of a red brick with a grey tiled roof. The building is in the centre of the site, with two existing access points and associated car parking areas located on either side. The rear of the site comprises an area of astroturf, previously used by the Nursery for outdoor play space.

An aerial photo of the site is included below:



Figure 1: Aerial image of the site dated April 2019.

A Site Location Plan is contained in Appendix 2.

Proposed Development

This Phase 1 Geo-Environmental Investigation is to be used for submission to the Local Authority as part of a planning application. It is the Client's intention to develop the site into a three-storey apartment block comprising 20 No. apartments with associated soft landscaping, car park and access road.

A proposed development plan is contained in Appendix 2. Extracts of the proposed development are included below.



Figure 2: An extract of the proposed development plan, taken from D2 Architects, PL03 6380 Rev F: Proposed Site Plan, dated 16.12.2021.



Figure 3: An extract of the proposed development plan, taken from D2 Architects, PL09 6380 Rev D: Proposed Site Plan, dated 23.09.2023.



Figure 4: An extract of the proposed development plan, taken from D2 Architects PL01 Rev I: Proposed Site Plan, dated 29.01.2018.

1.2 Brief

The brief was to carry out a Phase 1 Geo-Environmental Investigation for the site based upon the proposed development outlined in Section 1.0. The site area is shown on the Site Location Plan contained in Appendix 2.

The investigation was to include the following:

- a) Assess the probable ground conditions and contaminated land conditions on and below the site based on existing and historical site uses and relevant off-site activities, this is to include a site walkover.
- b) Identify probable contaminants / sources of contamination that may be present at the site using current contaminated land guidance and develop a conceptual site model for potential human health, ground gas and controlled waters receptors.
- c) Undertake a Preliminary Risk Assessment – which will determine the requirement for further environmental (contaminated land) investigation and assessment.
- d) Design, on the basis of the anticipated ground conditions, appropriate ground investigation works and discuss potential development issues (i.e. sub-surface features – obstructions, infilling, compressible ground, faulting, mineral extraction, mining and land instability).

A summary of the information / data sources is detailed in Section 2.2. A report was to be provided to summarise findings and to provide recommendations.

The limitations of this investigation work and report are included in Appendix 1.

1.3 Third Parties

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2.0 SCOPE OF INVESTIGATION WORKS

2.1 Walkover Survey

The site was visited on 8th November 2023 in overcast weather conditions and the objectives of the site walkover were, where applicable:

- to identify and assess visual and olfactory evidence of contamination (e.g. staining of concrete / soils, odours, presence of gas protection measures etc.);
- to identify locations of potential sources of contamination and assess their conditions (i.e. tank location, presence / condition of secondary containment / bunds, location of fill points, process areas);
- to identify surrounding land uses and any potentially contaminating activities;
- to identify / verify the presence of potential receptors (on- and off-site) which may be affected by identified sources;
- to obtain information on activities / procedures and standards of housekeeping etc.;
- to assess site access and potential investigation locations and constraints; and
- to assess any visual subsurface geotechnical features / anomalies (e.g. foundations, Made Ground, subsidence etc.).

Photographs were taken of the site during the walkover survey and these, together with a plan indicating their location and direction, are contained in Appendix 3.

2.2 Documentation

A combined Enviro + Geo Insight report (Ref.: GS-1Z7-SFO-D4Q-TLB, dated October 2023) was obtained from Groundsure, an environmental database company, which provides a list of recorded past and present activities at or adjacent to the site which could have an impact on the levels of contamination in the soils and groundwater at the site. As part of the desk study works, the below documents were obtained and examined. Unless otherwise stated, the documents are contained within the Groundsure Enviro + Geo Insight Report in Appendix 5:

a) Groundsure maps, all dated 2023 as follows:

- Historical Land Use map;
- Environmental Permits, Incidents and Registers map;
- Landfill and other Waste Sites map;
- Current Land Use map;
- Hydrogeology and Hydrology maps;
- Environment Agency / Natural Resources Wales flood maps;
- Designated Environmentally Sensitive Sites map;
- Geological maps and Ground Working map;
- Mining, Extraction & Natural Cavities map;
- Natural Ground Subsidence maps;
- Borehole Records map; and
- Railways and Tunnels map.

b) Aerial photographs of the site dated April 2019, April 2016, June 2009, May 2005 and June 2000.

c) Historical Ordnance Survey maps dated between 1876 and 2023, at scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

d) The following sources were obtained and examined from the British Geological survey. All items were copied under licence; [C18/01] British Geological Survey ©UKRI. All rights reserved:

- The British Geological Survey (BGS) 1:63,360 drift geological map (Sheet ref 98 dated 1971).
- The British Geological Survey (BGS) 1:50,000 solid geological map (Sheet ref 98 dated 1977).
- The BGS Borehole Logs (Ref: SJ88NW13, SJ88NW884-885, SJ88NW893-901), contained in Appendix 6.

e) A Zetica UXO Risk Map was obtained and is included in Appendix 7.

3.0 FINDINGS

3.1 Walkover Survey

The walkover survey was carried out on 8th November 2023 during sunny weather conditions. During the walkover survey the following features were noted.

The site currently comprises vacant land with the former Clever Clowns nursery building in the central site section and former play areas in the northern site section. Although the walkover did not include the internal building areas, it is known through communication with the site manager that a basement is present.



Figure 5: The former Clever Clowns Nursery as seen from the southern site section, looking north (left) and from the northern site section comprising former play areas, looking south-west (right).

The topography is noted to gently slope towards the north. The slope is the most prominent in the car park areas. A level difference of c. 0.50m was noted along the northern site boundary, with the former nursery being slightly more elevated than the site-adjacent gardens of the neighbouring residential properties.



Figure 6: Sloping topography in the western site section (left) and along the northern boundary (right).

Overhead BT / electric cables were noted along the southern site boundary. Numerous manholes were recorded on site. A metal cover was noted on the ground in the southern site section by the building, known from anecdotal evidence to have been used as beer storage when the site was utilised as a public house. An off-site electricity substation was noted in the eastern site section.



Figure 7: The overhead BT / electric cables connecting to site in the southern section (left) and manholes in the western site section – car park (right).



Figure 8: An off-site electricity substation adjacent to the eastern site boundary (left) and a metal cover of historical beer storage when the site was utilised as a public house (right).

Established trees were noted along the southern site boundary and in the south-western site corner forming part of ornamental landscaping.

Contamination

No evidence of contamination (i.e. spillages or leakages) or contaminative sources were identified. Evidence for suspected fly tipping was noted across site, notably in

the southern site section and along the fence in the eastern and western site sections. Rubbish and discarded items and toys were also recorded in the northern site section, in the former play areas.



Figure 9: Discarded plastic containers, disused items and wood in the northern site section (left) and potential fly tipping recorded in the southern site section by the southern boundary (right).

3.2 Site History

The site development history has been researched by reference to historical maps, street plans and aerial photographs. The historical maps are included in Appendix 4 to this report and the principal observations, which are divided into on-site history and off-site history, are summarised below:

On-Site History

Date	Site Feature
1876 – 1898	On the earliest historical maps, the site is recorded as residential land. A residential dwelling is recorded in the southern site section, the central part of the site includes part of an orchard. There are numerous trees within the boundaries and surrounding the site. The site is located to the north of Oldwood Lane.
1898 – 1910	By the end of the 19 th century, small differences are recorded with regard to the on-site building, however the building remains in place. The entire site is now part of a large orchard, which extends beyond site boundaries.
1910 – 1954	The on-site orchard is significantly reduced, with the eastern site section now disused and no longer being part of the orchard. By 1954 the orchard is no longer recorded. No other significant changes recorded.
1954 – 1973	The site is now an open field with no distinct features recorded within the boundaries. The site is surrounded by a residential development.
1973 – 2011	In the early 1970s, the Eagle pub is constructed on-site.
2011 - 2023	In the early 2010s the Clever Clowns Nursery is now based in the former Eagle pub building. The nursery was active until winter 2022, when it closed permanently. The site remained unchanged since.



Figure 10: Extracts of the OS historical maps dated 1876 (top left), 1910 (top right), 1964 (bottom left) and 1995 (bottom right).

Off-Site History

Given the agricultural and residential nature of the surrounding area, no significant contaminative sources have been identified within 250m of the site. Numerous small reservoirs and ponds were recorded between 1899 and 2023, as well as an unidentified heap located within 250m south of the site, recorded from 1977, suspected to be related to the construction of the M56 motorway, which is located c. 300m south-east of the site. Hospitals, schools, farms and allotment gardens existed c. 500m to 750m from the site.

3.3 Geology

3.3.1 BGS Geological Map

The BGS 1:63,360 drift and 1:50,000 solid Geological Maps of the area (Sheet No: 98, dated 1971 and 1977, respectively) indicate that the site is underlain by superficial deposits comprising **Glacial Till** which typically comprises a heterogenous mixture of clays, sands and gravels. The superficial deposits are underlain by bedrock of the **Bollin Mudstone Member** comprising laminated reddish-brown and greenish-grey mudstone with siltstones. The Bollin Mudstone Member is part of the wider Mercia Mudstone Group.

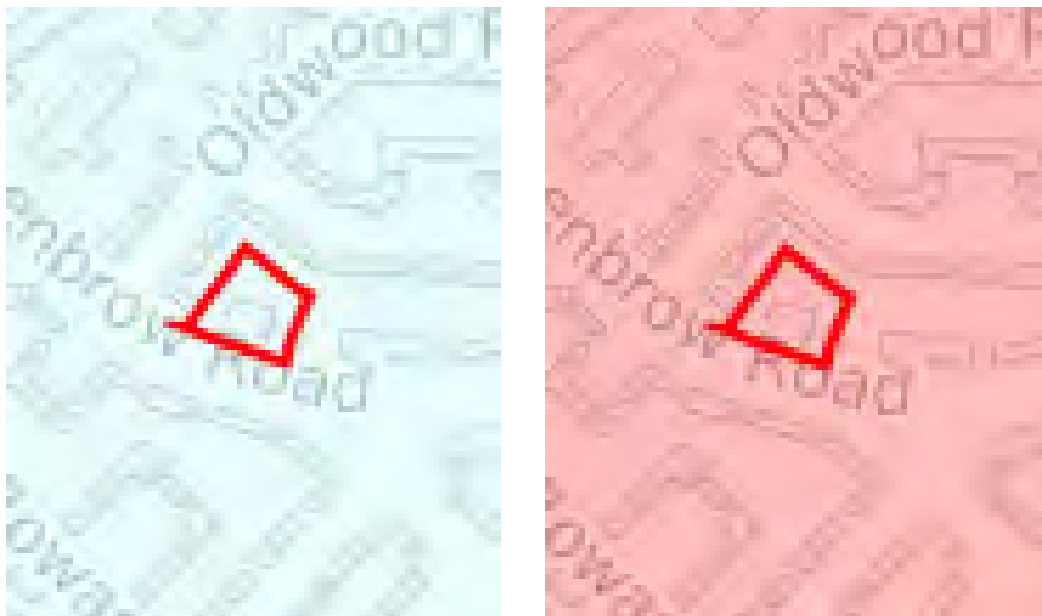


Figure 11: Extracts of the BGS 1:10,000, drift (left) and solid (right) geological maps. Light blue = Glacial Till, Red = Bollin Mudstone Member.

The nearest bedrock fault is recorded within 631m to the south-west of the site, downthrowing to the south-west. Based on the dip direction recorded on the map and the younging direction, the bedrock is anticipated to be dipping to the south-west. No bedrock dip angles are recorded, however, based on the dip angles recorded in the area, the strata are anticipated to be gently inclined.

3.3.2 BGS Borehole Logs

There were no available BGS boreholes on site. There were 12 No. BGS boreholes available in close proximity to the site within a comparable geological setting. The pertinent information from the borehole logs is outlined below:

BGS Borehole Reference: SJ88NW13, SJ88NW884 and 885, SJ88NW893 to 901

These boreholes are located between approximately 300m south-east and 700m north-east of the site and were excavated to depths of between 4.50m and 24.80m bgl between May and June 1991. The date of borehole SJ88NW13 is unknown. The logs recorded the following pertinent information:

- **Topsoil** comprising brown, sandy, clayey silt, brown, fine, sandy clay to depths of between 0.15m and 0.80m bgl, underlain by:
- **Made Ground** comprising firm to stiff, grey, mottled yellow, black and brown, silty clay and soft to firm, grey, mottled yellow, silty clay with much organic material and rootlets to depths of between 1.00m and 1.85m bgl, underlain by:
- (in places) **Glacial Till** comprising firm to stiff, reddish brown, mottled orangish brown and pale green, silty to very silty clay and medium dense to dense, greyish brown, mottled yellow, friable, clayey silt and medium dense, yellowish brown, clayey, silty, fine to medium sand to depths of between 1.50m and 4.60m bgl, underlain by:
- **Bollin Mudstone Member** comprising dense, friable, grey, clayey silt, very stiff to hard, reddish brown, friable, silty clay, firm to stiff, bluish grey, mottled yellow and brown, silty clay, brown and brownish grey and interlaminated, siltstone, sandstone and silty mudstone to a depth of at least 24.80m bgl.

3.3.3 BGS Geohazards

Data Type	Details
Ground Stability Data	<ul style="list-style-type: none"> ➤ The Potential for Shrinking or Swelling Clay Ground Stability Hazards is regarded as very low. ➤ The Potential for Running Sand Ground Stability Hazards is regarded as very low. ➤ The Potential for Compressible Ground Stability Hazards is regarded as negligible. ➤ The Potential for Collapsible Ground Stability Hazards is regarded as very low. ➤ The Potential for Landslide Ground Stability Hazards is regarded as very low. ➤ The Potential for Dissolution Ground Stability Hazards is regarded as negligible.

3.3.4 BGS Estimated Soil Chemistry

The BGS have estimated that the superficial deposits across the site to naturally comprise the following determinands:

- Arsenic – 15mg/kg
- Cadmium – 1.8mg/kg
- Chromium – 60mg/kg – 90mg/kg
- Nickel – 15mg/kg
- Lead – 100mg/kg
- Bioaccessible Lead – 60mg/kg

3.4 Mining

3.4.1 Coal Mining

The site does not lie within a Coal Authority Coal Mining Reporting Area. There are no coal outcrops, mine entries, recorded or probable shallow or underground workings or Development High Risk Areas on-site and in the vicinity. The site does not lie within the Cheshire Brine Subsidence Compensation Board Compensation District or a Consultation Area.

3.4.2 Non-Coal Mining

The Groundsure Enviro + Geo Insight report indicates that no non-coal mining has been undertaken on-site or within 1000m of the site. There were no BritPits, underground workings, underground mining extents, Historical Mineral Planning Areas, JPB mining areas or The Coal Authority non-coal mining records within 500m of the site.

3.4.3 Historical Surface Excavations

No historical surface excavations are recorded on-site on the historical maps. The BGS record 6 No. surface ground workings within 250m, including unspecified heaps and cuttings, anticipated to be related to the construction of the M56 motorway in the vicinity of the site. The below extract illustrates the extent of the recorded surface excavations in relation to the site (highlighted in red).



Figure 12: An extract of Map 18: Mining and ground workings, included in the Groundsure Enviro + Geo Insight report (ref: GS-1Z7-SFO-D4Q-TLB, dated 20.10.2023, page 80.

Consequently, based on the above evidence, the presence of unrecorded historical excavations on-site cannot be discounted.

3.4.4 Mineral Safeguarding

Where mineral resources are present the mineral planning authority may designate areas as Mineral Safeguarding Areas (MSA) and Mineral Consultation Areas (MCA). These are aimed to safeguard mineral resource areas from unnecessary sterilization by non-mineral development. The BGS Mineral Resources maps designate the areas of potential mineral resources and where active / lapsed planning permission was granted for mineral extraction.

The BGS Mineral Resources Map for Greater Manchester indicates that the site does not lie within an area designated as containing mineral resources.

The Manchester City Council Mineral Safeguarding Areas map indicates that the site does not lie within an area designated as a Mineral Safeguarding Area.

The BGS Mineral Resources Map for Greater Manchester and the Manchester City Council Mineral Safeguarding Areas map are included within Appendix 6.

3.5 Hydrology and Hydrogeology

Environmental data relevant to the site and its immediately surrounding area has been obtained from sources available in the public domain. In addition, an environmental report was obtained from Groundsure. The Enviro + Geo Insight report and associated maps that have been inspected are presented in Appendix 5 and the principal observations in relation to waters and flooding can be summarised as follows:

Data Type	Details
Flooding	<ul style="list-style-type: none"> ➤ With respect to rivers and seas, the site lies within Flood Zone 1. ➤ The risk of flooding with respect to surface water is regarded to be negligible. ➤ The risk of flooding with respect to groundwater is regarded to be low. ➤ There are 2 No. groundwater vulnerability zones recorded on-site, pertaining to a secondary superficial aquifer and a productive secondary bedrock aquifer. The vulnerability has been assessed as low to medium. ➤ There are a further 2 No. groundwater vulnerability zones recorded within 50m of the site.
Surface Water Features	<ul style="list-style-type: none"> ➤ There are no surface water features recorded on-site. ➤ The nearest surface water feature is the Fairywell Brook located within 260m to the south-west of the site. Fairywell Brook is designated as a Water Framework Directive (WFD) water body. ➤ A WFD surface water catchment is recorded on-site, related to the Fairywell Brook.
Surface Water Abstractions	<ul style="list-style-type: none"> ➤ There are no licensed surface water abstractions located on-site. ➤ There are 5 No. licensed surface water abstractions located within 2000m of the site, all are historical. The nearest license is located 1768m south west and pertains to the abstraction of water from an underground storage tank fed by local surface drainage for direct spray irrigation.
Superficial Aquifer	<ul style="list-style-type: none"> ➤ The site is underlain by superficial deposits classified as a Secondary Undifferentiated Aquifer. ➤ A Water Framework Directive groundwater body was recorded on-site, pertaining to Weaver and Dane Quaternary Sand and Gravel Aquifers of poor quality.
Bedrock Aquifer	<ul style="list-style-type: none"> ➤ The underlying bedrock is classified as a Secondary B Aquifer - <i>Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.</i>
Groundwater Abstractions	<ul style="list-style-type: none"> ➤ There are no recorded groundwater abstraction licenses located on-site or within 2000m of the site.
Source Protection Zones	<ul style="list-style-type: none"> ➤ There are no recorded Source Protection Zones recorded on-site or within 500m of the site.
Nitrate Vulnerable Zones	<ul style="list-style-type: none"> ➤ There are no Nitrate Vulnerable Zones or sensitive areas recorded on-site or within 2000m of the site.
Licensed Discharge Consents	<ul style="list-style-type: none"> ➤ There are no recorded licensed discharge consents to controlled waters located on-site or within 500m of the site.
Pollution Incidents to Controlled Waters	<ul style="list-style-type: none"> ➤ There are no recorded pollution incidents to controlled waters located on-site or within 500m of the site.

3.6 Hazardous Installations, Landfill and Waste

The following information relating to hazardous installations, landfill and waste obtained from the Groundsure Enviro + Geo Insight report, published information and the walkover survey can be summarised as follows:

Data Type	Details
Environment Agency Recorded Active Landfill Sites	➤ There are no Environment Agency recorded landfill sites located on-site or within 500m of the site.
Environment Agency Recorded Historical Landfill Sites	➤ There are no Environment Agency recorded historical landfill sites located on-site or within 500m of the site.
BGS Recorded Historical Landfill Sites	➤ There are no BGS recorded landfill sites located on-site or within 500m of the site.
Local Authority Recorded Landfill Sites	➤ There are no Local Authority recorded landfill sites located on-site or within 500m of the site.
Local Authority Pollution Prevention and Control (Part A(2) and Part B Activities and Enforcements)	➤ There are no Local Authority Part A(2) or Part B Activities or Enforcements located on-site or within 500m of the site.
Registered Radioactive Substances	➤ There are no Registered Radioactive Substances recorded on-site or within 500m of the site.
Registered Waste Treatment, Transfer or Disposal Sites	<ul style="list-style-type: none"> ➤ There are no waste exemptions recorded on-site. ➤ There is a single waste exemption recorded within 159m to the east of the site pertaining to the use of waste in construction at a new housing site at Greenbrow Road, Wythenshawe.
Industrial Land Use	<ul style="list-style-type: none"> ➤ There are no current industrial land uses recorded on-site. ➤ There are 3 No. recent industrial uses recorded within 500m of the site, the nearest is located 3m south-east and pertains to an electricity substation. ➤ There are no historical industrial site uses recorded on-site. ➤ There are 17 No. historical industrial site uses recorded within 500m of the site including unspecified heaps, an unspecified mill, cuttings and an isolation hospital. ➤ A single historical electricity substation was recorded on site between 1974 and 1995. ➤ A further 4 No. electricity substations were recorded within 500m of the site between 1960 and 1995.
Dangerous Substances	➤ There are no recorded discharges of dangerous substances on-site or within 500m of the site.
Hazardous Building Materials	➤ Asbestos may be present across the site as the current on-site building was constructed prior to the 2000s.

3.7 Radon

A site-specific radon map is included in the Groundsure Enviro + Geo Insight report which finds that the site lies within an area where less than 1% of homes are above the Action Level and consequently, no radon protection measures are required.

3.8 Previous Site Investigations

No previous site investigation data was available for the site.

3.9 Services

Gas, electric, water mains and a drainage system were noted to be present on site. These services were noted to be live at the time of the walkover survey. Manholes and overhead BT comms lines were noted on site and adjacent. An electricity substation was recorded adjacent to the eastern site boundary. Full service plans should be obtained prior to any intrusive works.

3.10 Unexploded Ordnance (UXO)

The Zetica UXO risk map, contained in Appendix 7, indicates that the site lies within an area of moderate risk. A detailed UXO risk assessment may be necessary for this site and is recommended prior to any works commencing.

3.11 Animal Burial Sites

The Animal Health and Veterinary Laboratories Agency (AHVLA) no longer routinely respond to consultations relating to records of animal burial sites. Based upon a review of the site history it is considered unlikely that the site has been subject to recorded animal burials.

3.12 Archaeology

We do not anticipate that the site will be affected by archaeological issues, however consultation with the county archaeologist is recommended.

4.0 CONCLUSIONS

4.1 General

The site comprises vacant land with the building of the former Clever Clowns Day Nursery present in the central site section, as well as former play areas in the northern site section. Numerous services were identified on site and site-adjacent.

4.2 Ground Conditions

The anticipated typical ground conditions across the site are as follows:

- **Topsoil**, expected to be less than 1.00m in thickness, underlain by;
- **Made Ground** of unknown composition to c. 2.00m bgl, underlain by;
- (in places) **Glacial Till** likely comprising clay, silt and sand to depths of between c. 1.50m and c. 5.00m bgl, underlain by;
- **Bollin Mudstone Member** comprising interlaminated siltstone, sandstone and silty mudstone.

4.2.1 Geotechnical Hazard Identification

Potential geotechnical hazards based on the expected ground conditions that may require further consideration at the site are outlined below:

Factors	Remarks	Considerations	Hazard
Made Ground	Made Ground is anticipated to be found across the site and is expected to comprise variable deposits.	Made Ground may settle variably, have highly inconsistent bearing capacity and may suffer significant movements that may be problematic for foundations, externals and infrastructure elements without treatment. The presence of Made Ground may be problematic for foundations as there may be loose / soft spots within the Made Ground and it may not be suitable to utilise traditional foundations.	Low to Moderate
Aggressive Ground and Groundwater	While the risk posed from the natural strata is anticipated to be very low, given the potential presence of Made Ground there is potential for aggressive ground conditions to be present on-site. The Bollin Member, being part of the Mercia Mudstone Group may increase the possibility of acidic ground and groundwater conditions, should the foundation solution be constructed upon this stratum.	Acidic ground / groundwater and sulfate may attack the concrete and steel used in foundations and react with aggregates. The oxidation of pyrite and other sulfides can also occur due to geotechnical activities. This can lead to the generation of high concentrations of sulfate and low pH that attacks construction materials and may lead to the precipitation of gypsum resulting in the heave of foundations and floor slabs. Pyrite oxidation can also be triggered by mixing susceptible materials with lime or cement resulting in high pH that can lead to the expansion of some sulfates that cause heave of stabilised soils.	Moderate

Shrink and Swell Clays	Established trees are present along the site boundaries and along field boundaries. Moderate to high plasticity and low to moderate volume change potential Glacial Till deposits may present at shallow depth.	Some types of ground (e.g., clay soils) can change volume due to changes in moisture content that may be induced by weather variations (e.g., drought), vegetation (e.g., growth or removal of trees) or man-made activities (e.g., changes to local drainage). This shrink / swell behaviour typically causes ground movement to a depth of approx. 3m potentially damaging building foundations, externals, pipes or services by differential movements.	Low to Moderate
Soft Spots	Soft spots may be present across the site associated with localised excavations i.e., associated with the construction of the on-site building.	Soft spots may cause differential settlement of foundations therefore there will be a requirement for localised deepening of foundations where soft spots are present.	Low to Moderate
Ground Obstructions	Former building slabs and foundations may still be in place based on the historical site use as a pub and nursery buildings. A basement is known to be located below the former nursery building.	May act as obstructions to excavations and / or the chosen foundation solution or act as 'hard spots' within the ground if left in-situ.	Moderate

4.3 Sources of Contamination and Probable Contaminants

Based on the desk study information the following potentially contaminative on-site sources have been identified:

Potentially Contaminative Source	Associated Determinands	Remarks	Hazard
On-Site Made Ground	Unknown, anticipated to be metals, semi-metals, PAHs, TPH, asbestos. Ground Gas – carbon dioxide, methane, hydrogen sulfide, VOCs	Made Ground is anticipated to be present across the site. Its composition is unknown but given the historical uses of the site, the Made Ground is assessed to pose a contaminative hazard.	Moderate
On-Site Nursery Building and Car Park	Unknown, anticipated to be metals, semi-metals, PAHs, TPH, asbestos.	The site comprises a disused nursery building with playground areas and an associated car park. The site uses may have led to contamination or contaminative hotspots.	Low to Moderate
On-Site Historical Orchard	Herbicides and Pesticides	The site was part of an orchard from 1876 until 1910, however it is known that the site has not been used to grow crops in recent years.	Low
On-Site Historical Residential Buildings	Unknown, anticipated to be metals, semi-metals, PAHs, TPH and ammonia	A residential building has been recorded in the southern site section between 1876 and 1962, therefore possible contamination may be present on site.	Low

It should be noted that potentially contaminative unrecorded historical activities may have occurred (e.g. the use or deposition of Made Ground from off-site during historical on-site developments) and in this event, further contaminative sources may be present.

4.3.1 Unknowns

Following the desk study, the areas of uncertainty are summarised as follows:

- Depth to bedrock
- Depth and extent of the on-site Made Ground
- Presence of historical building obstructions and obstructions associated with the pub/nursery building and associated infrastructure.

4.4 **Pathways for Contamination**

4.4.1 Human Health

The pathways along which contamination could potentially reach the receptors on-site during use and after completion of development works are detailed in 'Updated Technical Background to the CLEA Model' (Environment Agency 2009) but can be summarised as follows:

End Users (Residential Land Use Scenario):

- Ingestion of soil directly and indoor dust*;
- Inhalation of soil dust (indoor and outdoor);
- Dermal contact with soil (indoor and outdoor);
- Inhalation of soil vapours (indoor and outdoor);
- Oral background; and
- Inhalation background.

** Treated as one pathway*

4.4.2 Controlled Waters

The pathways along which contamination could potentially reach the controlled waters receptors during use and after completion of development works are as follows:

- Vertical migration along future foundations and pooling at base / beneath foundations;
- Vertical migration through possible granular Made Ground and granular lenses in natural cohesive deposits;
- Lateral migration along low permeability natural deposits and pooling at relative low points;
- Negligible infiltration through low-permeability natural cohesive deposits;
- Migration through porous sandstone bedrock;
- Migration along groundwater flow; and
- Overland flow.

4.4.3 Ground Gas Pathways

The pathways along which ground gas could potentially reach the receptors on-site during use and after completion of the development works are as follows:

- Migration through fractures and fissures in bedrock;
- Preferential migration along foundations, service ducts / trenches;
- Migration within groundwater;
- Ingress through wall cavities and floors and accumulation; and
- Inhalation of ground gas and vapours.

4.5 **Receptors of Contamination**

Human Health receptors for these pathways include the following:

- End Users (residential land use scenario);
- Construction workers; and
- The general public and adjacent site users.

Controlled waters receptors for these pathways include the following:

- Groundwater contained within the underlying superficial Secondary Undifferentiated Aquifer and bedrock Secondary B Aquifer; and
- Surface Water – Off-site stream (Fairwell Brook, 260m south-west).

Other receptors for these pathways include the following:

- Subsurface plastic (e.g. potable plastic water pipe); and
- Building fabric (e.g. concrete foundations, etc).

4.6 Conceptual Model

Source	Pathway	Receptor	Hazard (severity)	Likelihood	Risk
On-Site Made Ground including the former Clever Clowns nursery building and car park, and historical residential buildings (1876 – 1938)	Ingestion of soil and dust (indoor and outdoor)	End-user General public	Effect on human health (Medium)	Low Likelihood: Made Ground is expected to be present across the site, however based on the site history it is unlikely to contain significant contamination. Furthermore, dermal, ingestion and inhalation pathways will be negated across the majority of the site due to the presence of hardstanding (buildings and roads). However, private gardens and areas of soft landscaping are at increased risk. The Made Ground is not anticipated to be organic or contain putrescible / organic rich inclusions based on the historical site use, therefore, the ground gas risk associated with the Made Ground is anticipated to be low.	Low to Moderate
	Dermal contact with contaminated soil (indoor and outdoor)				
	Inhalation of dust (indoor and outdoor), airborne fibres and soil vapours				
	Inhalation of ground gas	Construction workers	Effect on human health (Medium)	Low Likelihood, reduced to unlikely: Construction workers are at the highest risk due to acute interaction with soils, however, no significant contamination is anticipated. Additionally, appropriate PPE and health and safety measures are anticipated to significantly reduce the risk.	Low
	Migration through ground vertically into aquifer groundwater	Secondary B and Secondary Undifferentiated Aquifers	Effects to controlled waters (Mild)	Unlikely: Although potential contamination may be present, the contaminants of concern are likely to be of low mobility and solubility (metals and PAHs). Therefore, vertical migration is unlikely. Additionally, low permeability Glacial Till is expected to be present below site, which will reduce any vertical migration to the underlying aquifers. Additionally, following development hardstanding will be present across the majority of the site which will significantly reduce infiltration of water and vertical migration.	Very Low
On-Site Historical Orchard	Migration through ground laterally into surface water	Fairwell Brook	Effects to controlled waters (Mild)	Unlikely: No surface water features exist on site. Fairwell Brook is located within 260m to the south-west of the site, however it is located at a significant enough distance, where contamination through overland flow is considered unlikely. Therefore, the risk to surface water features is deemed very low.	Very Low
	Overland flow				
On-Site Historical Orchard	Ingestion of soil and dust (indoor and outdoor)	End-user General public	Effect on human health (Medium)	Unlikely: It is unknown whether the site was used for crops and if herbicides and pesticides were routinely used. Whilst it is possible that they have been used on-site historically, they are not likely to include the persistent organochloride pesticides such as Dieldrin, Aldrin, DDT etc. Pesticides and herbicides routinely used in the UK degrade in soils or leach via rainwater infiltration to groundwater.	Low
	Dermal contact with contaminated soil (indoor and outdoor)				
	Inhalation of dust (indoor and outdoor), airborne fibres and soil vapours	Construction workers	Effect on human health (Medium)	Unlikely: Construction workers are at the highest risk due to acute interaction with soils, however, no significant widespread contamination has been recorded. Additionally appropriate PPE and health and safety measures is anticipated to significantly reduce the risk.	Low

	Migration through ground vertically into aquifer groundwater	Secondary B and Secondary Undifferentiated Aquifers	Effects to controlled waters (Mild)	Unlikely: Although the use of herbicides and pesticides cannot be discounted, the migration of any contamination into the underlying aquifers is deemed unlikely given the expected presence of low permeability Glacial Till reducing the possibility of vertical migration to the aquifers.	Very Low
	Migration through ground laterally into surface water Overland flow	Fairywell Brook	Effects to controlled waters (Mild)	Unlikely: No surface water features exist on site. Fairywell Brook is located within 260m to the south-west of the site, however it is located at a significant enough distance, where contamination through overland flow is considered unlikely. Therefore, the risk to surface water features is deemed very low.	Very Low
Off-Site Current and Historical Industrial Site Uses	Ingestion of soil and dust (indoor and outdoor) Dermal contact with contaminated soil (indoor and outdoor) Inhalation of dust (indoor and outdoor), airborne fibres and soil vapours	End-user General public	Effect on human health (Medium)	Low Likelihood: Contamination from off-site sources may be present on-site, however it is unlikely given significant distances between the site and any potential contaminative activities. Dermal, ingestion and inhalation pathways will be negated across the majority of the site due to the presence of hardstanding (buildings and roads). However, private gardens and areas of soft landscaping are at increased risk. The Made Ground is not anticipated to be organic or contain putrescible / organic rich inclusions based on the historical site use, therefore, the ground gas risk associated with the Made Ground is anticipated to be low.	Low to Moderate
	Inhalation of ground gas	Construction workers	Effect on human health (Medium)	Low Likelihood: Construction workers are at the highest risk due to acute interaction with soils, however, any contamination is likely to be very localised and may not be significantly disturbed. Additionally appropriate PPE and health and safety measures is anticipated to significantly reduce the risk.	Low to Moderate
	Migration through ground vertically into aquifer groundwater	Secondary B and Secondary Undifferentiated Aquifers	Effects to controlled waters (Mild)	Unlikely: Vertical migration of any contamination into the underlying aquifers is deemed unlikely given the expected presence of low permeability Glacial Till reducing the possibility of vertical migration to the aquifers. Additionally, contaminants of concern are likely to be of low mobility and solubility (i.e. metals and PAHs).	Very Low
	Migration through ground laterally into surface water Overland flow	Fairywell Brook	Effects to controlled waters (Mild)	Unlikely: No surface water features exist on site. Fairywell Brook is located within 260m to the south-west of the site, however it is located at a significant enough distance, where contamination through overland flow is considered unlikely. Therefore, the risk to surface water features is deemed very low	Very Low
Off Site Infilled Ponds and Reservoirs (1876 – 1982, 100-250m E-W) and an unspecified Heap (1973-2023, 250m S))	Inhalation of ground gas	End-user	Effect on human health (Mild to Severe*)	Low Likelihood: Off-site potentially infilled reservoirs are present within close proximity to the site, based on historical mapping the most recent of the reservoirs was infilled in the early 1980s. Based on the BS8576 (2013) Figure 6 Decision Matrix tool the ground gas generation potential of the off-site infilled land is anticipated to be moderate to high. Consequently, the ground gas risk is deemed low to moderate as migration of ground gas into the proposed dwellings is possible through potentially present granular natural deposits.	Low to Moderate
		Building and Structures	Damage to building (Mild)		

*Due to the risk of explosion.

4.7 Preliminary Risk Assessment Summary

Human Health

Based on the human health conceptual model the risk to human health is deemed low to moderate to end users and construction workers. Although the risk to construction workers is increased due to their acute interaction with site soils, it is envisaged that with appropriate PPE and site management, risks to construction workers can be mitigated therefore the risk is reduced to low.

Ground Gas

Ground gas sources have been identified on-site and off-site in close proximity to the site. Based on the contaminative sources and feasible pathways identified on-site and the ground gas conceptual model, the ground gas risk is deemed low to moderate. It is recommended that ground gas monitoring is undertaken with a minimum of 6 visits over a period of 3 months.

The length and frequency of the ground gas monitoring regime and the sampling method, initial results and alterations to the conceptual model are subject to the findings of the ground investigation works and development constraints (i.e. development timescales and liaison with the local authority).

Controlled Waters

Although sensitive receptors have been identified on-site (Secondary Undifferentiated and Secondary B Aquifers) and off-site (Fairywell Brook – 260m south-west) no significant contaminative linkages exist, therefore the risk to controlled waters is deemed very low.

If unrecorded contaminative sources are noted, the above conceptual models may require re-assessment / re-appraisal.

4.8 Scope of Phase 2 Intrusive Geo-Environmental Ground Investigation

As a result of the preliminary risk assessment, a Phase 2 intrusive geo-environmental ground investigation should be carried out to quantify the identified risks. This intrusive ground investigation works should include the collection of appropriate samples – solid and / or liquid, if deemed necessary, across the site for appropriate chemical testing as detailed above.

Furthermore, to determine the geotechnical and geological properties of the underlying ground conditions, appropriate intrusive works and associated testing should be undertaken. The rationale and aims for these Phase 2 environmental, geotechnical and geological investigative works are detailed below.

In order to provide adequate assessment in terms of both environmental and geotechnical site parameters, ground investigation works will be required on a spatial basis in accessible areas.

The proposed initial ground investigation works should comprise the following:

- Dynamic sampling boreholes; and
- Mechanically excavated trial pits.

There may be a requirement for deep (piled) foundations at the site, in which case deep boreholes formed by rotary drilling techniques may be required.

The rationale for the exploratory holes is discussed below:

- To allow the collection of samples from the Made Ground and natural deposits for chemical laboratory testing (solid samples) for an appropriate suite of determinands and to determine the suitable concrete classification in associated with relevant guidance e.g. BRE Special Digest 1.
- To determine the extent, composition and depth of any Made Ground deposits.
- To determine the nature, thickness and extent of superficial deposits.

- Enable geotechnical testing, including density testing (SPTs), hand shear vane (HSV) testing and undrained shear strengths of the underlying Made Ground and natural deposits for the purposes of sub-structure design;
- To allow installation of ground gas monitoring wells.

Based on the findings of the initial ground investigation works, further works may be required for detail design including:

- CBR Plate tests / Dynamic Cone Penetrometer tests
- Deep boreholes (likely formed by rotary drilling techniques) if piled design information is required.

5.0 RECOMMENDATIONS

- 5.1 As a result of the information gathered and the risks identified in this report, there is a low to moderate risk to human health on the basis that feasible contaminative linkages have been identified for end users and construction workers in localised areas. The risk to controlled waters is deemed very low given the lack of significant contaminative linkages.
- 5.2 A low to moderate ground gas risk has been identified based on ground gas sources and potential migration pathways. Ground gas monitoring with a minimum of 6 No. visits over a period of 3 months is recommended. On the basis that the site lies within an area where between less than 1% of homes are above the action level no radon protection measures are necessary.
- 5.3 Due to geotechnical requirements, ground investigation works should be undertaken in order to determine the ground conditions with a greater degree of certainty and allow design of the proposed development, drainage, services and immediate external areas to be undertaken. It is therefore recommended that exploratory holes are constructed where access is permitted across the site.
- 5.4 From the results of the Phase 2 ground investigation work – if this report identifies a potential risk and / or a requirement for further detailed site-specific assessment, a Phase 3 environmental investigation report and / or a Remedial Strategy (informing on potential remediation solutions) may be required.
- 5.5 The nature and extent of the proposed targeted chemical and environmental testing should be confirmed, if time / commercial constraints allow, with the relevant Local Authority Environmental Health Officer and the Environment Agency prior to undertaking works on-site. Proceeding without agreement between regulatory authorities may result in further assessment being required.
- 5.6 It should be noted that, if any visual or olfactory evidence of contamination is encountered during remediation or construction work, then the Local Authority

Environmental Health Officer and Environment Agency should be contacted immediately in order to agree any necessary remediation measures.

- 5.7 Given the possibility of services on-site, full service plans should be obtained prior to any intrusive ground investigation works.
- 5.8 The Zetica UXO risk map, contained in Appendix 7, indicates that the site lies within an area of moderate risk of unexploded ordnance. Consequently, a Preliminary UXO Risk Report is recommended for the site prior to any works commencing.

APPENDIX 1

LIMITATIONS OF INVESTIGATION WORK AND REPORT AND CONTAMINATED LAND LEGISLATIVE FRAMEWORK

LIMITATIONS OF REPORT

This consultancy report was compiled and carried out by IGE Consulting Limited ('IGE') for the client, as defined in the main report (the 'client'), on the basis of a defined programme and scope of works and the terms of a contract between IGE and the client. IGE undertook this with all reasonable skill and care, taking into account the limits of the scope of works required by the client, the prevailing site conditions, the time scale involved and the resources, including financial and manpower resources, agreed between IGE and the client. IGE cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered outwith the agreed scope of works.

Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices. This report may not be relied upon, or transferred to, by any other party without the written agreement of its author. If a third party relies on this report, it does so wholly at its own and sole risk and IGE disclaims any liability to such parties.

It is IGE's understanding that this report is to be used for the purpose described in the 'Brief' section of this report. That purpose was a significant factor in determining the scope and the services to be provided. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without IGE's review and advice shall be at the client's sole and own risk.

The information contained in this report is protected by disclosure under Part 3 of the Environmental Information Regulations 2004 pursuant to the provisions of Regulation 12(5) without the consent in writing of a Director of IGE.

This report is a function of the date it was written and should be read in light of any subsequent changes in legislation, statutory requirements and industry practices. Ground conditions can also change over time and further investigations or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of IGE. In the absence of such written advice of IGE, reliance on the report in the future shall be at the client's own and sole risk. Should IGE be requested to review the report in the future, IGE shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between IGE and the client.

The observations and conclusions described in this report are based solely upon the scope of works agreed between the client and IGE. IGE has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report. IGE is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the agreed scope of works. For the avoidance of doubt, this report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species (e.g. Japanese Knotweed). It is recommended that the client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the suspected presence asbestos or asbestos-containing materials this is for indicative purposes only and does not constitute or replace full and proper surveys.

Throughout the report the term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements) and the term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation and these two main aspects are inter-related. The geo-environmental sections are written in broad agreement with BS 10175:2011+A2 2017.

LIMITATIONS OF INVESTIGATION WORK

Desk Study References

This report is based upon IGE's observations of existing physical conditions at the site gained from a walkover survey of the site together with IGE's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. Reliance has been placed on this publicly available data obtained from the sources identified in the main report. When using the information, it has been assumed that it is correct. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst IGE have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report. IGE did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services. IGE is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to IGE and including the doing of any independent investigation of the information provided to IGE except when otherwise provided in the terms of the contract between the client and IGE.

Historical Mapping

Historical Ordnance Survey maps do not provide a comprehensive description of a site history. They provide details of the site from a date prior to the publication of the map (i.e. a snapshot in time). The period between map editions can be substantial (i.e. several decades). Not all map series are available for every date range in many areas of the UK and therefore there will be gaps in this mapped record for some sites. Potentially contaminative land uses could have been present and removed during such periods and may therefore not form a part of this particular record. In addition, there will be potentially contaminative land uses which are not identified on the map records such as small scale storage / use of hazardous materials, illegal / unlicensed waste disposal activities etc. Different map series identify different features utilising different symbols which can result in features that remain on-site being removed from maps. Some features are also not mapped for security reasons (e.g. airfields and other military installations). These areas are mostly shown as blank areas on historical maps.

Site Walkover

During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.

Flooding

Flooding in this report is defined as flooding caused by the sea, ditches, rivers, streams, ponds, lakes, reservoirs and the like. It does not extend to flooding caused by surcharged piped drainage systems and investigations into flooding of this nature are excluded from this report.

Extent of Contamination Studies

Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

The conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the reporting in full. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

Intrusive Investigation

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations, the potential exists for ground conditions to be encountered which are different to those considered in this report. The explored extent of the site area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters, based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Exploratory Holes

Where exploratory holes have been carried out as part of this investigation, the spacing has been determined to provide a reasonable indication of the general ground conditions across the site, but the number has ultimately been limited by commercial constraints. The findings of the exploratory holes relate specifically to the exploratory hole locations and are no absolute guarantee of the ground conditions between such locations. Due allowance should be made for the possibility of variation in conditions between exploratory hole locations.

Extent of Contamination Testing

The extent of contaminated land testing carried out on samples obtained from the site has been determined in accordance with the latest legal guidance issued by the government to provide, with reasonable certainty, the probable general levels of contamination present on site that could pose a significant hazard to human health or waters. The extent of site investigation works including chemical testing has also been limited by reasonable commercial constraints. Although extensive testing of samples has been carried out, the volume of samples taken for testing are a minute fraction of the total volume of soils and groundwater present on site. Therefore, there is a residual risk that undetected pockets of contamination may be present on site, situated between testing locations.

When investigating or developing potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and temporally. The absence of certain ground, ground gas, contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

Extent of Geo-Environmental Studies

This report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species e.g. Japanese Knotweed. It is recommended that the Client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the identification asbestos or asbestos-containing materials this is for indicative purposes only and does not constitute or replace a full and proper survey. If an Unexploded Ordnance (UXO) report has been obtained within the report, it has been so on the basis of Health and Safety concerns and no assessment has been made other than transcribing the recommendations of the sub-contractor contained within the report. In terms of a potential contaminative source, unless ordnance has been manufactured / stored on site, UXOs will only be determined as a contaminative source following a positive identification on site.

PLANNING CONTEXT

The National Planning Policy Framework (NPPF, 2021) states that the purpose of the planning system is to contribute to the achievement of sustainable development. In order to do this the planning system has three overarching objectives, one of which directly relates to the potential for pollution and contaminated land:

- *'environmental objective - to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy'.*

In accordance with this environmental objective, Paragraph 118 clarifies that 'making effective use of land' includes to:

- *'give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land'.*

In accordance with this environmental objective, Paragraph 170 clarifies that 'conserving and enhancing the natural environment includes:

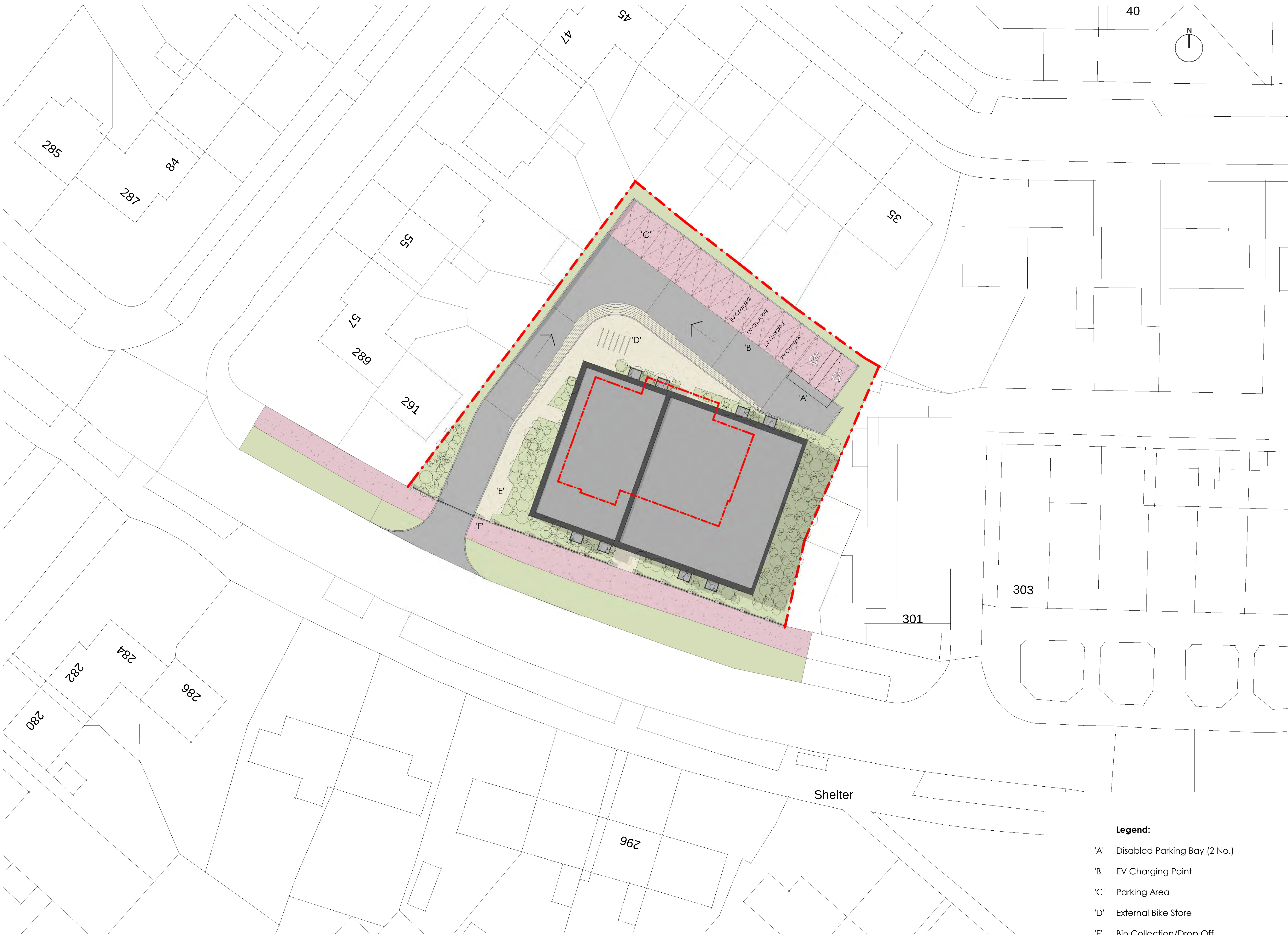
- *'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability'; and*
- *'remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate'.*

Paragraph 178 of the NPPF states that planning policies and decisions for developments should also ensure that:

- *'a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation)'; and,*
- *'after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990'; and*
- *'adequate site investigation information, prepared by a competent person, is available to inform these assessments'.*

This report has been prepared and authorised by staff that are competent as defined in the NPPF.

APPENDIX 2
FIGURES AND DRAWINGS



Proposed - Site Plan
Scale: 1 : 200

GENERAL NOTE:		
1.	UNDER NO CIRCUMSTANCES SHOULD DIMENSIONS BE SCALED FROM THIS DRAWING IF IN DOUBT ASK:	
2.	THE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS/NOTIFICATION. ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF 'EE ARCHITECTS'.	
3.	ALL DIMENSIONS ARE TO BE CHECKED PRIOR TO COMMENCEMENT.	
4.	THIS DRAWING IS THE PROPERTY OF 'EE ARCHITECTS' AND MUST NOT BE COPIED OR REPRODUCED EITHER IN WHOLE OR IN PART WITHOUT WRITTEN PERMISSION.	

Rev:	Description:	Date:
X	First Issue	18.11.22
A	Massing	18.11.22
B	Sketch Scheme	23.11.22
C	Add. Info	11.01.23
D	West Planting	15.01.23
E	Planning Comm.	07.05.23
F	Planning Info.	04.07.23
G	Client Amend	12.07.23
H	Planning Amend.	21.07.23
I	Planning Amend.	19.08.23

Planning

Scheme Title:	
Cleveir Clowns Nursery	
Drawing Reference:	
Proposed Site Plan	
Scale @ A1:	1 : 200
Drawn by:	RAL
Checked by:	MOH

Project Number:	Drawing Number:	Revision:
6380	PL01	I

Legend:

- 'A' Disabled Parking Bay (2 No.)
- 'B' EV Charging Point
- 'C' Parking Area
- 'D' External Bike Store
- 'E' Bin Collection/Drop Off
- 'F' Pedestrian Access



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FOR GUIDANCE PURPOSES ONLY

Approximate Site Boundary

Rev	Drawn	Date	Description
-----	-------	------	-------------

Drawing Status:
Information

Contract: Clever Clowns Nursery

For:
Stockport Developments Ltd &
Wythenshawe Community Housing Group

Drawing Title:

Site Location Plan



Office 16, Bartle House, Manchester, M2 3WQ
Email: contact@igeconsulting.co.uk
Web: www.igeconsulting.co.uk
Tel: 0161 914 9170

Scale: 1:2000 @A3	Date: Oct 2023	
Drawn: AS	Checked: AE	
Contract No. 4031	Drawing No. SI-01	P1



FOR GUIDANCE PURPOSES ONLY

- Approximate Site Boundary
- On-Site Nursery Building (1973 - 2023)
- Historical Buildings (1876 - 1954)
- Historical Orchard - Maximum Extent (1876 - 1938)



Rev	Drawn	Date	Description
Drawing Status: Information			
Contract: Clever Clowns Nursery			
For: Stockport Development Ltd & Wythenshawe Community Housing Group			
Drawing Title:			
Site Features Plan			
<div>IGEconsulting</div> <div>Office 16, Bartle House, Manchester, M2 3WQ Email: contact@igeconsulting.co.uk Web: www.igeconsulting.co.uk Tel: 0161 914 9170</div>			
Scale: 1:400 @A3		Date: Oct 2023	
Drawn: AS		Checked: AE	
Contract No.	Drawing No.		
4031	SI-02	P1	



FOR GUIDANCE PURPOSES ONLY

- Approximate Site Boundary
- On-Site Nursery Building (1973 - 2023)
- Historical Buildings (1876 - 1954)
- Historical Orchard - Maximum Extent (1876 - 1938)
- Current and Infilled Reservoirs (1876 - 2023)
- Unknown Heap (1972 - 2023)

Rev	Drawn	Date	Description
Drawing Status: Information			
Contract: Clever Clowns Nursery			
For: Stockport Development Ltd & Wythenshawe Community Housing Group			
Drawing Title: Site Features Plan			

Office 16, Bartle House, Manchester, M2 3WQ
Email: contact@igeconsulting.co.uk
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Tel: 0161 914 9170

Scale: 1:1500 @A3	Date: Oct 2023	
Drawn: AS	Checked: AE	
Contract No. 4031	Drawing No. SI-02	P2

Notes

- 1 This drawings is indicative and not to scale.
- 2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

Key

- Topsoil
- Made Ground
- Glacial Till – Cohesive
- Glacial Till – Granular
- Bollin Mudstone Member

RECEPTORS

- Receptors
1. End User
2. Construction Workers
3. General Public / Adjacent Site Users
4. Secondary B Aquifer in Bedrock
5. Secondary Undifferentiated Aquifer in Superficial Deposits
6. Surface Water - Fairywell Brook (260m SW)
7. Buildings and Services

PATHWAYS

- Pathways To Human Health
1. Dermal Contact
2. Inhalation of Soil Dust and Vapours
3. Ingestion of Soil Directly

- Pathways To Controlled Waters
1. Vertical Migration Along Current and Future Foundations
2. Vertical Migration Through Granular Made Ground, Granular Natural Deposits and Granular Lenses Within Natural Cohesive Deposits
3. Negligible Infiltration Through Low Permeability Natural Deposits
4. Lateral Migration Along Low-Permeability Natural Deposits
5. Migration Through Fractures and Fissures in Bedrock
6. Migration Along Groundwater Flow

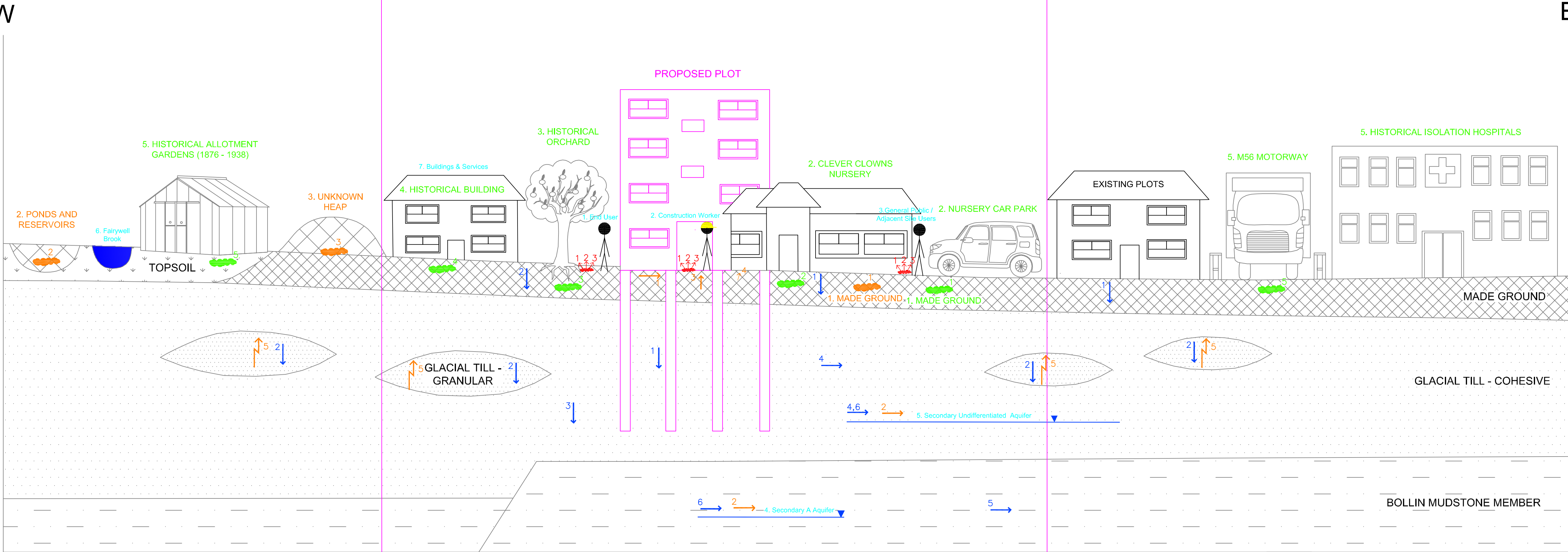
- Ground Gas Pathways
1. Preferential Migration Beneath Hardstanding, Along Foundations, Service Ducts and Trenches
2. Dissolved Gases Within Groundwater
3. Ingress Through Wall Cavities / Floors and Subsequent Accumulation
4. Inhalation of Ground Gas and Vapours
5. Vertical Migration Through Granular Deposits

SOURCES

- Sources
1. On-Site Made Ground
2. On-Site Clever Clowns Day Nursery Building and Car Park (1973 - 2023)
3. Historical On-Site Orchard (1876 - 1938)
4. Historical On-Site Residential Buildings (1876 - 1938)
5. Off-Site Current and Historical Industrial Land Use

- Secondary Sources
6. Pooling Beneath Current and / or Future Foundations
7. Pooling in Relative Low Points Above Low Permeability Deposits
8. Pooling within Granular Lenses within Low Permeability Deposits

- Ground Gas Sources
1. On-Site Made Ground
2. Off-Site Infilled Ponds and Reserviors (1876 - 1982, 100 - 250m E-W)
3. Off-Site Unspecified Heap (1973 - 2023, 250m S)



Rev	Drawn	Date	Description
Drawing Status			
INFORMATION			

Contract
CLEVER CLOWNS NURSERY,
WYTHENSHAW,
MANCHESTER

FOR: STOCKPORT
DEVELOPMENT LTD &
WYTHENSHAW COMMUNITY
HOUSING GROUP

Drawing Title
CONCEPTUAL SITE
MODEL

IGE
consulting

Office 16, Bartle House, Manchester, M2 3WQ
email: contact@igeconsulting.co.uk
web: www.igeconsulting.co.uk
tel: 0161 914 9170

Scale	NTS	Date	NOV 2023
Drawn	AS	Checked	AE
Contract No.	4031	Drawing No.	SI-03 P1

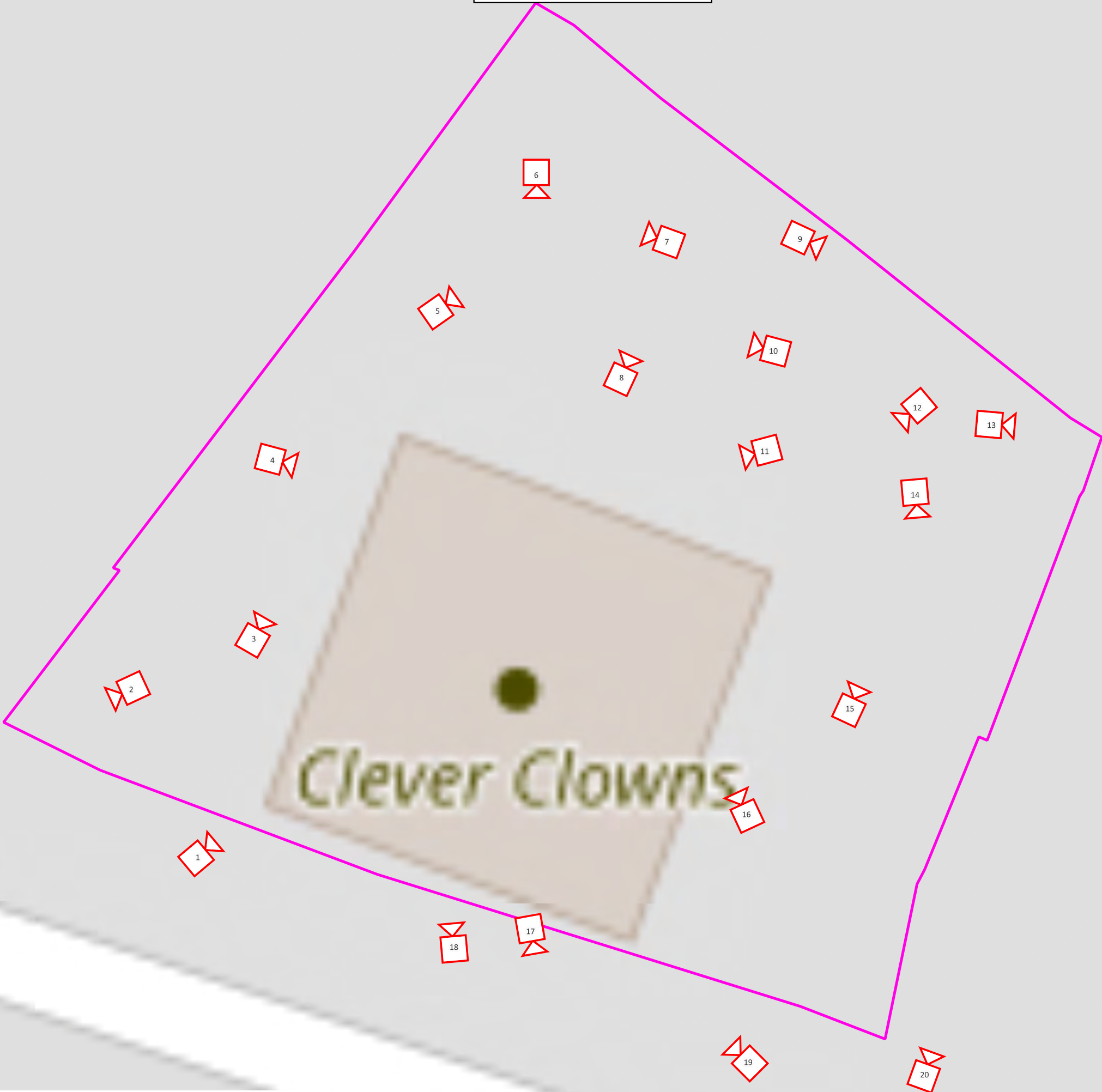
APPENDIX 3

WALKOVER SURVEY PHOTOGRAPHS AND PHOTOGRAPH LOCATION PLAN



FOR GUIDANCE PURPOSES ONLY

- Approximate Site Boundary
- Walkover Photograph Locations



Rev	Drawn	Date	Description
Drawing Status: Information			
Contract: Clever Clowns Nursery			
For: Stockport Development Ltd & Wythenshawe Community Housing Group			
Drawing Title:			
Site Walkover Photograph Location Plan			
<div>IGEconsulting</div>			
Office 16, Bartle House, Manchester, M2 3WQ Email: contact@igeconsulting.co.uk Web: www.igeconsulting.co.uk Tel: 0161 914 9170			
Scale: 1:200 @A3		Date: Nov 2023	
Drawn: AS		Checked: AE	
Contract No.	Drawing No.		
4031	SI-04	P1	

SITE WALKOVER PHOTOGRAPHS – 8th November 2023



Figure 1 – The nursery building and the southern site section, looking north.



Figure 2 – The south-western site section with the landscaping, looking south-west.



Figure 3 – Manholes in the western car park, looking north.



Figure 4 – The sloping ground in the western car park, looking east.



Figure 5 – Astroturf playing area, looking north-east.



Figure 6 – The northern site section, looking south-east.

SITE WALKOVER PHOTOGRAPHS – 8th November 2023



Figure 7 – Fly tipping in the northern site section, looking west.



Figure 8 – A former wooden playing shed in the southern site section.



Figure 9 – The northern site boundary, illustrating the slight level difference between the site and the neighbouring residential properties, looking east.



Figure 10 – Fly tipping in the western site section, looking west.



Figure 11 – The northern site section, looking south-west.



Figure 12 – The former nursery building as seen from the northern site section, looking south-west.

SITE WALKOVER PHOTOGRAPHS – 8th November 2023



Figure 13 – The north-eastern site corner, looking east.



Figure 14 – The south-eastern site corner with the eastern car park, looking south-east.



Figure 15 – The eastern car park and access to the northern site section, looking north.



Figure 16 – Manhole in the eastern site section, looking north-west.



Figure 17 – Fly tipping in the southern site section along the southern boundary, looking south.



Figure 18 – A metal cover above the former beer storage, looking north-west.

SITE WALKOVER PHOTOGRAPHS – 8th November 2023



Figure 19 – The southern site section, looking north-west.



Figure 20 – The off-site electrical substation by the eastern site boundary, looking north.

APPENDIX 4

HISTORICAL ORDNANCE SURVEY MAPS

Site Details:

CLEVER CLOWNS DAY
NURSERY, CLEVER CLOWNS
DAY NURSERY, GREENBROW
ROAD, MANCHESTER, M23 2UH

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Report Ref: GS-XUQ-W3A-L4E-YT7
Grid Ref: 381061, 386988

Map Name: County Series

Map date: 1876

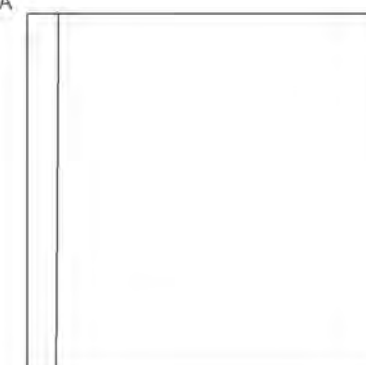
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Printed at: 1:2,500



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Revised 1876
Edition N/A
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Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

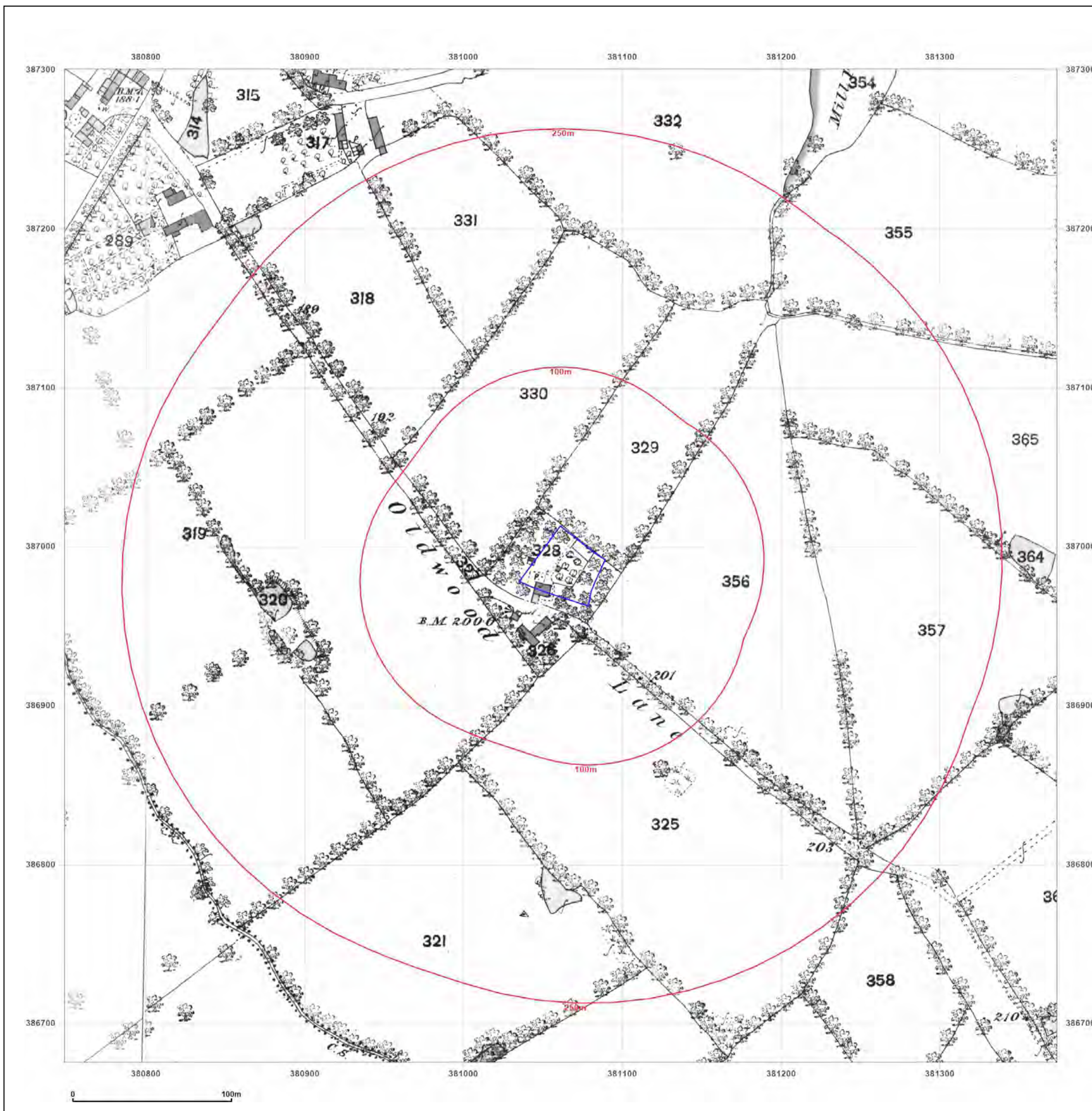


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ROAD, MANCHESTER, M23 2UH

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Map date: 1898

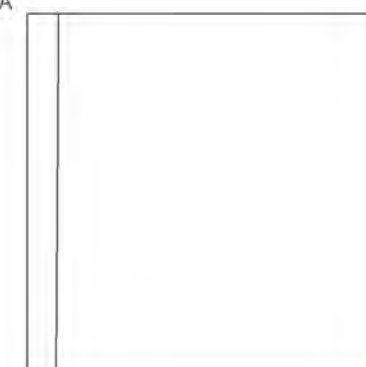
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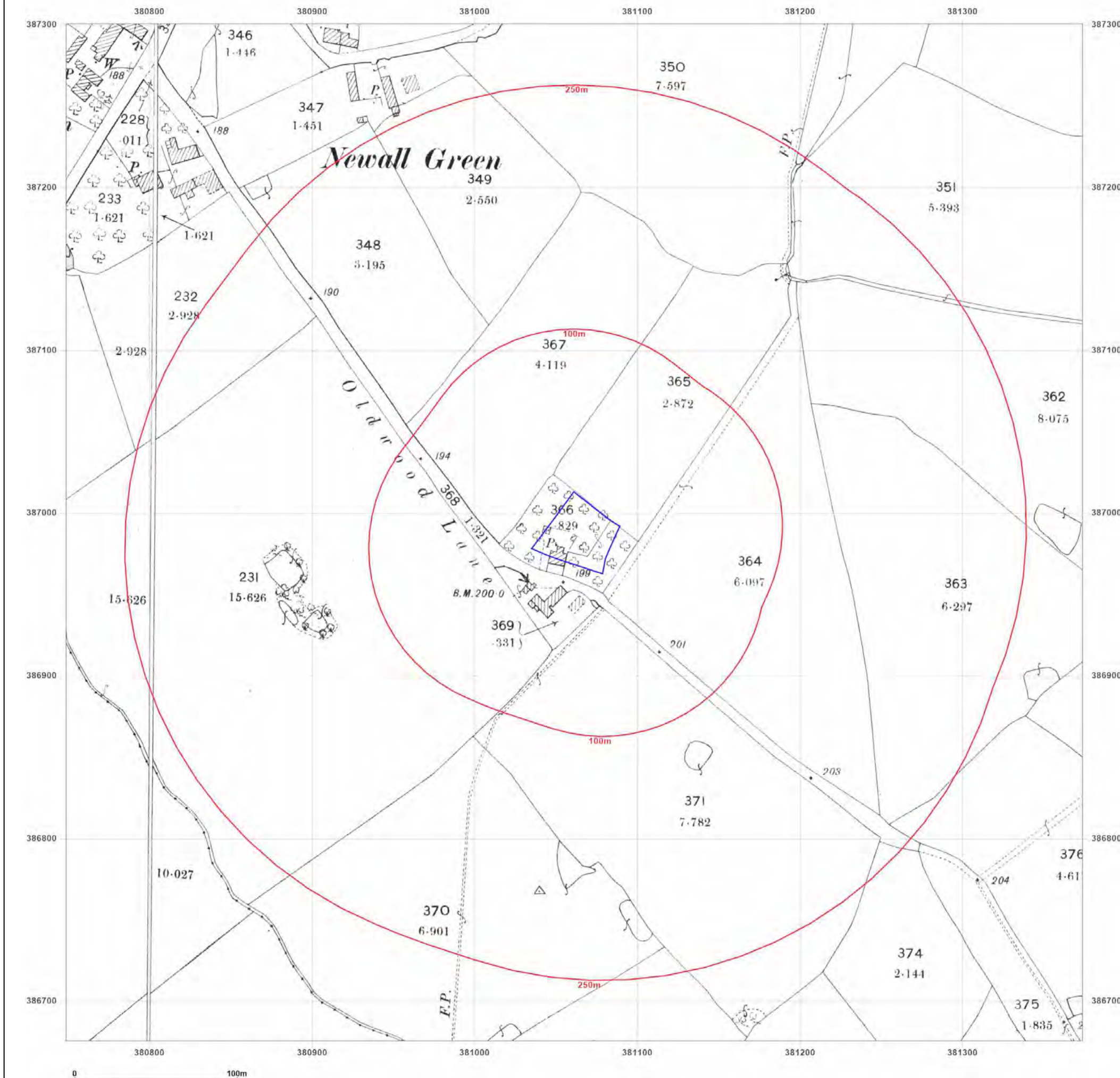


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Map Name: County Series

Map date: 1910

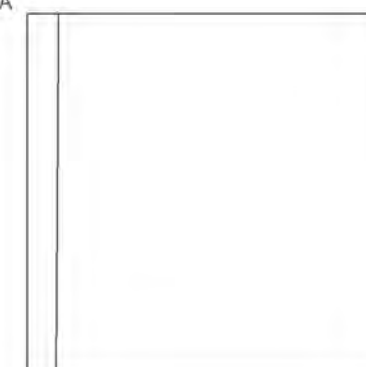
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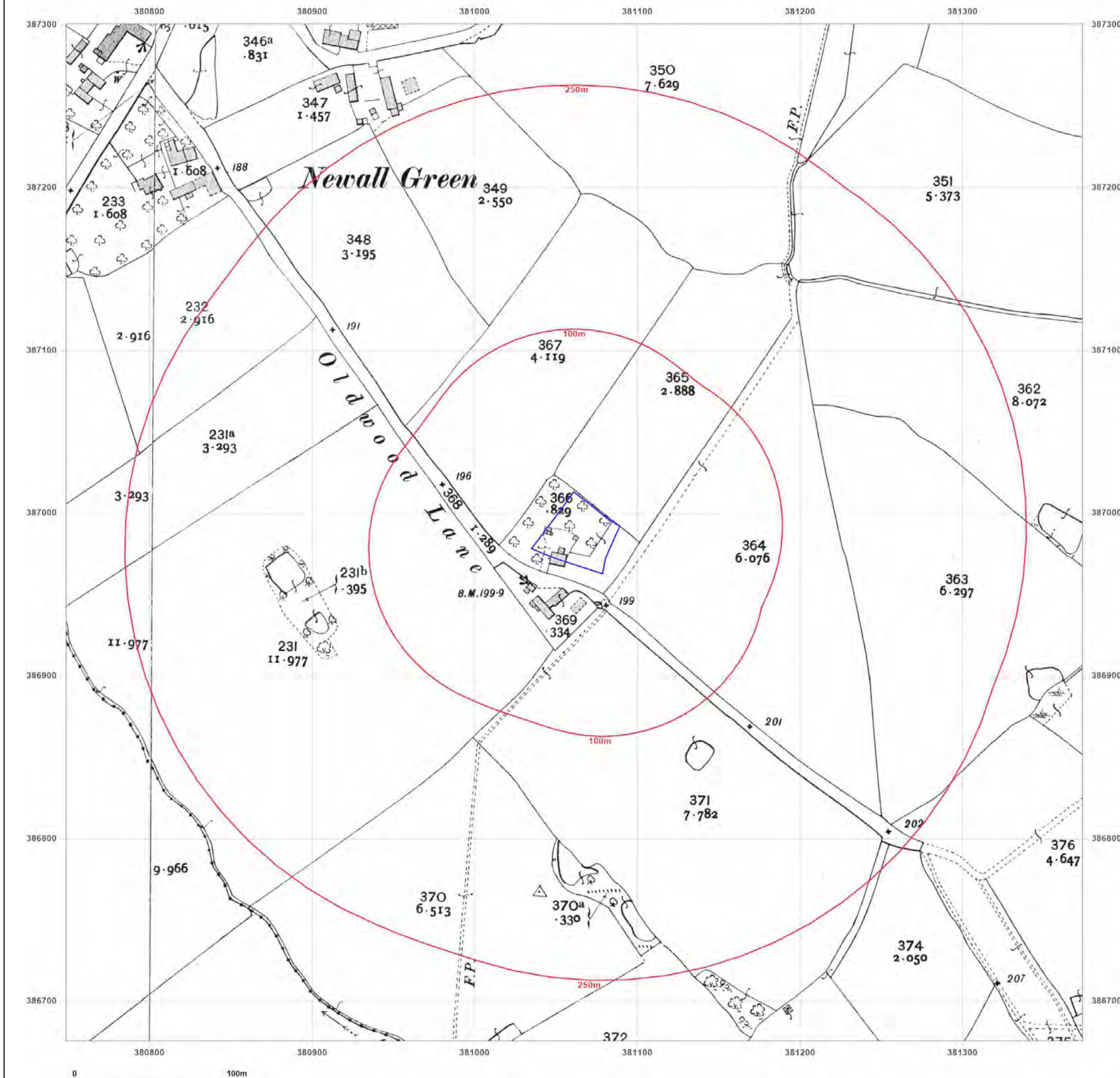


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Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 1960-1962

Scale: 1:2,500

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Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 1960-1964

Scale: 1:1,250

Printed at: 1:2,000



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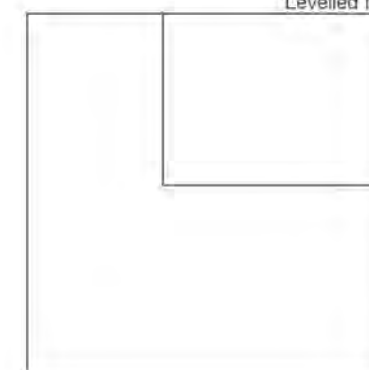
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Map Name: National Grid

Map date: 1973-1976

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Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 1992-1995

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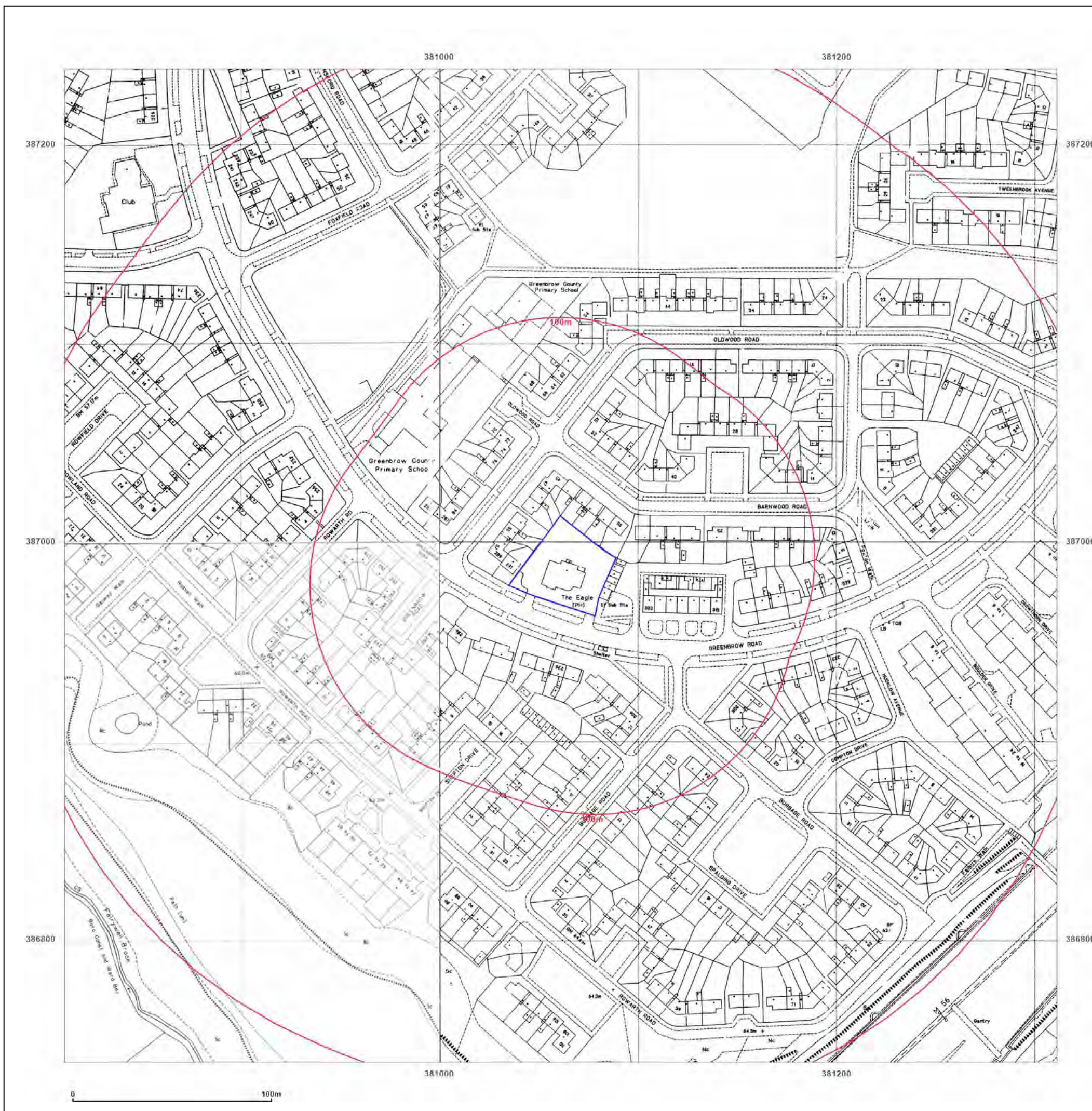


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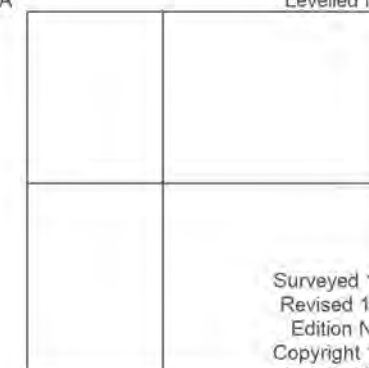
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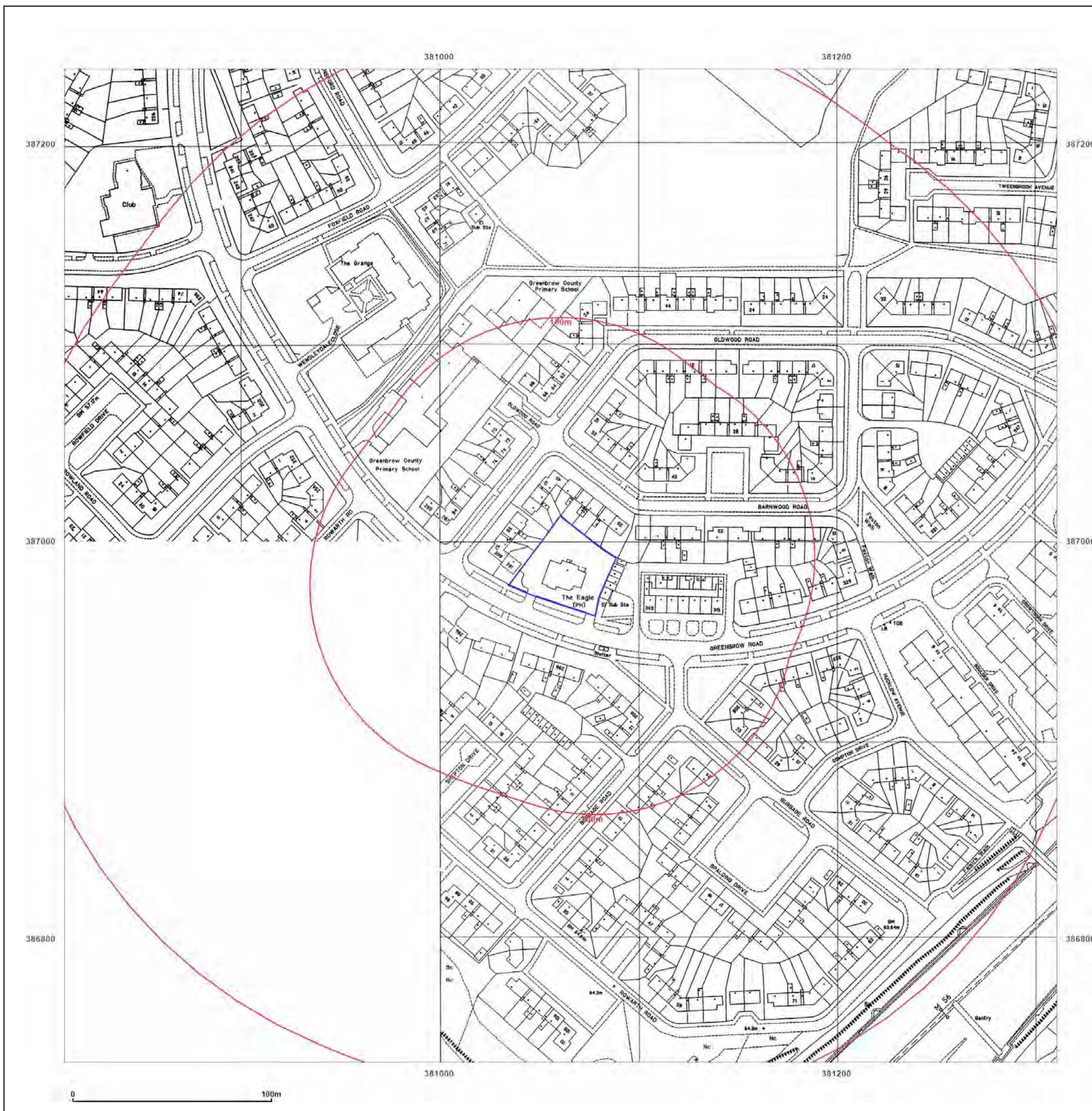


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Grid Ref: 381061, 386988

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

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Grid Ref: 381061, 386988

Map Name: County Series

Map date: 1907

Scale: 1:10,560

Printed at: 1:10,560



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Edition 1907
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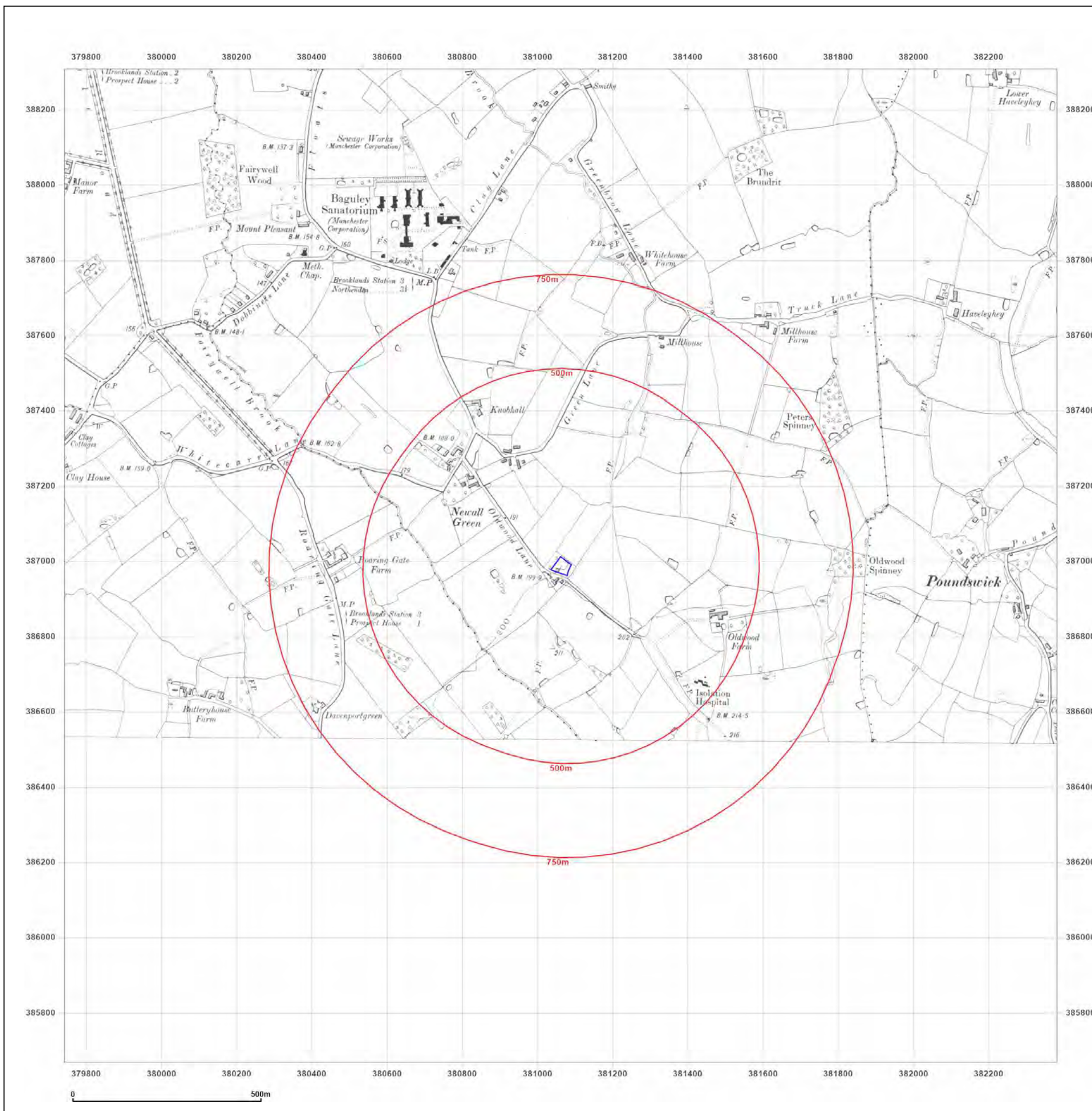


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ROAD, MANCHESTER, M23 2UH

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Edition 1907
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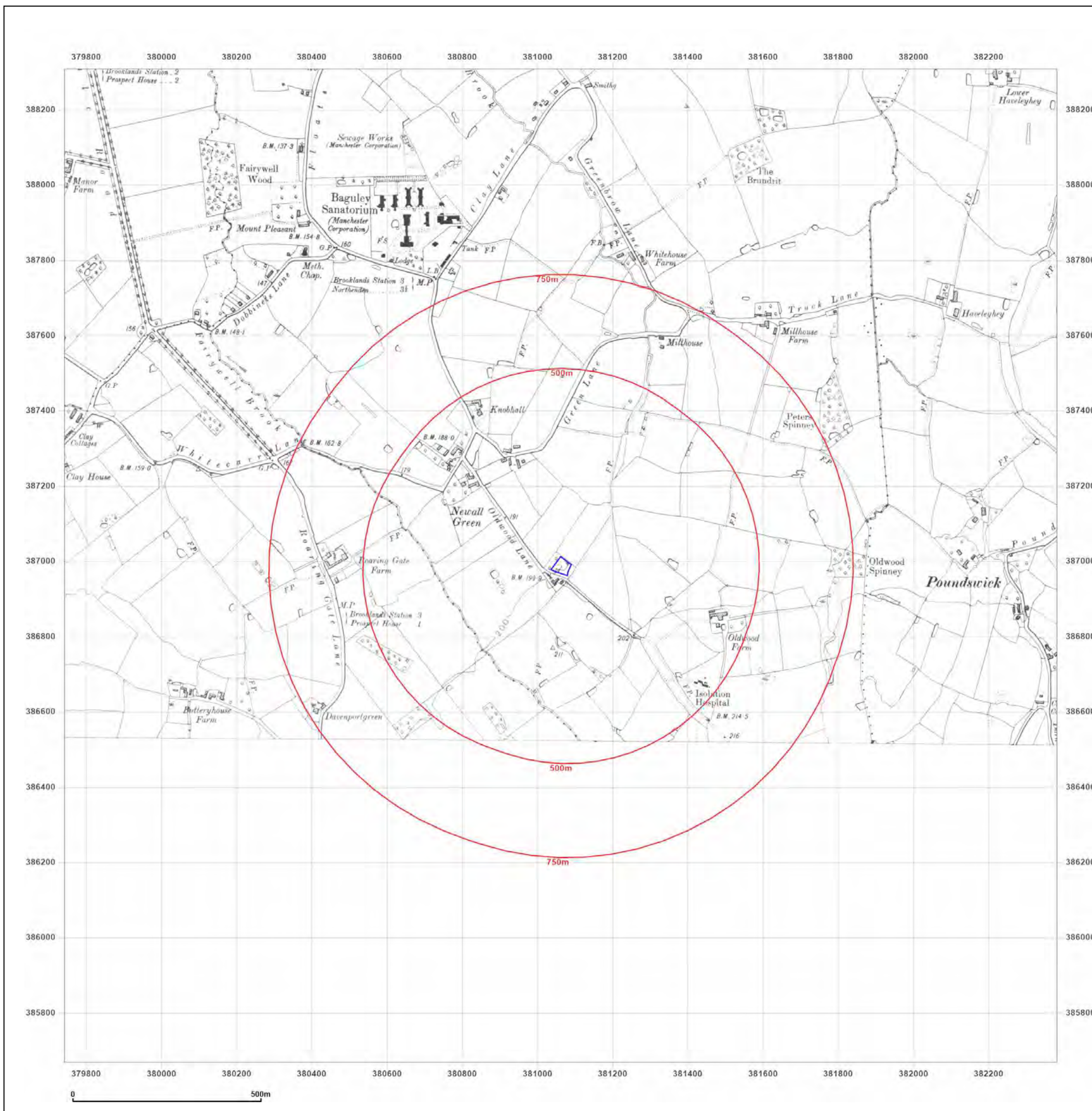


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ROAD, MANCHESTER, M23 2UH

Client Ref: 4031
Report Ref: GS-XUQ-W3A-L4E-YT7
Grid Ref: 381061, 386988

Map Name: County Series

Map date: 1907-1910

Scale: 1:10,560

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Edition 1910
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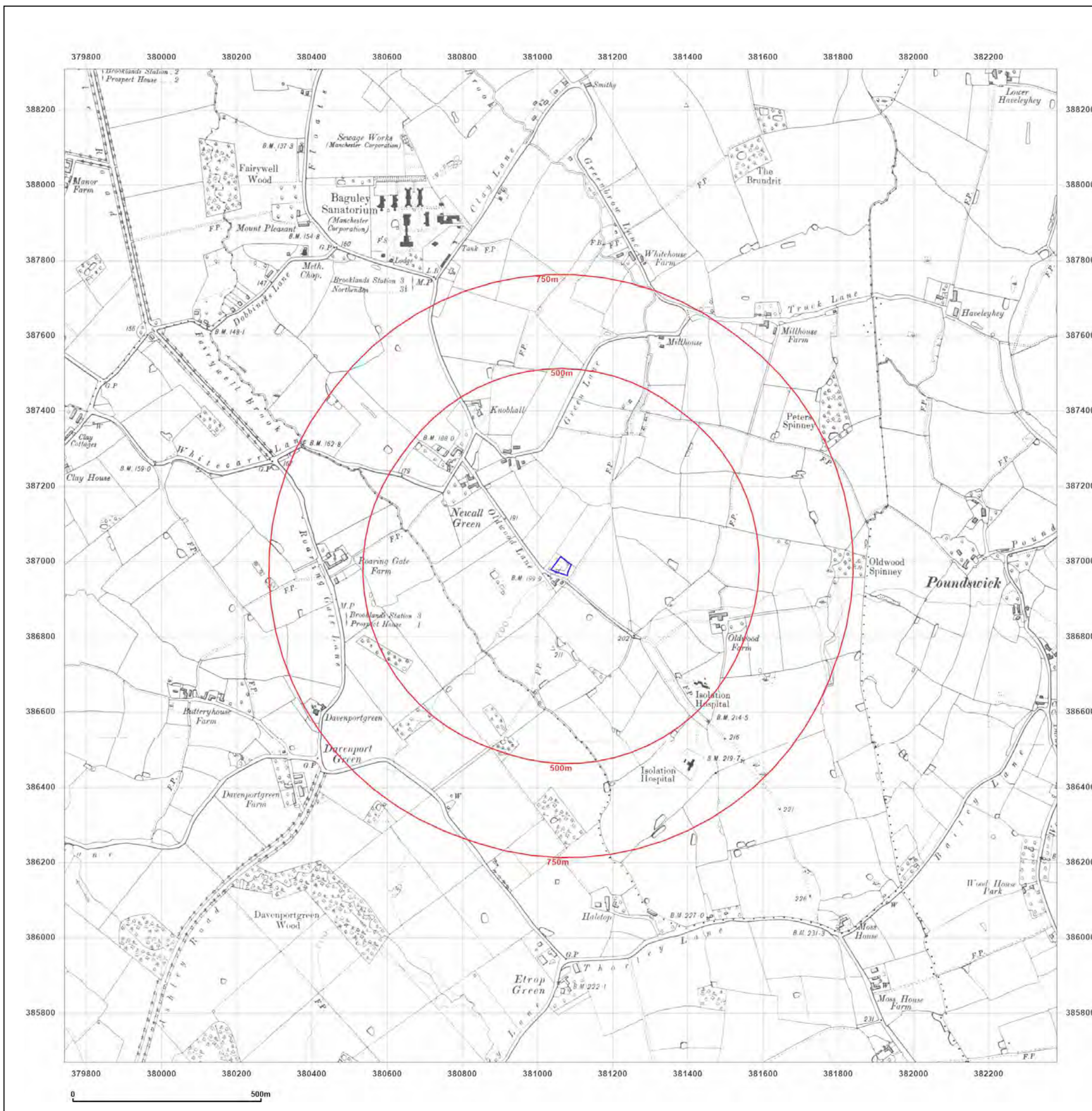


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Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



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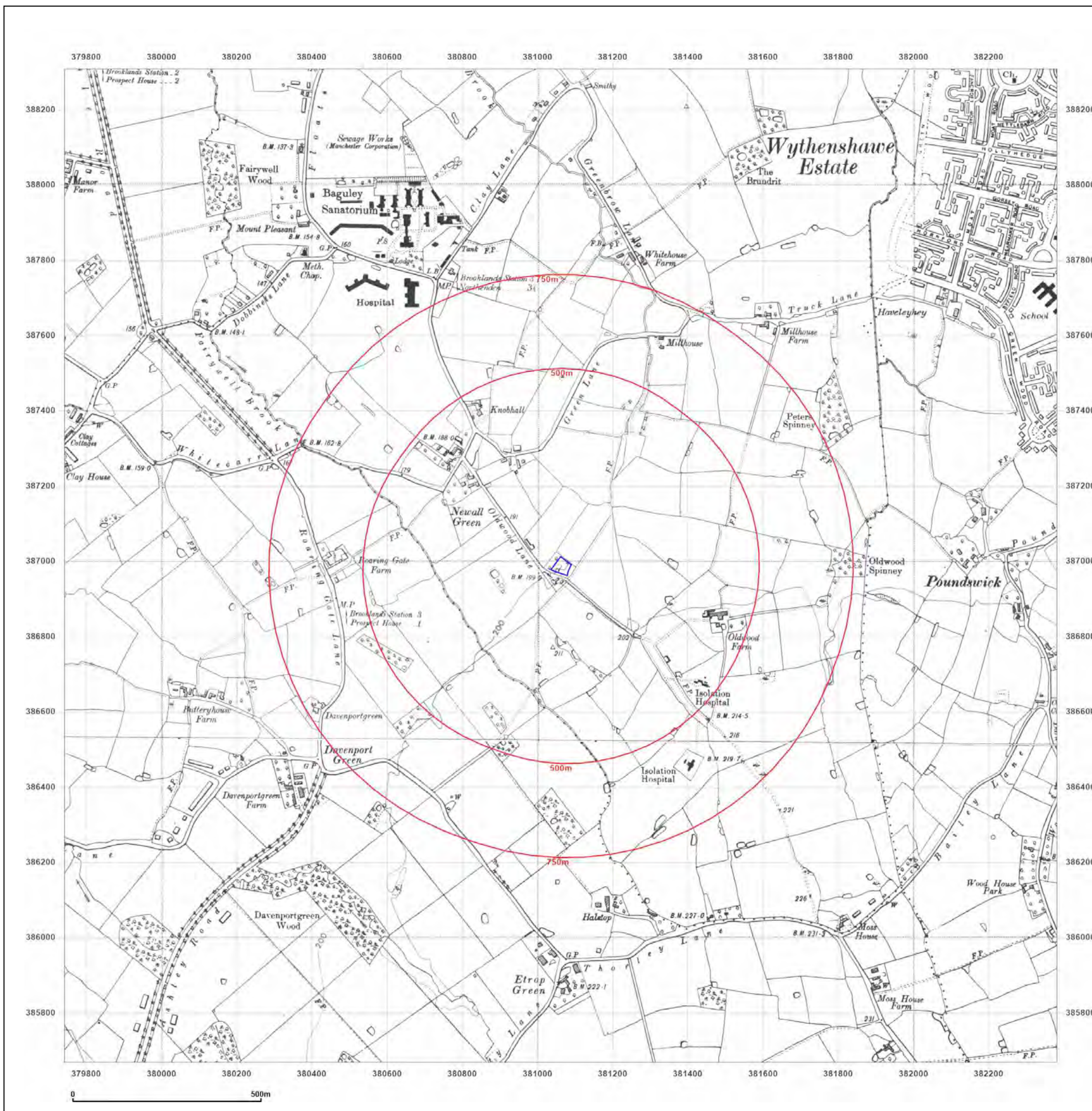


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Grid Ref: 381061, 386988

Map Name: Provisional

Map date: 1954

Scale: 1:10,560

Printed at: 1:10,560



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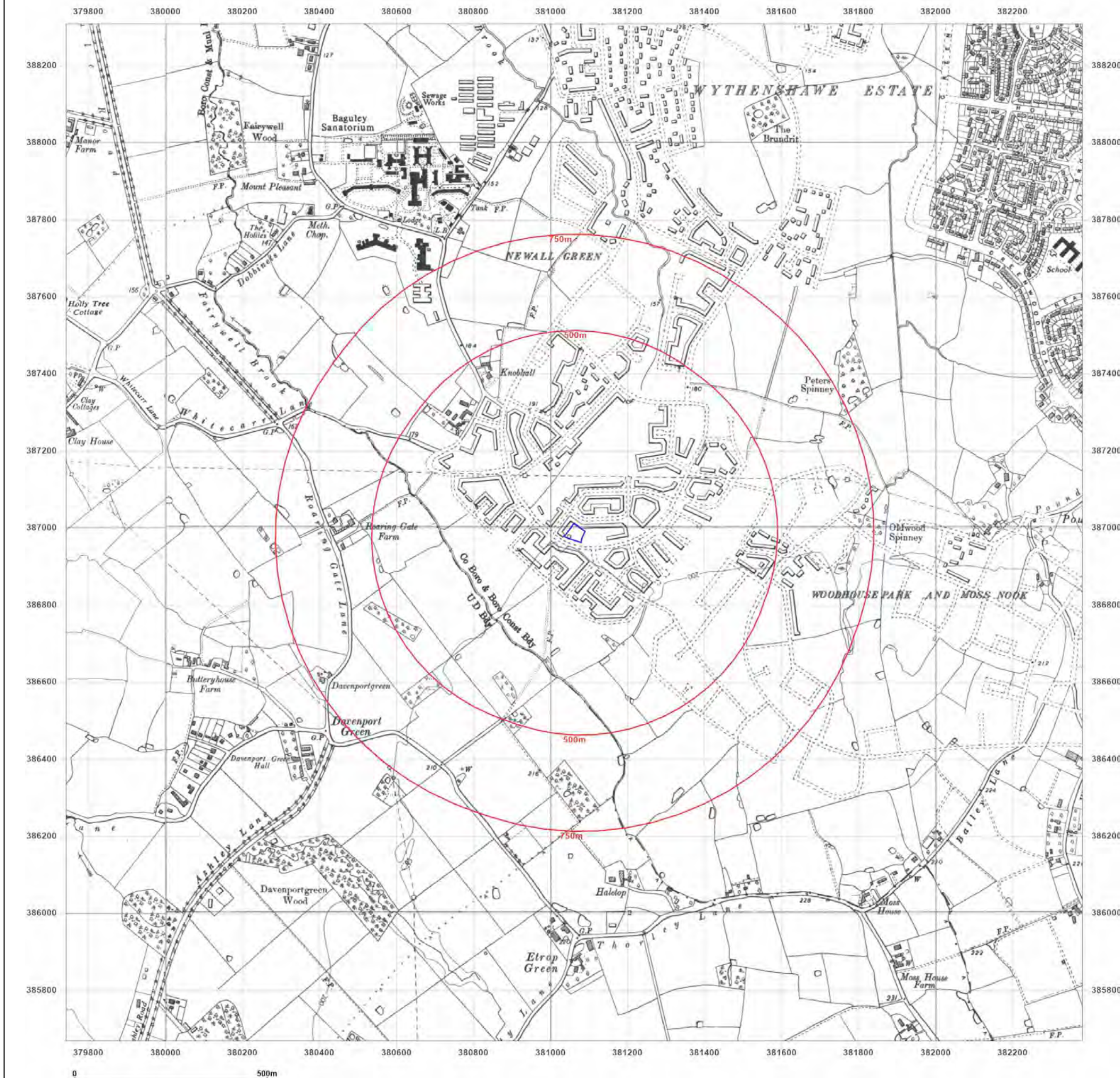


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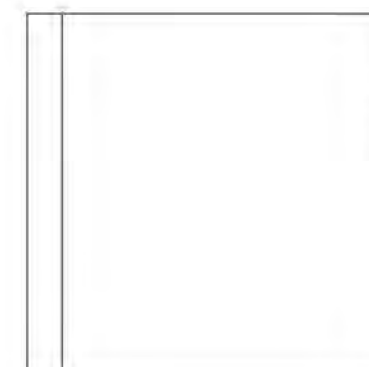
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Map Name: Provisional

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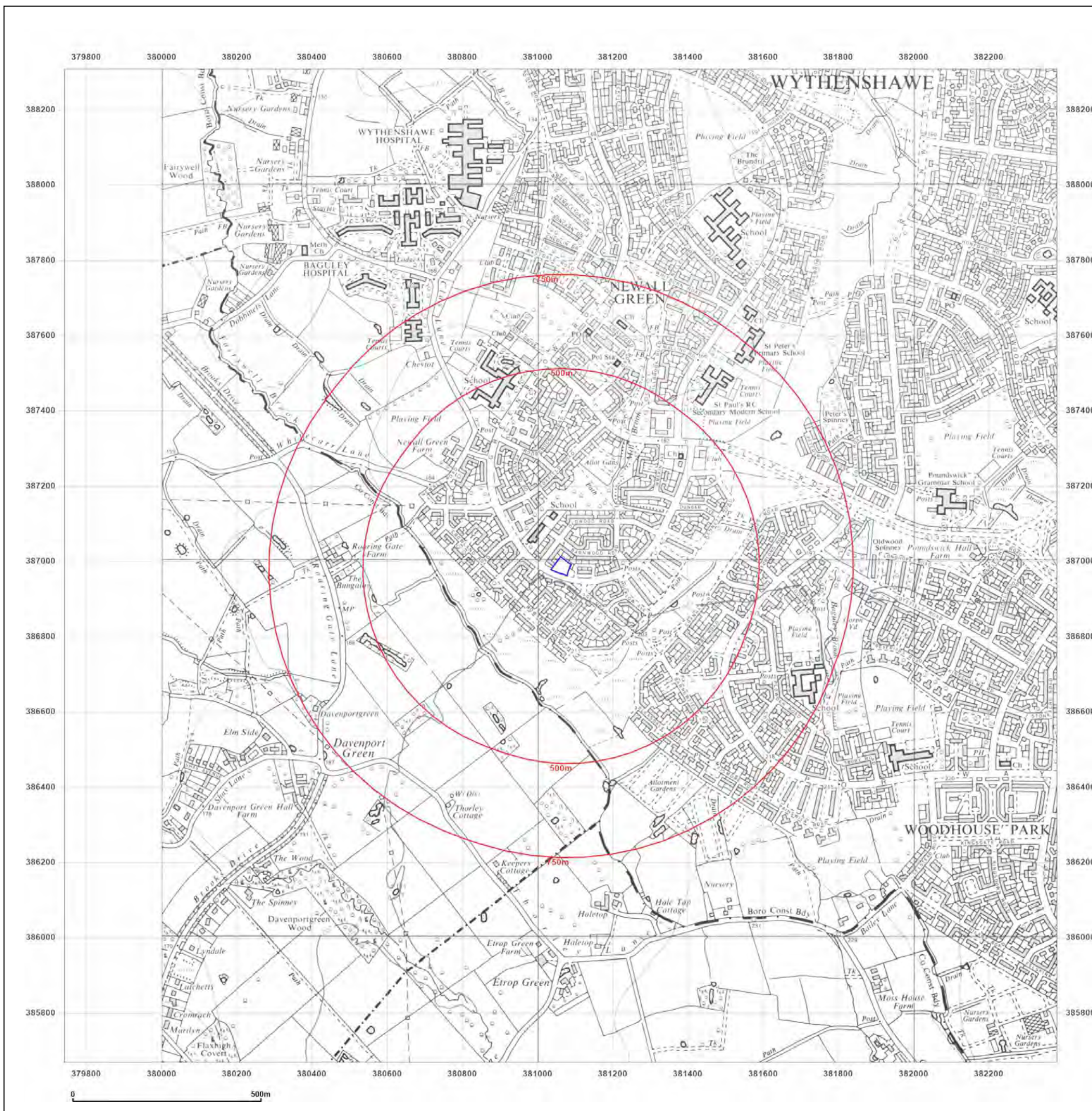


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Client Ref: 4031
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Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 1972-1977

Scale: 1:10,000

Printed at: 1:10,000



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Revised 1977
Edition N/A
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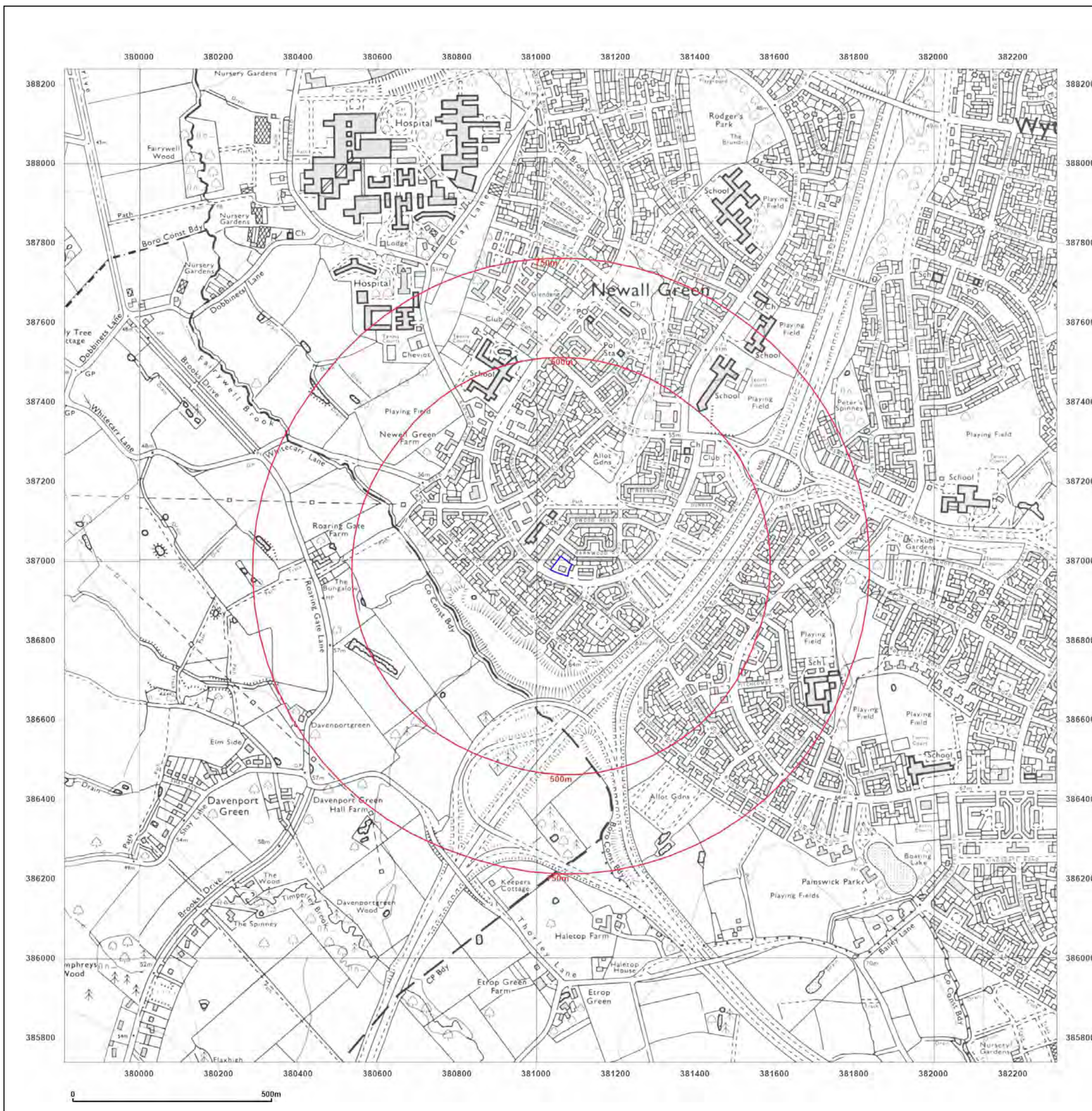


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Client Ref: 4031
Report Ref: GS-XUQ-W3A-L4E-YT7
Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 1989-1990

Scale: 1:10,000

Printed at: 1:10,000



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Revised 1989
Edition N/A
Copyright 1989
Levelled 1981

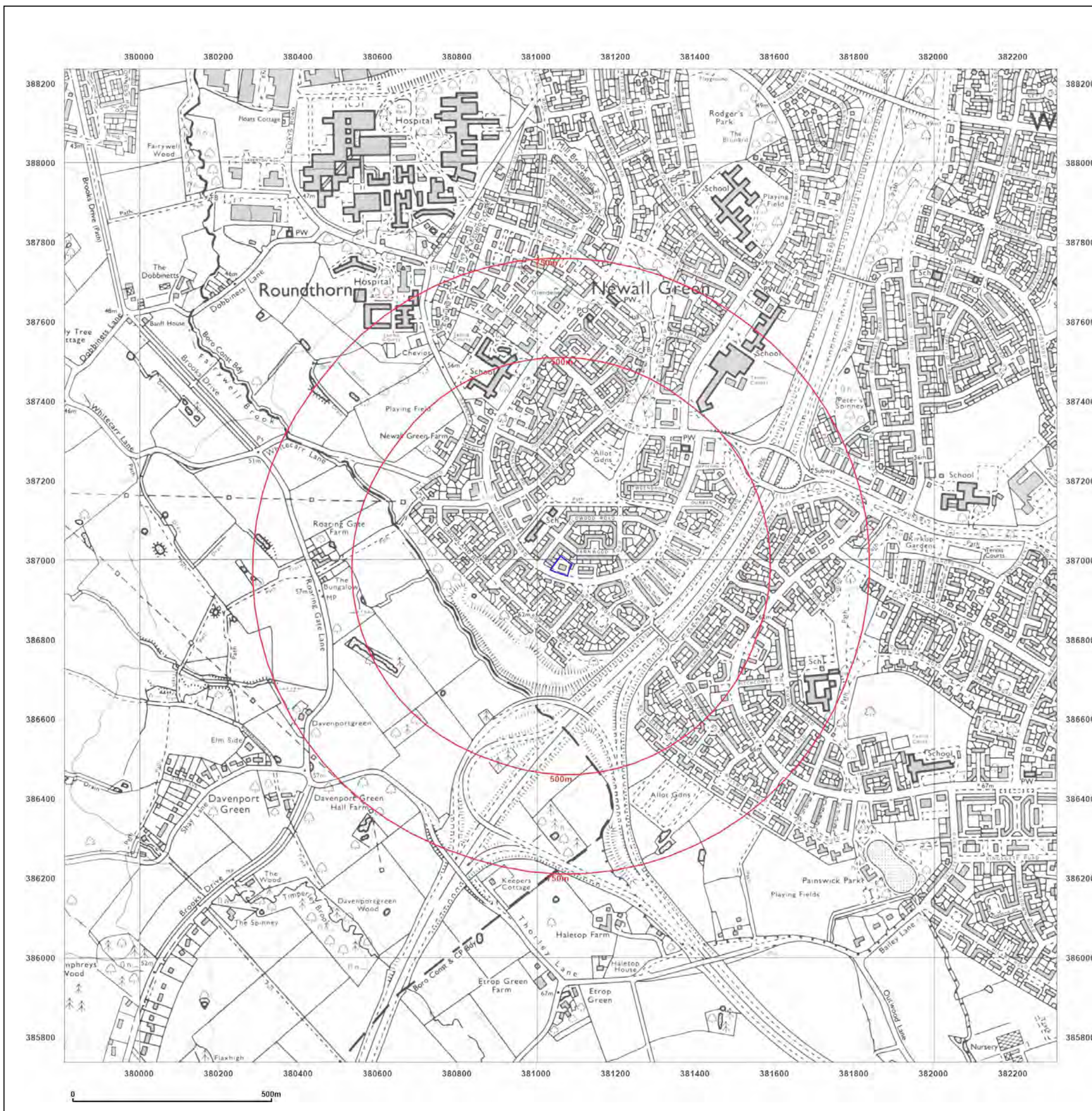


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Site Details:

CLEVER CLOWNS DAY
NURSERY, CLEVER CLOWNS
DAY NURSERY, GREENBROW
ROAD, MANCHESTER, M23 2UH

Client Ref: 4031
Report Ref: GS-XUQ-W3A-L4E-YT7
Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 1995

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1984
Revised 1995
Edition N/A
Copyright 1995
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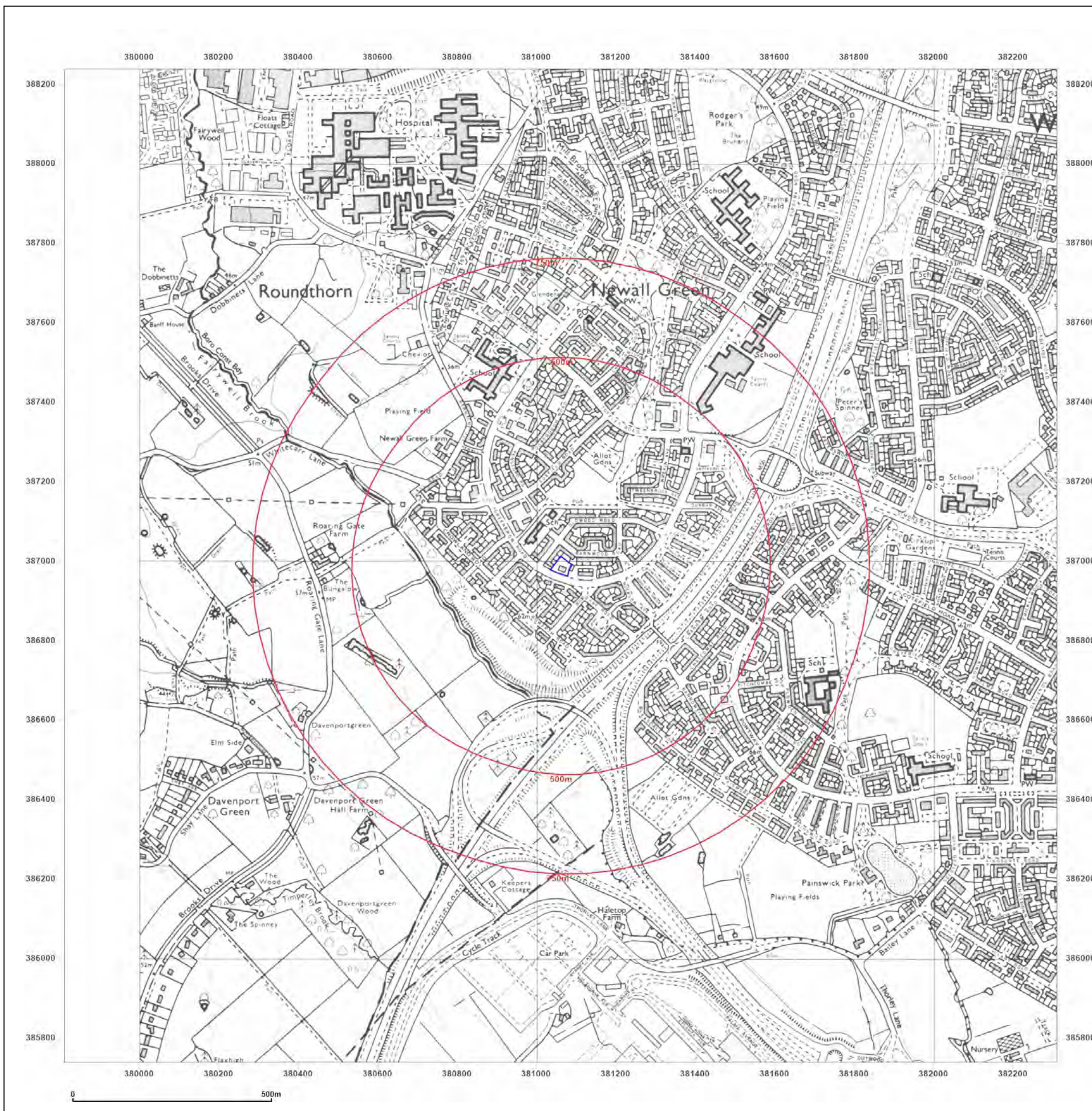


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Site Details:

CLEVER CLOWNS DAY
NURSERY, CLEVER CLOWNS
DAY NURSERY, GREENBROW
ROAD, MANCHESTER, M23 2UH

Client Ref: 4031
Report Ref: GS-XUQ-W3A-L4E-YT7
Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

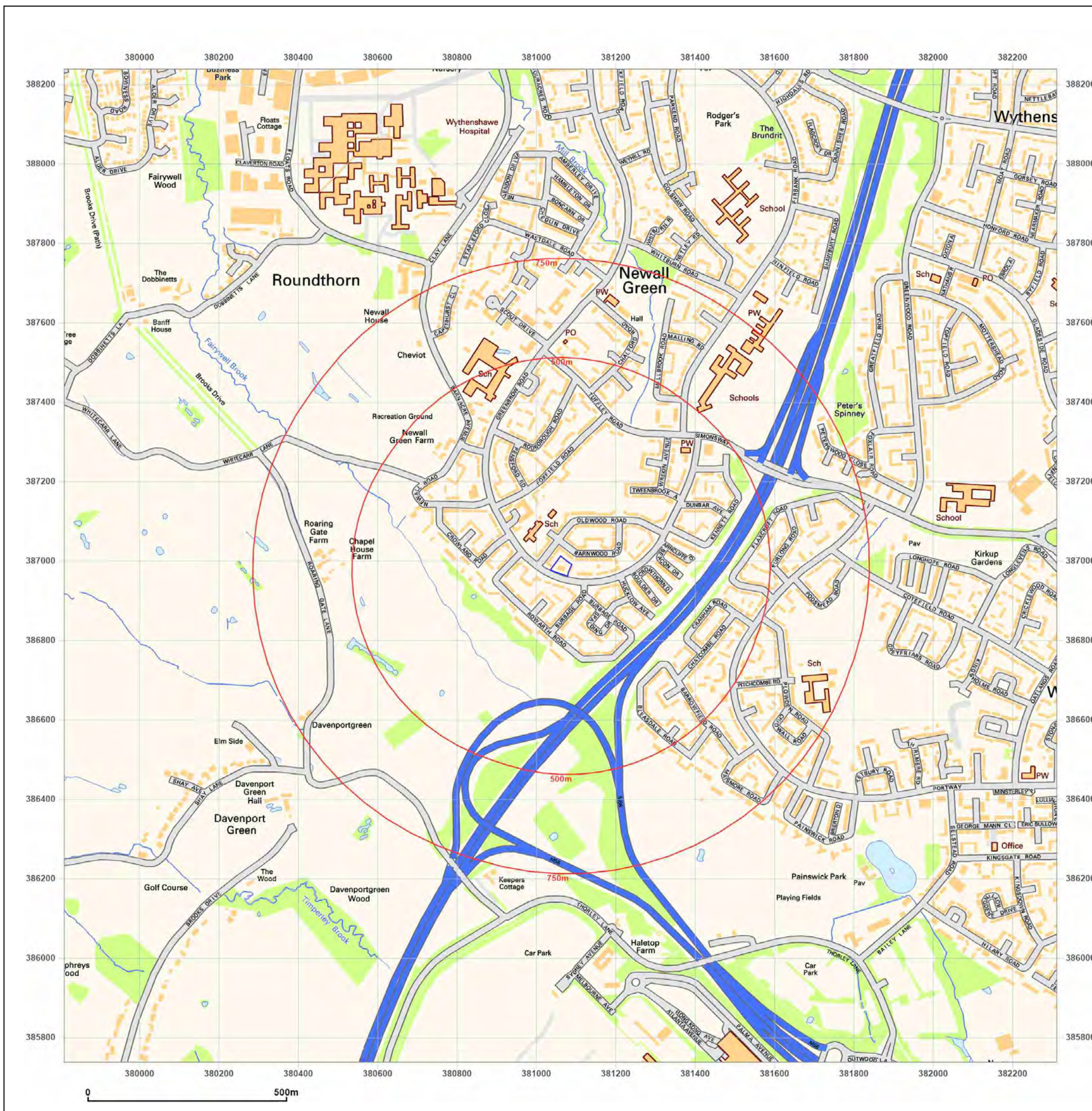


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Site Details:

CLEVER CLOWNS DAY
NURSERY, CLEVER CLOWNS
DAY NURSERY, GREENBROW
ROAD, MANCHESTER, M23 2UH

Client Ref: 4031
Report Ref: GS-XUQ-W3A-L4E-YT7
Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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Site Details:

CLEVER CLOWNS DAY
NURSERY, CLEVER CLOWNS
DAY NURSERY, GREENBROW
ROAD, MANCHESTER, M23 2UH

Client Ref: 4031
Report Ref: GS-XUQ-W3A-L4E-YT7
Grid Ref: 381061, 386988

Map Name: National Grid

Map date: 2023

Scale: 1:10,000

Printed at: 1:10,000

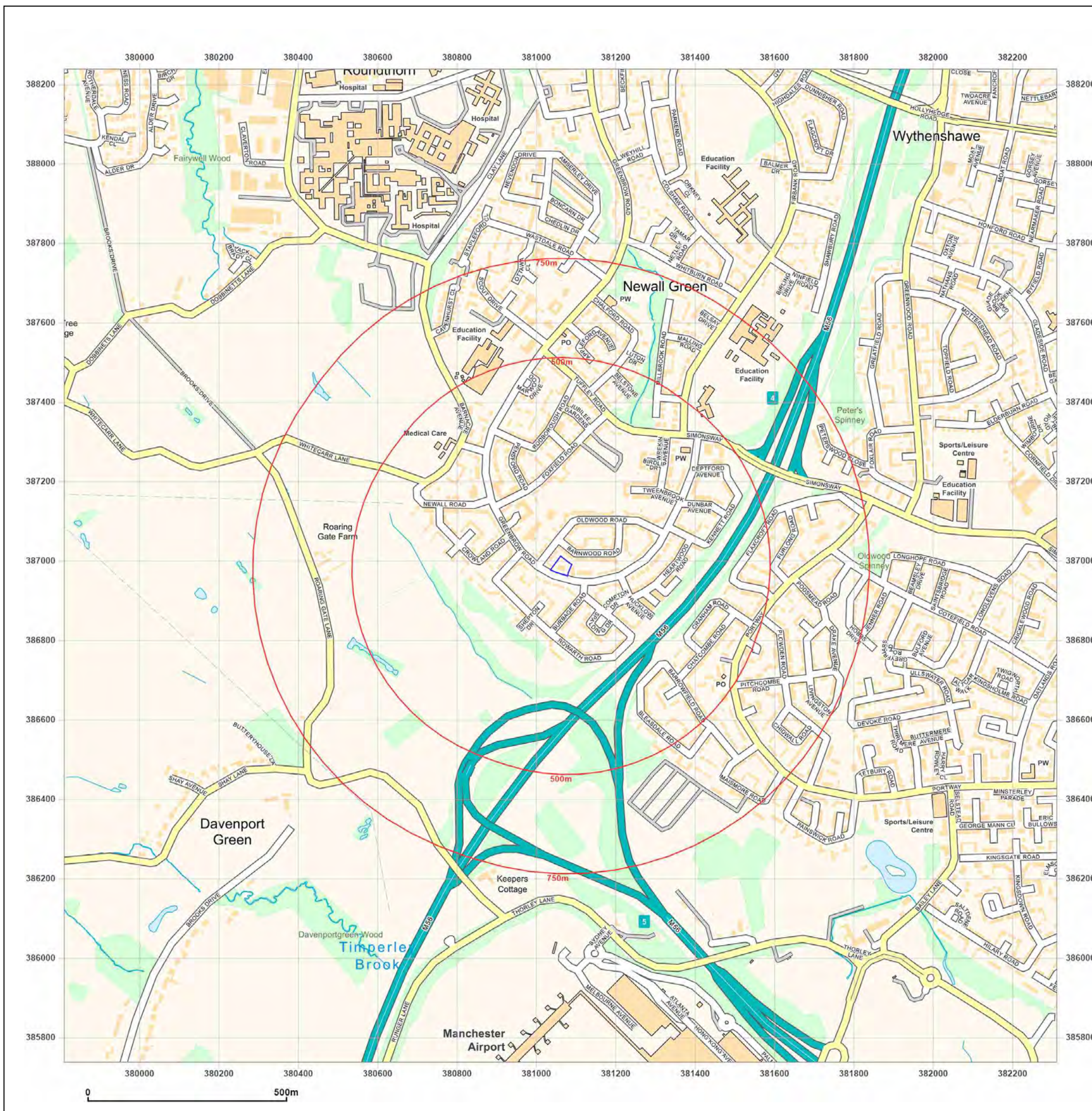


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APPENDIX 5

GROUNDSURE COMBINED ENVIRO + GEO INSIGHT REPORT

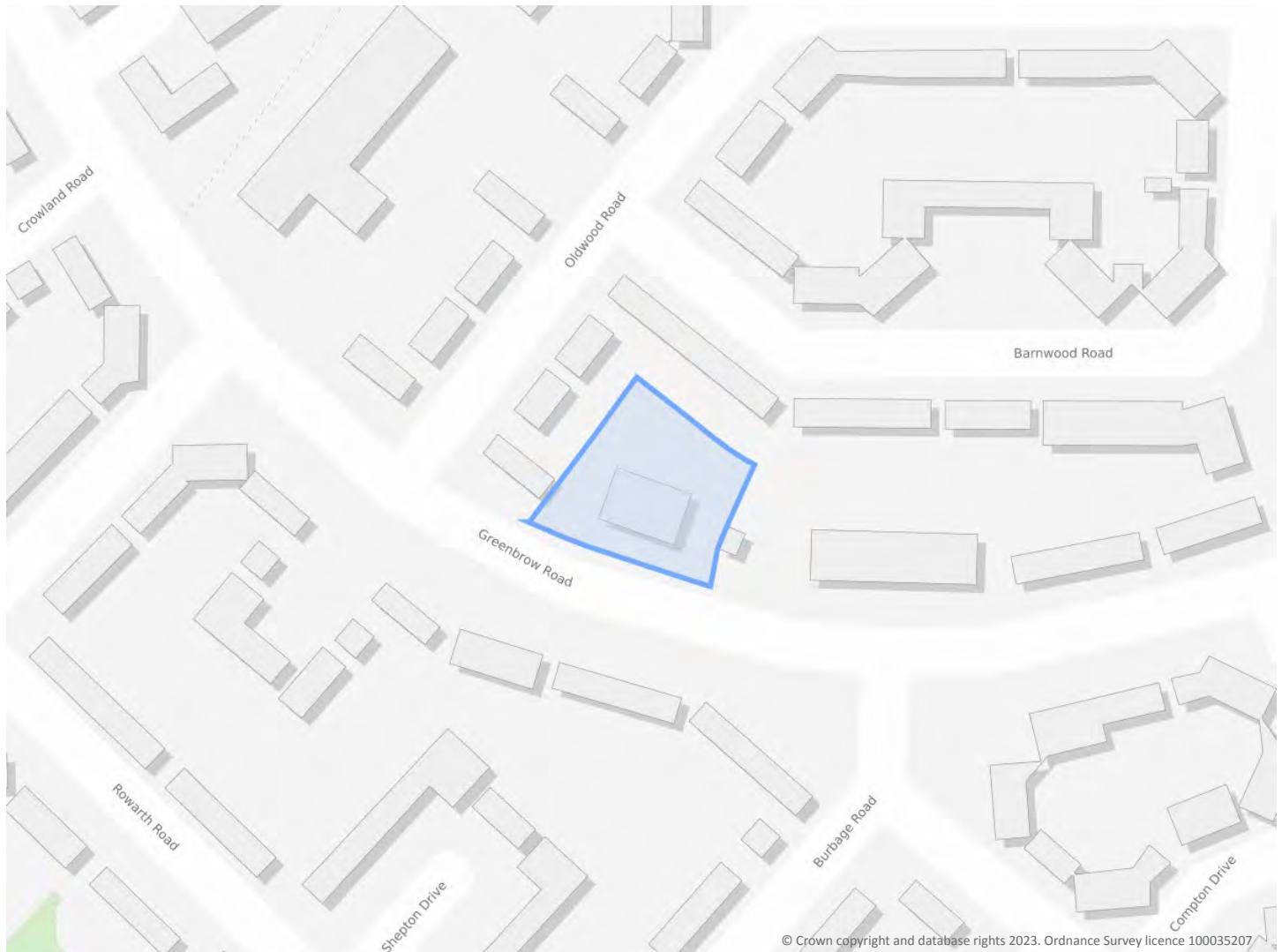
CLEVER CLOWNS DAY NURSERY, CLEVER CLOWNS DAY NURSERY, GREENBROW ROAD, MANCHESTER, M23 2UH

Order Details

Date: 20/10/2023
Your ref: 4031
Our Ref: GS-1Z7-SFO-D4Q-TLB

Site Details

Location: 381067 386991
Area: 0.15 ha
Authority: [Manchester City Council](#) ↗



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Summary of findings

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

[p. 9 >](#)

OS MasterMap site plan

[p.14 >](#) groundsure.com/insightuserguide ↗

Contact us with any questions at:

info@groundsure.com ↗

01273 257 755

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	0	5	8	-
16	1.2	Historical tanks	0	0	0	0	-
16 >	1.3 >	Historical energy features >	1	0	1	1	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	0	0	-
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	7	10	-
19	2.2	Historical tanks	0	0	0	0	-
19 >	2.3 >	Historical energy features >	1	1	2	1	-
20	2.4	Historical petrol stations	0	0	0	0	-
20	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
21	3.1	Active or recent landfill	0	0	0	0	-
21	3.2	Historical landfill (BGS records)	0	0	0	0	-
22	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
22	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
22	3.5	Historical waste sites	0	0	0	0	-
22	3.6	Licensed waste sites	0	0	0	0	-
22 >	3.7 >	Waste exemptions >	0	0	1	0	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
24 >	4.1 >	Recent industrial land uses >	0	1	2	-	-
25	4.2	Current or recent petrol stations	0	0	0	0	-
25	4.3	Electricity cables	0	0	0	0	-
25	4.4	Gas pipelines	0	0	0	0	-
25	4.5	Sites determined as Contaminated Land	0	0	0	0	-



25	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
26	4.7	Regulated explosive sites	0	0	0	0	-
26	4.8	Hazardous substance storage/usage	0	0	0	0	-
26	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
26	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
26	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
27	4.12	Radioactive Substance Authorisations	0	0	0	0	-
27	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
27	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
27	4.15	Pollutant release to public sewer	0	0	0	0	-
27	4.16	List 1 Dangerous Substances	0	0	0	0	-
28	4.17	List 2 Dangerous Substances	0	0	0	0	-
28	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
28	4.19	Pollution inventory substances	0	0	0	0	-
28	4.20	Pollution inventory waste transfers	0	0	0	0	-
28	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology >	On site	0-50m	50-250m	250-500m	500-2000m
29 >	5.1 >	Superficial aquifer >	Identified (within 500m)				
30 >	5.2 >	Bedrock aquifer >	Identified (within 500m)				
31 >	5.3 >	Groundwater vulnerability >	Identified (within 50m)				
32	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
33	5.5	Groundwater vulnerability- local information	None (within 0m)				
34	5.6	Groundwater abstractions	0	0	0	0	0
35 >	5.7 >	Surface water abstractions >	0	0	0	0	5
36	5.8	Potable abstractions	0	0	0	0	0
36	5.9	Source Protection Zones	0	0	0	0	-
37	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
38	6.1	Water Network (OS MasterMap)	0	0	0	-	-



38	6.2	Surface water features	0	0	0	-	-
39 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
39 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
40 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
41	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
41	7.2	Historical Flood Events	0	0	0	-	-
41	7.3	Flood Defences	0	0	0	-	-
42	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
42	7.5	Flood Storage Areas	0	0	0	-	-
43	7.6	Flood Zone 2	None (within 50m)				
43	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
44	8.1	Surface water flooding	Negligible (within 50m)				
Page	Section	Groundwater flooding >					
45 >	9.1 >	Groundwater flooding >	Low (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
46	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
47	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
47	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
47	10.4	Special Protection Areas (SPA)	0	0	0	0	0
47	10.5	National Nature Reserves (NNR)	0	0	0	0	0
48	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
48 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	1
48	10.8	Biosphere Reserves	0	0	0	0	0
48	10.9	Forest Parks	0	0	0	0	0
49	10.10	Marine Conservation Zones	0	0	0	0	0
49 >	10.11 >	Green Belt >	0	0	1	1	0
49	10.12	Proposed Ramsar sites	0	0	0	0	0



49	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
50	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
50	10.15	Nitrate Sensitive Areas	0	0	0	0	0
50	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
51 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
52	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
53	11.1	World Heritage Sites	0	0	0	-	-
53	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
53	11.3	National Parks	0	0	0	-	-
53	11.4	Listed Buildings	0	0	0	-	-
54	11.5	Conservation Areas	0	0	0	-	-
54	11.6	Scheduled Ancient Monuments	0	0	0	-	-
54	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
55 >	12.1 >	Agricultural Land Classification >	Grade 3 (within 250m)				
56	12.2	Open Access Land	0	0	0	-	-
56 >	12.3 >	Tree Felling Licences >	0	0	7	-	-
56	12.4	Environmental Stewardship Schemes	0	0	0	-	-
57	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
58	13.1	Priority Habitat Inventory	0	0	0	-	-
58	13.2	Habitat Networks	0	0	0	-	-
58	13.3	Open Mosaic Habitat	0	0	0	-	-
58	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
59 >	14.1 >	10k Availability >	Identified (within 500m)				
60	14.2	Artificial and made ground (10k)	0	0	0	0	-
61 >	14.3 >	Superficial geology (10k) >	1	0	0	0	-

62	14.4	Landslip (10k)	0	0	0	0	-
63 >	14.5 >	Bedrock geology (10k) >	1	0	0	0	-
64	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
65 >	15.1 >	50k Availability >	Identified (within 500m)				
66	15.2	Artificial and made ground (50k)	0	0	0	0	-
66	15.3	Artificial ground permeability (50k)	0	0	-	-	-
67 >	15.4 >	Superficial geology (50k) >	1	0	0	0	-
68 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
68	15.6	Landslip (50k)	0	0	0	0	-
68	15.7	Landslip permeability (50k)	None (within 50m)				
69 >	15.8 >	Bedrock geology (50k) >	1	0	0	0	-
70 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
70	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
71 >	16.1 >	BGS Boreholes >	0	0	3	-	-
Page	Section	Natural ground subsidence >					
73 >	17.1 >	Shrink swell clays >	Very low (within 50m)				
74 >	17.2 >	Running sands >	Very low (within 50m)				
75 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
76 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
77 >	17.5 >	Landslides >	Very low (within 50m)				
78 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
80	18.1	BritPits	0	0	0	0	-
81 >	18.2 >	Surface ground workings >	0	0	6	-	-
81	18.3	Underground workings	0	0	0	0	0
81	18.4	Underground mining extents	0	0	0	0	-
82	18.5	Historical Mineral Planning Areas	0	0	0	0	-



82	18.6	Non-coal mining	0	0	0	0	0
82	18.7	JPB mining areas	None (within 0m)				
82	18.8	The Coal Authority non-coal mining	0	0	0	0	-
83	18.9	Researched mining	0	0	0	0	-
83	18.10	Mining record office plans	0	0	0	0	-
83	18.11	BGS mine plans	0	0	0	0	-
83	18.12	Coal mining	None (within 0m)				
83	18.13	Brine areas	None (within 0m)				
84	18.14	Gypsum areas	None (within 0m)				
84	18.15	Tin mining	None (within 0m)				
84	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
85	19.1	Natural cavities	0	0	0	0	-
85	19.2	Mining cavities	0	0	0	0	0
85	19.3	Reported recent incidents	0	0	0	0	-
85	19.4	Historical incidents	0	0	0	0	-
86	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
87 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
89 >	21.1 >	BGS Estimated Background Soil Chemistry >	2	4	-	-	-
89	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
90	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects >	On site	0-50m	50-250m	250-500m	500-2000m
91	22.1	Underground railways (London)	0	0	0	-	-
91	22.2	Underground railways (Non-London)	0	0	0	-	-
92	22.3	Railway tunnels	0	0	0	-	-
92	22.4	Historical railway and tunnel features	0	0	0	-	-
92	22.5	Royal Mail tunnels	0	0	0	-	-



92	22.6	Historical railways	0	0	0	-	-
92	22.7	Railways	0	0	0	-	-
93	22.8	Crossrail 1	0	0	0	0	-
93	22.9	Crossrail 2	0	0	0	0	-
<u>93</u> >	<u>22.10</u> >	<u>HS2</u> >	0	0	1	2	-

Recent aerial photograph



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Capture Date: 22/04/2019

Site Area: 0.15ha



Recent site history - 2016 aerial photograph



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Capture Date: 21/04/2016

Site Area: 0.15ha



Recent site history - 2009 aerial photograph



Capture Date: 02/06/2009

Site Area: 0.15ha



Recent site history - 2005 aerial photograph



Capture Date: 15/05/2005

Site Area: 0.15ha



Recent site history - 2000 aerial photograph



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Capture Date: 27/06/2000

Site Area: 0.15ha

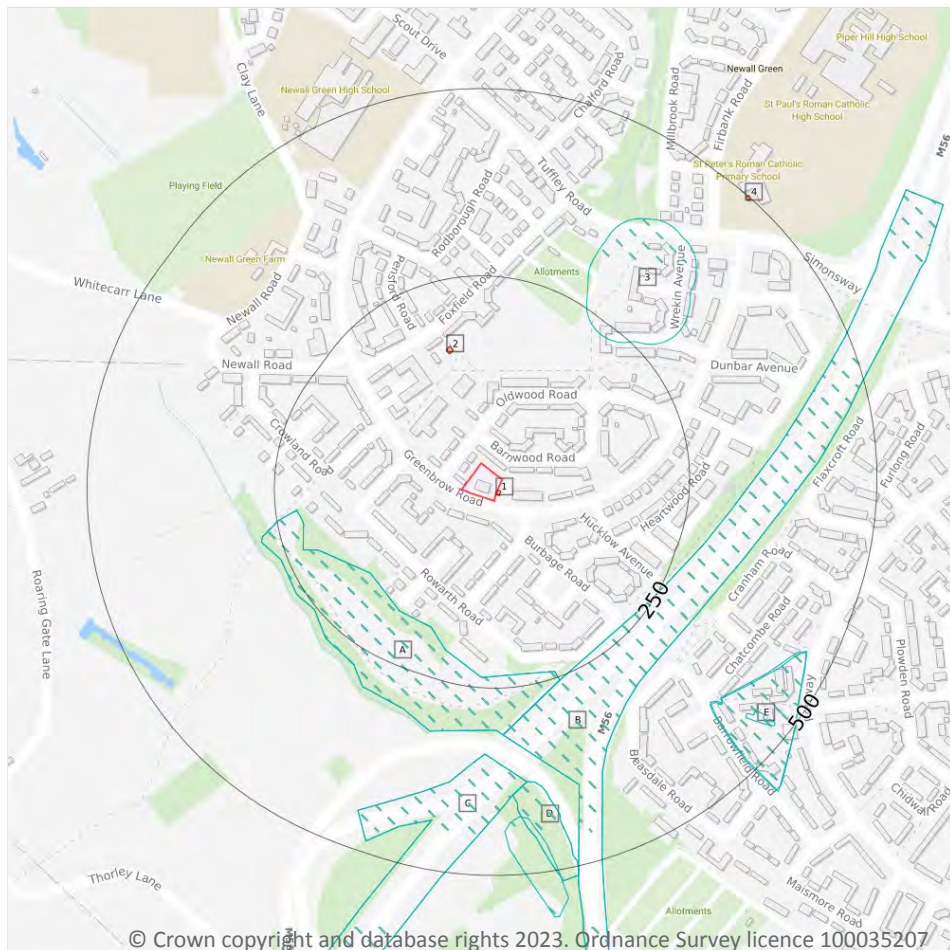


This map shows the Children's Nursery area in the City of London. The nursery building is highlighted in orange and labeled "Childrens Nursery". It is situated near the "Shelter" and "ESS" (East London School of Education). The map includes surrounding streets, buildings, and green spaces. A red line indicates the boundary of the nursery area. A scale bar shows a distance of 12.5 meters. A north arrow is located in the top right corner. The map is overlaid with a grid of numbers, likely representing street addresses or plot numbers.

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1 Past land use



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

1.1 Historical industrial land uses

Records within 500m

13

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

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

ID	Location	Land use	Dates present	Group ID
A	165m SW	Unspecified Heap	1989 - 1995	894531



ID	Location	Land use	Dates present	Group ID
A	165m SW	Unspecified Heap	1975	920360
3	233m NE	Unspecified Mill	1967	810330
B	237m SE	Cuttings	1989 - 1995	852650
B	237m SE	Cuttings	1975	935711
C	338m S	Cuttings	1989 - 1995	879675
C	338m S	Cuttings	1975	941588
D	378m S	Unspecified Heap	1989	872100
D	378m S	Unspecified Heap	1975	954193
E	394m SE	Isolation Hospital	1938	864109
E	396m SE	Isolation Hospital	1907	991484
D	423m S	Unspecified Heap	1995	979977
E	440m SE	Isolation Hospital	1907	867963

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

3

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

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



ID	Location	Land use	Dates present	Group ID
1	On site	Electricity Substation	1974 - 1995	69653
2	152m N	Electricity Substation	1960 - 1995	84530
4	496m NE	Electricity Substation	1995	61819

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

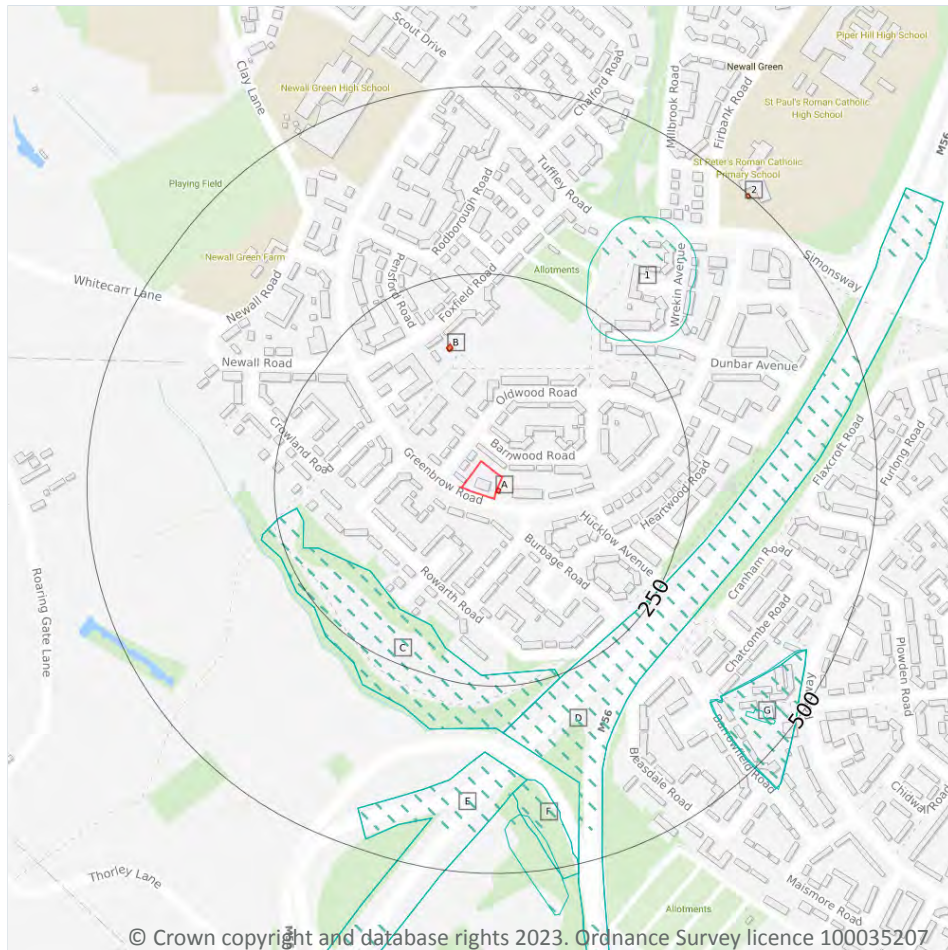
0

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

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



2 Past land use - un-grouped



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

2.1 Historical industrial land uses

Records within 500m

17

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
C	165m SW	Unspecified Heap	1995	894531
C	165m SW	Unspecified Heap	1975	920360
C	165m SW	Unspecified Heap	1989	894531



ID	Location	Land Use	Date	Group ID
1	233m NE	Unspecified Mill	1967	810330
D	237m SE	Cuttings	1995	852650
D	237m SE	Cuttings	1975	935711
D	237m SE	Cuttings	1989	852650
E	338m S	Cuttings	1995	879675
E	338m S	Cuttings	1975	941588
E	338m S	Cuttings	1989	879675
F	378m S	Unspecified Heap	1975	954193
F	378m S	Unspecified Heap	1989	872100
G	394m SE	Isolation Hospital	1938	864109
G	396m SE	Isolation Hospital	1907	991484
G	396m SE	Isolation Hospital	1907	991484
F	423m S	Unspecified Heap	1995	979977
G	440m SE	Isolation Hospital	1907	867963

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

5

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
A	On site	Electricity Substation	1974	69653
A	0m SE	Electricity Substation	1995	69653
B	152m N	Electricity Substation	1960	84530
B	153m N	Electricity Substation	1995	84530
2	496m NE	Electricity Substation	1995	61819

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m **0**

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

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

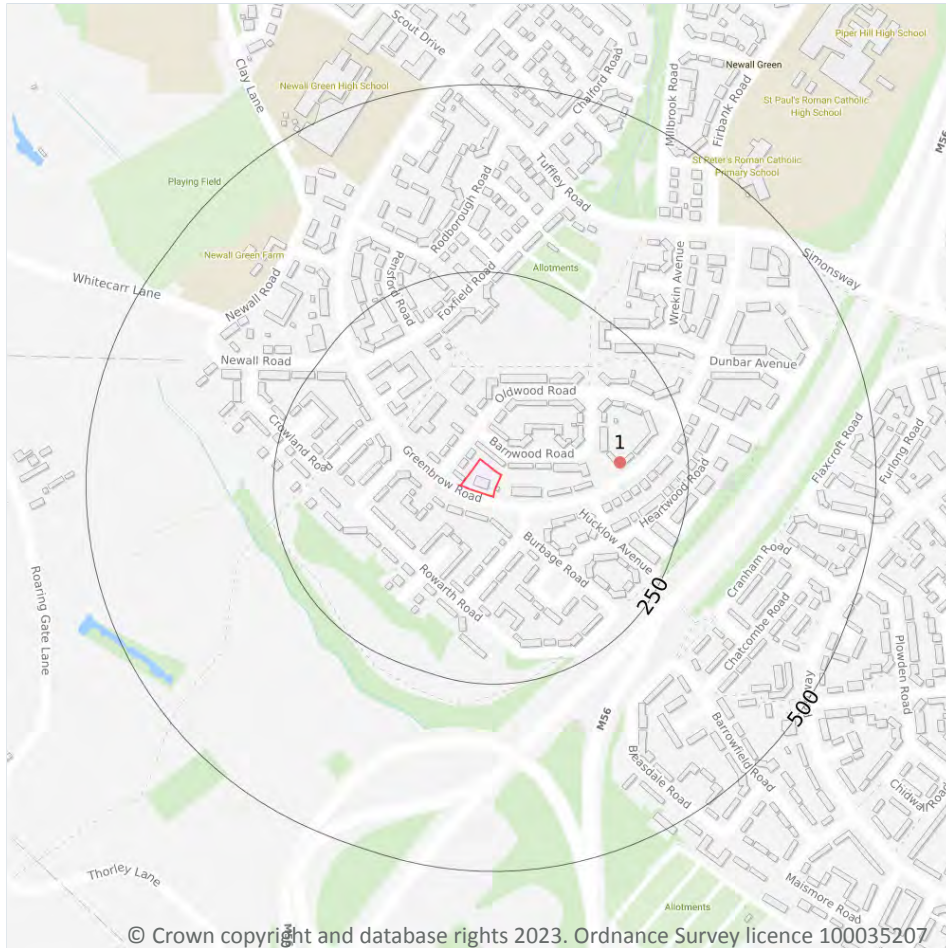
Records within 500m **0**

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

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



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

3.1 Active or recent landfill

Records within 500m

0

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

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

3.2 Historical landfill (BGS records)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m**0**

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

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

3.4 Historical landfill (EA/NRW records)

Records within 500m**0**

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

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

3.5 Historical waste sites

Records within 500m**0**

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

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

3.6 Licensed waste sites

Records within 500m**0**

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

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

3.7 Waste exemptions

Records within 500m**1**

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.

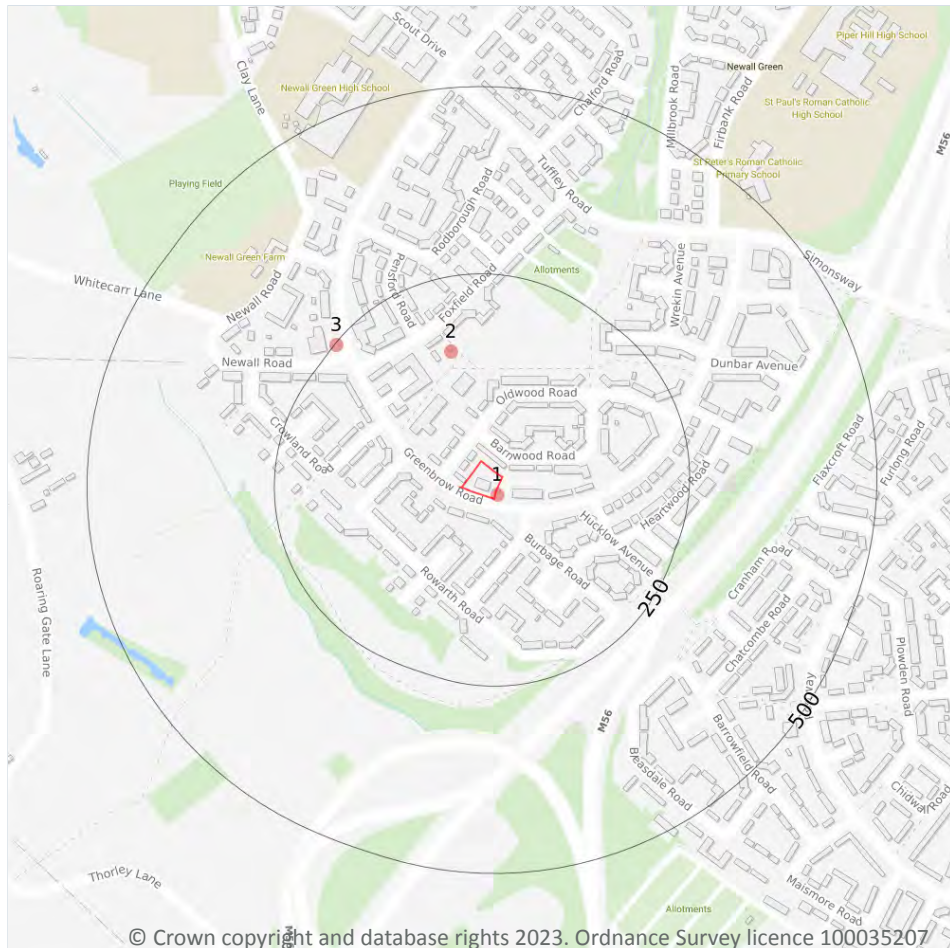
Features are displayed on the Waste and landfill map on [page 21](#) >

ID	Location	Site	Reference	Category	Sub-Category	Description
1	159m E	Lovell Partnerships, New Housing site., Greenbrow Road, Wythenshaw, M23 2ZA	WEX085139	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



— Site Outline
Search buffers in metres (m)
● Recent industrial land uses

4.1 Recent industrial land uses

Records within 250m

3

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 24](#) >

ID	Location	Company	Address	Activity	Category
1	3m SE	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities
2	151m N	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities
3	248m NW	Mast	Greater Manchester, M23	Telecommunications 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**0**

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

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

4.19 Pollution inventory substances

Records within 500m**0**

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

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

4.20 Pollution inventory waste transfers

Records within 500m**0**

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

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

4.21 Pollution inventory radioactive waste

Records within 500m**0**

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

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



5 Hydrogeology - Superficial aquifer



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

5.1 Superficial aquifer

Records within 500m

1

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 29 >](#)

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

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

1

Aquifer status of groundwater held within bedrock geology.

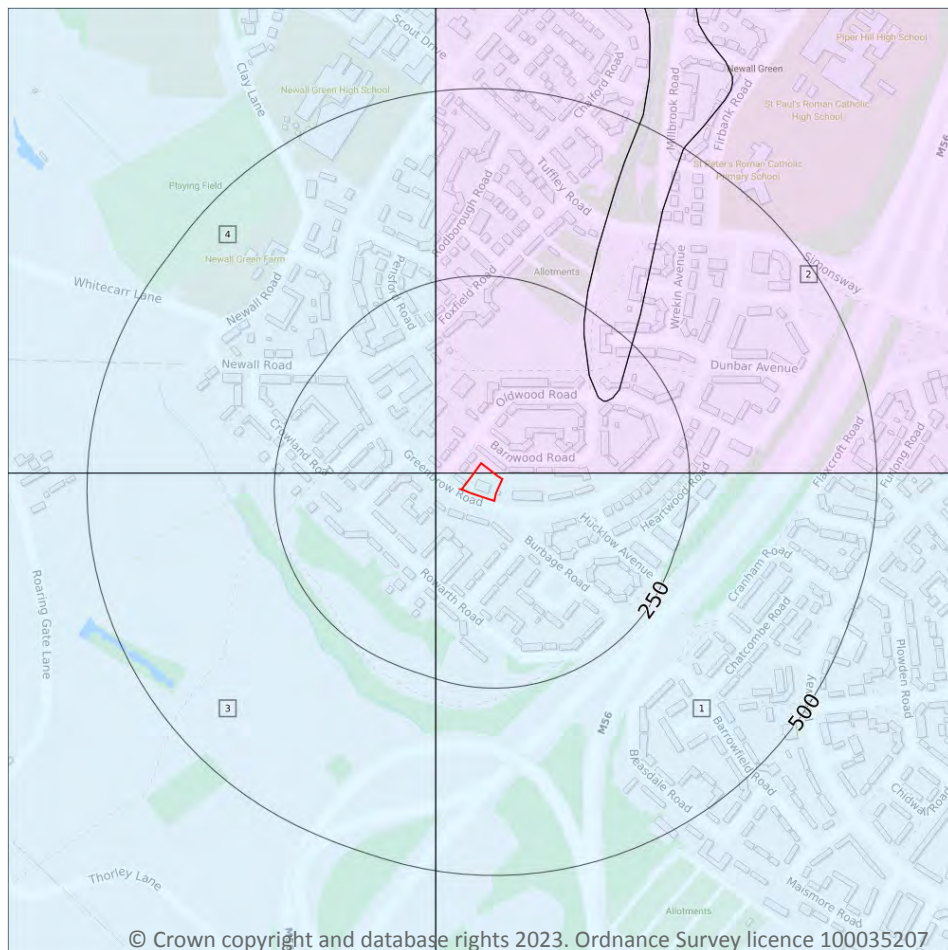
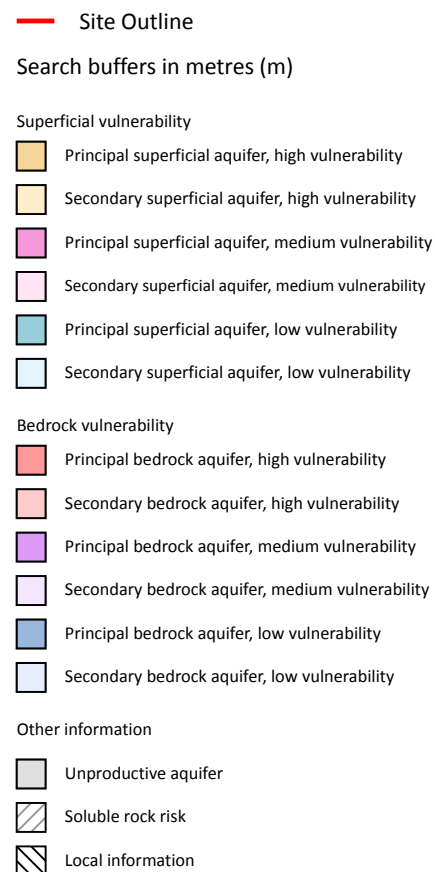
Features are displayed on the Bedrock aquifer map on [page 30](#) >

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

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

4

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 31](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
3	34m W	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
4	40m W	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures

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

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

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

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



5.5 Groundwater vulnerability- local information

Records on site

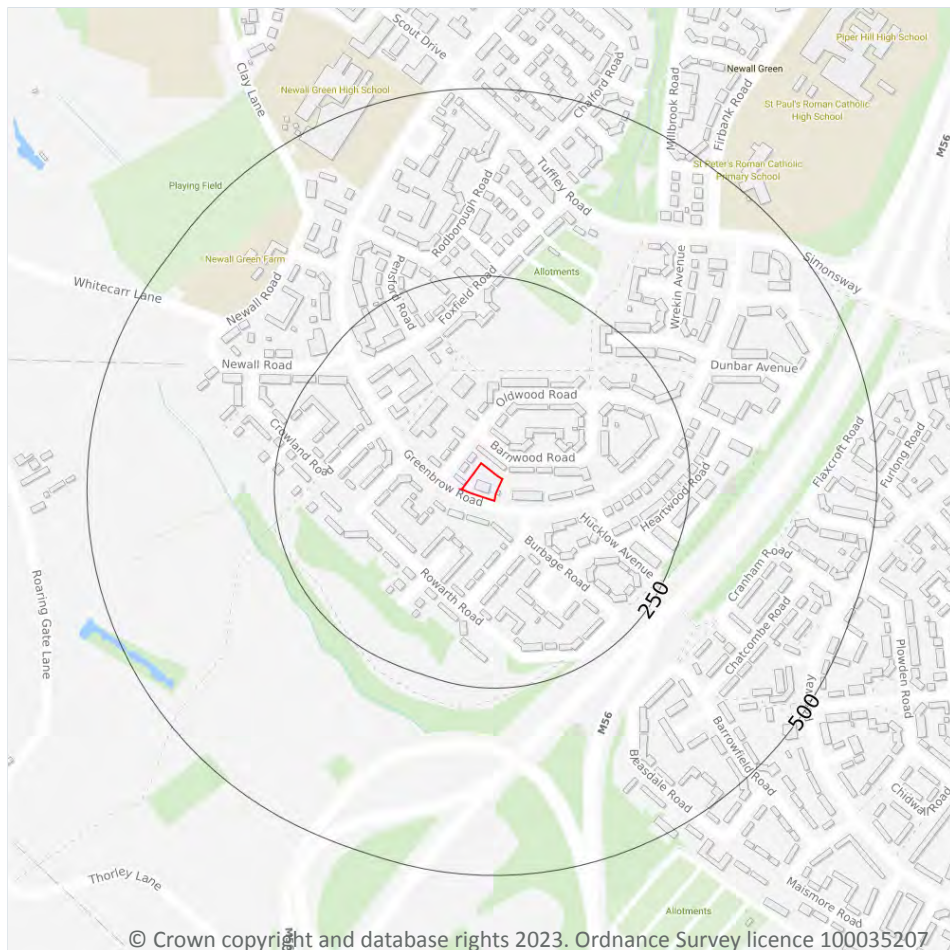
0

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

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



Abstractions and Source Protection Zones



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

5.6 Groundwater abstractions

Records within 2000m

0

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

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

5.7 Surface water abstractions

Records within 2000m

5

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

Features are displayed on the Abstractions and Source Protection Zones map on [page 34 >](#)

ID	Location	Details	
-	1730m SW	Status: Historical Licence No: 2569017036/R1 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: UNDERGROUND STORAGE TANK FED BY LOCAL SURFACE DRAINAGE Data Type: Point Name: RINGWAY GOLF CLUB LIMITED Easting: 379536 Northing: 386114	Annual Volume (m ³): 5000 Max Daily Volume (m ³): 71.5 Original Application No: - Original Start Date: 28/04/2004 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 28/04/2004 Version End Date: -
-	1730m SW	Status: Historical Licence No: 2569017036/R02 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: UNDERGROUND STORAGE TANK FED BY LOCAL SURFACE DRAINAGE Data Type: Point Name: RINGWAY GOLF CLUB LIMITED Easting: 379536 Northing: 386114	Annual Volume (m ³): 5000 Max Daily Volume (m ³): 60 Original Application No: NPS/WR/020466 Original Start Date: 01/04/2018 Expiry Date: 31/03/2030 Issue No: 1 Version Start Date: 01/04/2018 Version End Date: -
-	1768m SW	Status: Historical Licence No: 2569017036 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: UNDERGROUND STORAGE TANK FED BY LOCAL SURFACE DRAINAGE Data Type: Point Name: THE SECRETARY Easting: 379500 Northing: 386100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 13/07/1999 Expiry Date: 12/07/2004 Issue No: 1 Version Start Date: 13/07/1999 Version End Date: -



ID	Location	Details	
-	1768m SW	Status: Historical Licence No: 2569017036/R1 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: UNDERGROUND STORAGE TANK FED BY LOCAL SURFACE DRAINAGE Data Type: Point Name: RINGWAY GOLF CLUB LIMITED Easting: 379500 Northing: 386100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/04/2004 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 28/04/2004 Version End Date: -
-	1768m SW	Status: Historical Licence No: 2569017036/R1 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: UNDERGROUND STORAGE TANK FED BY LOCAL SURFACE DRAINAGE Data Type: Point Name: RINGWAY GOLF CLUB LIMITED Easting: 379500 Northing: 386100	Annual Volume (m ³): 5000 Max Daily Volume (m ³): 71.5 Original Application No: - Original Start Date: 28/04/2004 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 28/04/2004 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m	0
-----------------------------	----------

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

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

5.9 Source Protection Zones

Records within 500m	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

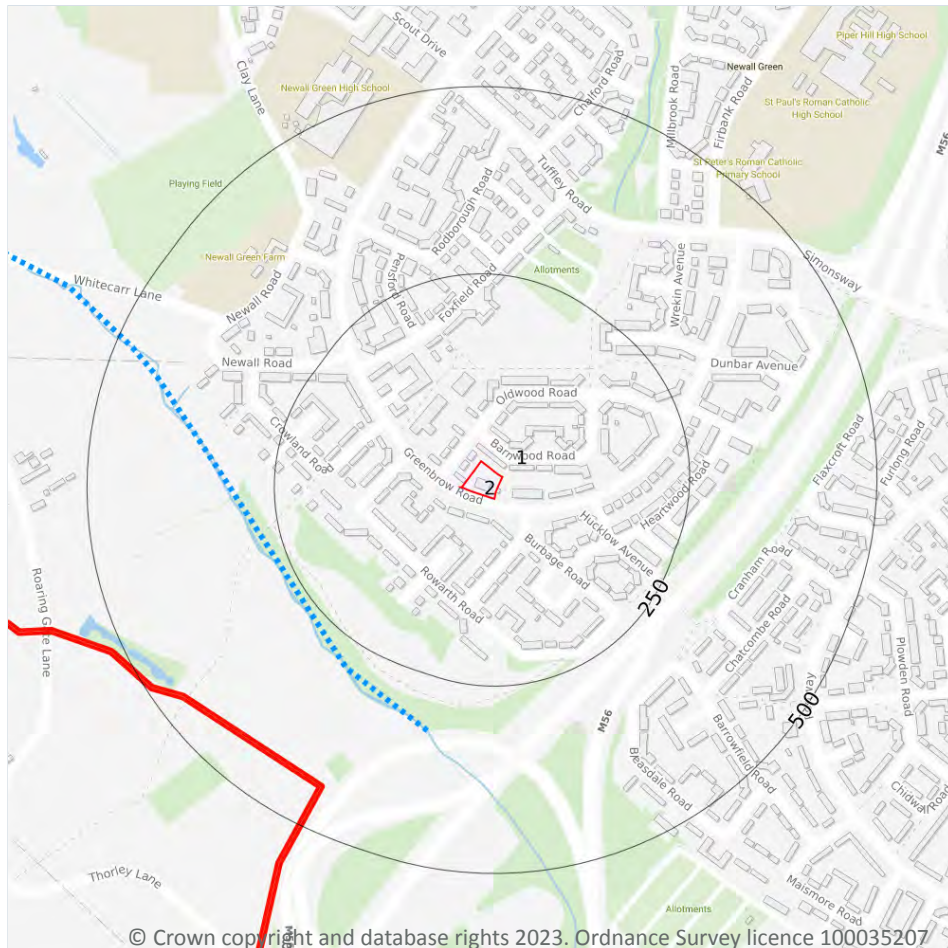
0

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

0

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

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

0

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.



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 38](#) >

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

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

6.4 WFD Surface water bodies

Records identified	1
--------------------	---

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

Features are displayed on the Hydrology map on [page 38](#) >

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
3	260m SW	River	Sinderland Brook (Fairywell Bk and Baguley Bk)	GB112069061270 ↗	Moderate	Fail	Moderate	2019

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



6.5 WFD Groundwater bodies

Records on site

1

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

Features are displayed on the Hydrology map on [page 38](#) >

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

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



7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m

0

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

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

7.2 Historical Flood Events

Records within 250m

0

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

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

7.3 Flood Defences

Records within 250m

0

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

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



7.4 Areas Benefiting from Flood Defences

Records within 250m

0

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

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

7.5 Flood Storage Areas

Records within 250m

0

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

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



River and coastal flooding - Flood Zones

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

Low

Highest risk within 50m

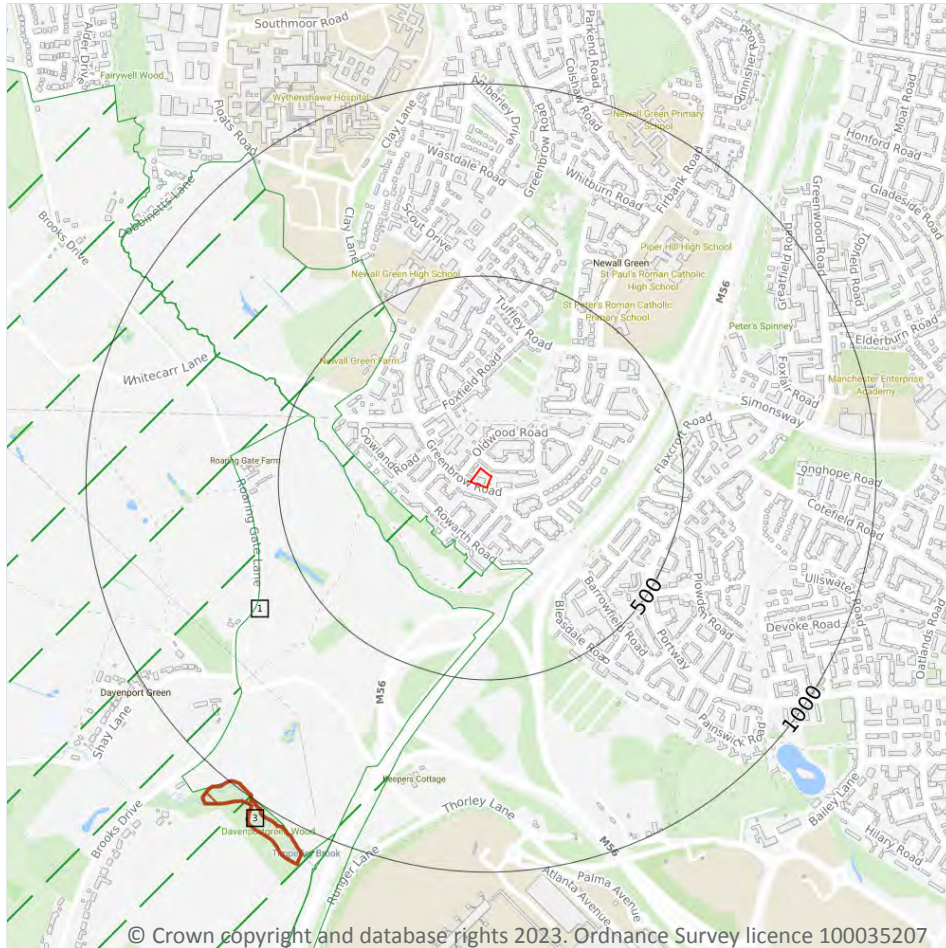
Low

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

Features are displayed on the Groundwater flooding map on [page 45 >](#)

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Designated Ancient Woodland
- Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m**0**

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

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

10.5 National Nature Reserves (NNR)

Records within 2000m**0**

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

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

10.6 Local Nature Reserves (LNR)

Records within 2000m**0**

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

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

10.7 Designated Ancient Woodland

Records within 2000m**1**

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 46 >](#)

ID	Location	Name	Woodland Type
3	988m SW	Davenport Green Wood	Ancient & Semi-Natural Woodland

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

10.8 Biosphere Reserves

Records within 2000m**0**

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

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

10.9 Forest Parks

Records within 2000m**0**

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

This data is sourced from the Forestry Commission.



10.10 Marine Conservation Zones

Records within 2000m

0

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

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

10.11 Green Belt

Records within 2000m

2

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

Features are displayed on the Environmental designations map on [page 46 >](#)

ID	Location	Name	Local Authority name
1	144m SW	Merseyside and Greater Manchester	Manchester
2	456m W	Merseyside and Greater Manchester	Trafford

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

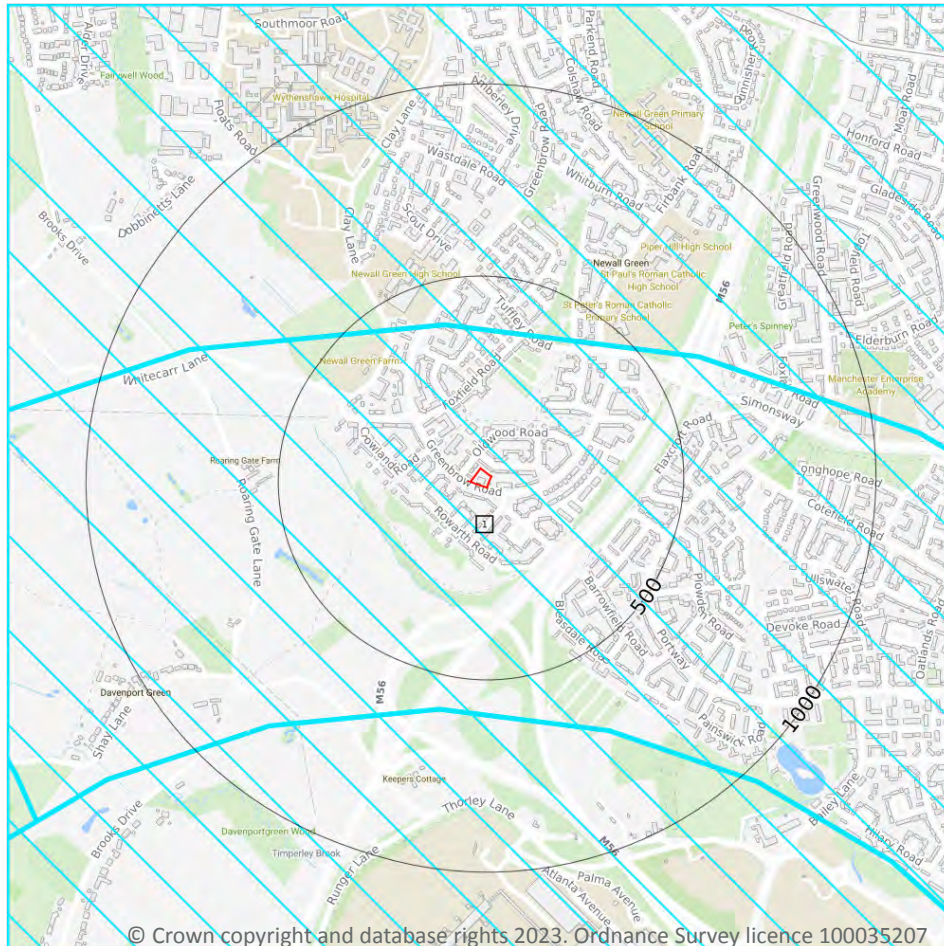
Records within 2000m

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 51](#) >

ID	Location	Type of developments requiring consultation
1	On site	<p>Infrastructure - Airports, helipads and other aviation proposals.</p> <p>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.</p> <p>Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t.</p> <p>Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion</p>

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	0
----------------------	---

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

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

11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m

0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

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

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

11.3 National Parks

Records within 250m

0

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

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

11.4 Listed Buildings

Records within 250m

0

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



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

11.5 Conservation Areas

Records within 250m

0

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

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

11.6 Scheduled Ancient Monuments

Records within 250m

0

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

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

11.7 Registered Parks and Gardens

Records within 250m

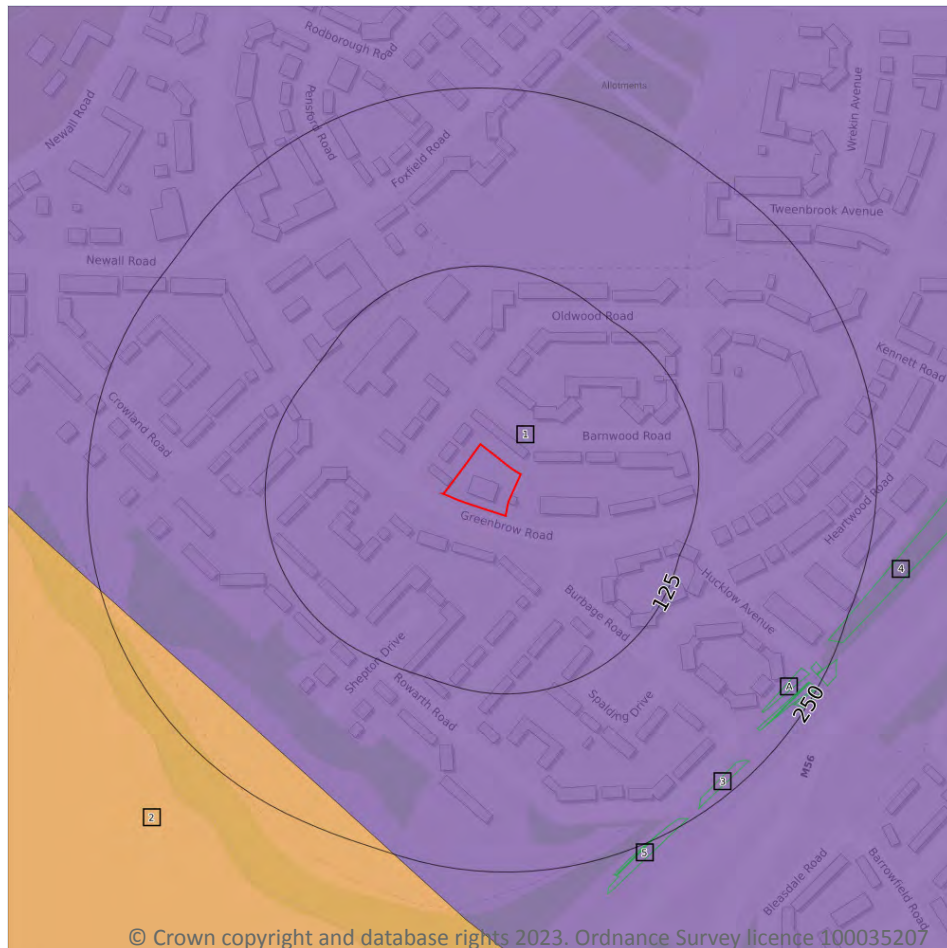
0

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

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



12 Agricultural designations



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

12.1 Agricultural Land Classification

Records within 250m

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 55](#) >

ID	Location	Classification	Description
1	On site	Urban	-
2	211m SW	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

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

7

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.

Features are displayed on the Agricultural designations map on [page 55 >](#)

ID	Location	Description	Reference	Application date
A	226m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
A	231m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
3	237m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
A	239m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
A	242m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
4	243m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
5	245m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

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

This data is sourced from Natural England.



12.5 Countryside Stewardship Schemes

Records within 250m

0

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

This data is sourced from Natural England.



13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m

0

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

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m

0

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

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

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

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

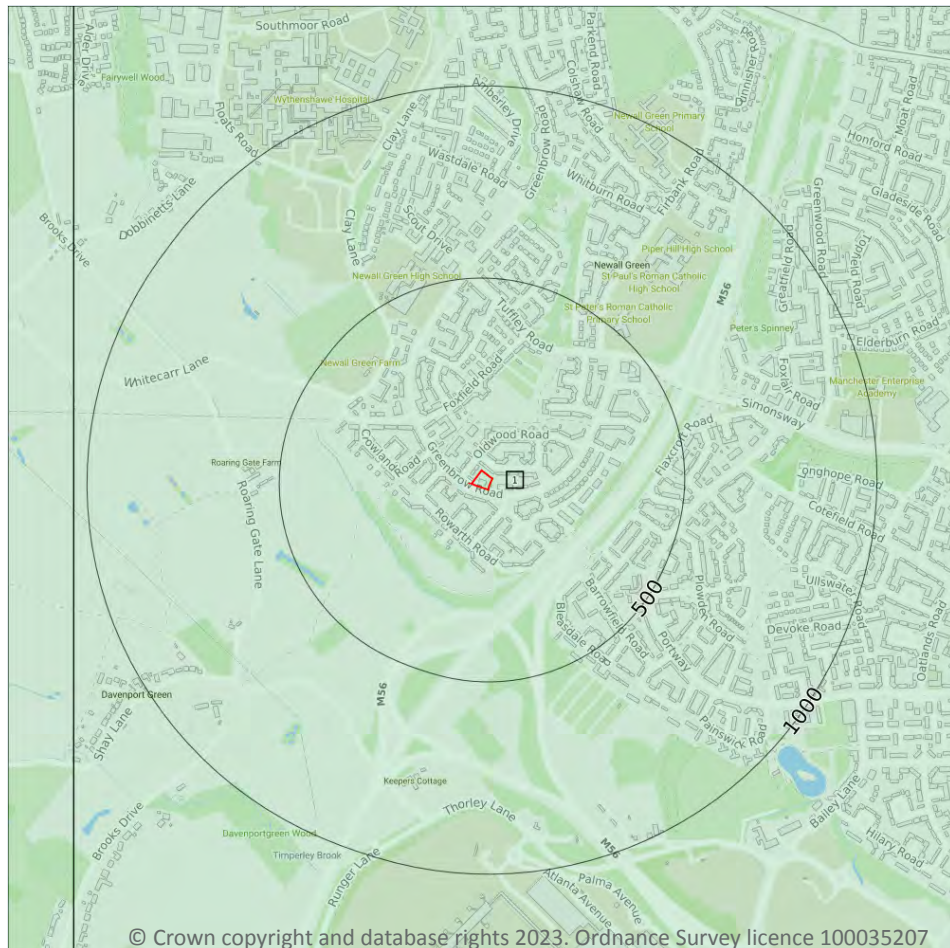
0

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

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

1

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

Features are displayed on the Geology 1:10,000 scale - Availability map on [page 59](#) >

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

This data is sourced from the British Geological Survey.



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

14.2 Artificial and made ground (10k)

Records within 500m

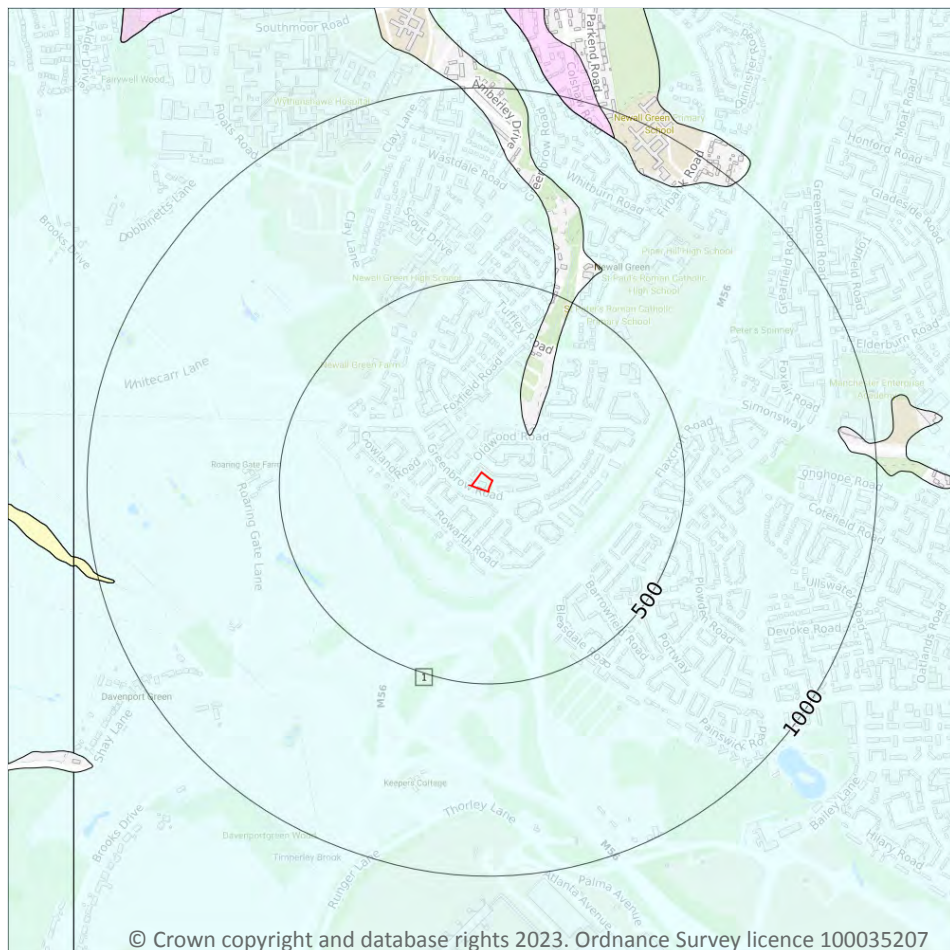
0

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

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

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

14.3 Superficial geology (10k)

Records within 500m

1

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

Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 61](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton

This data is sourced from the British Geological Survey.



14.4 Landslip (10k)

Records within 500m

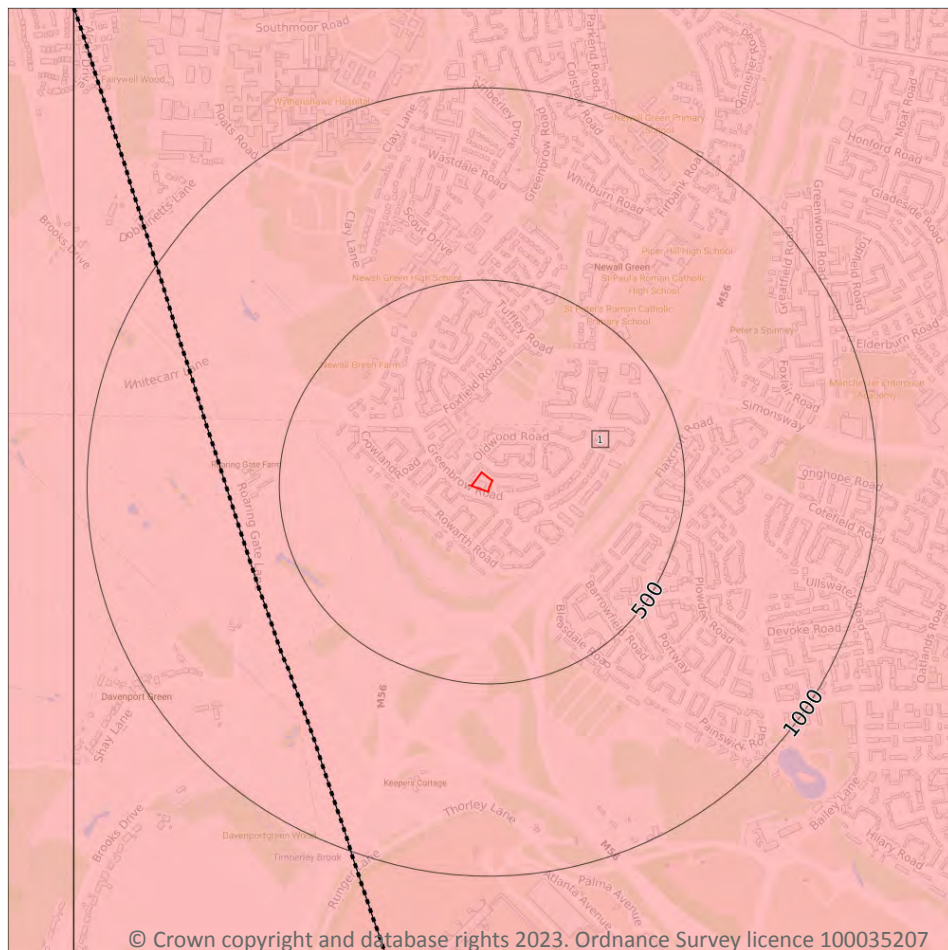
0

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

1

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 63](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	BOM-MDST	Bollin Mudstone Member - Mudstone	Anisian Age

This data is sourced from the British Geological Survey.



14.6 Bedrock faults and other linear features (10k)

Records within 500m

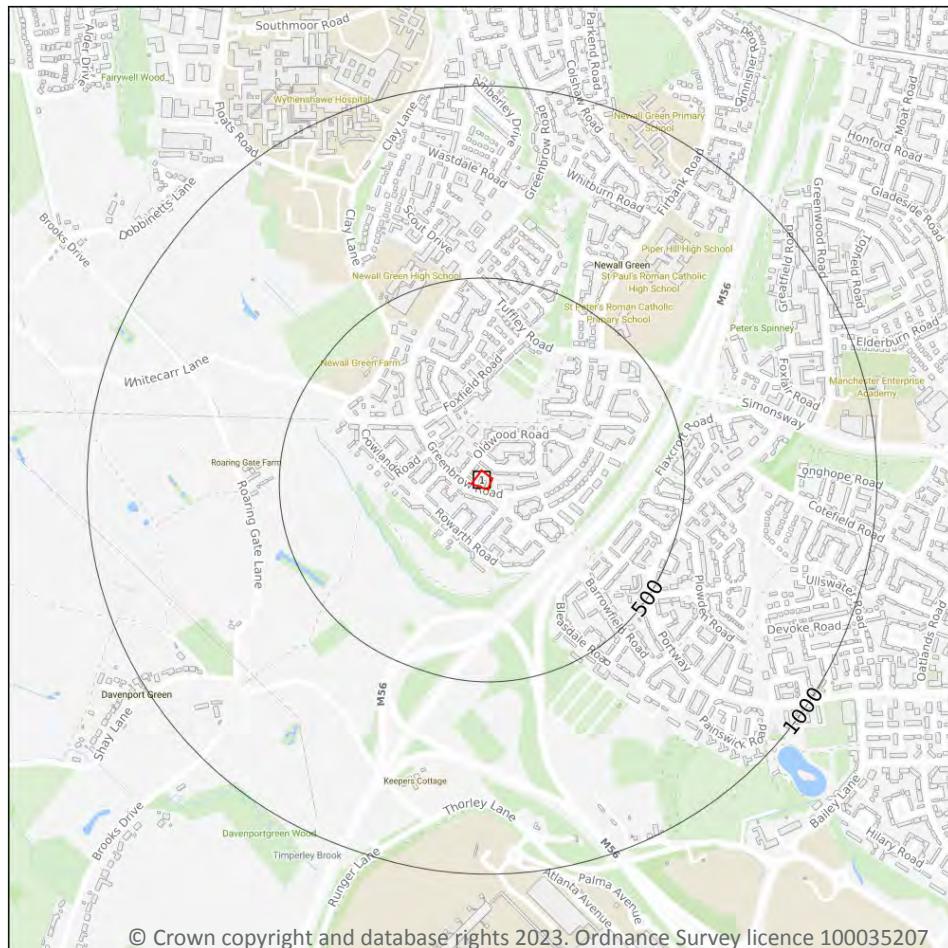
0

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

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline
Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

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

Features are displayed on the Geology 1:50,000 scale - Availability map on [page 65](#) >

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

This data is sourced from the British Geological Survey.



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

15.2 Artificial and made ground (50k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

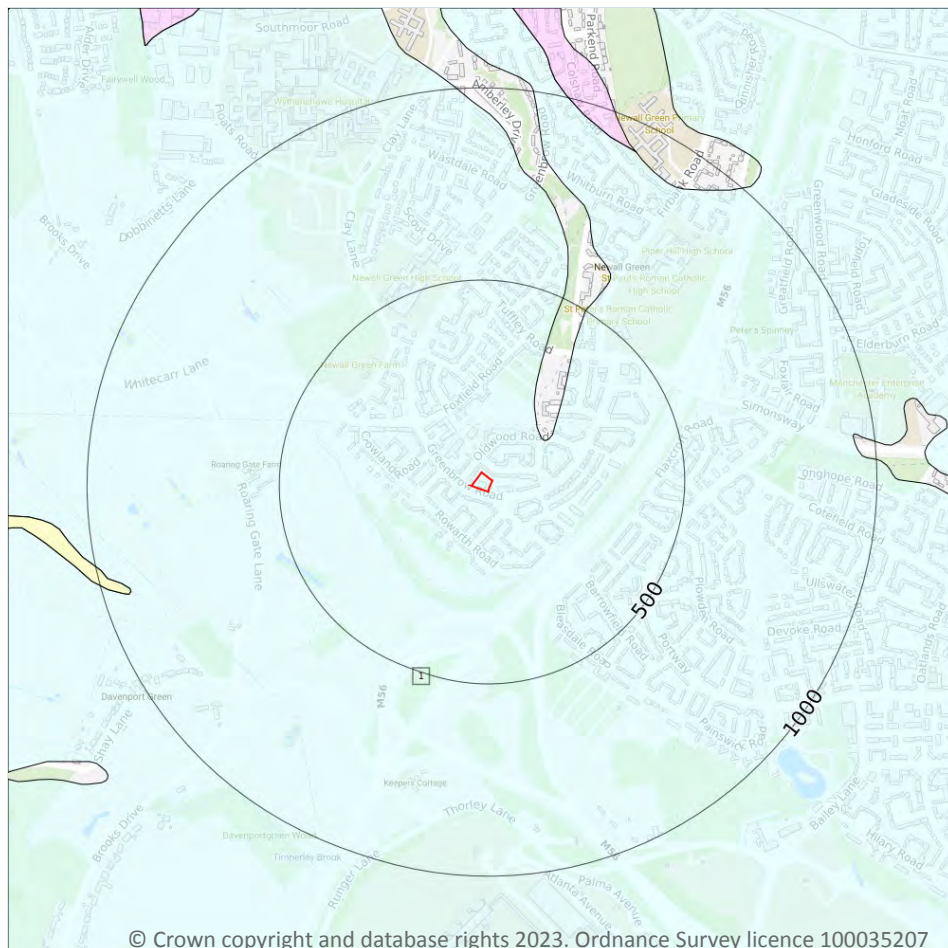
0

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

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



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15.4 Superficial geology (50k)

Records within 500m

1

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on [page 67](#) >

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

This data is sourced from the British Geological Survey.



15.5 Superficial permeability (50k)

Records within 50m**1**

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

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

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m**0**

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

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

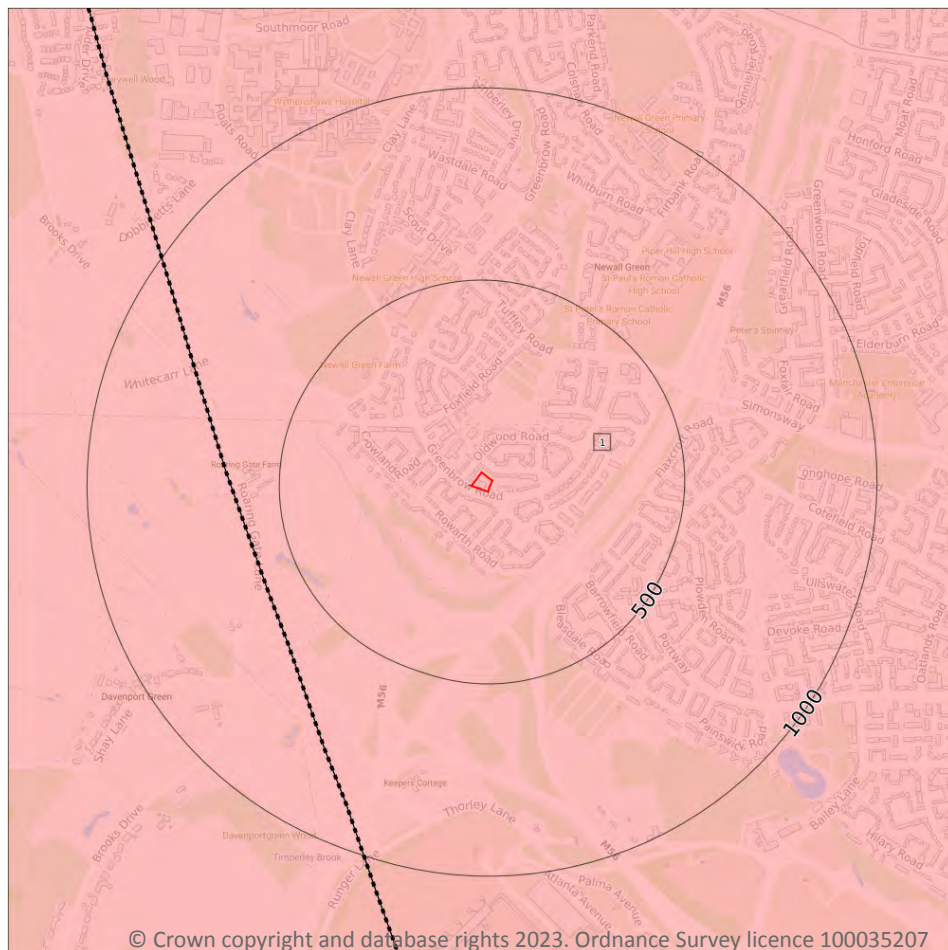
Records within 50m**0**

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

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

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

15.8 Bedrock geology (50k)

Records within 500m

1

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 69](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	BOM-MDST	BOLLIN MUDSTONE MEMBER - MUDSTONE	ANISIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

1

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

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

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



16 Boreholes



— Site Outline
Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

16.1 BGS Boreholes

Records within 250m

3

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

Features are displayed on the Boreholes map on [page 71](#) >

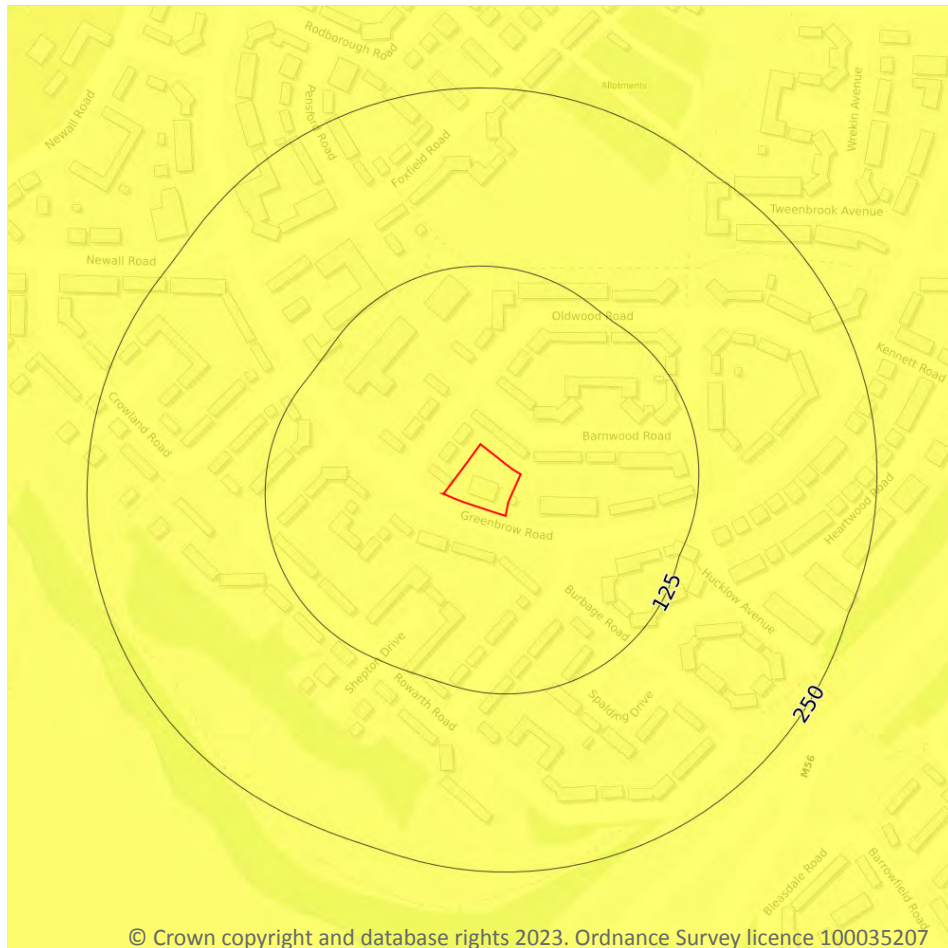
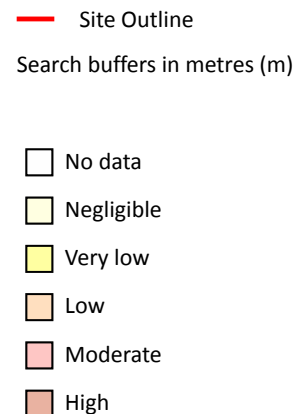
ID	Location	Grid reference	Name	Length	Confidential	Web link
1	160m SW	380890 386910	30 ROWARTH ROAD NEWHALL GREEN 1	-	Y	N/A
2	239m E	381315 386915	NEAR OLDWOOD FARM 10	9.45	N	914665 ↗
3	244m SE	381300 386860	M56 WIDENING JUNCTIONS 4 - 6 CH11	20.15	N	915578 ↗



This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



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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).

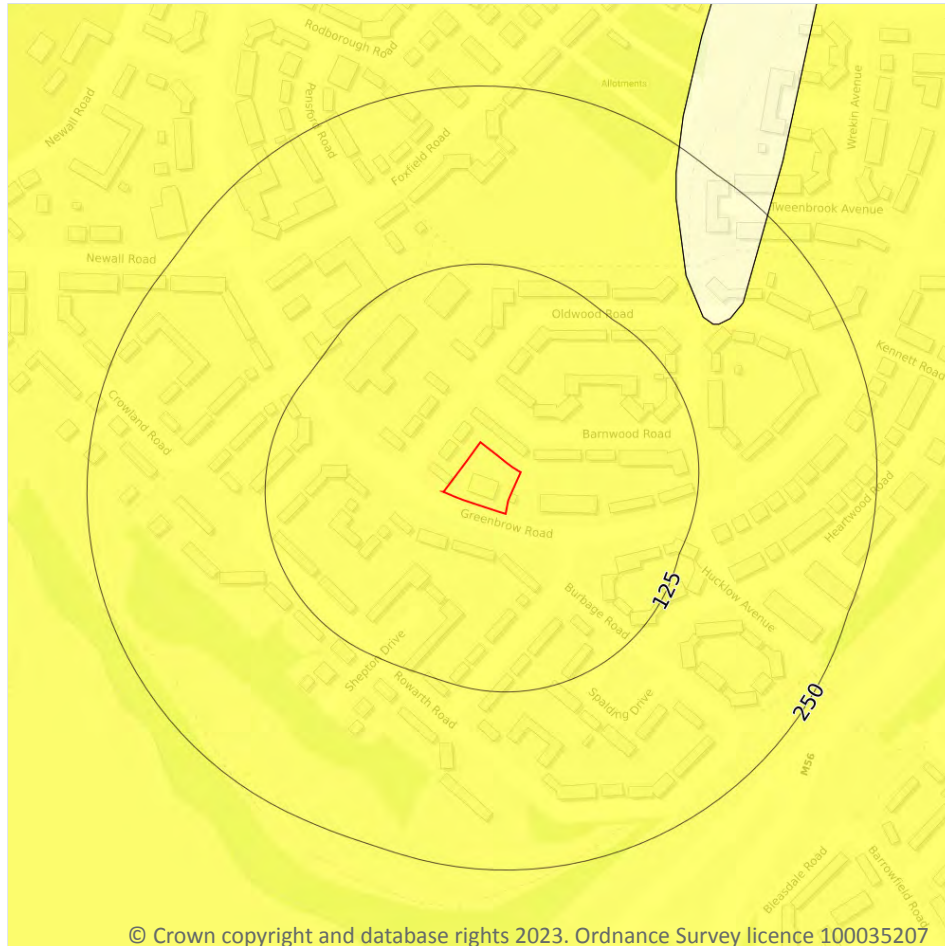
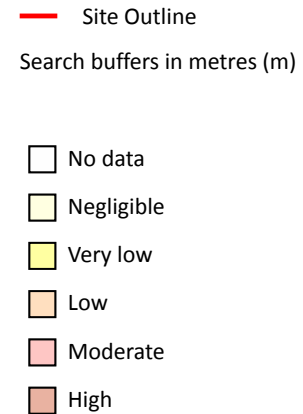
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 73 >](#)

Location	Hazard rating	Details
On site	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



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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.

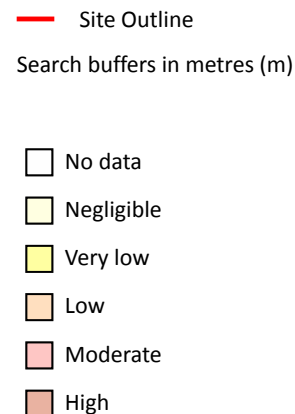
Features are displayed on the Natural ground subsidence - Running sands map on [page 74 >](#)

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

1

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

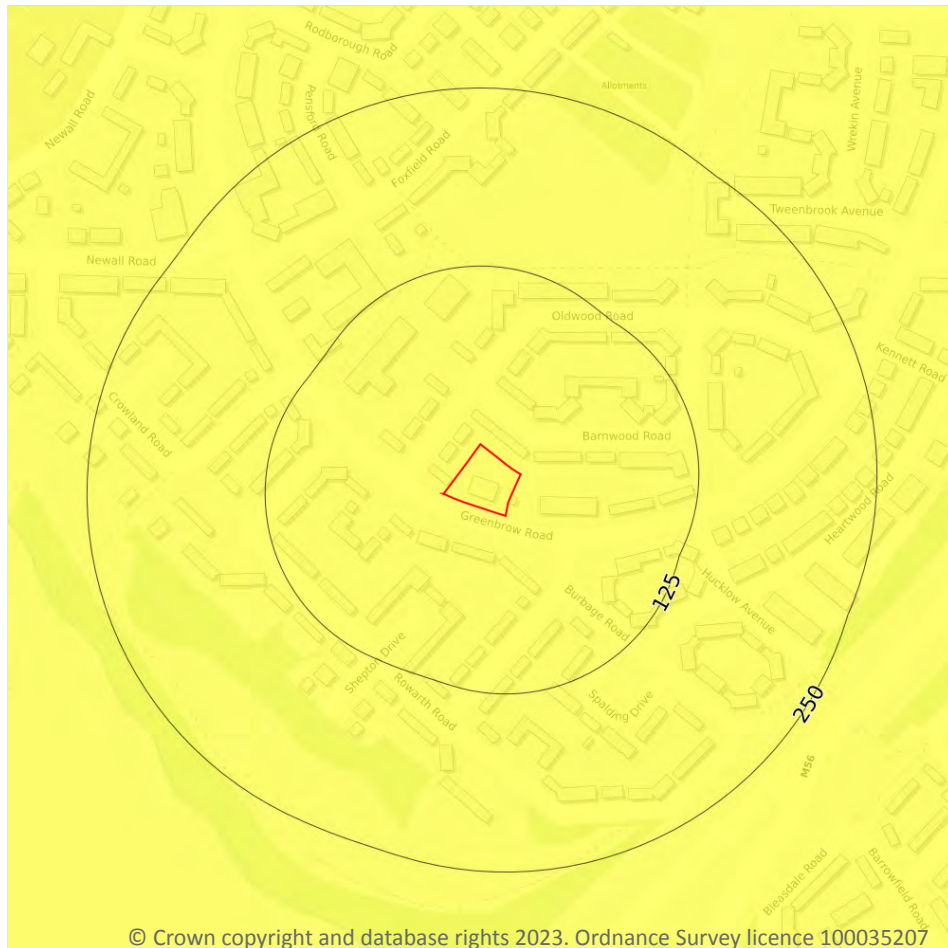
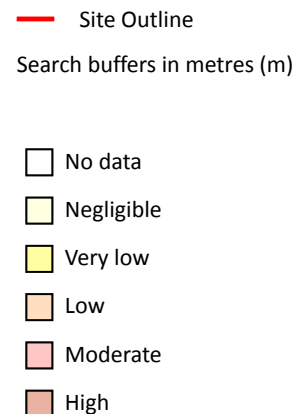
Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 75 >](#)

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



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17.4 Collapsible deposits

Records within 50m

1

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

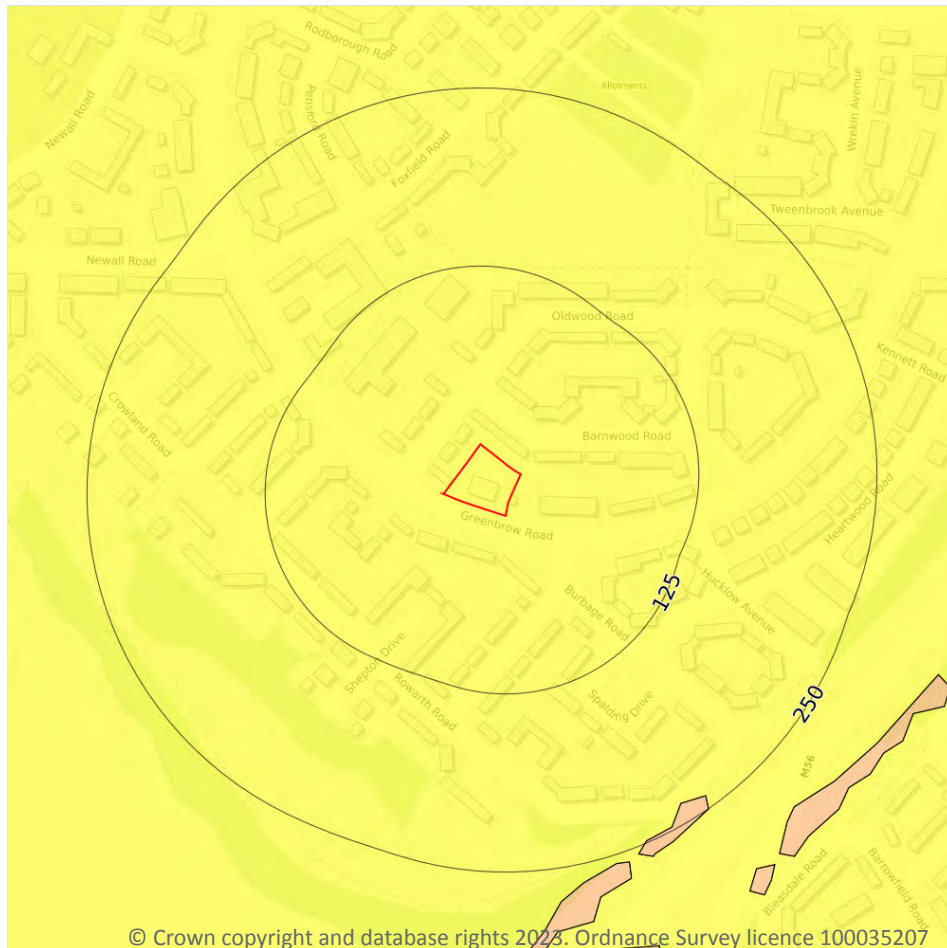
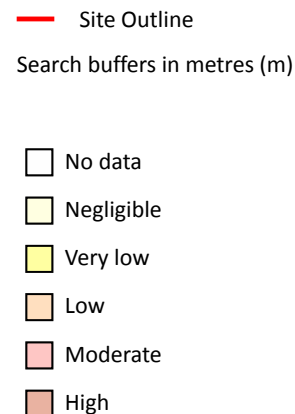
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 76 >](#)

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



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.

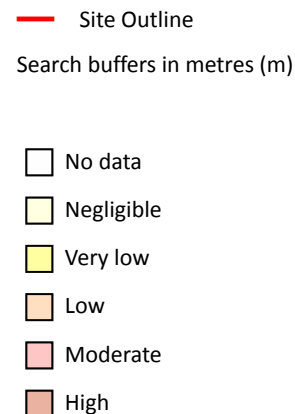
Features are displayed on the Natural ground subsidence - Landslides map on [page 77 >](#)

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on [page 78](#)

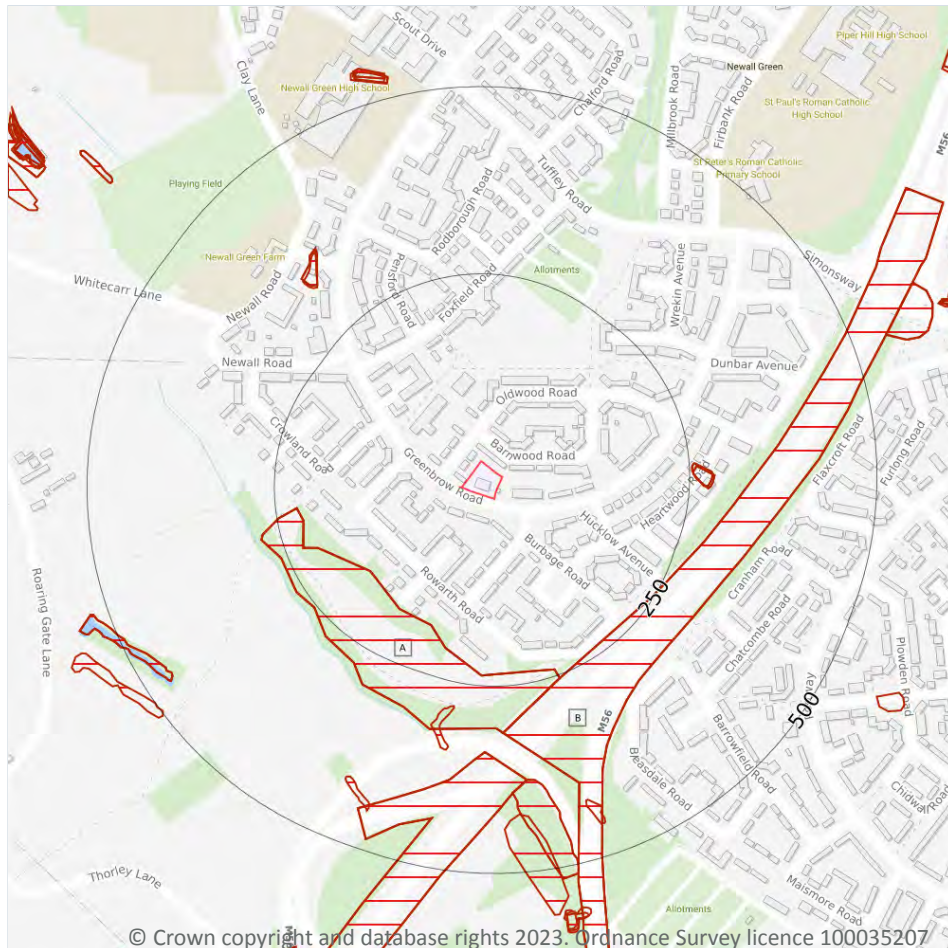
Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.



This data is sourced from the British Geological Survey.



18 Mining and ground workings



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

18.1 BritPits

Records within 500m

0

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

This data is sourced from the British Geological Survey.



18.2 Surface ground workings

Records within 250m

6

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

Features are displayed on the Mining and ground workings map on [page 80](#) >

ID	Location	Land Use	Year of mapping	Mapping scale
A	165m SW	Unspecified Heap	1975	1:10000
A	165m SW	Unspecified Heap	1989	1:10000
A	165m SW	Unspecified Heap	1995	1:10000
B	237m SE	Cuttings	1975	1:10000
B	237m SE	Cuttings	1989	1:10000
B	237m SE	Cuttings	1995	1:10000

This data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m

0

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

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m

0

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

This data is sourced from Groundsure.



18.5 Historical Mineral Planning Areas

Records within 500m

0

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

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

0

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

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site

0

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

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m

0

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

This data is sourced from The Coal Authority.



18.9 Researched mining

Records within 500m**0**

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

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m**0**

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

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m**0**

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

This data is sourced from Groundsure.

18.12 Coal mining

Records on site**0**

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

This data is sourced from the Coal Authority.

18.13 Brine areas

Records on site**0**

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

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



18.14 Gypsum areas

Records on site	0
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Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

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

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 Clay mining

Records on site	0
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Generalised areas that may be affected by kaolin and ball clay extraction.

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

19 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m

0

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

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m

0

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

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m

0

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

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m

0

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

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



This data is sourced from Groundsure.

19.5 National karst database

Records within 500m

0

This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

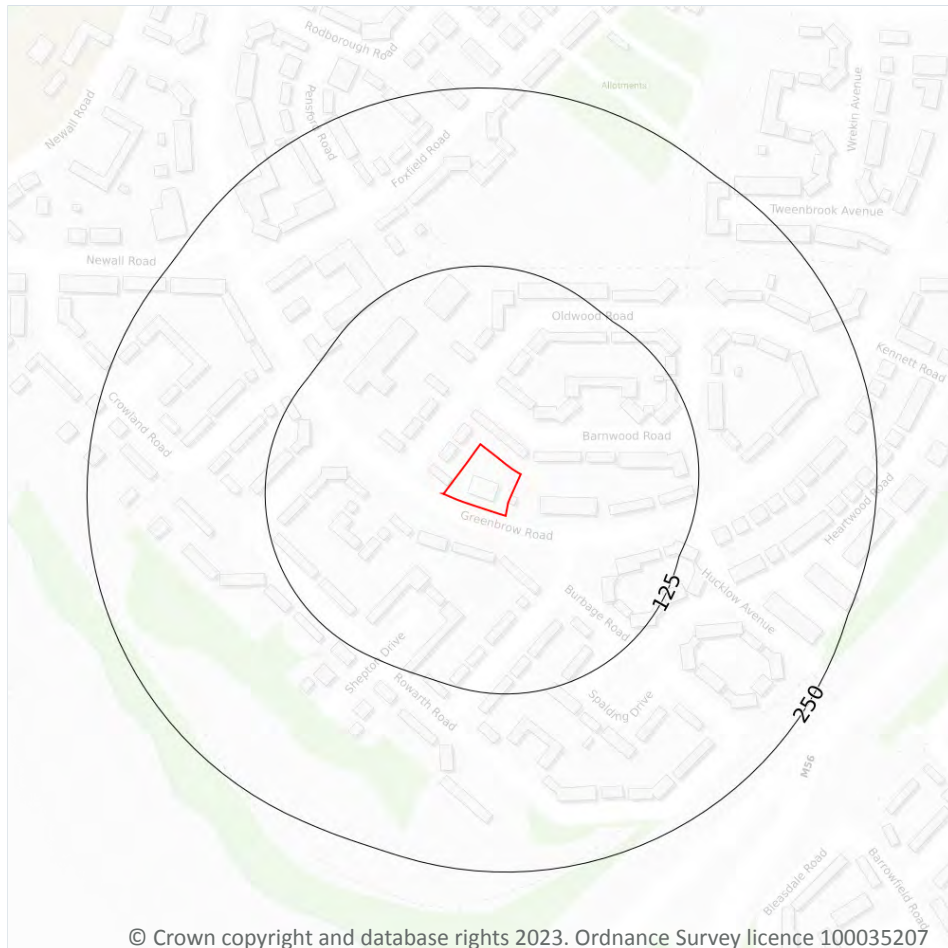
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.



20 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%

20.1 Radon

Records on site

1

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

Features are displayed on the Radon map on [page 87](#) >

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



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



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

6

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

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
35m W	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
35m W	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
41m W	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
41m W	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

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

This data is sourced from the British Geological Survey.



21.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

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

This data is sourced from the British Geological Survey.



22 Railway infrastructure and projects



- Site Outline
- Search buffers in metres (m)
- C1 Crossrail 1 Stations
- Crossrail 1 Route
- C2 Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

22.1 Underground railways (London)

Records within 250m

0

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

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m

0

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



This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m

0

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

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m

0

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

This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m

0

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

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m

0

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

This data is sourced from Ordnance Survey and OpenStreetMap.



22.8 Crossrail 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.

22.9 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.

22.10 HS2

Records within 500m**3**

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.

Features are displayed on the Railway infrastructure and projects map on [page 91](#) >

Location	Track Type	Speed (mph)	Speed (km/h)	Status
65m W	Tunnel	143mph	230kph	Current preferred consultation route
365m SW	Surface Running Track	143mph	230kph	Current preferred consultation route
470m SW	Surface Running Track	143mph	230kph	Current preferred consultation route

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-april-2023/> ↗.



APPENDIX 6

BGS BOREHOLE LOGS, MINERAL RESOURCES MAP FOR GREATER MANCHESTER AND MANCHESTER CITY COUNCIL MINERAL SAFEGUARDING AREAS MAP



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL



Office of the Deputy Prime Minister
Creating sustainable communities

GREATER MANCHESTER

(comprising the Cities of Manchester and Salford and the Metropolitan Boroughs of Bolton, Bury, Oldham, Rochdale, Stockport, Tameside, Trafford and Wigan)

Mineral Resource Information in Support of National, Regional and Local Planning

Mineral Resources

Scale 1:100 000

Compiled by D.J. Minchin, D.G. Cameron, D.J. Evans, G.K. Lott, S.F. Hobbs and D.E. Highley.
Project Leader: D.E. Highley.
Digital cartography by N.A. Spencer, British Geological Survey.
Published 2006.

This map comprises part of a summary of the Mineral Resources of the North-West England Region.
For more information see www.mineralsUK.com

BIBLIOGRAPHIC REFERENCE

Minchin D. J. and 5 others. 2006. Mineral Resource Information for National, Regional and Local Planning: Greater Manchester (comprising the Cities of Manchester and Salford and Metropolitan Boroughs of Bolton, Bury, Oldham, Rochdale, Stockport, Tameside, Trafford and Wigan). British Geological Survey Commissioned Report CR06/0626N.

Production of this map was commissioned and funded by the Office of the Deputy Prime Minister (Contract MP0677).

SAND & GRAVEL

Superficial deposits

- Sub-alluvial: Inferred resources
- River Terrace deposits
- Glaciofluvial deposits

PEAT

-

SANDSTONE

- Carboniferous: Millstone Grit and Pennine Coal Measures

BRICK CLAY

- Brick clay and Fireclay coincident with coal bearing strata - Shallow Coal
- Unproductive Coal Measures

COAL

- Area of shallow coal
- Opencast coal: worked area

MINERAL PLANNING PERMISSION (as at 01.01.06)

Source: Mineral Planning Authorities

- Surface planning permission (valid and expired)
- Underground planning permission other than coal (valid and expired)

MINERAL WORKINGS

- Harwood
- Active site
- Inactive (including yet to be worked), worked-out and/or restored site

Mineral commodity

Cl	Clay & Shale	San	Sand
CR	Crossed Rock	Sis	Silica Sand
Fr	Fireclay	Sst	Sandstone
Gas	Natural Gas	Sg	Sand and Gravel
Min	Mineral, unspecified		
■	Active rail aggregate depot		

ENVIRONMENTAL DESIGNATIONS (as at 06/07/05)

- National nature conservation designations (SSSIs and NNRs)
- International nature conservation designations (SCAPs, SACs and Ramsar sites)
- National Park: Peak District (part)
- Scheduled Monument

ADMINISTRATIVE AREAS

- Mineral Planning Authority (National Parks are also MPAs)

Aims and Limitations

The purpose of the maps in this series is to show the broad distribution of those mineral resources which may be of current or potential economic interest and to relate these to selected nationally-recognised planning designations. The maps are intended to assist in the consideration and preparation of development plan policies in respect of mineral extraction and the protection of important mineral resources against disturbance. For further information the reader should be consulted.

The maps have been produced by the collation and interpretation of mineral resource data principally held by the British Geological Survey. Information on the extent of mineral planning permissions has been obtained from the relevant Mineral Planning Authority (MPA). Some of these permissions may have lapsed or expired. The status of individual areas can be ascertained from the appropriate MPA. Location information on national planning designations has been obtained from the appropriate statutory body (Countrywide Agency, English Nature and English Heritage). For further information the reader should be consulted.

The mineral resource data presented are based on the best available information, but are not comprehensive and their quality is variable. The inferred boundaries are, therefore, approximate. Mineral resources defined on the map delineate areas within which potentially workable minerals may occur. These areas are not of uniform potential and also take no account of planning constraints that may limit their working. The economic potential of specific sites can only be proved by a detailed evaluation programme. Such an investigation is an essential prerequisite to submitting a planning application for mineral working. Extensive areas are shown having no mineral resource potential, but some isolated mineral resources may occur in these areas. The presence of these opportunities generally reflect very local or specific situations.

The maps are intended for general consideration of mineral issues and not as a source of detailed information on specific sites. The maps should not be used to determine individual planning applications or in taking other decisions on the acquisition or use of a particular piece of land, although they may give useful background information which sets a specific proposal within context.

BRICK CLAY (including FIRECLAY)

Brick clay is the term used to describe 'clay and shale' used in the manufacture of structural clay products, such as facing and engineering bricks, paving, clay tiles and vitrified clay bricks. These clays may also be used in cement manufacture, as a source of constructional fill and for lining and sealing landfill sites. Brick manufacture is the largest tonnage use in England. Clay bricks are versatile construction materials and one of the most visible components of the built environment. They make an important contribution to local architectural styles.

Brick clays are essentially mudstones of different geological ages and compositions. Their mineralogy, chemistry and physical properties are critical to determining their suitability for the manufacture of structural clay products. These properties affect the forming behaviour of the clay (the process of shaping the ware) and also its behaviour during drying and firing. They will also determine the technical properties of the final product, such as strength, water absorption (porosity) and frost resistance, and thus its durability and performance in service and, importantly, its architectural appearance, such as colour and texture. Most facing bricks, engineering bricks and vitrified clay-based building products are manufactured in large automated factories. These represent a high capital investment and are therefore increasingly dependent on raw material with predictable and consistent firing characteristics in order to achieve high yields of saleable products. Blending different clay to achieve improved durability and to provide a range of frost colours and textures is an increasingly common feature of brick industry. Continuity of supply of consistent raw materials is of paramount importance.

In Manchester, brick clay has been produced for local consumption from small brick pits for over two hundred years. Historically, a variety of clays were extracted for 'brown' brick making, including local clay, Triassic Meria Mudstone and mudstones from the Pennine Lower and Middle Coal Measures. Freely, the fire-grained sandstones that commonly underlie coal seams, were mined alongside coal in opencast and deep mines for use in pipe making. With the demise of the 'common' brick and consolidation of the brick industry, most of these clay quarries closed. Today, one active clay quarry remains at Harwood, northwest of Bolton, working the Pennine Lower Coal Measures. This quarry produces high quality brick clay for use in facing, engineering and paving bricks but has no associated brownstone. The clay is delivered to a brickworks at Denton, in Tameside, which has no associated quarry and sources clay from a variety of locations, mainly from a site in Glossop, approximately 13 km away in Derbyshire.

Pennine Coal Measures mudstones, which occur interbedded with siltstones, sandstone, coal seams and sandstones, are the principal brick clay resource in North West England. Resources occur across the north and west of the county but are currently only worked in Bolton. The clay mineralogy of Coal Measures mudstones is dominated by kaolinite and life which tend to provide optimum firing characteristics. Carbon and sulphur contents are also critical to firing performance. Bivalve remains of life which may lead to firing problems and sulfur may also give unacceptable emission levels, although leaching of clays may reduce these problems. In general, carbon and sulphur contents should be less than 1.5 per cent and 0.2 per cent respectively. Both freestays and mudstones occur in association with opencast coal, with which they may be worked. However, this is only rarely the case because of the variable quality of the clay, particularly of the freestays, and due to operational and planning difficulties. Freestays have relatively low iron content compared to other brick clays and they are primarily valued for the manufacture of buff coloured bricks and pavers. There is no current freely extraction in the area.

PEAT

Peat is an unconsolidated deposit of compressed plant remains in a water-saturated environment such as a bog or fen. Bogs occur in areas where inputs of water (either exclusively from precipitation) have a low nutrient content and where the rainfall is sufficient to maintain the ground surface in a waterlogged condition. The vegetation is characterised by acid-tolerant plant communities in which the moss genus *Sphagnum* is dominant. The two main types of bog are (i) raised bogs, where conditions of flat underlying topography and burial on plains and broad valley floors and (ii) blanket bogs, which occur mainly in upland areas where conditions are suitably cool and wet. Many lowland raised bogs have been designated as sites of international and national conservation value. Peat is dug in England mainly from raised blanket bogs, almost entirely (98 per cent) for horticultural use, either as growing media or as a soil improver. Areas of upland blanket peat are not worked and therefore not shown.

Peat is being extracted from three sites on Chat Moss in the west and north west of Man in the Wigan/Salford boundary. The peat deposits cover an area of 2847 ha, may be over 30 m in thick on a flat underlying topography. Planning permission for peat extraction covers 302 ha, both in the Wigan and Salford districts. Smaller worked peat deposits such as Carrington Moss and Ashton Moss cover approximately two square kilometres each, but are not worked.

Many of the peat deposits have been worked extensively in the past and today a large percentage of these areas have been 'reclaimed' to agricultural land. Due to the unavailability of up to date borehole defining the extent of the reclamation, the entire resource as mapped is shown on the face of the map.

COAL

The area lies predominantly within the South Lancashire Coalfield. The coal-bearing strata of the Pennine Lower and Middle Coal Measures (Upper Carboniferous) generally dip to the southwest and west. The South Lancashire Coalfield crops out across an area of approximately 970 km², stretching from Rochdale in the east to St Helens in the west. A spur runs southwards from Rochdale to just south of Stockport. In the east and north, older Namurian strata are present at outcrop and to the west and south, Permian-Triassic strata unconformably overlie the Coal Measures. To the south, the coalfield deepens significantly to greater than 3000 m below Ordinance Datum beneath Permian-Triassic strata and passes into the Cheshire Basin. A substantial portion of the coalfield is covered by urban development.

Coal seams are numerous with in excess of 36 named coal seams, which vary laterally in both thickness and composition, chiefly by variation in the number of the partings present within the seam. Coals are mainly present within the Pennine Lower and Middle Coal Measures, with a few additional coals in the lower part of the Pennine Upper Coal Measures. The main coal-bearing interval typically varies from about 590 m in the west to 880 m in the east. In the lower part of the Pennine Lower Coal Measures, below the *Alder* seam, typically contains coals that are thin and of variable quality. The rest of the Pennine Lower and Middle Coal Measures form the most important coal-bearing interval, with a number of coals in excess of 2 m in thickness. Coals from the Pennine Upper Coal Measures are generally thin, the exception being the Worsley Four Foot, which can be up to 1.6 m in thickness. Coal vein ranges from high to medium coals.

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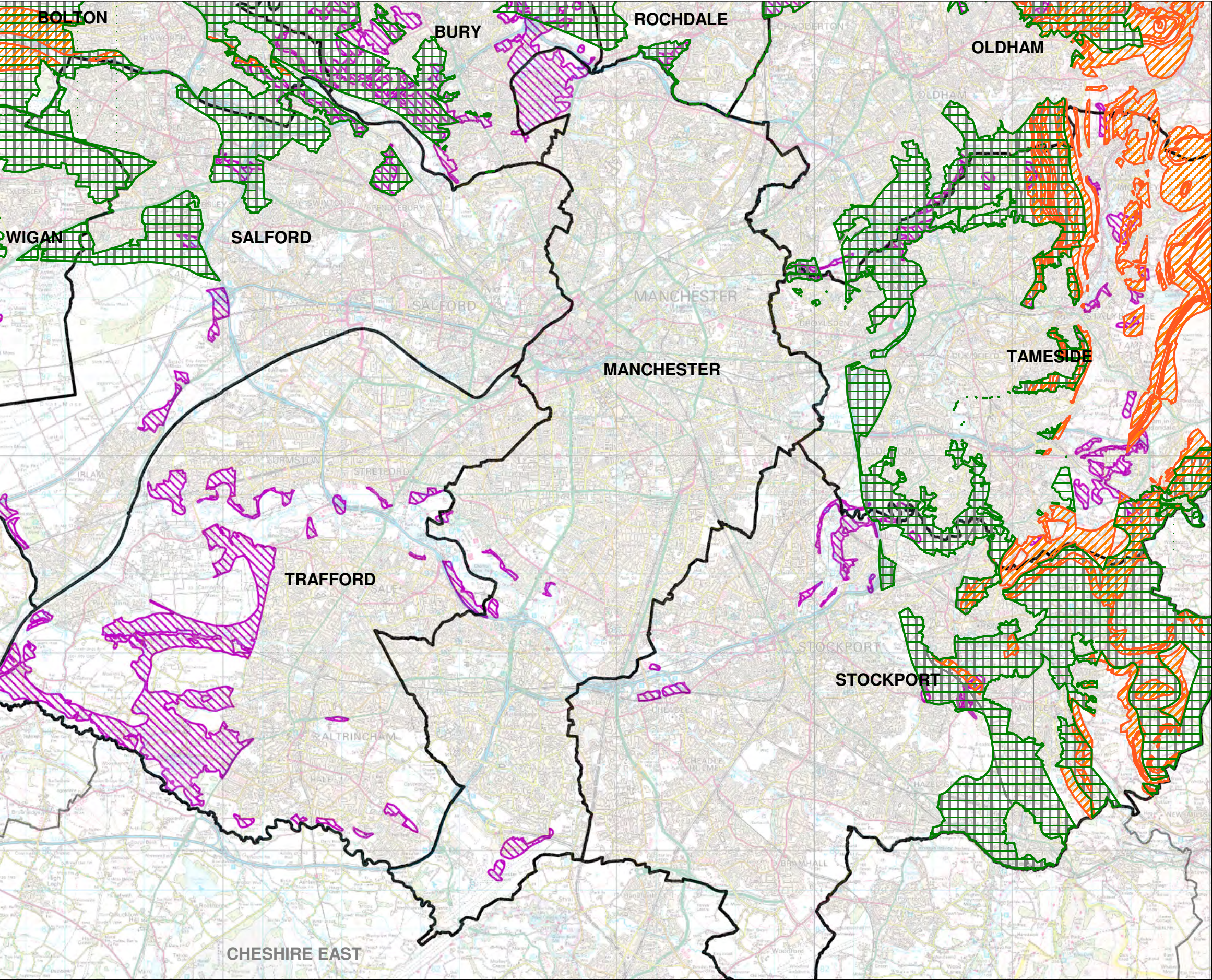
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- Greater Manchester Districts
- Neighbouring District Boundaries
- Mineral Safeguarding Area for Coal
- Mineral Safeguarding Area for Sand and Gravel
- Mineral Safeguarding Area for Brick Clay
- Mineral Safeguarding Area for Sandstone

MAP 22 MANCHESTER

All Mineral Safeguarding Areas
in Manchester

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Scale @ A3
1cm = 1km



BGS ID: 914665 : BGS Reference: SJ88NW13
British National Grid (27700) : 381315,386915

1063 Wt. 22438/0384 10x 7/45 (51) F.&S.

(For Survey use only)

RECORD OF SHAFT OR BORE FOR MINERALS

1-inch Map Registered No.

Name and Number of Shaft or Bore

For Messrs.

Town or Village

County _____ Six-inch quarter sheet

Exact site

6-inch Map
Registered
No.

Attach a tracing from a map, or a sketch-map, if possible.

Purpose for which made

Level at which shaft commenced relative to O.D.

State if ^{shaft} ~~base~~ is up, down, horizontal or

GEOLOGICAL SURVEY AND MUSEUM.

BORING AND SHAFTS

Wythen shawe
Katata Bwings
(Cont.)

SJ88NW

my nap

Description.	THICKNESS.		DEPTH.	
	Feet.	Inches.	Feet.	Inches.
No. 10. 200 yds. W 20° N of NW corner of main building of OLDWOOD FARM (S.E. of Newall Green) Baginbun				
Soil	-	8	-	8 0.20
Variiegated clay	1	4	2	- 0.61
Very sandy clay	-	6	2	6 0.76
Variiegated marl	10	-	12	6 8.81
Soft " "	8	6	21	- 6.40
Marl	7	-	28	- 8.53
Variiegated marl	3	-	31	- 9.45

[illegible]

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date
received

Correspondence File No.

1" N.S. Map
No.

1" O.S. Map
No. ,

Site marked (use symbol)	
on 1" Map	on 6" Map

[illegible]

ADDITIONAL NOTES



SJ8132 8690 SJ88 21

98/13NE 1/6

Wythenshame
Letchworth
(cont.)

100 maps

GEOLOGICAL SURVEY AND MUSEUM. BOREHOLES AND SHAFTS.

Folio 2. County Cheshire
6 in. Map 2

Description.	THICKNESS.		DEPTH.	
	Feet.	Inches.	Feet.	Inches.
No. 10. 200 yds. W 20°N of NW corner of main building of OLDWOOD FARM (S.E. of Newall Green) Baginbun				
Soil	-	8	-	8
Variegated clay	1	4	2	-
Very sandy clay	-	6	2	6
Variegated marl	10	-	12	6
Soft " "	8	6	21	-
Marl	7	-	28	-
Variegated marl	3	-	31	-
No. 11. 6 yds. from NW side of BAILEY LANE, RINGWAY. at a point 166 yds ^{NE} along lane from NE fence of Moss House, (that is, about 10 yds. SW. of boundary fence)				
Soil	1	9	1	9
Brown clay	2	3	4	-
Variegated clay	22	-	27	-
Recorded under 18SE/2.				



Geotechnical Engineering Limited

BOREHOLE LOG

884

SJ88NW/884



CLIENT The Department of Transport

Easting: 5986.0 8152

BOREHOLE BH 12

SITE M56 Widening, Junctions 4 - 6

Northing: 7195.5 8727

Sheet 1 of 1

Date 11th June 1991

Ground Level 59.42m AOD

Scale 1:50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	description	m (%)	tests	depth (m)	level (mOD)	legend
11.6.91			0.00 - 0.30	1B	Medium dense brown sandy SILT with rootlets, and traces of coal and red brick. (TOPSOIL)			0.30	59.12	
			0.30 - 0.75	2B	Stiff red brown rarely mottled grey silty CLAY with fine to medium coarse sub angular gravel of sandstone and sub rounded white quartz, with traces of charcoal and occasional rootlets. (FILL)			(0.45)		
			0.75 - 1.20	3B	Stiff grey mottled yellow, black and brown silty CLAY with stiff red brown silty clay with traces of charcoal and brick.			0.75	58.67	
	0.00	175 blows (1)	1.20 - 1.65	4U	(FILL)			(0.95)		
			1.65 - 1.70	5B				1.70	57.72	
			1.70 - 2.20	6B	Stiff red brown silty CLAY with some medium gravel. Gravel consists of grey sandy siltstone and mudstone. (DRIFT)	13	LCb			
	0.00	N=15	2.25 - 2.70	7J		15		(1.90)		
			2.70 - 3.30	8B						
	0.00	32 blows (1)	3.32 - 3.77	9U				3.60	55.82	
			3.77 - 3.82	10B	Medium dense to dense grey brown mottled yellow friable clayey SILT with traces of rootlets.			(1.00)		
			3.82 - 4.30	11B	(DRIFT)	20	L			
	3.85	N=14	4.30 - 4.75	12J		18		4.60	54.82	
			4.30 - 4.60					(0.40)		
			4.60 - 4.75	13J	Dense friable grey clayey SILT with some medium sub angular gravel (lithorelicts?) (Zone III MARL)	17		5.00	54.42	
			4.75 - 5.00	14B		21	L			
			5.00 - 5.20	15B	Very stiff to hard brown thinly laminated friable very silty CLAY with occasional sub rounded fine to medium gravel sized lithorelicts of silty mudstone weak. (Zone III MARL)			(0.70)		
pm Dry			5.25 - 5.70	16U		13	L			
12.6.91	4.00	40 blows (1)	5.70 - 5.75	17B	Brown and brown grey thinly laminated silty MUDSTONE very weak interlaminated with SILTSTONE weak to moderately weak with some hard friable brown clay laminations. (Zone II MARL)			5.70	53.72	
am Dry			5.75 - 6.00	18B						
Dry	4.00	N=63	6.05 - 6.50	19J	End of Borehole at 6.50m.	12		6.50	52.92	
Equipment/Methods Borehole advanced by a light cable percussive rig using 200mm diameter tools from base of an inspection pit at 0.75m to completion at 6.50m. Borehole backfilled with grout on completion.										
Remarks (1) Slide hammer and 2 sinker bars							GEL JOB NO. 2334N		FIGURE 1/12.1	



Geotechnical Engineering Limited

BOREHOLE LOG

885 SJ88NW/885



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
Date 11th to 12th June 1991

Easting: 6204.0 8173
Northing: 7121.5 8719
Ground Level 58.18m AOD

BOREHOLE BH 13
Sheet 1 of 1
Scale 1:50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	description	m (%)	tests	depth (m)	level (mOD)	legend
11.6.91			0.00 - 0.60	1B	Brown fine sandy CLAY with some fine to coarse sub angular gravel and occasional sub rounded cobble. Many rootlets. Gravel includes mudstone and sandstone. (TOPSOIL)					
			0.60 - 1.00	2B	Stiff brown and grey very silty CLAY with some fine to medium angular gravel. Gravel includes mudstone and fragments of coal and clinker. (FILL)			0.60 (0.40)	57.58	
pm Dry			1.00 - 1.20	3B	Very stiff mottled orange brown and grey silty CLAY with a little rounded and sub angular gravel and occasional thin laminae of fine to medium sand.	16	LCb	1.00 (0.60)	57.18	
12.6.91			1.20 - 1.50	4B	Gravel includes sandstone, mudstone quartz and fragments of coal. (DRIFT)					
am Dry	0.00	30 blows	1.50 - 1.95	5U	Firm to stiff brown silty CLAY with a little fine to medium sub angular gravel of mudstone very weak and occasional coarse sand sized fragments of coal. (DRIFT)	17	LCb	1.60 (0.90)	56.58	
			1.95 - 2.15	6B						
			2.15 - 2.50	7B		9		2.50	55.68	
	1.68	N=56	2.50 - 2.95	8J	Very stiff to hard red-brown friable silty CLAY with some fine to medium sub angular occasionally sub rounded gravel sized lithorelicts of mudstone very weak and weak.					
			2.95 - 3.50	9B						
	3.18	N=41	3.50 - 3.95	10J	(Zone III MARL)	11				
			3.55 - 4.50	11B						
Dry	3.18	67 blows (1)	4.50 - 4.65		End of Borehole at 4.50m			4.50	53.68	
Equipment/Methods Drilled by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.20m to completion at 4.50m.										
Remarks (1) U100 tube 'snapped off' in hole. Hole terminated at 4.50m							GEL JOB NO. 2334N		FIGURE 1/13.1	

Geotechnical Engineering Limited

BOREHOLE LOG

SJ88NW
893



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
Date 18th to 28th June 1991

Easting: 5754.0 8150
Northing: 6430.0 8699
Ground Level 66.27m AOD

BOREHOLE CH 7(BH)
Sheet 1 of 3
Scale 1:50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	piezo- meter	description	m (%)	tests	depth (m)	level (mOD)	legend
18.6.91			0.80 - 1.20	1B		TOPSOIL with brick and marl - Driller's description.			(0.80)		
			1.20 - 1.50	2B		Firm grey silty CLAY with much black mottling of carbonaceous silt and a little fine to medium sub angular to rounded gravel. Gravel includes coal, quartz and brick. Occasional plant rootlets. (FLU)			0.80 (0.40)	65.47	
pm Dry	0.00	N=10	1.50 - 1.95	3J		Firm blue grey mottled yellow brown and occasionally red brown very silty CLAY with occasional rootlets. (Zone IVb MARL)	24		1.20 (0.80)	65.07	
19.6.91			1.95 - 2.50	4B		Firm to stiff blue grey occasionally mottled yellow brown silty CLAY with a little fine to medium sub angular gravel of mudstone very weak. Occasional rootlets. (Zone III MARL)		LPp	2.00 (0.50)	64.27	
	1.68	N-70	2.50 - 2.95	5J		Thinly interlaminated grey and red brown SILTSTONE weak silty MUDSTONE very weak and hard CLAY. Recovered as a fine to medium platy sub angular gravel in a clay matrix. (Zone III MARL)	12		2.50 (1.30)	63.77	
			2.95 - 3.50	6B				L			
pm 3.05m	1.68	N*=152	3.50 - 3.80	7J			12		3.80	62.47	
Borehole continued by rotary coring, see Fig. 2/7.2.											
Equipment/Methods Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.20m to 3.80m, and then extended by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 12.05m. Type of flush: Foam. Water added to assist drilling 2.95m to 3.80m.											
Remarks Standpipe piezometer installation: Sand response zone, 1.00m to 12.05m; Tip at 11.50m. Casing advanced to 3.65m depth at end of cable percussive boring.								GEL JOB NO. 2334N	FIGURE 2/7.1		



Geotechnical Engineering Limited

BOREHOLE LOG

SJ88NW
813



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 18th to 28th June 1991

Easting: 5754.0 8150 BOREHOLE CH 7(BH)
Northing: 6430.0 8699 Sheet 2 of 3
Ground Level 66.27m AOD Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
								Main	Detail				
								From 0.00m to 3.80m borehole advanced by cable percussive drilling, see Fig. 2/7.1					
27.6.91 am Dry	3.65		3.80	82	82 (25)	0		Red brown and grey slightly weathered very highly fractured thinly to thickly laminated fine to medium SANDSTONE moderately weak to moderately strong and MUDSTONE weak. (Zone I MARL)	Fractures: Generally VIII and V 5-10° Also: 4.30m to 4.45m II 85° 4.50m VIII 50° Intensely fractured zones: 4.00m to 4.03m 5.90m to 6.10m	S	3.80	62.47	
			4.80		99 (26)	0		Highly weathered to a clay with lithofaenites: 4.20m to 4.23m, 4.80m to 4.84m, 7.35m to 7.38m (Zone III MARL)	Outside of core has a rather irregular eroded appearance with irregular 'holes' in the core up to 40 x 40 x 20mm (7solution cavities) Gypsum band: 7.38m to 7.47m	Cr	(4.00)		
	3.65	N* = 150	5.76 5.76 - 5.97		85 (18)	9							
			6.89		88 (72)	17							
pm								Red brown fresh moderately fractured thinly to thickly laminated fine to medium SANDSTONE moderately strong and silty MUDSTONE weak to moderately weak. (Zone I MARL)	Fractures: Generally V 5°, VII 5° and VIII 5° Gypsum bands: 8.89m to 8.91m 9.04m to 9.06m 9.77m to 9.83m 10.50m to 10.52m 10.60m to 10.61m		7.80	58.57	
28.6.91 am 7.58m	3.65	N* = 187	8.34 8.34 - 8.49 8.64		100 (55)	0					(2.90)		
			9.89		104 (50)	0				U			
										Cu	(10.00)	(56.27)	
Continued on Sheet 3 in same stratum													
Equipment/Methods See sheet 1.													
Remarks										GEL JOB NO.		FIGURE	
Fracture types: II - smooth stepped; V - smooth undulating; VII - rough planar; VIII - smooth planar.										2334N		2/7.2	



Geotechnical Engineering Limited

BOREHOLE LOG

SJ88NW
813



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 18th to 28th June 1991

Easting: 5754.0 8150 BOREHOLE CH 7(BH)
Northing: 6430.0 8699 Sheet 3 of 3
Ground Level 66.27m AOD Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
								Main	Detail				
(28.6.91)					97 (97)	97		Continued from Sheet 2 in same stratum - description as Sheet 2 from 7.80m depth.			(10.00)	(56.27)	
											(2.90)		
											10.70	55.57	
	3.65	N*= 300	11.39 11.39-11.48		100 (97)	88		Red brown fresh moderately fractured thickly laminated to thinly bedded very silty MUDSTONE moderately weak with closely spaced thin laminae of grey siltstone. (Zone I MARL)	Fractures: 11.39m VII 15° 11.46m VII 20° 11.88m VII 10° 12.00m V 10° Gypsum bands: 10.97m to 10.88m 11.45m to 11.46m 11.55m to 11.56m 11.71m to 11.72m	U			
pm			12.05								12.05	54.22	
								End of Borehole at 12.05m					
Equipment/Methods See Sheet 1.													
Remarks										GEL JOB NO.	FIGURE		
										2334N	2/7.3		

Borehole Log

915574_11724_CH7

Page 1 of 3

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915574_11724_CH7

Location: M56 J6 to J8 Co-ords (British National Grid): 381500 - 386990 Level: 66.27

Hole Type: CP+RC Logged By: Dates: 1991-06-18 - 1991-06-28

Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

Well	Water	Samples		Result	Depth (m)	Level (m)	Legend	Stratum Description	Depth m
		Depth (m)	Type						
		0.8 - 1.2	B	10	0.80	65.47		TOPSOIL with brick and marl Driller s description	0.5
		1.2 - 1.5	B		1.20	65.07		Firm grey silty CLAY with much black mottling of carbonaceous silt and a little fine to medium sub angular to rounded gravel Gravel includes coal quartz and brick Occasional plant rootlets FILL	1.0
		1.5 - 1.95	J					Firm blue grey mottled yellow brown and occasional red brown very silty CLAY with occasional rootlets Zone IVb MARL	1.5
		1.95 - 2.5	B	70	2.00	64.27		Firm to stiff blue grey occasionally mottled yellow brown silty CLAY with a little fine to medium sub angular gravel of mudstone Occasional rootlets Zone III MARL	2.0
		2.5 - 2.95	J		2.50	63.77		Thinly interlaminated grey and red brown SILTSTONE weak silty MUDSTONE very weak and hard CLAY Recovered as a line to medium platy sub angular gravel in a clay matrix Zone III MARL	2.5
		2.95 - 3.5	B					Red brown and grey slightly weathered very highly fractured thinly to thickly interlaminated fine to medium SANDSTONE moderately weak to moderately strong and MUDSTONE weak Zone I MARL	3.0
		3.5 - 3.8	J	152	3.80	62.47		Red brown and grey slightly weathered very highly fractured thinly to thickly interlaminated fine to medium SANDSTONE moderately weak to moderately strong and MUDSTONE weak Zone I MARL	3.5
								Red brown and grey slightly weathered very highly fractured thinly to thickly interlaminated fine to medium SANDSTONE moderately weak to moderately strong and MUDSTONE weak Zone I MARL	4.0
								Red brown and grey slightly weathered very highly fractured thinly to thickly interlaminated fine to medium SANDSTONE moderately weak to moderately strong and MUDSTONE weak Zone I MARL	4.5

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see www.bgs.ac.uk/services/ngdc. Generated 23-10-2023 at 07:50. BGS Reference 2020020411595814147

<p style="text-align: center;">Borehole Log</p>	<p>915574_11724_CH7</p> <p>Page 2 of 3</p>
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915574_11724_CH7

915574_11724_CH7

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915574_11724_CH7

Location: M56 J6 to J8 Co-ords (British National Grid): 381500 - 386990 Level: 66.27

Hole Type: CP+RC Logged By: Dates: 1991-06-18 - 1991-06-28
--

Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

[illegible]

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see www.bgs.ac.uk/services/ngdc. Generated 23-10-2023 at 07:50. BGS Reference 2020020411595814147

GENERAL REMARKS

Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.2m to 3.8m, and then by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 12.05m. Fracture types: II - smooth stepped; V- smooth undulating; VII- rough planar; VIII- smooth planar.

Geotechnical Engineering Limited
BOREHOLE LOG

5588NW
894



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 29th May to 2nd June 1991

Easting: 5648.0 8113
 Northing: 6569.5 8668
 Ground Level 58.53m AOD

BOREHOLE CH 8
Sheet 1 of 1
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description	Main	Detail	tests	depth (m)	level (mOD)	legend
29.5.91								TOPSOIL				0.20	58.33	
pm Dry	0.00	N = 48	0.80 - 1.25	S				Firm to stiff brown silty CLAY. (Zone IV MARL)				(0.68)		
30.5.91 am Dry			0.80 0.91		100(0) 81 (38)	0 0		Grey and red brown slightly weathered highly fractured thinly laminated silty MUDSTONE weak. (Zone I MARL)	Fractures: Generally IV 5°	Bedding: Dip: sub horizontal some slumping of laminae.	W	0.88	57.65	
31.5.91 am 0.80m			1.17		87 (35)	0					S	(2.92)		
pm 1.21m			2.50		108 (11)	92								
1.6.91 am 1.18m	1.15	N* = 375	3.40 3.40 - 3.53	8	81 (41)	0						3.80	54.73	
			3.77		102 (102)	102		Grey fresh to slightly weathered moderately to highly fractured very thinly to thinly interbedded silty MUDSTONE weak to moderately weak SILTSTONE moderately weak. With closely spaced laminae of silty fine sandstone. (Zone I MARL)	Fractures: Generally VIII 5° Also: 5.30m 20° V 5.67m 5° VIII 5.88m 5° II	Bedding: Dip: sub horizontal.	CS			
	5.28		4.65		100 (92)	54								
			5.30		89(67)	0								
			5.39		107 (104)	85								
			5.92		88 (88)	88								
	5.28	N* = 1500	6.44 6.44 - 6.46	41	92 (88)	55					SUI			
			7.41		56(50)	56								
pm 1.23m			7.59		104 (76)	84								
			7.84		97 (78)	47								
2.6.91 am 1.39m			8.18		114(75)	0								
			8.32		85(58)	0								
			8.58		111(78)	0								
			8.67		72(67)	0								
			8.85		83 (78)	78								
			9.26		103 (103)	103								
pm 1.30	5.28	N* = 1500	9.60 9.60 - 9.62	19	106 (100)	91						9.94	48.59	
			9.94					End of Borehole at 9.94m						
<p>Equipment/Methods Borehole drilled by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm core from the base of an inspection pit at 0.80m to completion at 9.94m. Type of flush: Air.</p> <p>Remarks Standpipe piezometer installation: Sand response zone 9.94m to 1.00m: Tip at 8.00m. Fracture types: II - smooth stepped; IV - rough undulating; V - smooth undulating; VIII - smooth planar.</p>														
											GEL JOB NO.	FIGURE		
											2334N	2/8.1		

Borehole Log

915575_11724_CH8

Page 1 of 2

Project Name: Smart Motorway Programme Project No: HE544645

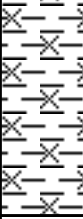
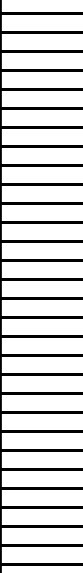
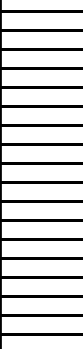
Borehole ID: 915575_11724_CH8

Location: M56 J6 to J8 Co-ords (British National Grid): 381130 - 386680 Level: 58.53

Hole Type: RC Logged By: Dates: 1991-05-29 - 1991-06-02

Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

Well	Water	Samples		Result	Depth (m)	Level (m)	Legend	Stratum Description	Depth m
		Depth (m)	Type						
		0.20			0.20	58.33		TOPSOIL	
		0.8 - 1.25	S	48	0.88	57.65		Firm to stiff brown silty CLAY Zone IV MARL	0.5
								Grey and red brown slightly weathered highly fractured thinly laminated silty MUDSTONE weak Zone I MARL	1.0
								Grey fresh to slightly weathered moderately to highly fractured very thinly to thinly interbedded silty MUDSTONE weak to moderately weak SILTSTONE moderately weak With closely spaced laminae of silty fine sandstone Zone I MARL	1.5
				375	3.80	54.73			2.0
									2.5
									3.0
									3.5
									4.0
									4.5

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Borehole Log

915575_11724_CH8

Page 2 of 2

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915575_11724_CH8

Location: M56 J6 to J8 Co-ords (British National Grid): 381130 - 386680 Level: 58.53

Hole Type: RC Logged By: Dates: 1991-05-29 - 1991-06-02

Client: Highways England Contractor: Mouchel Project Engineers:

Plant Used: SPT Hammer Serial No:

[illegible]

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see www.bgs.ac.uk/services/ngdc. Generated 23-10-2023 at 07:50. BGS Reference 2020020411595814148

GENERAL REMARKS

Borehole drilled by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm core from base of an inspection pit at 0.8m to completion at 9.94m. Fracture types: II - smooth stepped; V- smooth undulating; VII- rough planar; VIII- smooth planar



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NN
895



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
Date 17th to 26th June 1991

Easting: 5802.0 8127
Northing: 6635.0 8671
Ground Level 63.21m AOD

BOREHOLE CH 9(BH)
Sheet 1 of 3
Scale 1:50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	description	m (%)	tests	depth (m)	level (mOD)	legend
17.6.91			0.15 - 0.50	D	(TOPSOIL) - Drillers description			0.15 (0.35)	63.06	
			0.50 - 1.20	D	Medium dense yellow brown clayey silty fine to medium SAND with a little sub rounded gravel of quartz. (DRIFT)			0.50	62.71	
pm Dry			1.20 - 1.50	1B	Very stiff pale green grey mottled orange brown silty CLAY with a trace of fine gravel. Gravel includes coal. (DRIFT)			(1.00)		
18.6.91			1.50 - 1.95	2J	Stiff red brown and grey silty CLAY with some fine to medium sub angular platy gravel. Gravel includes sandstone. (Zone III MARL)	24	L	1.50	61.67	
am Dry	1.68	N=20	1.95 - 2.50	3B			LPpS			
			2.50 - 2.95	4J	Thinly interlaminated to thinly interbedded red brown hard silty CLAY and silty MUDSTONE weak with occasional thin beds of siltstone moderately weak to moderately strong. Recovered as a fine to coarse platy gravel in a matrix of clay. (Zone II MARL)	11		2.50	60.71	
	1.68	N=72	2.95 - 3.50	5B						
pm 2.90	1.68	N*=250	3.50 - 3.64	6J		11				
					Borehole continued by rotary coring, see Fig. 2/9.2.			3.65	59.56	
Equipment/Methods					Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.20m to 3.65m, and then extended by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 19.00m. Type of flush: Foam. Water added to assist drilling 2.95m to 3.65m.					
Remarks					Casing advanced to 3.50m depth at end of cable percussive boring.		GEL JOB NO. 2334N		FIGURE 2/9.1	

Geotechnical Engineering Limited

BOREHOLE LOG

ST88NW

845



CLIENT The Department of Transport

SITE M56 Widening, Junctions 4 - 6

DATE 17th to 26th June 1991

Easting: 5802.0 8127

Northing: 6635.0 8671

Ground Level 63.21m AOD

BOREHOLE CH 9(BH)

Sheet 2 of 3

Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legends
							Main	Detail				
							Borehole advanced by cable percussive drilling from 0.00m to 3.64m, see Fig. 2/9.1					
24.6.91 am 3.48m	3.50		3.65	49	71 (14)	0	Red brown slightly to moderately weathered very highly fractured thinly interbedded silty MUDSTONE very weak and SILTSTONE moderately weak. (Zone II MARL)	Fractures: Generally VIII 5° Also: 3.81m to 4.00m II 85° 8.51m to 8.70m II 75° 8.70m to 8.90m II 85° Intensely fractured zones: 3.90m to 4.10m 5.60m to 5.80m 6.40m to 7.85m 8.40m to 8.50m		3.65	59.56	
			5.12	12	36 (10)	0						
			5.61	8	114 (10)	0						
			5.90	15	100 (0)	0						
			6.20	16	48 (12)	0						
pm 4.64m	3.50	N* = 130	5.90 - 6.17									
			6.62		85 (6)	0						
25.6.91 am 4.58m			7.09		82 (15)	0						
			8.12		56 (18)	0						
			8.12 - 8.25									
			9.62		104 (74)	53	Red brown fresh to slightly weathered highly fractured silty MUDSTONE very weak to weak. (Zone I MARL)	Fractures: Generally VIII 5° and VIII 30°, often clay infilled.		9.50	53.71	
							Continued on Sheet 3 in same status			(1.50)	(53.21)	
Equipment/Methods See sheet 1.												
Remarks Fracture types: II - smooth stepped; VIII - smooth planar.										GEL JOB NO. 2334N		FIGURE 2/9.2

Geotechnical Engineering Limited

BOREHOLE LOG

5J88NW

85



CLIENT The Department of Transport

SITE M56 Widening, Junctions 4 - 6

DATE 17th to 26th June 1991

Easting: 5802.0 8127

Northings: 6635.0 8671

Ground Level 63.21m AOD

BOREHOLE CH 9(BH)

Sheet 3 of 3

Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
(25.6.91)			10.09		83 (42)	0	Continued from Sheet 2 in same stratum - description as Sheet 2 from 9.50m depth			(10.00)	(53.21)	X
			10.57		96 (82)	36				(1.50)		X
	3.50	N* = 200	11.12		64 (32)	0	Red brown and gray fresh to slightly weathered highly fractured thinly to thickly interlaminated SILTSTONE moderately strong and	Fractures: Generally VIII 5° Also: 14.80m to 14.95m II 60°		11.00	52.21	X
			11.12-11.25		74 (17)	0	MUDSTONE very weak to weak. (Zone I MARL)	Intensely fractured zones: 11.70m to 11.83m 13.30m to 13.35m 15.15m to 15.25m 16.50m to 17.00m				X
			11.59		74 (17)	0						X
			12.05		74 (53)	19	Highly weathered to a clay with lithorelicts: 15.60m to 16.00m 16.20m to 16.23m 16.34m to 16.37m 16.34m to 16.45m 16.55m to 16.57m (Zone III MARL)	Gypsum bands: 12.15m and 12.17m (10mm thick); 15.75m and 16.01m (25mm thick).				X
	3.50	N* = 273	12.62		68 (64)	0						X
			12.62-12.72		72 (17)	0						X
			13.09		88 (70)	61						X
pm 3.98m			13.55		53 (23)	0						X
			14.12		107 (67)	0						X
26.6.91 am 4.48m			14.12-14.26		72 (60)	32						X
			14.55		78 (49)	29						X
			15.00		91 (43)	32						X
			15.50		33 (6)	0						X
			16.01		52 (16)	0						X
			16.48		66 (30)	0						X
			16.96		90 (48)	10						X
			16.96-17.13									X
			17.46									X
			17.96									X
pm			19.00									X
	3.50	N* = 250	19.00-19.13				End of Borehole at 19.00m			19.00	44.21	X
Equipment/Methods See Sheet 1.												
Remarks										GEL JOB NO. 2334N		
										FIGURE 2/9.3		

Borehole Log

915576_11724_CH9

Page 1 of 4

Project Name: Smart Motorway Programme Project No: HE544645

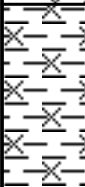
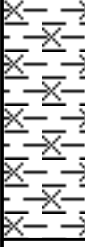
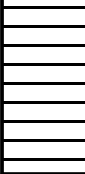
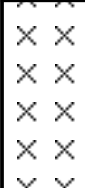
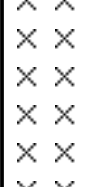
Borehole ID: 915576_11724_CH9

Location: M56 J6 to J8 Co-ords (British National Grid): 381270 - 386710 Level: 63.21

Hole Type: CP+RC Logged By: Dates: 1991-06-17 - 1991-06-26

Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

Well	Water	Samples		Result	Depth (m)	Level (m)	Legend	Stratum Description	Depth m
		Depth (m)	Type						
		0.15 - 0.5	D		0.15	63.06		TOPSOIL Driller s description	
		0.5 - 1.2	D		0.50	62.71		Medium dense yellow brown clayey silty fine to medium SAND with a little sub rounded gravel of quartz DRIFT	0.5
		1.2 - 1.5	B					Very stiff pale green grey mottled orange brown silty CLAY with a trace of fine gravel Gravel includes coal DRIFT	1.0
		1.5 - 1.95	J	20	1.50	61.71		Stiff red brown and grey silty CLAY with some fine to medium sub angular platy gravel Gravel includes sandstone Zone III MARL	1.5
		1.95 - 2.5	B					Thinly interlaminated to thinly interbedded red brown hard silty CLAY and silty MUDSTONE weak with occasional thin beds of siltstone moderately weak to moderately strong Recovered as a fine to coarse platy gravel in a matrix of clay Zone II MARL	2.0
		2.5 - 2.95	J	72	2.50	60.71		Red brown slightly to moderately weathered very highly fractured thinly interlaminated to thinly interbedded silty MUDSTONE very weak and SILTSTONE moderately weak Zone II MARL	2.5
		2.95 - 3.5	B						3.0
		3.5 - 3.64	J	250	3.65	59.56			3.5
									4.0
									4.5

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Borehole Log

915576_11724_CH9

Page 2 of 4

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915576_11724_CH9

Location: M56 J6 to J8 Co-ords (British National Grid): 381270 - 386710 Level: 63.21

Hole Type: CP+RC Logged By: Dates: 1991-06-17 - 1991-06-26
--

Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

[illegible]

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Borehole Log

915576_11724_CH9

Page 4 of 4

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915576_11724_CH9

Location: M56 J6 to J8 Co-ords (British National Grid): 381270 - 386710 Level: 63.21

Hole Type: CP+RC Logged By: Dates: 1991-06-17 - 1991-06-26

Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

Well	Water	Samples		Result	Depth (m)	Level (m)	Legend	Stratum Description	Depth m				
		Depth (m)	Type										
				167		44.21	×	×	Red brown and grey fresh to slightly weathered highly fractured thinly to thickly interlaminated SILTSTONE moderately strong and MUDSTONE very weak to weak Zone I MARL	15.5			
							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
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							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
							×	×					
							250	19.00					19.0
													19.5

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GENERAL REMARKS

Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.2m to 3.65m, and then by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 19m. Fracture types: II - smooth stepped; V- smooth undulating: VII- rough planar; VIII- smooth planar.



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
816



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
Date 14th to 20th June 1991

Easting: 5853.5 8134
Northing: 6697.5 8679
Ground Level 63.53m AOD

BOREHOLE CH 10(BH)
Sheet 1 of 4
Scale 1:50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	piezo- meter	description	m (%)	tests	depth (m)	level (mOD)	legend
14.6.91			0.30 - 0.90	1B		Brown clayey SILT. (TOPSOIL)			0.30 (0.60)	63.23	
			0.90 - 1.50	2B		Soft to firm grey mottled yellow silty CLAY with much organic material and rootlets. Slight organic odour. (FILL?)		L	0.90 (0.60)	62.63	
	0.00	N=20	1.50 - 1.95	3J		Very stiff red brown rarely mottled grey silty CLAY thickly interlaminated with occasional brown silty bands to 5mm thickness and occasional medium gravel. Gravel consists of brown siltstone weak. (Zone III MARL)	15	L	1.50	62.03	
pm Dry			1.95 - 2.50	4B		From 2.00m to 2.50m traces of gypsum. Below 2.50m becomes hard.	14	LS			
17.6.91			2.50 - 2.95	5J			12		(2.00)		
am Dry	1.68	N=61	2.95 - 3.50	6B							
			3.50 - 3.63	7J		Green grey silty MUDSTONE weak, thinly interlaminated with grey siltstone weak. (Zone III MARL)	13		3.50	60.03	
	1.68	N*=63	3.63 - 3.75	8J		Below 3.60m becomes red brown.	10		(1.20)		
			3.75 - 4.50	9B							
	1.68	N*=167	4.50 - 4.71	10J		Red brown silty MUDSTONE weak and SILTSTONE weak interlaminated with occasional thick laminae of brown sandstone strong. (Zone I MARL)	11		4.70	58.83	
pm 4.10m			4.71 - 5.00	11B					5.00	58.53	
Borehole continued by rotary coring, see Fig. 2/10.2											
Equipment/Methods Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.20m to 5.00m, and then extended by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 21.66m. Type of flush: Foam. Water added to assist drilling 3.75m to 5.00m.											
Remarks Standpipe piezometer installation: Sand response zone, 4.50m to 10.50m; Tip at 8.50m. Casing advanced to 5.00m prior to rotary coring.											
								GEL JOB NO.	FIGURE		
								2334N	2/10.1		

Geotechnical Engineering Limited

BOREHOLE LOG

5588NW/896
~~5588NW/896~~



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 14th to 17th June 1991

Easting: 5853.5 8134
 Northing: 6697.5 8679
 Ground Level 63.53m AOD

BOREHOLE CH 10(BH)
Sheet 2 of 4
Scale 1 : 50

[illegible]



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
896



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 14th to 17th June 1991

Easting: 5853.5 8134
Northing: 6697.5 8679
Ground Level 63.53m AOD

BOREHOLE CH 10(BH)
Sheet 3 of 4
Scale 1 : 50

progress water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
(19.6.91)								Main	Detail				
				59	90 (37)	0		Continued from Sheet 2 in same stratum - description as Sheet 2 from 8.20m depth	same stratum - description as		(10.00)	(53.53)	
	5.00	N* = 200	11.23 11.23-11.38					(Zone I MARL) Highly weathered to a clay with lithorelicts: 8.40m to 8.45m and 10.45m to 10.70m. (Zone II MARL)	Sandstone laminae tend to be very highly fractured. Many mudstone laminae are moderately to highly weathered often to a silty clay.	Cr	(4.00)		
				50	94 (87)	21							
			12.73					Blue gray and red brown fresh moderately to highly fractured thinly to thickly interlaminated (with occasional very thin beds) silty fine SANDSTONE moderately weak silty MUDSTONE weak to very weak and SILTSTONE very weak. (Zone I MARL)	Fractures: Generally VIII 5-10° Also: 13.20m to 13.25m VII 75° 18.20m to 18.40m VII 85° Intensely fractured zone: 18.10m to 19.48m		12.20	51.33	
	5.00	N* = 750	14.23 14.23-14.30					Highly weathered to a clay with lithorelicts: 12.57m to 13.03m and 19.13m to 19.18m. (Zone III MARL)					
				51	93 (60)	19							
			15.73										
				43	100 (93)	47							
	5.00	N* = 600	17.23 17.23-17.30										
				50	91 (56)	17							
pm Dry			18.73										
20.6.91 pm 5.15m					98 (60)	45				UI _s			
											(20.00)	(43.53)	
Equipment/Methods See sheet 1.													
Remarks													
										GEL JOB NO.	FIGURE		
										2334N	2/10.3		



Geotechnical Engineering Limited

BOREHOLE LOG

SJ88NW
816



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 14th to 17th June 1991

Easting: 5853.5 8134
Northing: 6697.5 8679
Ground Level 63.53m AOD

BOREHOLE CH 10(BH)
Sheet 4 of 4
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
								Main	Detail				
	5.00	N=64	20.23 20.23-20.68					Continued from Sheet 3 in same stratum - description as Sheet 3 from 12.20m depth			(20.00)	(43.53)	
pm 5.10m			21.66		80 (24)	20					21.66	41.87	
								End of Borehole at 21.68m					
Equipment/Methods See sheet 1.													
Remarks										GEL JOB NO. 2334N	FIGURE 2/10.4		

915577_11724_CH10

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915577_11724_CH10

Location: M56 J6 to J8 Co-ords (British National Grid): 381340 - 386790 Level: 63.53

Hole Type: CP+RC Logged By: Dates: 1991-06-14 - 1991-06-20

Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

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915577_11724_CH10

Plant Used: SPT Hammer Serial No:

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see www.bgs.ac.uk/services/ngdc. Generated 23-10-2023 at 07:49. BGS Reference 2020020411595814150

Borehole Log

915577_11724_CH10

Page 4 of 5

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915577_11724_CH10

Location: M56 J6 to J8 Co-ords (British National Grid): 381340 - 386790 Level: 63.53

Hole Type: CP+RC	Logged By:	Dates: 1991-06-14 - 1991-06-20
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Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

[illegible]

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see www.bgs.ac.uk/services/ngdc. Generated 23-10-2023 at 07:49. BGS Reference 2020020411595814150

Borehole Log

915577_11724_CH10

Page 5 of 5

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915577_11724_CH10

Location: M56 J6 to J8 Co-ords (British National Grid): 381340 - 386790 Level: 63.53

Hole Type: CP+RC	Logged By:	Dates: 1991-06-14 - 1991-06-20
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Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

[illegible]

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see www.bgs.ac.uk/services/ngdc. Generated 23-10-2023 at 07:49. BGS Reference 2020020411595814150

GENERAL REMARKS

Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.2m to 5m, and then by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 21.66m. Fracture types: II - smooth stepped; V- smooth undulating; VII- rough planar; VIII- smooth planar.



Geotechnical Engineering Limited

BOREHOLE LOG

SJ88NW

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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
Date 10th to 29th June 1991

Easting: 5800.0 8130
Northing: 6759.5 8686
Ground Level 60.48m AOD

BOREHOLE CH 11(BH)
Sheet 1 of 4
Scale 1:50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	description	m (%)	tests	depth (m)	level (mOD)	legend
10.6.91			0.00 - 0.55	1B	Medium dense dark brown mottled orange clayey sandy SILT with traces of rootlets, occasional thin orange sandy lenses and fine gravel. Gravel consists of red brick, coal and plastic. (FILL)					
			0.55 - 1.20	2B	Firm to stiff yellow brown sandy CLAY with a few rootlets and some dark grey carbonaceous material. (FILL)			0.55 (0.65)	59.93	
pm Dry			1.30 - 1.50	3B				1.20 (0.65)	59.28	
11.6.91			1.50 - 1.95	4U	Stiff to very stiff dark brown and green brown silty CLAY, laminated in places, with fragments of red brick, carbonaceous material and plant remains. (FILL)		L T			
am Dry	0.00	31 blows	1.95 - 2.15	5B				1.85	58.63	
			2.15 - 2.50	6B	Interlaminated dark brown silty MUDSTONE weak and brown sandy SILTSTONE moderately weak					
	1.68	N=55	2.50 - 2.95	7J	Ripple marks on some fragment surfaces. Recovered as a medium to coarse sub angular gravel with brown silty clay. (Zone II MARL)					
			2.95 - 3.40	8B						
	1.68	N*=100	3.40 - 3.68	9J						
			3.68 - 4.15	10B						
pm Dry	1.68	N*=250	4.15 - 4.20	11J				4.15	56.33	
					Borehole continued by rotary coring, see Fig. 2/11.2					
Equipment/Methods Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.20m to 4.15m, and then extended by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 20.15m. Type of flush: Foam.										
Remarks Borehole backfilled with grout on completion.							GEL JOB NO.	FIGURE		
							2334N	2/11.1		



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 10th to 29th June 1991

Easting: 5802.0 8130
Northing: 6761.5 8686
Ground Level 60.48m AOD

BOREHOLE REDRILL
CH 11(BH)
Sheet 2 of 4
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
							From 0.00m to 4.15m borehole advanced by cable percussive drilling, see Fig. 2/11.1		P			
28.6.91 am Dry	2.15		4.15	49	100 (73)	0	Red brown slightly to moderately weathered highly fractured thinly to medium bedded silty MUDSTONE very weak and weak. (Zone II MARL)	Fractures: Generally VIII 5° and VIII 85° but core held intact by clay infills.		4.15 (1.05)	56.33	
			5.20	75	98 (33)	0	Red brown and grey slightly weathered highly fractured thinly to thickly interlaminated fine SANDSTONE moderately weak MUDSTONE weak SILTSTONE moderately weak. (Zone I MARL)	Fractures: Generally VIII 5° Also: 5.50m to 5.60m VII 85° 5.70m to 6.15m II 85° 6.20m to 6.25m II 85° Many of the above fractures are highly weathered to a stiff clay. 7.05m: 2mm band of silty fine sand.	SCI	5.20 (2.10)	55.28	
	4.09	N* = 167	6.66 - 6.84 6.70	60	89 (46)	0	Stiff red brown silty CLAY with many fine to medium sub angular gravel sized lithorelicts of silty mudstone weak. (Zone III MARL)		LCr	7.30 (0.70)	53.18	
			8.00	75	100 (73)	0	Red brown and grey slightly weathered moderately to highly fractured thickly laminated to thinly bedded fine SANDSTONE moderately weak with very closely to closely spaced laminae of moderately weathered silty mudstone very weak. Highly weathered to a clay with lithorelicts: 8.32m to 8.37m, 8.88m to 8.90m, 9.70m to 9.73m and 9.85m to 9.97m. (Zone III MARL)	Fractures: Generally VIII 5° Also: 10.25m to 10.47m II 85° 11.24m to 11.45m I 85° 12.05m VIII 25° Intensely fractured zones: 9.50m to 9.80m 10.70m to 10.90m	Is L	8.00 (5.50)	52.48	
	4.09	N* = 500	9.50 9.66 - 9.77	60	96 (67)	0				(10.00)	(50.48)	
Continued on Sheet 3 in same stratum												
Equipment/Methods See sheet 1.												
Remarks Original borehole CH 11 (BH) - Insufficient core recovery between 0.00m and 14.20m. SPT values are all taken from the original CH 11 (BH)									GEL JOB NO.	FIGURE		
									2334N	2/11.2		



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 10th to 29th June 1991

Easting: 5802.0 8130
Northing: 6761.5 8686
Ground Level 60.48m AOD

BOREHOLE REDRILL
CH 11(BH)
Sheet 3 of 4
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
(28.6.91)							Continued from Sheet 2 in same stratum - description as Sheet 2 from 8.00m depth			(10.00)	(50.48)	
om			10.70				Highly weathered to a clay with lithorelicts: From 10.85m to 10.70m, 12.47m to 12.50m, 12.83m to 12.73m, 12.85m to 12.93m, 12.97m to 13.03m (Zone III MARL)			(5.50)		
29.6.91 am				75	88 (26)	0						
	4.09	N* = 500	12.66	85	93 (50)	0						
			13.50				Grey fresh highly fractured very thinly bedded fine sandy SILTSTONE moderately weak to moderately strong with very closely spaced laminae of mudstone weak. (Zone I MARL)	Fractures: Generally VIII 5° Also: 14.10m to 14.24m I 80° Intensely fractured zone: 13.90m to 13.94m.		13.50	46.98	
pm			14.40	60	100 (69)	0	Highly weathered to a clay with lithorelicts: 14.76m to 14.81m, 15.90m to 15.92m, 16.02m to 16.04m, 16.48m to 16.50m, 17.18m to 17.20m, 17.54m to 17.57m, 18.42m to 18.44m, 18.80m to 18.82m and 19.73m to 19.78m. (Zone III MARL)	Generally red brown: 16.30m to 17.20m and 17.70m to 18.20m.		14.40	46.08	
							This is a redrill of the first part of CH 11(BH), see Fig. 2/11.4 for the continuation to comple- tion at 20.15m.					
Equipment/Methods See sheet 1.												
Remarks									GEL JOB NO.	FIGURE		
									2334N	2/11.3		



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 10th to 29th June 1991

Easting: 5800.0 8130 BOREHOLE CH 11(BH)
Northing: 6759.5 8686 Sheet 4 of 4
Ground Level 60.48m AOD Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
							Continued from Sheet 3 in same stratum - description as Sheet 3 from 13.50m depth					
							10.00m to 14.40m see Fig. 2/11.3 (Redrill CH 11(BH)).					
15.6.91 am 5.36m			14.40		85 (57)	40	Gray fresh highly fractured very thinly bedded fine sandy SILTSTONE moderately weak to moderately strong with very closely spaced laminae of mudstone. (Zone I MARL)	Fractures: Generally VIII 5° Also: 14.10m to 14.24m I 80° Intensely fractured zone: 13.80m to 13.94m.		14.40	46.08	
			15.66		92 (72)	0	Highly weathered to a clay with lithorelicts: 14.76m to 14.81m, 15.90m to 15.92m, 16.02m to 16.04m, 16.48m to 16.50m, 17.18m to 17.20m, 17.54m to 17.57m, 18.42m to 18.44m, 18.80m to 18.82m and 19.73m to 19.76m. (Zone III MARL)	Generally red brown: 16.30m to 17.20m and 17.70m to 18.20m.				
pm 5.43m			17.18		100 (82)	29						
17.6.91 am 3.40m	4.09	N*750	17.67		10038 (75)							
			18.60		92 (58)	19						
pm 4.28m	4.09	N*1000	20.15									
			20.15-20.18				End of Borehole at 20.15m			20.15	40.33	
Equipment/Methods See sheet 1.												
Remarks									GEL JOB NO.	FIGURE		
									2334N	2/11.4		

915578_11724_CH11

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915578_11724_CH11

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Borehole Log

Page 3 of 5

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Borehole ID: 915578_11724_CH11

Location: M56 J6 to J8 Co-ords (British National Grid): 381300 - 386860 Level: 60.48

Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

		Samples						Depth
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[illegible]

Borehole Log

915578_11724_CH11

Page 4 of 5

Project Name: Smart Motorway Programme Project No: HE544645

Borehole ID: 915578_11724_CH11

Location: M56 J6 to J8 Co-ords (British National Grid): 381300 - 386860 Level: 60.48

Hole Type: CP+RC	Logged By:	Dates: 1991-06-10 - 1991-06-29
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Client: Highways England Contractor: Mouchel Project Engineer:

Plant Used: SPT Hammer Serial No:

[illegible]

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see www.bgs.ac.uk/services/ngdc. Generated 23-10-2023 at 07:48. BGS Reference 2020020411595814151

GENERAL REMARKS

Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.2m to 4.15m, and then by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 20.15m. Fracture types: II - smooth stepped; V- smooth undulating; VII- rough planar; VIII- smooth planar.

Geotechnical Engineering Limited

BOREHOLE LOG

SJ88NW
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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
Date 10th to 13th June 1991

Easting: 5932.0 8146
Northing: 6943.5 8702
Ground Level 58.93m AOD

BOREHOLE CH 12(BH)
Sheet 1 of 3
Scale 1:50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	piezo- meter	description	m (%)	tests	depth (m)	level (mOD)	legend
10.6.91			0.45 - 1.20	D		TOPSOIL - Driller's description					
			1.20 - 1.50	D		Very stiff brown fine to coarse sandy silty CLAY with some fine to coarse angular to rounded gravel. Gravel includes quartz and coal.		L	0.45	58.48	
			1.50 - 1.95	S		(FILL)		L	(0.60)		
	0.00	N=20	1.95 - 2.50	D		Stiff red brown silty CLAY with a little fine to medium angular gravel of mudstone very weak and weak (Zone III MARL)			1.40	57.53	
			2.50 - 2.75	U		Very stiff becoming hard red brown occasionally mottled blue grey friable silty CLAY with a little fine to medium angular gravel of mudstone very weak and weak (Zone III MARL)		LT	(0.60)	56.93	
	1.68	61 blows	2.75 - 2.95	C					(1.50)		
	1.68	N*=187	2.95 - 3.16	S							
			3.16 - 3.45	D							
pm Dry		N*=300	3.45 - 3.57			Thinly interlaminated hard red-brown silty CLAY and silty MUDSTONE weak and very weak. (Zone I MARL)	PpS		3.50	55.43	
									3.57	55.36	
Borehole continued by rotary coring, see Fig. 2/12.2											
Equipment/Methods Borehole initially advanced by a light cable percussive rig using 150mm diameter tools from base of an inspection pit at 1.20m to 3.45m, and then extended by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm diameter core to completion at 16.43m. Type of flush: Foam. Water added to assist drilling 3.16m to 3.45m.											
Remarks Standpipe piezometer installation: Sand repose zone 6.00m to 11.00m, Tip at 8.50m.								GEL JOB NO.	FIGURE		
								2334N	2/12.1		



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
898



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 11th to 12th June 1991

Easting: 5932.0 8146
Northing: 6943.5 8702
Ground Level 58.93m AOD

BOREHOLE CH 12(BH)
Sheet 2 of 3
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
								Main	Detail				
								From 0.00m to 3.45m borehole advanced by cable percussive drilling, see Fig. 2/12.1					



Geotechnical Engineering Limited

BOREHOLE LOG

SJ88 NW
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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 11th to 12th June 1991

Easting: 5932.0 8146 BOREHOLE CH 12(BH)
Northing: 6943.5 8702 Sheet 3 of 3
Ground Level 58.93m AOD Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
								Main	Detail				
(12.6.91)								Continued from Sheet 2 in Sheet 2 from 7.70m depth	same stratum - description as		10.10	48.83	
	3.60	N*= 750	11.20 11.20-11.30	49	73 (36)	0		Thinly interlaminated red brown slightly weathered moderately fractured silty MUDSTONE weak and grey brown SILTSTONE moderately weak. (Zone I MARL)	Fractures: Generally VII 10° and VII 10° Clay (up to 2mm thick) on fracture surfaces below 10.88m.		(1.20)		
								Red brown fresh to slightly weathered moderately fractured silty MUDSTONE weak with thin medium spaced irregular lenses and laminae of grey green mudstone and siltstone. (Zone I MARL) From 13.30m to 13.40m moderately weathered, highly fractured zone of clay and mudstone. (Zone II MARL)	Fractures: Generally VII 10° Also: 11.80m VII 70° 13.20m VII 70° 13.50m VII 70° From 12.35m to 12.95m generally non-intact recovered as a sub angular gravel with thin (1- 2mm) smearings of clay.		11.30	47.63	
			12.35	30	100 (19)	0					(2.60)		
			13.31	36	100 (71)	29							
	3.60	N*= 500	14.20 14.20-14.30	45	65 (35)	9		Thinly to thickly interlaminated red brown and grey brown moderately weathered highly fractured silty MUDSTONE weak and SILTSTONE weak to moderately weak. (Zone II MARL) Highly weathered to a clay with lithorelicts: 13.90m to 14.55m and 14.80m to 14.90m. (Zone III MARL)	Fractures: Generally VII 10° Clay smears on some fracture surfaces.		13.90	45.03	
											(1.00)		
			15.63	32	100 (94)	41					14.90	44.03	
pm 12.10m			16.43					Red brown fresh to slightly weathered moderately fractured thickly laminated to thinly bedded silty MUDSTONE weak with very closely to closely spaced thin laminae of siltstone. (Zone I MARL)	Fractures: Generally VIII 10° Clay smears on fracture surfaces. Occasional solution cavities (up to 20mm diameter).		16.43	42.50	
13.6.91 am 4.55	3.60	N*= 1000	16.43-16.50					End of Borehole at 16.43m					
Equipment/Methods See sheet 1.													
Remarks										GEL JOB NO.	FIGURE		
										2334N	2/12.3		



Geotechnical Engineering Limited

BOREHOLE LOG

SJ88NW
899



CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 6th to 8th June 1991

Easting: 6004.0 8106
Northing: 6958.0 8630
Ground Level 55.65m AOD

BOREHOLE CH 13
Sheet 1 of 2
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
6.6.91							TOPSOIL					
			0.40	15	100 (31)	0	Light grey fresh to slightly weathered highly fractured thickly laminated sandy SILTSTONE weak thin red brown laminae of mudstone. (Zone I MARL)	Fractures: Generally V 5° and VIII 5° Rootlets along fractures 0.40m to 0.80m		0.15 (0.75)	55.50	
			0.85	15	92 (20)	0				0.90	54.75	
			1.10	20	88 (13)	9	Red brown fresh to slightly weathered highly fractured thinly to thickly laminated silty MUDSTONE weak with very closely spaced laminae of grey brown sandy siltstone weak to moderately weak. (Zone I MARL)	Fractures: Generally IV 10°		1.60 (0.90)	54.05	
			1.50	60	78 (72)	31	Red brown fresh to slightly weathered moderately fractured thickly interlaminated SILTSTONE moderately weak and MUDSTONE weak with closely spaced sandstone laminae. (Zone I MARL)	Fractures: Generally V 5° and VIII 5°		2.50 (0.65)	53.15	
			2.85	90	74 (43)	11	Grey brown fresh to slightly weathered highly fractured thinly to thickly laminated SILTSTONE moderately weak with very closely spaced laminae of brown mudstone weak. (Zone I MARL)	Fractures: Generally VIII 5° Some ripple marks on bedding planes.	SCI H	3.15 (3.45)	52.50	
Water strike at 4.00m rising to 3.70m in 5 mins	0.00	N* = 300	3.80 - 3.90 4.00	45	91 (68)	29	Green grey fresh to slightly weathered highly fractured thickly interlaminated to thinly interbedded silty MUDSTONE moderately weak and SILTSTONE moderately weak. (Zone I MARL)	Fractures: Generally VIII 5°, IV 75° and IV 75°				
pm 4.25m			5.00	30	100 (44)	20						
7.6.91 am 2.00m			5.50	60	97 (63)	12						
	0.00	N* = 500	6.30 - 6.37 6.50	70	100 (81)	31	Red brown rarely mottled grey fresh to slightly weathered moderately fractured silty MUDSTONE moderately weak. (Zone I MARL) Highly weathered to a clay with lithorelicts: 6.70m to 6.73m and 7.13m to 7.15m. (Zone III MARL)	Fractures: Generally VIII 5°, VIII 50° and VIII 80°		6.60 (1.20)	49.05	
			7.55	60	97 (69)	24	Red brown and green grey fresh to slightly weathered moderately fractured thinly interlaminated MUDSTONE moderately weak and SILTSTONE moderately weak. (Zone I MARL)	Fractures: Generally V 15° Some ripple marks on bedding planes.		7.80 (1.20)	47.85	
	0.00	N* = 300	9.00 - 9.10	60	80 (68)	31	Reddish brown rarely mottled grey fresh to slightly weathered moderately fractured thinly bedded silty MUDSTONE moderately weak (Zone I MARL) Highly weathered to a clay with lithorelicts: 9.24m to 9.64m and 9.70m to 9.71m. (Zone III MARL)	Fractures: Generally VIII 5°, VIII 50° and VIII 80°		9.00 (1.40) (10.00)	46.55 (45.65)	
Continued on Sheet 2 in same station												
Equipment/Methods			Borehole drilled by a Geotechnical Sitemaster rotary rig using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm core from the base of an inspection pit at 0.40m to completion at 14.00m. Type of flush: 0.40m to 4.00m - Air; 4.00m to 14.00m - Air/mist. Borehole backfilled with grout on completion.									
Remarks			Water strike at 4.00m; 3.80m at 5 mins; 3.70m at 10 mins; 3.70m at 15 mins and 3.70m at 20 mins. Fracture types: IV - rough undulating; V - smooth undulating; VII - rough planar; VIII - smooth planar.							GEL JOB NO. 2334N	FIGURE 2/13.1	



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 6th to 8th June 1991

Easting: 6004.0 8106 BOREHOLE CH 13
Northing: 6958.0 8630 Sheet 2 of 2
Ground Level 55.65m AOD Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
(7.6.91)							Continued from Sheet 1 in same stratum - description as Sheet 1 from 9.00m depth.			(10.00)	(45.65)	
			10.40		96 (75)	33	Brown and grey green fresh to slightly weathered highly fractured thickly interlaminated MUDSTONE moderately weak SILTSTONE moderately weak. (Zone I MARL)	Fractures: Generally VII 5°		10.40	45.25	
				70						10.60	45.05	
pm 8.75m			11.80		70 (63)	43	Red brown fresh to slightly weathered moderately fractured very thin to thinly bedded silty MUDSTONE moderately weak with closely spaced laminae of sandstone. (Zone I MARL)	Fractures: Generally VII 10° and VIII 10° Also: 10.80m VIII 80°		(1.60)		
8.6.91 am 1.85m	0.00	N*= 500	12.20 12.20-12.28		100 (60)	43	Brown and grey green fresh to slightly weathered highly fractured thickly interlaminated MUDSTONE moderately weak and SILTSTONE moderately weak. (Zone I MARL)	Fractures: Generally VII 5°		12.20	43.45	
			13.00		100 (30)	0	Brown fresh to slightly weathered moderately fractured thinly bedded silty MUDSTONE moderately weak. (Zone I MARL)	Fractures: Generally VII 5°		(0.40)	43.05	
			13.40		92 (58)	18				(0.35)	42.70	
pm 8.75m	0.00	N*= 375	14.00 14.00-14.09				Red brown fresh to slightly weathered highly fractured silty thinly interlaminated MUDSTONE moderately weak SILTSTONE moderately strong. (Zone I MARL)	Fractures: Generally VII 5° Some ripple markings on bedding planes		12.95		
										14.00	41.65	
Equipment/Methods See sheet 1.												
Remarks									GEL JOB NO.	FIGURE		
									2334N	2/13.2		



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 21st to 25th June 1991

Easting: 6096.0 8163
Northing: 7164.5 8724
Ground Level 53.82m AOD

BOREHOLE CH 14
Sheet 1 of 3
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
21.6.91 am Dry			0.30				TOPSOIL			0.10	53.72	
	1.00		1.00		0 (0)	0	Brown silty CLAY with some fine to medium sub angular gravel of mudstone and siltstone. (Zone III MARL)					
	1.00	N* = 67	1.77 - 2.19	(1)	Clean	out				2.00	51.82	
			2.19		87 (0)	0	Red brown fresh to slightly weathered moderately to highly fractured silty MUDSTONE weak to moderately weak with occasional lenses of grey siltstone up to 20mm thick. (Zone I MARL)	Fractures: Generally VIII 5° and VIII 60° Also: 7.50m to 7.65m II 85° 8.50m to 8.65m II 80°	S			
			2.74		108 (35)	0	Highly weathered to a clay with lithorelicts: 4.26m to 4.32m and 8.26m to 8.36m. (Zone III MARL)	Bands of moderately weathered mudstone: 3.00m to 3.40m 6.10m to 6.50m 7.66m to 8.10m	L			
pm 3.86m			3.60		91 (30)	0			LCr			
23.6.91 am 3.00m	1.00	N* = 231	4.26 - 4.41		95 (68)	27						
			5.76		87 (70)	20						
	1.00	N* = 214	7.26 - 7.44		88 (16)	0						
			8.17		85 (38)	16						
			9.47		91 (38)	19						
Continued on Sheet 2 in same status										(10.00)	(43.82)	
Equipment/Methods Borehole drilled by a Geotechnical Sitemaster rotary rig using 128mm casing (Dry-drilling) from the base of an inspection pit at 0.30m to 1.00m and then using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm core to completion at 9.63m. Type of flush: Foam. Borehole backfilled with grout on comple-												
Remarks (1) SPT (C) carried out from 1.77m to 2.19m. Hole subsequently cleaned out before coring recommenced at 2.19m. Fracture types: II - smooth stepped; VIII - smooth planar.												
										GEL JOB NO.	FIGURE	
										2334N	2/14.1	



Geotechnical Engineering Limited
BOREHOLE LOG

SJ88NW
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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 21st to 25th June 1991

Easting: 6096.0 8163
Northing: 7164.5 8724
Ground Level 53.82m AOD

BOREHOLE CH 14
Sheet 2 of 3
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
(23.6.91) pm 3.69 24.6.91 am	1.00	N* = 500	10.26 10.26-10.33		93 (87)	50	Continued from Sheet 1 in same stratum - description as Sheet 1 from 2.00m depth			(10.00)	(43.82)	
										11.45	42.37	
			11.76		80 (23)	17	Red brown fresh to slightly weathered highly fractured thinly to thickly interlaminated silty MUDSTONE weak and SILTSTONE moderately weak. (Zone I MARL)	Fractures: Generally VIII 5° Intensely fractured zones: 12.20m to 12.45m 13.50m to 13.60m		(2.15)		
	1.00	N* = 600	13.26 13.26-13.32		100 (30)	0	Red brown slightly weathered highly fractured thinly bedded silty MUDSTONE weak. (Zone I MARL)	Fractures: Generally VIII 5° Also: 13.85m to 14.00m II 70° 14.20m to 14.40m VIII 70° 14.48m to 14.60m VIII 45° Intensely fractured zones: 14.30m to 14.35m and 14.56m to 14.62m.		13.60	40.22	
			14.76		97 (63)	49	Red brown and gray fresh to slightly weathered highly fractured thinly interbedded silty MUDSTONE weak and fine sandy SILTSTONE moderately weak to moderately strong. (Zone I MARL)	Fractures: Generally VIII 5° Also: 14.80m to 15.00m II 80° 15.05m VIII 60° Intensely fractured zone: 15.20m to 15.35m		14.80	39.02	
	1.00	N* = 500	16.26 16.26-16.34		74 (20)	14	Highly weathered to a clay with lithorelicts: 15.86m to 15.89m (Zone III MARL)			16.50	37.32	
			17.74		98 (88)	68	Red brown moderately weathered intensely fractured thinly to thickly interlaminated silty MUDSTONE and SILTSTONE weak. (Zone II MARL)			17.70	36.12	
			19.26		100 (63)	48	Red brown fresh to slightly weathered moderately fractured thinly bedded silty MUDSTONE weak with closely spaced laminae of grey siltstone. (Zone I MARL)	Fractures: Generally VIII 5°	UI ₅	(1.90)		
pm 25.6.91 am 0.86m	1.00	N* = 375	19.26-19.34				Description on Sheet 3			19.60	34.22	
							Continued on Sheet 3 in same stratum			(20.00)	(33.82)	
Equipment/Methods See Sheet 1												
Remarks										GEL JOB NO.	FIGURE	
										2334N	2/14.2	



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BOREHOLE LOG

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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 21st to 25th June 1991

Easting: 6096.0 8163 BOREHOLE CH 14
Northing: 7164.5 8724 Sheet 3 of 3
Ground Level 53.82m AOD Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	description		tests	depth (m)	level (mOD)	legend
							Main	Detail				
(25.6.91)							Continued from Sheet 2 in same stratum - from 19.80m depth.			(20.00)	(33.82)	
			20.46		94 (43)	34	Red brown fresh to slightly weathered highly fractured thinly to thickly interlaminated SILTSTONE moderately weak to moderately strong and MUDSTONE weak. (Zone I MARL) Highly weathered to a clay with lithorelicts: 21.17m to 21.25m, 21.00m to 21.07m. (Zone III MARL)	Fractures: Generally VIII 5-10° Also: 21.02m to 21.23m II 85°		(1.55)		
	1.00	N* = 1000	21.98 21.98-22.04		88 (66)	61	Red brown fresh moderately fractured thickly laminated to thinly bedded silty MUDSTONE moderately weak. (Zone I MARL)	Fractures: Generally VIII 5° 21.47m to 21.60m II 85°		21.15	32.67	
			23.50		85 (46)	8	Red brown slightly weathered moderately to highly fractured thinly to thickly laminated SILTSTONE moderately weak with very closely spaced laminae of grey mudstone. (Zone I MARL) Highly weathered to a clay with lithorelicts: 23.90m to 23.96m (Zone III MARL)	Fractures: Generally VIII 5° Also: 24.30m II 60° 24.25m to 24.30m II 80°		(2.05)		
pm GL(1)	1.00	N* = 500	24.80 24.80-24.88				End of Borehole at 24.80m			23.20	30.62	
										24.80	29.02	
Equipment/Methods See Sheet 1												
Remarks (1) Probably foam - difficult to identify true water level										GEL JOB NO. 2334N		
										FIGURE 2/14.3		



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BOREHOLE LOG

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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 15th to 20th June 1991

Easting: 6171.0 8158
Northing: 7340.5 8723
Ground Level 53.70m AOD

BOREHOLE CH 15
Sheet 1 of 3
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
								Main	Detail				
15.6.91	0.30		0.00 - 0.10 0.10 - 0.20 0.30	18 28	100 (81)	33		Firm red brown mottled grey silty CLAY with lithorelicts of brown sandy siltstone. (Zone III MARL)			0.30	53.40	
pm Dry			0.72		48 (34)	20		Brown occasionally grey slightly weathered highly fractured thinly interbedded sandy SILTSTONE moderately weak to moderately strong and silty MUDSTONE weak (Zone I MARL)	Fractures: Generally VIII 10° and II 70° Clay smears on fracture surfaces. Occasional solution cavities (up to 20mm diameter)				
16.6.91 am Dry			1.85		74 (11)	0		Moderately weathered highly fractured mudstone bands: 2.40m to 2.80m, 3.50m to 4.20m, 4.30m to 4.45m and 4.80m to 5.10m (Zone II MARL)					
			2.93		36 (12)	0		Highly weathered to clay with lithorelicts: 0.80m to 0.90m and 1.85m to 2.20m. (Zone III MARL)		SCI			
	0.30	N* = 1000	3.26 - 3.30		56 (35)	0		Completely weathered to a firm clay: 5.18m to 5.17m and 5.31m to 5.33m. (Zone IV MARL)			(5.70)		
pm Dry			3.80		89 (59)	19							
17.6.91 am Dry			4.80		96 (60)	21				S			
			5.93		99 (69)	7		Red brown fresh to slightly weathered highly fractured thinly to medium bedded silty MUDSTONE moderately weak with closely to medium spaced thin lenses of grey green silty mudstone moderately weak. (Zone I MARL)	Fractures: Generally VIII 10°, V 45-60° and VIII 45-60°.		6.00	47.70	
			7.45		100 (64)	48		With closely to medium spaced zones of moderately weathered, highly fractured mudstone and clay. (Zone II MARL)		I _s U SCr U _s	(10.10)		
pm 2.86m			8.86		93 (68)	19		Highly weathered to clay with lithorelicts: 8.20m to 8.35m, 8.88m to 9.00m, 11.95m to 12.20m and 12.55m to 12.65m (Zone III MARL)					
18.6.91 am 2.23	0.30	N* = 429	8.86 - 8.98								(10.00)	(43.70)	
Continued on Sheet 2 in same stratum													
Equipment/Methods		Borehole drilled by a Geotechnical Sitemaster rotary rig using 128mm casing (Dry-drilling) from the base of an inspection pit at 0.20m to 0.30m and then using a 116mm diameter core barrel with a rigid plastic liner to produce 90mm core to completion at 23.18m. Type of flush: Foam.											
Remarks		Fracture types: II - smooth stepped; VIII - smooth planar. Standpipe piezometer installation: Sand response zone 15.00 to 5.50m. Tip at 10.50m.									GEL JOB NO. 2334N	FIGURE 2/15.1	



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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 15th to 20th June 1991

Easting: 6171.0 8158
Northing: 7340.5 8723
Ground Level 53.70m AOD

BOREHOLE CH 15
Sheet 2 of 3
Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
								Main	Detail				
(18.6.91)								Continued from Sheet 1 in same stratum - description as Sheet 1 from 6.00m depth			(10.00)	(43.70)	
			10.41		98 (67)	20							
	0.30	N* = 429	11.95 11.95-12.07		100 (84)	47					(10.10)		
			13.47		97 (77)	33			Zones of thinly to thickly interlaminated brown and grey silty mudstone and siltstone from 13.10m to 13.40m, 14.10m to 14.40m, 15.10m to 15.40m and 15.66m to 15.98m.				
	0.30	N* = 600	14.99 14.99-15.09		95 (70)	35							
pm 5.63m			16.51		91 (77)	53		Red brown and grey slightly weathered moderately fractured very thinly laminated to very thinly bedded silty MUDSTONE weak with closely spaced laminae of siltstone moderately weak. (Zone I MARL)	Fractures: Generally VIII 10° Clay on fracture surfaces.		16.10	37.60	
19.6.91 am 5.63m			18.01 18.01-18.08		76 (63)	32		Red brown slightly weathered moderately fractured silty MUDSTONE, moderately weak to moderately strong. (Zone I MARL)	Fractures: Generally VIII 25° Some solution cavities (up to 5mm diameter).		16.90	36.80	
	0.30	N* = 600	19.53 20.00		53 (0)	0		Red brown and grey slightly to moderately weathered highly fractured thinly laminated to very thinly bedded of sandy silty MUDSTONE weak to moderately weak with closely spaced thin laminae of siltstone, moderately weak (Zone II MARL)	Fractures: Generally VIII 10° Clay on fracture surfaces. Core generally non-intact: 19.35m to 20.39m.		18.45	33.25	
								Continued on Sheet 3 in same stratum			(20.00)	(33.70)	
Equipment/Methods See Sheet 1													
Remarks										GEL JOB NO. 2334N	FIGURE 2/15.2		



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BOREHOLE LOG

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CLIENT The Department of Transport
SITE M56 Widening, Junctions 4 - 6
DATE 15th to 20th June 1991

Easting: 6171.0 8158 BOREHOLE CH 15
Northing: 7340.5 8723 Sheet 3 of 3
Ground Level 53.70m AOD Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	TCR (SCR)	RQD	piezo meter	description		tests	depth (m)	level (mOD)	legend
								Main	Detail				
(19.6.91)	0.30	N* = 214	20.00-20.20		34 (0)	0		Continued from Sheet 2 in same stratum description as Sheet 2 from 18.45m depth			20.00	(33.70)	
pm 5.66m													
20.6.91 am 5.69m	0.30	N* = 1000	21.03 21.03-21.08		67 (30)	0		Highly weathered to a clay with lithorelicts: 22.25m to 22.30m, 22.70m to 22.76m, and 22.86m to 22.91m (Zone III MARE)					
	0.30	N* = 750	22.53 22.53-23.18		77 (22)	0							
pm 7.29m													
			23.18								23.18	30.52	
								End of Borehole at 23.18m					
Equipment/Methods See Sheet 1													
Remarks										GEL JOB NO.	FIGURE		
										2334N	2/15.3		

APPENDIX 7
ZETICA UXO RISK MAP

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Map Centre: 381036,386986



LEGEND

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

- military**
- industry**
- UXO find**
- transport**
- dock**
- Luftwaffe targets**
- utilities**
- Bombing decoy**
- other**

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

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

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

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

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: (<https://zeticauxo.com/downloads-and-resources/risk-maps/>)

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It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.