



The Fairways, Westhoughton

Combined Phase 1 Geo-Environmental Investigation and Coal Mining Risk Assessment

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1.0 INTRODUCTION

This Combined Phase 1 Geo-Environmental Investigation and Coal Mining Risk Assessment Report has been prepared at the request of Bellway Homes (Manchester) Ltd. Instructions to proceed were received in January 2021 and desk study works were received and undertaken in February 2021.

Proposed Development

This Combined Phase 1 Geo-Environmental Investigation and Coal Mining Risk Assessment Report (CMRA) is to be used for submission to the Local Authority as part of 2 No. planning applications as it is the Client's intention to develop the site into a low-rise residential development with associated private gardens, areas of soft landscaping and highways. Development Phases 3 and 4 will be submitted as a single planning application and Development phase 5 as a separate stand-alone application, the development phases are shown below:



Figure 1; Extract of the Bellway Homes The Vistas masterplan

A proposed development plan is included in Appendix 12.

1.1 Brief

The brief was to carry out a Combined Phase 1 Geo-Environmental Investigation and Coal Mining Risk Assessment Report 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 historic site and relevant off-site activities including 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 based on the anticipated ground conditions appropriate site investigation works and discuss potential development issues (i.e. sub-surface features – obstructions, infilling, compressible ground, faulting, mineral extraction, mining and land instability).
- e) To undertake a detailed Coal Mining risk Assessment (CMRA) for the site and to assess the risk of ground instability as the result of coal mining beneath the site and the need for further intrusive ground investigation works.

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.

1.2 Third Parties

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2.0 SCOPE OF INVESTIGATION WORK

2.1 Walkover Survey

The site was visited on 1st February 2021 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 photographs, together with a plan indicating their location and direction, are contained in Appendix 3.

2.2 Documentation

The following documents were obtained and examined during the desk study:

- a) A recent aerial photograph of the site dated April 2019. This photograph and recent aerial images (taken in 2015, 2011 and 2000) are contained within the Groundsure Enviro Insight report in Appendix 5.

- b) Historical Ordnance Survey maps dated between 1849 and 2020 at scales of 1:500, 1:1250, 1:2500, 1:10,000 and 1:10,560. These maps are contained in Appendix 4.
- c) Groundsure maps, all dated 2020 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;
 - Ground Workings map;
 - Mining, Extraction & Natural Cavities map;
 - Natural Ground Subsidence maps;
 - Borehole Records map;
 - Railways and Tunnels map.

These maps are contained within the reports in Appendices 5 and 6.

- d) A combined Enviro and Geo Insight report 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. These reports are contained in Appendices 5.
- e) The British Geological Survey (BGS) 1:50,000 solid and drift maps (sheet number: 84, dated 1970 and 1977 respectively). The BGS 6 inch county map (Ref: OLA 94 NW, dated 1909). 5 No. BGS Boreholes (Ref: SD60NW143, SD60NW270, SD60NW271, SD60NW275 and SD60NW512).

- f) The Indicative Atlas of Radon in England and Wales published by the British Geological Survey and the Health Protection Agency and BR 211 Radon Report (2015) were examined to assess the probable presence or otherwise of radon gas in the ground. Extracts of the relevant maps are contained in Appendix 7.
- g) A Zetica UXO Risk Map was also obtained and is included in Appendix 8.
- h) A Coal Authority Consultants Coal Mining Report was obtained (ref: 51002356377001) and is included within Appendix 11.
- i) BGS Memoirs of the Geological Survey of Great Britain, Wigan District, Explanation of Sheet 84 Dated 1938.

3.0 FINDINGS

3.1 Site Location and Description

This report pertains to a c. 14Ha site located to the west and east of Dobb Brow Road, Westhoughton, c. 500m south west of Westhoughton town centre. The approximate postcode for the site is BL5 2BA and the National Ordnance Survey Grid Reference for the centre of the site is 364742E, 405757N. The site is part of a wider Bellway Homes development (The Vistas) and pertains to Phases 3 – 5 of the masterplan shown below:



Figure 2; Extract of the Bellway Homes The Vistas masterplan

The site currently comprises numerous open fields with associated hedgerows, ponds and vegetated areas. The site is bound by open fields and a golf course to the north and east, residential properties and open fields to the south and a railway to the west. Access to the site is off Dobb Brow Road which runs through the centre of the site.



Figure 3 - Aerial image of the site dated February 2021. The site boundary is highlighted in magenta.

3.2 Walkover Survey

The walkover survey was carried out on 1st February 2021 during overcast weather conditions and follows recent heavy rain and snowfall. During the walkover survey the following features were noted relating to geology and contaminated land matters:

Geology

The site was noted to be a series of open fields separated by hedgerows with localised steep level differences between fields with areas of dense vegetation. The ground underfoot was noted to be grassland across the entirety of the site, which was noted to be soft / compressible and wet / saturated in areas with a suspected spring or collapsed land drain noted in the central site section, where water was emerging from the ground and sinking into an adjacent hole. Large portions of the site were noted to be waterlogged which were generally in areas of low topography or in proximity to existing land drains. However, areas of waterlogged ground were noted

upon higher flat areas indicating that infiltration into the underlying ground was limited (anticipated given recent temporal conditions).

2 No. ponds were noted on-site in the northern and southern site sections (development phases 4 and 5) – with associated reed vegetation indicating larger area of saturated ground over longer periods of the year.

The only other notable feature was a built up track / former bridge located along the western boundary of the site within development phase 5 which connected to a former bridge over the railway which runs along the western boundary. No evidence of structural defects were noted within the bridge structure of built up land which forms the batter. The contents of the batter are unknown however evidence of animal burrow spoil suggest reworked glacial clay deposits (which is indicative of the area and are likely to have been sourced from the railway line construction given it is within a formed topographical depression.

The topography of the site was noted to be variable, generally gently undulating with the exception of a slightly more significant slope along the southern extent of the western boundary down to Pendleton brook (c. 1 in 7 gradient). A slope also existed down to the railway along the western boundary.

Contaminated Land

No potentially contaminative features were noted on-site during the walkover. Only note would be unknown materials within the railway batter mixed with anticipated reworked natural materials.

Photographs from the site walkover with a photograph location plan are included within Appendix 3.

3.3 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
1849 - 1892	The site is recorded as numerous open fields with 4 No. pits located across the site. A small building is recorded in the south eastern site section. Pennington Brook is recorded along the southern extent of the eastern boundary of the site (development phase 3) and a track is recorded in the western site section leading to a bridge across the railway recorded along the western boundary (development phase 5).
1892 - 1907	The pits are recorded as ponds . The largest pit along the southern boundary (development phase 5) has been extended and the pit in the western site section is no longer recorded. Old Field Farm is recorded in the south eastern site section (development phase 3) along with an associated well .
1907 – 1952	Half of the pond along the southern boundary (development phase 5) appears to have been infilled . The bridge over the railway is now recorded as an Aqueduct .
1952 - 2020	Old Field Farm is no longer recorded (development phase 3). The well is also no longer noted on the historic maps. The pond in the eastern site section (development phase 3) appears to have been infilled . No notable changes have occurred since.

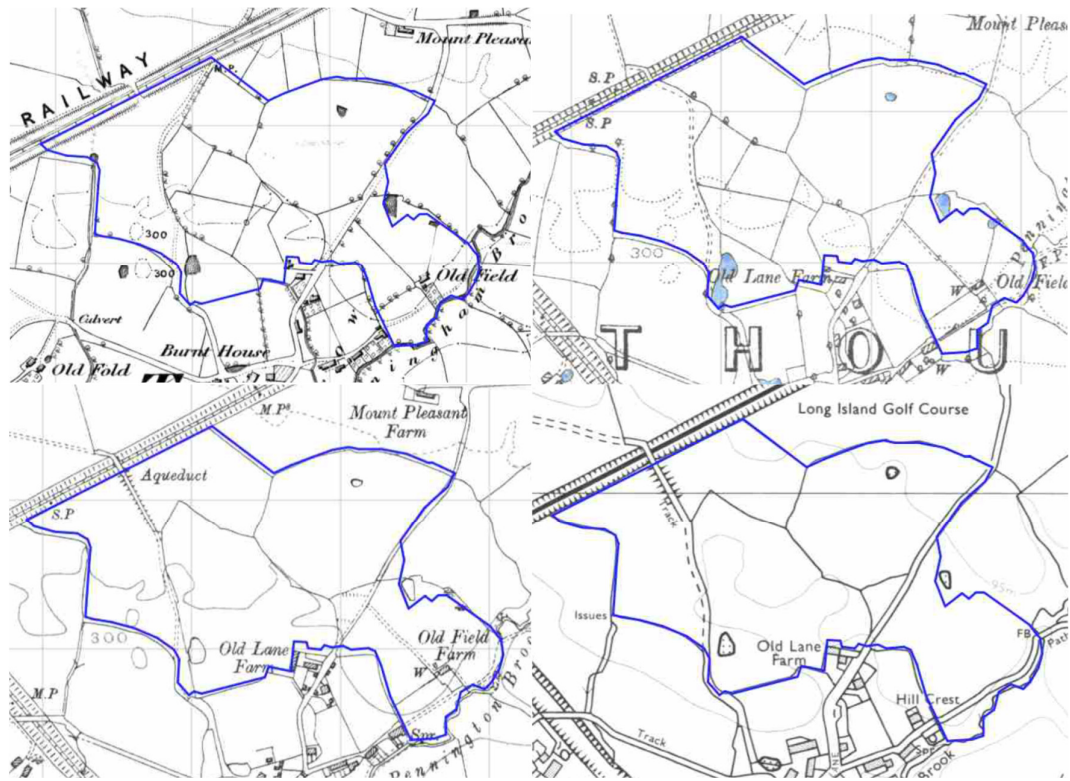


Figure 4; Extracts of the OS Historic maps showing the site in 1849, 1892, 1927 and 1977.

Off Site History

Date	Site Feature	Distance (m)	Direction
1892 – 1953	A small Mill is recorded c. 400m east of the site by 1892. By 1907 the mill is recorded as Grove lane Mill. Grove Mill is no longer recorded by 1953.	400	E
1892 – 1938	Harlett Pits No.2 and Harlett Pits No.1 are record c. 400m and 700m south west of the site respectively with associated colliery railway and buildings. The pits, railway and buildings are no longer recorded by 1938.	400 – 700	SW
1927 – 2021	Allenby Mill is recorded c. 350m south east of the site by 1907 with associated reservoir. By 2021 the mill is no longer recorded however the building remains.	400	SE

Given the agricultural and residential nature of the surrounding area no significant contaminative sources have been identified in close proximity (<250m) of the site.

3.4 Geology

3.4.1 BGS Geological Map

The BGS 1:50,000 Solid and Drift Geological Maps of the area (Sheet No: 84, dated 1970 and 1977 respectively) indicate that the majority of the site is underlain by **Glacial Till** superficial deposits comprising a heterogeneous mixture of clay, sand and gravel. The exception being along the southern extent of the eastern boundary of development phase 3 along Pennington Brook where **Alluvium** is recorded, which typically comprises unconsolidated soft to firm, compressible silty clay, with layers of silt, sand, peat and basal gravel. It should also be noted that glaciofluvial deposits are recorded in close proximity to the site, therefore localised areas of glaciofluvial sand and gravel may also be present on-site. It should be noted on the BGS 6 inch county map (Ref: OLA 94 NW dated 1909) an area of sand and gravel is noted in the northern site section in development phase 5.

The majority of the site is underlain by bedrock of the **Pennine Lower Coal Measures**, comprising interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part and more numerous and thicker coal seams in the upper part. The exception being in the central northern site section of development phase 5 where **Cannel Rock** comprising sandstone is recorded.

2 No. outcropping faults are recorded on-site which cross all development phases, the first crossing the centre of the site from south west to north east, down throwing to the south. The second crossing the southern site section from south east to west also downthrowing to the south. 3 No. underground faults are also recorded trending roughly east – west / north east – south west through the central site section. Numerous other faults are recorded in close proximity to the site. Consequently, given the highly faulted nature of the bedrock on-site and in the surrounding area, no bedrock dips are recorded on the geological map. However, based on the younging direction of the bedrock the bedrock is anticipated to be dipping to the east / south east. It should be noted that the bedrock may be subject to fault drag and therefore the bedrock dip cannot be ascertained.

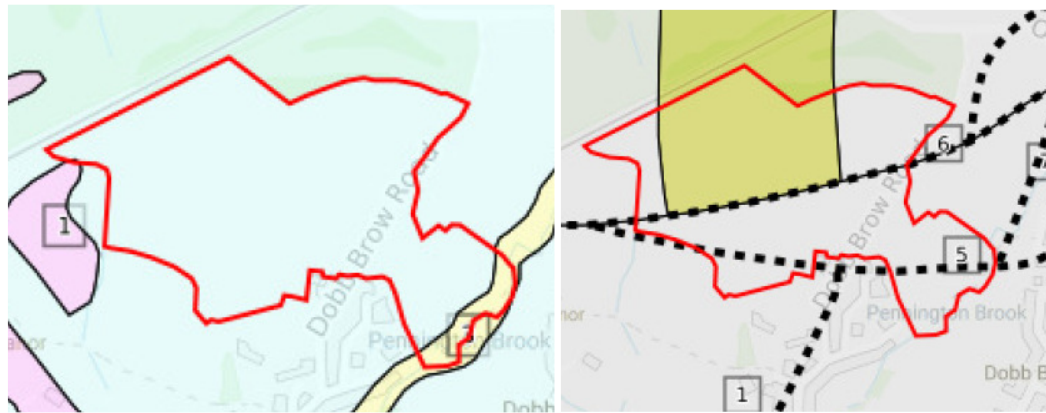


Figure 5; Extracts of BGS 1:50,000 drift (left) and solid (right) showing the superficial deposits and bedrock as well as the numerous faults on-site and in close proximity to the site. Blue = Glacial Till, Yellow = Alluvium, Pink = Glaciofluvial Deposits, Green = Cannel Rock, Grey = Pennine Middle Coal Measures, Dashed Line = Faults.

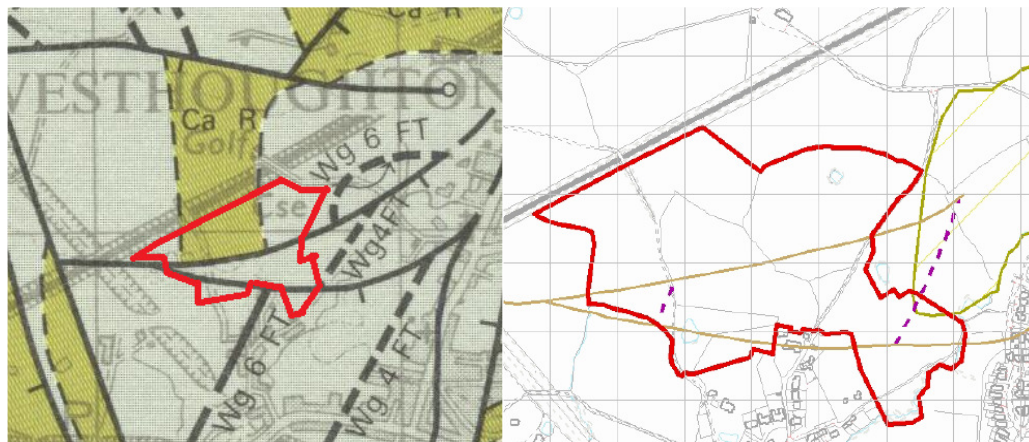


Figure 6; Extracts of the BGS 1:50,000 solid geological map (left) and the Coal Authority Consultants Coal Mining map (right)

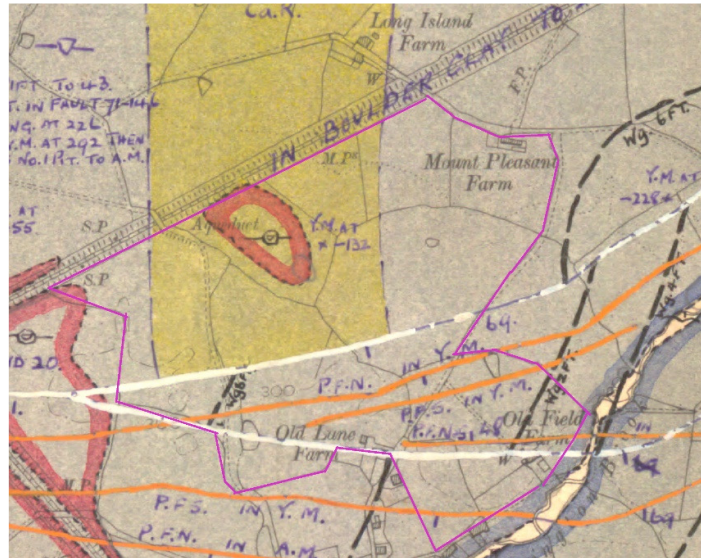


Figure 7; Extract of the BGS 6 inch country map (OLA 94 NW, 1909)

The BGS 1:50,000 solid geological map (Sheet No. 84, dated 1977) does not record any coal outcrops on-site, only the Wigan Four Foot and Wigan Six Foot coal seams outcropping to the east of the site as shown in the above extract (left). However, a Coal Authority Consultants Coal Mining Report was obtained which records 2 no. outcropping coal seams on-site (purple dashed lines), as shown in the above extract (right). The 6 inch county map (Ref: OLA 94 NW dated 1909), also records 2 No. coal outcrops in the same locations as those recorded by the Coal Authority.

Based on the Coal Authority Consultants Coal Mining Report and the 6 inch county map, the coal outcrops pertain to the **Trencherbone (Wigan Six Foot)** (development phase 5) and **Wigan Two Feet** (development phase 3) coal seams. Development high risk areas are associated with both seams, the position of the development high risk areas indicates that the bedrock is dipping to the east. A Coal Mining Risk Assessment is contained in Section 4.0 of this report.

3.4.2 BGS Borehole Logs

There were no available BGS boreholes on-site, however, there were 5 No. BGS boreholes located off-site in close proximity and within a comparable geological setting. The pertinent information from the borehole logs are outlined below:

BGS Borehole Reference: SD60NW143

This borehole is located approximately 110m north of site and was excavated to a depth of 18.59m bgl in 1952. The log recorded the following pertinent information:

- ASH and CLINKER fill to a depth of 0.60m bgl, underlain by;
- Soft to firm, yellow brown mottled CLAY with grey fissures to a depth of 2.28m bgl, underlain by;
- Firm to stiff, dark brown, sandy CLAY with stone inclusions to a depth of 14.02m bgl, underlain by;
- Very stiff, dark brown, sandy CLAY with stone and boulder inclusions to a depth of 18.59m bgl where the borehole was terminated.

Groundwater was recorded at 7.62m bgl.

BGS Borehole Reference: SD60NW271

This borehole is located approximately 320m west of the site and was excavated to a depth of 11.00m bgl in 1981. The log recorded the following pertinent information:

- TOPSOIL to a depth of 0.20m bgl, underlain by;
- Firm, brown and grey, silty CLAY with occasional gravel and traces of sand to a depth of 1.80m bgl, underlain by;
- Firm, brown, silty, very sandy CLAY with fine to coarse sub-rounded to sub-angular gravel to a depth of 3.00m bgl, underlain by;
- Firm, grey, silty CLAY with occasional fine to coarse gravel and bands of dark brown, clayey, silty sand and pockets of light brown, fine sand to a depth of 5.20m bgl, underlain by;
- Dense, grey, silty SAND with occasional gravel to a depth of 7.00m bgl, underlain by;
- Very stiff, grey and red brown, with red patches, silty, very sandy CLAY with fine to coarse, sub-angular to subrounded gravel to a depth of 8.30m bgl, underlain by;
- Very stiff, brown, sandy CLAY to a depth of 9.40m bgl, underlain by;
- Very stiff, pale grey, brown, laminated, fissured, silty CLAY to a depth of 10.00m bgl, underlain by;
- Very stiff, light grey CLAY to a depth of 10.10m bgl, underlain by;

- Dense, silty SAND and GRAVEL to a depth of 10.30m bgl, underlain by;
- Highly weathered, brown and grey SANDSTONE to a depth of 10.70m bgl, underlain by;
- Highly weathered, brown SANDSTONE to a depth of 11.00m bgl where the borehole was terminated.

Groundwater was recorded at 10.10m bgl.

BGS Borehole Reference: SD60NW270

This borehole is located approximately 265m west of the site and was excavated to a depth of 11.00m bgl in 1981. The log recorded the following pertinent information:

- TOPSOIL to a depth of 0.23m bgl, underlain by;
- Stiff, orangish brown, dark brown, silty, sandy CLAY with some fine to medium gavel and organic material to a depth of 1.15m bgl, underlain by;
- Firm to s tiff, greyish brown, sandy, silty CLAY with gravel and cobbles to a depth of 4.50m bgl, underlain by;
- Medium dense, brown SAND with occasional gravel to a depth of 4.65m bgl, underlain by;
- Very stiff, grey, sandy, silty CLAY with gravel to a depth of 5.30m bgl, underlain by;
- Very stiff, brown, silty, sandy CLAY with fine to coarse sub-angular to subrounded gravel to a depth of 10.00m bgl, underlain by;
- Very stuff, brown, silty, sandy CLAY with fine to coarse sub-angular to sub-rounded gravel to a depth of 10.20m bgl, underlain by;
- Highly weathered, brown SANDSTONE with bands of sandy clay to a depth of 10.70m bgl, underlain by;
- Highly weathered, brown SANDSTONE to a depth of 11.00m bgl where the borehole was terminated.

Groundwater was recorded at 4.50m bgl.

BGS Borehole Reference: SD60NW275

This borehole is located approximately 295m west of the site and was excavated to a depth of 11.50m bgl in 1981. The log recorded the following pertinent information:

- TOPSOIL to a depth of 0.20m bgl, underlain by;
- Firm, grey, sandy, gravelly CLAY to a depth of 0.90m bgl, underlain by;
- Firm to stiff, greyish brown mottled, silty, sandy, gravelly CLAY with sand pockets and occasional cobbles to a depth of 7.40m bgl, underlain by;
- Stiff, light brown, sandy, gravelly CLAY to a depth of 10.00m bgl, underlain by;
- Stiff, sandy, gravelly CLAY to a depth of 10.50m bgl, underlain by;
- Completely weathered, light grey, silty MUDSTONE to a depth of 11.50m bgl where the borehole was terminated.

No groundwater was recorded during drilling.

BGS Borehole Reference: SD60NW512

This borehole is located approximately 165m north of the site and was excavated to a depth of 55m bgl in 2004. The log recorded the following pertinent information:

- Grey CLAY with boulders to a depth of 36.00m bgl, underlain by;
- MUDSTONE to a depth of 39.00m bgl, underlain by;
- Yellow SANDSTONE to a depth of 55.00m bgl.

Groundwater was recorded at 20.10m bgl.

3.4.3 Geohazards

Data Type	Details
Ground Stability Data	➤ The Potential for Shrinking or Swelling Clay Ground Stability Hazards at the site is regarded as negligible to very low. ➤ The Potential for Landslide Ground Stability Hazards at the site is regarded as very low. ➤ The Potential for Dissolution Ground Stability Hazards at the site is regarded as negligible. ➤ The Potential for Compressible Ground Stability Hazards at the site is regarded as negligible to moderate (alluvium). ➤ The Potential for Collapsible Ground Stability Hazards at the site is regarded as negligible to very low. ➤ The Potential for Running Sand Ground Stability Hazards at the site is regarded as very low to low.

For further details please see the Groundsure Geo Insight Report contained in Appendix 6.

3.4.4 BGS Estimated Soil Chemistry

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

- Arsenic – 15 - 25mg/kg
- Cadmium – 1.8mg/kg
- Chromium – 60mg/kg - 120mg/kg
- Nickel – 15mg/kg – 30mg/kg
- Lead – 200mg/kg - 600mg/kg
- Bioaccessible Lead – 120mg/kg – 360mg/kg

3.5 Mining

3.5.1 Coal Mining

The site lies within a Coal Authority High Risk Development Area and 2 No. coal seams are recorded to outcrop on site and possible shallow workings may be present. Therefore, a detailed coal mining risk assessment has been carried out. Please refer to Section 4.0.

3.5.2 Non-Coal Mining

The Groundsure Geo and Enviro Insight report (contained in Appendix 5) indicates that no non-coal mining activities are recorded within 1km of the site.

3.5.3 Brine Extraction

The site lies outside of a recognised brine extraction area.

3.5.4 Historical Surface Excavations

4 No. ponds have been recorded on-site since the 19th Century. No other historical surface excavations have existed on-site, however, due to the presence of numerous other ponds, gravel pits and unspecified pits recorded in close proximity to the site, unrecorded historic excavations on-site cannot be discounted.

3.5.5 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 lies within an area of shallow coal resources and that an area of sandstone (pertaining to the Cannel Rock) exists in the central northern site section (development phases 4 and 5). However, no mineral workings or surface planning permission (valid and expired) are present on-site.

The Greater Manchester Joint Minerals Plan (April 2013) indicates that the site lies within a *Carboniferous Pennine Coal Measures Clay Resource Area* and that a Mineral Safeguarding Areas for sandstone (cannel rock), coal and brick clay exist on-site.

However, the sandstone underlying the site is not deemed to be significant mineral resources as, based on the geological memoir, the sandstone (Cannel Rock) is only recorded to be a few feet thick in the area of the site (discussed further in Section 4.3.2).

Likewise, the coal mining investigation works undertaken to the north of the site (Phase 1 of the wider development) also found no significant coal resources as the coal seams encountered were thin (average 0.60m thick, discussed in Section 4.3.7) and are not regarded as a consistent resource. Additionally, the bedrock is significantly faulted in the area as a result the coal seams are heavily fractured and disturbed which limits the coal seams as a meaningful resource.

Given the presence of shallow groundwater and significant, variable sand deposits recorded within the glacial till in the immediate area, mineral extraction of the brick

clay is also considered unlikely as the benefits of extracting the clay are outweighed by the poor quality of the mineral (sand / silt / gravel content) and technical / logistical issues (dewatering, excavation stabilisation).

Consequently, the proposed development is not anticipated to lead to sterilisation of the mineral resources as the resources are not significant (thin in nature) and are also not consistent due to the highly faulted bedrock and therefore are unlikely to be extracted in future.

The BGS Mineral Resource Map and Appendix 9 of the Greater Manchester Joint Minerals Plan, are contained in Appendix 6.

3.6 Previous Site Investigation

The site in question in this report pertains to Phases 3 – 5 of the wider development shown in the below plan. 3 No. site investigations have previously been undertaken on Phases 1 and 2, with some exploratory holes located within Phases 3 and 4. The previous site investigations are discussed below.



Figure 8; Extract of the Bellway Homes wider development plan

3.6.1 Curtins Site Investigation 2017 – Phase 2 and 4.

Curtins undertook an intrusive site investigation in 2017 comprising 25 No. window sample holes (WS1 – WS19 and WS11A, and WS101 – WS105) undertaken to depths of between 1.30m and 4.45m bgl. 6 No. of the window sample holes were located in Phase 4 (part of the site referred to in this report).

The typical ground conditions encountered during the site investigation is as follows:

- TOPSOIL comprising dark, brown, silty, sandy CLAY to a depth of between 0.20m and 0.50m bgl, underlain by;
- GLACIAL TILL comprising very soft to very stiff, sandy, gravelly CLAY occasionally interbedded with loose to dense, clayey sand and gravel, to a depth of at least 4.45m bgl.

MADE GROUND comprising black, very sandy, very gravelly CLAY with coal, brick, pottery, sponge, jars, concrete, tile and ash fragments was encountered in WS13 to a depth of 0.80m bgl. Possible reworked ground (very soft glacial till) was also recorded in WS11 and WS11A as obstructions were recorded at 1.30m and 1.35m bgl.

Groundwater was recorded between 1.10m and 3.40m bgl during the site investigation, and between ground level and 2.90m bgl during subsequent monitoring visits.

Geotechnical Testing

Standard penetration tests undertaken within the cohesive glacial till recorded N-values of between 1 and 45 indicating that the cohesive deposits are highly variable and very soft in places. N-values of between 5 and 37 were recorded within the granular glacial till indicating that the granular deposits are loose to dense. N-values in both the cohesive and granular deposits increased with depth.

Atterberg limit testing undertaken within the cohesive glacial till indicated that the glacial till is of low plasticity / volume change potential.

Based on the site investigation works, Curtins state that widened strip foundations (600mm) with an allowable bearing pressure of 100kN/m² are suitable across the majority of the site. However, deep mass trench fill foundations will be required in localised areas where loose sands and soft clays were recorded.

Chemical testing

Human health GAC exceedances were only recorded within sample of made ground from WS13 (0.20m bgl) where elevated concentrations of arsenic (140mg/kg), lead (1900mg/kg) and Dibenzo(ah)Anthracene (0.4mg/kg) were recorded.

Ground Gas Monitoring

4 No. ground gas monitoring visits were undertaken between July and August 2017 on 11 No. ground gas monitoring wells which recorded no methane above detection limits (0.1% (v/v)), carbon dioxide concentrations of between 0.4% and 8.2% (v/v) and a maximum flow of 37.6(l/hr). However, the majority of the flows recorded were below detection limits (<0.1l/hr), therefore, Curtins state that the high flow recorded were due to groundwater level fluctuations between ground gas monitoring visits and is not representative of ground gas flow conditions on-site. Consequently, the high flow was excluded and Curtins state that the ground gas regime is in-line with NHBC classification Green if a 150mm void will be present beneath the proposed plots. If no void is present ground gas protection measures in-line with NHBC Amber 1 should be utilised due to the elevated concentrations of carbon dioxide recorded.

3.6.2 Curtins Site Investigation 2018 – Phase 2 and 4

A second site investigation was undertaken by Curtins in 2018 which comprised the following:

- 30 No. window sample holes (WS201 - WS229 and WS222A) to depths of between 5.00m and 5.45m bgl;
- 27 No. trial pits (TP01 – TP15, TPD1 – TPD4), TT01 – TT05 and TPW01-TP103) to depths of between 0.67m and 3.70m bgl;
- 2 No. cable percussive holes to a depths of between 12.50m and 14.00m bgl;
- 10 No. open hole rotary holes (OHR1 – OHR10) to depths of between 39.20m and 40.00m bgl

The majority of the exploratory holes were located in Phase 2 (off-site) but 3 No. trial pits (TP13 – TP15) and 2 No. window sample holes (WS16 – WS17) were located in Phase 4, in the eastern site section of the site referred to in this report.

The typical ground conditions encountered were as follows:

- TOPSOIL comprising dark brown, silty, sandy CLAY to a depth of between 0.10m and 0.60m bgl, underlain by;
- Localised MADE GROUND comprising brown to black, very sandy, very gravelly, ashy CLAY and clayey SAND and GRAVEL to a depth of between 0.80m and 2.10m bgl, underlain by;
- GLACIAL TILL comprising very soft to very stiff, sand, gravelly CLAY with occasional bands of very soft to firm, brown, very sandy, clayey silt and occasionally interbedded with loose to dense sand and gravel to a depth of between 12.90m and 20.60m bgl, underlain by;
- PENNINE MIDDLE COAL MEASURES comprising brown grey, SANDSTONE interbedded with greyish brown MUDSTONE and COAL to a depth of at least 40.00m bgl,

Coal was recorded in numerous rotary holes at depths of between 13.60m and 36.70m bgl with a thickness of between 0.20m and 0.80m. An area of possible coal of 1.20m thickness was recorded in OHR07 between 31.30m and 32.50m bgl where loss of flush was recorded. The coal findings are discussed in detail in Section 4.3.7 within the coal mining risk assessment.

Groundwater was recorded between 1.50m and 5.00m during the site investigation and between 0.05m and 4.00m during subsequent monitoring visits.

Geotechnical Testing

Standard penetration tests undertaken within the cohesive glacial till recorded N-values of between 1 and 45 (average 15) indicating that the cohesive deposits are highly variable and very soft in places. N-values of between 2 and 37 (average 13) were recorded within the granular glacial till indicating that the granular deposits are

loose to dense. N-values in both the cohesive and granular deposits increased with depth.

Atterberg limit testing undertaken within the cohesive glacial till indicated that the glacial till is of low to high plasticity / volume change potential (average low).

Curtins state that the majority of the site is suitable for traditional strip foundations, with areas requiring deep mass fill trench and piled foundations where soft / loose deposits are recorded.

Chemical testing

Numerous significant exceedances of arsenic, lead, PAHs and nickel were recorded within the made ground encountered in localised areas (WS04, TP03, WS229, TT1-5). Curtins recommend made ground removal and off-site disposal or placement beneath a suitable thickness of inert capping in areas of POS under a Material Management Plan should be undertaken to mitigate the risk to end users.

Ground gas monitoring

10 No. ground gas monitoring visits were undertaken between August 2017 (previous wells) and November 2018 which recorded below detection limit of methane in all exploratory holes with the exception of WS201 and WS212 where 5.65% and 11.3% (v/v) were recorded respectively. Carbon dioxide concentrations of between 0.4% and 9.5% (v/v) were recorded and slow rates of between <0.1l/hr and 10l/hr (2 no. higher values of flow discounted based on being considered unrepresentative due to groundwater level changes). Consequently, Curtins determined that the majority of the site fell in-line with the NHBC classification Green / CS1, with areas designated as Amber 1 and Amber 2 / CS2 and CS3 due to elevated concentrations of methane and carbon dioxide. Curtins recommend that an allowance is made for ground gas protection measures in line with CS2 and CS3.

3.6.3 Curtins Site Investigation 2016 – Phase 1

Curtins also undertook a site investigation in Phase 1 of the wider development in 2016, c. 110m north of the site referred to in this report. The site investigation comprised 13 No. window sample holes to a depth of 4.00m bgl.

The typical ground conditions encountered during the site investigation works is as follows:

- Very loose, dark brown, slightly gravelly TOPSOIL to a depth of between 0.20m and 0.80m bgl, underlain by;
- GLACIAL TILL comprising very soft to stiff, dark brown, sandy and gravelly CLAY interbedded with layers of very loose to medium dense gravelly, clayey sand to depths of between 0.65m and at least 4.00m bgl

PEAT comprising black, very organic, potentially pseudo-fibrous / fibrous slightly clayey PEAT with pieces of wood and roots in decomposition was also recorded in areas (WS01, WS05, WS08 and WS09) to depths of between 0.20m and 3.40m bgl (1.10m to 3.20m thick).

Groundwater was recorded at depths of between 0.80m and 2.00m bgl in the majority of exploratory holes.

Chemical Testing

Chemical laboratory testing of soils identified no human health GAC exceedances for the residential with home grown produce land use scenario (1% SOM). Therefore, the risk to human health was deemed to be low. The risk to controlled waters was also deemed to be low.

Ground Gas Monitoring

Ground gas monitoring was undertaken on one occasion, which recorded a maximum methane concentration of 0.4% (v/v), and maximum carbon dioxide concentration of 4.9% (v/v) in WS05 which was installed within the peat. No positive flow was recorded above detection limit (0.1l/h). Consequently, the site classed as Characteristic Situation 1 (CS1), However due to the slightly elevated carbon dioxide concentrations Curtins considered it prudent to allow for ground gas protection measures in-line with

Characteristic Situation 2. During the ground gas monitoring visits, the groundwater level was recorded to be between 0.54m and 2.16m bgl, the majority being <1.22m bgl.

Geotechnical Testing

Standard penetration tests undertaken within the glacial till recorded N-Values of between 0 and 26 (average 9) indicating that the glacial till is of variable strength / density. N-values within the peat ranged from 0 to 4 (average 0.5) indicating that the peat is very soft to soft. Atterberg limit tests undertaken on samples of the cohesive glacial till indicated that the cohesive glacial till is of low to moderate plasticity / volume change potential.

Due to the soft peat and variable glacial till, Curtins concluded that the superficial deposits were not a suitable founding stratum without further investigation work or ground improvement. Curtins recommended removal of the peat to full depth and replacement with suitable compacted granular fill and utilising raft or piled foundation solutions in this area and utilising vibro compaction or vibro stone columns in the areas of granular glacial till and using raft foundations on the cohesive glacial till.

A coal mining risk assessment concluded that the risk from coal mining on the site was very low to low however it was considered prudent to confirm the assumptions by undertaking investigation to 20m – 30m bgl.

3.7 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 combined Geo and Enviro 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	➤ The majority of the site lies within Flood Zone 1. However, an area of Flood Zone 2 and Flood Zone 3 is present along the southern extent of the eastern boundary of development phase 3 associated with Pennington Brook.
Surface Water Features	➤ 2 No. ponds are recorded on-site. Pennington Brook is also recorded adjacent to the eastern boundary of the site.
Surface Water Abstractions	➤ There are no recorded surface water abstraction licenses located on-site. ➤ There are 3 No. surface water abstractions recorded within 2km of the site, 2 No. are historic. The active surface water abstraction is located 1196m south west and pertains to the extraction of water from reservoir fed by surface drainage at common farm for spray irrigation.
Superficial Aquifer	➤ The site is underlain by superficial deposits classed as Secondary Undifferentiated Aquifer .
Bedrock Aquifer	➤ The site is underlain by bedrock classed as a Secondary A Aquifer. ➤ These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Groundwater Abstractions	➤ There are no recorded groundwater abstraction licenses located on-site or within 2km of the site.
Nitrate Vulnerable Zones	➤ A Nitrate Vulnerable Zone exists on-site associated with the River Glaze. ➤ 5 No. other Nitrate Vulnerable Zones exist within 2km of the site associated with the River Glaze and Pennington Flash.
Source Protection Zones	➤ No Source Protection Zones exist on site or within 500m of the site.
Licensed Discharge Consents	➤ There are no recorded licensed discharge consents located on-site. ➤ There are 2 No. licensed discharge consents recorded within 500m of the site, the nearest pertains to the discharge of sewage and trade effluent into the Trib Marsh Brook 86m north east of the site.
Pollution Incidents to Controlled Waters	➤ There are no recorded pollution incidents on-site. ➤ There are 5 No. Environment Agency recorded pollution incidents recorded within 500m of the site. The 2 No. nearest are located 123m north east of the site and pertain to 2 No. category 3 (minor) incidents on 31st march 2002 involving the discharge of crude sewage into an unspecified controlled water source. The remaining 3 No. are category 2 (significant) events which occurred 259m east – 406m north east and pertained to the discharged of unidentified pollutants and food and drink.

For further details please see the Groundsure combined Geo and Enviro Insight Report contained in Appendix 5.

3.8 Hazardous Installations, Landfill and Waste

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

Data Type	Details
Environment Agency Recorded Landfill Sites	➤ There are no active Environment Agency recorded landfill sites located on-site or within 500m of the site.

Environment Agency Recorded Historic Landfill Sites	➤ There are no Environment Agency recorded historic landfills recorded within 500m of the site.
BGS Recorded Historic Landfill Sites	➤ There are no BGS recorded historic landfill sites located on-site or within 500m of the site.
Local Authority Recorded Historic 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	➤ There are no Local Authority pollution prevention and control 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	➤ There are no registered waste treatment, transfer or disposal sites recorded on-site or within 500m of the site.
Current Industrial Land Use	➤ There are no current or recently recorded industrial land uses recorded on-site. ➤ There are 2 No. recent industrial land uses recorded within 250m of the site, pertaining to an electricity substation located 155m south east of the site and a stain glass manufacture located 241m north east of the site. ➤ There are 2 No. petrol stations recorded within 500m of the site but both are closed or obsolete.
Historic Industrial Land Use	➤ There are 5 No. historic industrial land uses recorded on-site all pertaining to cuttings recorded on historic maps. The cutting is associated with the railway adjacent to the western boundary. ➤ There are a further 111 No. historic industrial land uses recorded within 500m of the site pertaining to cuttings, railway sidings, unspecified mills, unspecified depots, cemeteries, unspecified pits, chimneys, colliery, gravel pit, refuse heaps, unspecified ground workings, unspecified heaps and police stations.
Dangerous or Hazardous Sites	➤ No recorded Control of Major Accident Hazards (COMAH) and Notification of Installations Handling Hazardous Substances (NIHHS) exist on-site or within 500m of the site.
Hazardous Building Materials	➤ No hazardous building materials are anticipated on-site.

For further details please see the Groundsure combined Geo and Enviro Insight Report contained in Appendix 5.

3.9 Radon

The Indicative Atlas of Radon in England and Wales produced by the Health Protection Agency and British Geological Survey indicates that the site lies within an area where less than 1% of homes are above the action level. Consequently, BR211

(2015) indicates that no radon protection measures are necessary in the construction of new dwellings or extensions.

Map 13 of the Indicative Atlas of Radon in England and Wales and BR 211 (2015) are contained within Appendix 7.

3.10 Services

A trunk main is recorded to cross the site from east to west through development phases 4 and 5, other services are also anticipated to be present associated with the former farm located in development phase 3. It is recommended that full service plans are obtained prior to any intrusive works.

3.11 Unexploded Ordnance (UXO)

The Zetica UXO risk map, contained in Appendix 8, indicates that the site lies within an area of low risk - Areas indicated as having 15 bombs per 1000 acre or less. No further assessment is deemed necessary.

3.12 Animal Burial Sites

The Animal Health and Veterinary Laboratories Agency (AHVLA) no longer routinely respond to consultations relating to records of animal burial sites. However, based upon a review of the site history it is considered possible that the site has been subject to recorded animal burials therefore it is recommended that the AHVLA are consulted.

3.13 Archaeology

For details pertaining to possible archaeological issues, refer to Heritage Archaeology Historic Environment Assessment for Phase 3 &4 and Phase 5, Westhoughton (report ref: P00085.01.01, dated June 2021).

4.0 COAL MINING RISK ASSESSMENT

The site lies within a Coal Authority Coal Mining Reporting area and due to the presence of 2 No. outcropping coal seams on-site and the potential for shallow unrecorded workings, 2 No. *Development High Risk Areas are located on-site in development phases 3 and 5*. The risk posed by the shallow coal seams and possible workings is discussed below.

4.1 Scope of Coal Mining Risk assessment

The purpose of this Coal Mining Risk Assessment is to:

- Present a desk-based review of all available information on the coal mining issues which are relevant to the application site;
- Use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues;
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and / or demonstrate how coal mining issues have influenced the proposed development in line with *C758 Abandoned Mine Workings Manual* (2019); and
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of the National Planning Policy Framework with regard to development on potentially unstable land.

4.2 Site Specific Coal Risks

The table below summarises the potential risks associated with the coal mining legacy for the proposed development site.

Coal Mining Issue	Yes	No	Risk Assessment
Underground coal mining (recorded at shallow depths <30m)		X	-
Underground coal mining (probable unrecorded at shallow depths)	X		Low
Mine entries (shafts and adits)		X	-
Coal mining geology (fissures)	X		Low
Record of past mine gas emissions		X	-

Recorded coal mining surface hazard		X	-
Surface mining (opencast workings)		X	-

4.3 Coal Mining Findings

Due to the coal mining history, the recorded coal outcrops and recorded deep underground workings, the site is at risk of unrecorded coal mining at shallow depths. Therefore, a review of the available information was undertaken to assess this risk.

4.3.1 BGS Geological Maps

As discussed in Section 3.4.1, the BGS 1:50,000 solid geological map (sheet No. 84 dated 1977) does not record any coal outcrops on-site only 2 No. coal outcrops pertaining to the Wigan Six Foot and Wigan 4 Foot coal seams outcropping adjacent to the eastern boundary of the site.

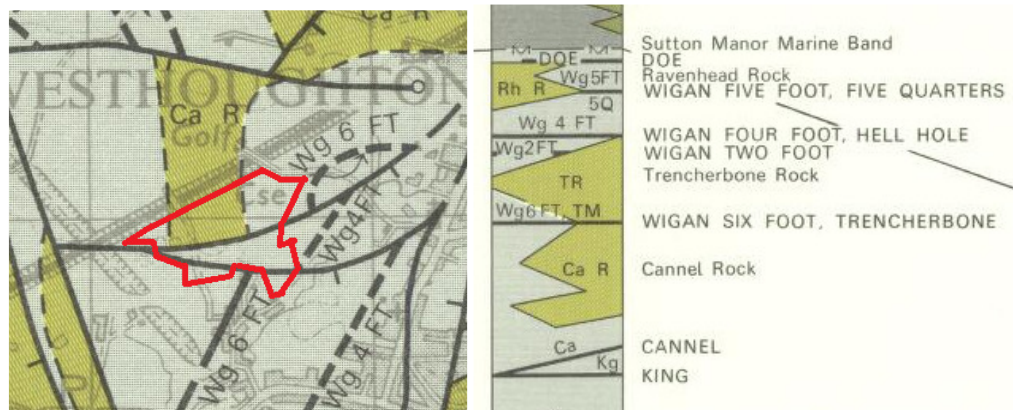


Figure 9; Extracts of the BGS 1:50,000 geological map (sheet No. 84) and generalised vertical section (GVS)

However, the BGS 6 inch county map (ref: OLA94NW dated 1909), records 2 No. coal outcrops in the eastern and western site sections (development phases 3 and 5 respectively) pertaining to the Wigan Six Foot / Trencherbone (development phase 5) and the Wigan Two Feet (development phase 3) coal seams, as shown in the below extract:

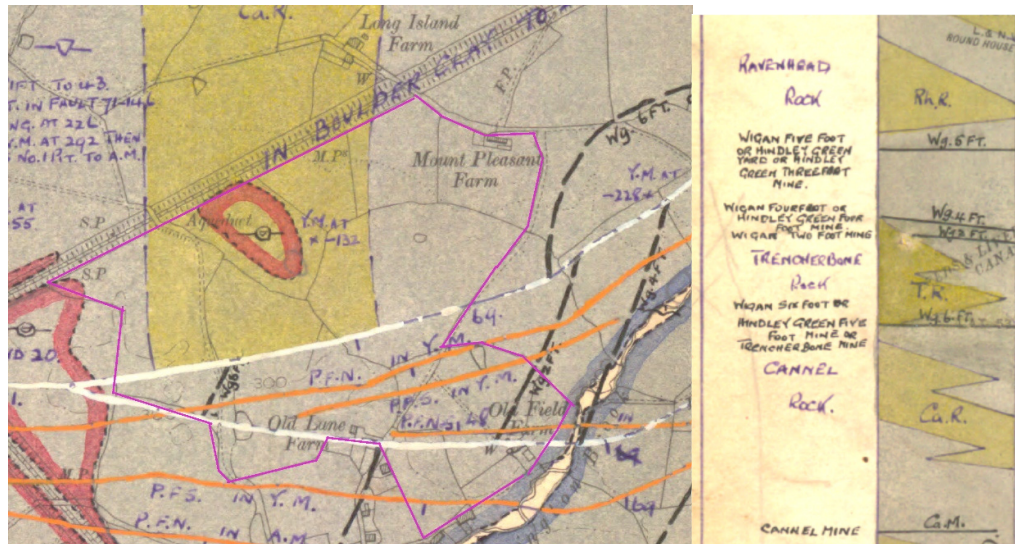


Figure 10; Extract of the BGS 6 inch county map showing 2 No. coal outcrops on-site and associated GVS.

Given the bedrock dip of between 2.5° and 4.5° east / south east recorded within underground coal working, the Wigan Six Foot / Trencherbone coal seam which outcrops in development phase 5 is anticipated to be at shallow depth across the majority of development phases 4 and 5 between the 2 No. recorded surface faults. The Wigan Two Feet coal seam is anticipated to be present at shallow depth in development phase 3.

The Wigan Six Foot / Trencherbone coal seam is also recorded to outcrop to the east of the site. The next coal seam underlying the Wigan 6 Foot, the Cannel Mine, is recorded to outcrop c. 130m west of the site on the 6 inch county map. Therefore, due to the shallow eastward dip of the bedrock, the Cannel Mine is anticipated to be present at shallow depths in the northern section of development phase 5. It should be noted that this area is not designated as a Development High Risk area by the Coal Authority as the Cannel Mine outcrop and associated area of probable shallow workings is not recorded on the Coal Authority plan to extend on-site.

As the Wigan Six Foot coal seam is also recorded to outcrop to the south of the site on the BGS 1:50,000 geological map, there is potential for the seam to be present at shallow depth below development phase 3.

The Wigan Four Foot coal seam is recorded to outcrop off-site adjacent to the southern extent of the eastern site boundary. Given the eastern bedrock dip, the Wigan Four Foot is not anticipated to be at shallow depth beneath the site, however the outcrop position is only inferred and therefore there is potential for the seam to be present in along the eastern boundary of development phase 3.

Consequently, due to the presence of 2 No. coal seams outcropping on-site, as well as coal outcrops in close proximity to the site boundaries, shallow coal seams (<30m bgl) are anticipated to be present across the southern half of the site in all development phases (Wigan 6 Foot and Wigan 2 Feet) as well as the northern section of development phase 5 (Cannel Mine).

4.3.2 BGS Geological Memoir

The BGS *Memoirs of the geological Survey of Great Britain, Wigan District (Dated 1938)* was reviewed in order to obtain additional information regarding the coal seams of concern; Wigan Six Foot / Trencherbone, Wigan Two Feet. Wigan Four Foot, Cannel Coal, as well as information regarding the Cannel Rock which outcrops on-site.

The geological memoir states that the Wigan Mines form one of the most valuable groups of coals in the area and where the Trencherbone Rock is missing, lie only a short distance between each other. It is recorded that the Wigan coals have been almost completely exhausted across the Wigan coal field with the exception of localised areas. However, the memoir states that little is known about the measures above the Wigan Six Foot (i.e. those present beneath the site) to the east of Pennington Green which is located to the west of the site.

The Cannel Rock, which outcrops in the northern section of development phases 4 and 5 is recorded as a grey to white, flaggy, current bedded SANDSTONE which weathers yellow to brown. It is recorded to be of considerable thickness in areas (c. 12 – 54m thick) but thins out to the west of Westhoughton where the rock is represented by only a few feet of sandstone.

Wigan Six Foot / Trencherbone Coal Seam

The Wigan Six Foot is also referred to as the Trencherbone mine in the Westhoughton and Wigan district, as well as Roger Mine, Nine Foot Mine and the Five Foot Mine in the St Helens, Hindley Green and Atherton Districts respectively.

The Wigan Six Foot coal seam is recorded to be a first class coal with the top coal being very bright and unsurpassed as a house coal, with no dirt partings between the top and bottom band. The coal is also recorded to have a well developed fossil band but show more variation than any other coal seam in the Wigan mines, being subject to large washouts by the overlying Trencherbone Rock. However, the fossil band is recorded to be absent around Westhoughton and where the band is absent the coal is also recorded to deteriorate in quality and thickness.

The Wigan Six Foot is recorded to have been worked as a 3Ft 3inch seam (0.99m thick) from a shallow pit near Daisy Hill Station (>1km south west of the site) but to the north and west of Westhoughton deteriorates and thins out to a workable seam thickness of 2Ft 6inch (0.76m thick).

Wigan Two Feet Coal Seam

The Wigan Two Feet, which is also known as the Victoria Mine in St Helens, is recorded to usually be represented by two or more coal partings which are fairly consistent throughout the Wigan coalfield, rarely yielding over 2 Ft (0.60m) of coal, with a workable thickness of between 1Ft 6inch (0.45m) and 2 Ft (0.60m). However, in the northern part of the coalfield where the Wigan Six Foot is recorded to be poor, the Wigan Two Feet is recorded to only be a few inches or fails entirely. The Wigan Two Feet is recorded to lie close below the Wigan Four Foot coal and is often only separated by fireclay. However, its position beneath the Wigan Six Foot is recorded to vary considerably according to whether the Trencherbone Rock is present.

Although the Wigan Two Feet is recorded to be good quality coal, the roof and floor of the seam make it difficult to work, with the exception of around Atherton and Leigh where it has been extensively worked as the Victoria Mine.

Cannel Coal Seam

The Cannel Coal Seam lies beneath the Wigan 6 Foot seam and the Cannel Rock and is noted to outcrop c. 130m west of the site on the 6 inch county map. The seam is noted to be well developed and an important coal seam across the coalfield. The Cannel Coal Seam is noted to have been extensively worked in areas and is noted to be completely exhausted in areas to the north west of Wigan, however, is noted to be a thin coal elsewhere in the coalfield. As mentioned above, the Cannel Rock is noted to be represented by only a few feet of sandstone in the Westhoughton area, and the memoir states that the failure of the Cannel Rock is accompanied by the considerable reduction in the interval between the Cannel Rock and the Wigan Six Foot seams. In the Wigan area the Cannel Rock is noted to occupy 60Ft (18.28m) of the 250Ft (76.20m) between the Cannel and Wigan Six Foot seams, however in Haydock only 145Ft (44.19m) lies between both coal seams as the Cannel Rock thins out.

Wigan Four Foot Coal Seam

The Wigan Four Foot coal seam is recorded to outcrop adjacent to the east of the site. The seam is not recorded on-site but given the inferred outcrop position and variability in mapping there is potential for the coal seam to be present at shallow depth along localised areas of the eastern boundary. In the geological memoir the coal is recorded to be of outstanding quality and around 3Ft 10inch thick (1.16m) and has been worked across much of the coalfield. The coal is known as the Ravenhead Main Delf in the St Helens area and is widely worked as a thick coal seam, with the top coal being 2Ft 6inch thick (0.76m) separated from the bottom band by a dirt parting. However, the coal is recorded to reduce in thickness and quality to the north of Wigan and does not always give a workable thickness. The memoir states that the coal seam is present at a workable thickness (unspecified) in the vicinity of the site but is recorded as a dirty coal in the area.

4.3.3 Mine Entries

No Coal Authority mine entries are recorded on-site or within 100m of the site.

4.3.4 Historical Maps

The historical maps of the area do not show any evidence of coal mining activities on-site or in close proximity (<250m) to the site. However, coal mining features including Heulett Pits (No.1 and No.2) and a colliery railway are record c. 400m south west of the site.

For further details please refer to the historical maps contained in Appendix 4.

4.3.5 Coal Authority Consultants Report

As mentioned Coal Authority Consultants Report (Ref: 51002356377001) was obtained that indicates that the Trencherbone (Wigan Six Foot) and the Wigan Two Foot coal seams outcrop on-site and potential shallow workings may exist beneath the site. The Coal Authority report states that the seams are workable.

The report also states recorded past underground coal mining is present beneath the site. The following information was recorded:

Seam Name	Depth (m bgl)	Dip Rate	Dip direction	Extraction Thickness (cm)	Year last mined
Plodder	73	3.6	East	170	1935
Haigh Yard	115	2.6	East	90	1915
Haigh Yard	148	4.0	South East	90	1915
Half Yard	155	2.5	South East	50	1926
Haigh Yard	164	3.0	South East	90	1915
Three Quarters	196	4.1	South East	60	1913
Arley	233	12.0	South East	110	1904
Arley	258	7.1	South East	120	1917

These recorded workings are at an unnamed colliery.

The report also states that:

- Possible shallow workings may exist beneath the site.
- No spine roadways are recorded on-site at shallow depth.
- No mine entries are recorded on-site or within 100m of the site.
- No opencast sites exist on-site or within 500m of the site.

- No Coal Authority managed tips are recorded on-site or within 500m of the site.
- A coal related site investigations exists within the site (see Coal Authority Plan for location).
- No remediated sites are recorded within 50m of the site.
- The Coal Authority have not received a damage notice or claim associated with mining subsidence since October 1994.
- No mine gas is recorded on-site or within 500m of the site
- No mine water treatment schemes are recorded on-site or within 500m of the site.
- No future underground mining or coal mining licenses are recorded on-site or within 200m of the site.
- No court orders or Section 46 notices are recorded on-site.

4.3.6 Abandonment Plans

Within the Consultants Coal Mining Report it is stated that abandonment plans are available that intersect with some or all of the site boundary. Consequently, the Coal Authority were contacted regarding the abandonment plans. However upon discussion with the Coal Authority no abandonment plans exist for shallow workings (<50m bgl).

For further details, refer to the Coal Authority Consultants Coal Mining Report contained in Appendix 11.

4.3.7 Off-Site Site Investigation Coal Mining Findings

As discussed in Section 3.6.2, Curtins undertook an intrusive site investigation adjacent to the east and north east of the site in 2017 primarily for Phase 2 of the wider masterplan. The site investigation included 10 No. open hole rotary boreholes which were undertaken to depths of between 39.20m and 40.00m bgl. Coal was encountered in the majority of the rotary holes as summarized below:

- OHR01 – Coal was encountered between 13.60m and 14.00m bgl (84.63m and 84.23m AOD) (0.40m thick).

- OHR01 – Coal was encountered between 27.90m and 28.20m bgl (71.88m – 71.58m AOD) (0.30m thick).
- OHR03 – No coal encountered.
- OHR04 – No coal encountered.
- OHR05 – Coal was encountered between 35.90m and 36.70m bgl (59.31m – 58.51m AOD) (0.80m thick).
- OHR06 – Coal was encountered between:
 - 23.40m and 24.00m bgl (72.55m – 71.96m AOD) (0.80m thick)
 - 28.70m and 29.30m bgl (67.25m – 66.65m AOD) (0.60m thick).
- OHR07 – Possible coal was encountered between 31.30m and 32.50m bgl (63.89m – 62.69m AOD) (1.20m thick).
- OHR08 – No coal encountered.
- OHR09 – No coal encountered.
- OHR10 – Coal was encountered between:
 - 21.50m and 22.00m bgl (74.11m – 73.61m AOD) (0.50m thick)
 - 22.20m and 22.40m bgl (73.41m – 73.21m AOD) (0.20m thick)
 - 28.30m and 28.90m bgl (67.31m – 66.71m AOD) (0.60m thick).

A plan of the locations of the open hole rotary boreholes as well as the BGS and Coal Authority recorded coal outcrops is included below:

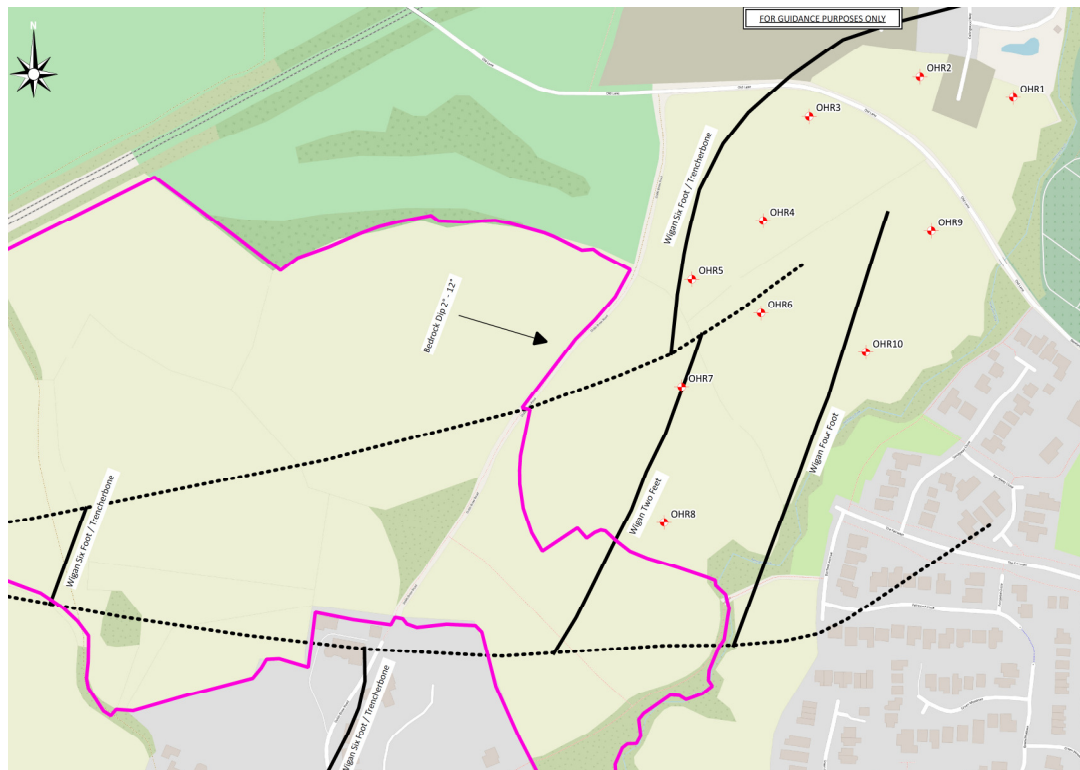


Figure 11; Plan showing BGS and Coal Authority recorded coal outcrop positions (solid black line) and faults (dashed line) which downthrow to the south.

Based on the above plan and the findings of the rotary holes it is unclear which coal seams have been recorded in the above rotary holes. An indicative cross section has been produced, as shown below, however the findings do not concur with the recorded outcrop positions and bedrock dip. This is anticipated to be due to the close proximity to recorded surface faults (as shown above) and underground faults, this is likely to have resulted in these inconsistencies and varying dips and seam location when compared with geological mapping.

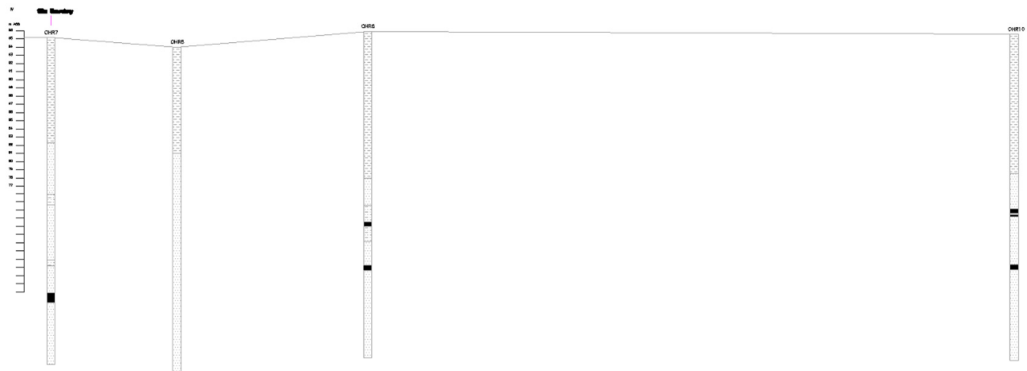


Figure 12; Indicative cross section showing the coal (black) encountered within the Curtins rotary holes

4.3.8 Coal Mining Conclusions

Based on the Coal Authority and BGS information, it is anticipated that 2 No. seams outcrop on-site within development phases 3 and 5 with additional outcrops in close proximity to the site. Therefore, shallow coal seams are anticipated across the majority of the site although based upon secondary information the risk of coal workings which will require treatment / stabilization via drill and grouting works is regarded as low.

However, based on the Curtins findings which does not concur with the BGS information (i.e. outcrop positions and bedrock dip), it is unclear whether the coal outcrops exist at the anticipated locations and depths. Consequently, it is recommended that intrusive site investigation works should be undertaken to establish the location and depth of the underlying shallow coal seams across the site and to confirm that possible workings are absent.

The information and assessment contained within the IGE Consulting combined phase 1 geo-environmental and coal mining risk assessment report and the IGE Consulting phase 2 geo-environmental report (Ref: 3430-02, dated June 2021) are regarded as substantial enough as to characterise the site geo-environmental risk whereby the granting of planning permission is deemed suitable. Any future works required associated with the scheme associated with the detailed design are regarded as suitable to be conditioned through planning.

5.0 CONCLUSIONS

5.1 General

The site is greenfield in nature, with the exception of the presence of Old Field Farm in development phase 3 from the 19th Century till the mid-20th Century and the presence of an existing raised track / aqueduct in development phase 5 since the early 20th Century.

5.2 Ground Conditions

The anticipated typical ground conditions across the majority of the site are anticipated to be as follows:

- TOPSOIL to a depth of c. 0.30m bgl, underlain by;
- Localised MADE GROUND (i.e. infilled ponds, associated with historic farm, tracks and aqueduct) of unknown composition to an unknown depth (likely <2.00m bgl), underlain by;
- GLACIAL TILL comprising firm to stiff, becoming very stiff with depth, brown to reddish brown, slightly sandy, silty CLAY with occasional gravel, cobbles and boulders to a depth of between c.12.00m and c. 20.00m bgl, underlain by;
- PENNINE MIDDLE COAL MEASURES comprising interbedded grey mudstone, siltstone and pale grey sandstone with coal seams.

The exception to the above typical ground conditions is the presence of alluvium, which typically comprises soft, silty CLAY with sand, gravel and peat inclusions along the eastern boundary of development phase 3 and the presence of CANNEL ROCK comprising SANDSTONE in the northern section of development phases 4 and 5.

5.2.1 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	Risk
Made Ground	Widespread made ground is not anticipated across the site, however, localised areas of made ground is likely to be present in all development phases (i.e. infilled ponds, former farm in eastern site section and within areas of tracks). The localised made ground is likely to be relatively shallow (<1.00m bgl) with the exception of the infilled ponds where made ground may be deeper (<2.00m bgl). The made ground is of unknown composition and is anticipated to be variable, particularly within the infilled ponds.	Made ground may settle variably, have highly inconsistent bearing capacity and may suffer significant movements due to cases other than imposed loading that may be problematic for foundations, externals and infrastructure elements without treatment.	Low to Moderate
Compressible Ground	Given the anticipated presence of made ground within the infilled ponds there is potential for soft deposits to be present. Alluvium is also recorded along the eastern boundary of development phase 3 associated with Pennington Brook which may also be soft and compressible. Localised areas of peat have also been recorded in close proximity to the site, therefore peat may also be present on-site.	May cause significant settlement or differential settlement of foundations if foundations have been placed on compressible ground.	Low to Moderate
Coal Seam(s) and Possible Shallow Workings	The Wigan Six Foot / Trencherbone and Wigan Two Feet coal seams are recorded to outcrop on-site. The Wigan Six Foot and Wigan Four Foot coal seams are also recorded to outcrop adjacent to the eastern and southern boundaries of the site. Therefore, shallow coal seams may be present across the majority of the site, including the northern site section if the Cannel Coal seam is at shallow depth beneath the Cannel Rock. Consequently, possible shallow workings may be present in any of the seams at shallow depth. However, a significant cover of glacial till (c. 10m+) is anticipated which reduced the risk slightly.	The site is within a coal mining area and there is a potential for workings to have taken place within the underlying coal seam. Workings can result in collapses and surface ground movement. The depth of the underlying seam will need to be established prior to development.	Low to Moderate
Sand pockets / lenses and beds within Glacial Till	The glacial till is anticipated to contain significant sand bands which may be water bearing, based on the off-site Curtins site investigation.	May cause differential settlement of foundations if parts of foundations are on different strata. Support may be required in open excavations especially if water bearing (i.e. running sand).	Low to Moderate
Aggressive Ground and Groundwater	While the risk posed from the natural strata is anticipated to be very low, given the anticipated made ground of unknown composition there is potential for aggressive ground conditions to be present on-site.	Acidic ground / groundwater and sulphate may attack the concrete and steel used in foundations and react with aggregates. The oxidation of pyrite and other sulphides can also occur due to geotechnical activities. This can lead to the generation of high concentrations of sulphate 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 sulphates that cause heave of stabilised soils.	Low
Shallow Groundwater / Surface Water Pooling	Shallow groundwater or stagnant surface water pooling may represent re-engineering or excavation issues during construction.	During construction careful design and control of surface water and management during construction should be considered to negate risk of saturating the	Moderate

		anticipated shallow cohesive soils and resulting in high moisture content spoil.	
Obstructions	Some obstructions are anticipated in localised areas of the site (i.e, in the area of the historic farm in development phase 3, around Curtins WS11/WS11A). However, obstructions are not anticipated across the majority of the site.	May act as obstructions to excavations and / or the chosen foundation solution or act as 'hard spots' within the ground if left in-situ.	Low
Shrink and Swell Clays	Semi-mature and mature trees are present on-site and around the site boundaries and cohesive deposits (glacial till and possible cohesive made ground) are anticipated across the majority of the site. Atterberg limit testing undertaken on samples of glacial till from adjacent to the site have recorded a generally low volume change potential but with areas of moderate and high plasticity clays.	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
Fault	2 No. faults are recorded crossing the site from west to north east / south east downthrowing to the south.	Given the possible requirement for piled foundations in localised areas, the presence of the faults could have implications on foundations if the fault zone is substantial and the bedrock highly fractured i.e. reinforced foundations may be required in the vicinity of the fault.	Low

5.2.2 Soakaways

Given the shallow cohesive low permeability glacial clay deposits across the site, the use of soakaways for surface water discharge is not anticipated to be suitable. However, alternative methods of Sustainable Urban Drainage (SUDs) maybe feasible once the proposed scheme is understood.

5.3 Contaminated Land Legislative Framework

Environmental risks are assessed in accordance with Contaminated Land (England) (Amendment) Regulations (2012), Part IIA of the Environmental Protection Act 1990, and Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, DEFRA (2012). Part IIA provides a statutory definition of contaminated land. To fall within this definition it is necessary that, as a result of the condition of the land, substances may be present on or under the land such that:

- (a) Significant harm is being caused or there is a significant possibility of such harm being caused; or
- (b) Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused.

Risk from contamination is assessed by consideration of possible linkages between contaminant sources and potential receptors which could be harmed or polluted and the potential pathways between them – known as the Contaminant Linkage. For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- A source – a substance that is capable of causing pollution or harm;
- A receptor – something which could be affected by the contaminant;
- A pathway – a route by which the contaminant can reach the receptor.

If one of these elements is absent there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

The Environment Agency Contaminated Land Report LCRM (2020) Model Procedures for the Management of Land Contamination provides the technical framework for structured decision making about land contaminations. LCRM (2020) advocates a phased approach to risk assessment comprising:

- Preliminary Risk Assessment (PRA) – desk study and qualitative assessment;
- Generic Quantitative Risk Assessment (GQRA) – assessment of contaminant concentrations against generic assessment criteria;
- Detailed Quantitative Risk Assessment (DQRA) – detailed site-specific risk assessment and development of site-specific assessment criteria.

Each of these phases follows the same basic steps but adds site specific details and further certainty into the assessment as the stages progress. The basic steps are:

- Hazard Identification and hazard assessment- development or refinement of the source – pathway – receptor conceptual model, and identification of potential pollutant linkages;
- Risk Estimation – qualitative risk estimation predicting magnitude and probability of potential consequences that may arise as a result of a hazard.
- Risk Evaluation – deciding whether a risk is unacceptable.

The key to the classification is that the designation of risk is based upon the consideration of both:

- (a) The magnitude of the potential consequence which takes into account both the potential severity of the hazard and the sensitivity of the receptor.
- (b) The magnitude of probability which considers both the presence of the hazard and receptor and the integrity of the pathway.

Generic Quantitative Risk Assessment (GQRA) will utilise generic assessment criteria (GAC) for the purposes of screening allowable concentrations in comparison to the measured site concentrations. The GAC are defined based on the critical receptors identified at the site. Receptors are considered in relation to:

- Human health receptors (e.g. site users) via measured solid concentrations;
- The water environment (e.g. groundwater and surface water) via measured leachate / water concentrations.

Additional receptors may be relevant dependant on the site e.g. flora/fauna, water supply pipes, buried concrete.

The GAC adopted for assessment of soils in relation to Human Health are based on published Soil Guideline Values (SGV) in 2009 for those compounds for which published criteria are available for varying scenarios (residential, commercial, allotment). In the absence of SGVs the following GAC defining documents are adopted - LQM/CIEH S4ULs (2015), CL:AIRE Soil GAC for Human Health Assessment (2010) and Category 4 Screening Levels (C4SL's) (2014).

GACs for waters must be selected to assess potential risks to the identified environmental receptors. There are numerous UK and European guidelines for waters based on the site situation and different receptors. GACs utilised include - The River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2009 (Part 7: Groundwater Threshold Values), UK Drinking Water Standards (2000), Environmental Quality Standards, World Health Organisation concentrations, Environment Agency

guidance concentrations and United States Environmental Protection Agency – Region 9 GACs.

5.4 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
On-Site Made Ground (localised areas including infilled ponds)	Unknown – likely to include; metals and semi-metals, hydrocarbons, PAHS, asbestos and BTEX. Ground gas – carbon dioxide, methane, hydrogen sulphide and VOCs (vapour).	Made ground has been recorded in localised areas during the Curtins site investigations adjacent to the east. Significant human health GAC exceedances were recorded within the made ground. Although these were recorded off-site there are similar conditions (i.e. infilled ponds) anticipated on-site. Made ground will also be present beneath the bridge area in the western periphery of development phase 5, however anticipated to be reworked natural soils.
Agricultural Use	Herbicides and Pesticides.	The site has been of agricultural use throughout history, although it is anticipated that only livestock grazing was undertaken, herbicides and pesticides may be present in areas if crops were present,
Demolished Buildings	Asbestos Containing Materials and Asbestos Fibres	A farm with associated buildings was present in development phase 3 until mid 20 th Century therefore there is potential for asbestos containing materials and asbestos fibres to be present in the vicinity,
Peat	Ground gas – carbon dioxide, methane and hydrogen sulphide.	Peat has been recorded in localised areas within Phase 1 of the wider development during the Curtins 2016 site investigation – although this was placed during construction of the railway and is not considered to be a natural deposit. Although only a maximum methane concentration of 0.4% (v/v) was recorded during the single monitoring visit of a ground gas monitoring well within the peat. Peat may be present in localised areas on-site.
On-Site and Off-Site Infilled Ponds		2 No. infilled ponds exist along the northern and southern boundaries of the site, infilled by the 1950s. Organic rich matter is anticipated within the infilled pond which may be a ground gas source.
Possible Shallow Coal Workings		4 No. shallow coal seams exist on-site and in close proximity to the site, although workings are considered unlikely, if workings do exist they may be a ground gas source as pathways would be present.

It should be noted that potentially contaminative unrecorded historic activities may have occurred (e.g. the use or deposition of made ground from off-site) and in this event, further contaminative sources may be present.

5.4.1 Chemical Testing

In consideration of all the above and the guidance contained in the appropriate DEFRA industry profile and associated documents, it is therefore proposed to test for at least the following basic determinands:

Asbestos, sulphate, pH, arsenic, barium, beryllium, boron, cadmium, chromium, chromium (hexavalent), copper, cyanide, lead, mercury, nickel, selenium, vanadium, zinc, sulphate, pH, Total Petroleum Hydrocarbon screen and Speciated Polyaromatic Hydrocarbons.

If elevated levels of total petroleum hydrocarbon screen recorded, Speciated Aliphatic and Aromatic Total Petroleum Hydrocarbon Fractions (TPHCWG) testing should be undertaken.

Volatile Organic Compounds (VOCs) / Semi-VOC (SVOCs) target list testing to be undertaken following positive PID reading in excess of 25.0 ppm where appropriate. A PID 10.6 mV PID lamp will be utilised or where visual and / or olfactory evidence of is noted.

Shallow made ground samples will also be tested for asbestos. Positive asbestos identification will be quantified for further analysis.

Topsoil samples will also be tested for herbicides and pesticides.

5.4.2 Unknowns

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

- Presence, extent, depth and composition of the made ground on-site – including infilled ponds
- Depth of obstructions i.e. relic footings and walls associated with historic farm.
- Depth of anticipated shallow coal seams across the site
- Depth of groundwater within bedrock
- Presence of a shallow site wide groundwater table
- Presence of shallow coal workings

5.5 Pathways for Contamination

5.5.1 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:

- Ingestion of soil directly (including on home grown produce) 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;
- Inhalation background.

** Treated as one pathway*

5.5.2 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 current and future foundations and pooling at base / beneath foundations.
- Vertical migration through granular made ground and possible granular natural bands in natural cohesive deposits.
- Lateral migration along low permeability made ground and / or natural cohesive deposits and pooling at relative low points.
- Lateral migration along historic drainage.
- Negligible infiltration through low-permeability natural cohesive deposits.
- Migration along cracks and fissures in bedrock.
- Migration along groundwater flow.
- Overland flow

5.5.3 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 and overlying superficial deposits – *especially from any possible workings / coal seams.*
- Preferential migration along foundations, service ducts / trenches
- Migration within groundwater
- Ingress through wall cavities and floors and accumulation
- Inhalation of ground gas and vapours

5.6 **Receptors of Contamination**

Human Health receptors for these pathways include the following:

- End Users - Human Occupants (residential with home grown produce land use scenario)
- Construction workers.
- The general public and adjacent site users.

Controlled waters receptors for these pathways include the following:

- Groundwater contained within the underlying Secondary Undifferentiated Aquifer within the superficial deposits and the Secondary A Aquifer within the bedrock.
- Surface Water – Pennington brook and on-site ponds.

Other receptors for these pathways include the following:

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

5.7 **Conceptual Model for Human Health Risk Assessment**

A site conceptual model in the form of a linkage table for the purposes of a preliminary risk assessment for the human health of site occupants has been

produced as a result of the probable contaminants, pathways and receptors identified above:

Sources of Contamination	Pathway	Receptor	Hazard (severity)	Likelihood	Risk
On-Site Made Ground (localised areas including infilled ponds) Agricultural Use Demolished Buildings	Ingestion of contaminated soil and dust (indoor and outdoor)	End users and general public	Effect on human health (Medium)	Low Likelihood: Widespread made ground is not anticipated, however localised made ground is likely to be present (i.e. infilled ponds and in vicinity of historic farm). Elevated concentrations of arsenic, lead, PAHs and nickel above human health GACs for the residential with plant uptake land use scenario have been recorded within made ground within Phase 2 of the wider development. Given the similar history and site uses, localised contamination hotspots may also be present associated with localised made ground. Although considered unlikely, asbestos containing materials or asbestos loose fibres may be present within soils in the vicinity of the historic demolished farm in development phase 3. Hotspots of herbicides and pesticides may also be present in localised areas, however these are not anticipated to be present in significant concentrations. However, ingestion, dermal and inhalation pathways will be reduced across the majority of the site following development given the presence of hardstanding i.e. roads and buildings. Private gardens and areas of soft landscaping will be at increased risk.	LOW TO MODERATE
	Dermal contact with contaminated soil (outdoor and indoor)				
	Inhalation of contaminated dust (indoor and outdoor)				
		Construction workers		Low Likelihood: Widespread contamination is not anticipated, however hotspots are possible. Construction workers will be at increased risk due to their acute interaction with soil. Dust is likely to be generated during any earthworks and construction, consequently this pathway will become prevalent. However, the use of proper health and safety procedures and PPE will significantly reduce risk.	LOW TO MODERATE
	Inhalation of soil vapours (indoors and outdoors)	End users and general public		Unlikely: No widespread potential source of VOCs identified on-site, however hotspots possible. If VOCs were present, there is a low likelihood of them remaining due to their inherent volatility and mobility.	LOW
		Construction workers		Unlikely: Construction workers at increased risk as disturbance of soil may generate a temporary increase in the release of soil vapours, however risk remains low given the lack of widespread source of VOCs.	

A diagram of the conceptual site model is contained within Appendix 10.

5.8 Conceptual Model for Ground Gas Risk Assessment

A conceptual model in the form of a linkage table for the purposes of a preliminary risk assessment for ground gas has been produced as a result of the probable contaminants, pathways and targets identified above as follows:

Source	Pollutant	Pathway	Receptor	Hazard (severity)	Likelihood of Occurrence	Risk
Made Ground (including infilled ponds)	Methane	Preferential migration along foundations, service ducts / trenches	Human occupants	. Effect on human health	Low Likelihood: Although made ground is anticipated to be present in localised areas made ground is not anticipated to be deep (<2.00m bgl). The majority of the made ground is anticipated to contain minimal organic matter, with the exception of within the infilled pond where organic rich deposits may be present. Nevertheless, the made ground including within the infilled ponds is anticipated to be of low ground gas generation potential. Additionally, given the small scale of the infilled ponds relative to the site, potential ground gas sources are only present in localised areas of the site. Migration through proposed development possible e.g. ground floor slabs and wall cracks. Disturbance of the ground and exposure of contaminants during construction works may increase ground gas generation temporarily.	LOW
	Carbon dioxide		Site Workers	(Mild to Severe*)		
Peat	Hydrogen Sulphide	Ingress through wall cavities and floors and accumulation	Building and Structures	Damage to building	Low Likelihood: Peat has been recorded in localised areas in Phase 1 of the wider development (c. 110m north) to a depth of 3.40m bgl. Elevated ground gas concentrations (methane and carbon dioxide) have also been recorded which may be associated with the peat. Given the similar ground conditions and historic uses of the site, there is potential for localised peat deposits to be present on-site. Peat is a high concentration, low generation source therefore there is potential for elevated ground gas concentrations to be present in localised areas in close proximity to any peat deposits. However, peat is not anticipated to be widespread therefore the risk is not considered to be significant. Migration through proposed development possible e.g. ground floor slabs and wall cracks. Disturbance of the ground and exposure of contaminants during construction works may increase ground gas generation temporarily.	LOW TO MODERATE
	VOCs / Vapours	Inhalation of ground gas		(Mild)		

Possible Coal Mine Workings					Unlikely: Although shallow coal seams are anticipated to be present beneath the site which may be considered a ground gas source, given the thickness of primarily cohesive superficial deposits (>10m) and the anticipated lack of shallow workings providing a pathway the ground gas risk associated with possible shallow coal seams is deemed low as. Ground gas may migrate through fractures and fissures within the bedrock and glacial till however this is deemed unlikely.	LOW
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*Due to the risk of explosion.

A diagram of the conceptual site model is included within Appendix 10.

5.9 Conceptual Model for Waters Risk Assessment

A site conceptual model in the form of a linkage table for the purposes of a preliminary risk assessment for pollution of waters has been produced as a result of the probable contaminants, pathways and targets identified above as follows:

Source	Pathway	Receptor	Hazard (severity)	Likelihood of Occurrence	Risk
On-Site Made Ground (localised areas including infilled ponds) Agricultural Use	Vertical migration along current and future foundations	Groundwater within Secondary Undifferentiated and Secondary A Aquifer	Effects to controlled waters: (Mild)	Pre-Development Site Low Likelihood: Widespread made ground and contamination is considered unlikely, however localised areas of made ground with associated contaminated hotspots may be present. Although contaminative hotspots may be present, the contaminants of concern (metals and PAHs) are considered to be of low mobility and solubility. Additionally, the presence of cohesive superficial deposits will significantly reduce the migration of many contaminants to the underlying aquifers.	LOW
	Vertical migration through granular made ground and / or natural deposits			Post-Development Site Low Likelihood: Although additional pathways may be created i.e. along new foundations, there will be an increase in the presence of hardstanding (i.e. buildings and roads) following development which will reduce the infiltration of water and an increase in drainage. Furthermore, foundations will be in intimate contact with the surrounding cohesive soil and therefore migration of contaminants is unlikely.	LOW
	Negligible infiltration through (possible) low permeability cohesive deposits	Surface water courses & aquatic organisms	Effects to controlled waters: (Mild)	Pre-Development Site: Low Likelihood: Lateral migration of contaminants possible along low permeability glacial till to the adjacent Pennington Brook along the eastern boundary, however only localised contaminative hotspots anticipated and the contaminants of concern are anticipated to be of low mobility and solubility.	LOW
	Migration through porous bedrock				
	Lateral migration along low permeability cohesive deposits				

	Migration along groundwater flow				
				Post-Development Site: Unlikely: Lateral migration of contaminants possible, however will be significantly reduced due to the increase in hardstanding significantly reducing infiltration.	VERY LOW
	Overland flow	Surface water courses & aquatic organisms	Effects to controlled waters: (Mild)	Unlikely: Minimal hardstanding is currently present on-site, therefore overland flow is considered to be negligible. An increase in hardstanding following development will increase overland flow. However, the contaminative sources will have been removed or be beneath hardstanding.	VERY LOW

A diagram of the conceptual site model is included within Appendix 10.

5.10 Preliminary Risk Assessment Summary

Human Health

Based on the human health conceptual model the risk to human health is deemed low to moderate for end users and construction workers due to the anticipated presence of contaminative hotspots. The risk to construction workers is increased due to their direct contact with potential contaminative sources (i.e. made ground). However, it is envisaged that with appropriate PPE and site management, risks to construction workers can be mitigated.

Ground Gas

Potential ground gas sources exist on-site and in close proximity to the site, however, the ground gas sources are localised low generation sources therefore the risk is deemed low. However, it is considered prudent to undertake ground gas monitoring over 3 months with at least 6 visits to confirm the ground gas regime. Following the initial visits, dependent on the results further ground gas monitoring visits may be required (in-line with the recommendations of CIRIA 665).

If previously unrecorded potential ground gas sources are recorded during the site investigation works, then further ground gas monitoring may be required. 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 site

investigation works and development constraints (i.e. development timescales and liaison with the local authority).

Controlled Waters

Although potentially contaminative sources have been identified on-site and sensitive receptors (aquifers and Pennington Brook), the risk to controlled waters is deemed very low to low given the absence of significant contaminative linkages due to the anticipated presence of glacial till beneath the site and the low mobility and solubility of the contaminants of concern.

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

5.11 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, albeit they're **low** as contaminative sources are limited. This intrusive site investigation works should include the collection of appropriate samples – solid and / or liquid, if determined 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, site investigation works will be required on a spatial basis and also targeting the location of the following features:

- Infilled Ponds
- Eastern site section in vicinity of historic farm.

The proposed site investigation works should comprise the following:

- Trial Pits
- Window Sample Holes
- Rotary Open Holes – *for purposes of assessing the coal mining risk across the site.*

The rationale for the exploratory holes is discussed below:

- To allow the collection of samples from made ground, stockpile and natural deposits for chemical laboratory testing (solid samples) for an appropriate suite of determinands and for soluble sulphate (2:1 extract) and / or total sulphate and pH testing 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 the made ground on-site, including the composition and depth of the landfill within the infilled ponds.
- To determine the presence of any subterranean obstructions i.e. footings, slabs, walls etc.
- To determine the extent and nature of superficial deposits.
- Enable in-situ and ex-situ 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;
- Window sample holes to allow the installation of wells for monitoring of the groundwater regime and ground gas.
- Rotary Holes to determine the thickness of overlying superficial deposits and the depth to rockhead as well as the position and depth of the shallow coal seams on-site.

Site investigation should also include the following:

- Initial ground gas and groundwater depth monitoring of wells for 6 visits over at least 3 months, although, this monitoring period is subject to change following intrusive site investigation findings. Following the initial 6 visits, further ground gas monitoring may be deemed necessary subject to the findings of the initial visits.

6.0 PHASE 1 RECOMMENDATIONS

- 6.1 As a result of the information gathered and the risks identified in this report, it is regarded that there is a low to moderate risk to human health on the basis that potentially contaminative sources have been identified on-site and contaminative linkages may exist. However, the risk to controlled waters is deemed very low to low given the lack of identified contaminative linkages due to anticipated thick superficial clay deposits acting as an aquitard. Consequently, a Phase 2 intrusive environmental ground investigation should be undertaken, and spatial and targeted chemical testing of the site materials is considered prudent. In order to determine the suitability of existing site materials either for off-site disposal or re-engineering on-site, chemical laboratory testing should be undertaken for characterisation of site materials.
- 6.2 On the basis that a low ground gas risk has been identified, it is considered necessary to undertake ground gas monitoring for an initial period of at least 3 months with 6 visits given the high sensitivity of the proposed development. Dependent on the findings of the initial visits, further ground gas monitoring visits may be required. On the basis that the site lies within an area where less than 1% of homes are affected by radon at or above the Action Level; no radon protection measures are required.
- 6.3 Due to geotechnical requirements, site 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.
- 6.4 Ground investigation works should be carried out to determine the risk associated with shallow coal seams / workings. This information should be used to update the Coal Mining Risk Assessment for the site.

- 6.5 From the results of the Phase 2 site 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.
- 6.6 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.
- 6.7 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.
- 6.8 Due to the presence of semi-mature and mature trees on-site and the likely presence of cohesive deposits, an arboricultural survey is recommended.
- 6.9 Once proposed layout is provided then consideration of material management should be designed in the form of a DoWCoP Material Managements Plan or similar Permitting system. Given the greenfield nature of the site it is anticipated that significant quantities of surplus topsoil will be represent as a by-product of development of the site.

APPENDIX 1

LIMITATIONS OF INVESTIGATION WORK AND REPORT

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.

PLANNING CONTEXT

The National Planning Policy Framework (NPPF, 2018) 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’.***

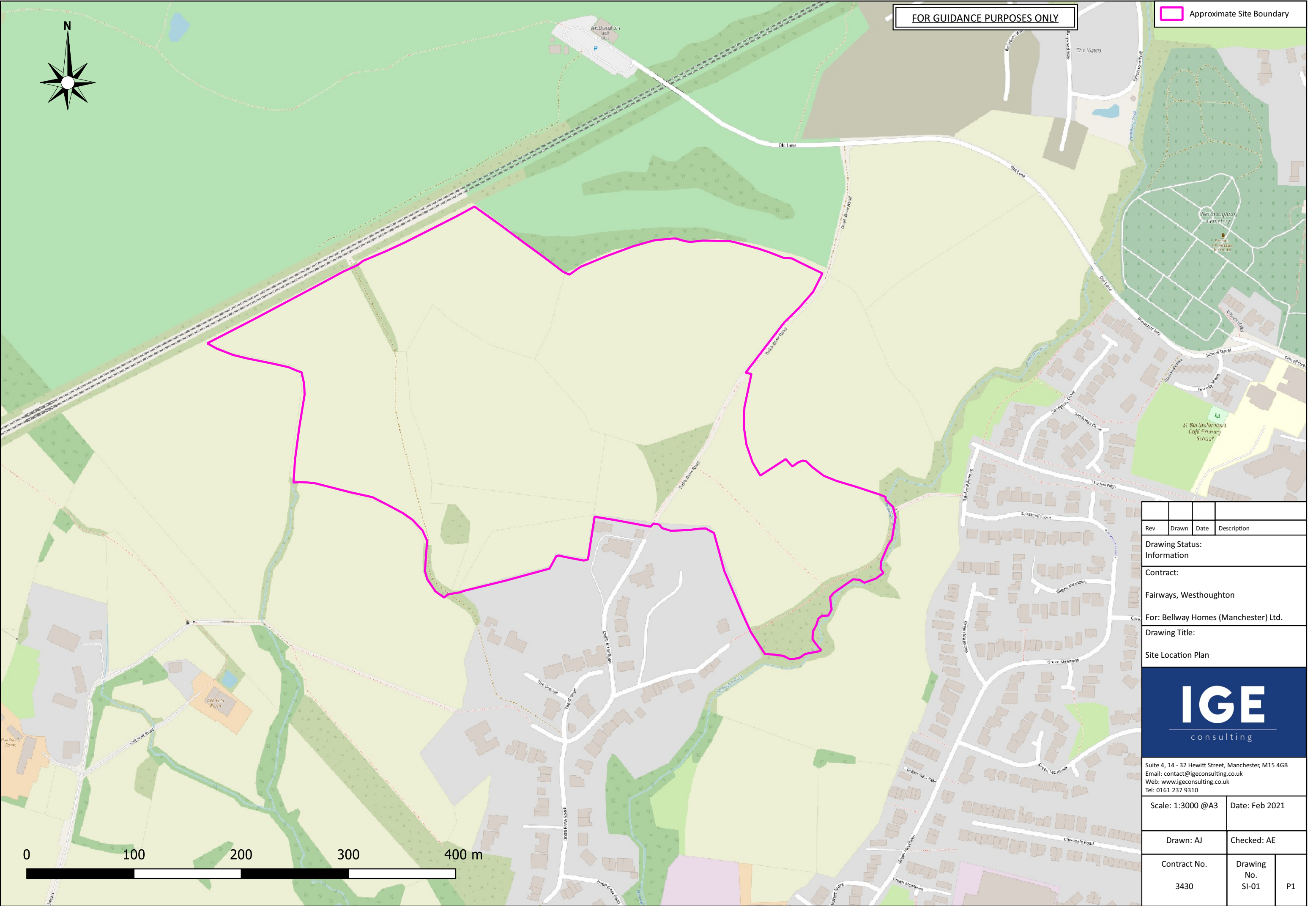
Paragraph 178 of the NPPF states that planning policies and decisions for developments should also ensure that:

- ***‘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.

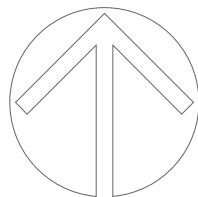
APPENDIX 2
SITE LOCATION PLAN



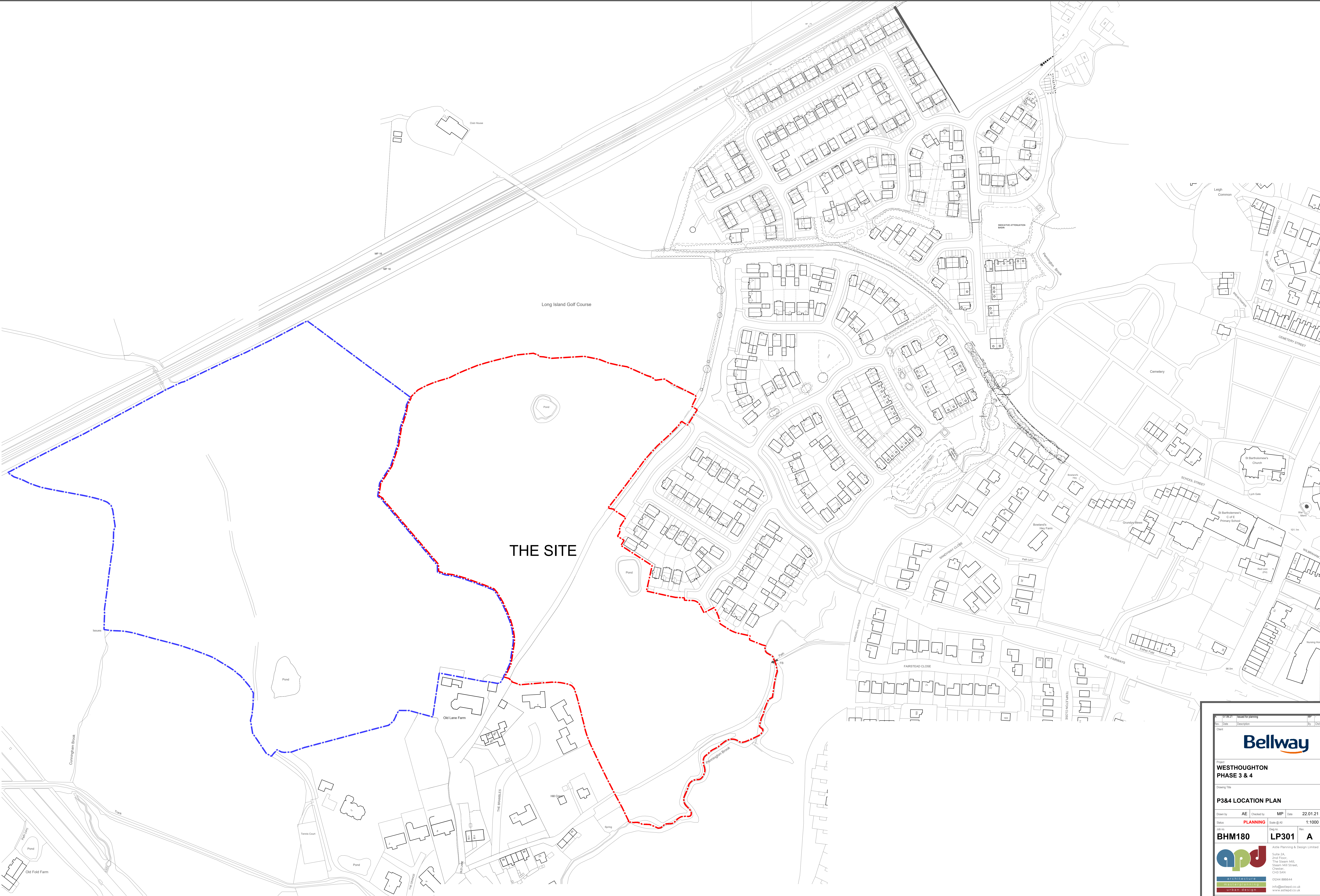
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For: Bellway Homes (Manchester) Ltd.			
Drawing Title: Site Location Plan			
IGEconsulting Suite 4, 14 - 32 Hewitt Street, Manchester, M15 4GB Email: contact@igeconsulting.co.uk Web: www.igeconsulting.co.uk Tel: 0161 237 9310			
Scale: 1:3000 @A3		Date: Feb 2021	
Drawn: AJ		Checked: AE	
Contract No.	Drawing No.		
3430	SI-01	P1	

WESTHOUGHTON FURTHER PHASES

PHASE 3&4 - LOCATION PLAN



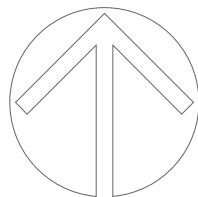
Note:
Do not scale from this drawing.
All contractors must visit the site and be responsible for taking and checking dimensions.
All construction information should be taken from figured dimensions only.
Any discrepancies between drawings, specifications and site conditions must be brought to the attention of the supervising officer.
This drawing is for planning purposes only. It is not intended to be used for construction purposes. While all reasonable efforts are used to ensure drawings are accurate, Asple Planning and Design Ltd accept no responsibility or liability for any reliance placed on, or use made of, this plan by anyone for purposes other than those stated above.



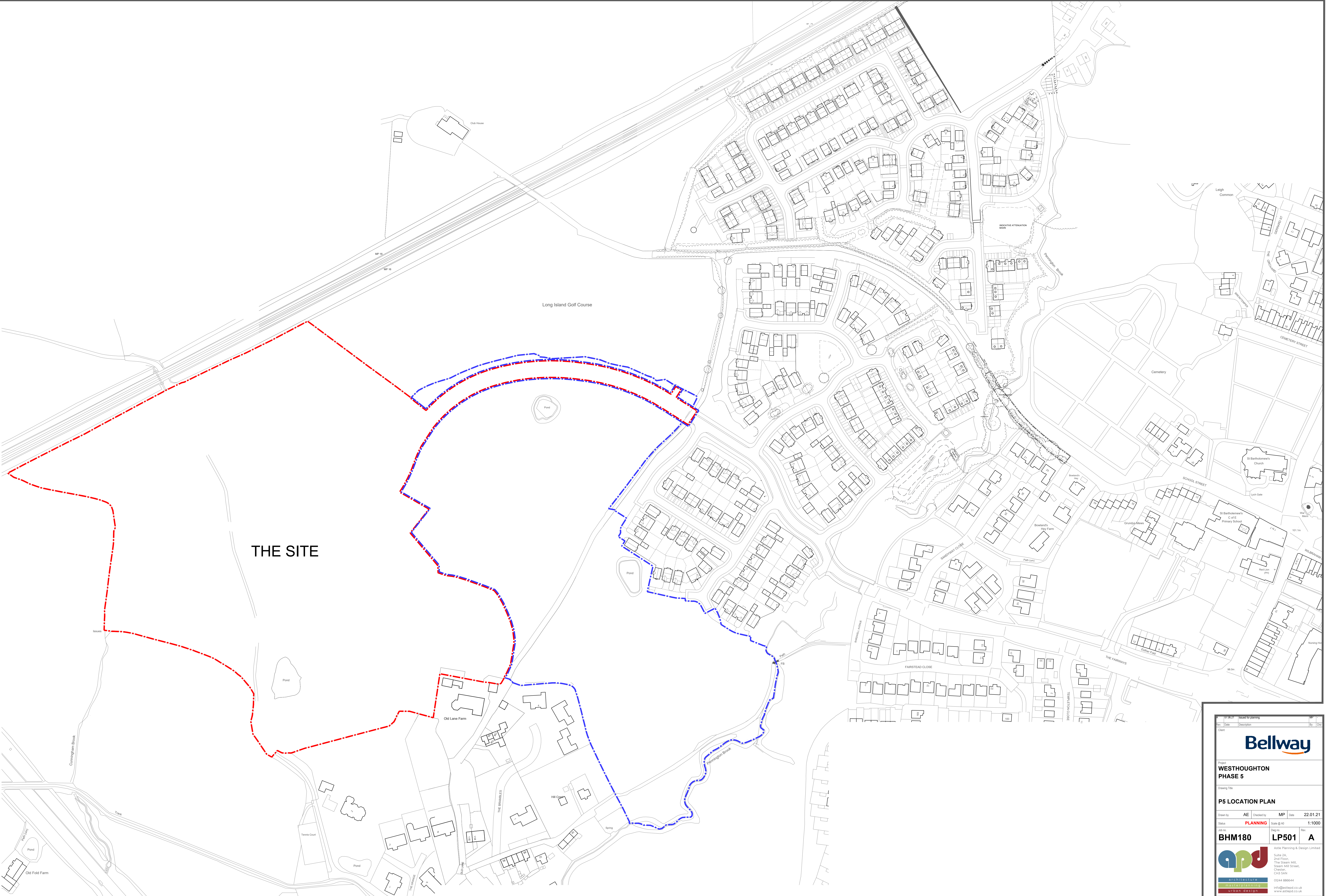
10/12/21 Issued for planning		MP
Rev	Date	Description
Client		
Bellway		
Project		
WESTHOUGHTON PHASE 3 & 4		
Drawing Title		
P3&4 LOCATION PLAN		
Drawn by	AE	Checked by
Date	22.01.21	Date
Scale	PLANNING	Scale @ A0
1:1000		
Job No.	BHM180	LP301
Rev.	A	
Asple Planning & Design Limited		
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WESTHOUGHTON FURTHER PHASES

PHASE 5 - LOCATION PLAN



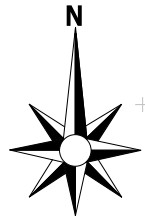
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All construction information should be taken from figured dimensions only.
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10/12/21 Issued for planning		MP
Rev	Date	Description
Client		
Bellway		
Project		
WESTHOUGHTON PHASE 5		
Drawing Title		
P5 LOCATION PLAN		
Drawn by	AE	Checked by
Date	22.01.21	Date
Scale	PLANNING	Scale @ A0
1:1000		
Job No.	BHM180	LP501
Rev.	A	
Asple Planning & Design Limited		
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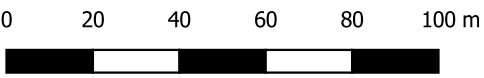
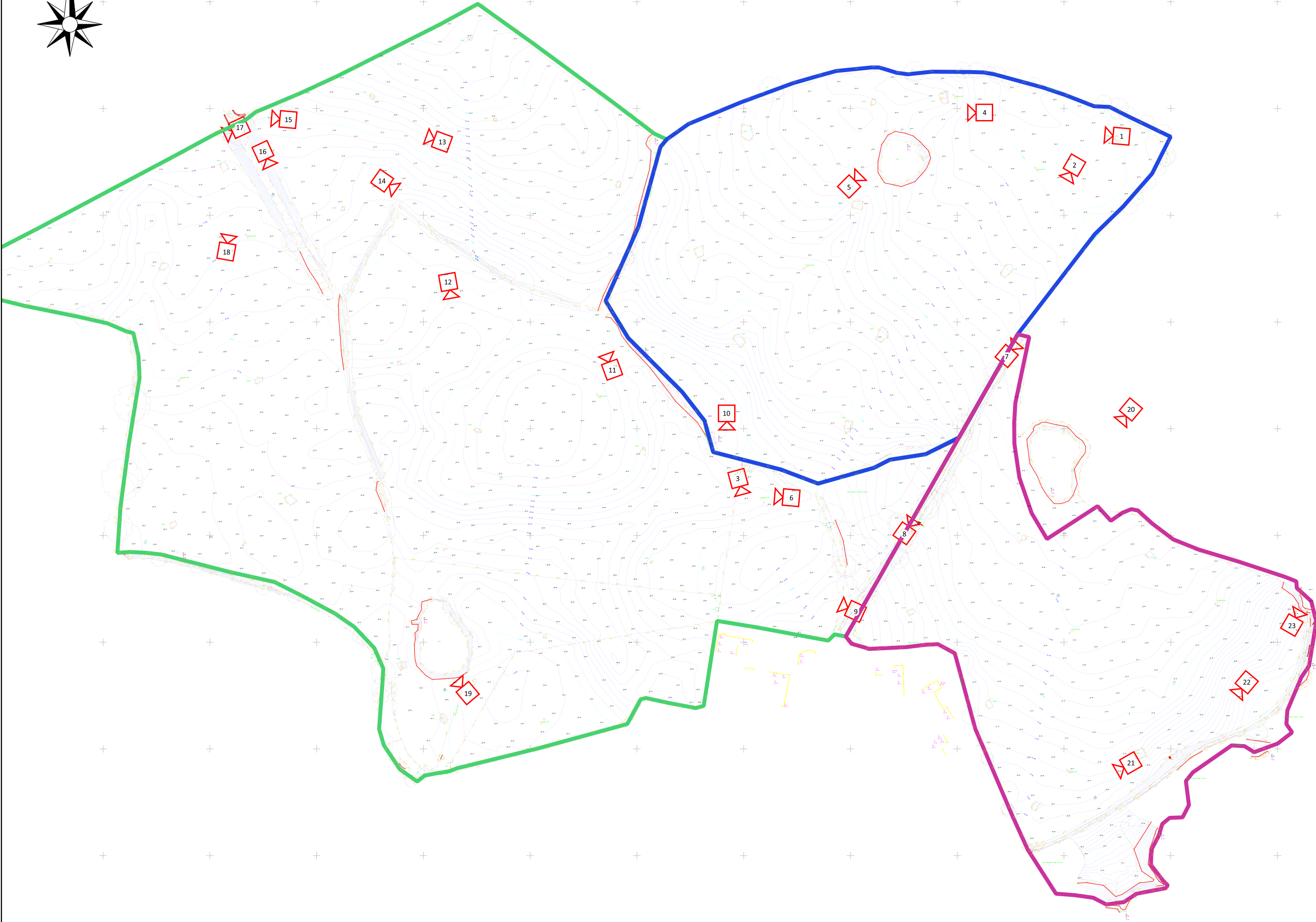
APPENDIX 3

WALKOVER SURVEY PHOTOGRAPHS AND PHOTOGRAPH PLAN



FOR GUIDANCE PURPOSES ONLY

- Development Phases**
- Development Phase 3
 - Development Phase 4
 - Development Phase 5
 - Walkover Photographs



Rev	Drawn	Date	Description
Drawing Status: Information			
Contract: Fairways, Westhoughton			
For: Bellway Homes (Manchester) Ltd			
Drawing Title: Walkover Photograph Location Plan			
IGEconsulting			
Suite 4, 14 - 32 Hewitt Street, Manchester, M15 4GB Email: contact@igeconsulting.co.uk Web: www.igeconsulting.co.uk Tel: 0161 237 9310			
Scale: 1:1750 @A3		Date: Feb 2021	
Drawn: AL		Checked: AE	
Contract No.	Drawing No.		
3430	SI-02	P1	



Photo 1: View west from the north eastern corner of the site off Dobb Brow road access.



Photo 2: View south showing a general overview of the site and the north eastern boundary with Dobb Brow road.



Photo 3: View north south of the southern site section and neighbouring residential dwellings.



Photo 4: View west showing the a pond outline in the northern site section.



Photo 5: View north west showing the pond in the northern site section and the northern site boundary.



Photo 6: View west showing fences within the site boundary and central site section.



Photo 7: View north east showing Dobb Brow Road which cuts through the eastern site section.



Photo 8: View north east showing Dobb Brow Road contained within the site area.



Photo 9: View west showing the southern section of the site.



Photo 10: View south showing the central and southern site sections.



Photo 11: View north west in the central site section showing water uprising and sinking into a hole. This may be a collapsed land drain.



Photo 12: View to the south showing the main central site section.



Photo 13: View north west showing a historic embankment over the railway line along the north western site boundary.



Photo 14: View south east showing the suspected hawthorn hedgerows on-site.



Photo 15: View west showing the historic railway bridge embankment.



Photo 16: View south east looking out across the central site section from on top of the historic railway bridge embankment.



Photo 17: View looking south west along the north western site boundary with the railway.



Photo 18: View north showing the historic railway bridge embankment.



Photo 19: View north west in the southern site section showing the southern on-site pond.



Photo 20: View south west from off-site showing the site boundary and off-site eastern pond.



Photo 21: View south west in the south eastern site corner showing a natural slope.



Photo 22: View south west showing a natural on-site slope and the site boundary with a footpath in the south eastern site corner.



Photo 23: View north showing the Pennington Brook which runs along the south eastern site boundary.

APPENDIX 4

HISTORICAL ORDNANCE SURVEY MAPS

Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_1_1
Grid Ref: 364247, 405637

Map Name: National Grid

Map date: 1952

Scale: 1:1,250

Printed at: 1:2,000



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Edition N/A
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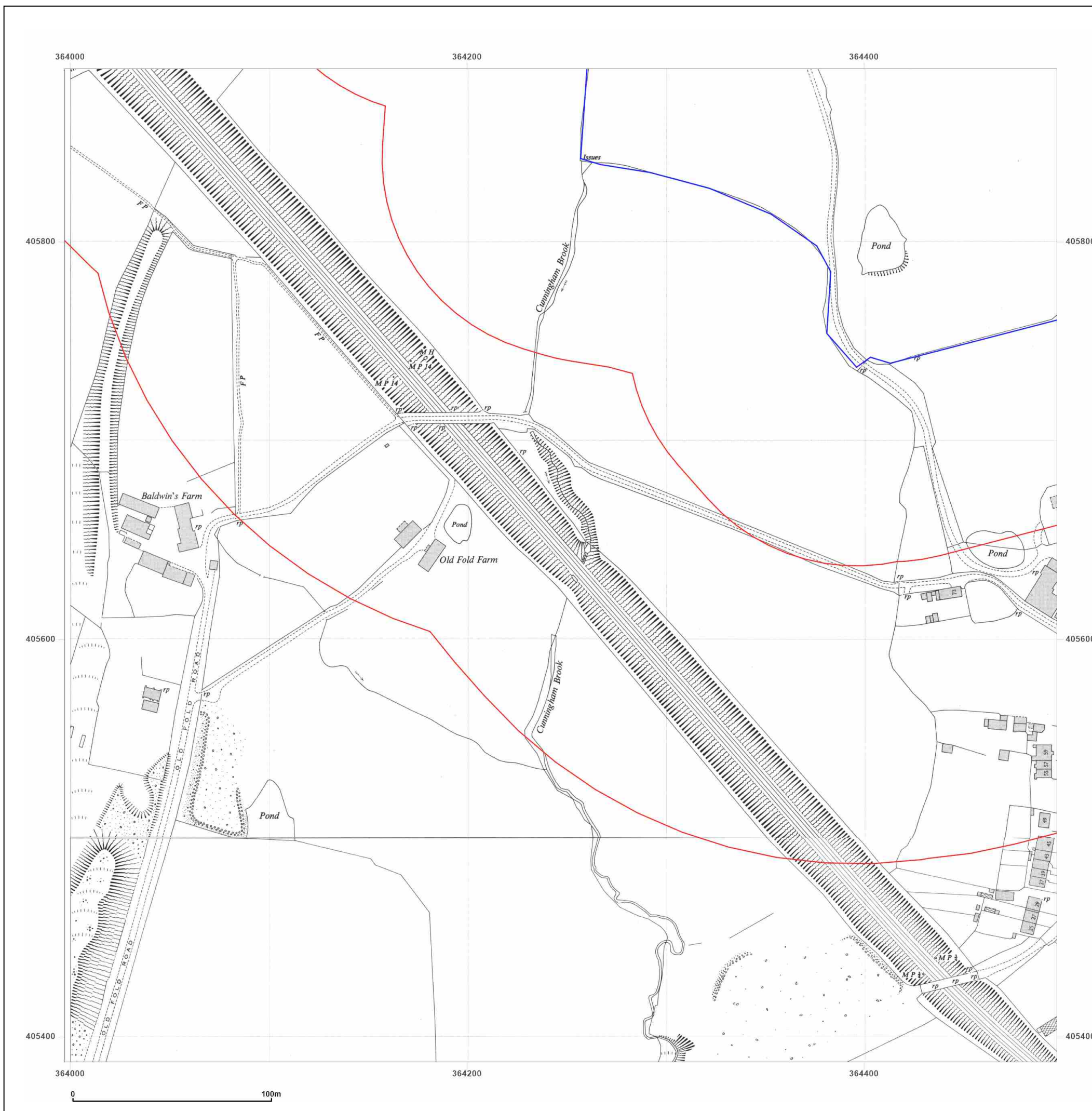


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Site Details:

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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_1_1
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Map Name: National Grid

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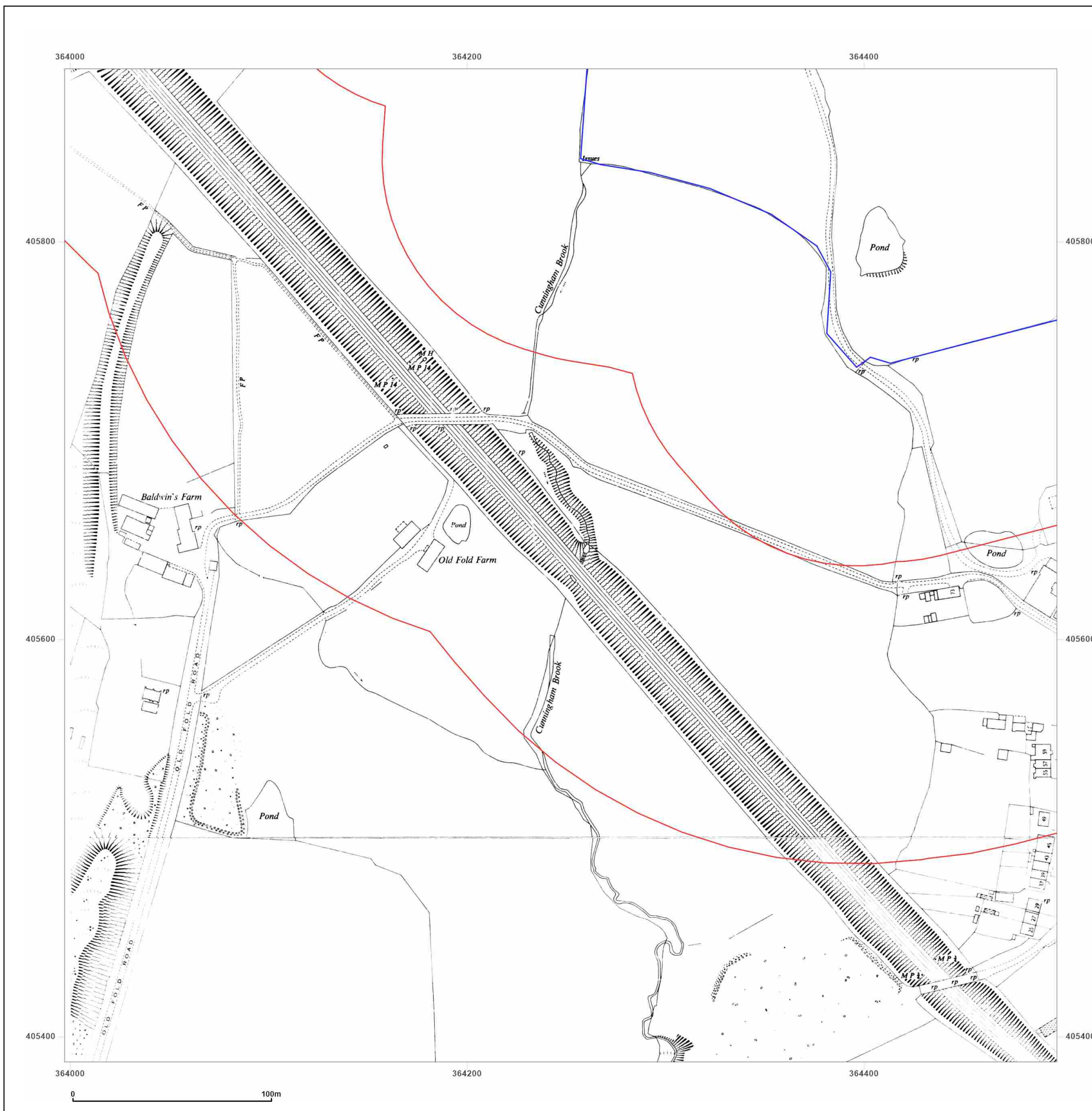


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Site Details:

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BL5 2BA

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Grid Ref: 364247, 405637

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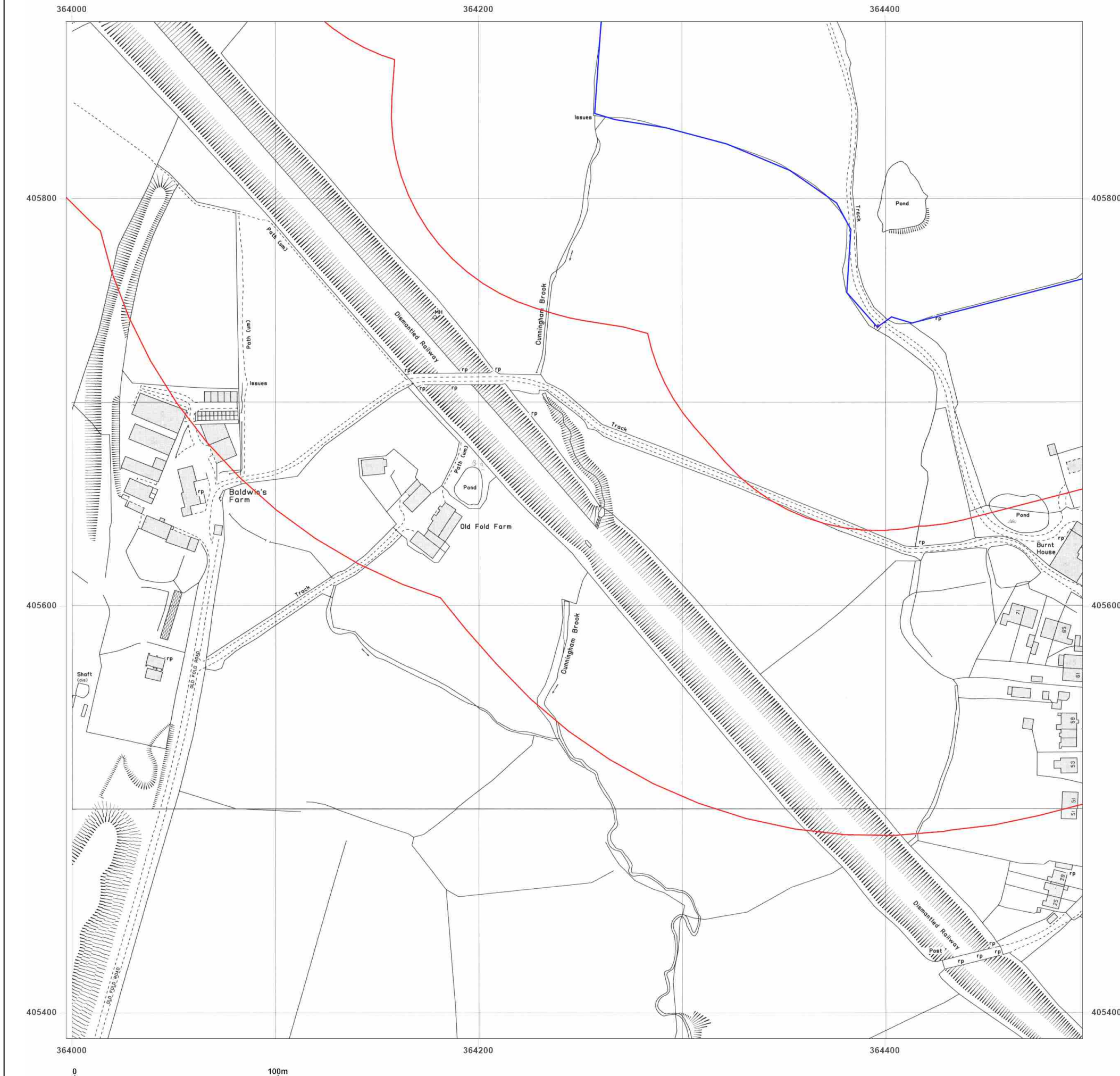


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Site Details:

Land off The Fairways,
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BL5 2BA

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Grid Ref: 364247, 405637

Map Name: National Grid

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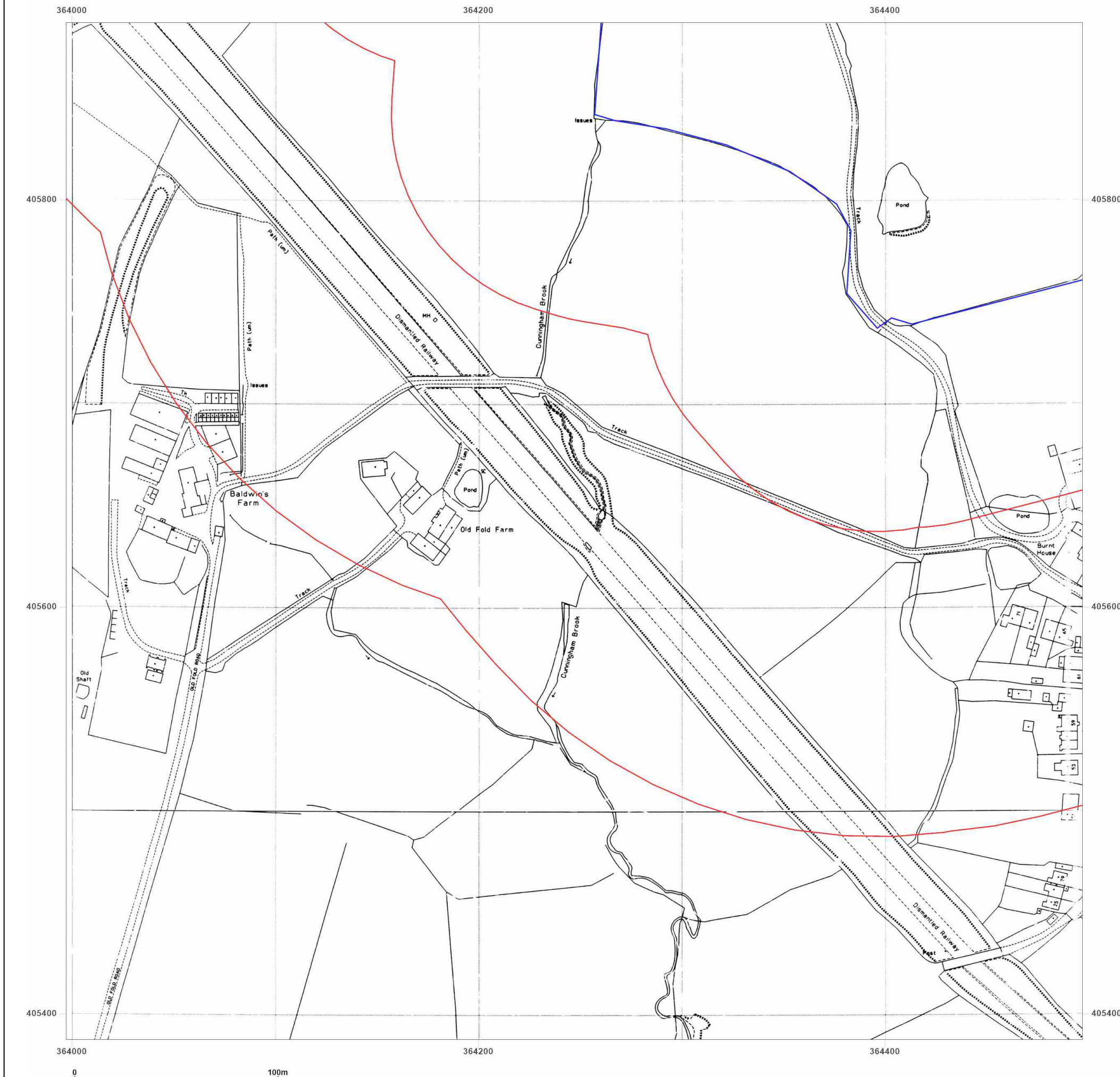


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BL5 2BA

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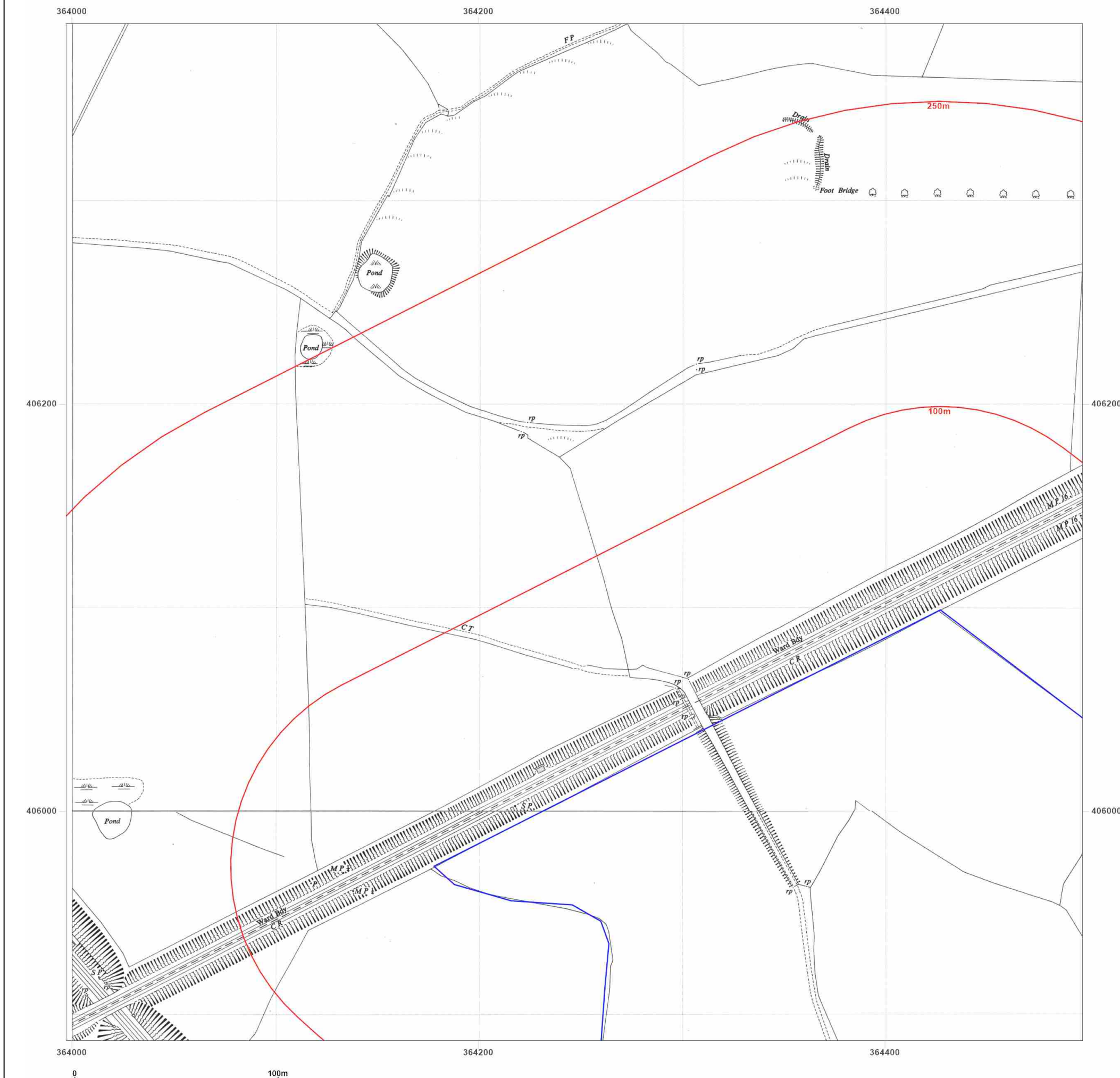


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BL5 2BA

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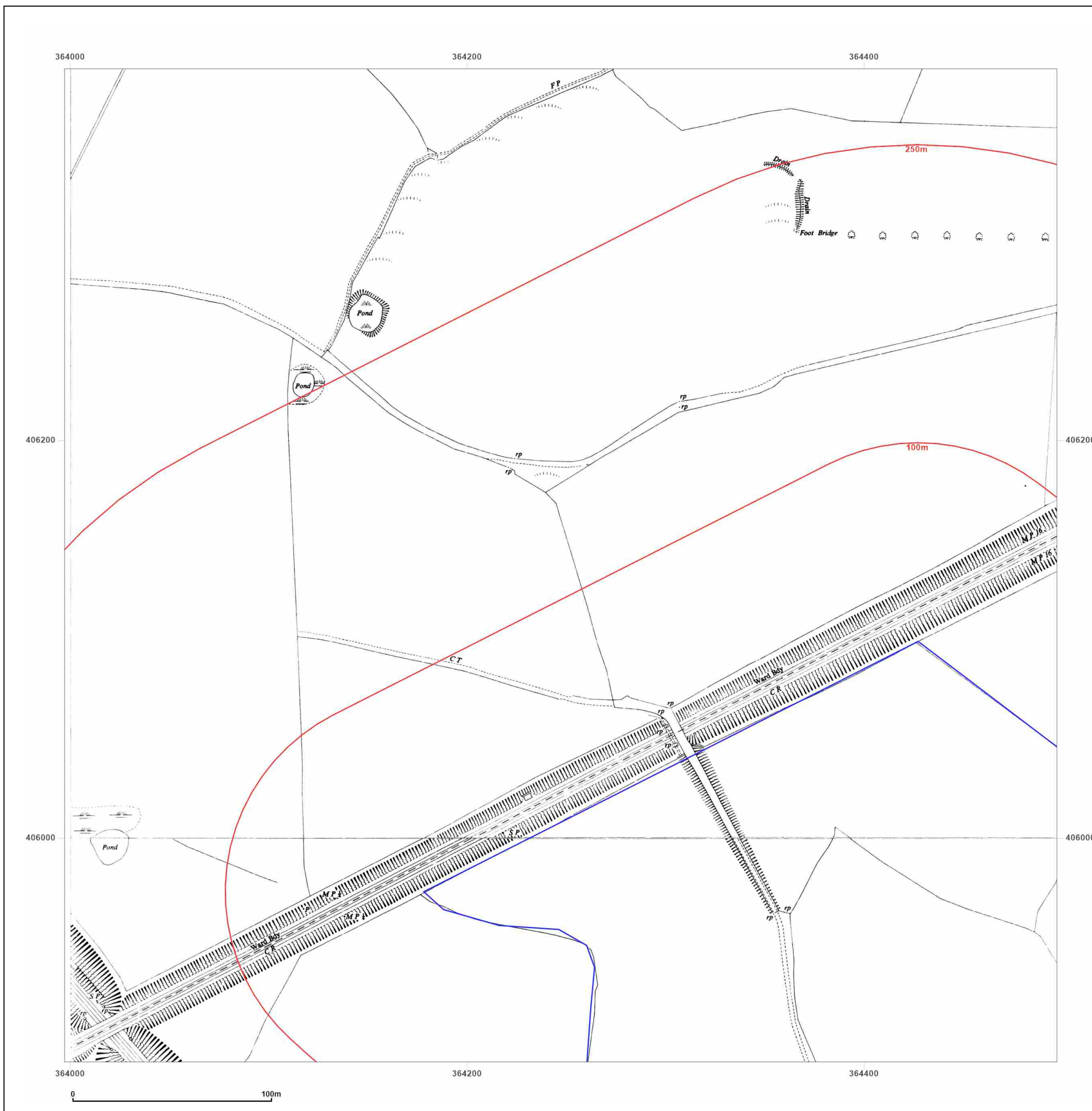


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Site Details:

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BL5 2BA

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Grid Ref: 364247, 406137

Map Name: National Grid

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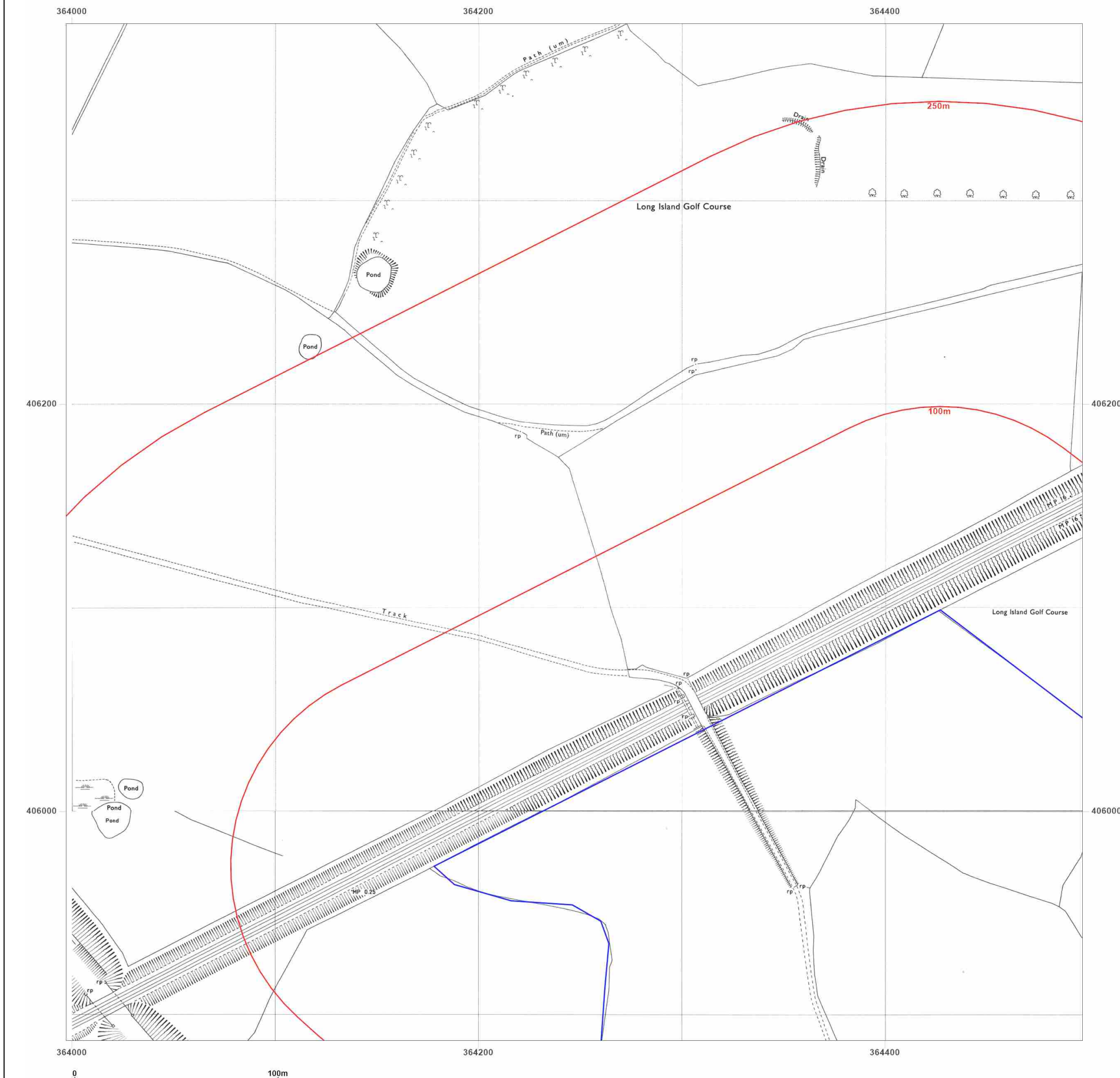


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Client Ref: 3430
Report Ref: GS-7520736_1250_1_2
Grid Ref: 364247, 406137

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Map date: 1992

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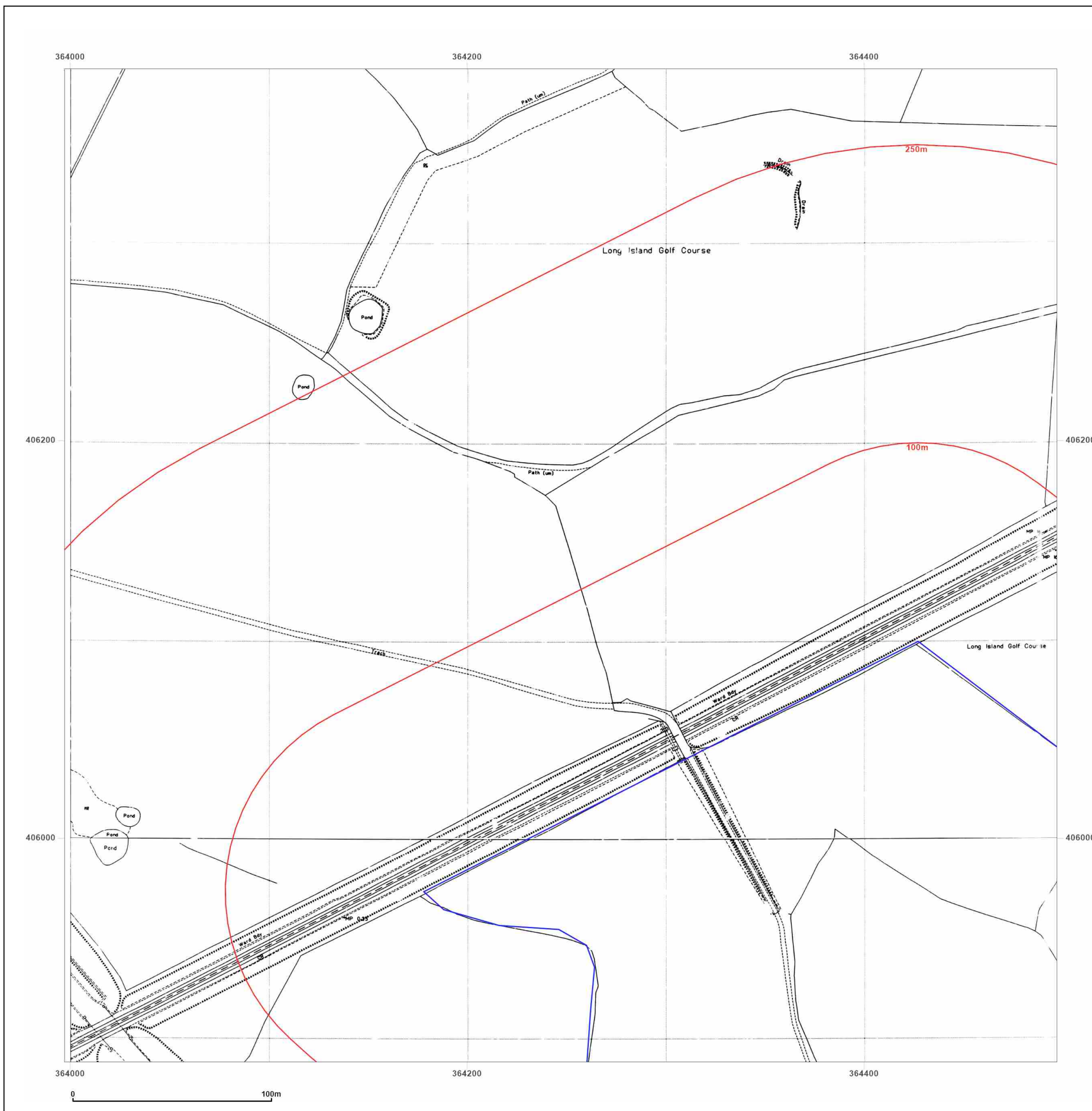


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Site Details:

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BL5 2BA

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Grid Ref: 364747, 405637

Map Name: National Grid

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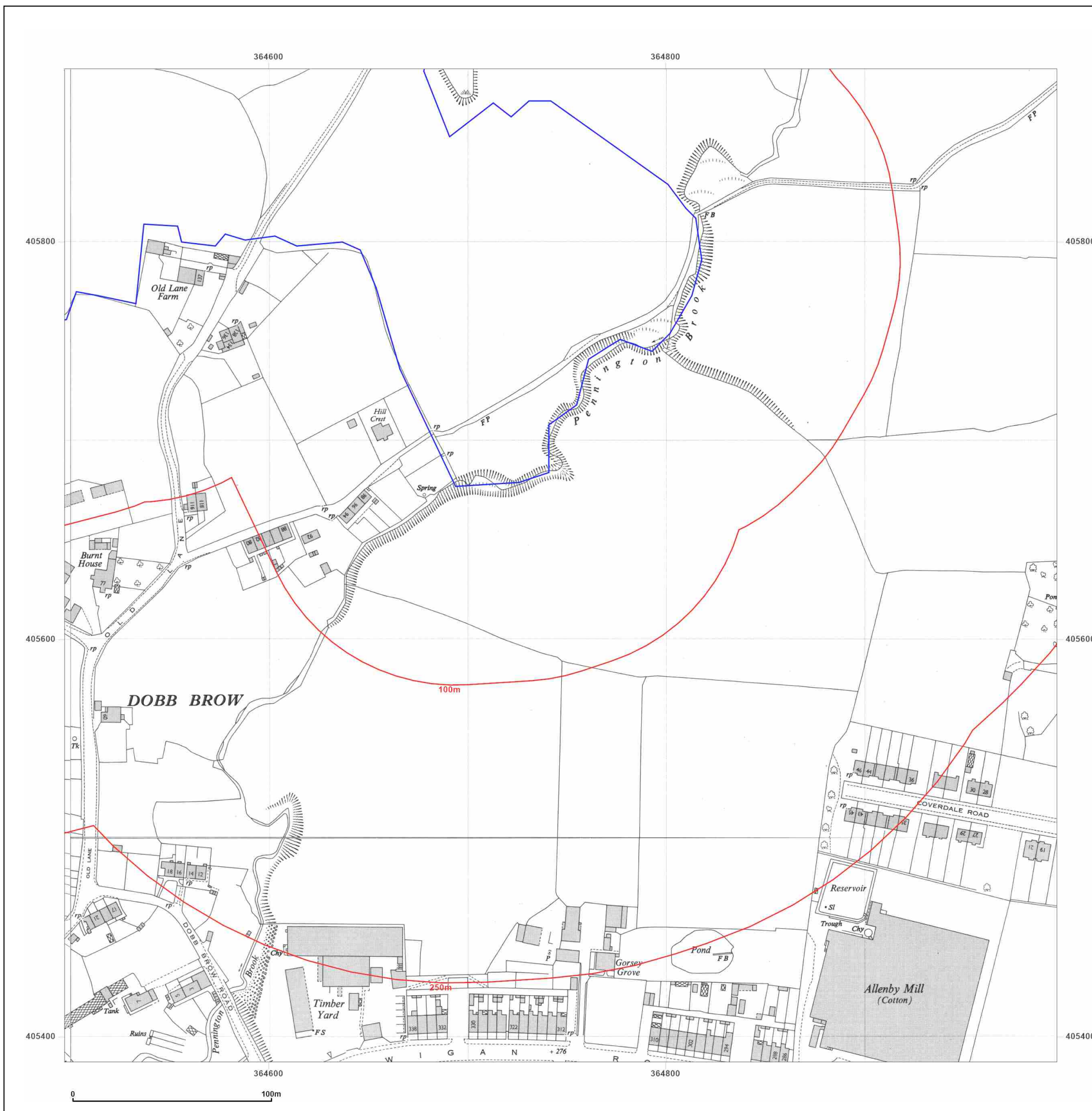


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BL5 2BA

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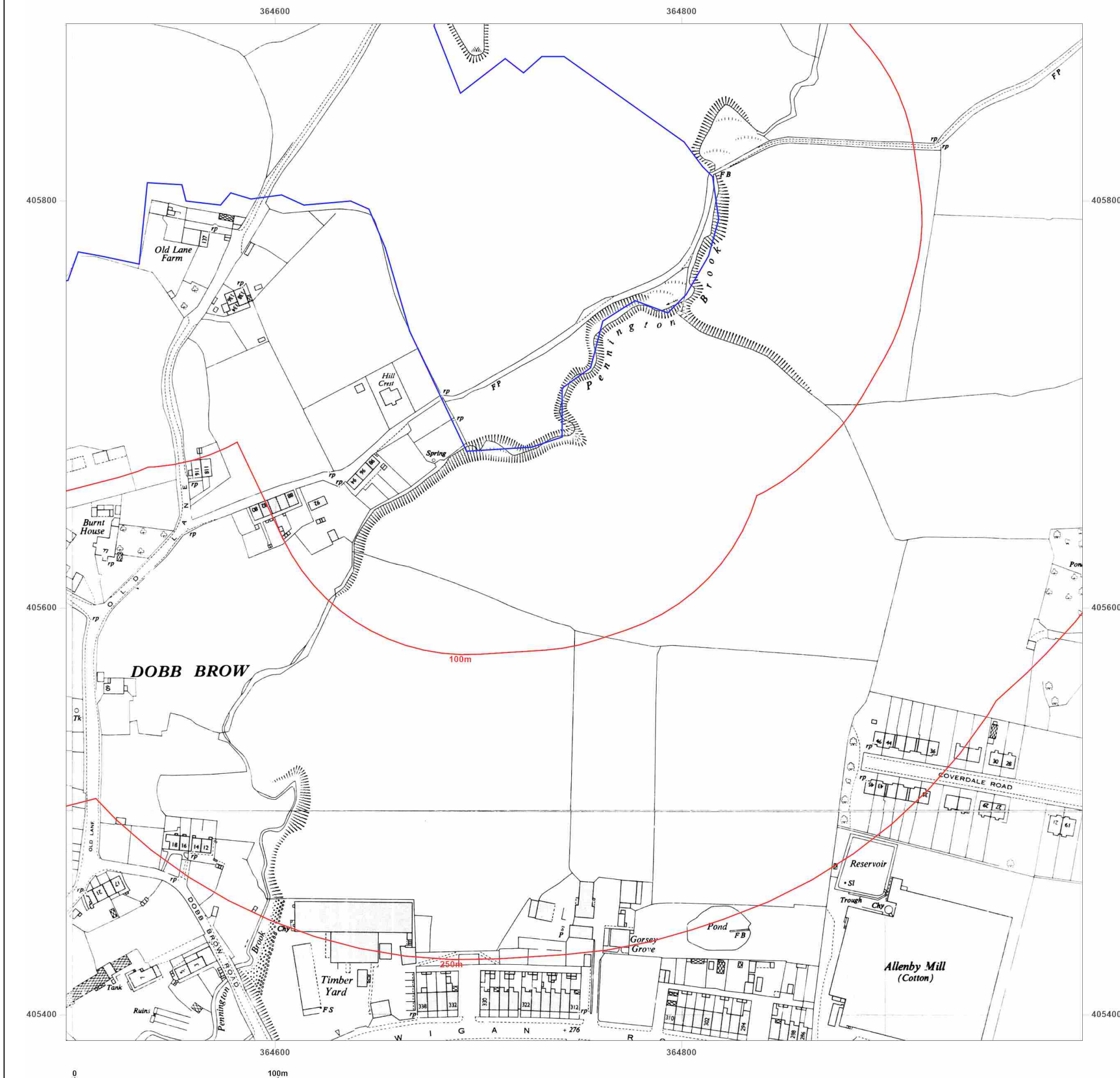


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BL5 2BA

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Levelled 1964

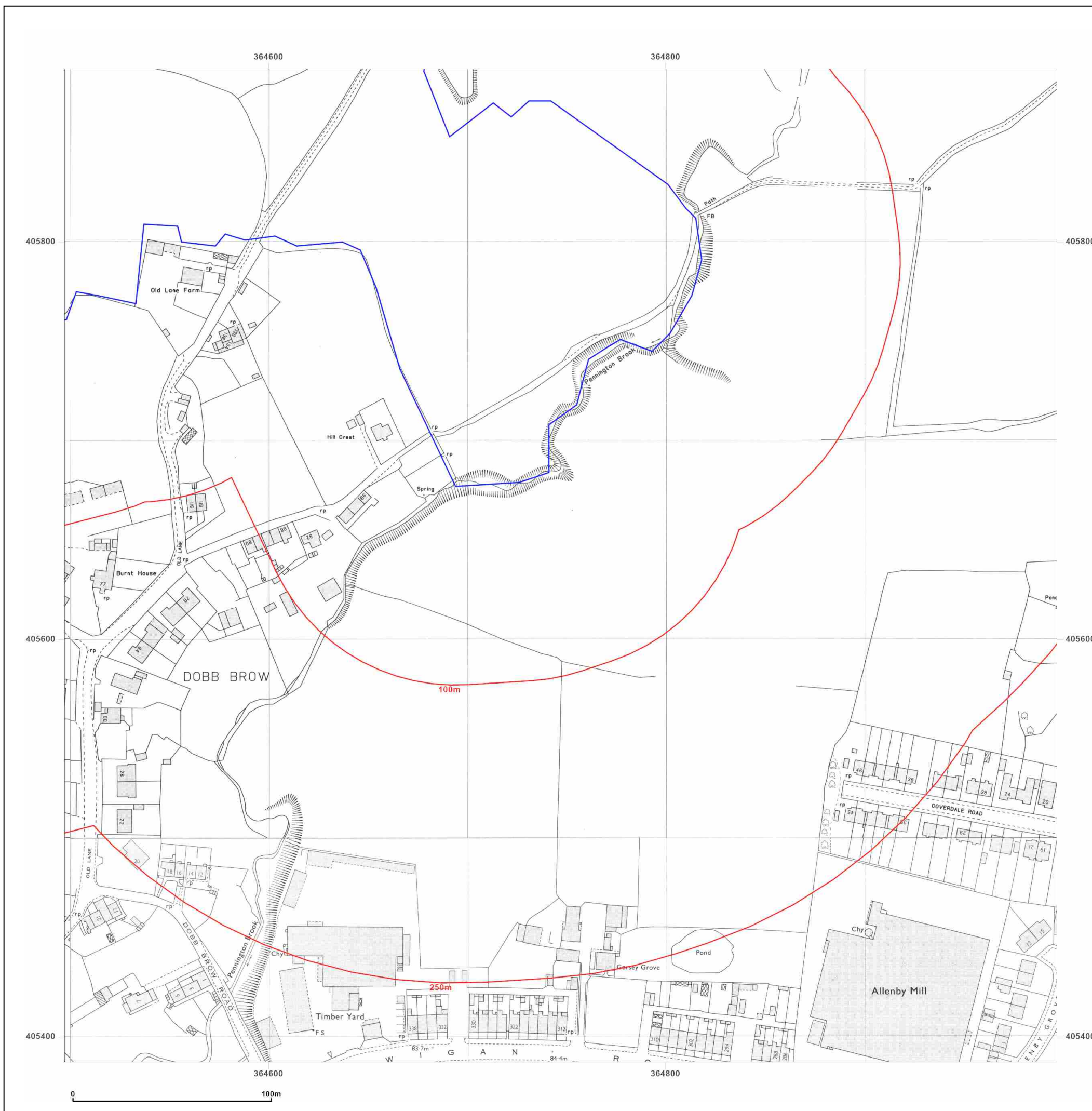


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_2_1
Grid Ref: 364747, 405637

Map Name: National Grid

Map date: 1978

Scale: 1:1,250

Printed at: 1:2,000



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1978
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1978
Levelled 1964

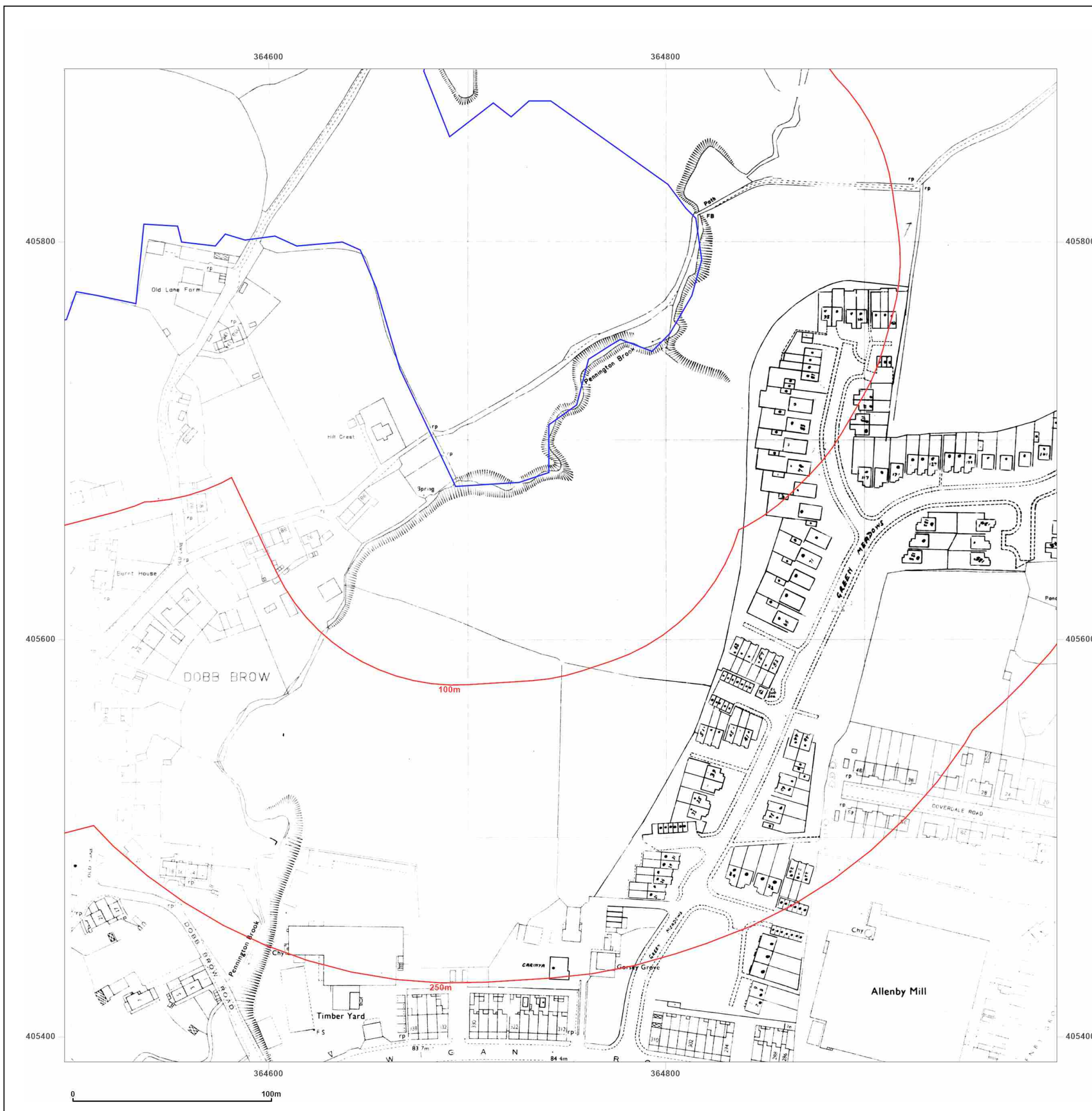


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_2_1
Grid Ref: 364747, 405637

Map Name: National Grid

Map date: 1985-1989

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1958
Revised 1985
Edition N/A
Copyright 1985
Levelled 1958

Surveyed 1964
Revised 1989
Edition N/A
Copyright 1989
Levelled 1964

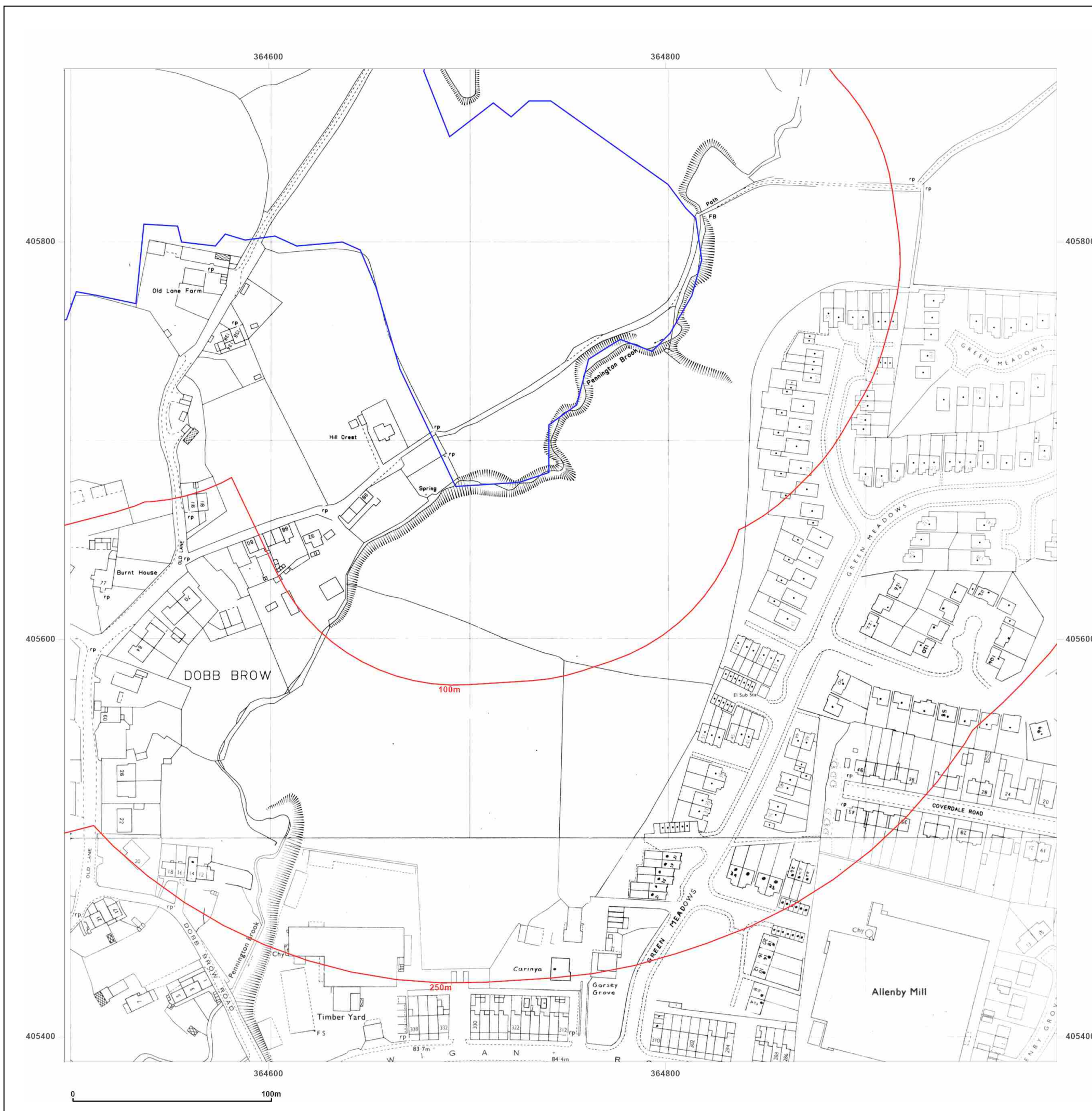


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_2_1
Grid Ref: 364747, 405637

Map Name: National Grid

Map date: 1989-1992

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1992
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1992
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1992
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1964
Revised 1989
Edition N/A
Copyright 1989
Levelled 1964

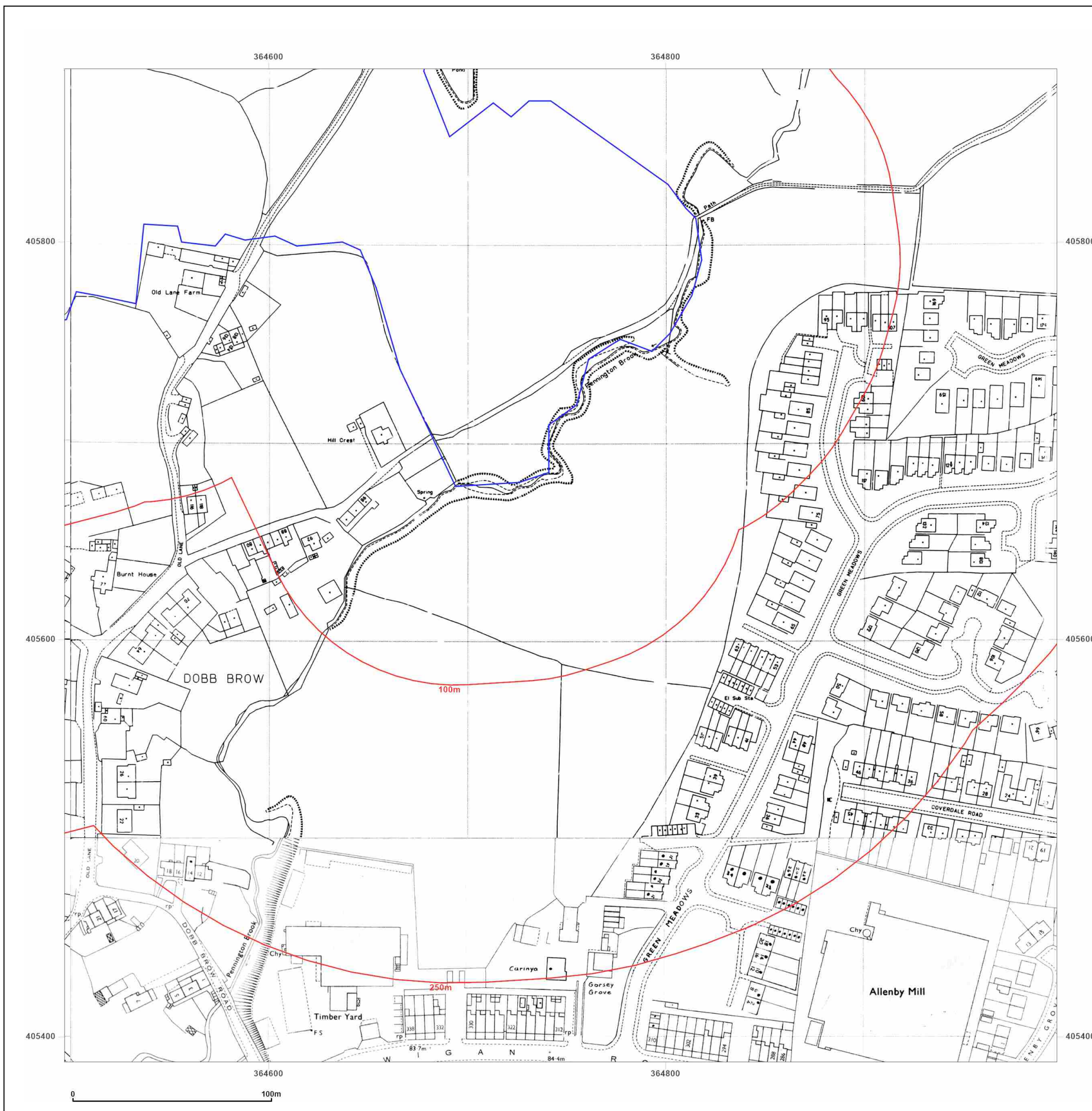


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_2_2
Grid Ref: 364747, 406137

Map Name: National Grid

Map date: 1952

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1926

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1926

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1926

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1926

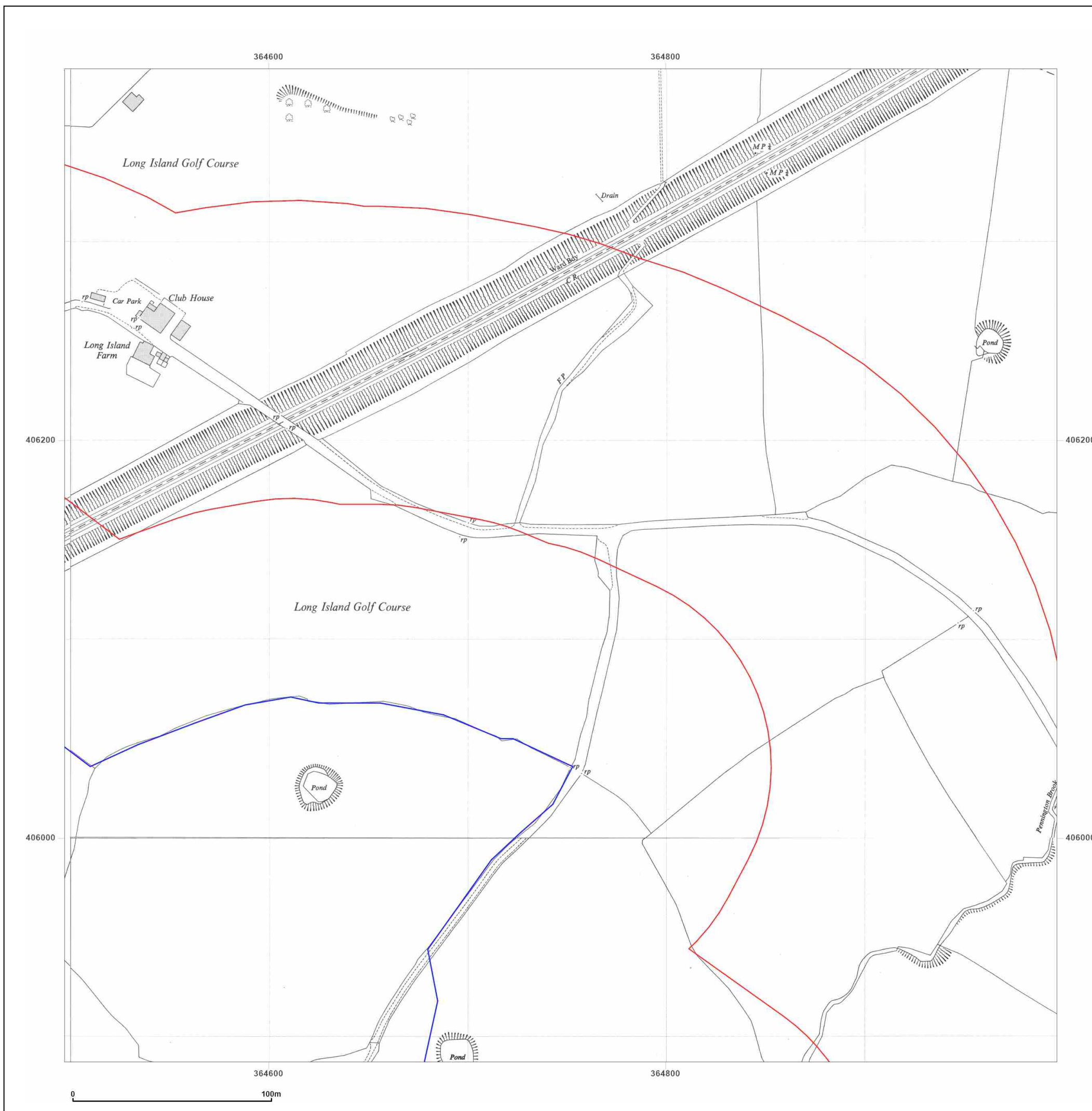


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_2_2
Grid Ref: 364747, 406137

Map Name: National Grid

Map date: 1953

Scale: 1:1,250

Printed at: 1:2,000



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

Surveyed 1952
Revised N/A
Edition N/A
Copyright 1953
Levelled 1926

Surveyed 1952
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Edition N/A
Copyright 1953
Levelled 1926

Surveyed 1952
Revised N/A
Edition N/A
Copyright 1953
Levelled 1926

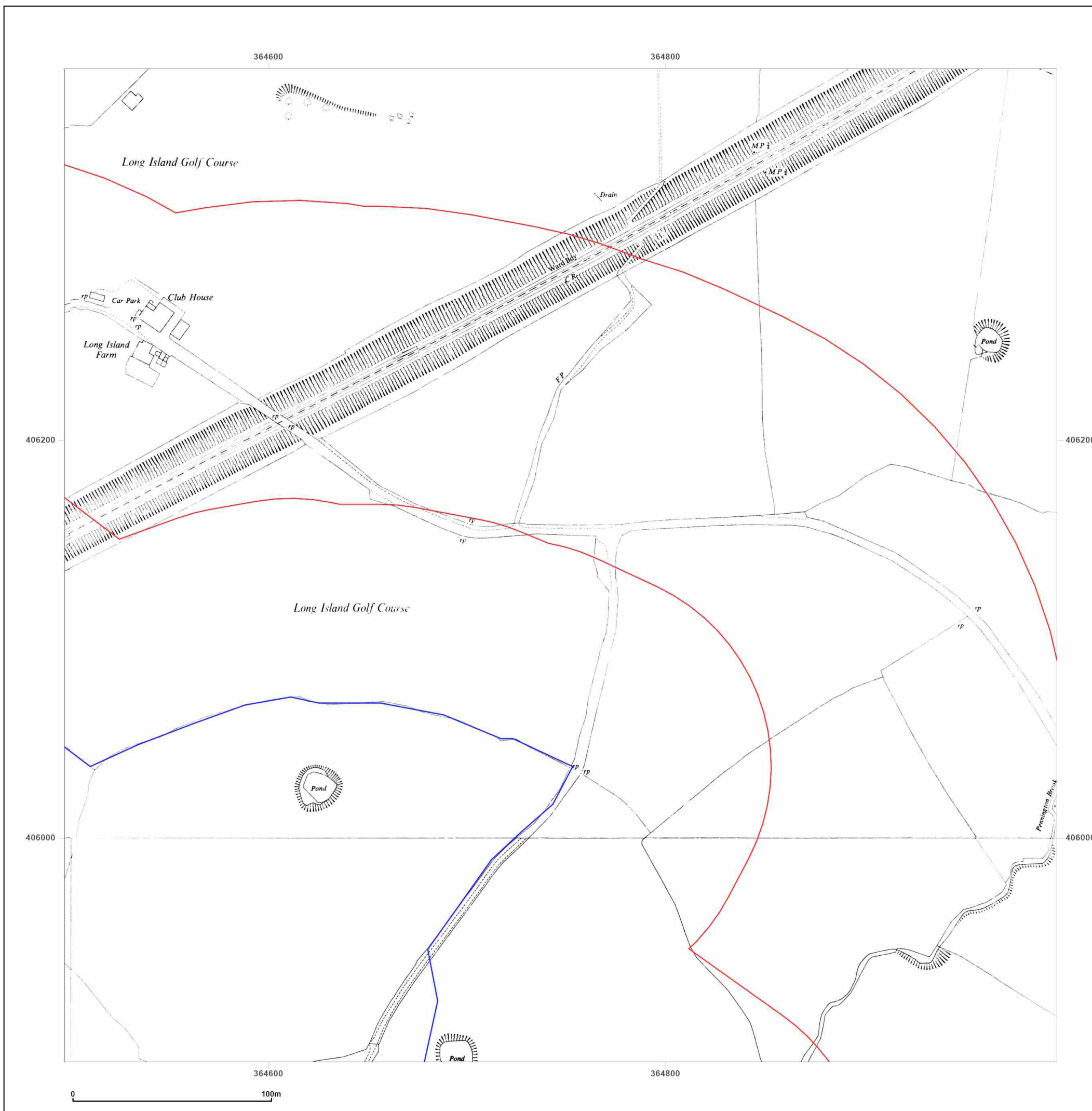


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Site Details:

Land off The Fairways,
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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_2_2
Grid Ref: 364747, 406137

Map Name: National Grid

Map date: 1974-1975

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1952
Revised 1973
Edition N/A
Copyright 1974
Levelled 1957

Surveyed 1952
Revised 1973
Edition N/A
Copyright 1974
Levelled 1957

Surveyed 1952
Revised 1974
Edition N/A
Copyright 1975
Levelled 1958

Surveyed 1952
Revised 1974
Edition N/A
Copyright 1975
Levelled 1958

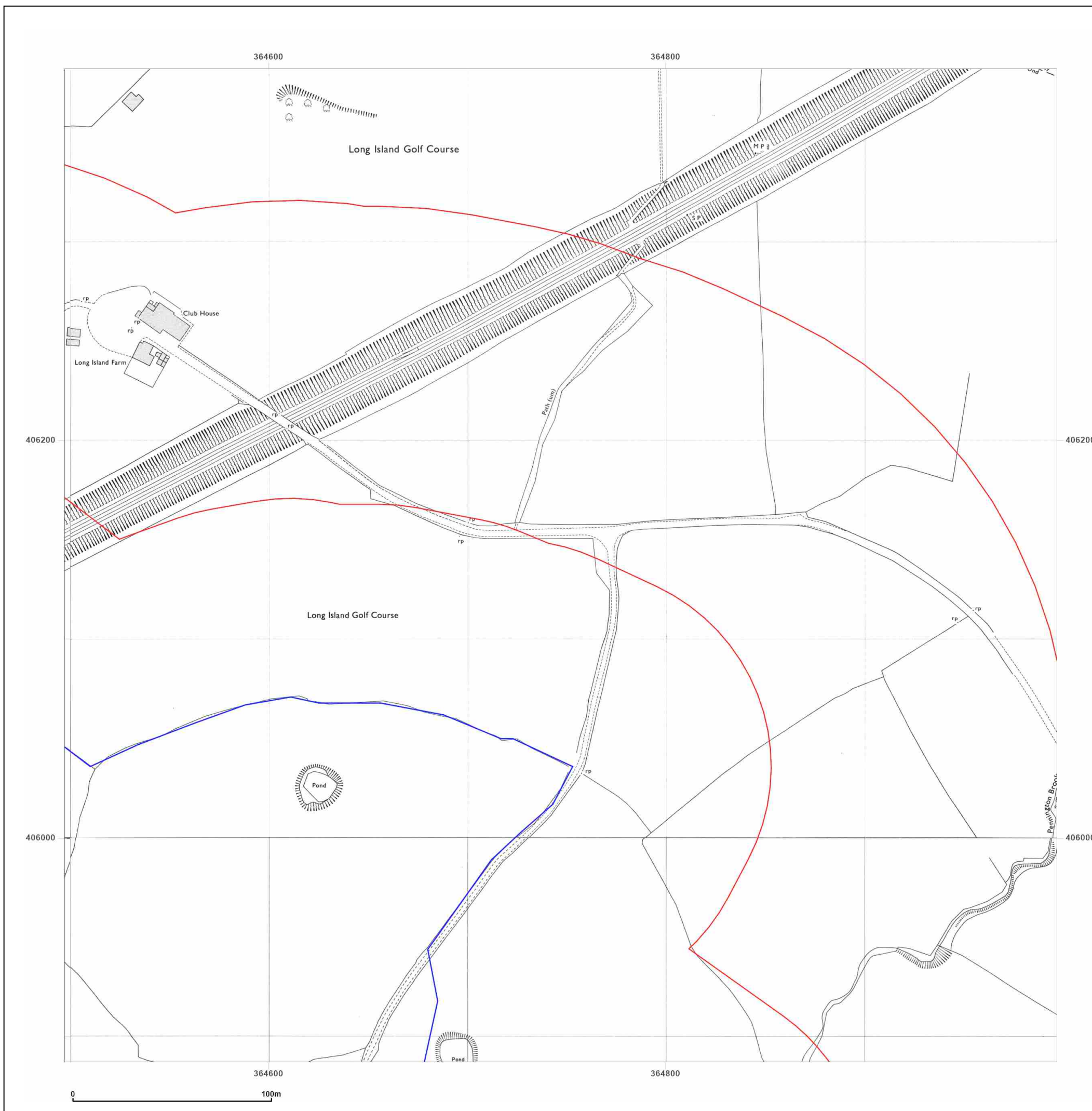


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_1250_2_2
Grid Ref: 364747, 406137

Map Name: National Grid

Map date: 1992

Scale: 1:1,250

Printed at: 1:2,000

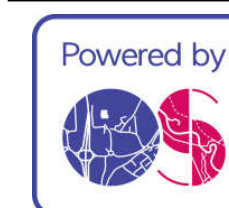


Surveyed 1992
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1992
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1992
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1992
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

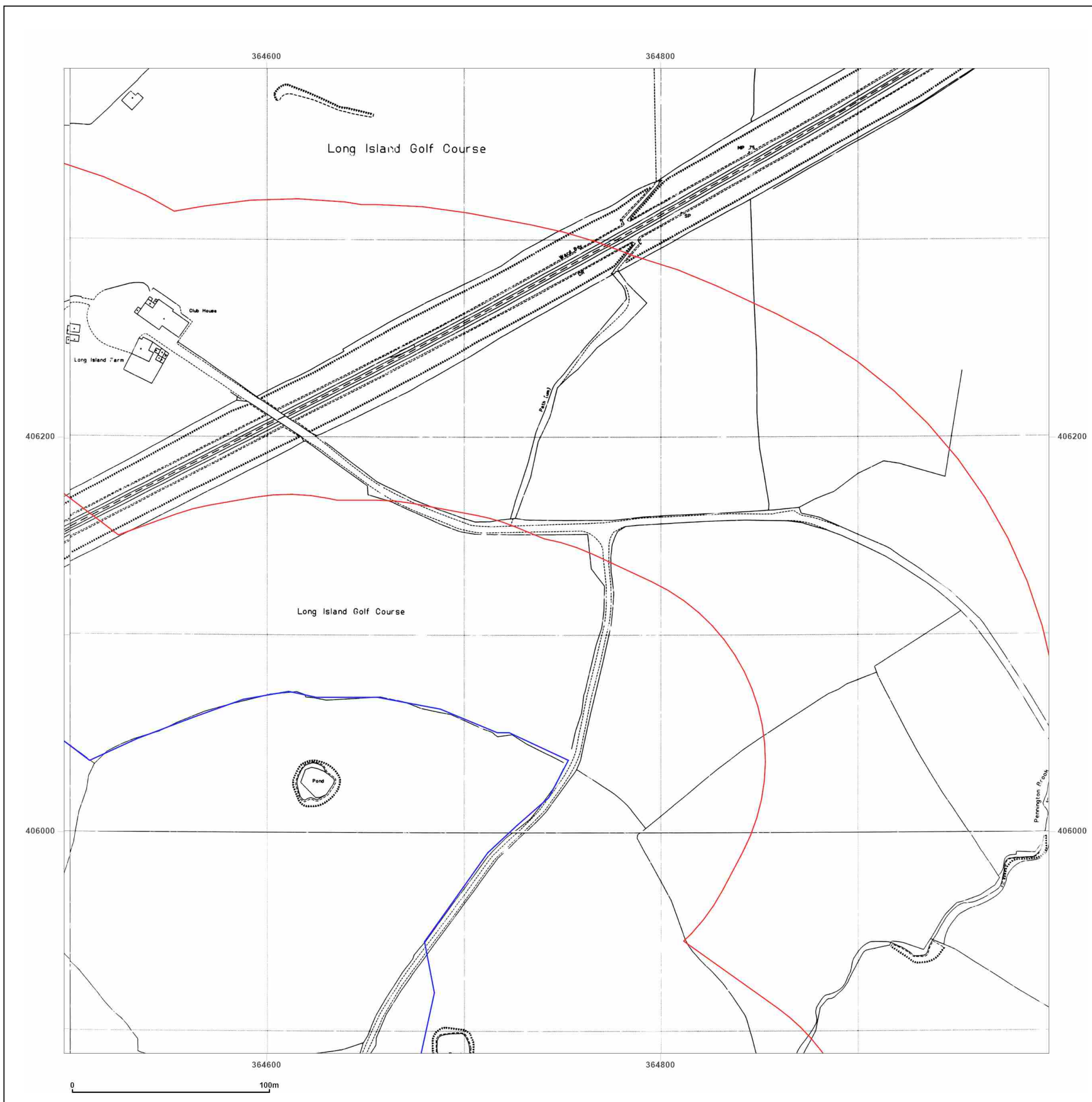


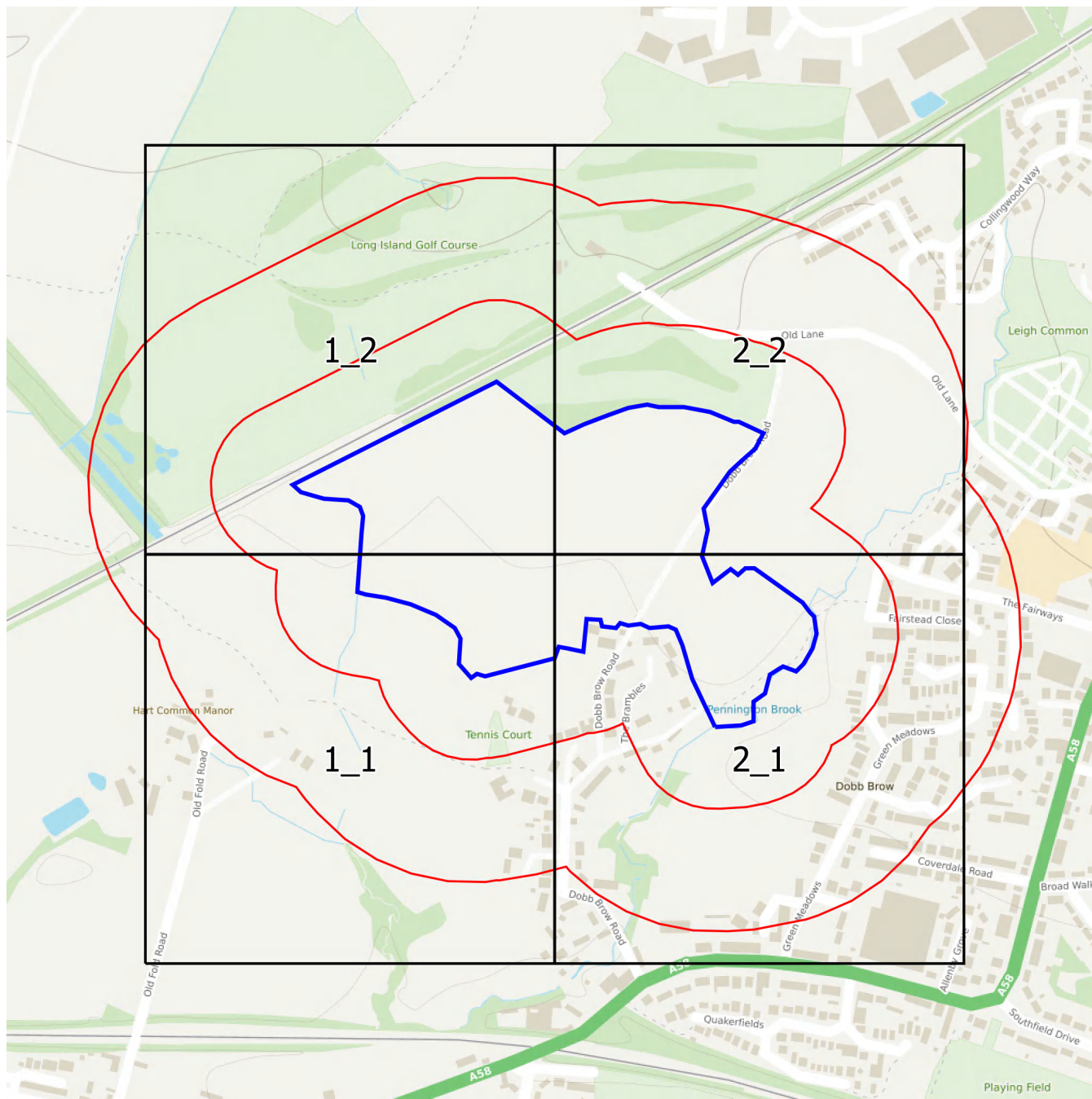
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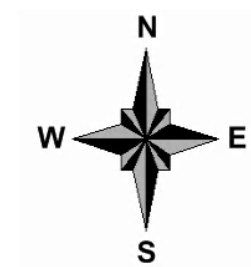
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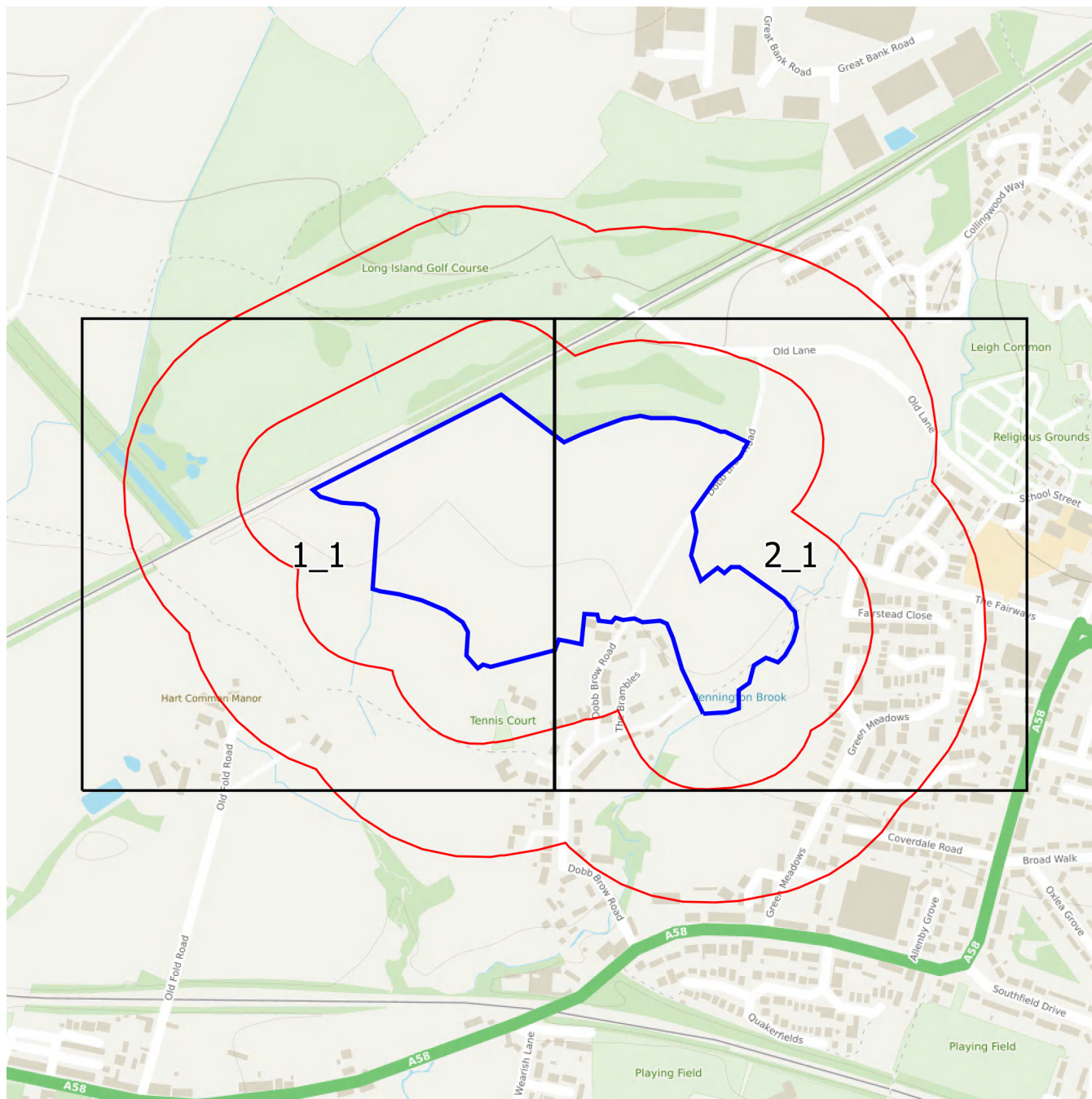




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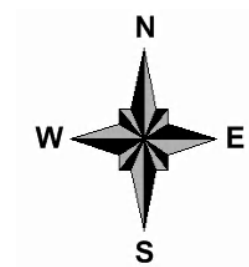
1:1,250 Scale Grid Index





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INSIGHTS

1:2,500 Scale Grid Index



Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_1_1
Grid Ref: 364184, 405887

Map Name: County Series

Map date: 1893

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1893
Revised 1893
Edition N/A
Copyright N/A
Levelled N/A

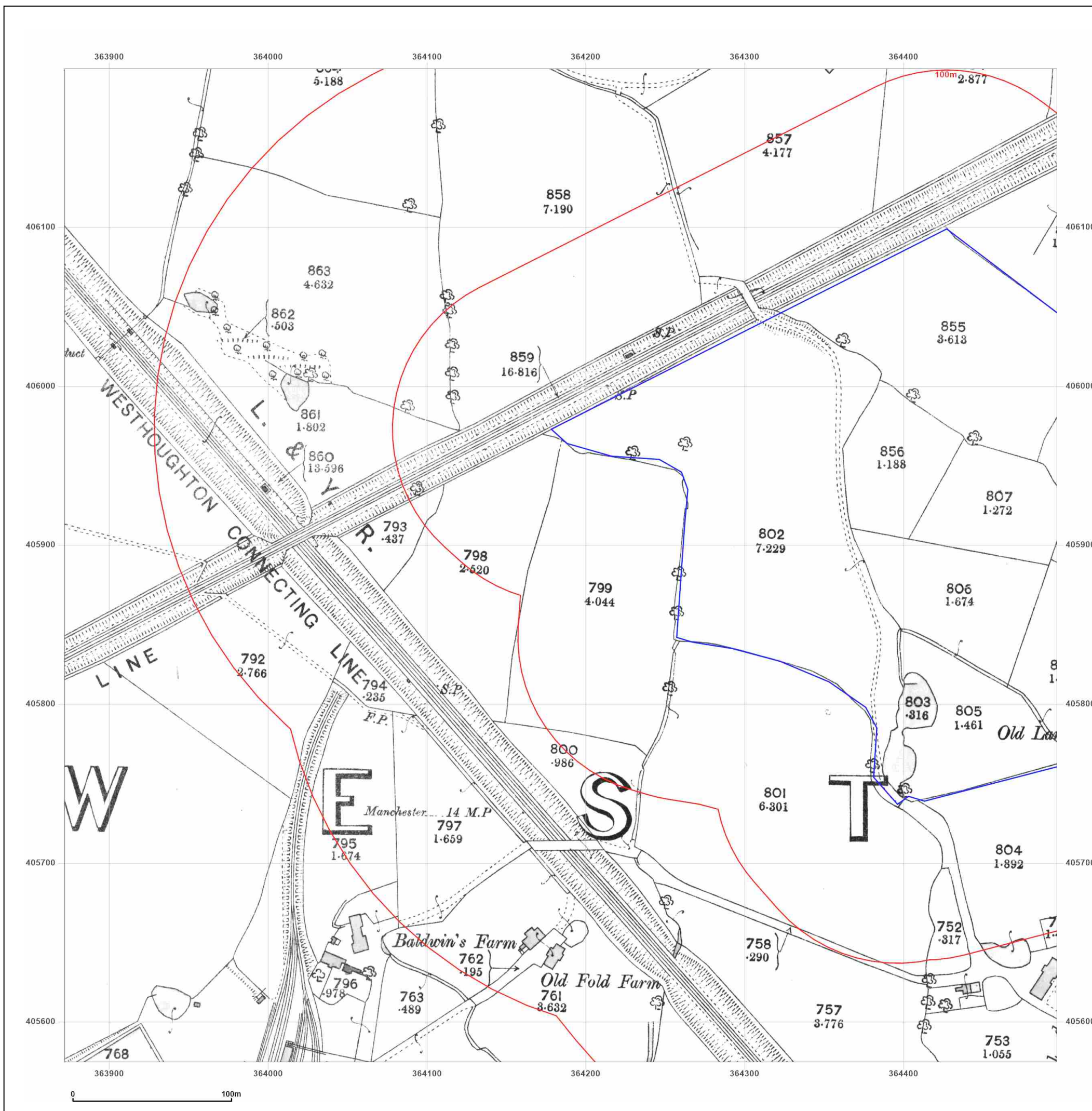


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Production date: 27 January 2021

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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_1_1
Grid Ref: 364184, 405887

Map Name: County Series

Map date: 1908

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1908
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A

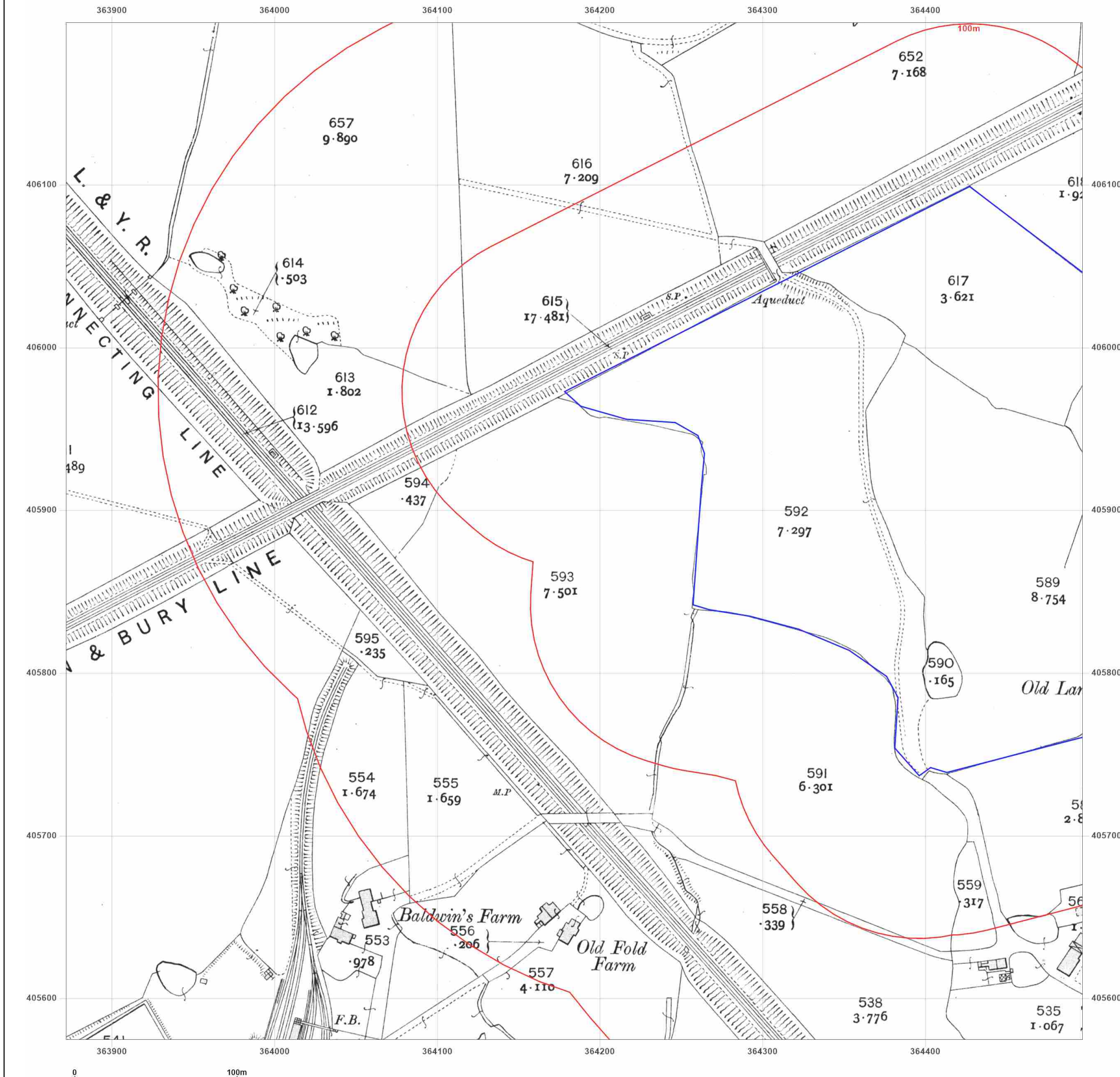


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_1_1
Grid Ref: 364184, 405887

Map Name: County Series

Map date: 1929

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1929
Revised 1929
Edition N/A
Copyright N/A
Levelled N/A

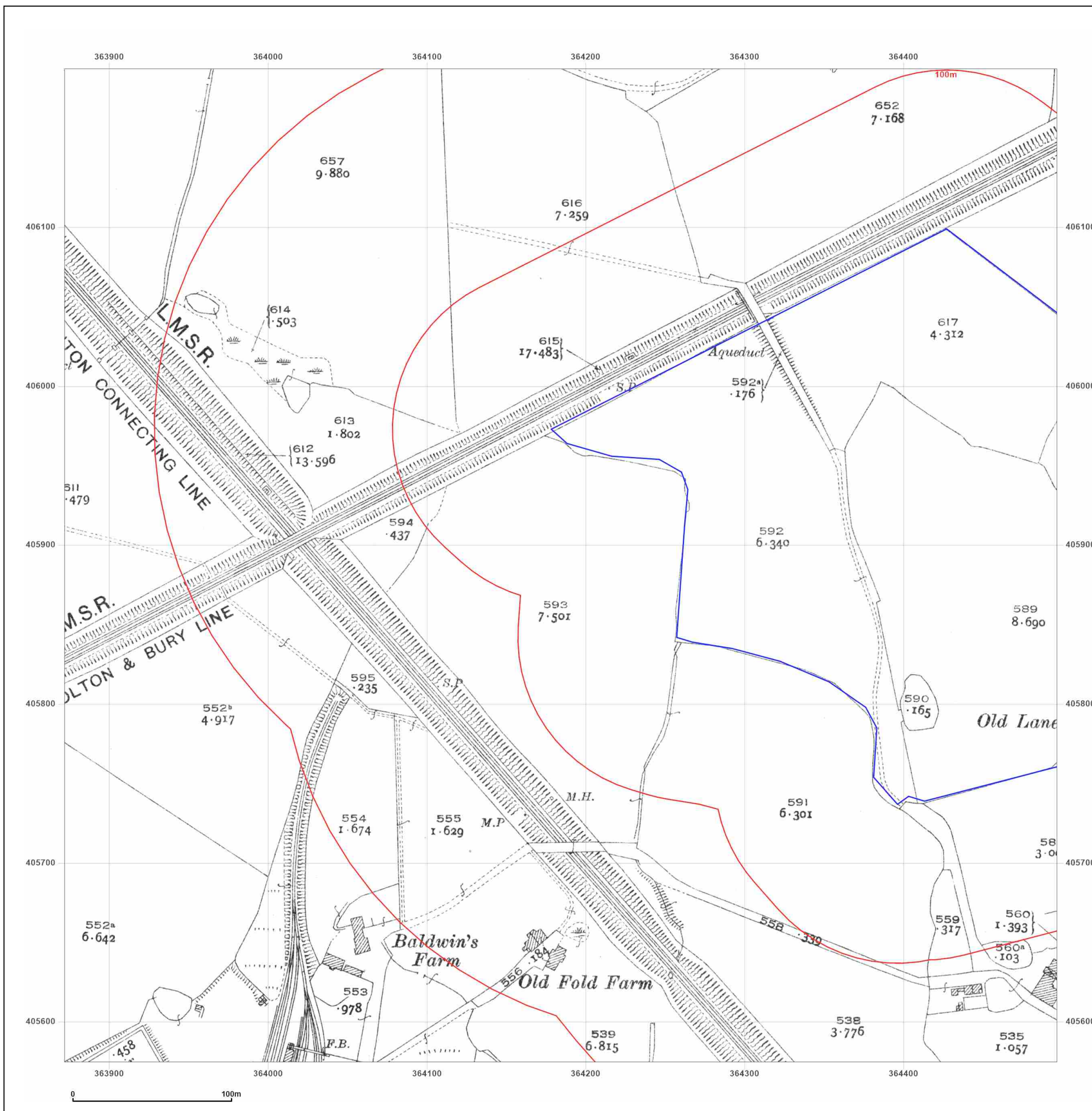


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Site Details:

Land off The Fairways,
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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_1_1
Grid Ref: 364184, 405887

Map Name: National Grid

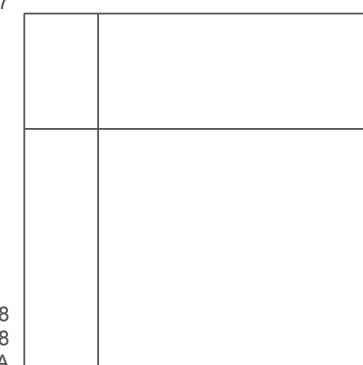
Map date: 1958-1959

Scale: 1:2,500

Printed at: 1:2,500

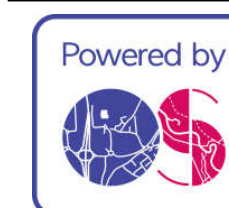


Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1957



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1949

Surveyed 1959
Revised 1959
Edition 1961
Copyright 1961
Levelled 1958

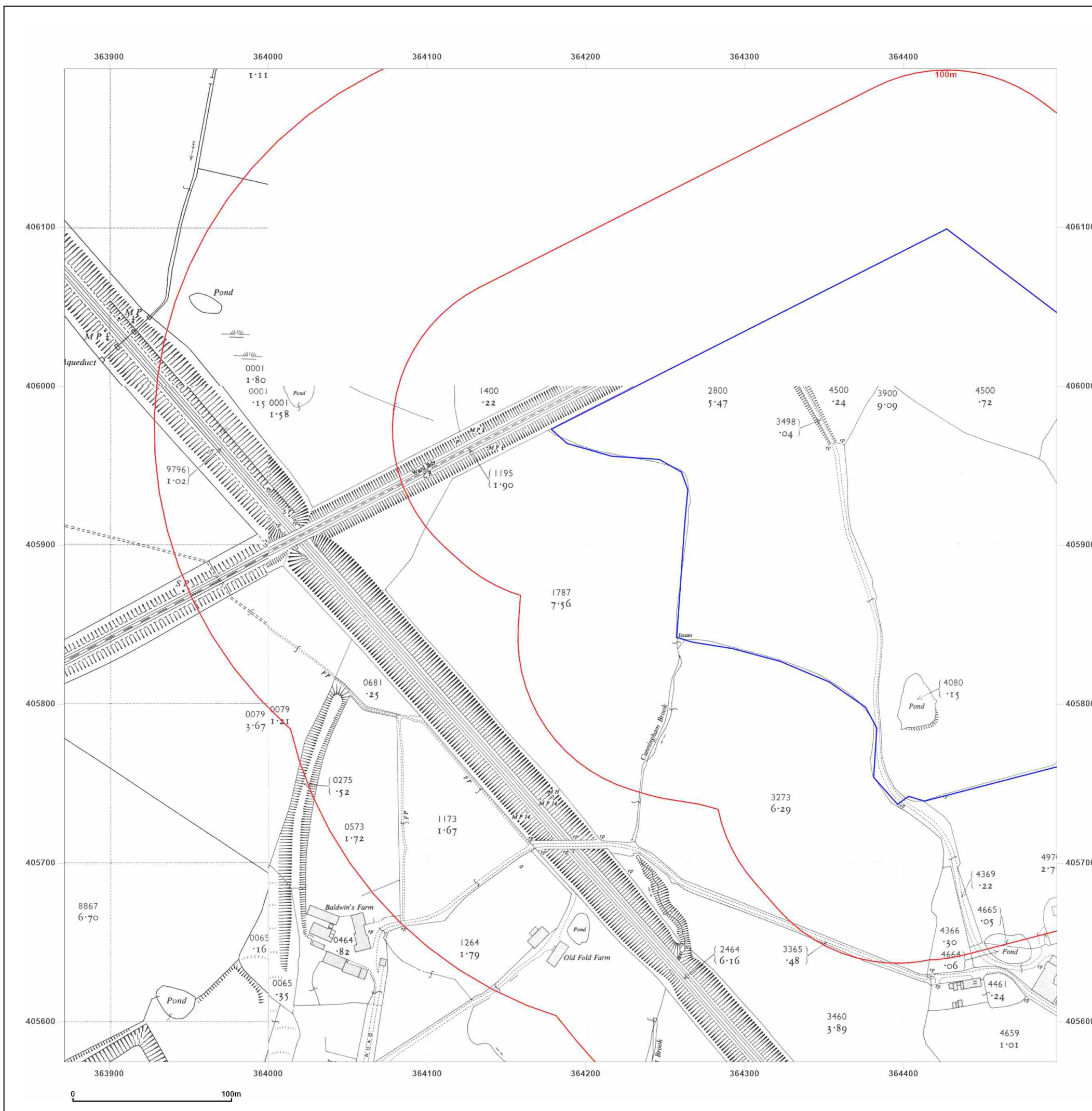


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Site Details:

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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_1_1
Grid Ref: 364184, 405887

Map Name: National Grid

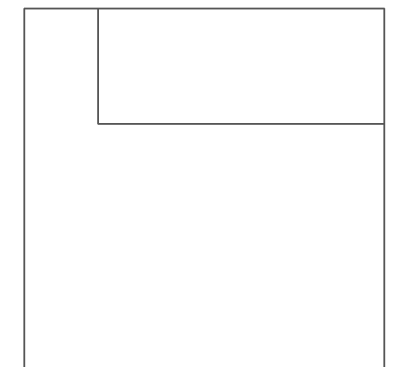
Map date: 1968

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1968
Revised 1968
Edition N/A
Copyright 1970
Levelled 1964

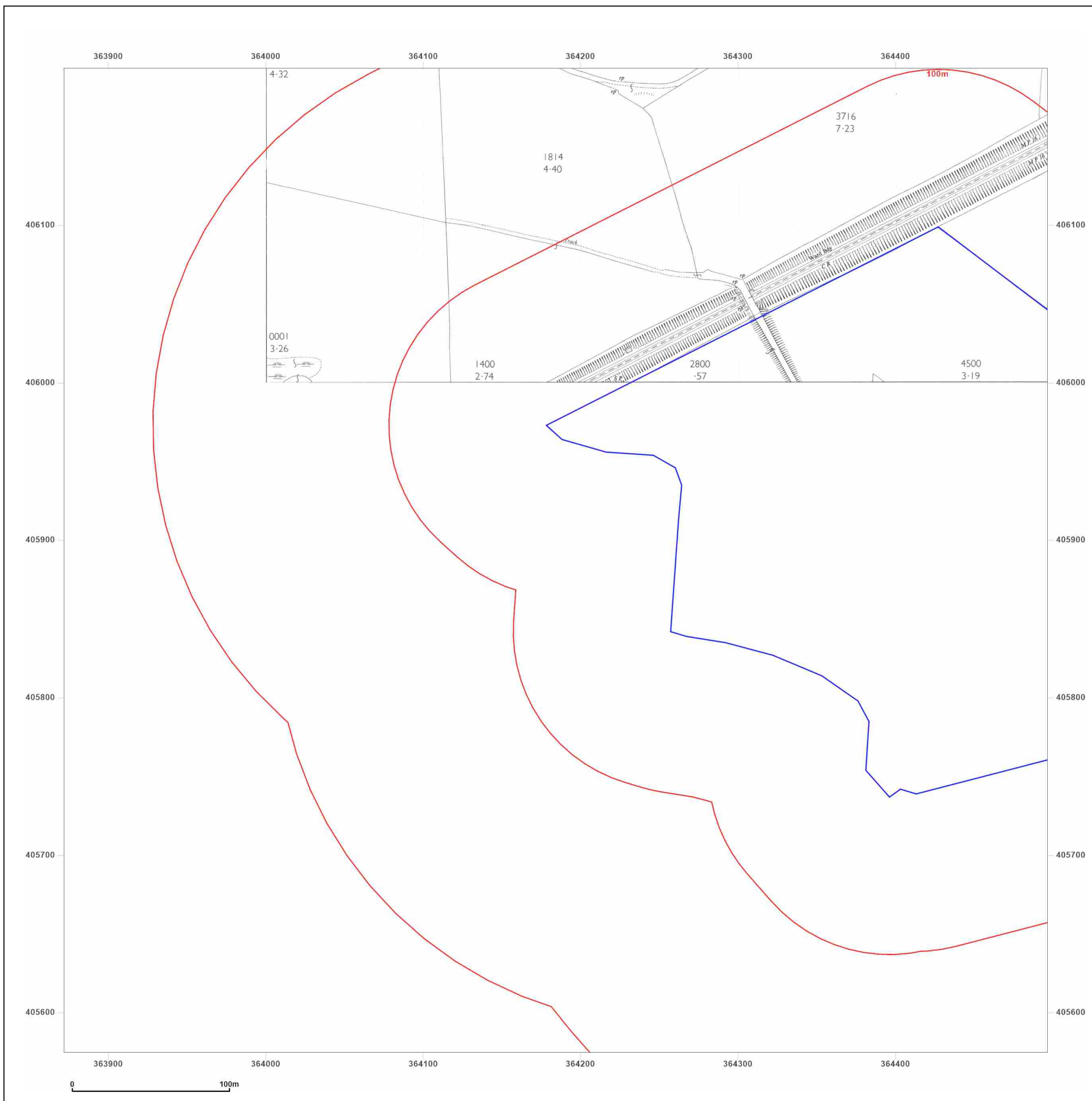


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_2_1
Grid Ref: 364809, 405887

Map Name: County Series

Map date: 1893

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1893
Revised 1893
Edition N/A
Copyright N/A
Levelled N/A

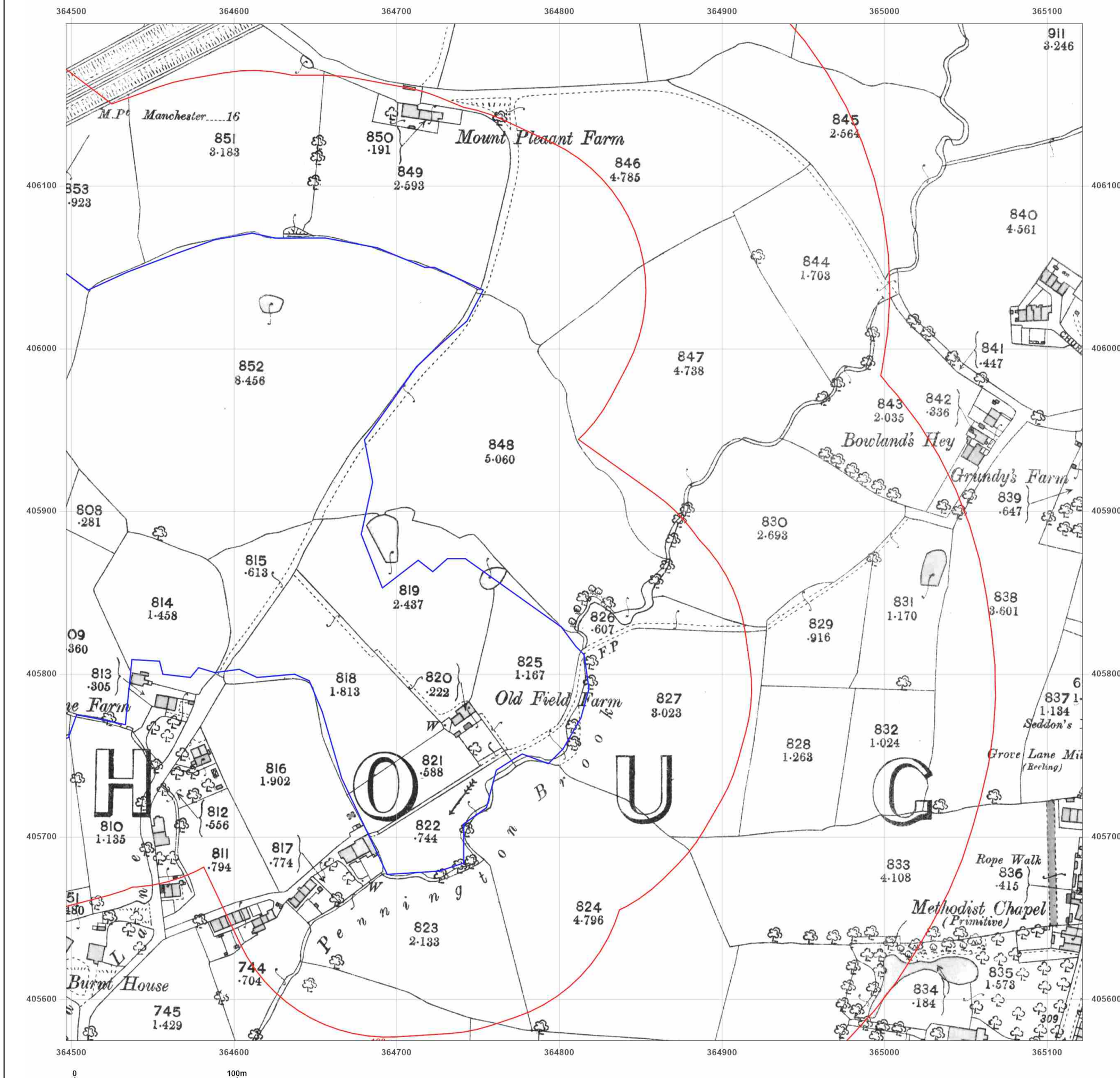


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_2_1
Grid Ref: 364809, 405887

Map Name: County Series

Map date: 1908

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1908
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A

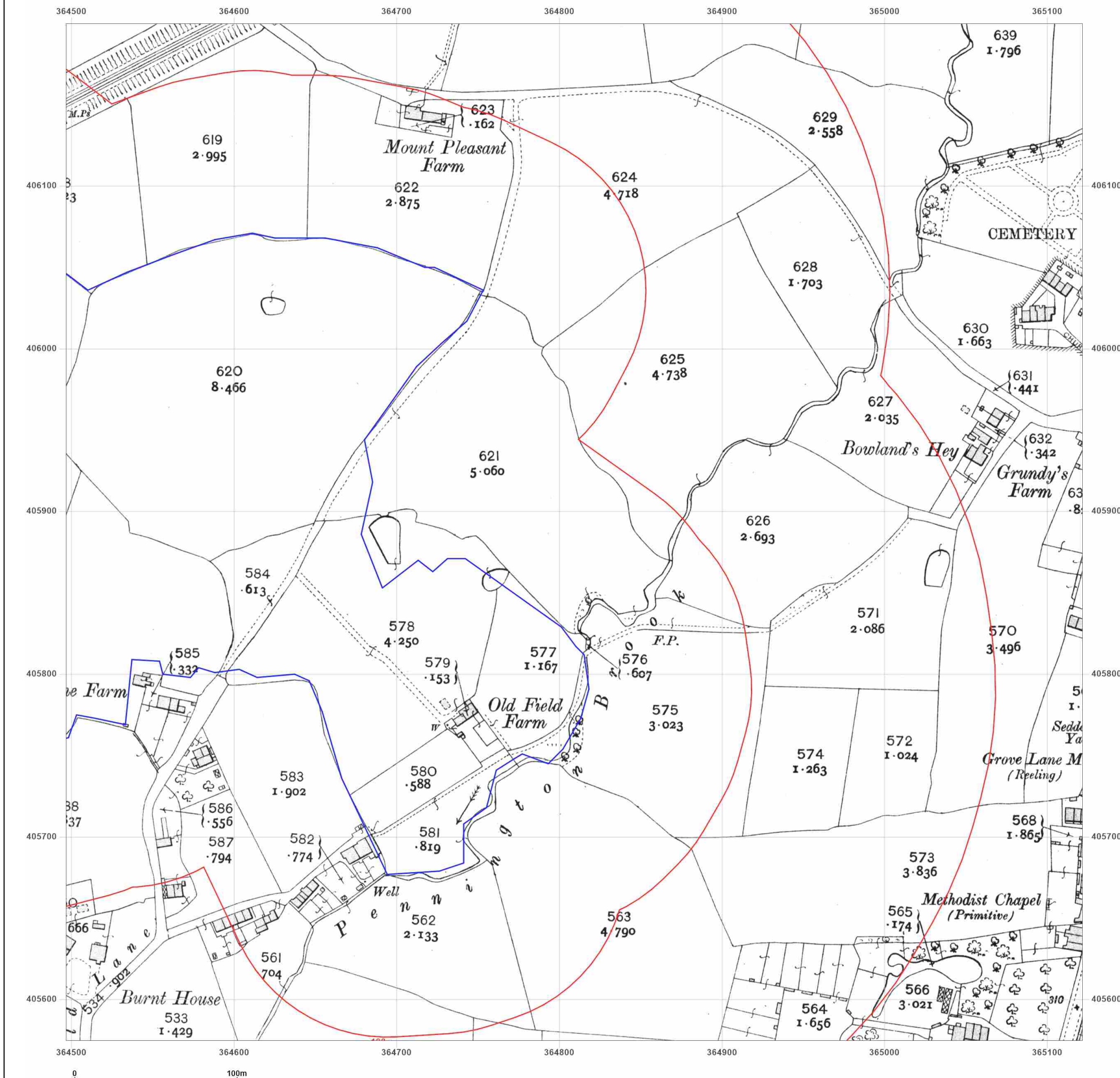


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_2_1
Grid Ref: 364809, 405887

Map Name: County Series

Map date: 1929

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1929
Revised 1929
Edition N/A
Copyright N/A
Levelled N/A

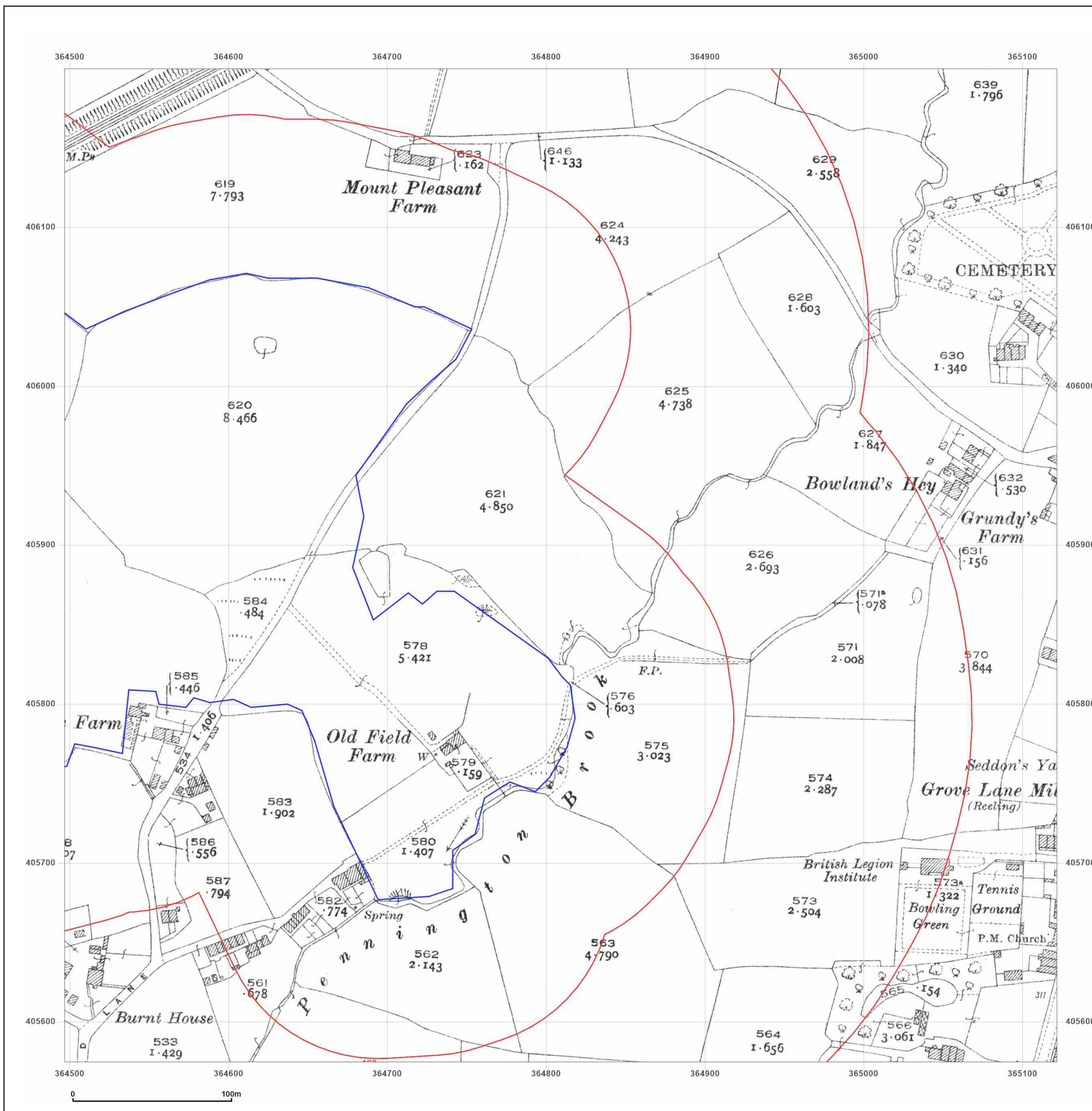


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_2_1
Grid Ref: 364809, 405887

Map Name: National Grid

Map date: 1952-1953

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1926

Surveyed 1953
Revised 1953
Edition 1954
Copyright N/A
Levelled 1926

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1950

Surveyed 1953
Revised 1953
Edition 1955
Copyright N/A
Levelled 1926

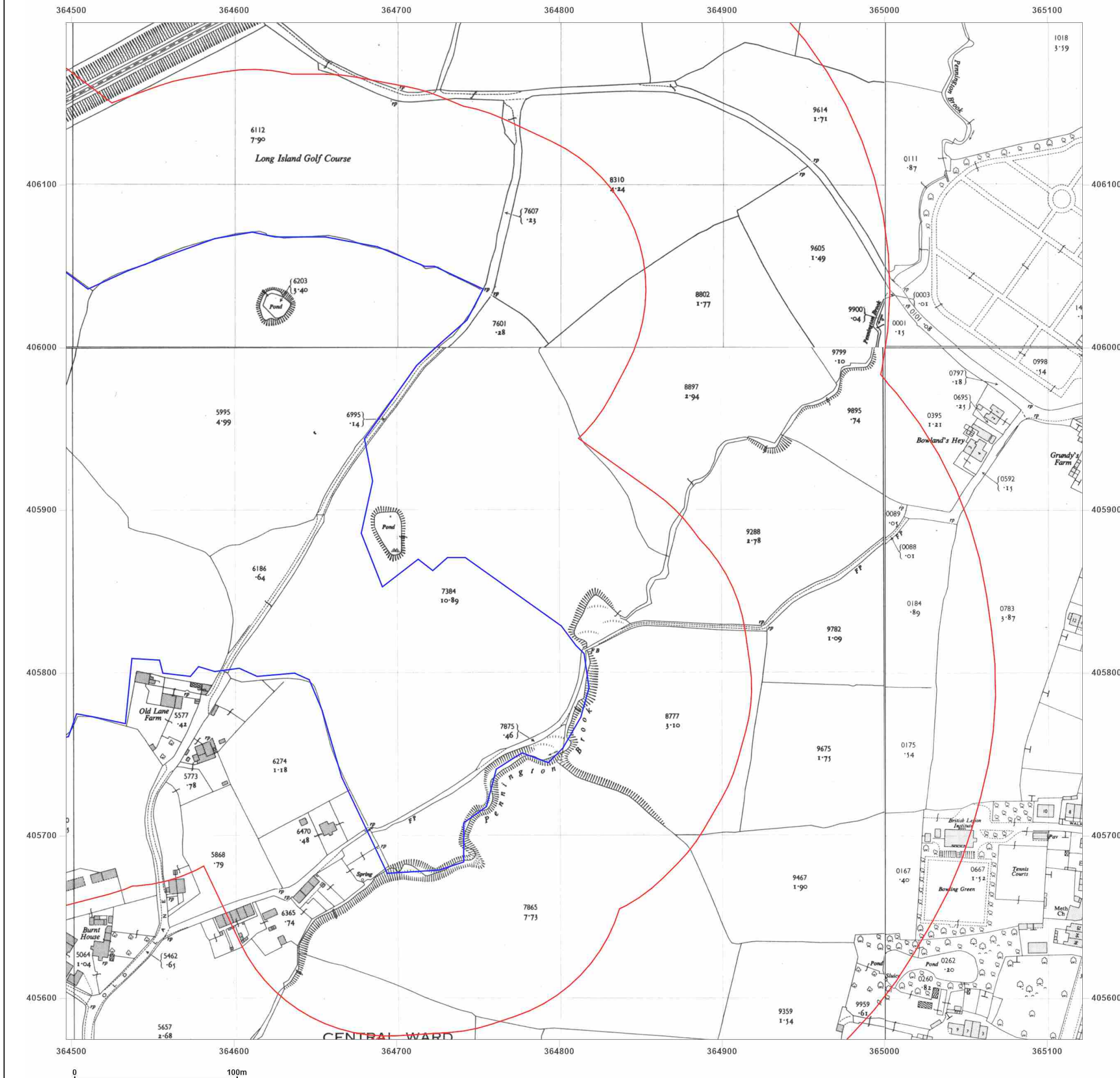


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Site Details:

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BL5 2BA

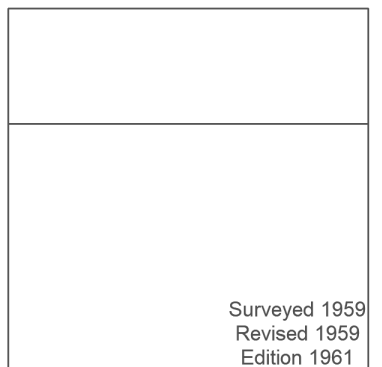
Client Ref: 3430
Report Ref: GS-7520736_LS_2_1
Grid Ref: 364809, 405887

Map Name: National Grid

Map date: 1959

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1959
Revised 1959
Edition 1961
Copyright 1961
Levelled 1958

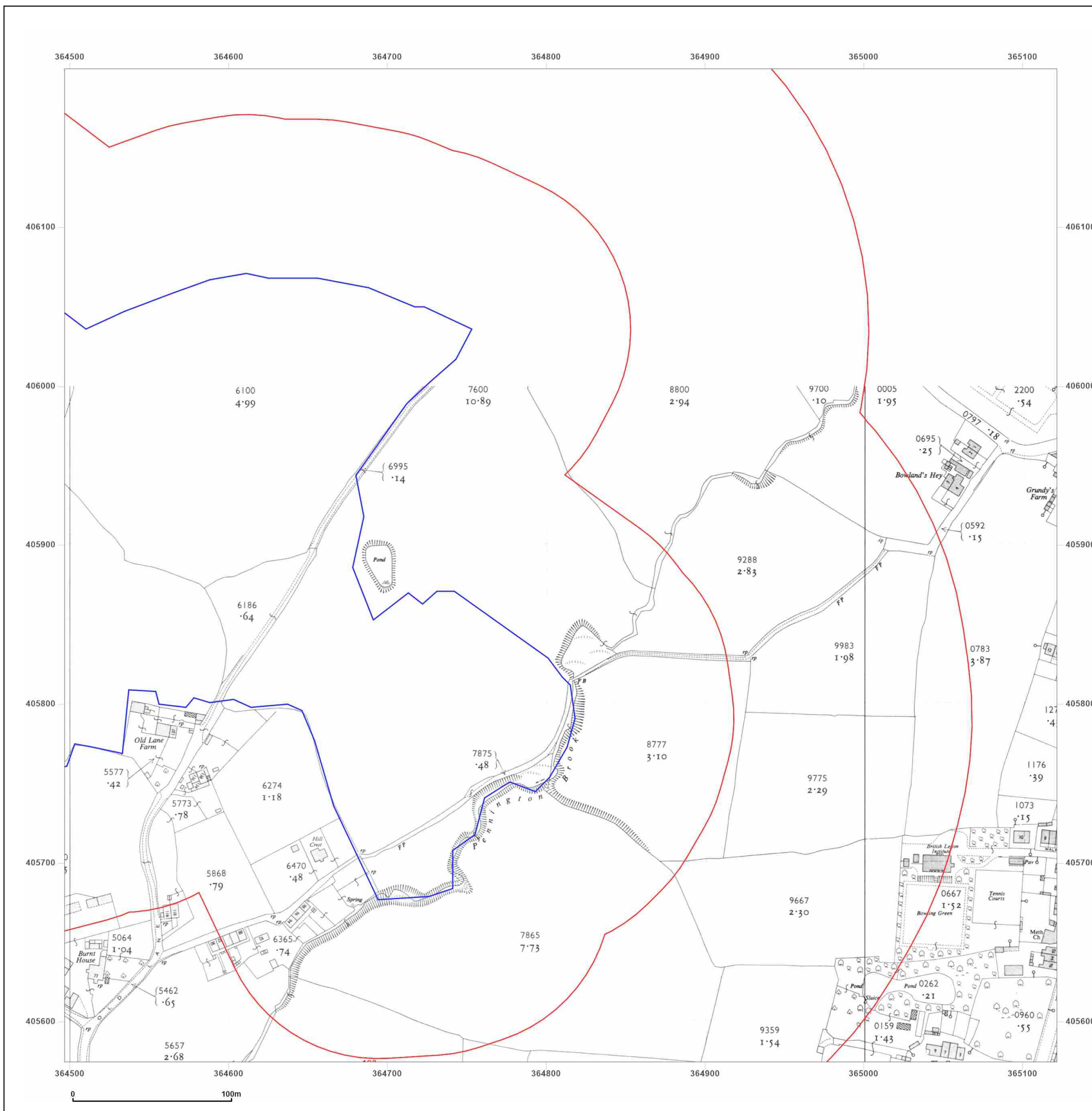


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736_LS_2_1
Grid Ref: 364809, 405887

Map Name: National Grid

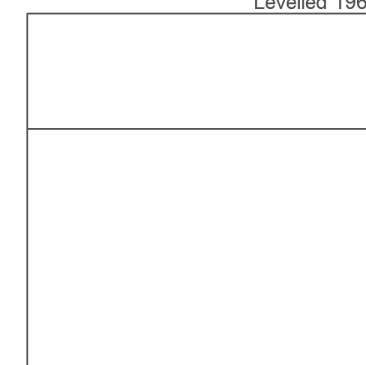
Map date: 1968

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1968
Revised 1968
Edition N/A
Copyright 1970
Levelled 1964

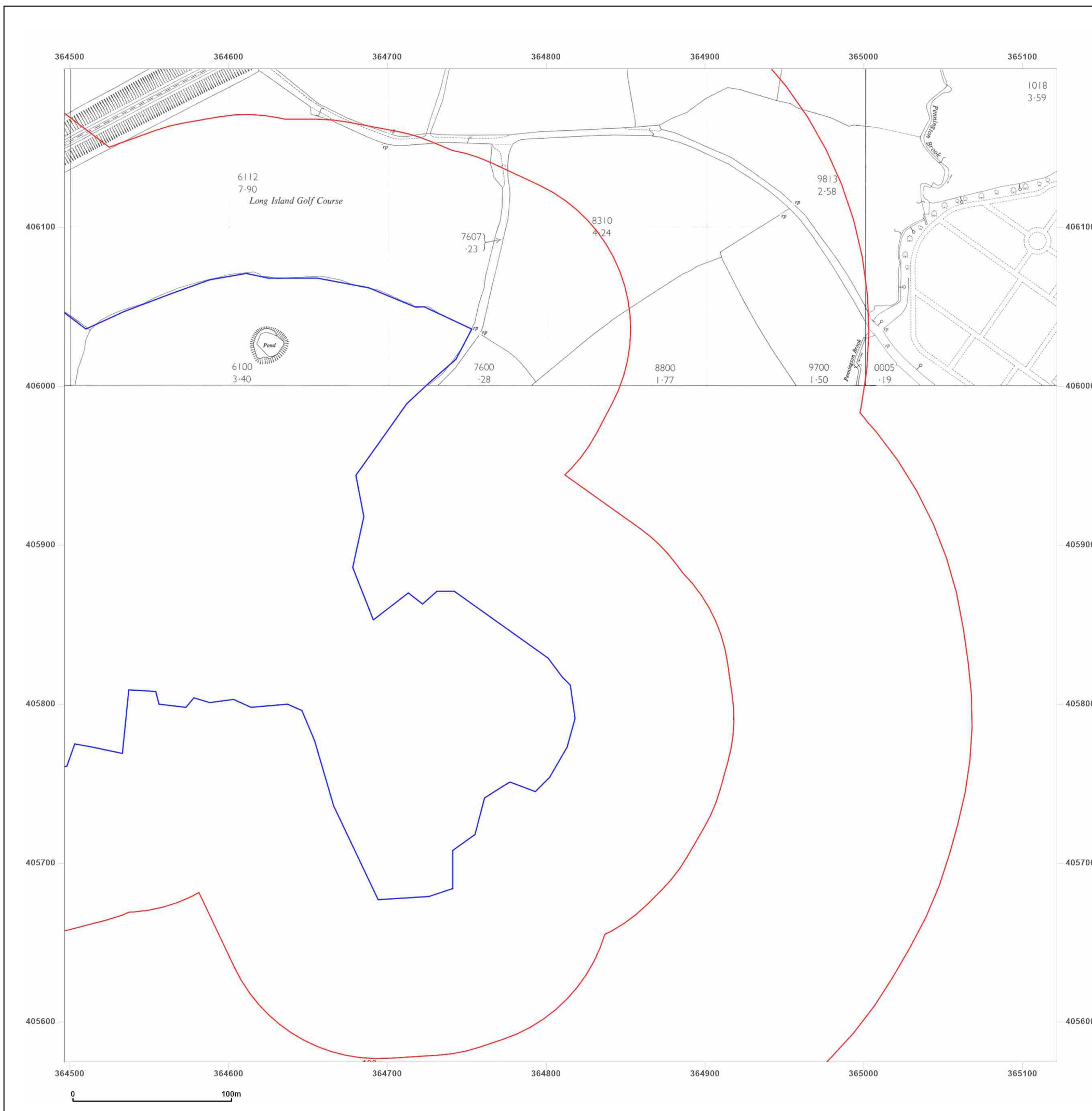


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Production date: 27 January 2021

Map legend available at:
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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: County Series

Map date: 1849

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1846
Revised N/A
Edition 1849
Copyright N/A
Levelled N/A

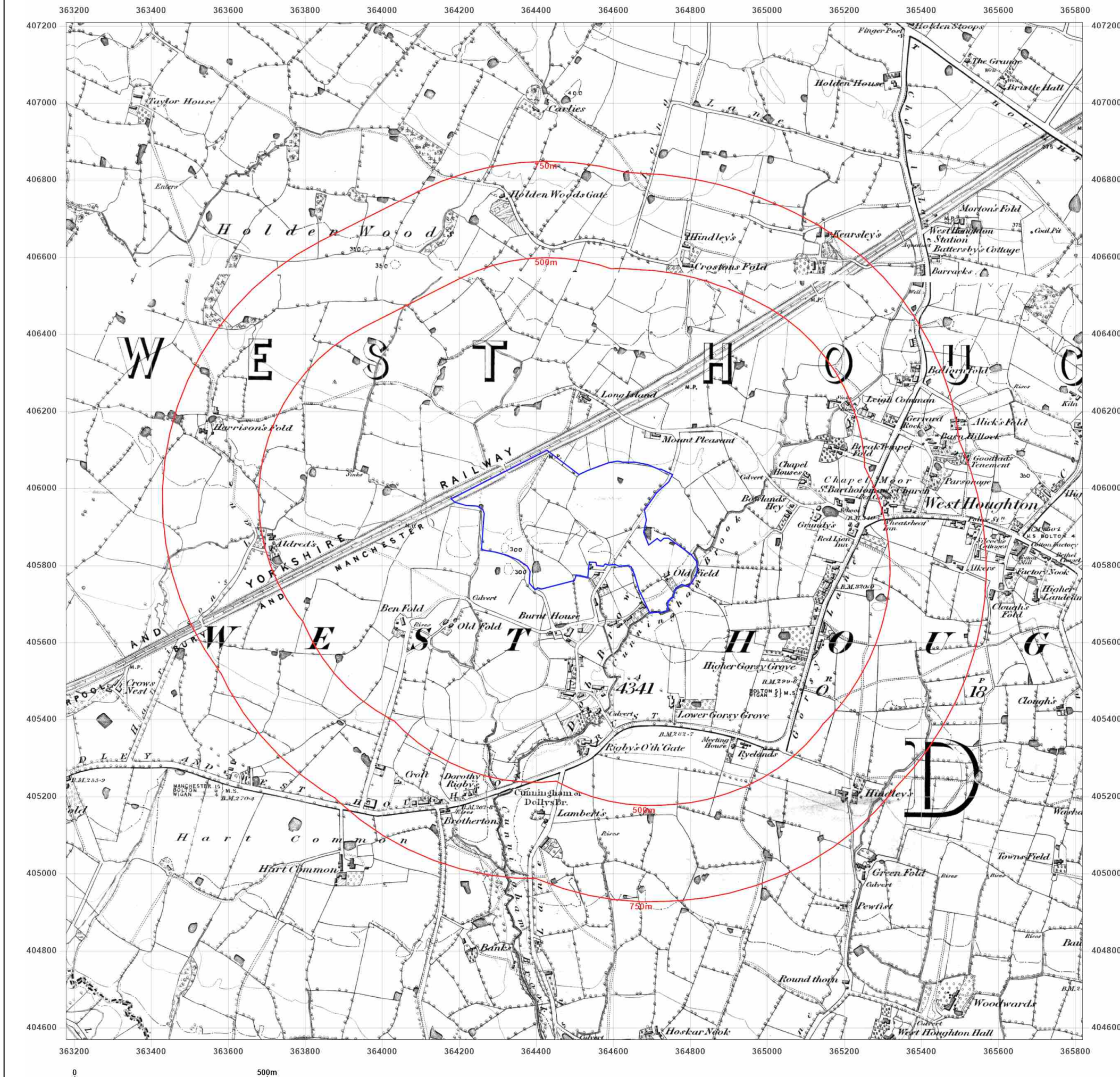


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Production date: 27 January 2021

Map legend available at:
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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: County Series

Map date: 1892

Scale: 1:10,560

Printed at: 1:10,560



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

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

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

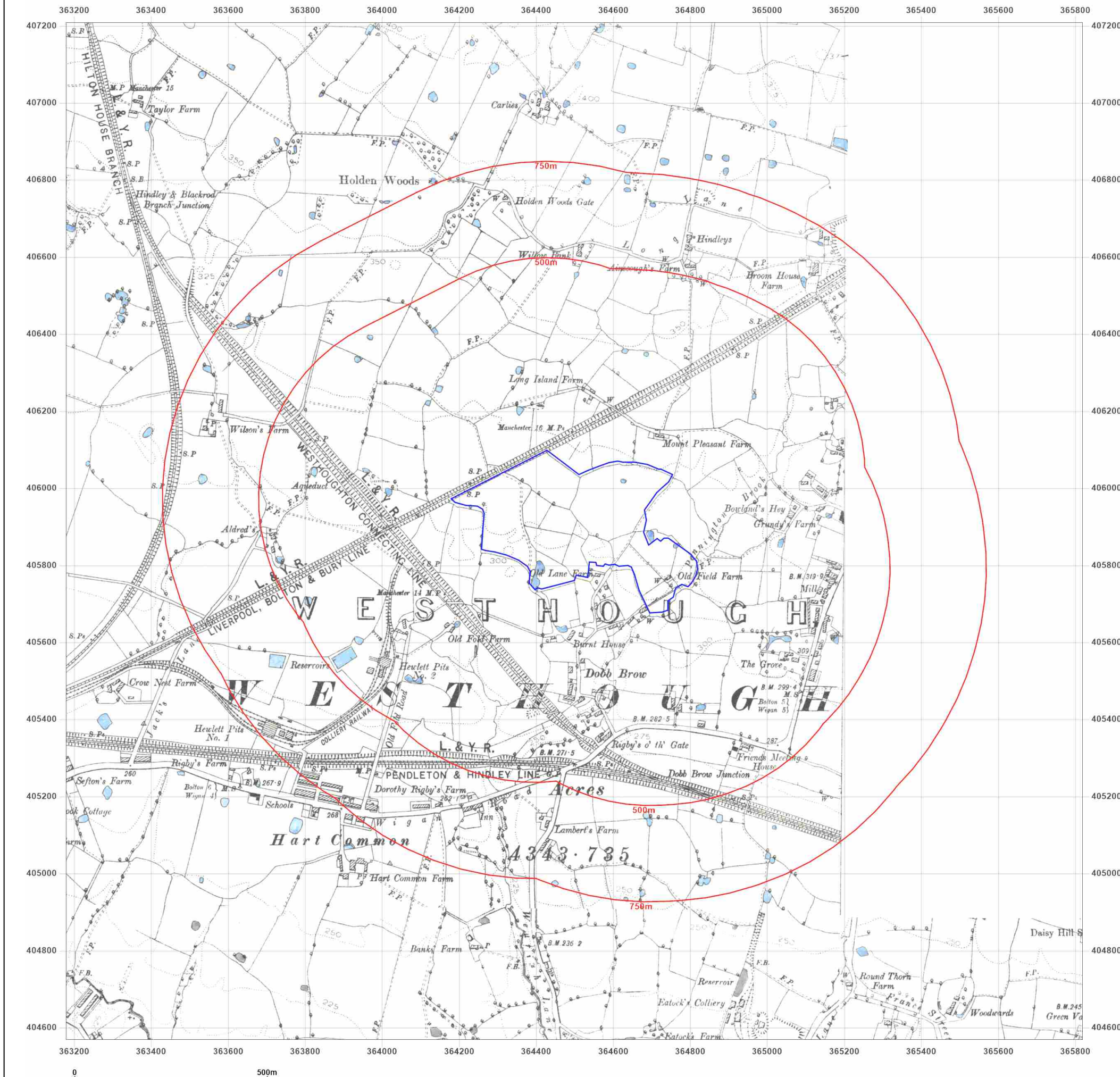


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Production date: 27 January 2021

Map legend available at:
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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: County Series

Map date: 1907

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1845
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1844
Revised 1907
Edition 1907
Copyright N/A
Levelled N/A

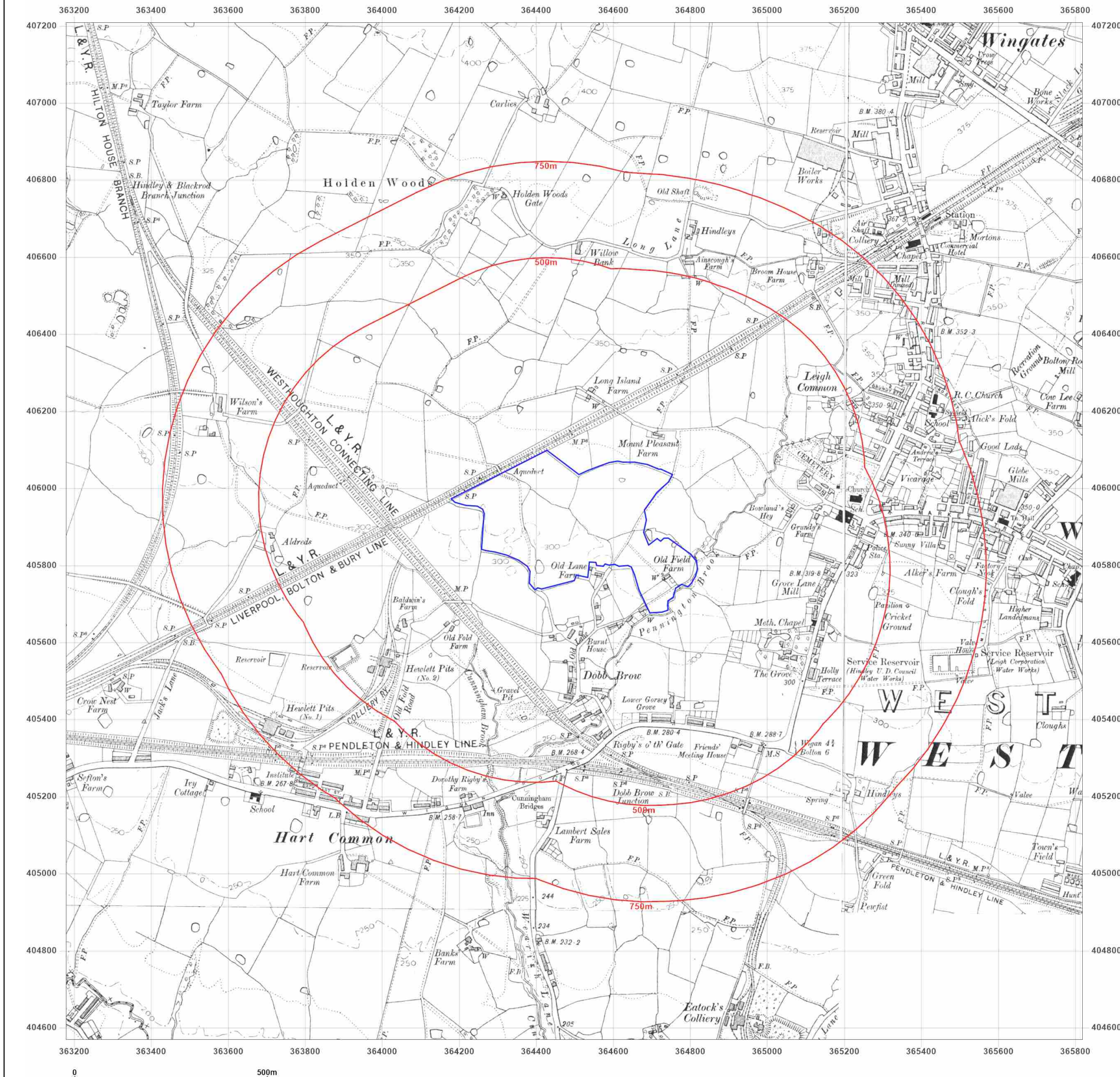


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Site Details:

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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: County Series

Map date: 1927-1929

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1927
Edition 1929
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Levelled 1927

Surveyed 1844
Revised 1927
Edition N/A
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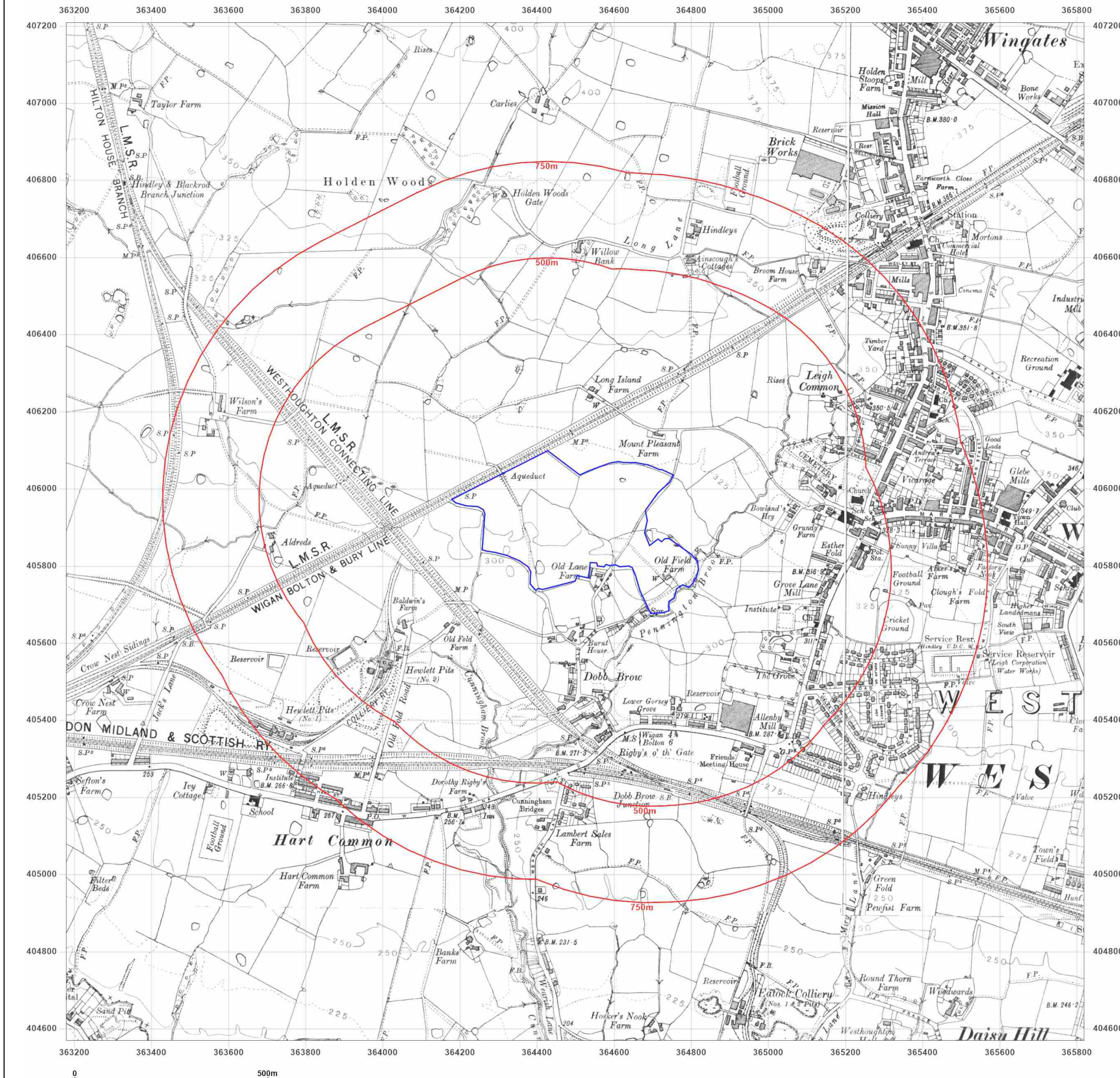


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Site Details:

Land off The Fairways,
WESTHOUGHTON, BOLTON,
BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: County Series

Map date: 1927-1929

Scale: 1:10,560

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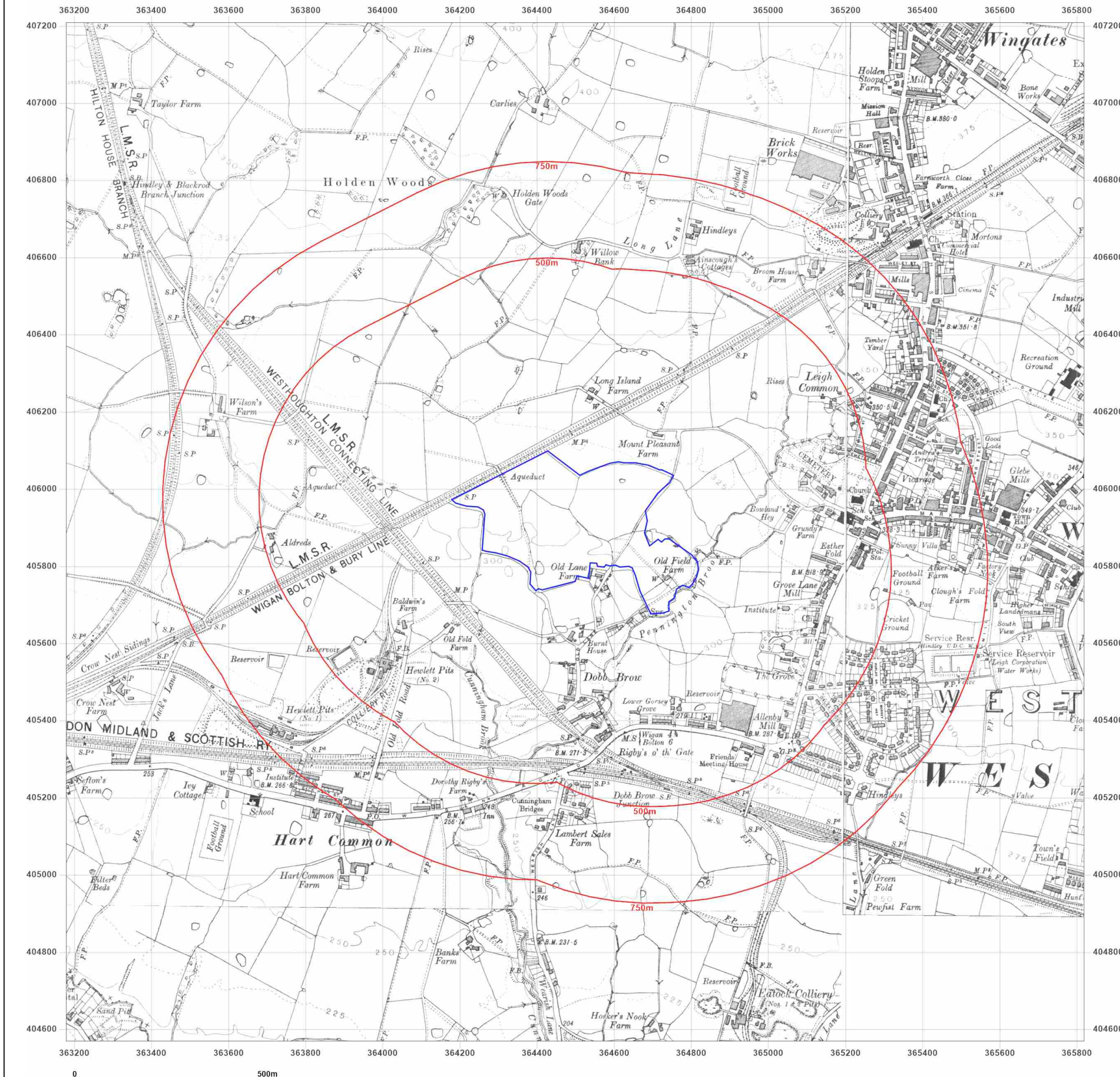


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Site Details:

Land off The Fairways,
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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: County Series

Map date: 1938

Scale: 1:10,560

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Surveyed 1845
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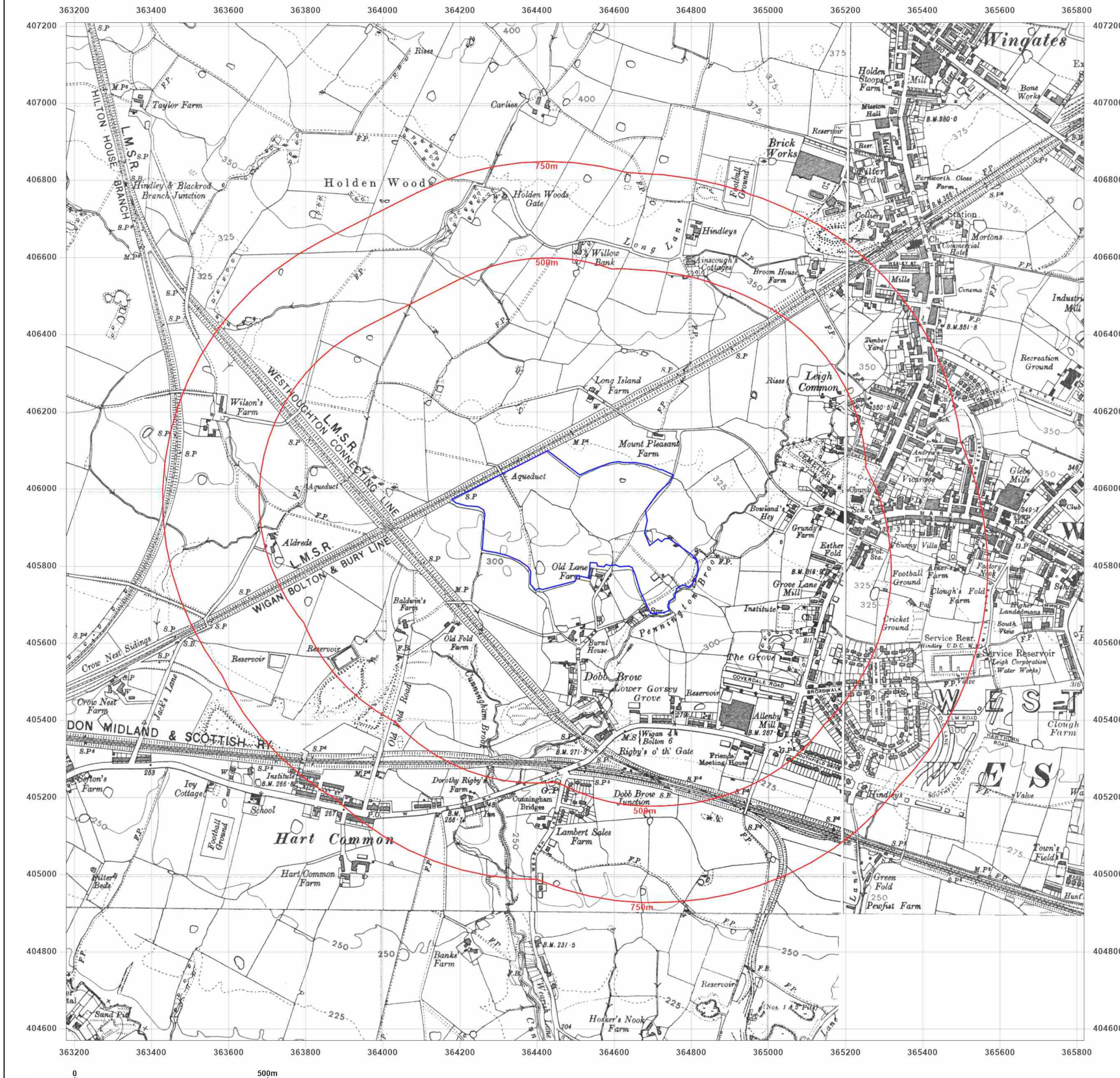


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Site Details:

Land off The Fairways,
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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: County Series

Map date: 1948-1950

Scale: 1:10,560

Printed at: 1:10,560



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Surveyed 1844
Revised 1950
Edition N/A
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Levelled 1949

Surveyed 1892
Revised 1948
Edition N/A
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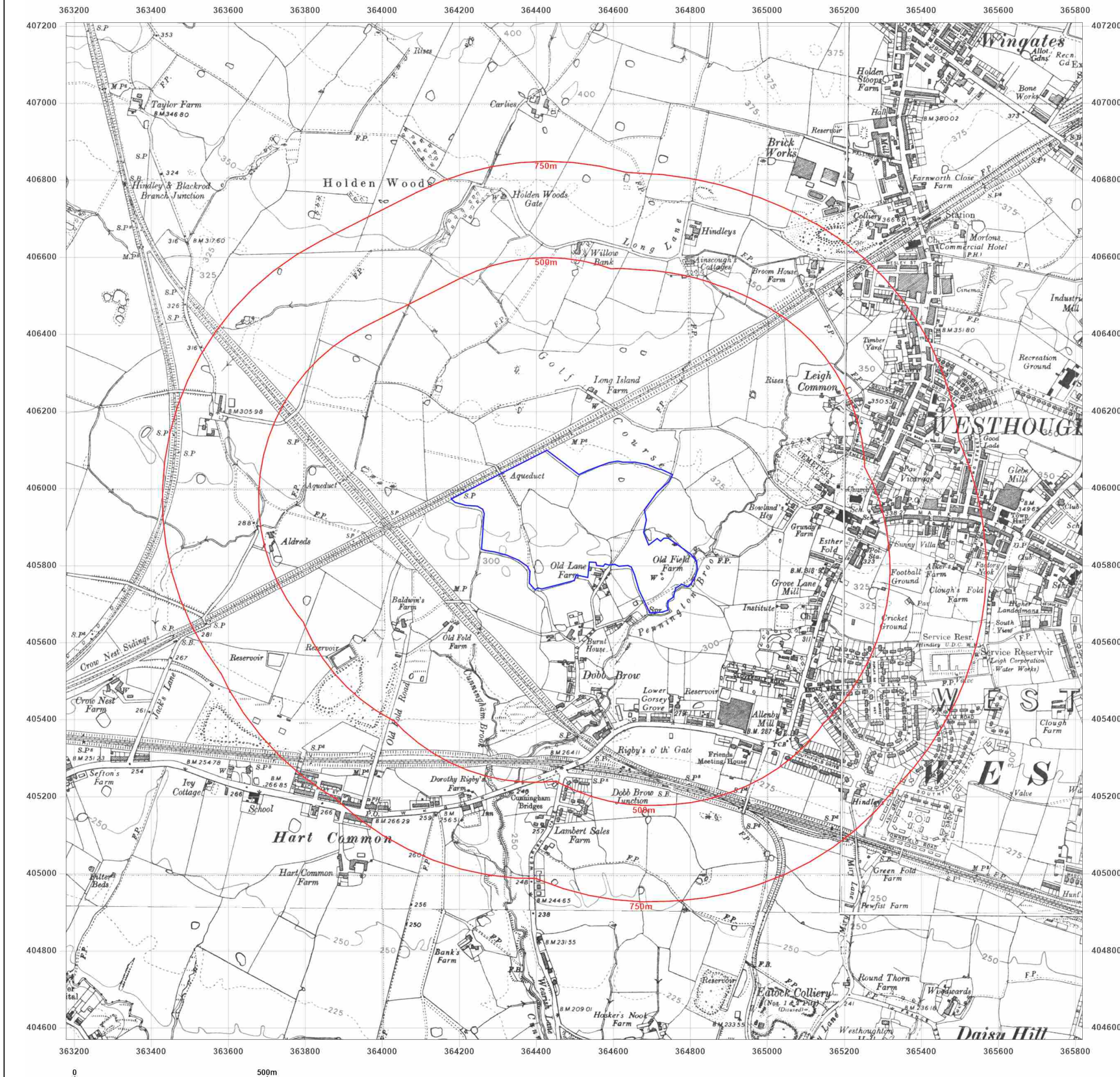


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Site Details:

Land off The Fairways,
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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: Provisional

Map date: 1953-1956

Scale: 1:10,560

Printed at: 1:10,560



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Surveyed 1956
Revised 1956
Edition N/A
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Surveyed 1952
Revised 1955
Edition N/A
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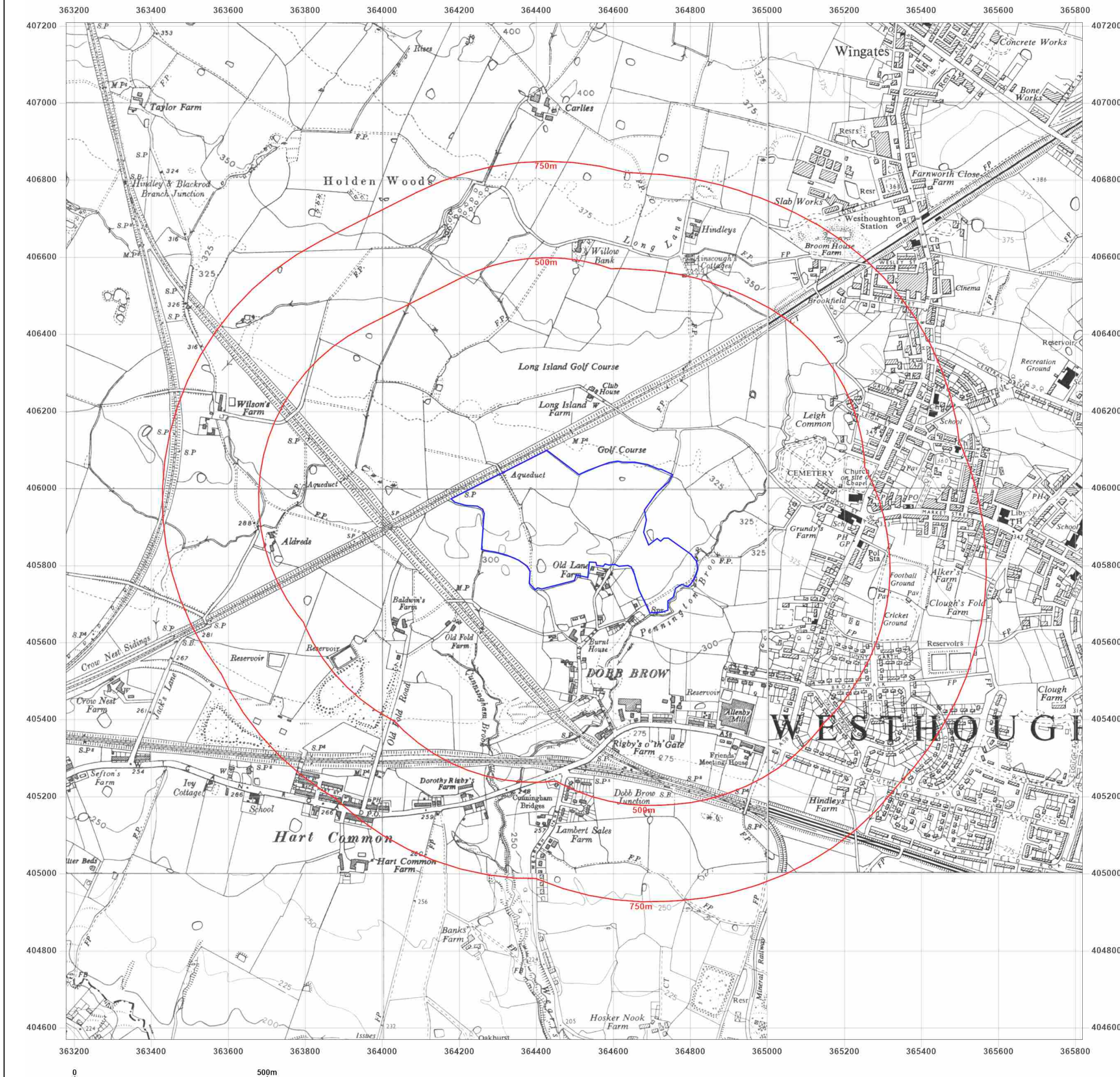


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Site Details:

Land off The Fairways,
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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: Provisional

Map date: 1965-1967

Scale: 1:10,560

Printed at: 1:10,560



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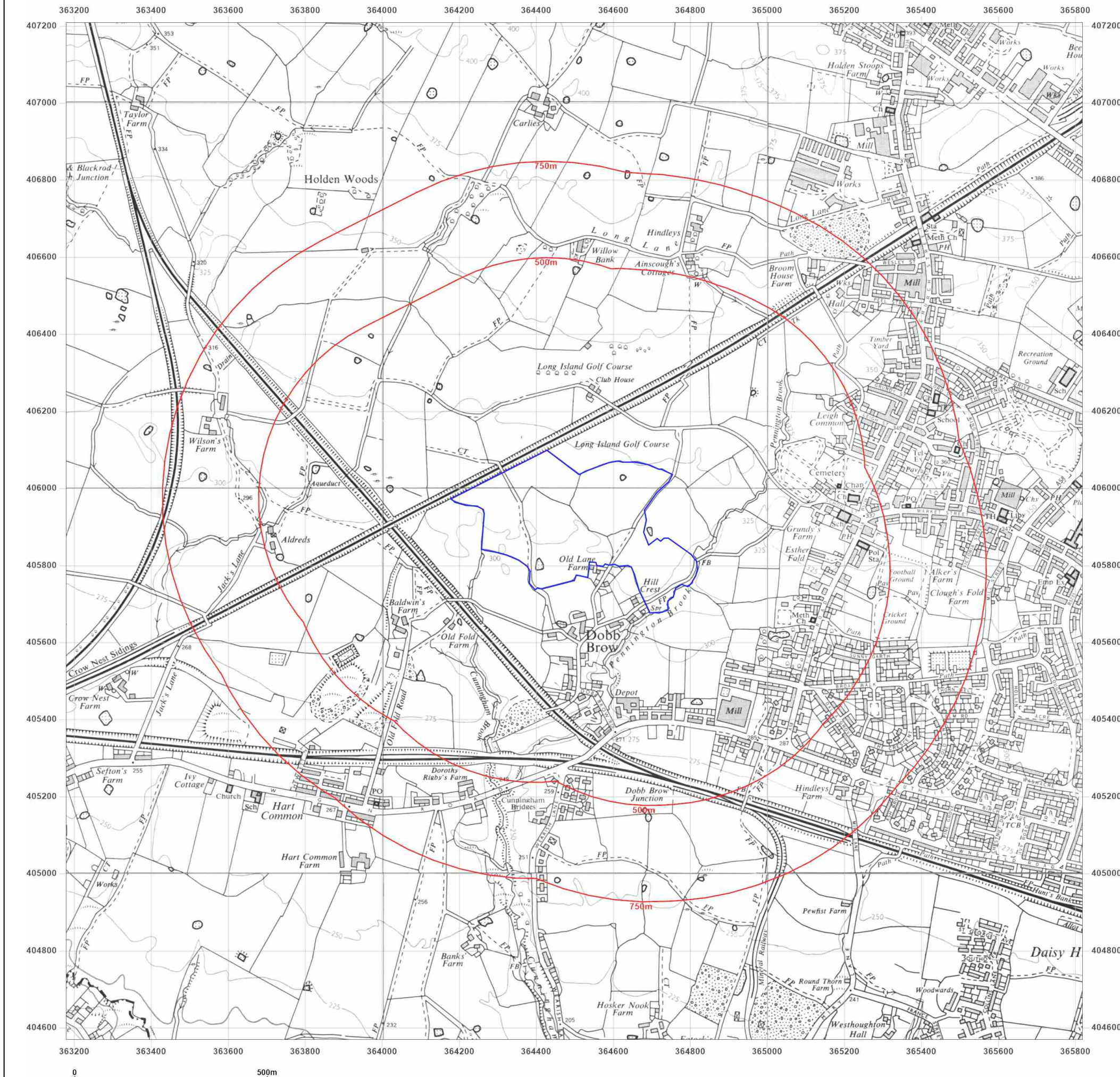


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Site Details:

Land off The Fairways,
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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: National Grid

Map date: 1977-1980

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1977
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Revised 1980
Edition N/A
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Revised 1978
Edition N/A
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Levelled 1977

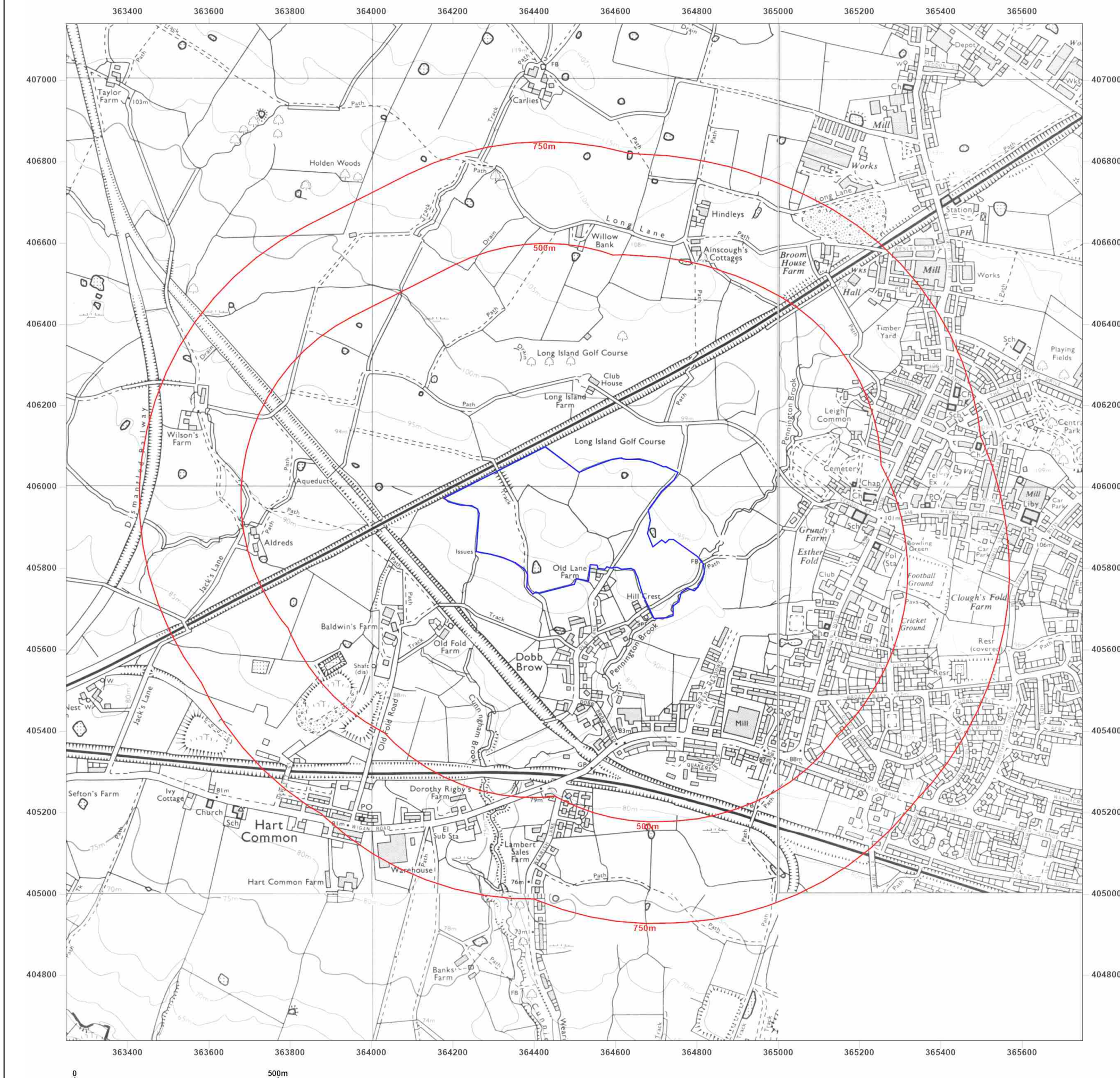


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Site Details:

Land off The Fairways,
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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: National Grid

Map date: 1987-1992

Scale: 1:10,000

Printed at: 1:10,000



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

Surveyed 1991
Revised 1992
Edition N/A
Copyright 1992
Levelled 1981

Surveyed 1985
Revised 1987
Edition N/A
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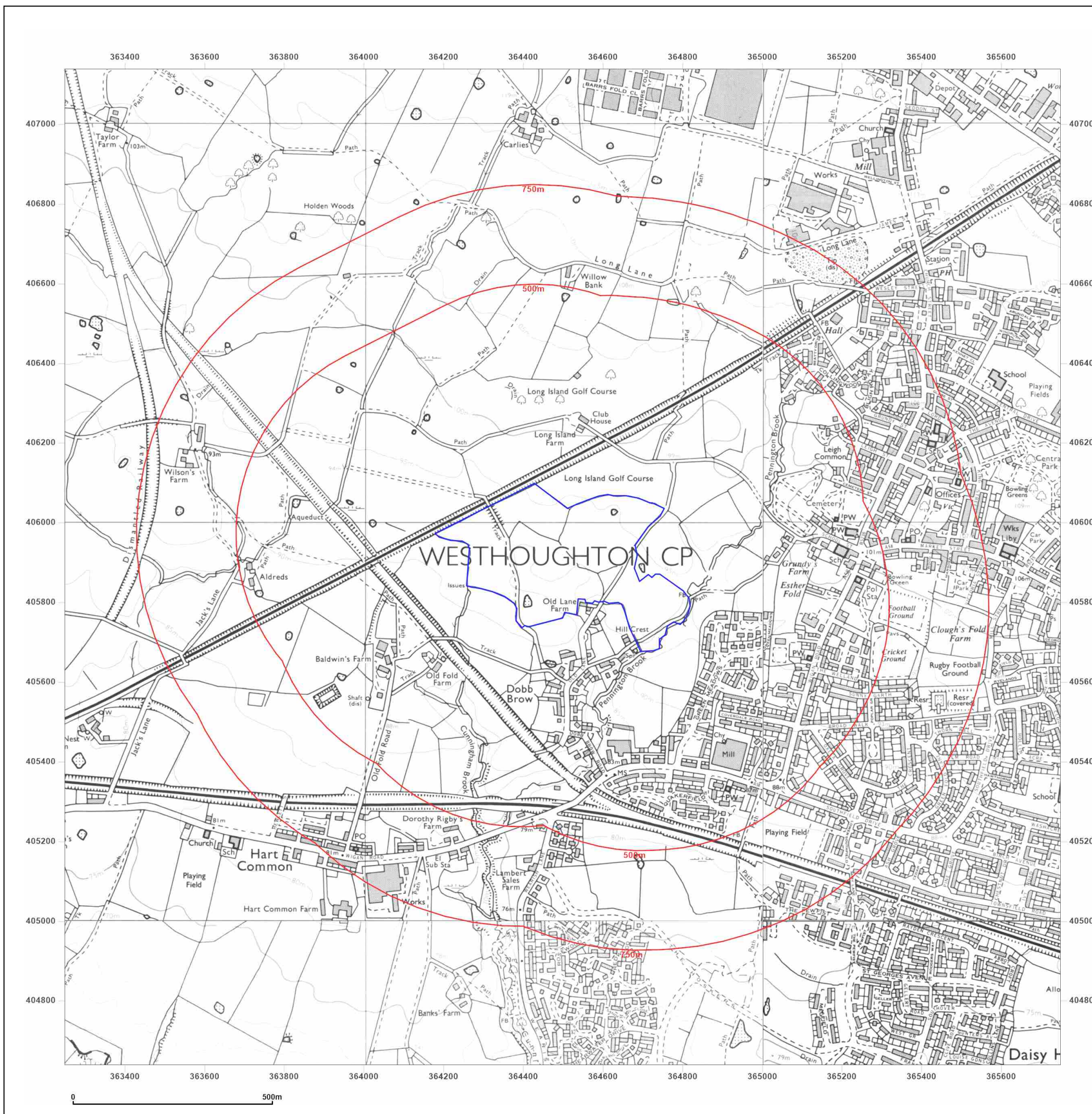


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Site Details:

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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: National Grid

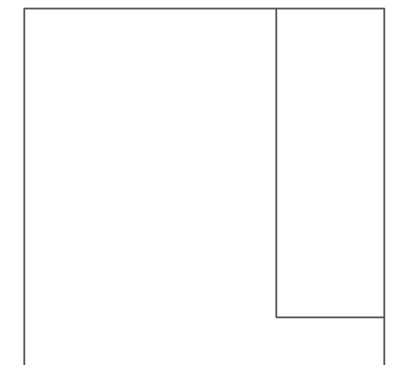
Map date: 1993

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1988
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

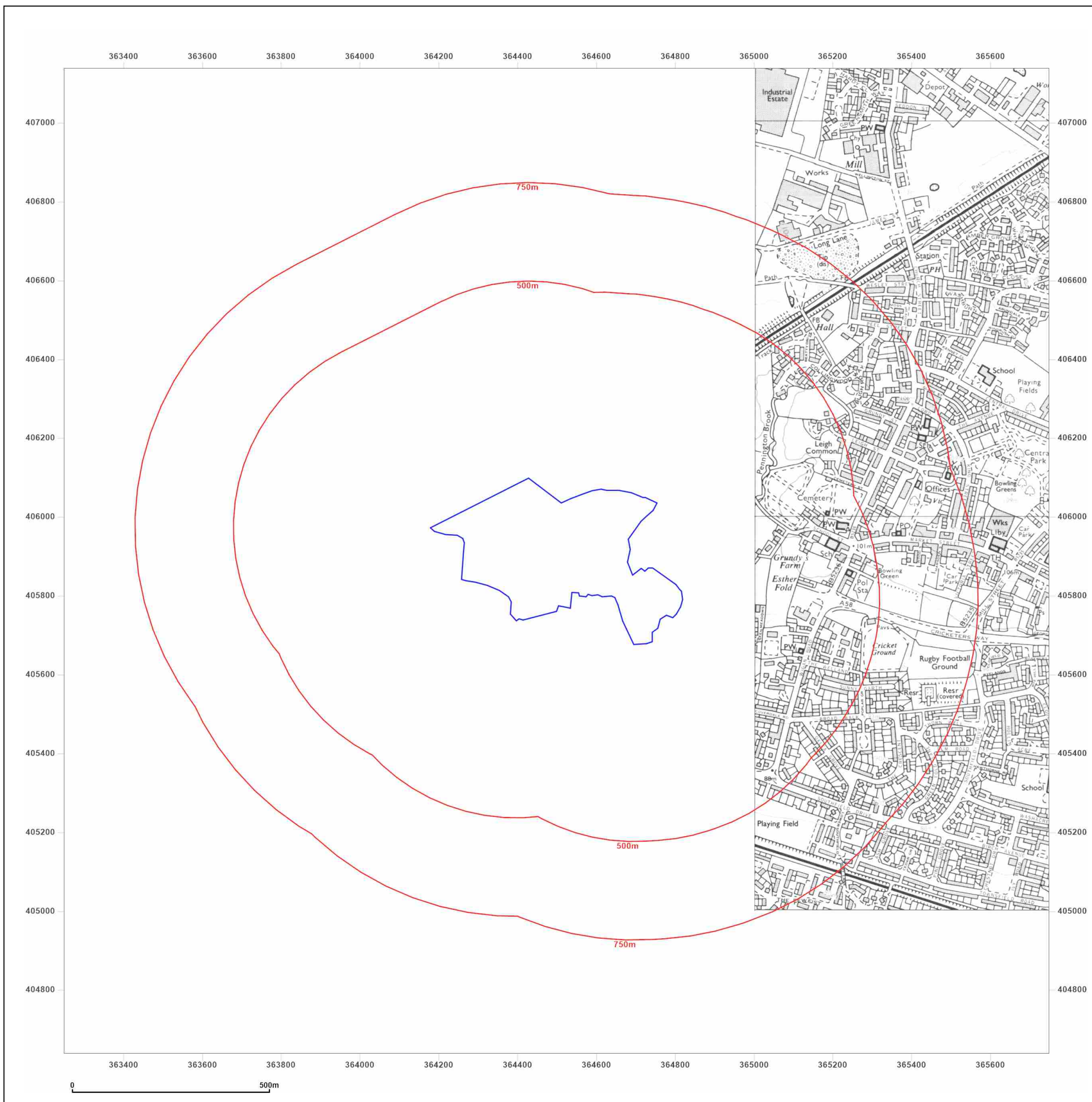


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Site Details:

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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



2001

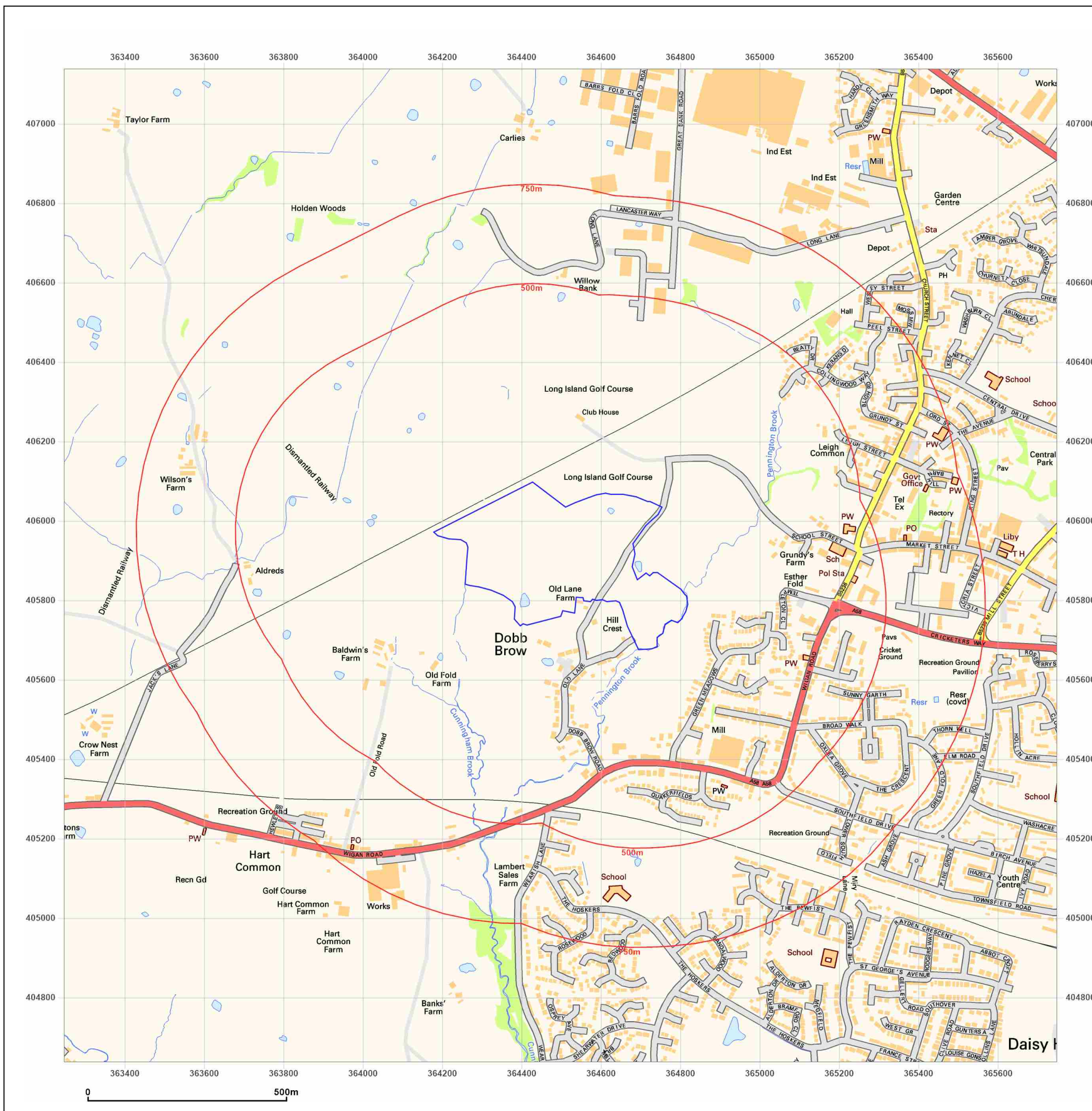


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Site Details:

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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

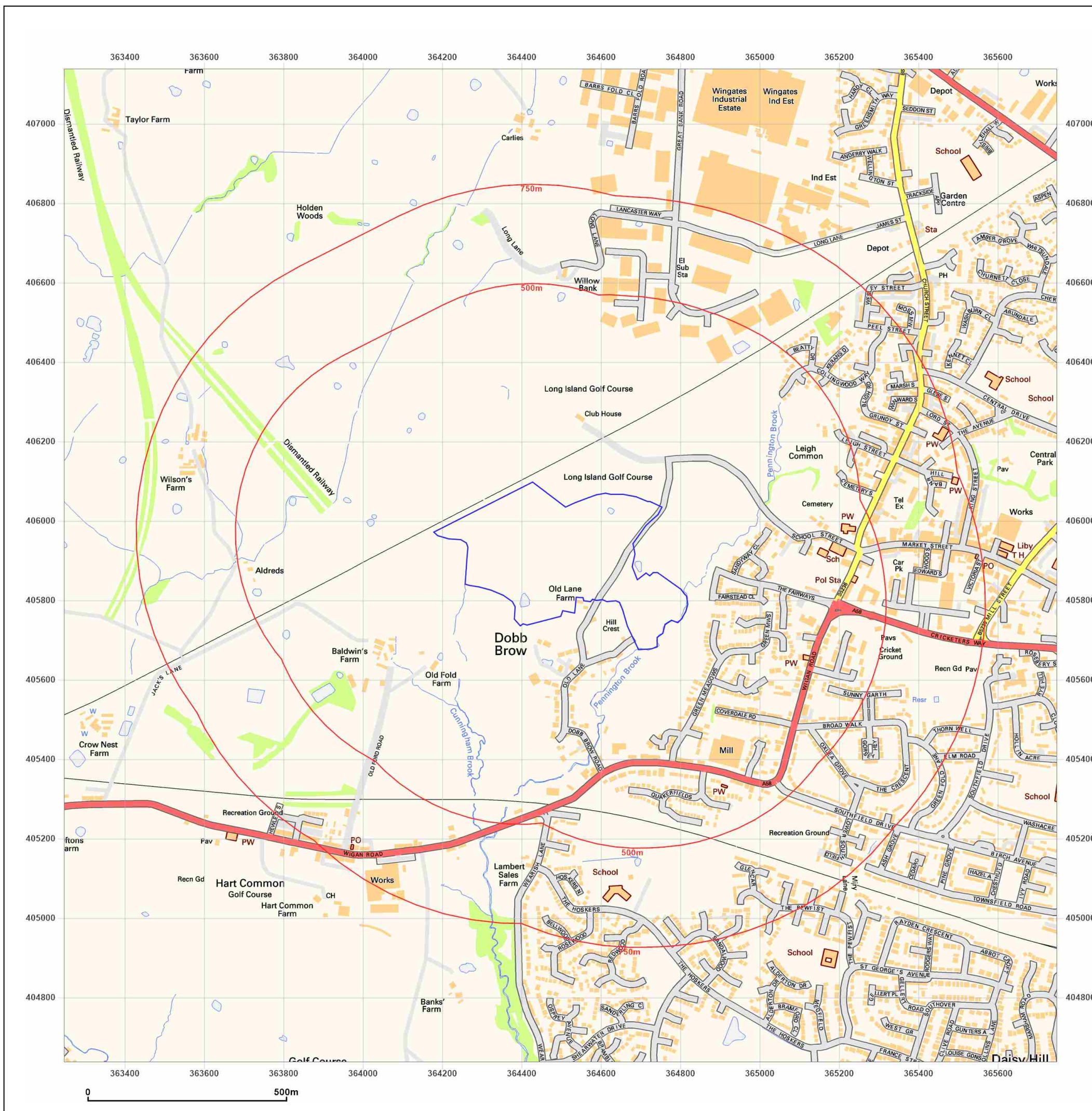


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Site Details:

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BL5 2BA

Client Ref: 3430
Report Ref: GS-7520736
Grid Ref: 364498, 405888

Map Name: National Grid

Map date: 2021

Scale: 1:10,000

Printed at: 1:10,000



2021

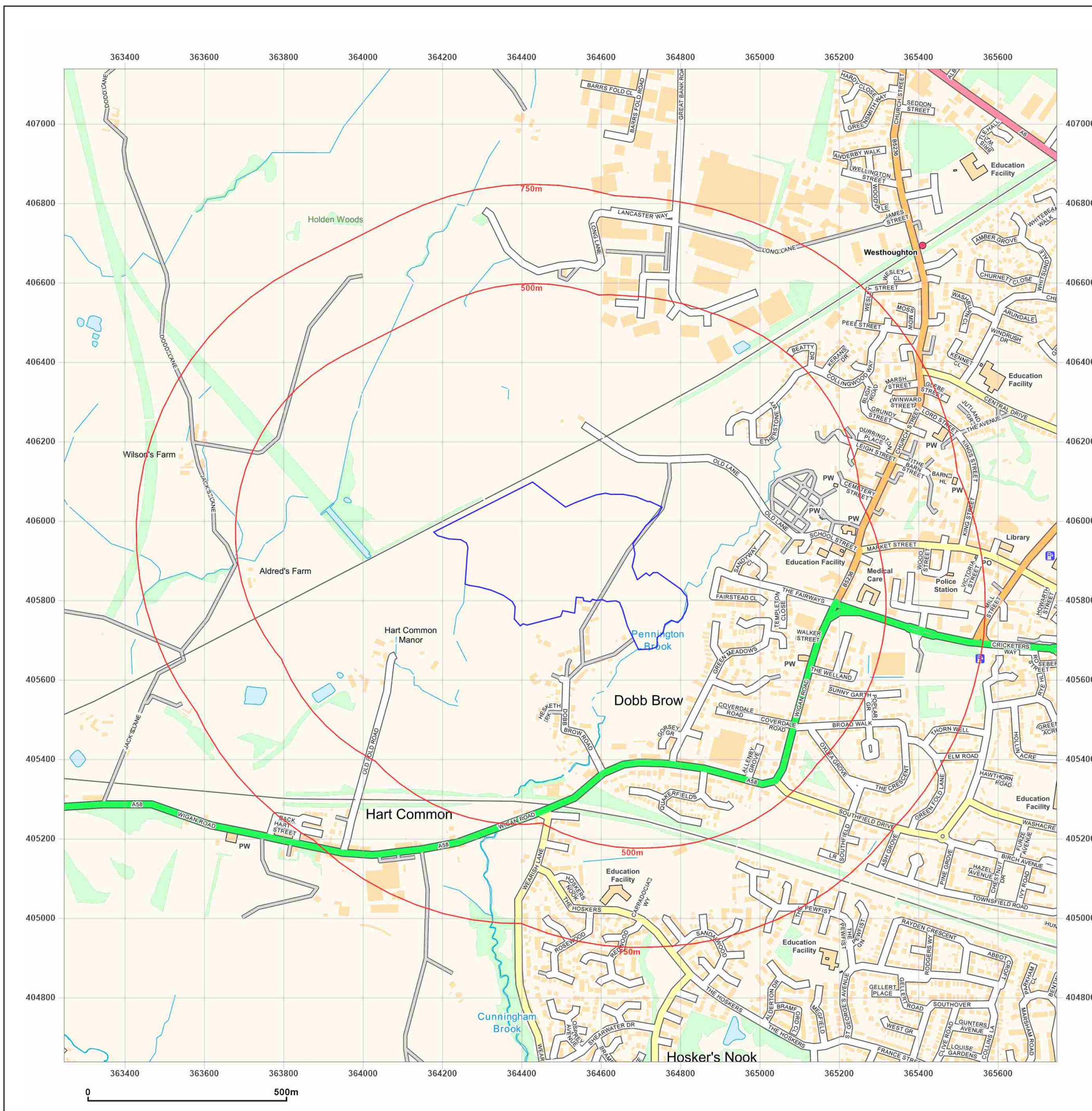


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APPENDIX 5

GROUNDSURECOMBINED ENVIRO AND GEO-INSIGHT REPORT

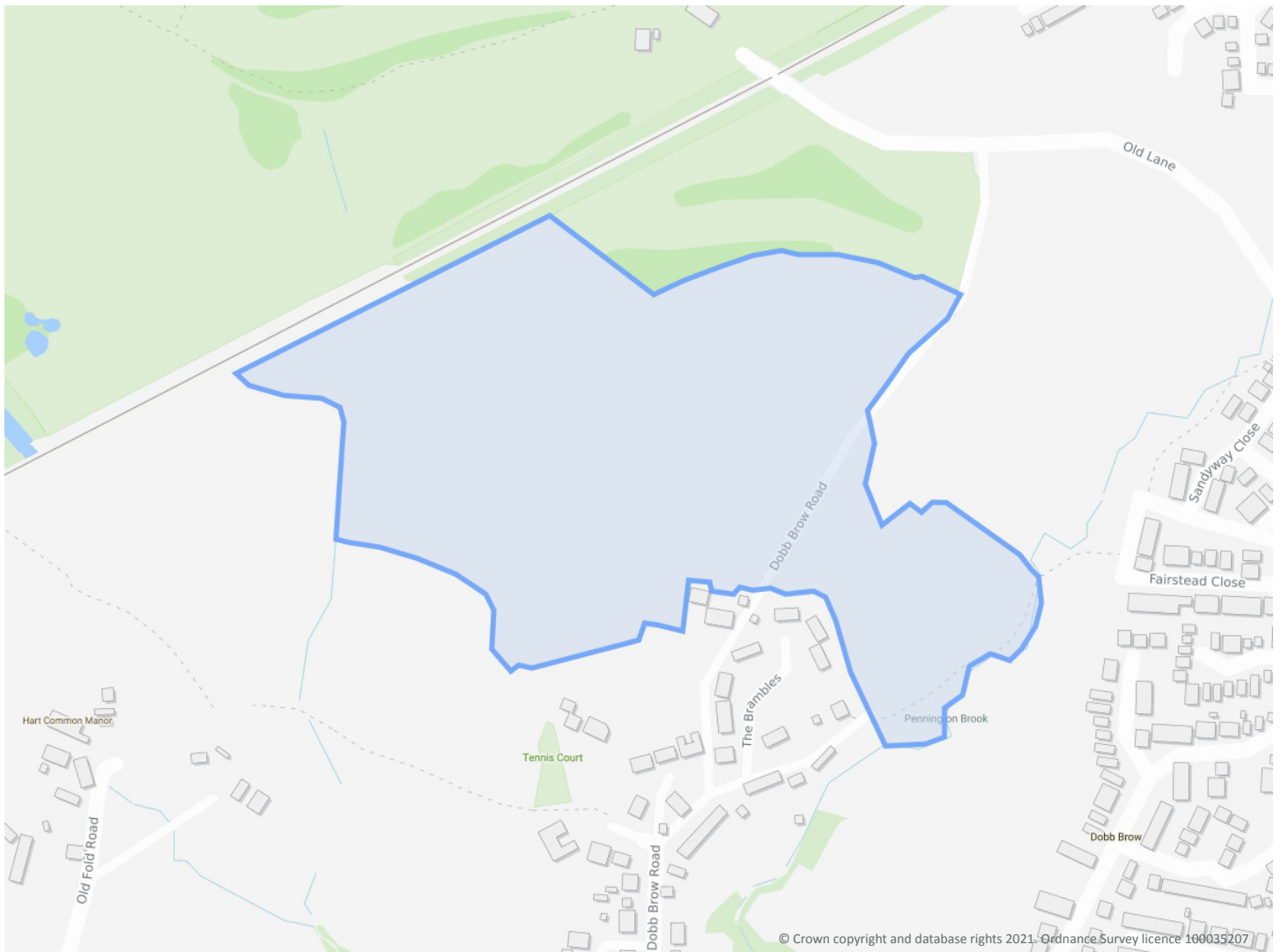
Land off The Fairways, WESTHOUGHTON, BOLTON, BL5 2BA

Order Details

Date: 27/01/2021
Your ref: 3430
Our Ref: GS-7520738
Client: IGE Consulting

Site Details

Location: 364742 405757
Area: 14.14 ha
Authority: [Bolton Metropolitan Borough Council](#)



Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

N/A: >10ha

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Contact us with any questions at:

info@groundsure.com

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Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
12	1.1	Historical industrial land uses	5	3	15	93	-
17	1.2	Historical tanks	0	0	2	5	-
17	1.3	Historical energy features	0	0	1	3	-
18	1.4	Historical petrol stations	0	0	0	1	-
18	1.5	Historical garages	0	0	0	3	-
19	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
20	2.1	Historical industrial land uses	8	6	35	141	-
27	2.2	Historical tanks	0	0	2	6	-
28	2.3	Historical energy features	0	0	1	10	-
29	2.4	Historical petrol stations	0	0	0	1	-
29	2.5	Historical garages	0	0	0	5	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
30	3.1	Active or recent landfill	0	0	0	0	-
30	3.2	Historical landfill (BGS records)	0	0	0	0	-
31	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
31	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
31	3.5	Historical waste sites	0	0	0	0	-
31	3.6	Licensed waste sites	0	0	0	0	-
31	3.7	Waste exemptions	0	0	0	20	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
34	4.1	Recent industrial land uses	0	0	2	-	-
35	4.2	Current or recent petrol stations	0	0	0	2	-
35	4.3	Electricity cables	0	0	0	0	-
35	4.4	Gas pipelines	0	0	0	1	-
36	4.5	Sites determined as Contaminated Land	0	0	0	0	-



36	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
36	4.7	Regulated explosive sites	0	0	0	0	-
36	4.8	Hazardous substance storage/usage	0	0	0	0	-
36	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
37	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
37	4.11	<u>Licensed pollutant release (Part A(2)/B)</u>	0	0	0	2	-
37	4.12	Radioactive Substance Authorisations	0	0	0	0	-
37	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	1	1	-
38	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
38	4.15	Pollutant release to public sewer	0	0	0	0	-
38	4.16	List 1 Dangerous Substances	0	0	0	0	-
39	4.17	List 2 Dangerous Substances	0	0	0	0	-
39	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	2	3	-
40	4.19	Pollution inventory substances	0	0	0	0	-
40	4.20	Pollution inventory waste transfers	0	0	0	0	-
40	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
41	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
43	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
45	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
46	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
46	5.5	Groundwater vulnerability- local information	None (within 0m)				
47	5.6	Groundwater abstractions	0	0	0	0	0
48	5.7	<u>Surface water abstractions</u>	0	0	0	0	3
49	5.8	Potable abstractions	0	0	0	0	0
49	5.9	Source Protection Zones	0	0	0	0	-
49	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
50	6.1	<u>Water Network (OS MasterMap)</u>	1	1	24	-	-



53	6.2	<u>Surface water features</u>	1	2	16	-	-
53	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
53	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
54	6.5	WFD Groundwater bodies	0	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
55	7.1	<u>Risk of Flooding from Rivers and Sea (RoFRaS)</u>	High (within 50m)				
56	7.2	Historical Flood Events	0	0	0	-	-
56	7.3	Flood Defences	0	0	0	-	-
56	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
56	7.5	Flood Storage Areas	0	0	0	-	-
57	7.6	<u>Flood Zone 2</u>	Identified (within 50m)				
58	7.7	<u>Flood Zone 3</u>	Identified (within 50m)				
Page	Section	Surface water flooding					
59	8.1	<u>Surface water flooding</u>	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding					
61	9.1	<u>Groundwater flooding</u>	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
62	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
63	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
63	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
63	10.4	Special Protection Areas (SPA)	0	0	0	0	0
63	10.5	National Nature Reserves (NNR)	0	0	0	0	0
64	10.6	<u>Local Nature Reserves (LNR)</u>	0	0	0	0	5
64	10.7	<u>Designated Ancient Woodland</u>	0	0	0	0	2
64	10.8	Biosphere Reserves	0	0	0	0	0
65	10.9	Forest Parks	0	0	0	0	0
65	10.10	Marine Conservation Zones	0	0	0	0	0
65	10.11	<u>Green Belt</u>	1	0	0	0	5
66	10.12	Proposed Ramsar sites	0	0	0	0	0



66	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
66	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
66	10.15	Nitrate Sensitive Areas	0	0	0	0	0
67	10.16	<u>Nitrate Vulnerable Zones</u>	2	0	2	0	3
68	10.17	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
69	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
70	11.1	World Heritage Sites	0	0	0	-	-
71	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
71	11.3	National Parks	0	0	0	-	-
71	11.4	Listed Buildings	0	0	0	-	-
71	11.5	<u>Conservation Areas</u>	1	0	0	-	-
72	11.6	Scheduled Ancient Monuments	0	0	0	-	-
72	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
73	12.1	<u>Agricultural Land Classification</u>	Grade 3b (within 250m)				
74	12.2	Open Access Land	0	0	0	-	-
74	12.3	Tree Felling Licences	0	0	0	-	-
74	12.4	Environmental Stewardship Schemes	0	0	0	-	-
75	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
76	13.1	<u>Priority Habitat Inventory</u>	0	0	4	-	-
77	13.2	Habitat Networks	0	0	0	-	-
77	13.3	Open Mosaic Habitat	0	0	0	-	-
77	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
78	14.1	<u>10k Availability</u>	Identified (within 500m)				
79	14.2	Artificial and made ground (10k)	0	0	0	0	-
80	14.3	Superficial geology (10k)	0	0	0	0	-

80	14.4	Landslip (10k)	0	0	0	0	-
81	14.5	<u>Bedrock geology (10k)</u>	0	0	2	1	-
82	14.6	<u>Bedrock faults and other linear features (10k)</u>	0	0	3	5	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
83	15.1	<u>50k Availability</u>	Identified (within 500m)				
84	15.2	Artificial and made ground (50k)	0	0	0	0	-
84	15.3	Artificial ground permeability (50k)	0	0	-	-	-
85	15.4	<u>Superficial geology (50k)</u>	3	0	3	2	-
86	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
86	15.6	Landslip (50k)	0	0	0	0	-
86	15.7	Landslip permeability (50k)	None (within 50m)				
87	15.8	<u>Bedrock geology (50k)</u>	4	0	4	10	-
88	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
89	15.10	<u>Bedrock faults and other linear features (50k)</u>	2	3	1	9	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
90	16.1	<u>BGS Boreholes</u>	0	1	3	-	-
Page	Section	Natural ground subsidence					
92	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
93	17.2	<u>Running sands</u>	Low (within 50m)				
95	17.3	<u>Compressible deposits</u>	Moderate (within 50m)				
97	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
98	17.5	<u>Landslides</u>	Very low (within 50m)				
99	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
100	18.1	Natural cavities	0	0	0	0	-
101	18.2	<u>BritPits</u>	0	0	0	1	-
101	18.3	<u>Surface ground workings</u>	10	7	36	-	-
103	18.4	<u>Underground workings</u>	0	0	0	3	7
104	18.5	Historical Mineral Planning Areas	0	0	0	0	-



104	18.6	Non-coal mining	0	0	0	0	0
104	18.7	Mining cavities	0	0	0	0	0
105	18.8	<u>JPB mining areas</u>	Identified (within 0m)				
105	18.9	<u>Coal mining</u>	Identified (within 0m)				
105	18.10	Brine areas	None (within 0m)				
105	18.11	Gypsum areas	None (within 0m)				
106	18.12	Tin mining	None (within 0m)				
106	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
107	19.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
108	20.1	<u>BGS Estimated Background Soil Chemistry</u>	13	1	-	-	-
109	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
109	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
110	21.1	Underground railways (London)	0	0	0	-	-
110	21.2	Underground railways (Non-London)	0	0	0	-	-
111	21.3	Railway tunnels	0	0	0	-	-
111	21.4	<u>Historical railway and tunnel features</u>	0	2	7	-	-
111	21.5	Royal Mail tunnels	0	0	0	-	-
112	21.6	<u>Historical railways</u>	0	0	1	-	-
112	21.7	<u>Railways</u>	0	4	5	-	-
113	21.8	Crossrail 1	0	0	0	0	-
113	21.9	Crossrail 2	0	0	0	0	-
113	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 22/04/2019

Site Area: 14.14ha



Recent site history - 2015 aerial photograph



Capture Date: 11/06/2015

Site Area: 14.14ha



Recent site history - 2011 aerial photograph



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Capture Date: 01/05/2011

Site Area: 14.14ha



Recent site history - 2000 aerial photograph



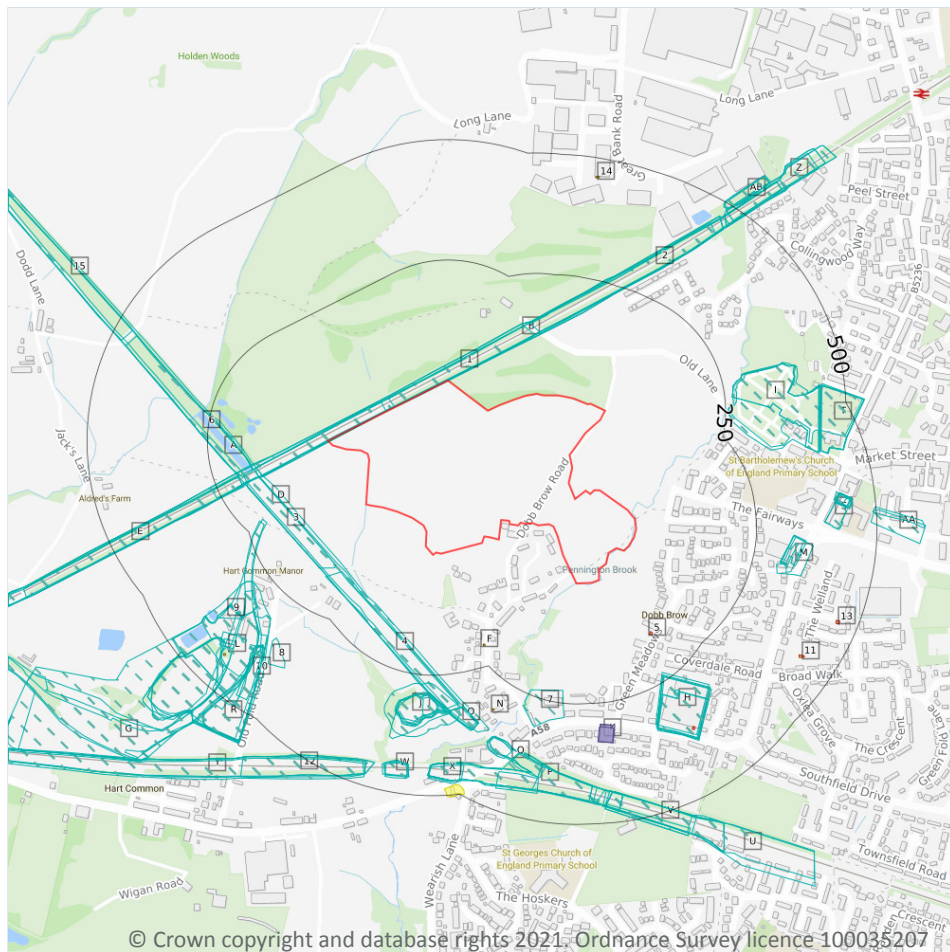
Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2021. All Rights Reserved

Capture Date: 04/09/2000

Site Area: 14.14ha



1 Past land use



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

1.1 Historical industrial land uses

Records within 500m

116

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 12**

ID	Location	Land use	Dates present	Group ID
A	On site	Cuttings	1928	706932



ID	Location	Land use	Dates present	Group ID
A	On site	Cuttings	1892 - 1938	766406
B	On site	Cuttings	1965	716192
B	On site	Cuttings	1977	764154
B	On site	Cuttings	1988	787174
C	1m NW	Cuttings	1948	748577
1	1m NW	Cuttings	1892 - 1938	746349
C	2m NW	Cuttings	1953	788029
D	120m SW	Cuttings	1965 - 1988	715672
D	126m SW	Cuttings	1948 - 1953	790954
2	127m N	Cuttings	1892 - 1938	741544
3	130m SW	Cuttings	1892 - 1938	769442
4	148m S	Cuttings	1892 - 1938	715070
6	167m W	Cuttings	1892 - 1938	739396
E	199m SW	Cuttings	1892 - 1938	740372
E	200m SW	Cuttings	1948 - 1953	788019
G	210m W	Railway Sidings	1892	703060
G	216m W	Railway Sidings	1928	749900
7	224m S	Unspecified Depot	1965	668826
H	232m SE	Unspecified Mill	1965 - 1988	755612
H	238m SE	Unspecified Mill	1948	767605
H	239m SE	Unspecified Mill	1938	713874
H	242m SE	Unspecified Mill	1928	728433
I	255m E	Cemetery	1956 - 1993	716570
I	256m E	Cemetery	1928 - 1948	699679
I	266m E	Cemetery	1928	737105
I	266m E	Cemetery	1907	775220
J	266m S	Unspecified Pit	1938	779094
H	270m SE	Unspecified Mill	1928	704985



ID	Location	Land use	Dates present	Group ID
H	272m SE	Unspecified Mill	1953	790155
H	279m SE	Chimney	1988	684286
G	284m SW	Colliery	1928	645139
G	284m SW	Railway Sidings	1928	785557
J	286m S	Refuse Heap	1965	676368
J	288m S	Unspecified Ground Workings	1953	721155
J	289m S	Unspecified Pit	1948	749927
J	291m S	Gravel Pit	1907	652885
J	291m S	Unspecified Pit	1928	780803
J	296m S	Unspecified Pit	1892	741691
L	297m SW	Unspecified Pit	1907	688081
M	301m E	Unspecified Mill	1892	728571
M	306m E	Unspecified Mill	1907 - 1928	697192
M	308m E	Unspecified Mill	1928 - 1938	747334
M	309m E	Unspecified Mill	1948	700820
O	321m S	Cuttings	1928	707422
O	321m S	Cuttings	1907	709800
O	321m S	Cuttings	1892	773001
O	321m S	Cuttings	1938	789754
J	322m S	Unspecified Ground Workings	1928	729439
L	322m SW	Unspecified Pits	1892	742493
L	323m SW	Unspecified Pits	1928	750000
8	334m SW	Refuse Heap	1965	676372
9	349m SW	Unspecified Heap	1953	649112
P	359m SW	Cuttings	1953	698191
P	359m SW	Cuttings	1965	733173
P	359m SW	Cuttings	1977 - 1988	787173
Q	361m SW	Cuttings	1948	712249



ID	Location	Land use	Dates present	Group ID
L	362m SW	Unspecified Heap	1965 - 1977	745167
L	362m SW	Refuse Heap	1953	764952
Q	362m SW	Cuttings	1892 - 1938	776053
R	365m SW	Refuse Heap	1938	699920
R	365m SW	Refuse Heap	1928	728891
10	365m SW	Railway Sidings	1907	775037
L	367m SW	Refuse Heap	1948	705640
Q	371m S	Cuttings	1892 - 1948	775612
Q	373m S	Cuttings	1928	776054
L	374m SW	Unspecified Disused Shaft	1977 - 1988	770704
R	377m SW	Unspecified Pits	1928	707841
L	381m SW	Railway Sidings	1907	779992
P	385m S	Cuttings	1948	746357
S	392m E	Police Station	1907 - 1927	735982
S	392m E	Police Station	1948	787677
L	409m SW	Refuse Heap	1928 - 1938	711574
T	410m E	Cemetery	1948	701377
T	410m E	Cemetery	1927	717994
T	410m E	Cemetery	1907	732339
L	411m SW	Unspecified Pits	1928	713331
T	411m E	Cemetery	1927	705592
Q	412m S	Cuttings	1928	708921
S	415m E	Police Station	1967 - 1993	698530
S	417m E	Police Station	1956	778816
S	417m E	Police Station	1892	752221
S	418m E	Police Station	1927	729353
S	419m E	Police Station	1938	788975
U	422m S	Railway Sidings	1948	751439



ID	Location	Land use	Dates present	Group ID
V	431m S	Railway Sidings	1965	745089
V	432m S	Cuttings	1892	721093
W	433m S	Cuttings	1953	700646
X	434m S	Cuttings	1892 - 1938	768833
V	434m S	Cuttings	1907 - 1948	774293
W	435m S	Cuttings	1948	734400
W	435m S	Cuttings	1892 - 1938	759494
P	437m S	Cuttings	1907	704566
P	437m S	Cuttings	1938	721437
P	437m S	Cuttings	1928	761548
U	437m S	Railway Sidings	1938	712565
W	438m S	Cuttings	1928	735132
X	438m S	Cuttings	1928	789996
P	447m S	Railway Building	1948	669171
Y	448m S	Cuttings	1953	757033
Y	448m S	Cuttings	1965 - 1988	773838
12	452m S	Cuttings	1892 - 1938	742099
Y	453m S	Cuttings	1948	769724
Y	456m S	Cuttings	1928	783889
Z	457m NE	Cuttings	1956	732634
Z	457m NE	Cuttings	1967	783228
V	460m S	Railway Sidings	1928	725095
Z	464m NE	Cuttings	1980	779492
15	466m NW	Cuttings	1892 - 1938	728443
Z	476m NE	Cuttings	1988	742462
Z	476m NE	Cuttings	1993	782513
AA	488m E	Unspecified Pit	1956	688111
AB	490m NE	Unspecified Heap	1928	770191



ID	Location	Land use	Dates present	Group ID
AB	490m NE	Unspecified Heap	1948	734069
AB	492m NE	Unspecified Heap	1928	764436
AA	493m E	Unspecified Ground Workings	1980 - 1993	714713

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

7

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original 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 12**

ID	Location	Land use	Dates present	Group ID
F	204m S	Unspecified Tank	1959	88973
F	205m S	Unspecified Tank	1952	94024
N	312m SW	Unspecified Tank	1952	79277
N	313m SW	Unspecified Tank	1959	93549
N	313m SW	Unspecified Tank	1952	91175
L	426m SW	Unspecified Tank	1893	79278
14	458m N	Tanks	1993 - 1996	97684

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

4

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 12**



ID	Location	Land use	Dates present	Group ID
5	151m SE	Electricity Substation	1985	43995
H	361m SE	Electricity Substation	1971 - 1996	46910
11	420m SE	Electricity Substation	1971	43994
13	454m E	Electricity Substation	1989 - 1998	50389

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

1

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'.

Features are displayed on the Past land use map on **page 12**

ID	Location	Land use	Dates present	Group ID
X	479m S	Filling Station	1975	1331

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

3

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

Features are displayed on the Past land use map on **page 12**

ID	Location	Land use	Dates present	Group ID
K	295m S	Garage	1995 - 1996	18894
K	295m S	Garage	1971	15863
K	300m S	Garage	1989	19610



This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

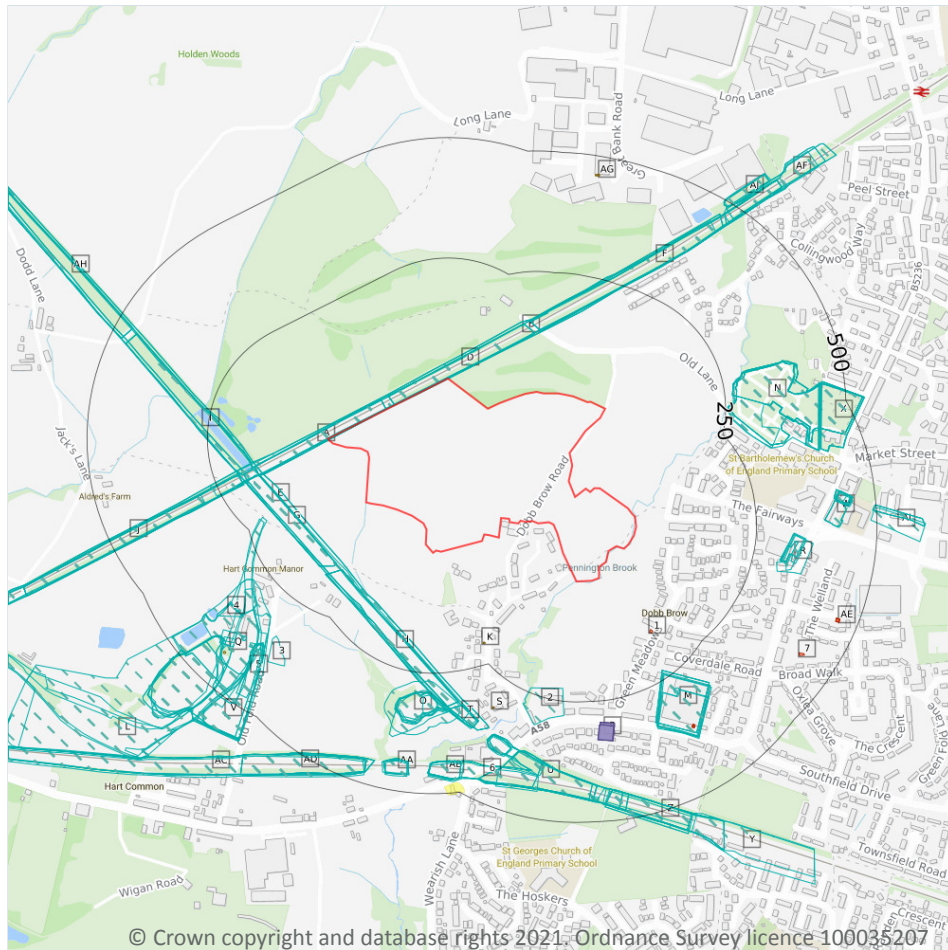
0

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

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



2 Past land use - un-grouped



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

2.1 Historical industrial land uses

Records within 500m

190

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

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
A	On site	Cuttings	1928	766406
A	On site	Cuttings	1938	766406
A	On site	Cuttings	1907	766406



ID	Location	Land Use	Date	Group ID
A	On site	Cuttings	1892	766406
A	On site	Cuttings	1928	706932
B	On site	Cuttings	1965	716192
B	On site	Cuttings	1977	764154
B	On site	Cuttings	1988	787174
C	1m NW	Cuttings	1948	748577
D	1m NW	Cuttings	1928	746349
D	1m NW	Cuttings	1938	746349
D	1m NW	Cuttings	1907	746349
D	1m NW	Cuttings	1892	746349
C	2m NW	Cuttings	1953	788029
E	120m SW	Cuttings	1965	715672
E	120m SW	Cuttings	1977	715672
E	120m SW	Cuttings	1988	715672
E	126m SW	Cuttings	1953	790954
F	127m N	Cuttings	1928	741544
F	127m N	Cuttings	1938	741544
F	127m N	Cuttings	1907	741544
F	127m N	Cuttings	1892	741544
G	130m SW	Cuttings	1928	769442
G	130m SW	Cuttings	1938	769442
G	130m SW	Cuttings	1907	769442
G	130m SW	Cuttings	1892	769442
E	131m SW	Cuttings	1948	790954
H	148m S	Cuttings	1928	715070
H	148m S	Cuttings	1938	715070
H	148m S	Cuttings	1907	715070
H	148m S	Cuttings	1892	715070



ID	Location	Land Use	Date	Group ID
I	167m W	Cuttings	1928	739396
I	167m W	Cuttings	1938	739396
I	167m W	Cuttings	1907	739396
I	167m W	Cuttings	1892	739396
J	199m SW	Cuttings	1928	740372
J	199m SW	Cuttings	1938	740372
J	199m SW	Cuttings	1907	740372
J	199m SW	Cuttings	1892	740372
J	200m SW	Cuttings	1953	788019
L	210m W	Railway Sidings	1892	703060
L	216m W	Railway Sidings	1928	749900
2	224m S	Unspecified Depot	1965	668826
M	232m SE	Unspecified Mill	1965	755612
M	232m SE	Unspecified Mill	1977	755612
M	232m SE	Unspecified Mill	1988	755612
M	238m SE	Unspecified Mill	1948	767605
M	239m SE	Unspecified Mill	1938	713874
M	242m SE	Unspecified Mill	1928	728433
N	255m E	Cemetery	1956	716570
N	255m E	Cemetery	1967	716570
N	255m E	Cemetery	1980	716570
N	255m E	Cemetery	1988	716570
N	255m E	Cemetery	1993	716570
N	256m E	Cemetery	1928	699679
N	257m E	Cemetery	1948	699679
N	266m E	Cemetery	1928	737105
N	266m E	Cemetery	1938	699679
N	266m E	Cemetery	1907	775220



ID	Location	Land Use	Date	Group ID
O	266m S	Unspecified Pit	1938	779094
M	270m SE	Unspecified Mill	1928	704985
M	272m SE	Unspecified Mill	1953	790155
M	279m SE	Chimney	1988	684286
L	284m SW	Colliery	1928	645139
L	284m SW	Railway Sidings	1928	785557
O	286m S	Refuse Heap	1965	676368
J	288m SW	Cuttings	1948	788019
O	288m S	Unspecified Ground Workings	1953	721155
O	289m S	Unspecified Pit	1948	749927
O	289m S	Unspecified Pit	1948	749927
O	291m S	Gravel Pit	1907	652885
O	291m S	Unspecified Pit	1928	780803
O	296m S	Unspecified Pit	1892	741691
Q	297m SW	Unspecified Pit	1907	688081
R	301m E	Unspecified Mill	1892	728571
R	306m E	Unspecified Mill	1928	697192
R	306m E	Unspecified Mill	1907	697192
R	308m E	Unspecified Mill	1938	747334
R	309m E	Unspecified Mill	1948	700820
R	310m E	Unspecified Mill	1928	747334
T	321m S	Cuttings	1928	707422
T	321m S	Cuttings	1938	789754
T	321m S	Cuttings	1907	709800
T	321m S	Cuttings	1892	773001
O	322m S	Unspecified Ground Workings	1928	729439
Q	322m SW	Unspecified Pits	1892	742493
Q	323m SW	Unspecified Pits	1928	750000



ID	Location	Land Use	Date	Group ID
3	334m SW	Refuse Heap	1965	676372
4	349m SW	Unspecified Heap	1953	649112
U	359m SW	Cuttings	1965	733173
U	359m SW	Cuttings	1977	787173
U	359m SW	Cuttings	1988	787173
U	359m SW	Cuttings	1953	698191
U	361m SW	Cuttings	1948	712249
Q	362m SW	Unspecified Heap	1965	745167
Q	362m SW	Unspecified Heap	1977	745167
Q	362m SW	Refuse Heap	1953	764952
U	362m SW	Cuttings	1928	776053
U	362m SW	Cuttings	1938	776053
U	362m SW	Cuttings	1907	776053
U	362m SW	Cuttings	1892	776053
U	365m SW	Cuttings	1928	776053
V	365m SW	Refuse Heap	1938	699920
V	365m SW	Refuse Heap	1928	728891
5	365m SW	Railway Sidings	1907	775037
Q	367m SW	Refuse Heap	1948	705640
Q	367m SW	Refuse Heap	1948	705640
U	371m S	Cuttings	1928	775612
U	371m S	Cuttings	1938	775612
U	371m S	Cuttings	1907	775612
U	371m S	Cuttings	1892	775612
U	373m S	Cuttings	1928	776054
Q	374m SW	Unspecified Disused Shaft	1977	770704
Q	374m SW	Unspecified Disused Shaft	1988	770704
V	377m SW	Unspecified Pits	1928	707841



ID	Location	Land Use	Date	Group ID
Q	381m SW	Railway Sidings	1907	779992
U	385m S	Cuttings	1948	746357
W	392m E	Police Station	1948	787677
W	392m E	Police Station	1927	735982
W	392m E	Police Station	1907	735982
Q	409m SW	Refuse Heap	1938	711574
6	410m S	Cuttings	1948	775612
X	410m E	Cemetery	1948	701377
X	410m E	Cemetery	1927	717994
X	410m E	Cemetery	1907	732339
Q	411m SW	Unspecified Pits	1928	713331
X	411m E	Cemetery	1927	705592
U	412m S	Cuttings	1928	708921
Q	412m SW	Refuse Heap	1928	711574
W	415m E	Police Station	1967	698530
W	415m E	Police Station	1980	698530
W	415m E	Police Station	1988	698530
W	415m E	Police Station	1993	698530
W	417m E	Police Station	1956	778816
W	417m E	Police Station	1892	752221
W	418m E	Police Station	1927	729353
W	419m E	Police Station	1938	788975
Y	422m S	Railway Sidings	1948	751439
Z	431m S	Railway Sidings	1965	745089
Z	432m S	Cuttings	1892	721093
AA	433m S	Cuttings	1953	700646
AB	434m S	Cuttings	1928	768833
AB	434m S	Cuttings	1938	768833



ID	Location	Land Use	Date	Group ID
AB	434m S	Cuttings	1907	768833
AB	434m S	Cuttings	1892	768833
Z	434m S	Cuttings	1948	774293
AA	435m S	Cuttings	1948	734400
AA	435m S	Cuttings	1928	759494
AA	435m S	Cuttings	1938	759494
AA	435m S	Cuttings	1907	759494
AA	435m S	Cuttings	1892	759494
U	437m S	Cuttings	1928	761548
U	437m S	Cuttings	1938	721437
U	437m S	Cuttings	1907	704566
Y	437m S	Railway Sidings	1938	712565
AA	438m S	Cuttings	1928	735132
AB	438m S	Cuttings	1928	789996
Z	439m S	Cuttings	1928	774293
U	447m S	Railway Building	1948	669171
AC	448m S	Cuttings	1965	773838
AC	448m S	Cuttings	1977	773838
AC	448m S	Cuttings	1988	773838
AC	448m S	Cuttings	1953	757033
Z	451m S	Cuttings	1928	774293
Z	451m S	Cuttings	1938	774293
Z	451m S	Cuttings	1907	774293
AD	452m S	Cuttings	1928	742099
AD	452m S	Cuttings	1938	742099
AD	452m S	Cuttings	1907	742099
AD	452m S	Cuttings	1892	742099
AC	453m S	Cuttings	1948	769724



ID	Location	Land Use	Date	Group ID
AC	456m S	Cuttings	1928	783889
AF	457m NE	Cuttings	1956	732634
AF	457m NE	Cuttings	1967	783228
Z	460m S	Railway Sidings	1928	725095
AF	464m NE	Cuttings	1980	779492
AH	466m NW	Cuttings	1928	728443
AH	466m NW	Cuttings	1938	728443
AH	466m NW	Cuttings	1907	728443
AH	466m NW	Cuttings	1892	728443
AF	476m NE	Cuttings	1988	742462
AF	476m NE	Cuttings	1993	782513
AI	488m E	Unspecified Pit	1956	688111
AJ	490m NE	Unspecified Heap	1928	770191
AJ	490m NE	Unspecified Heap	1948	734069
AJ	490m NE	Unspecified Heap	1948	734069
AJ	492m NE	Unspecified Heap	1928	764436
AI	493m E	Unspecified Ground Workings	1980	714713
AI	493m E	Unspecified Ground Workings	1988	714713
AI	493m E	Unspecified Ground Workings	1993	714713

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

8

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

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
K	204m S	Unspecified Tank	1959	88973



ID	Location	Land Use	Date	Group ID
K	205m S	Unspecified Tank	1952	94024
S	312m SW	Unspecified Tank	1952	79277
S	313m SW	Unspecified Tank	1959	93549
S	313m SW	Unspecified Tank	1952	91175
Q	426m SW	Unspecified Tank	1893	79278
AG	458m N	Tanks	1996	97684
AG	458m N	Tanks	1993	97684

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

11

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

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
1	151m SE	Electricity Substation	1985	43995
M	361m SE	Electricity Substation	1996	46910
M	361m SE	Electricity Substation	1995	46910
M	361m SE	Electricity Substation	1971	46910
M	361m SE	Electricity Substation	1989	46910
M	361m SE	Electricity Substation	1989	46910
7	420m SE	Electricity Substation	1971	43994
AE	454m E	Electricity Substation	1996	50389
AE	454m E	Electricity Substation	1994	50389
AE	454m E	Electricity Substation	1998	50389
AE	455m E	Electricity Substation	1989	50389

This data is sourced from Ordnance Survey / Groundsure.



2.4 Historical petrol stations

Records within 500m

1

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'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
AB	479m S	Filling Station	1975	1331

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m

5

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

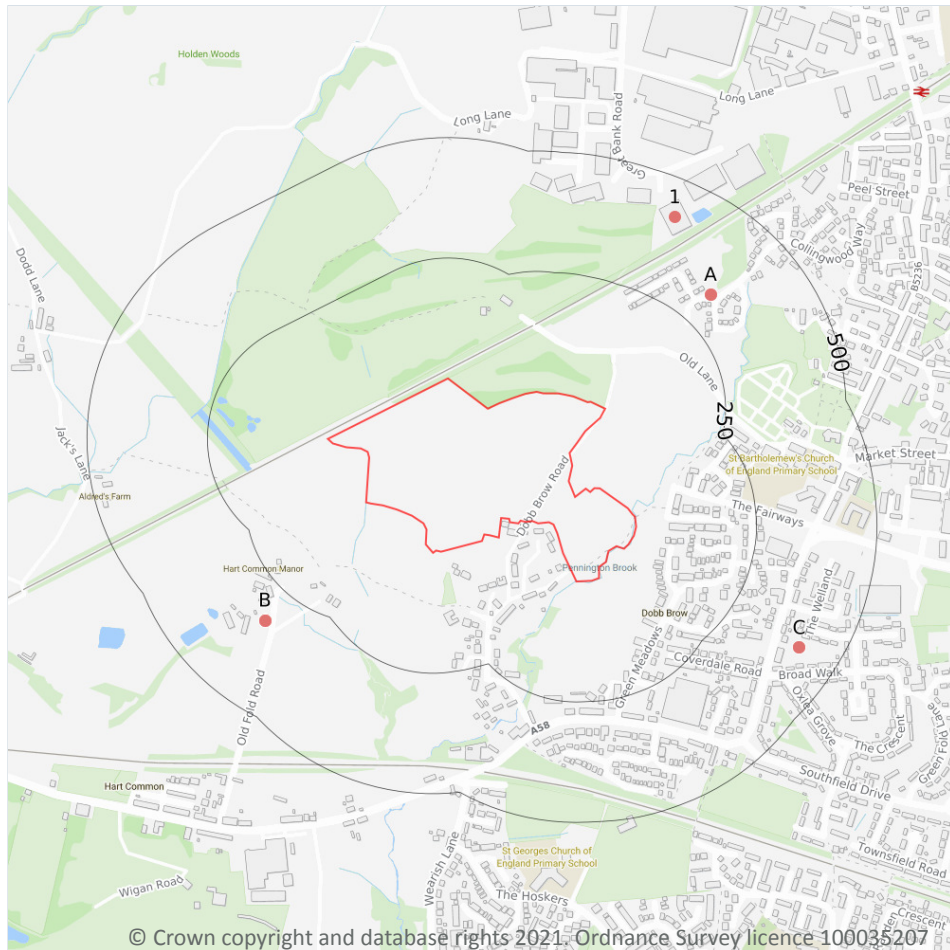
Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
P	295m S	Garage	1996	18894
P	295m S	Garage	1995	18894
P	295m S	Garage	1971	15863
P	300m S	Garage	1989	19610
P	300m S	Garage	1989	19610

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

20

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 30**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	322m NE	-	WEX120459	Treating waste exemption	Not on a farm	Screening and blending of waste



ID	Location	Site	Reference	Category	Sub-Category	Description
A	322m NE	-	WEX120459	Using waste exemption	Not on a farm	Use of waste in construction
B	323m SW	The Hawthorns Old Fold Road Bolton Lancashire BL5 2BY	EPR/GF0631TP /A001	Disposing of waste exemption	Agricultural Waste Only	Burning waste in the open
B	323m SW	The Hawthorns Old Fold Road Bolton Lancashire BL5 2BY	EPR/GF0631TP /A001	Treating waste exemption	Agricultural Waste Only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	323m SW	The Hawthorns Old Fold Road Bolton Lancashire BL5 2BY	EPR/GF0631TP /A001	Using waste exemption	Agricultural Waste Only	Use of waste in construction
B	323m SW	The Hawthorns Old Fold Road Bolton Lancashire BL5 2BY	EPR/GF0631TP /A001	Using waste exemption	Agricultural Waste Only	Burning of waste as a fuel in a small appliance
B	323m SW	The Hawthorns Old Fold Road Bolton Lancashire BL5 2BY	EPR/GF0631TP /A001	Using waste exemption	Agricultural Waste Only	Use of waste for a specified purpose
B	324m SW	THE HAWTHORNS, OLD FOLD ROAD, WESTHOUGHTON, BOLTON, BL5 2BY	WEX207529	Using waste exemption	On a Farm	Burning of waste as a fuel in a small appliance
B	324m SW	THE HAWTHORNS, OLD FOLD ROAD, WESTHOUGHTON, BOLTON, BL5 2BY	WEX207529	Using waste exemption	On a Farm	Spreading waste on agricultural land to confer benefit
B	324m SW	THE HAWTHORNS, OLD FOLD ROAD, WESTHOUGHTON, BOLTON, BL5 2BY	WEX207529	Using waste exemption	On a Farm	Use of mulch
B	324m SW	THE HAWTHORNS, OLD FOLD ROAD, WESTHOUGHTON, BOLTON, BL5 2BY	WEX207529	Disposing of waste exemption	On a Farm	Burning waste in the open
B	324m SW	THE HAWTHORNS, OLD FOLD ROAD, WESTHOUGHTON, BOLTON, BL5 2BY	WEX050223	Disposing of waste exemption	On a farm	Burning waste in the open
B	324m SW	THE HAWTHORNS, OLD FOLD ROAD, WESTHOUGHTON, BOLTON, BL5 2BY	WEX050223	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit

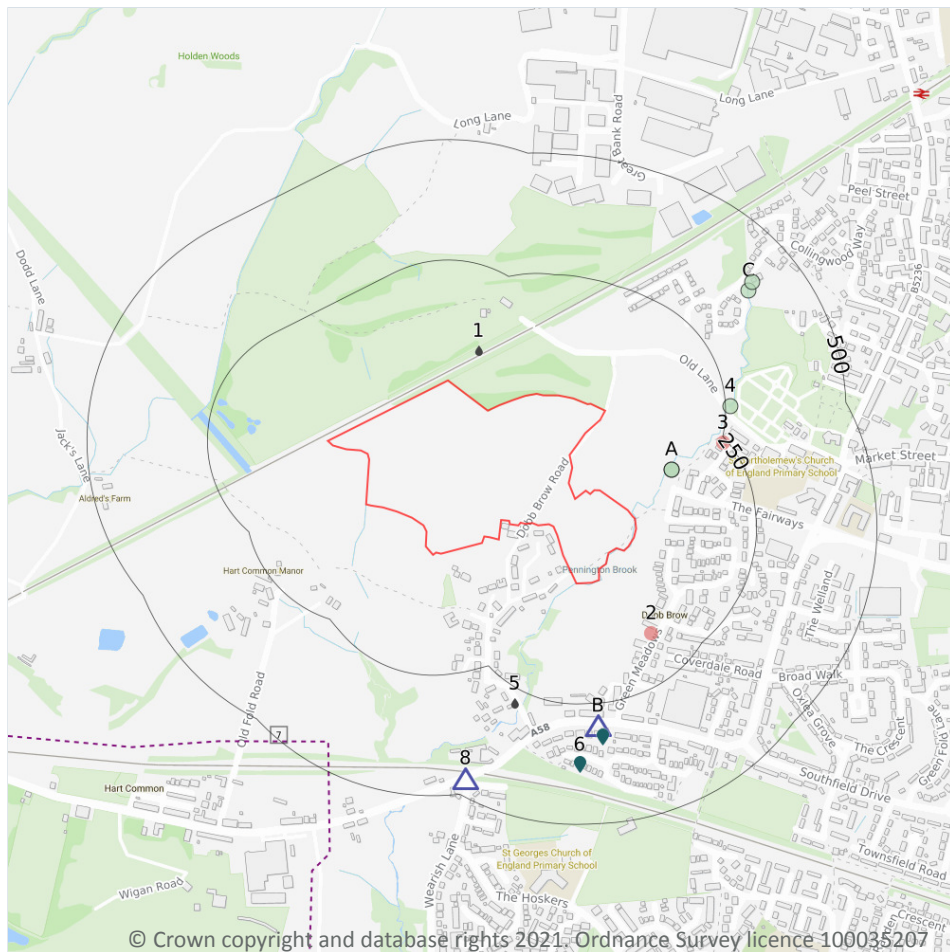


ID	Location	Site	Reference	Category	Sub-Category	Description
B	324m SW	THE HAWTHORNS, OLD FOLD ROAD, WESTHOUGHTON, BOLTON, BL5 2BY	WEX050223	Using waste exemption	On a farm	Use of mulch
B	324m SW	THE HAWTHORNS, OLD FOLD ROAD, WESTHOUGHTON, BOLTON, BL5 2BY	WEX050223	Using waste exemption	On a farm	Burning of waste as a fuel in a small appliance
C	415m SE	-	WEX144161	Using waste exemption	Not on a farm	Use of mulch
C	415m SE	-	WEX144161	Treating waste exemption	Not on a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	415m SE	To the rear off 11 Broadwalk Bolton BL52AA	EPR/YF0207CS /A001	Treating waste exemption	Non-Agricultural Waste Only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	415m SE	To the rear off 11 Broadwalk Bolton BL52AA	EPR/YF0207CS /A001	Using waste exemption	Non-Agricultural Waste Only	Use of mulch
1	421m NE	Linde Sterling Ltd, Unit 1 Easter Park, Westhoughton, Bolton, BL5 3XU	WEX235605	Storing waste exemption	Not on a farm	Storage of waste in secure containers

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
- △ Current or recent petrol stations
- Gas pipelines
- Licensed pollutant release (Part A(2)/B)
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

2

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 34**

ID	Location	Company	Address	Activity	Category
2	155m SE	Electricity Sub Station	Greater Manchester, BL5	Electrical Features	Infrastructure and Facilities
3	241m NE	Stained Glass Experience	17, Sandyway Close, Westhoughton, Bolton, Greater Manchester, BL5 3LW	Glass	Industrial Products

This data is sourced from Ordnance Survey.



4.2 Current or recent petrol stations

Records within 500m

2

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 34**

ID	Location	Company	Address	LPG	Status
B	297m S	TEXACO	Wigan Road, Westhoughton, Bolton, Greater Manchester, BL5 2AT	No	Closed
8	466m SW	SAVE	Wigan Road, Wearish Lane, Dobb Brow, Westhoughton, Bolton, Greater Manchester, BL5 2EE	Not Applicable	Obsolete

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

1

High pressure underground gas transmission pipelines.

Features are displayed on the Current industrial land use map on **page 34**

ID	Location	Pipe Name	Details	
7	444m SW	MAWDESLEY TO WARBURTON	Pipe Number: - Pipeline Safety Regulations Number: - Ownership: National Grid Maximum Operating Pressure (Bar): -	Pipeline Diameter (mm): 1050 Wall Thickness (mm): - Year of commission: Not specified Abandonment Status: Not abandoned

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

2

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

Features are displayed on the Current industrial land use map on **page 34**

ID	Location	Address	Details	
B	320m S	Southgrove Garage, 251 Wigan Road, Westhoughton, BL5 2AT	Process: Unloading of Petrol into Storage at Service Stations Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
6	376m S	Southgrove Gge, Wigan Rd, BL5 2AT	Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m

0

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

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

4.13 Licensed Discharges to controlled waters

Records within 500m

2

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

Features are displayed on the Current industrial land use map on **page 34**



ID	Location	Address	Details	
1	86m NE	WESTHOUGHTON GOLF CLUB, LONG ISLAND, SHAW STREET, WESTHOUGHTON, BOLTON, BL5 2BR	Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED Permit Number: 016993461 Permit Version: 1 Receiving Water: TRIB MARSH BROOK	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 23/12/2002 Effective Date: 23/12/2002 Revocation Date: -
5	280m SW	137 DOBB BROW RD, WESTHOUGHTON	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: 01M/307 Permit Version: 1 Receiving Water: UNKNOWN	Status: PRE NRA LEGISLATION WHERE ISSUE DATE 01-SEP-89 (HISTORIC ONLY) Issue date: 09/07/1959 Effective Date: 09/07/1959 Revocation Date: -

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

5

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

Features are displayed on the Current industrial land use map on **page 34**

ID	Location	Details	
A	123m NE	Incident Date: 31/03/2002 Incident Identification: 67860 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
A	123m NE	Incident Date: 31/03/2002 Incident Identification: 67860 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
4	259m E	Incident Date: 09/03/2005 Incident Identification: 297737 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
C	388m NE	Incident Date: 23/03/2012 Incident Identification: 973611 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
C	406m NE	Incident Date: 23/04/2013 Incident Identification: 1105556 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Food and Drink	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

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



4.19 Pollution inventory substances

Records within 500m**0**

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

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

4.20 Pollution inventory waste transfers

Records within 500m**0**

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

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

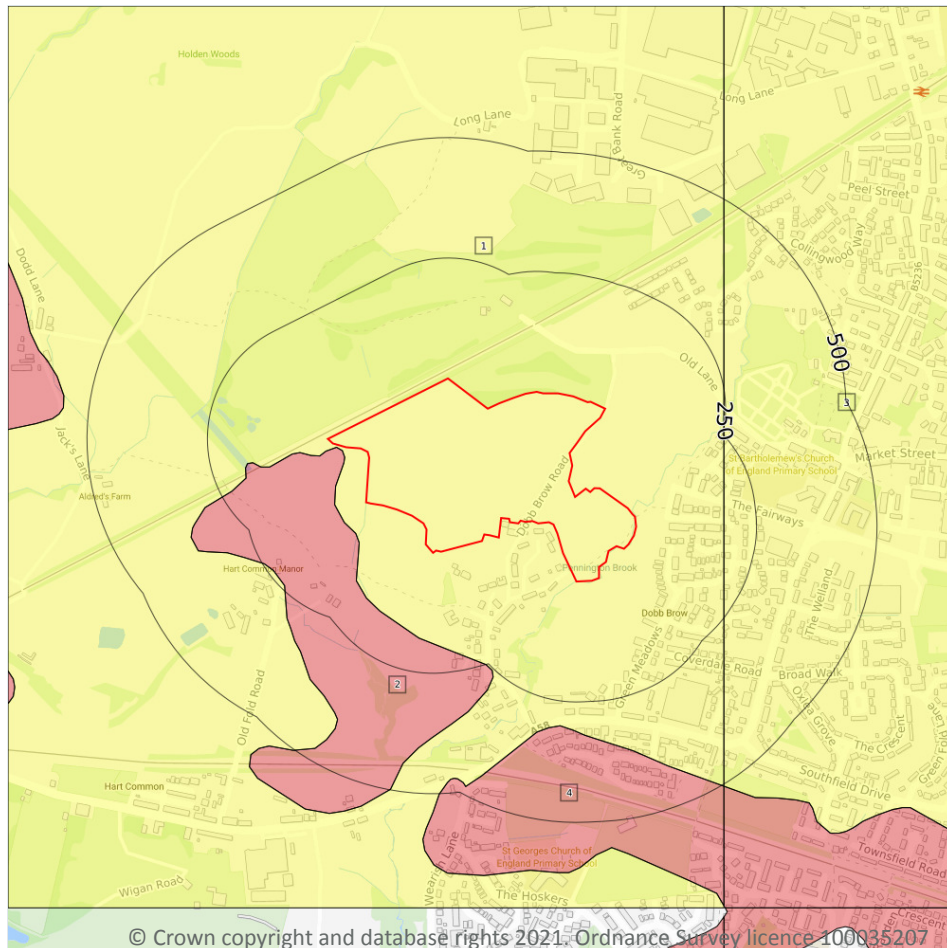
4.21 Pollution inventory radioactive waste

Records within 500m**0**

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

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

5 Hydrogeology - Superficial aquifer



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

5.1 Superficial aquifer

Records within 500m

4

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 41**

ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	6m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

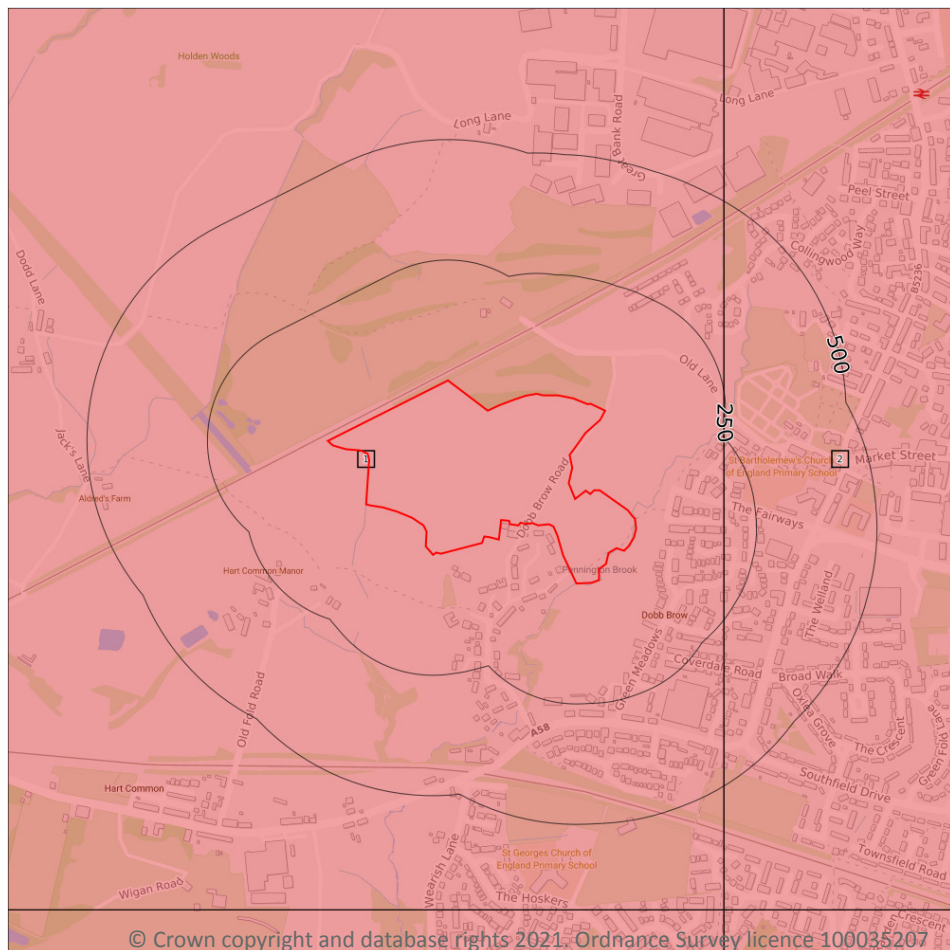


ID	Location	Designation	Description
3	182m E	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	301m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

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



Bedrock aquifer



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

5.2 Bedrock aquifer

Records within 500m

2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 43**

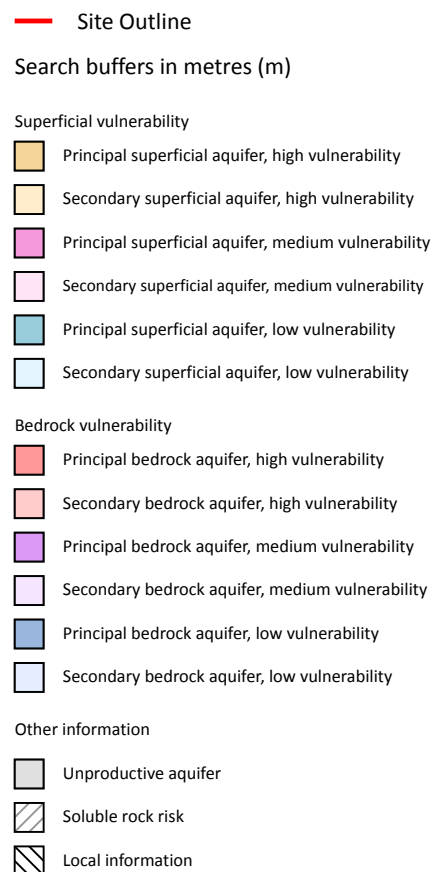
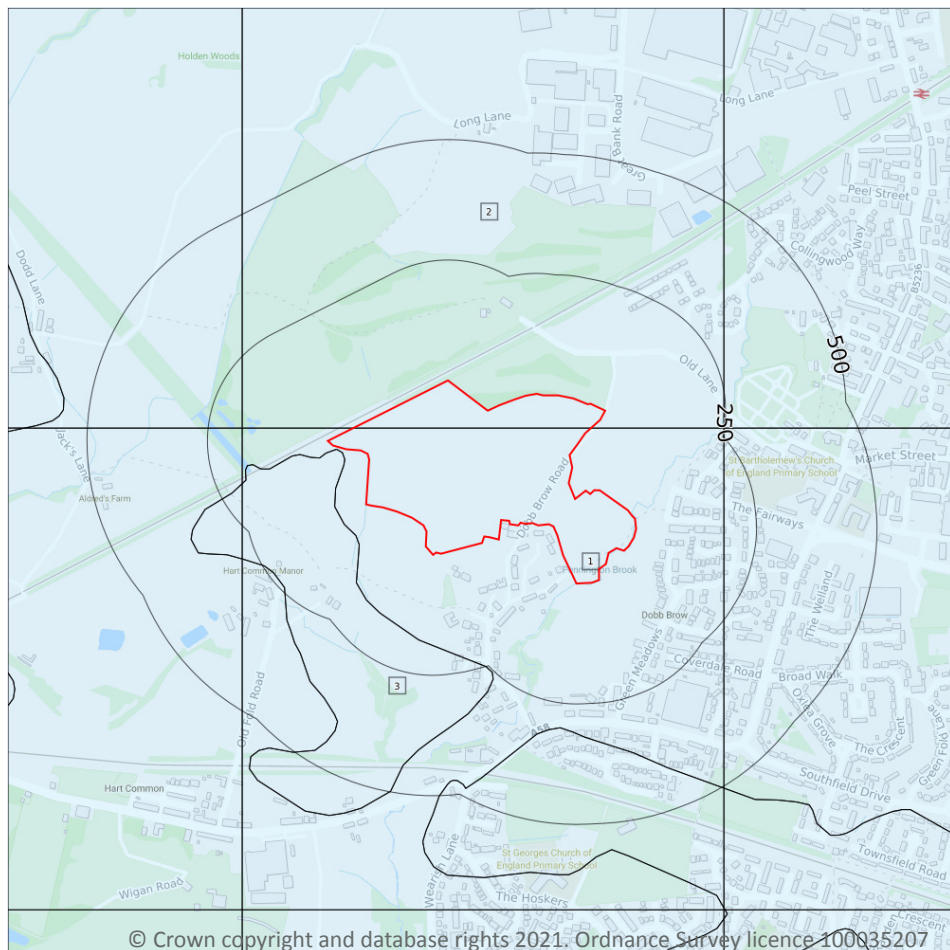
ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	182m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers



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



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

3

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 45**



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: >550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
2	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: >550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
3	5m S	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	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.



A map of Hart Common and surrounding areas in Wigan, Greater Manchester. The map features a red boundary line enclosing a central area, and two concentric black circles centered on the same point, labeled '250' and '500'. The map shows various streets including Long Lane, Bank Road, Peel Street, Collingwood Way, Market Street, The Fairways, The Willing, Broad Walk, Old Lane, Dobb Brow, Green Reasons, Coverdale Road, Southfield Drive, Townsfield Road, Green Fold Lane, Crescent, Wigan Road, Wearsh Lane, and Old Fold Road. Other landmarks include Holden Woods, Almonds Farm, Hart Common Manor, St Georges Church of England Primary School, The Hoskings, and Hart Common. The map is credited to Crown copyright and database rights 2021, Ordnance Survey licence 100035207.

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

47

5.7 Surface water abstractions

Records within 2000m

3

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 47**

ID	Location	Details	
-	1196m SW	Status: Historical Licence No: 2569016070 Details: Spray Irrigation - Direct Direct Source: "Surface, Non-Tidal - North West Region" Point: "RES. FED BY SURF DRAINAGE AT HART COMMON FM, WESTHOUGHTON" Data Type: Point Name: ROBERTS Easting: 363800 Northing: 404700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 27/10/1995 Expiry Date: - Issue No: 100 Version Start Date: 27/10/1995 Version End Date: -
-	1196m SW	Status: Historical Licence No: 2569016070 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: RES. FED BY SURF DRAINAGE AT HART COMMON FM, WESTHOUGHTON Data Type: Point Name: ROBERTS Easting: 363800 Northing: 404700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 27/10/1995 Expiry Date: - Issue No: 100 Version Start Date: 27/10/1995 Version End Date: -
-	1196m SW	Status: Active Licence No: 2569016070 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: RESERVOIR FED BY SURFACE DRAINAGE HART COMMON FARM Data Type: Point Name: ROBERTS Easting: 363800 Northing: 404700	Annual Volume (m ³): 4,700 Max Daily Volume (m ³): 79.19 Original Application No: - Original Start Date: 27/10/1995 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -

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



5.8 Potable abstractions

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

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

5.9 Source Protection Zones

Records within 500m	0
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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)

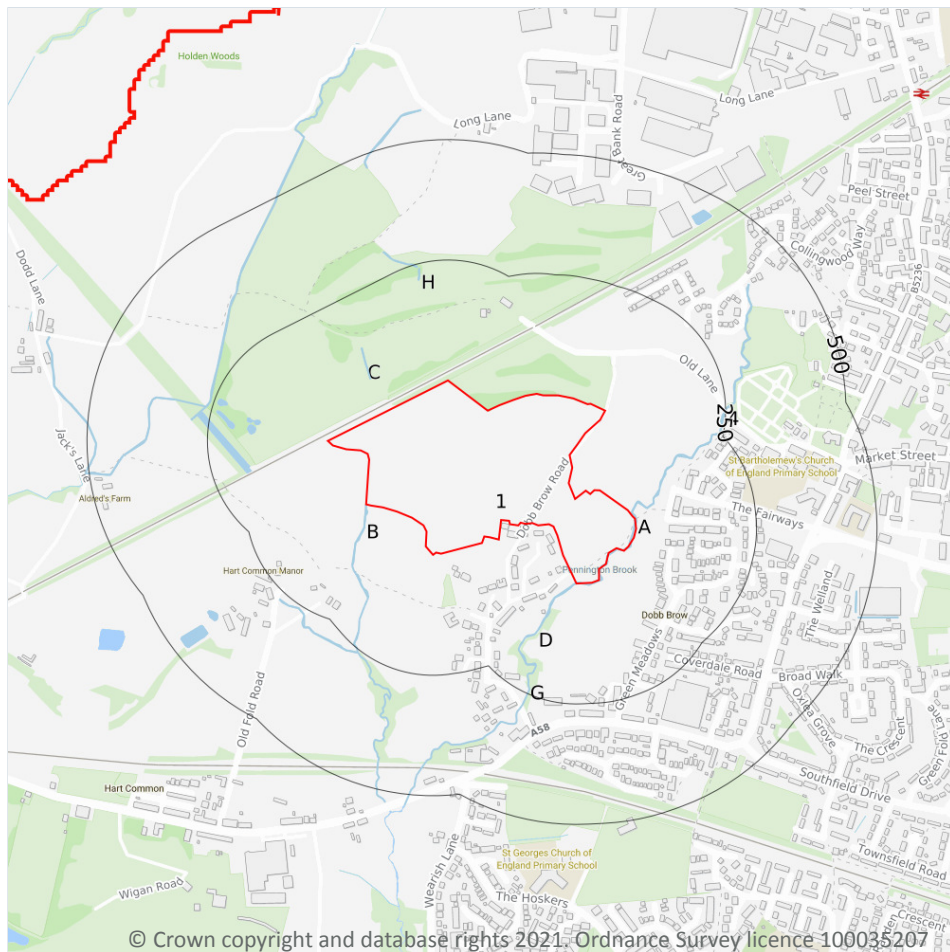
Records within 500m	0
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Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only 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

26

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

Features are displayed on the Hydrology map on **page 50**

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



ID	Location	Type of water feature	Ground level	Permanence	Name
B	1m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	75m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	79m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
D	124m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Pennington Brook
B	130m S	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
D	136m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Pennington Brook
B	139m S	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
B	144m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
D	153m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Pennington Brook
B	160m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
D	163m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Pennington Brook
B	164m SW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
D	173m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Pennington Brook



ID	Location	Type of water feature	Ground level	Permanence	Name
B	176m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
B	177m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	177m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
B	178m SW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
D	184m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Pennington Brook
G	188m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Pennington Brook
B	204m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
H	216m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	223m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook
H	243m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
4	248m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	Pennington Brook
B	249m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Cunningham Brook

This data is sourced from the Ordnance Survey.



6.2 Surface water features

Records within 250m

19

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

Features are displayed on the Hydrology map on **page 50**

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 50**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River WB catchment	Westleigh Brook	GB112069060820	Glaze	Lower Mersey

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 50**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	1415m E	River	Westleigh Brook	GB112069060820	Moderate	Good	Moderate	2016



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

6.5 WFD Groundwater bodies

Records on site

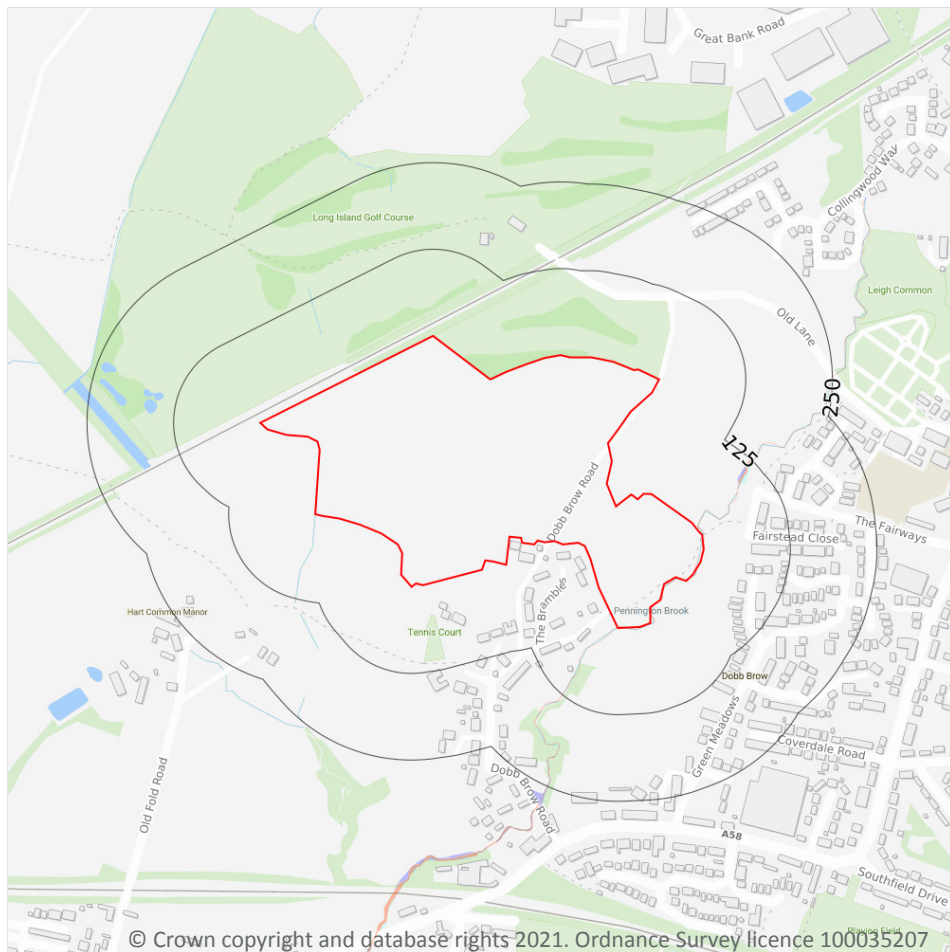
0

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

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



7 River and coastal flooding



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

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m

4

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

Features are displayed on the River and coastal flooding map on **page 55**

Distance	RoFRaS flood risk
On site	High
0 - 50m	High



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

7.2 Historical Flood Events

Records within 250m

0

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

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

7.3 Flood Defences

Records within 250m

0

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

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

7.4 Areas Benefiting from Flood Defences

Records within 250m

0

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

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

7.5 Flood Storage Areas

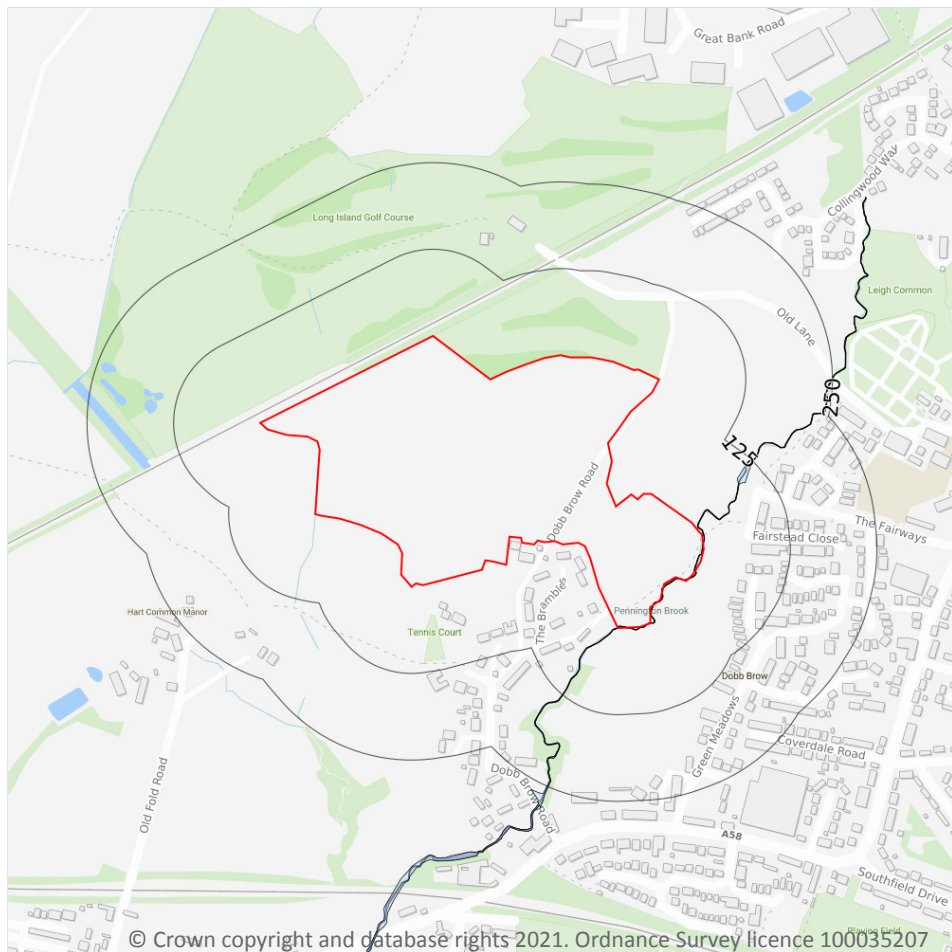
Records within 250m

0

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

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

River and coastal flooding - Flood Zones



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

7.6 Flood Zone 2

Records within 50m

1

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

Features are displayed on the River and coastal flooding map on **page 55**

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

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

7.7 Flood Zone 3

Records within 50m

1

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

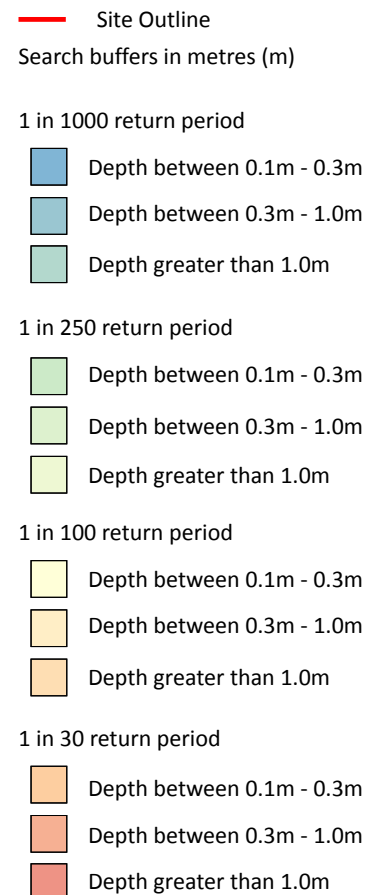
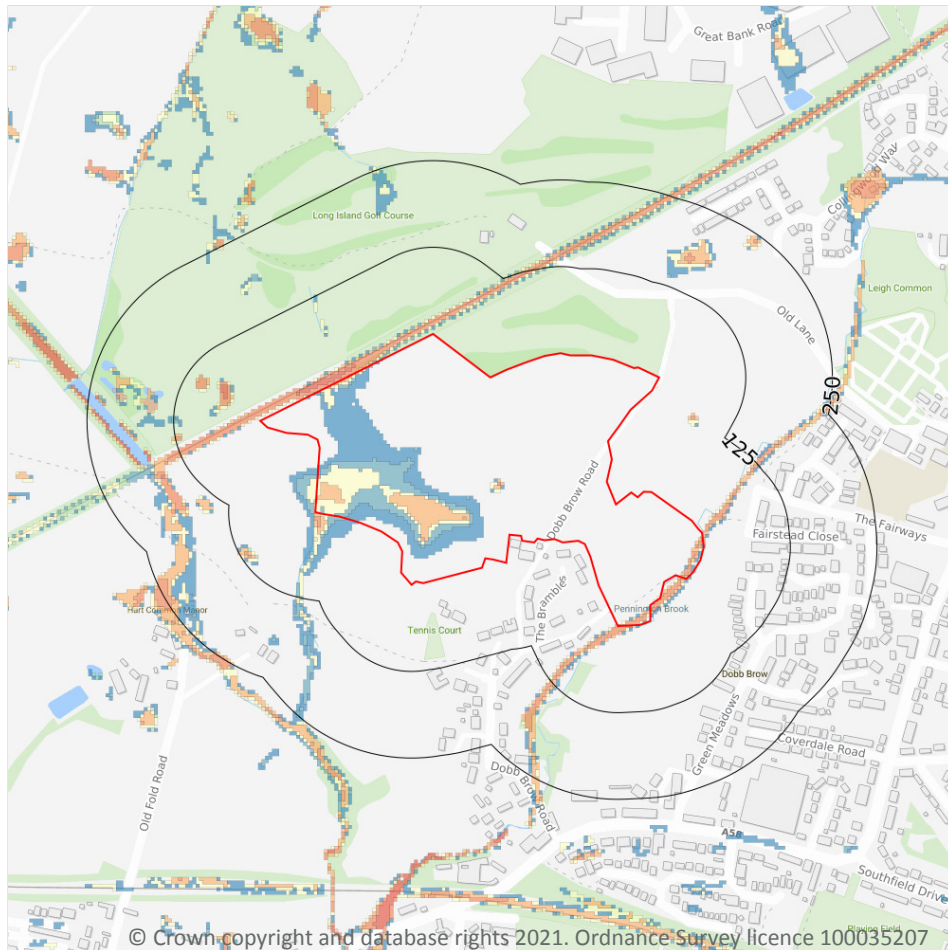
Features are displayed on the River and coastal flooding map on **page 55**

Location	Type
On site	Zone 3 - (Fluvial Models)

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



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.3m - 1.0m

Highest risk within 50m

1 in 30 year, Greater than 1.0m

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

Features are displayed on the Surface water flooding map on **page 59**

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

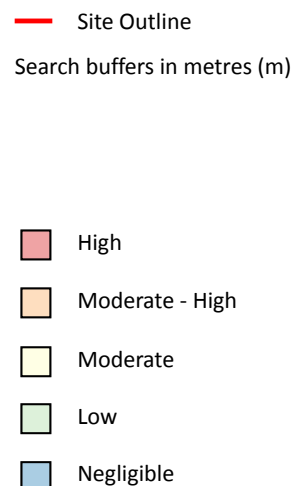
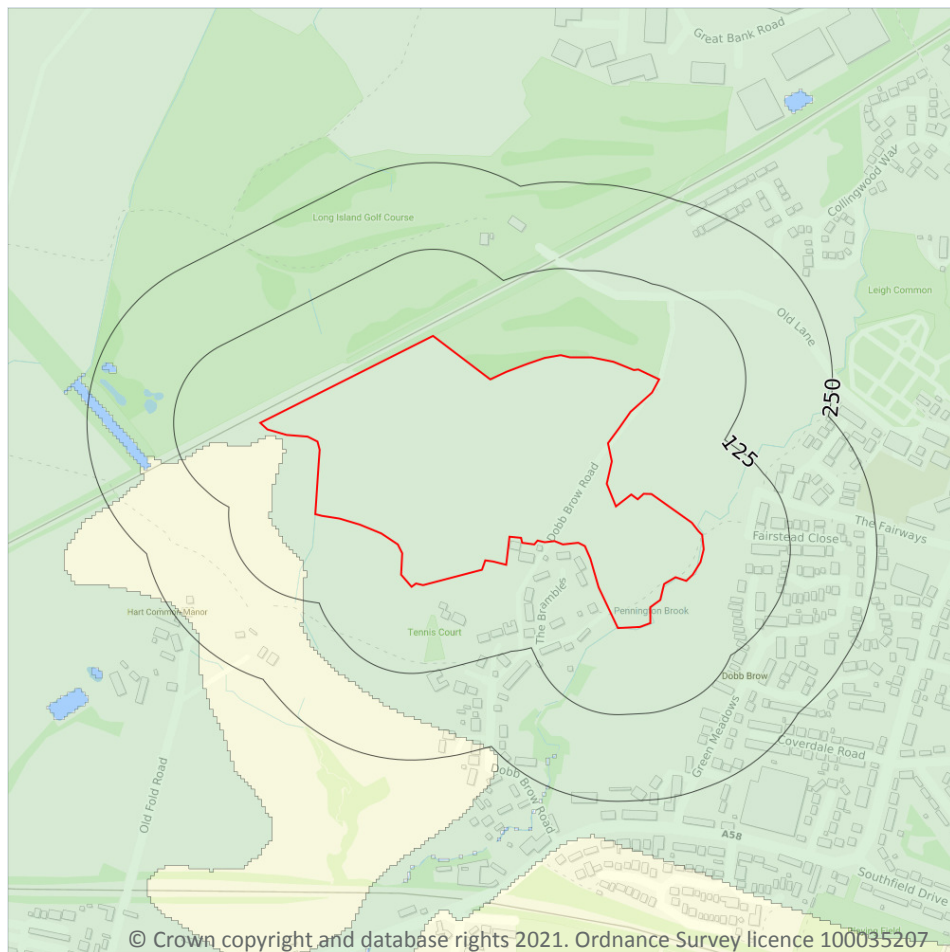
The table below shows the maximum flood depths for a range of return periods for the site.

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

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

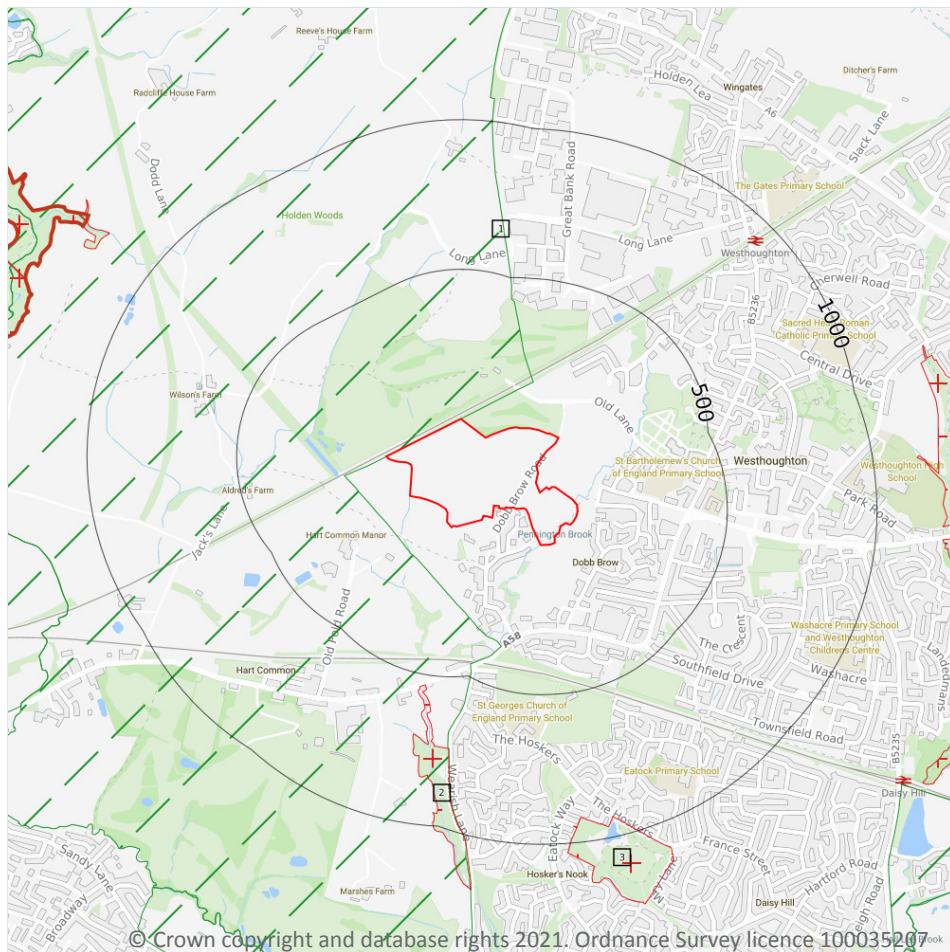
Moderate

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

Features are displayed on the Groundwater flooding map on **page 61**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



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

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m**0**

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

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

10.5 National Nature Reserves (NNR)

Records within 2000m**0**

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

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

10.6 Local Nature Reserves (LNR)

Records within 2000m

5

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

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

ID	Location	Name	Data source
2	534m S	Cunningham Clough Brook	Natural England
3	917m S	Eatock Lodge	Natural England
4	1148m E	Hall Lee Brook	Natural England
6	1188m NW	Borsdane Wood	Natural England
7	1224m E	Hall Lee Bank Park	Natural England

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

10.7 Designated Ancient Woodland

Records within 2000m

2

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 62**

ID	Location	Name	Woodland Type
8	1273m NW	Borsdane Wood	Ancient & Semi-Natural Woodland
-	1485m W	Unknown	Ancient & Semi-Natural Woodland

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

10.8 Biosphere Reserves

Records within 2000m

0

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



local community.

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

10.9 Forest Parks

Records within 2000m

0

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

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

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

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

10.11 Green Belt

Records within 2000m

6

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

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

ID	Location	Name	Local Authority name
1	On site	Liverpool and Manchester	Bolton
5	1171m W	Liverpool and Manchester	Wigan
9	1405m SE	Liverpool and Manchester	Bolton
11	1503m SW	Liverpool and Manchester	Wigan
-	1827m S	Liverpool and Manchester	Wigan
-	1927m SE	Liverpool and Manchester	Bolton

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

7

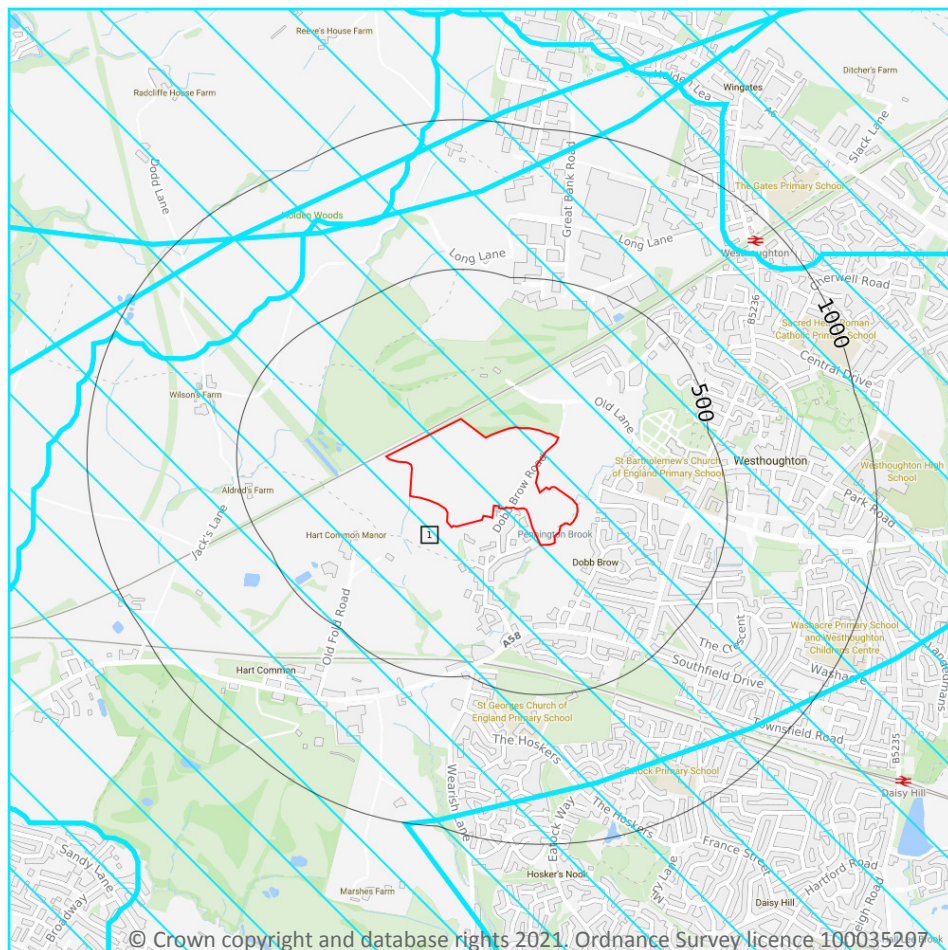
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	River Glaze NVZ	Surface Water	S641	Existing
On site	River Glaze NVZ	Surface Water	S641	Existing
86m NW	River Glaze NVZ	Surface Water	S641	Existing
86m SW	River Glaze NVZ	Surface Water	S641	Existing
605m NW	Pennington Flash Eutrophic lake NVZ	Eutrophic Water	EL138	New
744m SW	Pennington Flash Eutrophic lake NVZ	Eutrophic Water	EL138	New
1059m N	Pennington Flash Eutrophic lake NVZ	Eutrophic Water	EL138	New

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 68**

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t. 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

This data is sourced from Natural England.

10.18 SSSI Units

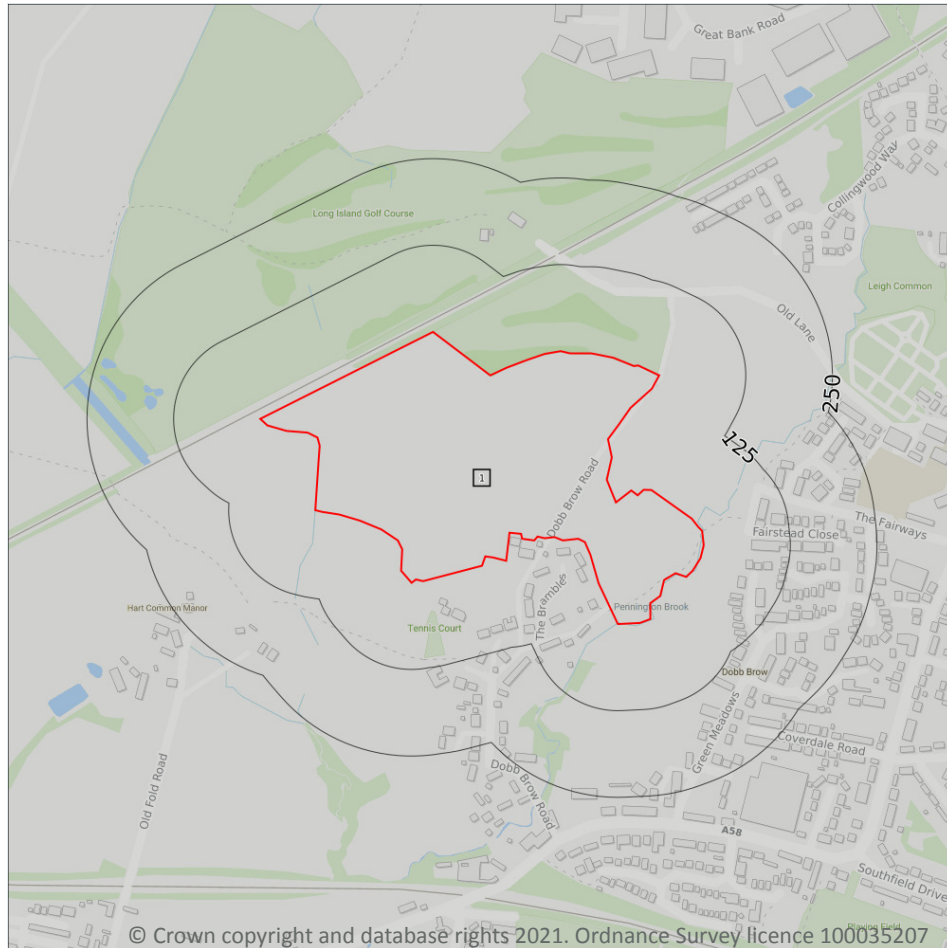
Records within 2000m	0
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management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

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



11 Visual and cultural designations



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

11.1 World Heritage Sites

Records within 250m

0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m**0**

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

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

11.3 National Parks

Records within 250m**0**

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

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

11.4 Listed Buildings

Records within 250m**0**

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

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

11.5 Conservation Areas

Records within 250m**1**

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



Features are displayed on the Visual and cultural designations map on **page 70**

ID	Location	Name	District	Date of designation
1	On site	The Local Authority for this area have not supplied conservation area data.		-

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

11.6 Scheduled Ancient Monuments

Records within 250m	0
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A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

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

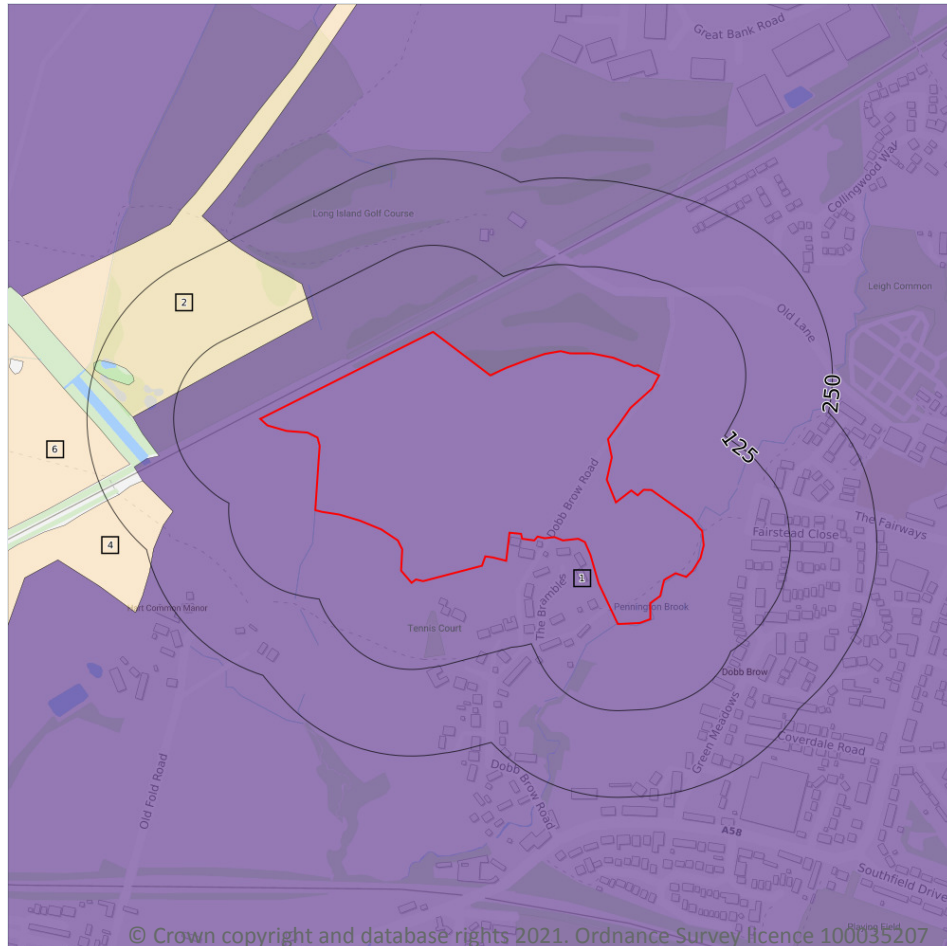
11.7 Registered Parks and Gardens

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

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

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

12 Agricultural designations



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

12.1 Agricultural Land Classification

Records within 250m

4

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 73**

ID	Location	Classification	Description
1	On site	Urban	-
2	91m NW	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.



ID	Location	Classification	Description
4	183m SW	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
6	199m W	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m

0

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

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

12.3 Tree Felling Licences

Records within 250m

0

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

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment.

This data is sourced from Natural England.



12.5 Countryside Stewardship Schemes

Records within 250m

0

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

This data is sourced from Natural England.



13 Habitat designations



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

13.1 Priority Habitat Inventory

Records within 250m

4

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

Features are displayed on the Habitat designations map on **page 76**

ID	Location	Main Habitat	Other habitats
1	153m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	169m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	174m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	179m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)



This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m

0

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

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

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

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

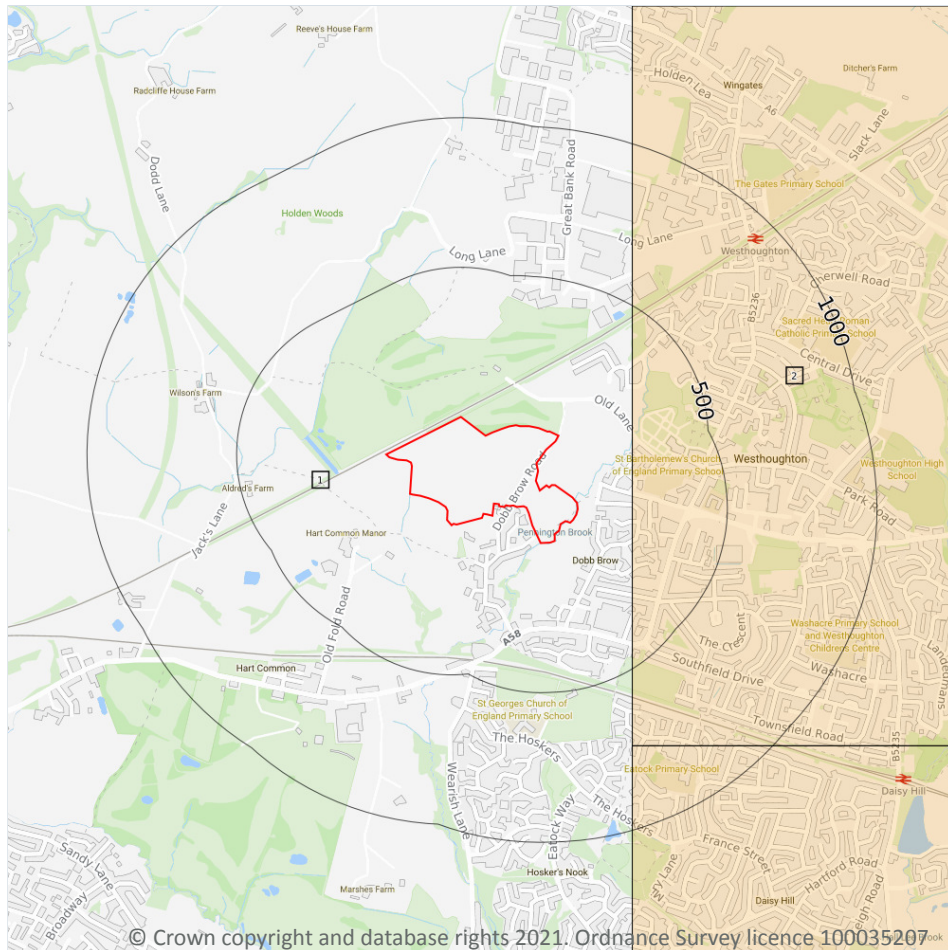
0

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

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



- Site Outline**
- Search buffers in metres (m)
- Full coverage
 - Partial coverage
 - No coverage

14.1 10k Availability

Records within 500m

2

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

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 78**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov
2	182m E	Full	Partial	Full	Full	SD60NE

This data is sourced from the British Geological Survey.



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

14.2 Artificial and made ground (10k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

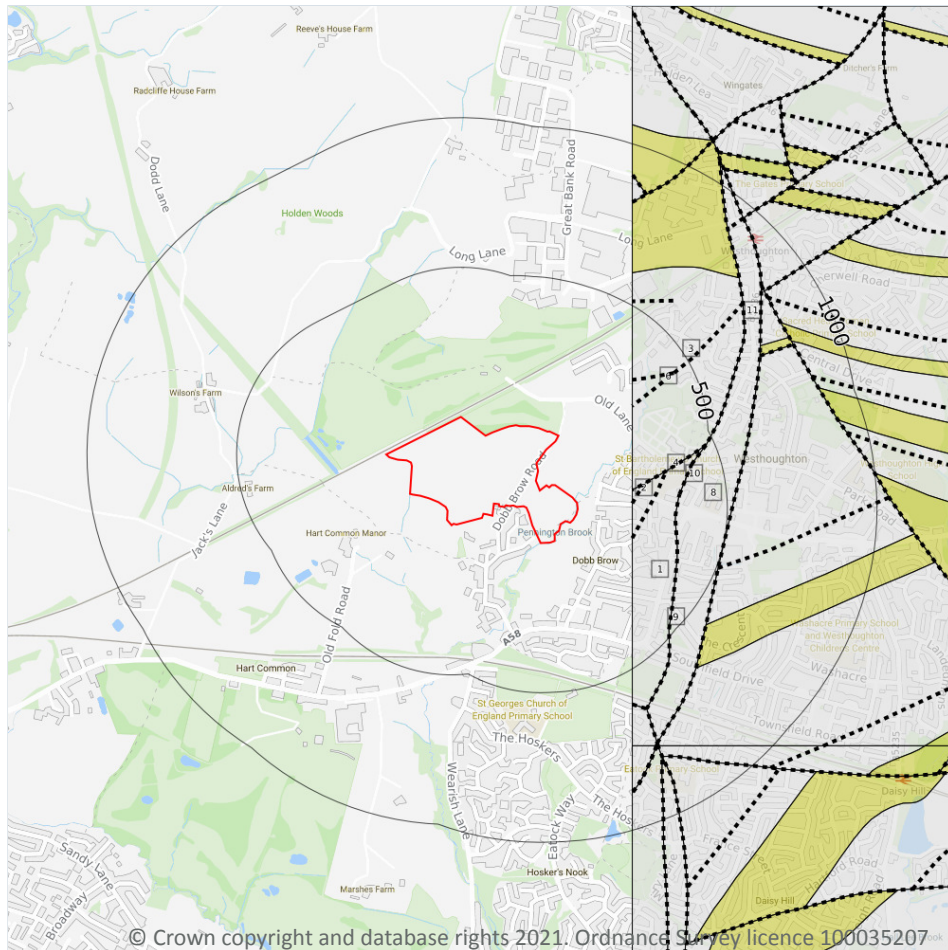
0

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

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

3

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

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 81**

ID	Location	LEX Code	Description	Rock age
1	182m E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
3	190m E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age

ID	Location	LEX Code	Description	Rock age
8	327m E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	8
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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.

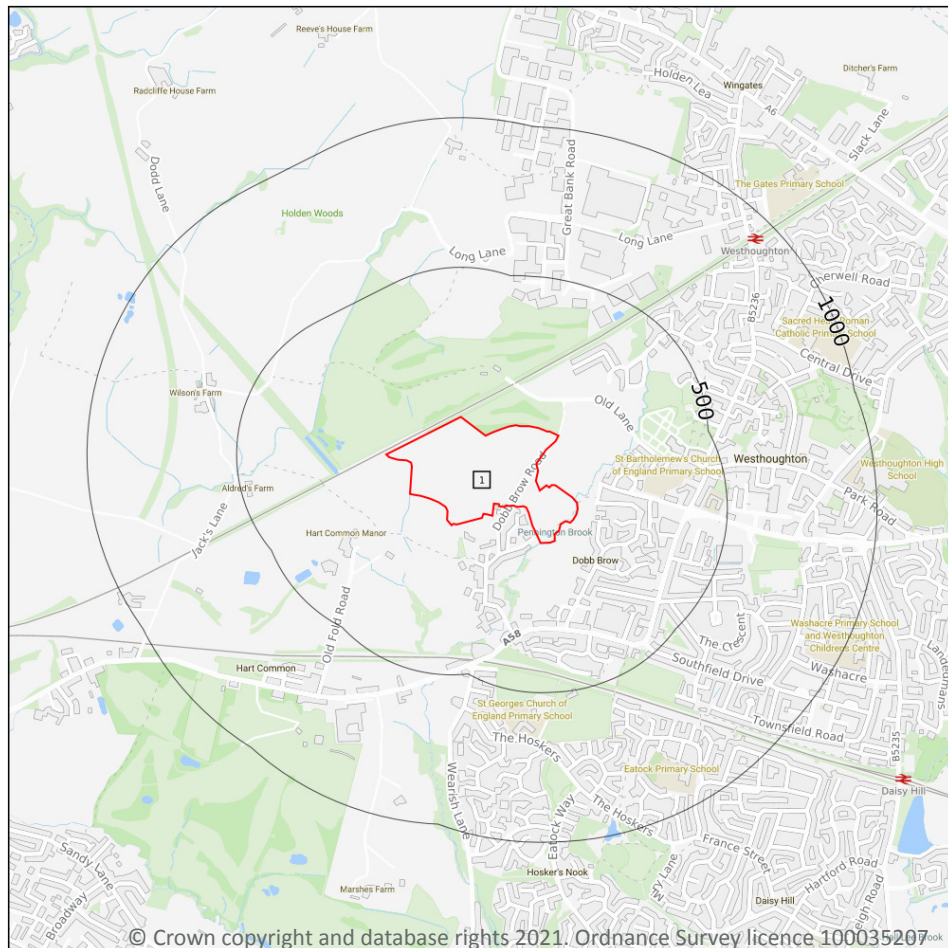
Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 81**

ID	Location	Category	Description
2	183m E	ROCK	Coal seam, inferred
4	190m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
5	203m SE	ROCK	Coal seam, inferred
6	266m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
7	309m NE	ROCK	Coal seam, inferred
9	327m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
10	344m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
11	404m E	FAULT	Normal fault, inferred; crossmarks on downthrow side

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 83**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW084_wigan_v4

This data is sourced from the British Geological Survey.



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

15.2 Artificial and made ground (50k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

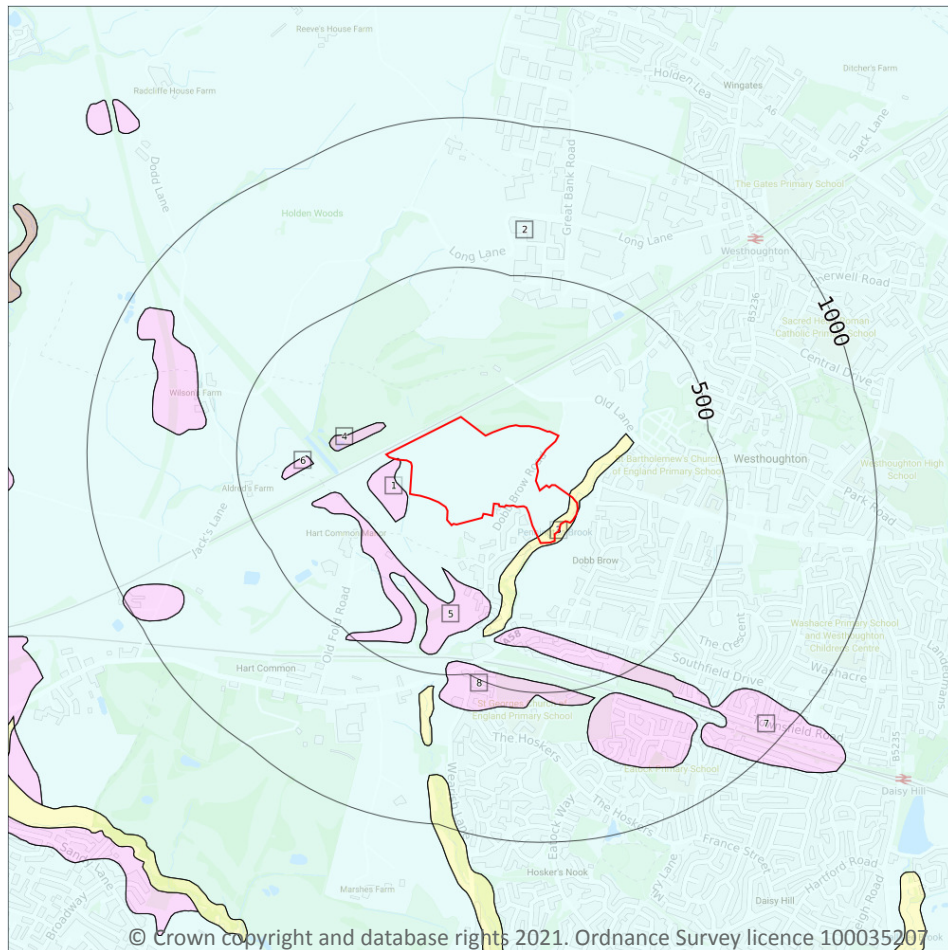
0

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

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

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

15.4 Superficial geology (50k)

Records within 500m

8

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 85**

ID	Location	LEX Code	Description	Rock description
1	On site	GFICD-XSV	GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN	SAND AND GRAVEL
2	On site	TILLD-CSVZ	TILL, DEVENSIAN	CLAY, SANDY, GRAVELLY, SILTY
3	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
4	79m NW	GFICD-XSV	GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN	SAND AND GRAVEL



ID	Location	LEX Code	Description	Rock description
5	147m S	GFICD-XSV	GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN	SAND AND GRAVEL
6	245m W	GFICD-XSV	GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN	SAND AND GRAVEL
7	287m S	GFICD-XSV	GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN	SAND AND GRAVEL
8	454m S	GFICD-XSV	GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN	SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	2
---------------------------	----------

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of 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
5m SW	Intergranular	Very High	High

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0
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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)

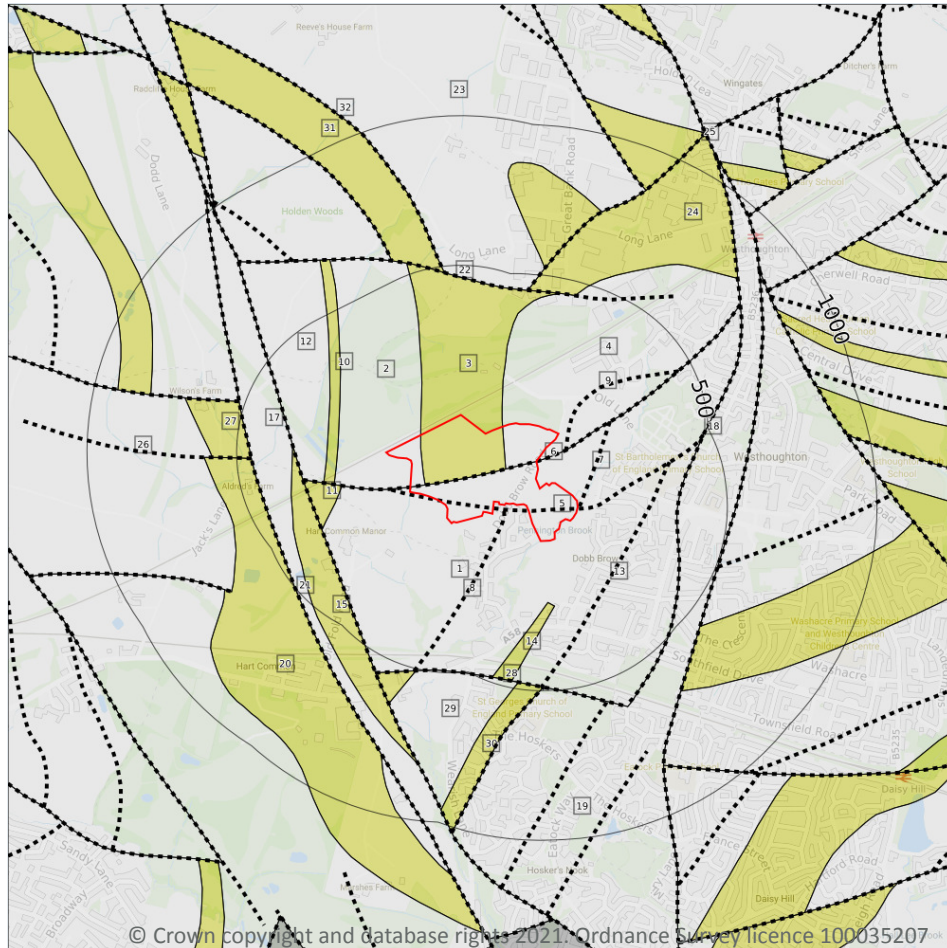
Records within 50m	0
---------------------------	----------

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

18

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 87**

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-MDST	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE	WESTPHALIAN
2	On site	PLCM-MDST	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE	WESTPHALIAN
3	On site	CAR-SDST	CANNEL ROCK (SOUTH LANCASHIRE) - SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
4	On site	PLCM-MDST	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE	WESTPHALIAN
10	163m W	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
11	185m SW	CAR-SDST	CANNEL ROCK (SOUTH LANCASHIRE) - SANDSTONE	WESTPHALIAN
12	198m W	PLCM-MDST	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE	WESTPHALIAN
14	206m S	TRBR-SDST	TRENCHERBONE ROCK - SANDSTONE	WESTPHALIAN
15	293m W	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
17	314m W	PLCM-MDST	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE	WESTPHALIAN
19	332m E	PLCM-MDST	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE	WESTPHALIAN
20	440m W	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
23	445m N	PLCM-MDST	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE	WESTPHALIAN
24	445m N	CAR-SDST	CANNEL ROCK (SOUTH LANCASHIRE) - SANDSTONE	WESTPHALIAN
27	451m W	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
29	477m S	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
30	478m S	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
31	478m N	CAR-SDST	CANNEL ROCK (SOUTH LANCASHIRE) - SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

2

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



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

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

15

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

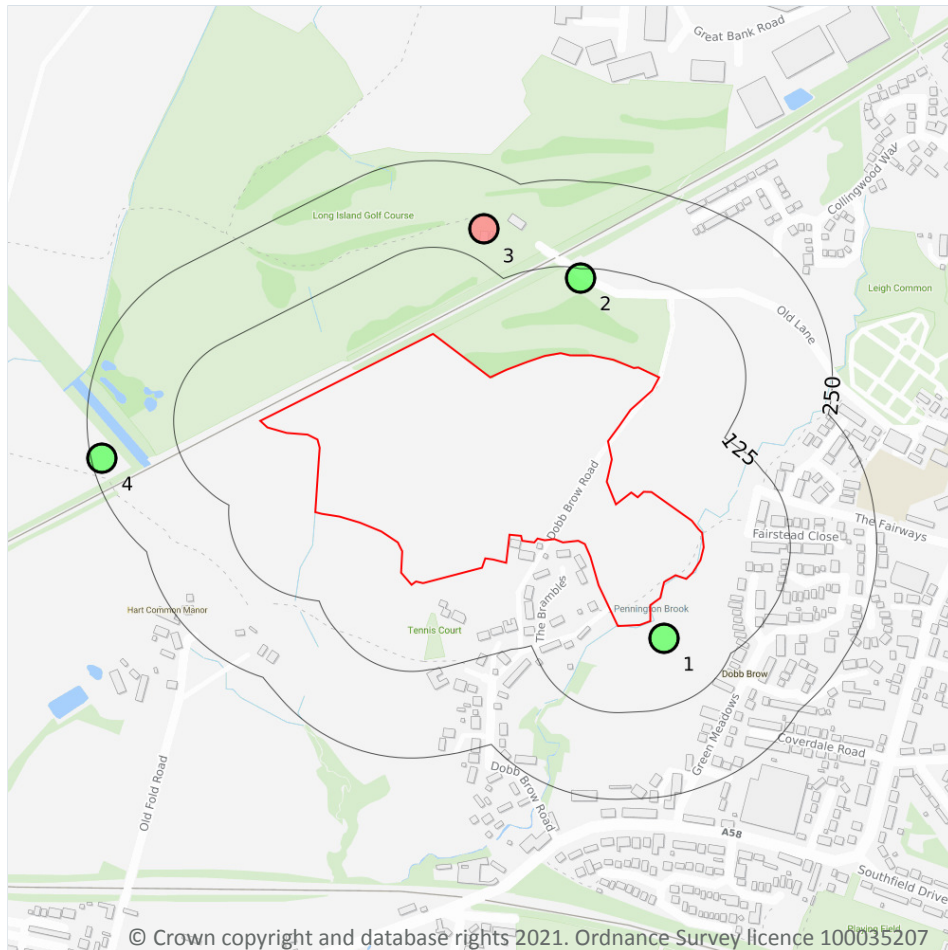
Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 87**

ID	Location	Category	Description
5	On site	FAULT	Fault, inferred
6	On site	FAULT	Fault, inferred
7	5m E	ROCK	Coal seam, inferred
8	15m S	ROCK	Coal seam, inferred
9	32m E	ROCK	Coal seam, inferred
13	206m SE	ROCK	Coal seam, inferred
16	293m W	FAULT	Fault, inferred
18	332m E	FAULT	Fault, inferred
21	440m W	FAULT	Fault, inferred
22	445m N	FAULT	Fault, inferred
25	446m N	FAULT	Fault, inferred
26	451m W	FAULT	Fault, inferred
28	477m S	FAULT	Fault, inferred
32	478m N	ROCK	Coal seam, inferred
33	488m S	ROCK	Coal seam, inferred

This data is sourced from the British Geological Survey.



16 Boreholes



— Site Outline
Search buffers in metres (m)

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

16.1 BGS Boreholes

Records within 250m

4

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 90**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	31m SE	364760 405660	WESTHOUGHTON SEWER 5	11.58	N	14009
2	112m N	364640 406180	WESTHOUGHTON SEWER 4	18.59	N	14008
3	168m NE	364500 406250	WESTHOUGHTON GOLF CLUB	55.0	N	15573780

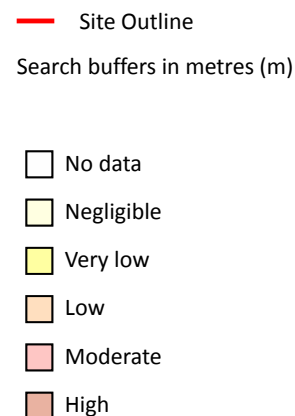
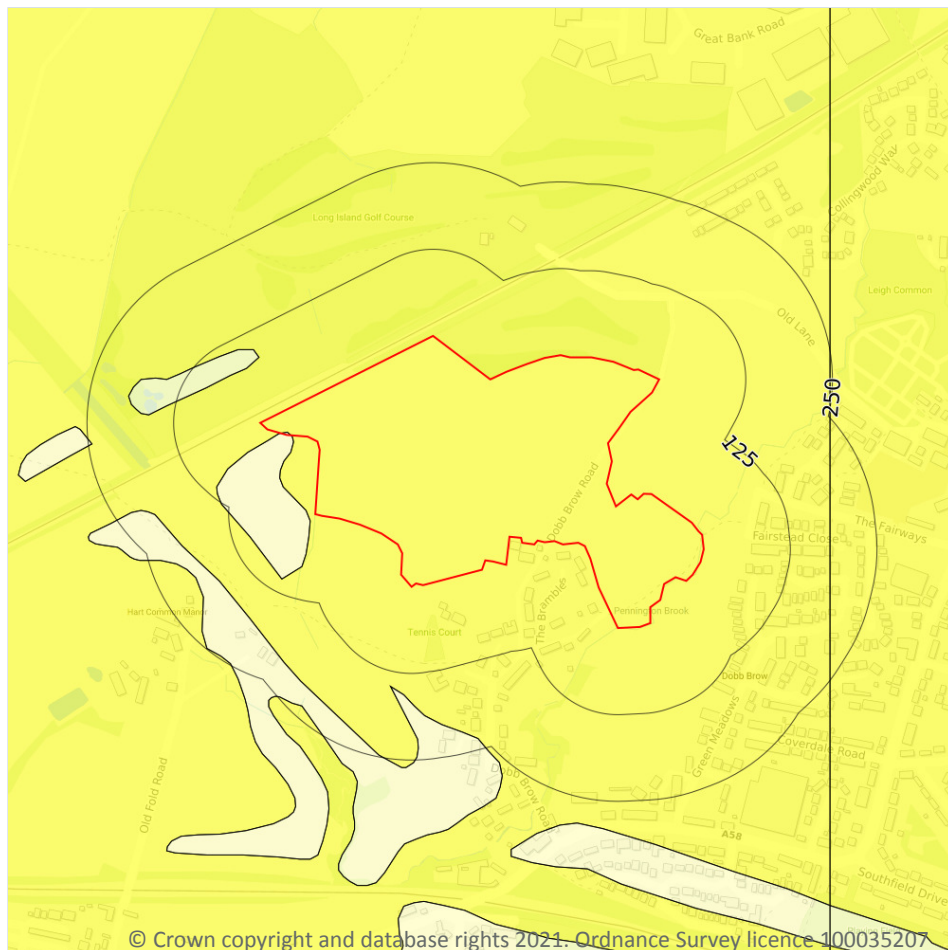


ID	Location	Grid reference	Name	Length	Confidential	Web link
4	234m W	363950 405920	WESTHOUGHTON 10	11.0	N	14136

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

2

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

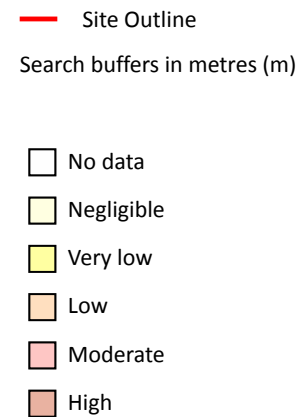
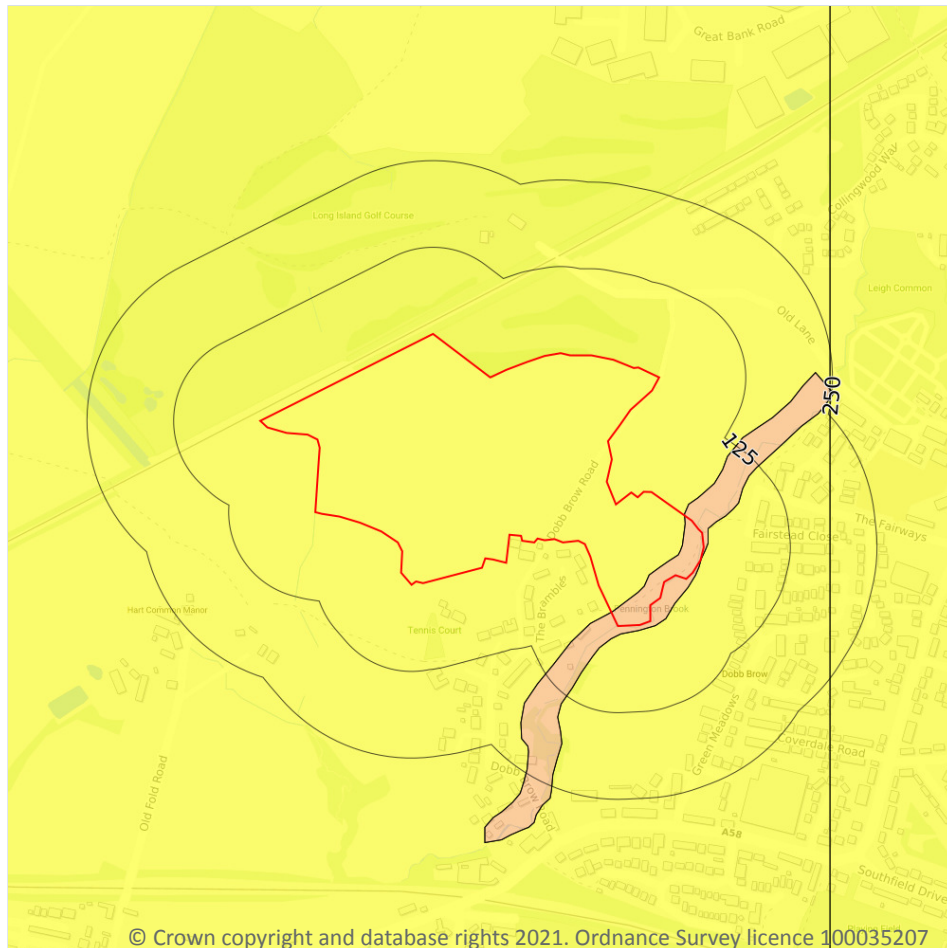
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 92**

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



17.2 Running sands

Records within 50m

2

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 93**

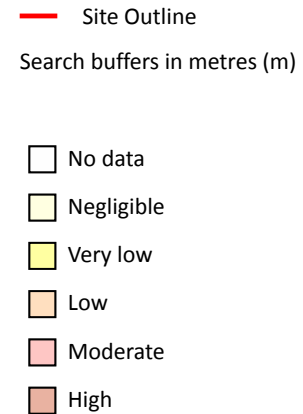
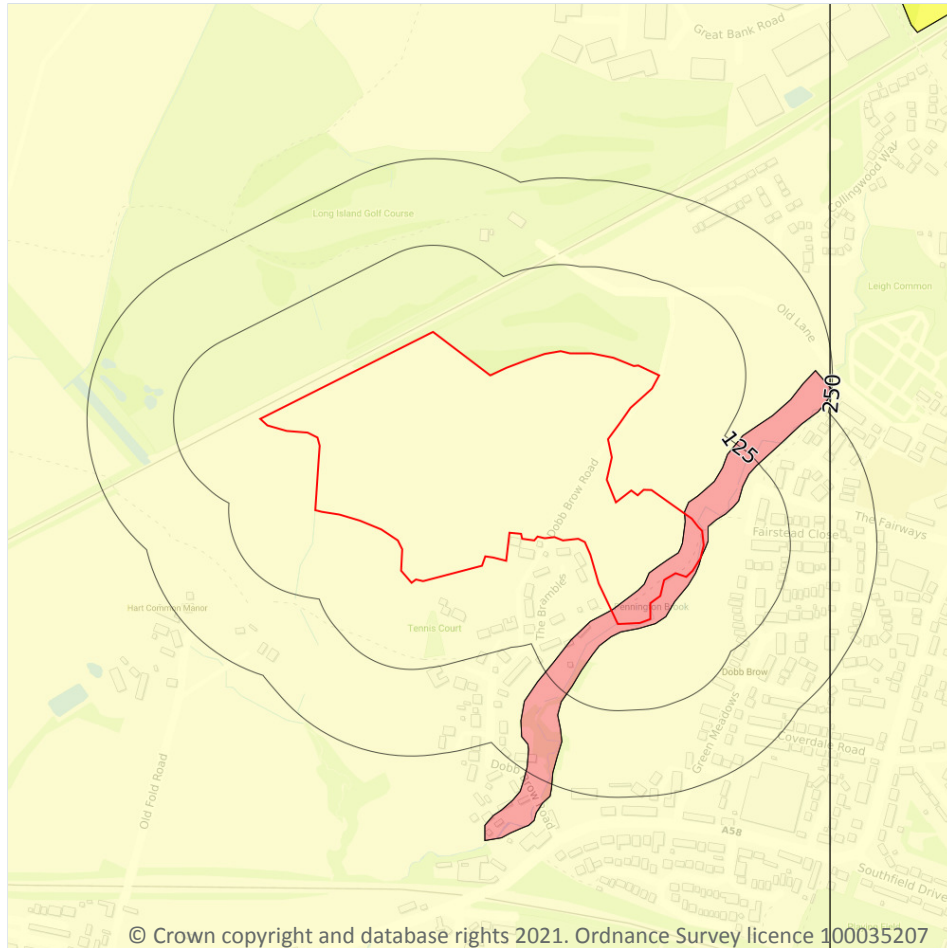
Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

Location	Hazard rating	Details
On site	Low	Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

2

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 95**

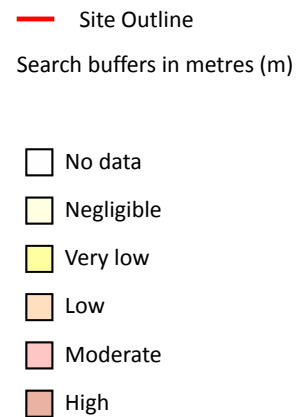
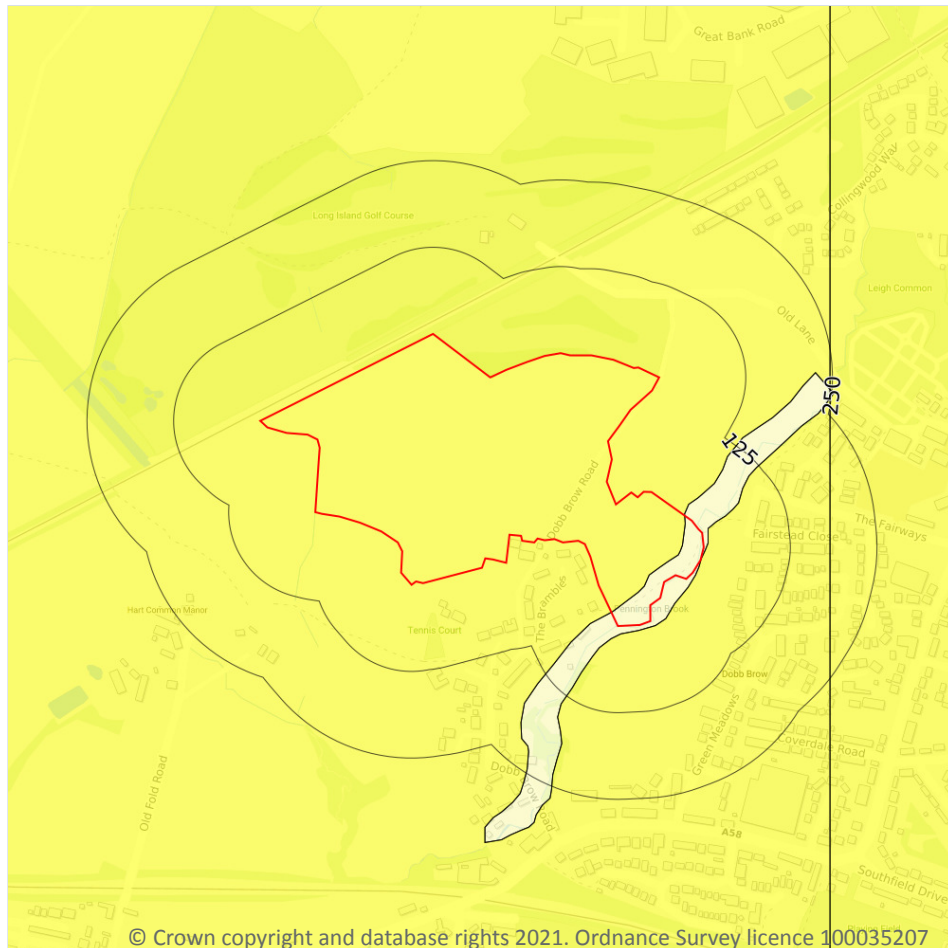
Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.
On site	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.



This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m

2

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.

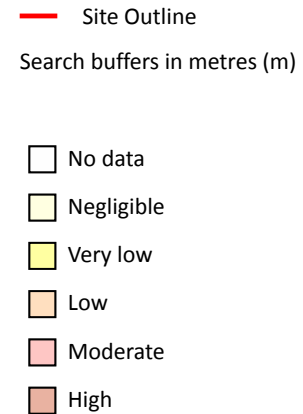
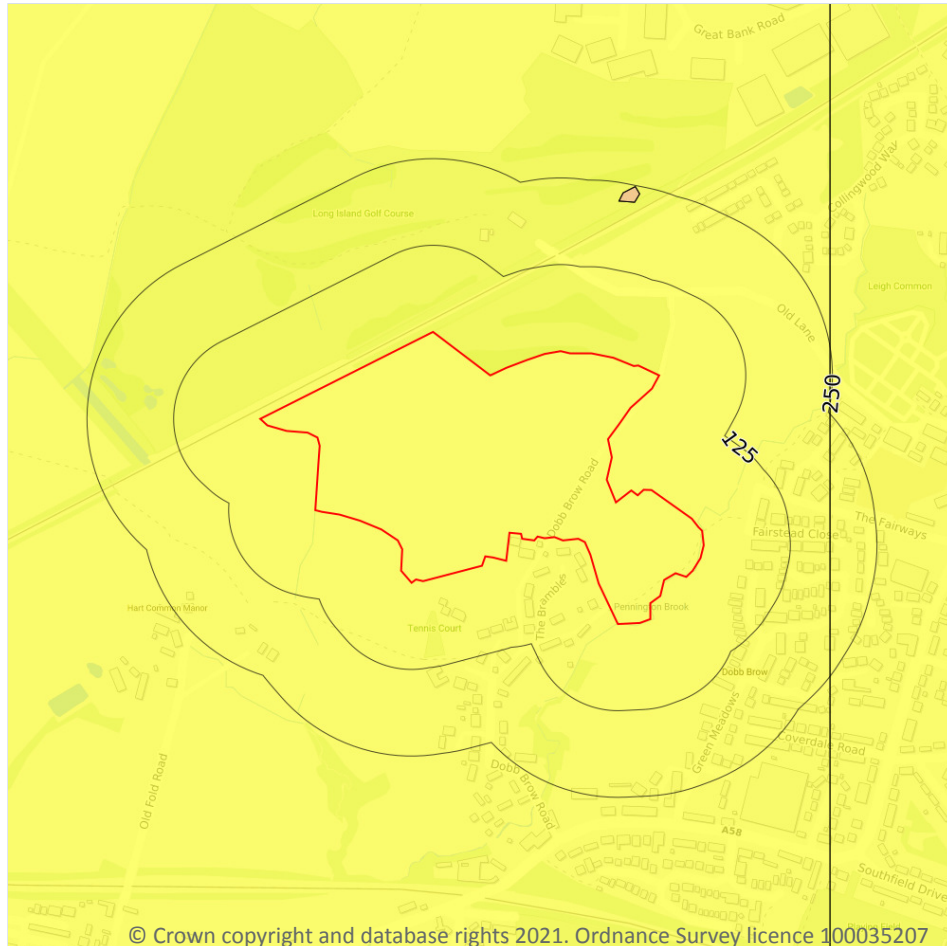
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 97**

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not to be present.
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.

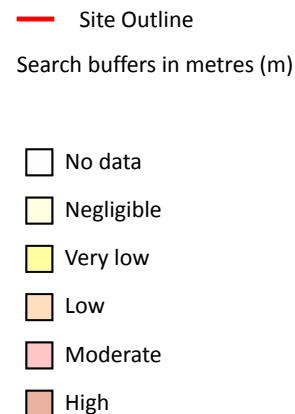
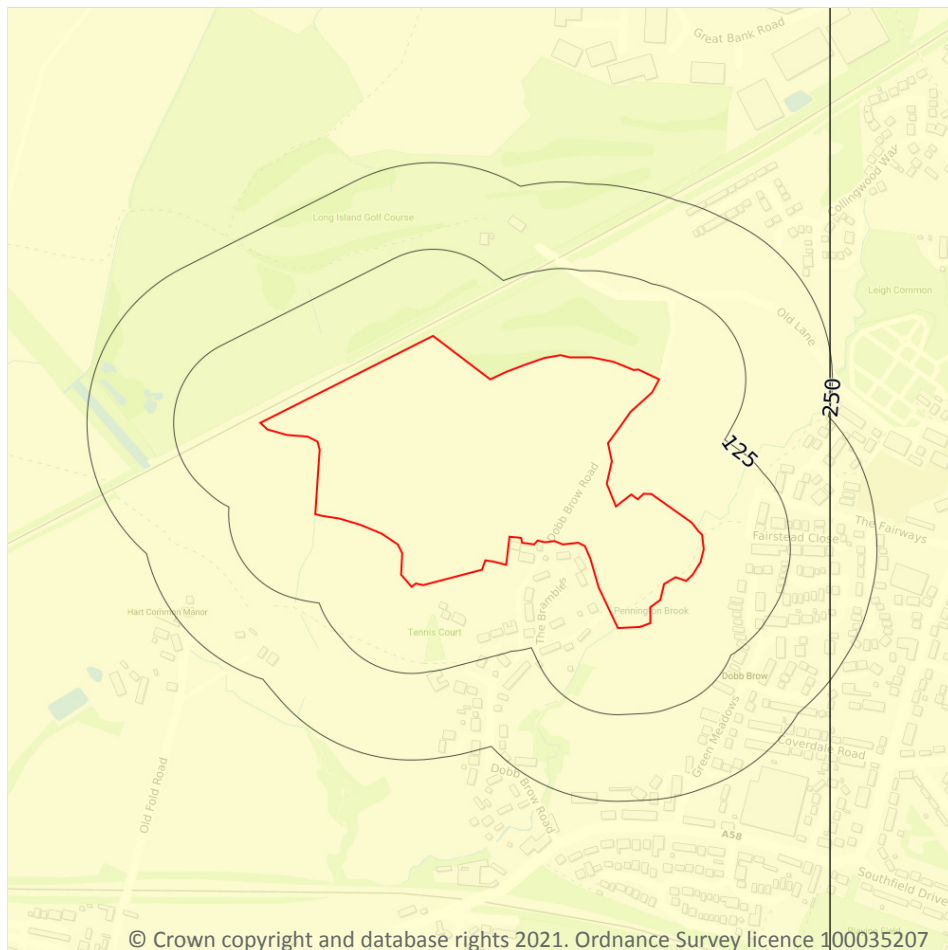
Features are displayed on the Natural ground subsidence - Landslides map on **page 98**

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.

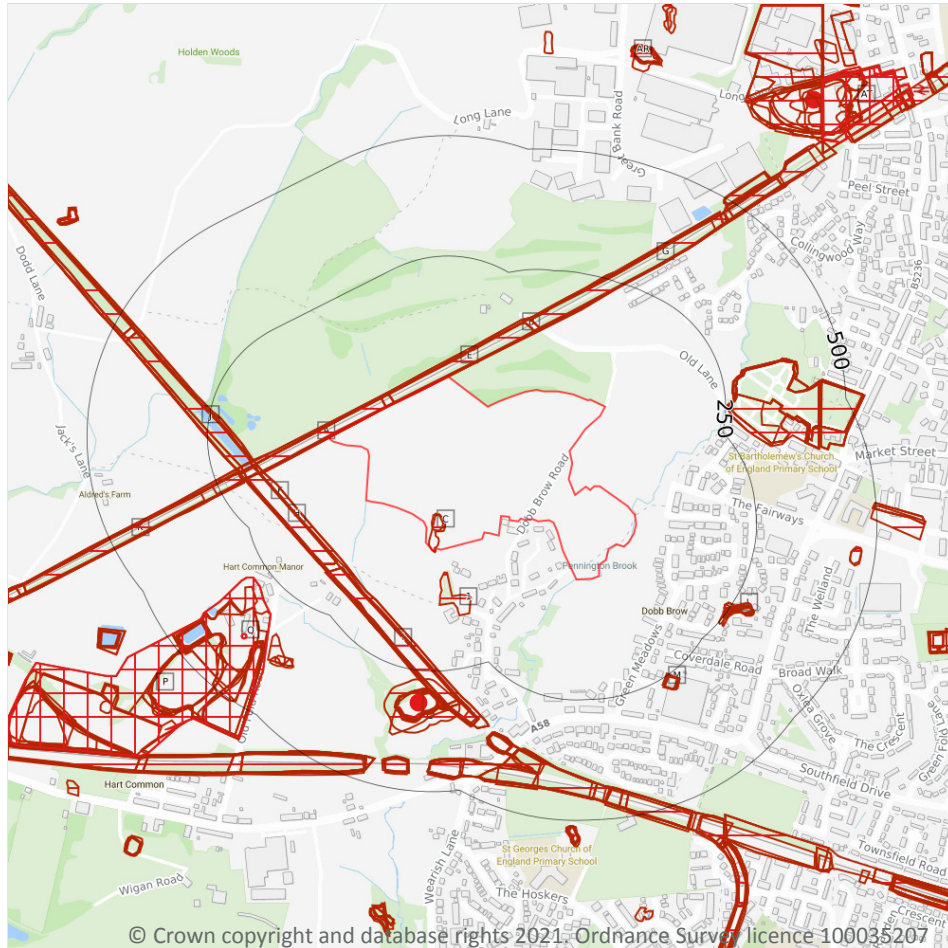
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 99**

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

This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities



- Site Outline
- Search buffers in metres (m)
- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities
- Non Coal Mining
- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m

0

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

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

18.2 BritPits

Records within 500m

1

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 100**

ID	Location	Details	Description
O	316m S	Name: Dobb Brow Address: Westhoughton, BOLTON, Lancashire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

53

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 100**

ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Cuttings	1928	1:10560
A	On site	Cuttings	1938	1:10560
A	On site	Cuttings	1907	1:10560
A	On site	Cuttings	1892	1:10560
A	On site	Cuttings	1928	1:10560
B	On site	Cuttings	1965	1:10560
B	On site	Cuttings	1977	1:10000
B	On site	Cuttings	1988	1:10000
C	On site	Pond	1892	1:10560
C	On site	Pond	1948	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
D	1m NW	Cuttings	1948	1:10560
E	1m NW	Cuttings	1928	1:10560
E	1m NW	Cuttings	1938	1:10560
E	1m NW	Cuttings	1907	1:10560
E	1m NW	Cuttings	1892	1:10560
D	2m NW	Cuttings	1953	1:10560
1	48m S	Ponds	1948	1:10560
F	120m SW	Cuttings	1965	1:10560
F	120m SW	Cuttings	1977	1:10000
F	120m SW	Cuttings	1988	1:10000
F	126m SW	Cuttings	1953	1:10560
G	127m N	Cuttings	1928	1:10560
G	127m N	Cuttings	1938	1:10560
G	127m N	Cuttings	1907	1:10560
G	127m N	Cuttings	1892	1:10560
H	130m SW	Cuttings	1928	1:10560
H	130m SW	Cuttings	1938	1:10560
H	130m SW	Cuttings	1907	1:10560
H	130m SW	Cuttings	1892	1:10560
F	131m SW	Cuttings	1948	1:10560
I	148m S	Cuttings	1928	1:10560
I	148m S	Cuttings	1938	1:10560
I	148m S	Cuttings	1907	1:10560
I	148m S	Cuttings	1892	1:10560
J	167m W	Cuttings	1928	1:10560
J	167m W	Cuttings	1938	1:10560
J	167m W	Cuttings	1907	1:10560
J	167m W	Cuttings	1892	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
K	199m SW	Cuttings	1928	1:10560
K	199m SW	Cuttings	1938	1:10560
K	199m SW	Cuttings	1907	1:10560
K	199m SW	Cuttings	1892	1:10560
K	200m SW	Cuttings	1953	1:10560
L	239m SE	Pond	1956	1:10560
L	239m SE	Pond	1967	1:10560
L	239m SE	Pond	1980	1:10000
L	240m SE	Pond	1907	1:10560
L	244m SE	Pond	1948	1:10560
L	245m SE	Pond	1892	1:10560
M	246m SE	Reservoir	1948	1:10560
L	248m SE	Pond	1938	1:10560
L	248m SE	Pond	1928	1:10560
L	249m SE	Pond	1928	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

10

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 100**

ID	Location	Land Use	Year of mapping	Mapping scale
P	284m SW	Colliery	1928	1:10560
Q	374m SW	Unspecified Disused Shaft	1977	1:10000
Q	374m SW	Unspecified Disused Shaft	1988	1:10000
AR	711m N	Unspecified Old Shaft	1907	1:10560
AT	715m NE	Colliery	1927	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
AT	715m NE	Colliery	1907	1:10560
AT	721m NE	Colliery	1892	1:10560
AT	728m NE	Colliery	1948	1:10560
-	818m S	Colliery	1892	1:10560
-	940m S	Colliery	1907	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m

0

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

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

0

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

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m

0

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

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



18.8 JPB mining areas

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

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

Location	Details
On site	In addition to being located inside an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property which may supplement this information. Further details and a quote for services can be obtained by emailing this report to enquiries.gs@jpb.co.uk .

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	1
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Areas which could be affected by past, current or future coal mining.

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

This data is sourced from the Coal Authority.

18.10 Brine areas

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

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

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

18.11 Gypsum areas

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

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.



18.12 Tin mining

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

Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

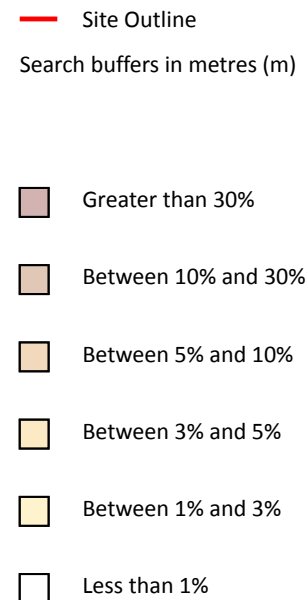
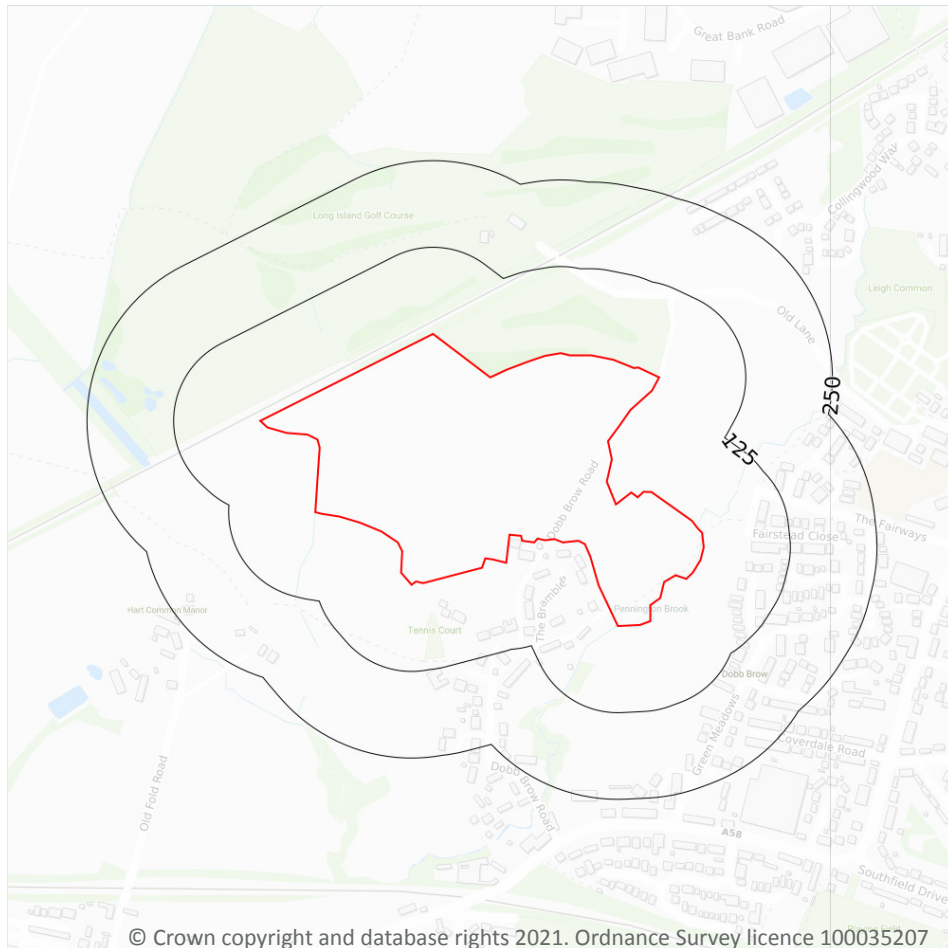
18.13 Clay mining

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

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

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

19 Radon



19.1 Radon

Records on site

1

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

Features are displayed on the Radon map on **page 107**

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

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



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

14

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

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg



Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
5m W	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 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.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

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

This data is sourced from the British Geological Survey.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m

9

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.

Features are displayed on the Railway infrastructure and projects map on **page 110**

Location	Land Use	Year of mapping	Mapping scale
4m NW	Railway	1908	-
7m NE	Railway	1893	-
210m W	Railway Sidings	1892	10560
214m W	Railway Sidings	1893	2500
216m W	Railway Sidings	1928	10560
217m W	Colliery Railway Sidings	1908	2500
219m W	Colliery Railway Sidings	1929	2500
232m S	Railway	1908	-
235m S	Railway	1893	-

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m

0

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

This data is sourced from Groundsure/the Postal Museum.



21.6 Historical railways

Records within 250m

1

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

Features are displayed on the Railway infrastructure and projects map on **page 110**

Location	Description
137m SW	Abandoned

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m

9

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

Features are displayed on the Railway infrastructure and projects map on **page 110**

Location	Name	Type
11m NW	-	rail
13m NW	Not given	Multi Track
15m NW	Not given	Multi Track
15m NW	-	rail
140m N	Not given	Multi Track
154m SW	-	rail
155m W	-	rail
186m SW	-	rail
186m SW	-	rail

This data is sourced from Ordnance Survey and OpenStreetMap.



21.8 Crossrail 1

Records within 500m**0**

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

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m**0**

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

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m**0**

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

This data is sourced from HS2 Ltd.



Data providers

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

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: <https://www.groundsure.com/terms-and-conditions-jan-2020/>.



APPENDIX 6

BGS BOREHOLE LOGS, BGS 6 INCH COUNTY MAP, BGS MINERAL RESOURCE PLANS FOR GREATER MANCHESTER AND THE GREATER MANCHESTER JOINT MINERALS PLAN

C. TEST PUMPING SUMMARY (Please supply full details on Form WR - 39)

5D60/186

Test Pumping Datum (if different from borehole datum)	GROUND LEVEL ^{above} m below borehole datum (mbd)	
Pump Suction Depth	<u>36</u>	mbd
Water Level (Start of Test)	<u>20.1</u>	mbd
Water Level (End of Test)	<u>27.3</u>	mbd
Pumping rate	<u>6 m³/hour</u>	m ³ /d : l/s
for	<u>48</u>	days/hours
Recovery to (from end of pumping)	<u>20</u> mbd	in <u>3</u> mins : hrs : days
Date(s) of measurements _____		
Please Supply Chemical Analysis If Available		

D. STRATA LOG

Geological Classification	Description of Strata	Thickness	Depth
(BGS only)		m	m
	Grey Clay with boulders	36	0/36
	mudstone	3	36/39
	yellow sandstone	16+	39/55
	[continue on separate page if necessary]		
	Other Comments (eg gas encountered, saline water intercepted, etc)		

FOR OFFICIAL USE ONLY

FILE	CONSENT NO	BGS REF NO
LICENCE NO	USE OF BH	NGR

SUB SOIL SURVEYS LTD.

MANCHESTER

COMMERCIAL

BOREHOLE No. 4

5060NW 143

6464-0618

EXPLORATORY BOREHOLE RECORD

Site Westhoughton.

Boring Method Shell and Auger.

Ground Level 327.390 D.

Date	Water Level	Dia. of casing & depth below ground level	Depth below ground level	STRATA Scale: 10 ft. to one inch.	Type of Sample	Number of Sample	SAMPLING Penetration of Sampler		Number of Blows	Depth of Casing when Sampling
							FROM	TO		
11 Oct		3"	2' 0"	Ash and clinker fill.	o	1	2' 6"			
				Soft/firm to firm yellow brown mottled clay with grey fissures.	o	2	5' 0"			
			7' 6"		o	3	7' 6"			
					o	4	10' 0"			
					o	5	12' 6"			
					o	6	15' 0"			
					o	7	17' 6"			
				Firm/stiff dark brown sandy clay with stone inclusions.	o	8	20' 0"			
					o	9	22' 6"			
					o	10	25' 0"			
11 Oct 1961		9' 0"			o	11	27' 6"			
12 Oct 1961	25' 0"				o	12	30' 0"			
					o	13	30' 0"	31' 6"	60	
					o	14	32' 6"			
					o	15	35' 0"			
					o	16	37' 6"			
					o	17	40' 0"			
					o	18	40' 0"	41' 6"	60	
					o	19	42' 0"			
					o	20	45' 0"			
12 Oct 1961		45' 0"	46' 0"		o	21	47' 6"			
13 Oct 1961	33' 0"		(Approx.)		o	22	50' 0"			
				Very stiff dark brown sandy clay with stone and boulder inclusions.	o	23	50' 0"	50' 7"	200	
					o	24	52' 6"			
					o	25	55' 0"			
					o	26	57' 6"			
13 Oct 1961			61' 0"		o	27	60' 0"	61' 0"	250	
					o	28	60' 0"			

SAMPLES SHOWN THUS: DISTURBED ☐ UNDISTURBED ☒ STANDARD PEN. TEST X WATER SAMPLE ☒

WATER STRUCK AT	CUTTING SHOB	WEIGHT OF SAMPLE HAMMER
1. None struck.	Internal Dia.	
2.	External Dia.	
3.	%age Relief	Height of Drop

REMARKS:

- Chiselling required below
- Water entered hole on the night of 11/10/62 to 25 ft. below ground level (Borehole at 27' 6")
- Further water levels could not be taken as hole had to be backfilled.

Ref. No.

Fig. No.

Checked by
Soils Engineer

Norwest Holst Soil Engineering Ltd.

Borehole No.

9

Contract No. F5028
Location Westhoughton
Client National Coal Board
Method of Boring Shell & Auger
Diameter of Borehole 150mm

BOREHOLE LOG

Sheet 1 of 2
Chainage
Ground Level m.A.O.D.
Date 24/9/81

SD60NW 270

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D. %	Daily Progress
TOPSOIL		0.23					
Stiff orange brown, dark brown silty sandy CLAY with some fine medium gravel and with some organic material.		1.15			0.50		
Firm to stiff grey brown sandy silty CLAY with gravel and cobbles.		4.50			1.30		
Medium dense brown SAND with occasional gravel.		4.65			2.40		
Very stiff grey sandy silty CLAY with gravel.		5.30			3.50		
Very stiff brown silty sandy CLAY with fine medium and coarse sub-angular, sub-rounded gravel.		10.00			4.50	14	
					5.00		
					6.50		
					8.00		
					9.50		

Type of Sample

Is S.P.T. Undisturbed
Ic. C.P.T. Vane
O Jar Water

Remarks (Observations of Ground Water etc.)

Water struck at 4.50m.
Sealed at 5.00m.

9

Sheet 2 of 2

Chainage.....

Ground Level..... m.A.O.D.

Date 24/9/81

Casing	Sampling	"N"/	Daily
--------	----------	------	-------

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

● Bulk **● Piezometer**

Norwest Holst Soil Engineering Ltd.

Borehole No.

10

Contract No. F5028
Location Westhoughton
Client National Coal Board
Method of Boring Shell & Auger
Diameter of Borehole 150mm

BOREHOLE LOG

Sheet 1 of 2
Chainage
Ground Level m.A.O.D.
Date 25/9/81

SD60NW 271

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D. %	Daily Progress
TOPSOIL		0.20					
Firm brown and grey silty CLAY with occasional gravel and traces of sand.					0.50		
		1.80			1.50		
Firm brown silty very sandy CLAY with fine medium and coarse sub-rounded sub-angular gravel.					2.50		
		3.00			3.50		
Firm grey silty CLAY with occasional fine medium coarse gravel and bands of dark grey brown clayey silty sand and pockets of light brown fine sand.					4.50		
		5.20			5.20	15	
Dense grey silty SAND with occasional gravel.					6.50	16	
		7.00			7.00		
Very stiff grey and red brown, with red patches, silty very sandy CLAY with fine medium and coarse, sub-angular sub-rounded gravel.					8.50		
		8.30					
Very stiff brown sandy CLAY.					9.50		
		9.40					
Very stiff pale grey brown laminated fissured silty CLAY.							

Type of Sample

Is S.P.T. ■ Undisturbed
Ic. C.P.T. X Vane
O Jar Δ Water

Remarks (Observations of Ground Water etc.)

Water struck at 3.00m, casing at 3.00m.
Sealed at 7.50m.

Norwest Holst Soil Engineering Ltd.

Borehole No.

10

Contract No. F5028
Location Westhoughton
Client National Coal Board
Method of Boring Shell & Auger
Diameter of Borehole 150mm

BOREHOLE LOG

Sheet 2 of 2

Chainage

Ground Level m.A.O.D.

Date 25/9/81

SD60NW/271

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D. %	Daily Progress
Very stiff light grey CLAY.		10.10					
Dense silty SAND and GRAVEL.		10.30			10.40	114 for 300mm	
Highly weathered brown and grey SANDSTONE-		10.70			11.00	50 for 100mm	
Highly weathered brown SANDSTONE.		11.00					

Type of Sample

Is S.P.T. ☐ Undisturbed
Ic. C.P.T. ☐ Vane
O Jar ☐ Water
● Bulk ☐ Piezometer

Remarks (Observations of Ground Water etc.)

Water struck at 10.10m, casing at 7.50m.

Norwest Holst Soil Engineering Ltd.

Borehole No.

14

Contract No. F5028
Location Westhoughton
Client National Coal Board
Method of Boring Percussion
Diameter of Borehole 150mm

BOREHOLE LOG

Sheet 1 of 2

Chainage

Ground Level m.A.O.D.

Date 21/1/82

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D. %	Daily Progress
TOPSOIL		0.20					
Firm grey sandy gravelly CLAY.		0.90					
Firm to stiff grey brown mottled silty sandy gravelly CLAY with sand pockets and occasional cobbles.					1.00 2.50 4.00 5.50 7.00		
Stiff light brown sandy gravelly CLAY.		7.40			8.50 9.00	90	

Type of Sample

- ☒ S.P.T. ☒ Undisturbed
☒ C.P.T. ☒ Vane
☒ Jar ☒ Water
☒ Bulk ☒ Piezometer

Remarks (Observations of Ground Water etc.)

Borehole dry during drilling.
 Standing level after pulling casing 2.20m.
 Standing level after 24hrs 0.90m.

Norwest Holst Soil Engineering Ltd.

Borehole No.

14

Contract No. F5028
Location Westhoughton
Client National Coal Board
Method of Boring Percussion
Diameter of Borehole 150mm

BOREHOLE LOG

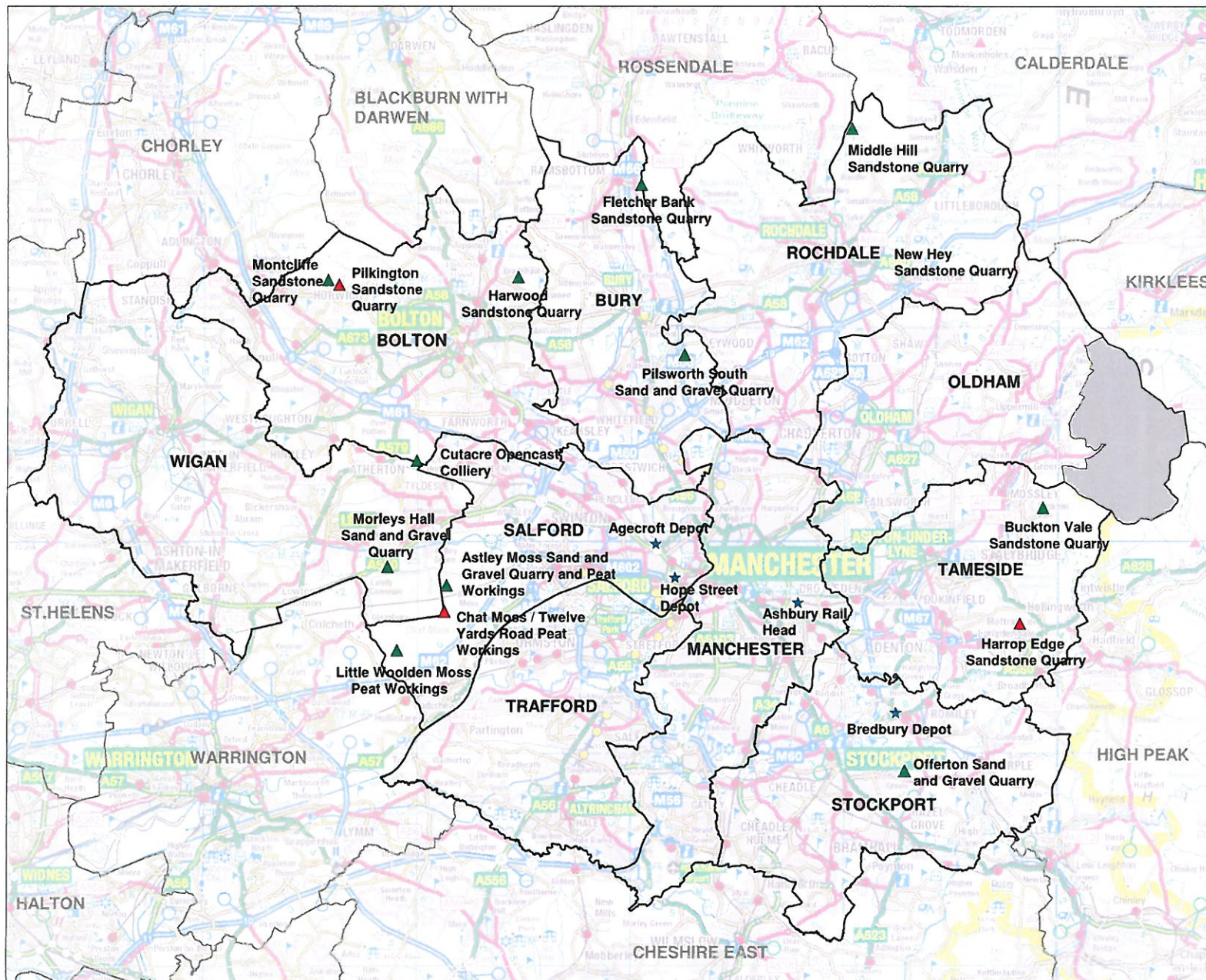
Sheet 2 of 2
Chainage
Ground Level m.A.O.D.
Date 21/1/82

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D.%	Daily Progress
Stiff sandy gravelly CLAY.		10.50			10.00		
Completely weathered light grey silty MUDSTONE.		11.50			11.00		

Type of Sample

- S.P.T. Undisturbed
- C.P.T. Vane
- Jar Water
- Bulk Piezometer

Remarks (Observations of Ground Water etc.)

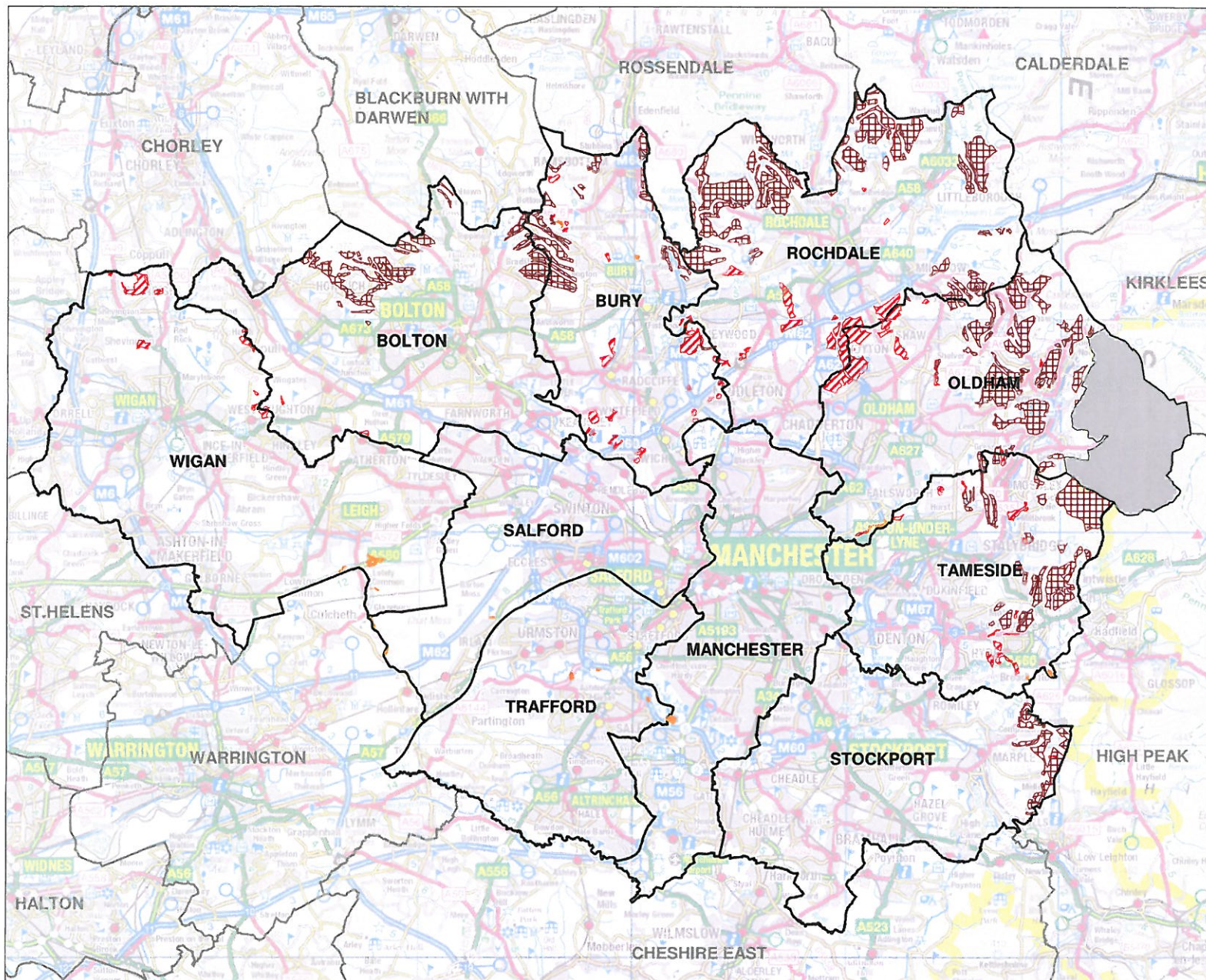


- Greater Manchester Districts
- Neighbouring District Boundaries
- Peak District National Park - although located within Oldham it is not part of the Minerals Plan area
- ▲ Inactive Mineral Extraction Sites
- ▲ Active Mineral Extraction Sites
- ★ Rail Depots

Inactive sites are those which have not been worked at any point within the previous year. In this case January - December 2010.

The following quarries have been identified by the English Heritage BGS Strategic Stone Study (SSS) as being important for maintaining and repairing historic buildings:

Buckton Vale
Harwood Quarry
Fletcher Bank Quarry
Middle Hill Quarry
Montcliffe Quarry

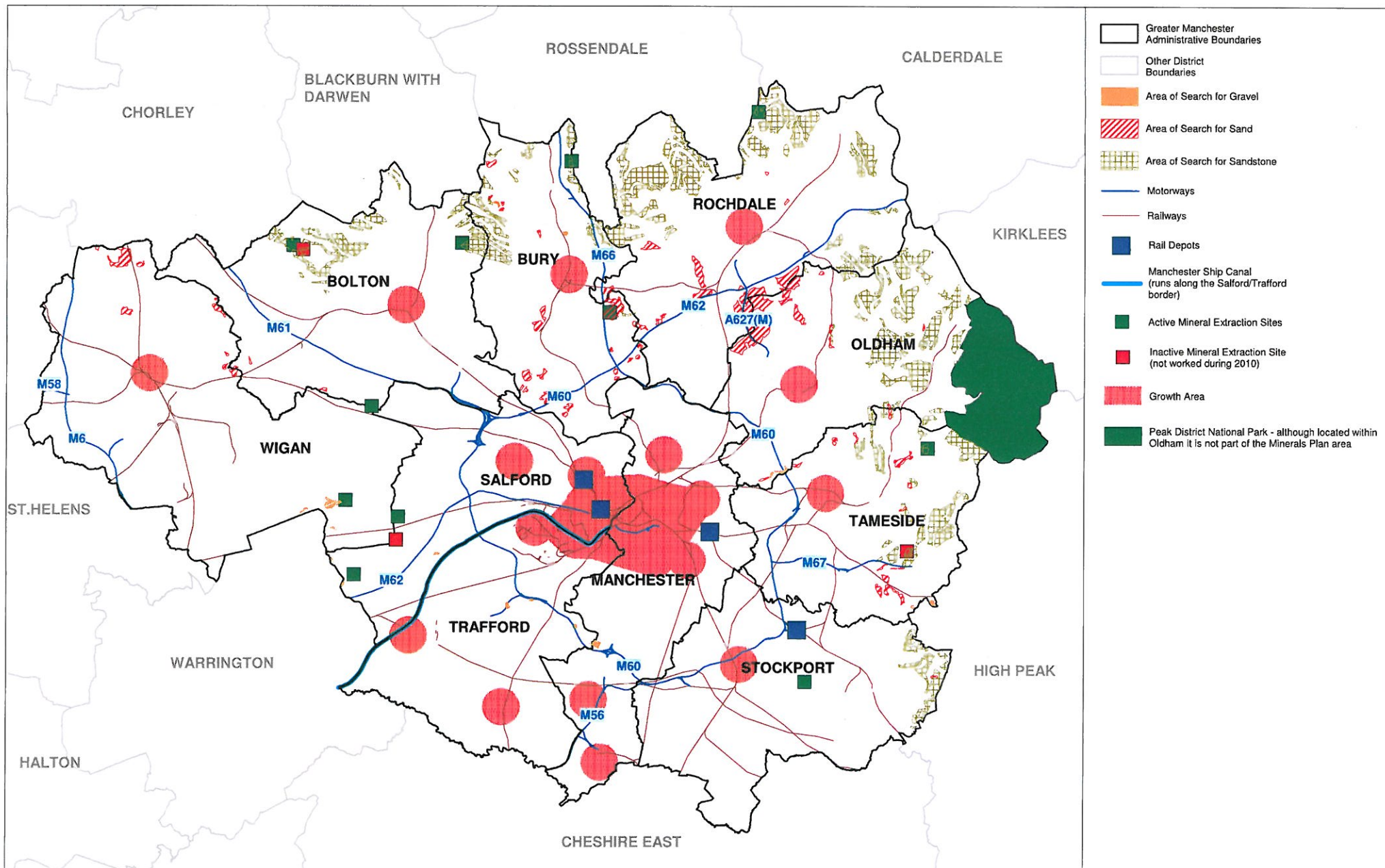


- Neighbouring District Boundaries
- Greater Manchester District Boundaries
- Peak District National Park - although located within Oldham it is not part of the Minerals Plan area
- Area of Search for Sand
- Area of Search for Sandstone
- Area of Search for Gravel

Map 2 - Areas of Search for Minerals in Greater Manchester

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Scale @ A3
1cm = 1.85km

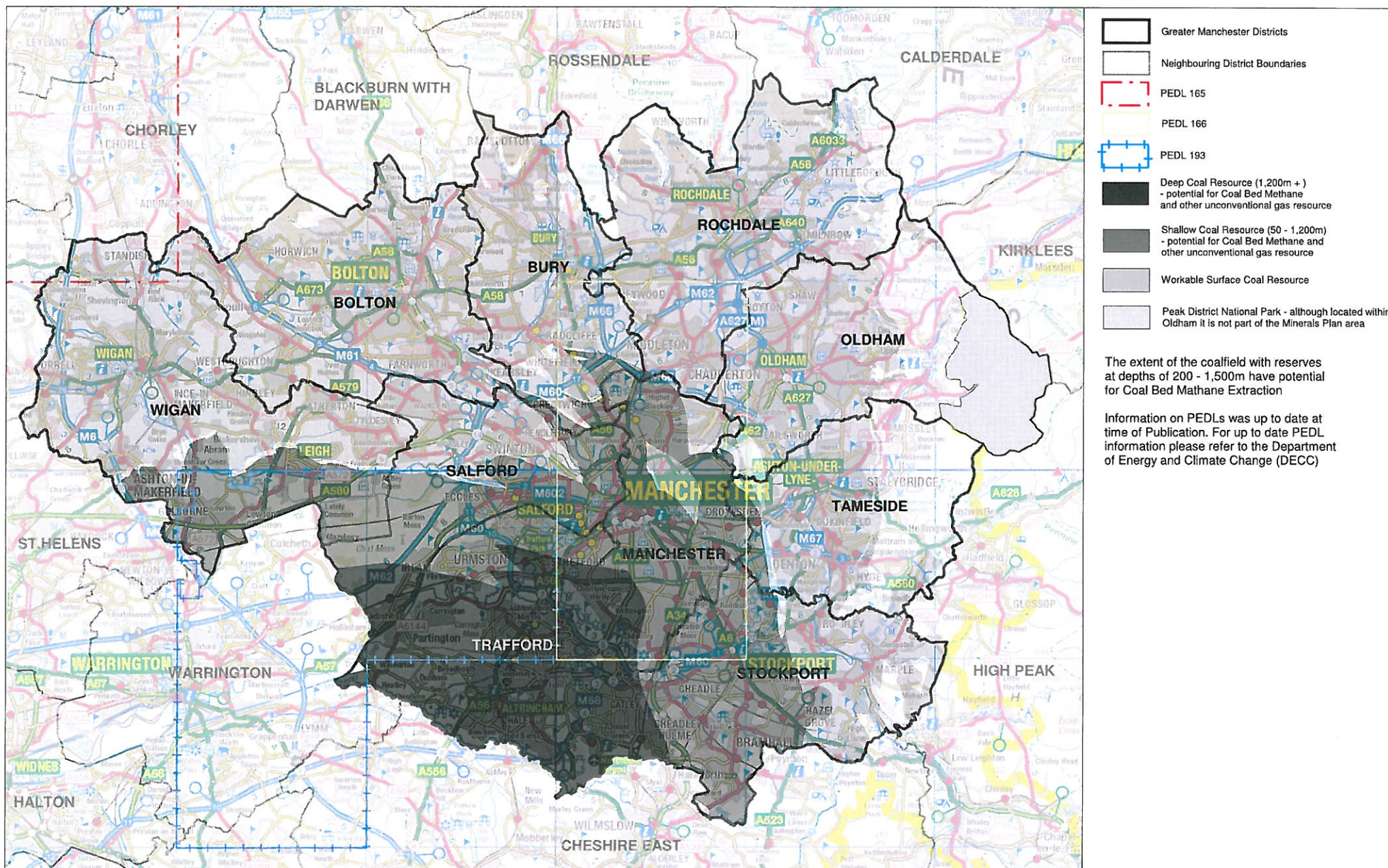


- Greater Manchester Administrative Boundaries
- Other District Boundaries
- Area of Search for Gravel
- Area of Search for Sand
- Area of Search for Sandstone
- Motorways
- Railways
- Rail Depots
- Manchester Ship Canal (runs along the Salford/Trafford border)
- Active Mineral Extraction Sites
- Inactive Mineral Extraction Site (not worked during 2010)
- Growth Area
- Peak District National Park - although located within Oldham it is not part of the Minerals Plan area

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Scale @ A3
 1cm = 1.85km

Map 2a - Greater Manchester Spatial Distribution of Mineral Sites and Rail Depots with Key Locational Criteria

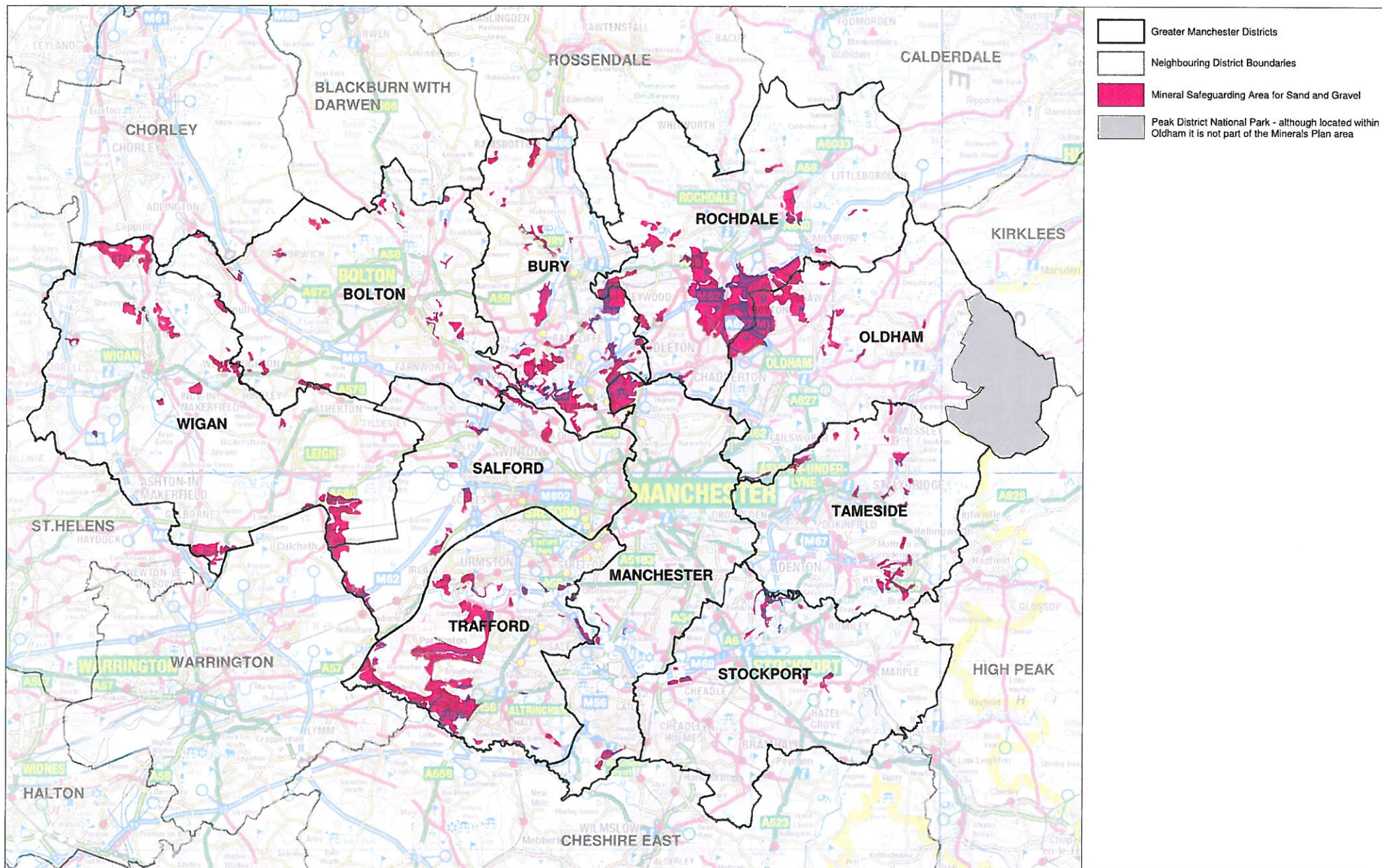


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Scale @ A3
1cm = 1.85km

Map 3 - Coal Resource and Petroleum Exploration Development Licenses (PEDLs) in Greater Manchester

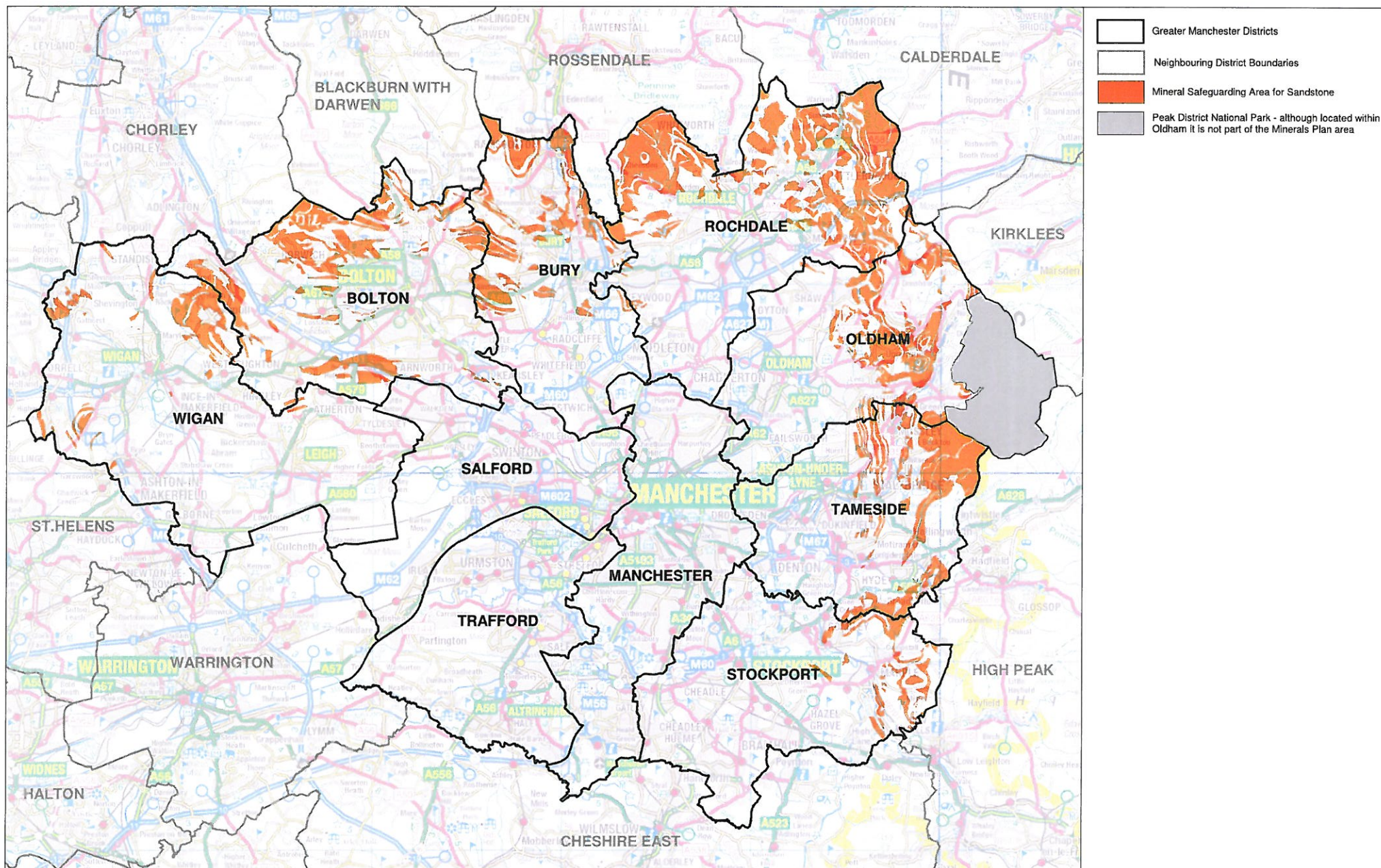


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Scale @ A3
1cm = 1.85km

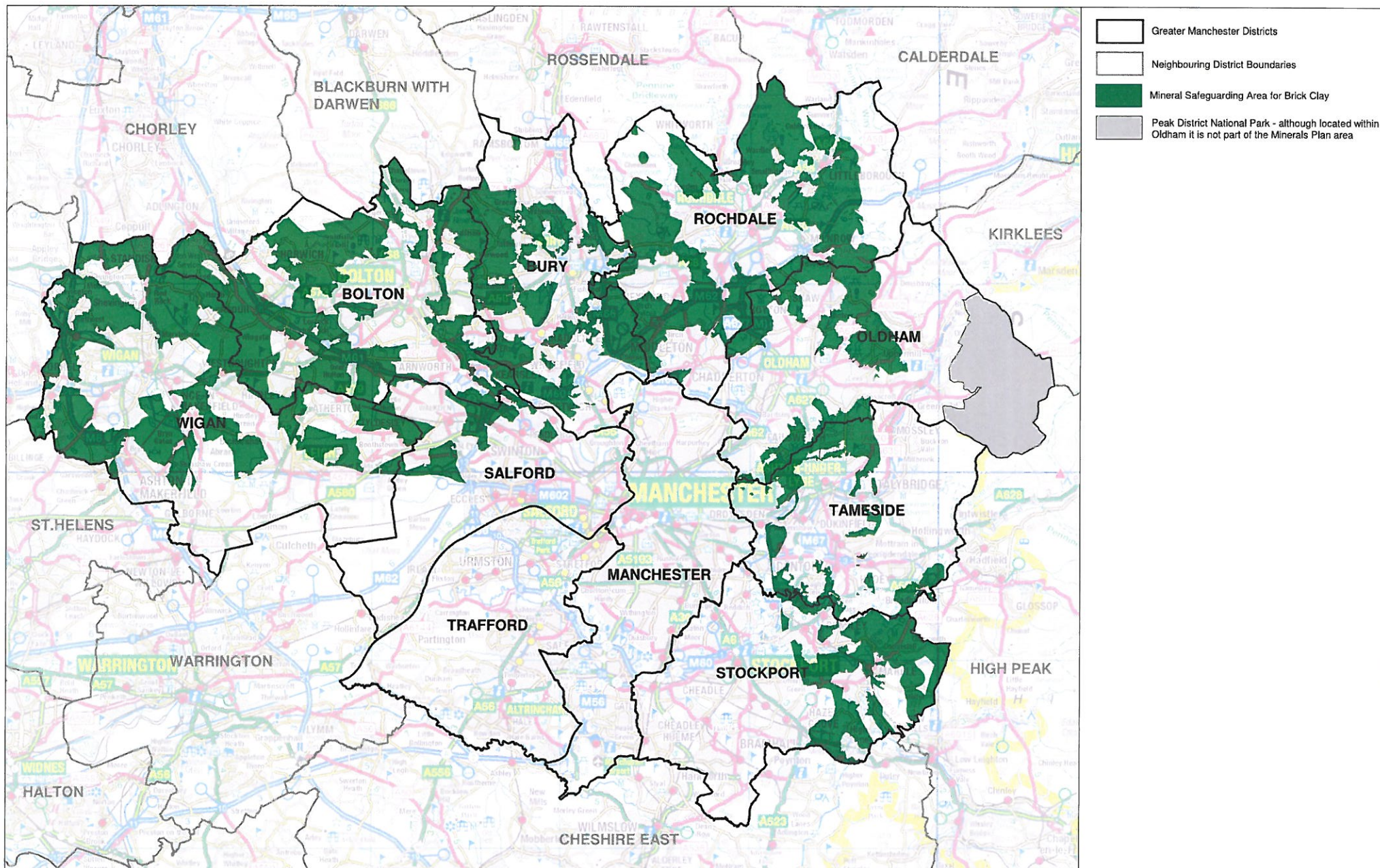
**Map 4 - Mineral Safeguarding
 Area for Glaciofluvial Sand
 and Gravel**



**Map 5 - Mineral Safeguarding
Area for Sandstone**

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**Scale @ A3
1cm = 1.85km**

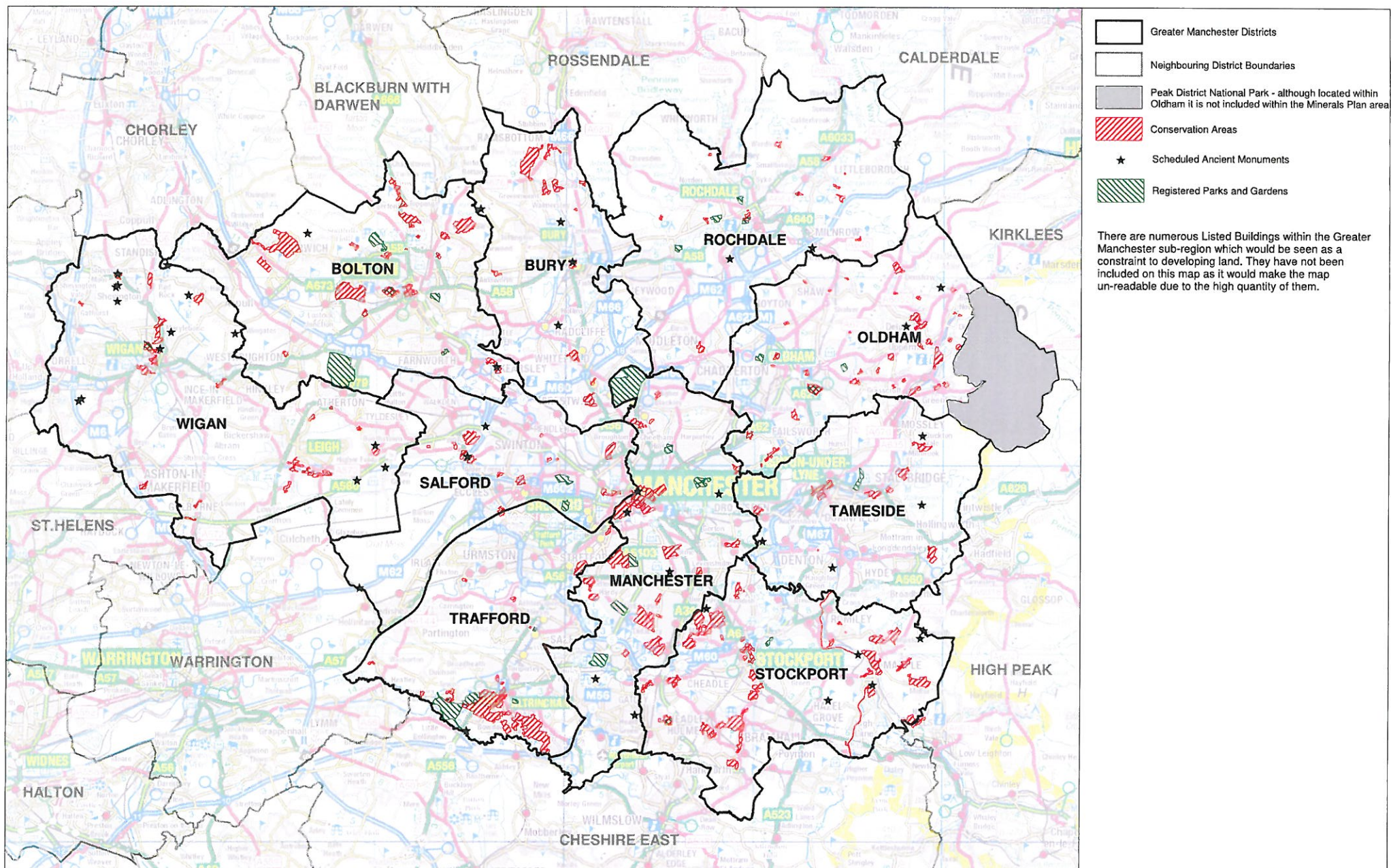


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Scale @ A3
1cm = 1.85km

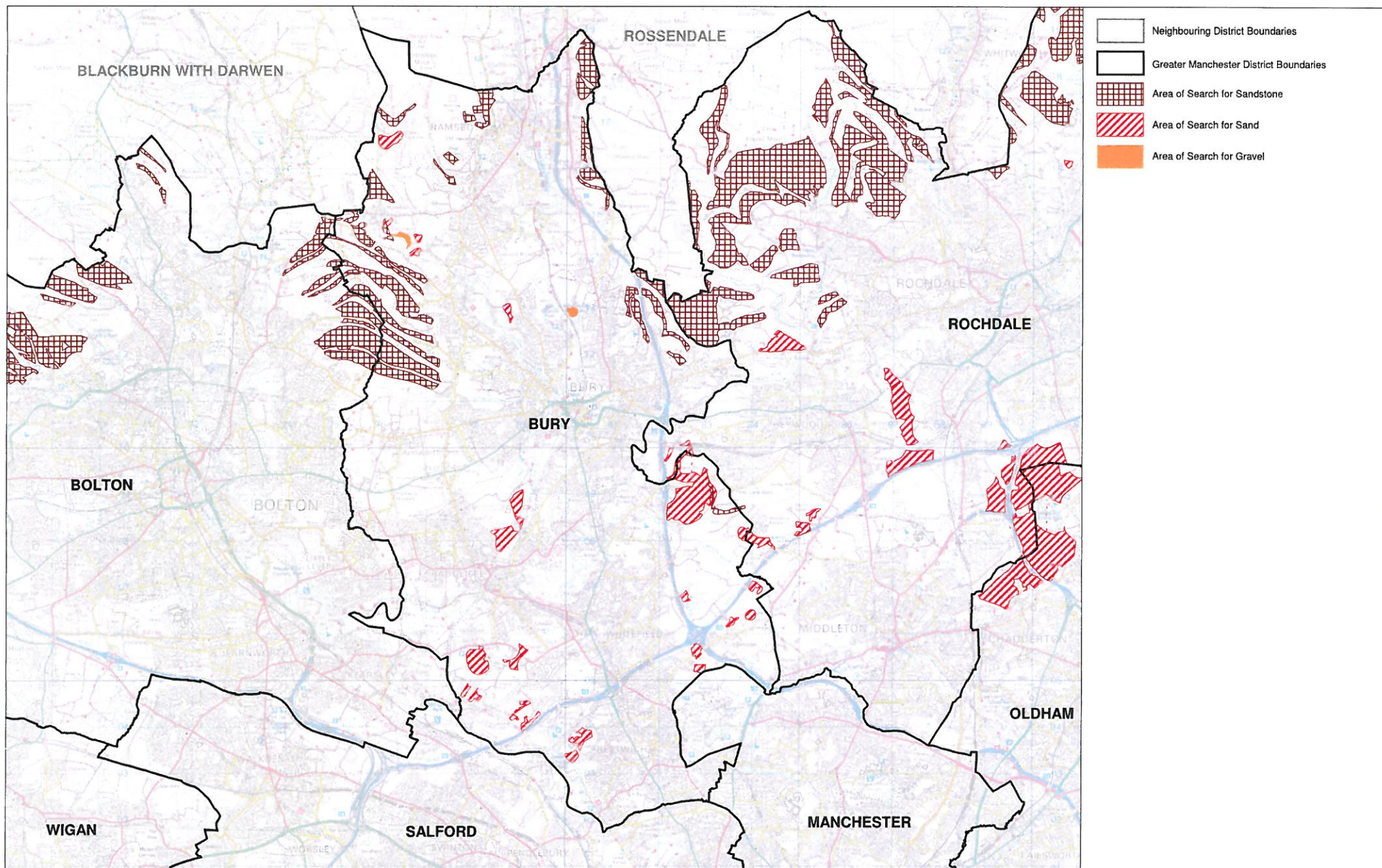
**Map 6 - Mineral Safeguarding
 Area for Brick Clay**



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Scale @ A3
 1cm = 1.85km

**Map 9 - Designated Sites
 of Historical Importance**



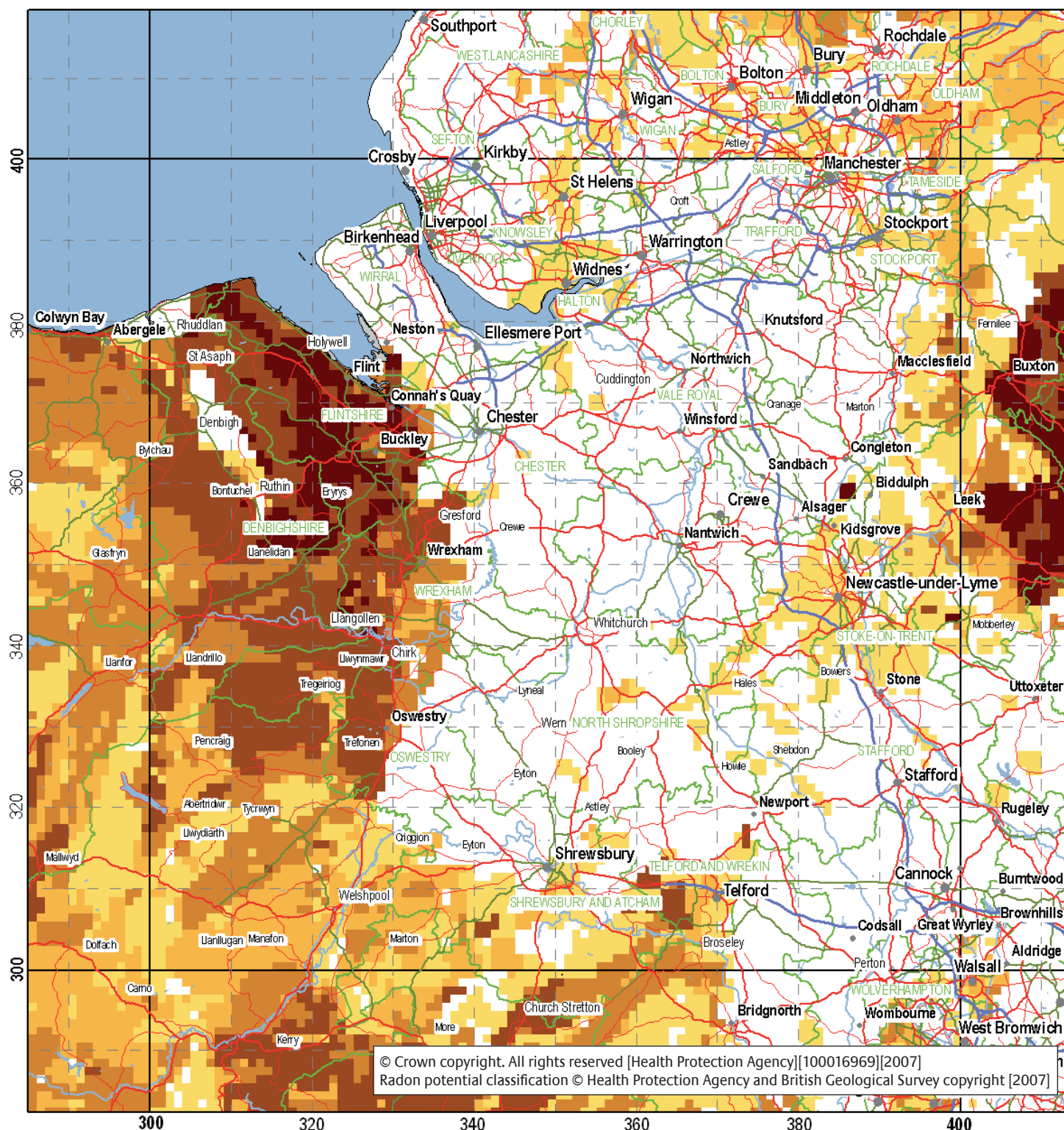
Map 11 Areas of Search for Aggregates in Bury

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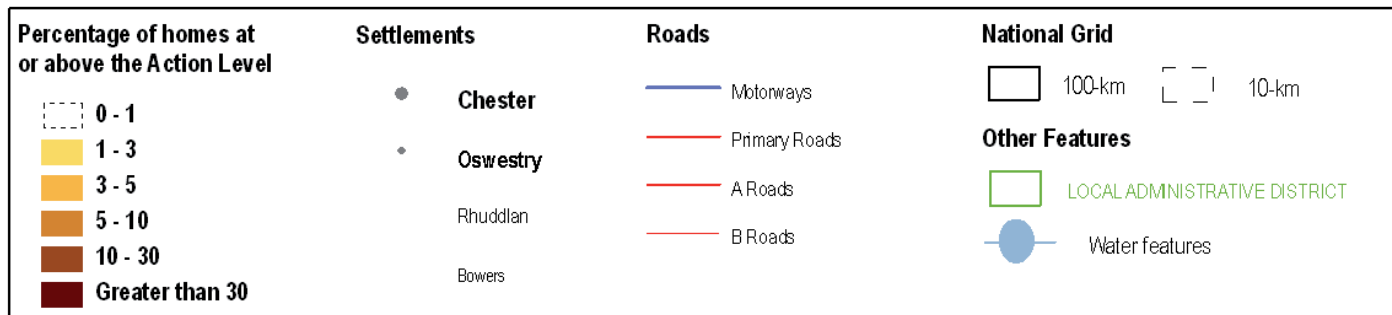
Scale @ A3
1cm = 0.75km

APPENDIX 7

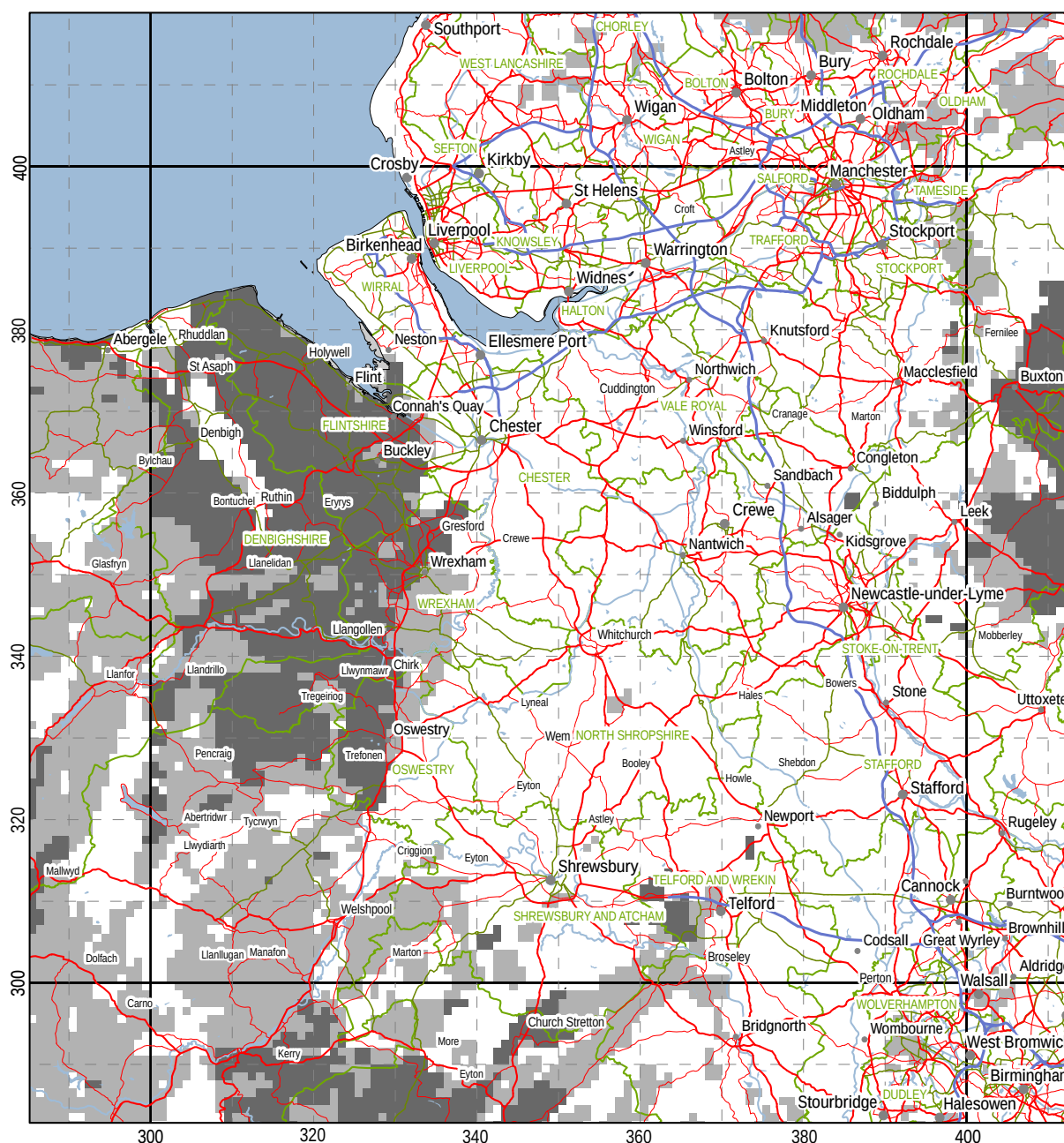
EXTRACTS OF RADON ATLAS FOR ENGLAND AND WALES



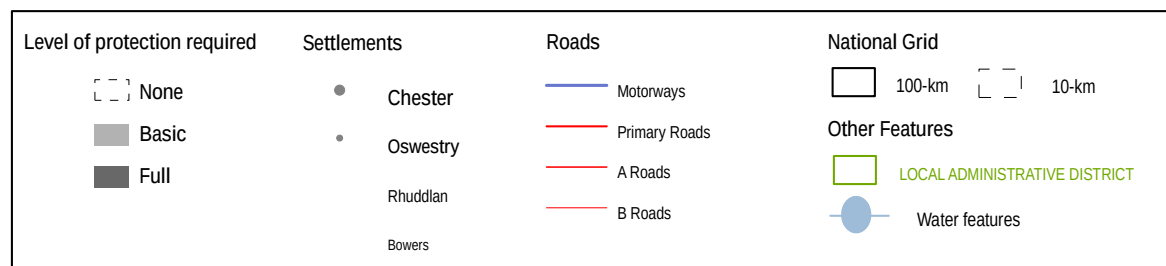
The colours show the maximum percentage band within each 1-km grid square of the national grid (see page 4). The best estimate for an individual property in a coloured square can be obtained for a small charge from www.ukradon.org. The white squares, the 0-1% band, contain no Affected Areas as defined by the HPA.



MAP 13 Northern Welsh Marches and Liverpool, 100-km grid square SJ (axis numbers are the coordinates of the national grid)



The shading indicates the maximum requirements for radon protective measures in any location within each 1-km grid square to satisfy the guidance in Building Regulations Approved Document C. The requirement for an existing building with a valid postal address can be obtained for a small charge from www.ukradon.org. The requirement for a site without a postal address is available through the British Geological Survey GeoReports service, <http://shop.bgs.ac.uk/GeoReports/>.



Map 13 Northern Welsh Marches and Liverpool, 100-km grid square SJ (axis numbers are the coordinates of the National Grid)

© Crown copyright. All rights reserved [Health Protection Agency][100016969][2007]

Radon potential classification © Health Protection Agency and British Geological Survey copyright [2007]

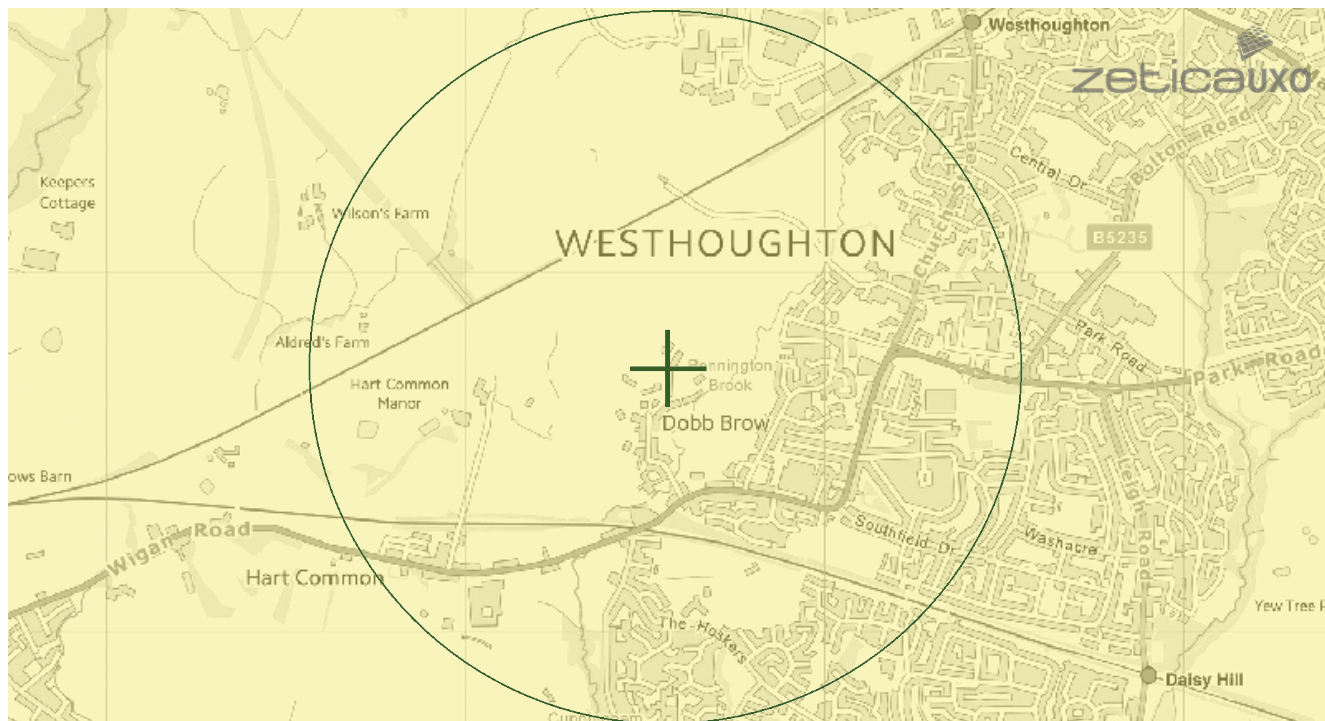
APPENDIX 8
ZETICA UXO RISK MAP

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Location: BL5 2BA,
Map Centre: 364569,405734



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/>)

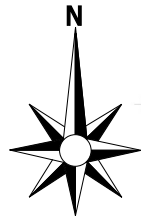
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It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*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'.

APPENDIX 9

SITE FEATURES PLAN



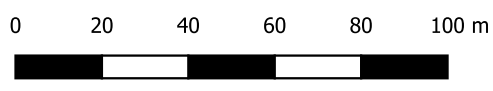
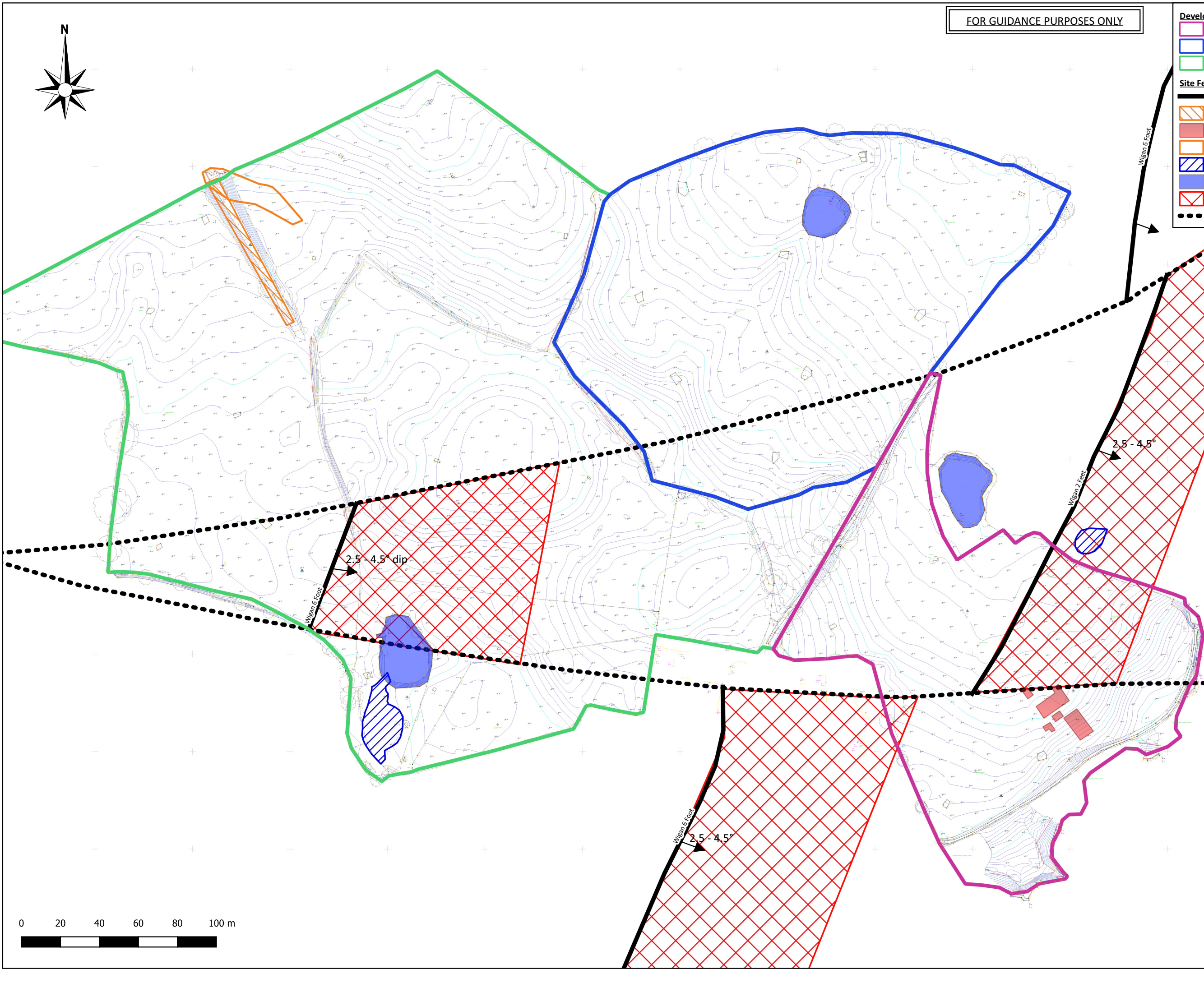
FOR GUIDANCE PURPOSES ONLY

Development Phases

- Development Phase 3
- Development Phase 4
- Development Phase 5

Site Features

- Coal Seams
- Existing Raised Track / Aqueduct
- Historic Old Field Farm (1890s - 1950s)
- Historic Raised Track (1900s)
- Infilled Ponds (1950s)
- Existing Ponds
- Coal Authority Development High Risk Area
- Faults



Rev	Drawn	Date	Description
Drawing Status: Information			
Contract: Fairways, Westhoughton			
For: Bellway Homes (Manchester) Ltd			
Drawing Title: Site Features Plan			
Suite 4, 14 - 32 Hewitt Street, Manchester, M15 4GB Email: contact@igeconsulting.co.uk Web: www.igeconsulting.co.uk Tel: 0161 237 9310			
Scale: 1:1750 @A3		Date: Feb 2021	
Drawn: AJ		Checked: AE	
Contract No. 3430	Drawing No. SI-03	P1	

Notes

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

Key

- Proposed Development
- Made Ground
- Cohesive Alluvium / River Terrace Deposits
- Alluvium
- Pennine Lower Coal Measures

SOURCES

PATHWAYS

RECEPTORS

Sources

1. On-Site Made Ground (Including Infilled Ponds)

2. Agricultural Use (Herbicides and Pesticides)

3. Historic Demolished Farm Buildings (Asbestos)

Secondary Sources

4. Pooling Beneath Current and / or Future Foundations

5. Pooling in Relative Low Points Above Low Permeability Deposits (i.e. Cohesive Alluvium)

6. Pooling within Granular Lenses within Low Permeability Deposits (i.e. Granular River Terrace Deposits)

Ground Gas Sources

1. On-Site Made Ground (Including Infilled Ponds 1950s)

2. On-Site Peat

3. Possible Shallow Coal Workings

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

7. Overland 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

Receptors

1. End User

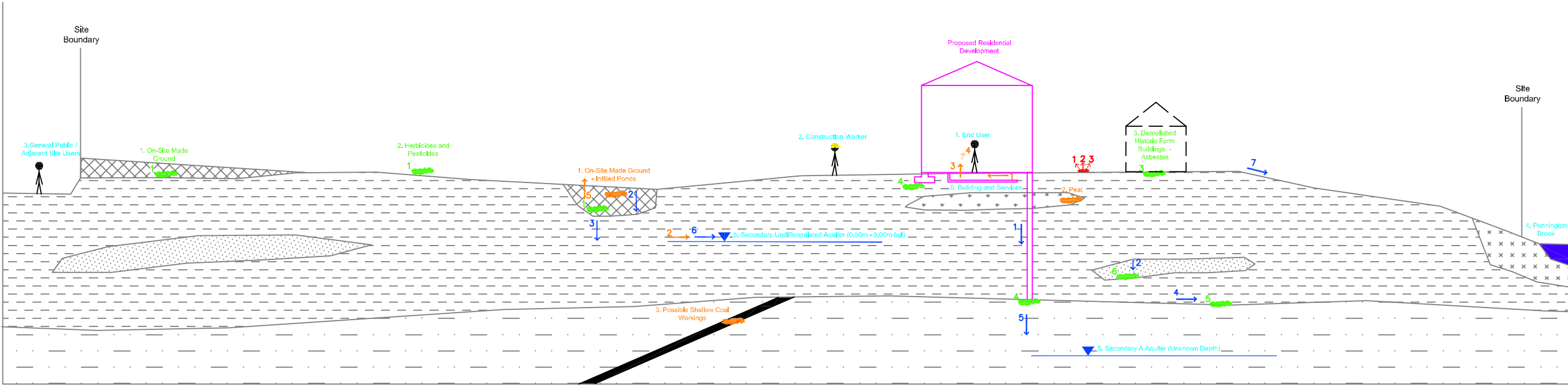
2. Construction Workers

3. General Public / Adjacent Site Users

4. Secondary Undifferentiated Aquifer in Superficial Deposits and Secondary A Aquifer in Bedrock (Unknown Depths)

5. Pennington Brook

6. Buildings and Services



Rev	Drawn	Date	Description
Drawing Status			
INFORMATION			
Contract			
THE FAIRWAYS, WESTHOUGHTON			
FOR: BELLWAY HOMES (MANCHESTER) LTD.			
Drawing Title			
CONCEPTUAL SITE MODEL DIAGRAM			
IGE consulting			
Suite 4, 14-22 Hewitt Street, Manchester, M15 4GB email: contact@igeconsulting.co.uk web: www.igeconsulting.co.uk tel: 0161 237 9310			
Scale	NTS	Date	FEB 2021
Drawn	AJ	Checked	AE
Contract No.	3430	Drawing No.	SI-04 P1

APPENDIX 10
CONCEPTUAL SITE MODEL DIAGRAM

APPENDIX 11

COAL AUTHORITY CONSULTANTS COAL MINING REPORT



The Coal
Authority

Consultants Coal Mining Report

Land Off The Fairways,
Westhoughton, Bolton, BL5 2ba
Greater Manchester

Date of enquiry:	28 January 2021
Date enquiry received:	28 January 2021
Issue date:	28 January 2021

Our reference:	51002356377001
Your reference:	GS-7520737



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

GROUNDSURE LIMITED

Enquiry address

Land Off The Fairways, Westhoughton, Bolton, BL5
2ba
Greater Manchester

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

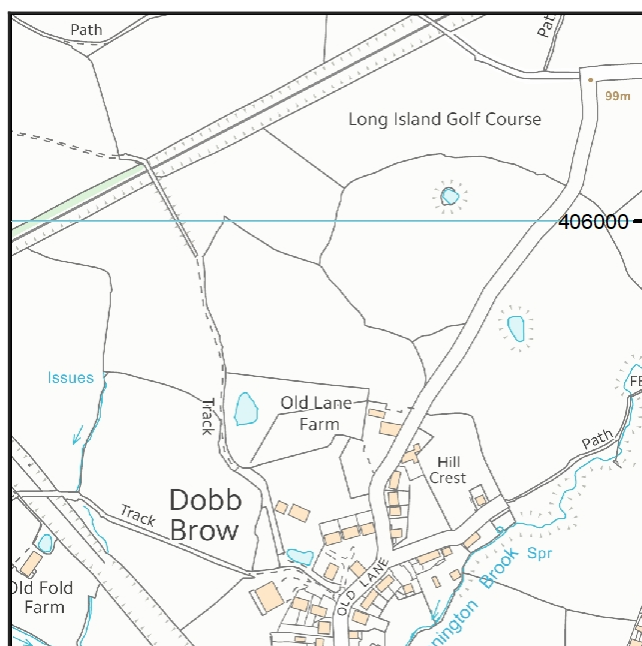
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	PLODDER	Coal	33GW	73	Beneath Property	3.6	East	170	1935
unnamed	HAIGH YARD	Coal	33BZ	115	Beneath Property	2.6	East	90	1915
unnamed	HAIGH YARD	Coal	33BW	148	South	4.0	South-East	90	1915
unnamed	HALF YARD	Coal	33E1	155	Beneath Property	2.5	South-East	50	1926
unnamed	HAIGH YARD	Coal	33BY	164	Beneath Property	3.0	South-East	90	1915
unnamed	THREE QUARTERS	Coal	33EO	196	North	4.1	South-East	60	1913
unnamed	ARLEY	Coal	33IB	233	Beneath Property	12.0	South-East	110	1904
unnamed	ARLEY	Coal	33IA	258	South	7.1	South-East	120	1917

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

6427A	NW1092	10455
6644	NW1087	10095
11477	6956	12025

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
TRENCHBONE	Coal	Yes	Within	N/A	23
WIGAN TWO FEET	Coal	Yes	Within	N/A	25

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Faults under or close to the property recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

Distance to site investigation (m)	Direction
Within	N/A

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

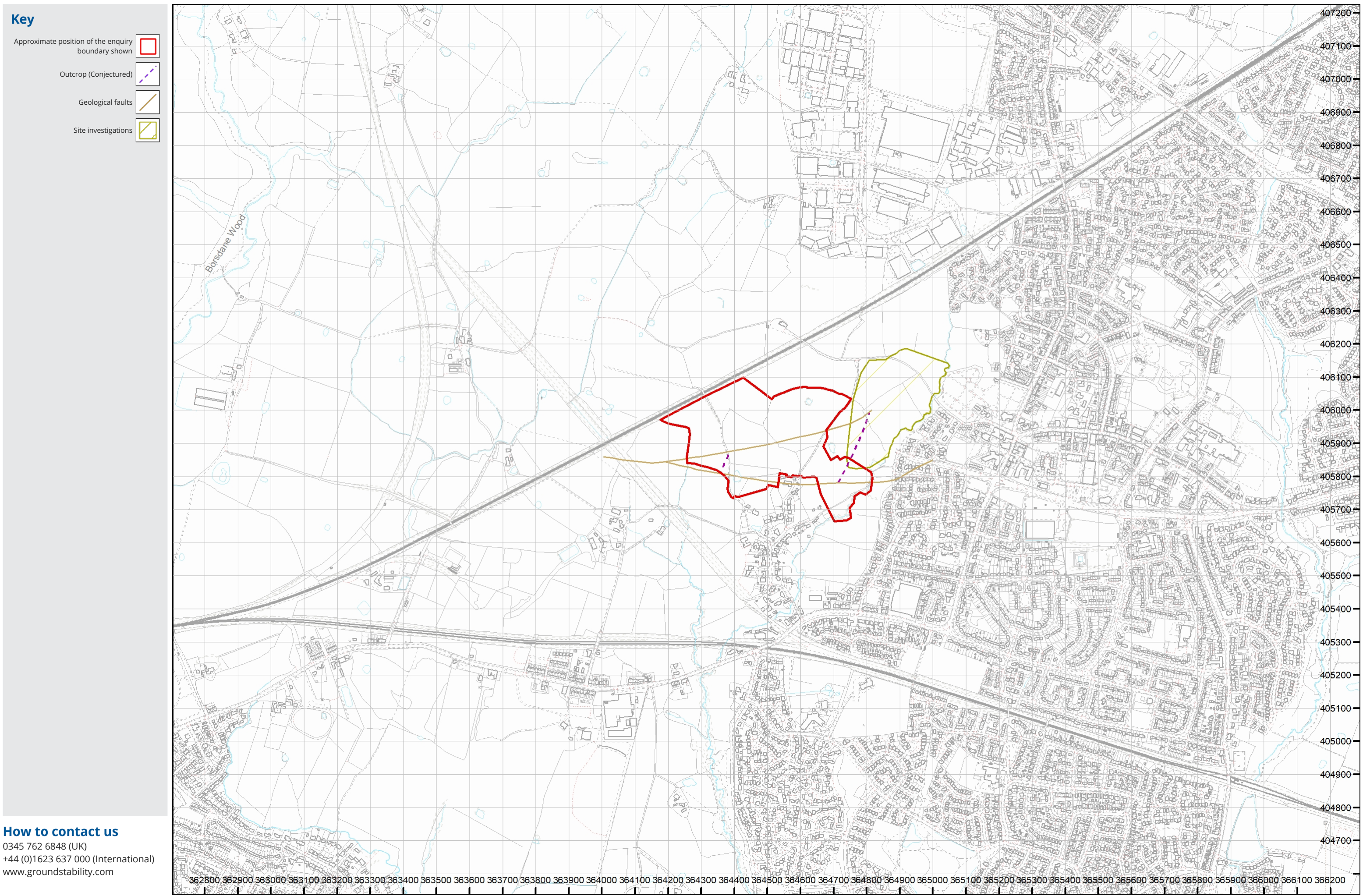
Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.



APPENDIX 12

PROPOSED DEVELOPMENT PLAN

ACCOMMODATION SCHEDULE - BELLWAY
OVERALL DEVELOPMENT

Name	Ref	Bed	Storey	Unit No's	Unit ft²	ft² Total
Private Housing						
Forester	FO-4B	4 Bed	2	20	1526	30520
Bowyer	BO-4B	4 Bed	2	13	1356	17628
Scrivener	SC-4B	4 Bed	2	26	1214	31564
Farrier	FA-4B	4 Bed	2	38	1171	44498
Sawyer	SY-3B	3 Bed	2	26	1092	28392
Mason	MA-3B	3 Bed	2	12	1059	12708
Lymer	LY-3B	3 Bed	2	33	986	32538
Thesplan	TH-3B	3 Bed	2	8	921	7368
Tailor	TA-3B	3 Bed	2	34	802	27268
Affordable Housing						
Thesplan	TH-3B	3 Bed	2	15	921	13815
Tailor	TA-3B	3 Bed	2	31	802	24862
Shoemaker	SH-3B	3 Bed	2	19	750	14250
Joiner	JO-2B	2 Bed	2	39	680	26520
Derby	DE-2B	2 Bed	ff	3	663	1989
York	YO-1B	1 Bed	ff	3	480	1440
Rydal	RY-1B	1 Bed	gf	3	537	1611
Grand Total:			323 Units		316971 ft²	

Gross Site Area: 14.08 ha 34.79 ac

Site Statistics:		
SSR	0.54 ha	1.33 ac
POS	3.58 ha	8.85 ac
Extended Gardens	0.21 ha	0.52 ac
Spine Road	0.74 ha	1.83 ac

Nett Site Area: 9.01 ha 22.25 ac

Gross Density: 22.94 Un/ha 9.28 Un/ac

Nett Density: 35.86 Un/ha 14.51 Un/ac

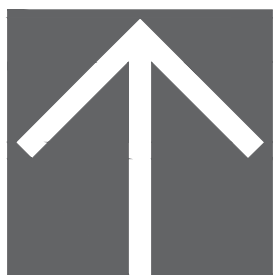
Gross Footage: 2091.45 m²/ha 9110.34 Un/ac

Nett Footage: 3269.78 m²/ha 14243.13 ft²/ac

*Note - All Areas Approx.
Abbreviations
Ac = Acres | ha = Hectares | ft² = Square Feet | m² = square | Un = units Metres | SSR = Single Sided Road | POS = Public Open Space | Det = Detached | Apt = Apartment | Int = Integral | Sgl = Single | Del = Double

Proposed Layout Key

- Red Edge Boundary extracted from Title Plan no. CH491619
- Plot Number
- Denotes Existing Buildings
- Dotted line either side of the existing water denotes an 8m stud off. Exact alignment to be determined
- Approximate tree canopy extracted from Master plan produced by GA Architects. Exact canopy and RPZ to be confirmed.
- Indicative landscaping - see landscaping proposals for further details
- Denotes Affordable dwelling



WESTHOUGHTON OVERALL

CAD SKETCH LAYOUT

Long Island Golf Course

Note:
Do not scale from this drawing
All contractors must visit the site and be responsible for taking and checking dimensions.
All construction information should be taken from figured dimensions only.
Any discrepancies between drawings, specifications and site conditions must be brought to the attention of the supervising officer.

This drawing is for planning purposes only. It is not intended to be used for construction purposes. Whilst all reasonable efforts are used to ensure drawings are accurate, Astle Planning and Design Ltd accept no responsibility or liability for any reliance placed on, or use made of, this plan by anyone for purposes other than those stated above.

Rev.	Date	Description	By	Chk
D	24.02.21	Survey brought into layout and overall scheme revised to address comments received from SGL Sub-Station added within phase 4 along spine road	AE	MP
C	22.02.21	Layout revised following comments received from client dated 21.02.21	AE	MP
B	17.02.21	Layout revised following comments received from client	RH/ AE	MP
A	04.02.21	Layout revised following comments received from client dated 02.02.21	AE	MP

Client



Project
WESTHOUGHTON OVERALL

Drawing Title
**DRAFT ISSUE
CAD SKETCH LAYOUT**

Drawn by AE Checked by MP Date 22.01.21

Status **SKETCH** Scale @ A1 NTS

Job no. **BHM180** Dwg no. **SK04** Rev. **D**



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WESTHOUGHTON

Further Phases - Scheme Parameters



PHASE 5
Developable Area 5.84Ha/14.43Ac
C. 200 dwellings @35UpHa

PHASE 4
Developable Area 2.80Ha/6.92Ac
C. 95 dwellings @35UpHa

PHASE 3
Developable Area 1.73Ha/4.28Ac
C. 60 dwellings @35UpHa