Environmental
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REPORT

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date 290/9/17	Upper Sheffield Road
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GEOTECHNICAL ENVIRONMENTAL

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Report on a Phase One Desk Study

Location:	Acorn Lodge Upper Sheffield Road, Barnsley, S70 4PL		
For:	Mason Clark Associates		
Report No.	J4044/17/EDS	Report date:	September 2017

For and on behalf of **Rogers Geotechnical Services Ltd**

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1. Introduction

The site comprises an area of brownfield land located on Pindar Oaks, off Upper Sheffield Road, Barnsley, S70 4PL. The site is approximately 0.33 hectares in size and its National Grid reference is centred around 435327 405215.

It is understood that the development proposals currently comprise the construction of a new twenty bedroom care home with garden areas and additional car parking. In order to assist with this decision making process, and any planning and construction aspects of the development, a phase one environmental desk study has been commissioned and is the subject of this report.

In accordance with issued guidance, a site walkover was conducted on the 25th September 2017 and the following observations were made:

General site description/current site use
The site comprises an all-weather football and basketball court and the footprint of a demolished building.

Site boundaries/access
The site is accessible via Pindar Oaks off Upper Sheffield Road.

Topography
The boundaries of the site slope inward towards the court and building footprint where the site is relatively flat.

Surface cover of site
The foundations of the demolished building occupy the northern section of the site and the court occupies the south. The remaining areas are covered by vegetation.

Visible evidence of contamination/ contaminative sources
Demolition material was observed around the footprint of the demolished building. However, there were no other visible signs of contamination present during the time of the walkover.

Presence of vegetation and wildlife
The site was overgrown with vegetation. This will need to be cleared prior to any site investigation. Vegetation seems to be healthy with no evidence of degradation. There were no obvious signs of invasive flora, fauna, nesting birds, burrowing animals or edible plants observed during the time of the site walkover.

Services
The status of underground services is unknown. There were no overhead services present within the site at the time of the walkover.

Site neighbours
The site is located within a residential area, with another care home present immediately to the east of the site.

In order to ensure that the site is fully characterised and to comply with the Environment Act 1995[1], a Phase One Desk Study has been commissioned by Mason Clark Associates. The desk study is intended to assess the environmental impact of historical, current and future factors on the development. This report will present the data obtained and provide a conceptual ground model and preliminary risk assessment as well as discussing the scope of any intrusive investigation that may be required. This report does not consider ecological impacts (e.g. bats) or botanical risks (e.g. Japanese Knotweed).

[1]S57 of the Environment Act 1995 inserted the contaminated land regime into the Environmental Protection Act 1990 (Part 2A). The regime **'provides a risk based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment'** See http://www.environment-agency.gov.uk/research/planning/40405.aspx. This places a duty on local authorities to inspect their areas for contaminated land and require its remediation using the 'suitable for use' approach. Much of this duty is discharged via the planning regime under the Town and Country Planning Act 1990 as historical land contamination is a 'material planning consideration.' The local authorities are required to secure the removal of unacceptable risks via remediation of the land, to therefore ensure the site is suitable for its new use. This is fulfilled via completion of a Phase One Environmental Desk Study, Phase Two Intrusive Investigation, Phase Three Remediation Strategy and Phase Four Validation Report. Therefore, as a minimum, once a site has been developed it should not be capable of being designated as 'contaminated land' under Part 2A of the Environmental Protection Act 1990, as inserted by the Environment Act 1995 (see also PPS 23 Planning and Pollution Control Section 8)

2. Review and Summary of Published Data

As a part of this desk study the following data has been considered.

- Groundsure Reports - Appendix 1
- Historical maps - Appendix 2
- Site Plan - Appendix 3
- Photographs - Appendix 4
- Coal Report - Appendix 5

The data obtained from the above mentioned sources has been summarised below[2].

2.1 Historical Land Use

Table 1: Historical Land Use[3]

HISTORICAL MAPPING SUMMARY		
Map Dates	**On site**	**Within 250m**
1850 - 1892	A building occupies the northern section of the site. The remaining area is assumed to be soft landscaping.	Old quarry – 220m W Bank Top Colliery – 250m SW
1906	The site itself remains unchanged.	Tramway and associated shed – 90m SW
1960 - 1983	The site appears to remain largely unchanged. However a couple of small buildings have been erected within the north-wester corner of the site. The main building is labelled as a maternity home.	Builder's yard – 20m N Tanks – 50m W & 80m SE Omnibus depot – 60m SW Allotment gardens – 90m NE Disused shaft – 110m SE Garage – 120m W Pond – 250m E
1993	The smaller buildings have been demolished, however, the main building in the northern section remains.	Depot – 40m SW Garage – 120m W Scrap yard – 130m E
2010 - 2017	The building on site has been demolished. It is assumed that the foundations revealed during the walkover are those of the demolished building.	Hospital – 20m E

NB. All distances given are approximate only.

[2] This report is a summary only and reference must be made in full to the information provided in the Groundsure Report.
[3] See Appendix 2

2.2 Published Geology and Geological Hazards

Table 2: Geological Data for the Site

BGS MAPPING DATA			
Strata Type	**Strata Name**[4]	**Previous Name**[4]	**Description**[5]
Made Ground/Fill	N/A	N/A	Not indicated on site although previous construction has resulted in the presence of made ground, observed during the walkover
Superficial Geology	N/A	N/A	Not indicated to underlie the site.
Solid Geology	Woolley Edge Rock	-	Sandstone, coarse-grained in the north, becoming finer southwards.

GEOLOGICAL FEATURES			
Type	**Location**	**Features**	**Comments**
Mining Activity	On site	Coal mining.	The study site is located within the specified search distance of an identified mining area.
		Vein Mineral/ Iron Ore	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
Faults	53m N	Fault	Normal fault, displacement unknown. This fault is not anticipated to affect the site.
Landslip Deposits	No data	No data	No data

BGS BOREHOLE DATA			
Reference[6]	**Location**	**Strata Description**	**Depth**
SE30NW95	520m W	Sandy topsoil	0.0m
		Made ground (broken sandstone)	0.5m
		MUDSTONE	1.5m
SE30NW388	600m W	Asphalt	0m
		Made ground (demolition material)	0.1m
		Sand, gravel and cobbles (weathered sandstone)	0.85m

NATURAL GROUND SUBSIDENCE & HAZARDS[7]	
Type	**Risk Rating**
Potential for collapsible ground stability hazards	Very low.

4 Sources: British Geological Survey (NERC) Map Sheets 87; Barnsley; Solid and Drift Edition, and Geology of Britain Viewer [*online resource from www.bgs.ac.uk*]
5 Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [*online resource from www.bgs.ac.uk*]
6 http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html
7 See Groundsure report

Potential for compressible ground stability	Negligible.
Potential for ground dissolution stability	Negligible
Potential for landslide ground stability	Very Low
Potential for running sand ground stability	Negligible.
Potential for shrinking or swelling clay ground stability	Negligible.
Radon	The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level. No radon protective measures are necessary

2.3 Construction Issues

2.3.1 Foundation Construction

On the basis of the prevailing geology and assuming that there are no areas of significantly filled ground, it is anticipated that shallow strip or spread foundations could be utilised at this site. It should be appreciated that an intrusive investigation will be required to validate this opinion. Moreover, it is possible that undifferentiated strata within the Woolley Edge Rock Formation may include very fine grained rocks which are likely to have weathered to cohesive soils at or near the surface. Such soils could be sensitive to soil moisture variations and thus be susceptible to desiccation as result of tree root action. In light of this, it is possible that footings within the zone of influence of trees (existing or previously removed), may need to founded at extended depths in excess of 1m.

2.3.2 Site Won Materials

Where sandstone outcrops it is possible that the resulting soil may provide a suitable bulk granular fill and may prove suitable for re-compaction.

2.3.3 Disposal of Site Materials

If made ground is present then contamination/WAC testing will be required to establish the nature of the underlying soil before disposal to a licensed landfill site. However, it is anticipated that the naturally occurring soils would not be significantly contaminated, thus would probably be accepted by a waste disposal site catering for inert material.

2.4. Coal Mining

The Groundsure Report states that the site is within an area that may be affected by coal mining. A Coal Authority Mining Report has therefore been obtained that is included in appendix 5 of this report and may be summarised as follows:

Table 3: Summary of the Non–Residential Coal Authority Mining Report			
Ref	**Mining Feature**	**Yes/No**	**Comments**
1	Underground Coal Mining: Past	Yes	The property is in a surface area that could be affected by underground mining in 6 seams of coal at 190m to 530m depth, and last worked in 1974. Any movement in the ground due to coal mining activity should have stopped.
2	Underground Coal Mining: Present	No	The property is not within a surface area that could be affected by present underground mining.
3	Underground Coal Mining: Future	Yes	The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods. The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods. The property is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future. No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.
4	Mine Entries	Yes	There are no known coal mine entries within, or within 20 metres of, the boundary of the property.
5	Coal Mining Geology	No	The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.
6	Opencast Coal Mining: Past	No	Please refer CON29M (ref: 51001629224001) for further information.
7	Opencast Coal Mining: Present	No	
8	Opencast Coal Mining: Future	No	
9	Coal Mining Subsidence	No	
10	Mine Gas	No	
11	Hazards Related to Coal Mining	No	
12	Withdrawal of Support	No	

2.5 Waste Management and Gas Monitoring

Table 4: Landfill Data and Artificial Ground, Recorded and Anticipated			
ENVIRONMENT AGENCY, LOCAL AUTHORITY, BGS & HISTORIC LANDFILLS			
Waste Type	**Location**	**Comments**	**Monitoring Requirement**
Landfills	Within 250m	None recorded within 250m	N
Other waste sites	63m E	Scrap Yard (dated 1993)	N
	141m E	Breakers Yard	N
Environment Agency/Natural Resources Wales licensed waste sites	195m E	Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes	N

MADE GROUND & INFILLED GROUNDWORKINGS			
Description	**Location**	**Comments**	**Monitoring Requirement**
Records of Potentially Infilled Features	64m SE	Unspecified Heap (1966 and 1974)	Y
	68m E	Unspecified old shaft (1948)	Y
	107m N	Cemetery (1992)	Y
	111m E	Refuse Heap (1951)	Y
	116m E	Unspecified old shaft (1982)	Y
	134m E	Unspecified heap (1982)	Y
	214m NE	Cemetery (1951)	Y
	225m E	Pond (1938)	N
	226m SW	Colliery (1890)	N
	232m E	Pond (1992)	Y

2.6 Hydrogeology, Hydrology

Table 5: Ground/Controlled Water Sensitivity and Flooding		
ENVIRONMENT AGENCY AQUIFER DESIGNATION[8]		
Strata	**Designation**	**Description**
Solid Geology 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.
GROUNDWATER SENSITIVITY[9]		
Description	**Location**	**Details**
Source Protection Zone[10]	-	None recorded within 250m.
Abstraction Licences	-	None recorded within 250m.
Discharge Consents	-	None recorded within 250m.
Records of Part A(2) and Part B Activities and Enforcements	170m W	Process: petrol vapour recovery process. Status: historical permit
	203m NW	Process: petrol vapour recovery process. Status: current permit.
Records of Licensed Discharge Consents	241m W	Effluent Type: sewage discharges.

[8] See Appendix 1
[9] See Appendix 1
[10] http://apps.environment-agency.gov.uk/wiyby/37833.aspx

CONTROLLED WATERS[11]		
Description	**Location**	**Details**
River Network Entries	123m E	Drain (Tertiary River)
	215m E	Maesborough Dike (Secondary and Tertiary River)
Surface Water Features	Within 250m	5 surface water records present within 250m. Unknown type.

POLLUTION INCIDENTS[12]			
Pollutant	**Receptor**	**Location**	**Date**
Oils and Fuel	Water Category 3 (Minor) Land Category 3 (Minor)	217m E	Oct 2002
Oils and Fuel	Water Category 3 (Minor) Land Category 4 (Minor)	229m E	Oct 2002
Other Pollutant	Water Category 3 (Minor) Land Category 3 (Minor)	229m E	Sep 2003
Chemicals/Product	Water Category 3 (Minor)	248m E	Apr 2003

ENVIRONMENT AGENCY FLOOD RISK[13]		
Description	**Location**	**Details**
Zone 2	-	The site is not situated within a zone 2 flood plain.
Zone 3	-	The site is not situated within a zone 3 flood plain.
Flood Defences	-	None recorded within 250m.
Groundwater Flooding Area	-	Limited potential for groundwater flooding to occur.

2.7 Sensitive Land Use

Table 6: Sensitive Land Uses within 250m

REGISTERED SENSITIVE LAND USES[14]		
Description	**Location**	**Details**
Nitrate Vulnerable Zone	On site	Existing
Green Belt Land	32m N	Liverpool, Manchester and West Yorkshire Greenbelt

2.8 Industrial Land Use and Potential Sources of Contamination

In order for a conceptual site model and preliminary risk assessment to be completed the historical maps and Groundsure data requires analysis to identify any past or present activities on the site and in the area that may have the potential to cause contamination on the site. Guidance has been issued by the Environment Agency, NHBC and Chartered Institute of

[11] See Appendix 1
[12] See Appendix 1
[13] See Appendix 1
[14] See Appendix 1

Environmental Health.[15] Within this document, annex 3 provides examples of important contaminants that are associated with individual uses of land. This data assists in the formulation of any chemical testing regime.

Those that we consider potentially contaminative according to the guidance are given below:

Table 7: Potentially Contaminative Sources

HISTORICAL		
Land Use	**Location**	**Classification**
Historical construction	On site	Artificial/made ground.
Garage	120m W	Road vehicle fuelling, service and repair: garages and filling stations.
Builder's yard	20m N	Unspecified works/factories/features.
Tank	50m W	
	80m SE	
Allotment gardens	90m NE	
Electricity Sub-station (1983)	247m NW	
Tramway	90m SW	Road vehicle fuelling, service and repair: transport and haulage centres.
Omnibus depot	60m SW	
CURRENT		
Land Use	**Location**	**Classification**
Electricity Sub-station	54m S	Unspecified works/factories/features.
Works	79m E	
Hand Car Wash & Valeting	126m SW	Road vehicle fuelling, service and repair: garages and filling stations.
Texaco	201m NW	
Co-op Upper Sheffield Road Service Station	201m NW	

3. Preliminary Qualitative Risk Assessment

The potential of contamination hazards on the land has been identified and the risks associated with them are assessed in the following preliminary risk assessment in accordance with industry practice and the 'suitable for use' approach. This has been conducted using the source-pathway-receptor approach. This method dictates that there must be a risk contaminant produced at a 'source' in sufficient concentration to cause harm and there must be a 'pathway' for the contaminant to reach an identifiable 'receptor' for the linkage to be proved and a contamination hazard to be considered present. Not all substances are contaminants and not all contaminants are considered to be a risk. Indeed DEFRA and The Environment Agency state that **'a contaminant is a substance which has the potential to cause harm, while a risk itself is considered to exist if such a substance is present in**

[15] Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66: 2008 Volume 1 and 2.

sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.'

R&D Publication 66: 2008 states that the groups at risk of harm (receptors) can be identified by the following categorisation:

1. Humans: site personnel, end users, visitors and adjacent land users.

2. The water environment – receptors: groundwater, surface water, coastal waters and artificial drainage.

3. Ecosystems: plants and animals.

4. Construction/building materials/services

In order to complete a conceptual site model and therefore a preliminary risk assessment, an appraisal of the sources of contamination, potential and actual, on and in the area of the site has therefore been completed with reference to this pollution linkage.[16]

3.1 Conceptual Ground Model & Preliminary Qualitative Risk Assessment

It is understood that the development proposals currently comprise the construction of a new care home with car parking and garden areas. In view of the sensitivity of the end users it is considered that the soil screening values (SSVs) for a residential with plant uptake end use should be employed.

The preliminary risk assessment has been evaluated with reference to the following ratings and definitions:

N/A - A source-pathway-receptor linkage is not considered to exist and therefore a risk assessment is not required.

Low - A pollution linkage is unlikely and/or the likelihood of harm occurring is low and of minor consequence.

Moderate - The linkage exists but further field or laboratory data is required to confirm that the contaminant has reached the receptor and the levels of contaminant are harmful.

High - The linkage exists and the available data indicates that significant harm may be caused and remedial action could be necessary.

[16] This assessment has been based on the information as to the proposed development that has been provided by the client. If the plans should change, the assessment should be re-evaluated.

Table 8: Conceptual Site Model and Preliminary Qualitative Risk Assessment

CONCEPTUAL SITE MODEL			PRELIMINARY RISK ASSESSMENT	
Pathways	**Receptor**	**Linkage Present?**	**Risk Rating**	**Notes**
Direct contact/dermal absorption/soil ingestion	Operative	Yes – potential contaminative sources from surrounding areas and from made ground related to historical construction on site.	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Any on site sources of contamination could migrate to neighbouring properties. Further testing required to reach a firm conclusion.
	End User	Yes – potential contaminative sources from surrounding areas and from made ground related to historical construction on site.	Moderate	
	Neighbours	Yes – possible source on site and immediate neighbours are present.	Moderate	
Inhalation of Dust/Vapours	Operative	Yes – potential contaminative sources from surrounding areas and from made ground related to historical construction on site. Contact with soil likely during works and vapours may accumulate in enclosed spaces.	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Any on site sources of contamination could migrate to neighbouring properties. Construction activities may create dust on and off site, which, if contaminated, could adversely affect operatives, end users and neighbours. In the event that harmful vapours are present they may accumulate in enclosed spaces, affecting operatives, end users and neighbours Further testing required to reach a firm conclusion.
	End User	Yes – potential contaminative sources from surrounding areas and from made ground related to historical construction on site. Vapours may accumulate in enclosed spaces.	Moderate	
	Neighbours	Yes – neighbouring properties present and possible inhalation of dust during the works.	Moderate	
Ingestion of fruit/vegetables and/or waters	Operative	No – no edible plants or contained water sources in the area of the proposed new works.	N/A	There are potential on and off site sources of contamination that may have caused contamination of the site. Further testing required to reach a firm conclusion.
	End User	Yes – soft landscaping proposed as part of the new development.	Moderate	
	Neighbours	Yes – residential dwellings present within 250m of the proposed development.	Moderate	

Migration of hazardous gases via permeable strata	Operative	Yes – possible off site sources and potential source on site associated with historical construction.	Moderate	Possible source on site and within 250m. A programme of monitoring is recommended but is suggested to be limited to 4 readings over one month in the first instance. If significant made ground considered capable of producing harmful gases is revealed during the investigation works, the monitoring regime may require reconsideration to take into account a higher potential risk.
	End User		Moderate	
	Neighbours	Yes – possible source on site due to historical construction.	Low to Moderate	It is not considered likely that any made ground that has been brought onto site for the construction of the demolished development will produce high levels of gas, thus presenting a significant risk of harm to this receptor. This should be re-assessed during any intrusive works should this be proven to the contrary.
Spillage/loss/run off direct to receiving water	Controlled Waters	Yes – possible source on site and controlled waters within 250m.	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Controlled waters within 250m. Secondary A aquifer underlies the site. Permeability of underlying geology should be assessed. Further testing required to reach a firm conclusion.
Migration via permeable unsaturated strata	Controlled Waters	Yes – possible source on site and Secondary A aquifer beneath the site.	Moderate	
Run off via drainage/sewers etc	Controlled Waters	Yes – possible source on site.	Moderate	
Direct contact with contaminated soils	Plants	Yes – some soft landscaping areas may be present as part of the proposed development.	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Any on site sources of contamination could migrate to neighbouring properties. Further testing required to reach a firm conclusion.
Uptake via root system			Moderate	
Direct contact with contaminated soils	Building Materials	Yes – possible source on and off site and foundation and service installation materials may be affected by the site soil.	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Further testing required to reach a firm conclusion.
Direct contact with contaminated groundwater				

Migration of mine gas via permeable strata	Operative End User	Yes – in an area affected by coal mining activity and where shallow worked seams may be present.	Low-moderate	Further knowledge required to reach a firm conclusion
Exposure to Radon	Operative End User	No – not in a radon affected area.	N/A	The publication BR211 states that no protection measures are necessary.
Mining Instability	End User	No – The property is in a surface area that could be affected by underground mining in 6 seams of coal at 190m to 530m depth, and last worked in 1974. Any movement in the ground due to coal mining activity should have stopped.	Low	No further action required.

Notes:

1. The above data and table is a qualitative assessment of the probable risks identified at this site, based on the information made available to us from the client, third party professional data and walkover survey.

2. Should any additional or new data come to light, the risk assessment should be revisited and any necessary changes made to any recommendations resulting from this study.

3. Where further testing is recommended as part of the risk assessment, this is in order to provide a quantitative assessment of any contamination issues. It should at all times be considered that uncertainties may remain, and therefore any testing regime and ground investigation philosophy should be ready to accommodate any necessary alterations should any data come to light or it become evident that it has not been previously considered.

4. Intrusive Investigation

4.1 Site Investigation Philosophy

The information from the Phase 1 Desk Study shows there are potential sources of contamination on the site and in the surrounding area. In view of the above, any intrusive investigation should be undertaken in accordance with the sampling strategies given in BS10175: 2011 +A1:2013 and CLR4:1994. These two sampling strategies may be classified as:

- Non Targeted – using a defined sampling pattern (BS10175)
- Targeted – based on prior knowledge and professional judgement (CLR4)

These sampling strategies are considered in more detail below. However, it is emphasised that they can be used individually or in combination depending on the depth of site knowledge.

Non Targeted Sampling.

If no obvious 'hot spots' of contamination have been identified on a site, it would be recommended that a stratified random pattern of sampling points be considered. This work should be undertaken with reference to BS10175: 2011 +A1: 2013 *Investigation of potentially contaminated sites – Code of practice*: 7.6, and BS5930, *Code of practice for site investigations, as amended in 2010*.

Targeted Sampling.

If a possible 'hot spot' of contamination has been identified on a site, it is recommended that a herringbone pattern of sampling points be considered in the immediate vicinity. If strong evidence of contamination has then been identified, it is recommended that sampling be highly focused to reflect that evidence and the investigator's experience. This work should be undertaken with reference to CLR4, *Sampling Strategies for Contaminated Land, 1994*.

The density of sampling required is defined in BS10175: 2011: +A1: 2013: 7.7.2.2.3, which indicates that an *exploratory* investigation usually requires a lower density sample spacing than does a *main* investigation. The BS goes on to state that *the actual density should depend upon the confidence and robustness required of decisions that will be based on the information obtained. Thus the area and depth of interest will be related to the contaminants present, the pathways and the receptors. Typical densities of sampling grids can vary from 25m to 50m centres for exploratory investigations, and 10m to 25m centres for main investigations.*

4.2 Site Specific Investigation

In view of the information provided above it is considered that an investigation of the site should include the following main elements.

4.2.1 Contamination Assessment

It may be appreciated that BS 10175 clause 7.7.2.2.3 suggests that the number of sampling points at the site should be based on a minimum of three testing locations or the size of the site with respect to the appropriate grid spacing, whichever the greater. On the basis of the site area being 0.32ha, the number of sampling points at the site should be considered with respect to the table below.

Table 11: Summary of sampling strategy

NUMBER OF SAMPLING POINTS					
	Soil	**Water**	**Asbestos**	**Standpipes**	**Standpipe Readings**
Exploratory Investigation 50m x 50m grid	3	-	3	3	A minimum of 4 readings over 1 month would be required as per risk assessment, however any regime must take into account the guidance detailed below.
Target Areas	Should be assessed during any investigation.				

Chemical testing should be undertaken on the above grid spacing and the following standard testing regime should be undertaken

- **Metals** – Cd, Cr, Cu, Hg, Ni, Pb, Zn, V.
- **Semi Metals and Non Metals** – As, Se, Free Cyanide and Phenols.
- **Hydrocarbons –** Polycyclic aromatic hydrocarbons (PAH EPA16), Total petroleum hydrocarbons (TPH CWG).
- **Others** – pH, Organic Content.
- **Asbestos**

<u>Sampling Method</u>

Investigation should include the installation of three gas monitoring standpipes for gas monitoring. Furthermore, soils should be obtained for chemical sampling. The sampling strategy should employ the non-targeted strategy given above in the first instance, i.e. at least three sampling points, if it is anticipated that made ground is significant across the site. However, if the made ground at the site is thought to be localised to specific areas, then the targeted strategy should be used.

It should be possible to carry out the above work with a windowless sampling drilling rig, however, it may be more pragmatic to employ hand-held digging tools for a targeted strategy.

<u>Gas Monitoring</u>

The final gas monitoring regime should be undertaken in accordance with Table 4.2 of CIRIA C665: 2007: *Assessing risks posed by hazardous ground gasses to buildings.* In that document guidance for the frequency of monitoring is provided on tables 5.5a and 5.5b *Typical/idealised frequency and period of monitoring* on page 60. For convenience, these tables have been combined and reproduced below.

Table 12: Typical/idealised frequency and period of monitoring.					
Sensitivity of development	**Generation potential of source**				
	Very low	**Low**	**Moderate**	**High**	**Very High**
Low (commercial)	4/1	6/2	6/3	12/6	12/12
Moderate (flats)	6/2	6/3	9/6	12/12	24/24
High (residential + gardens)	**6/3**	**9/6**	**12/6**	**24/12**	**24/24**

Notes:

a) The first number is the minimum number of readings and the second number is the minimum period in months, for example 4/1 – Four sets of readings over 1 month.

b) At least two sets of readings must be at low and falling atmospheric pressure (but not restricted to periods below 1000mb) known as worst case conditions.

c) The frequency and period stated are considered to represent typical minimum requirements. Depending on specific circumstances fewer or additional readings may be required (e.g. any such variation subject to site specific justification). The NHBC guidance is also recommending these periods/frequencies of monitoring.

d) Historical data can be used as part of the data set.

e) Not all sites will require gas monitoring. However this would need to be confirmed with demonstrable evidence.

f) Placing high sensitivity end use on a high hazard site is not normally acceptable unless the source is removed or treated to reduce its gassing potential. Under such circumstances long-term monitoring may not be appropriate or required.

g) This guidance should be read in conjunction with BS 8576:2013 figure 6 which may justify fewer readings in the first instance, where the generation potential is considered to be very low to low. However, this should be undertaken pragmatically, and further readings obtained according to the above table, where a potentially significant source is identified and initial readings suggest that remedial measures are not necessary.

4.2.2 Geotechnical Assessment

In addition to the above contamination assessment which is likely to be required by planning authorities and insurance providers, the following investigation strategy could be considered:

Sampling Method

It is anticipated that a windowless sampling drilling rig will be able to gain sufficient data in regard to the near surface soils. Moreover, such equipment should be able to undertake Standard Penetration Testing (SPT) and/or Dynamic Probing.

Soakaway Design

Should soakaway data be required for drainage design, trialpits could be excavated and infiltration tests conducted. Alternatively these tests could be undertaken within boreholes.

Geotechnical Testing

An allowance for geotechnical testing of the soils should be included in any ground investigation.

4.2.3 Reporting

The above data will need to be formulated into a formal assessment that should include the following:

- Geotechnical recommendations, particularly if existing loads are to increase.
- Contamination assessment.
- Contamination remediation strategy.
- Any recommendations for further work, if required and including validation reports where site remediation is necessary.

5. References

- British Standards Institution (2015), BS5930: *Code of practice for site investigations*, B.S.I., London.
- British Standards Institution (2007), Amendment No 1 to BS5930: *Code of practice for site investigations*, B.S.I., London.
- British Standards Institution (2011) +A1:2013, BS 10175: *Investigation of potentially contaminated sites – Code of Practice,* British Standards Institute.
- British Standards Institution (2013), BS 8576 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds.
- Department for Environment, Food and Rural Affairs and the Environment Agency, DEFRA R&D Publications, Environment Agency, Bristol.
- CLR 2, 1994, *Guidance on preliminary site inspection of contaminated land*, Volume 1.
- CLR 4, 1994, *Sampling Strategies for contaminated land*.

- R&D Publication 66: 2008 Guidance for the Safe Development of Housing on Land Affected by Contamination.
- CIRIA Report C665 (2007), Assessing risks posed by ground gasses in buildings.
- The Environment Agency: Groundwater source protection.

Appendix 1

Groundsure Reports

Groundsure
LOCATION INTELLIGENCE

Rogers Geotechnical Services

Barncliffe Mills, NEAR BANK,
HUDDERSFIELD, HD8 8LU

Groundsure Reference:	GS-4296378
Your Reference:	J4044_17_EDS
Report Date	25 Sep 2017
Report Delivery Method:	Email - pdf

Geo Insight

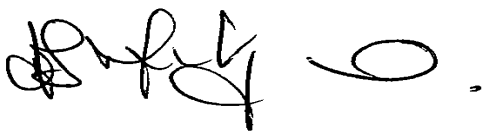
Address: ACORN LODGE, UPPER SHEFFIELD ROAD, BARNSLEY, S70 4PL

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Groundsure
LOCATION INTELLIGENCE

Geo Insight

Address:	**ACORN LODGE, UPPER SHEFFIELD ROAD, BARNSLEY, S70 4PL**
Date:	**25 Sep 2017**
Reference:	**GS-4296378**
Client:	**Rogers Geotechnical Services**

NW N NE

W E



SW S SE

Aerial Photograph Capture date:	07-Jun-2013
Grid Reference:	435327,405215
Site Size:	0.33ha

Groundsure
LOCATION INTELLIGENCE

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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale		
1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	No
	1.2.2 Are there any records of landslip within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of faults within 500m of the study site boundary at 1:10,000 scale?	Yes

Section 2: Geology 1:50,000 Scale		
2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	No
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	No
	2.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and Faults	2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?	Yes
	2.3.3 Are there any records of faults within 500m of the study site boundary?	Yes

Section 3: Radon

3. Radon	3.1Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.
	3.2Radon Protection	No radon protective measures are necessary.

Section 4: Ground Workings	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	25	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	4	5	8
4.3 Current Ground Workings	0	0	2	7	23

Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	4	5	8
5.2 Coal Mining	1	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	1	0	2	5	3
5.5 Non–Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	0

Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0

Section 6: Natural Ground Subsidence	On-site
6.1 Shrink-Swell Clay	Negligible
6.2 Landslides	Very Low
6.3 Ground Dissolution of Soluble Rocks	Negligible
6.4 Compressible Deposits	Negligible
6.5 Collapsible Deposits	Very Low
6.5 Running Sand	Negligible

Section 7: Borehole Records	On-site	0-50m	51-250
7 BGS Recorded Boreholes	2	9	5

Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250
8 Records of Background Soil Chemistry	1	1	0

Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500
9.1 Tunnels	0	0	0	Not Searched
9.2 Historical Railway and Tunnel Features	0	1	0	Not Searched
9.3 Historical Railways	0	0	0	Not Searched
9.4 Active Railways	0	0	0	Not Searched
9.5 Railway Projects	0	0	0	0

1:10,000 Scale Availability



1_10,000 Availability Legend

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Site Outline

Full Coverage

Partial Coverage

No Coverage

50
250
Search Buffers (m)

Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	No coverage
2	178.0	Some deposits are mapped	Full	Full	Some deposits are mapped
3	282.0	Some deposits are mapped	Full	Full	Some deposits are mapped
4	359.0	Some deposits are mapped	Full	Full	Some deposits are mapped

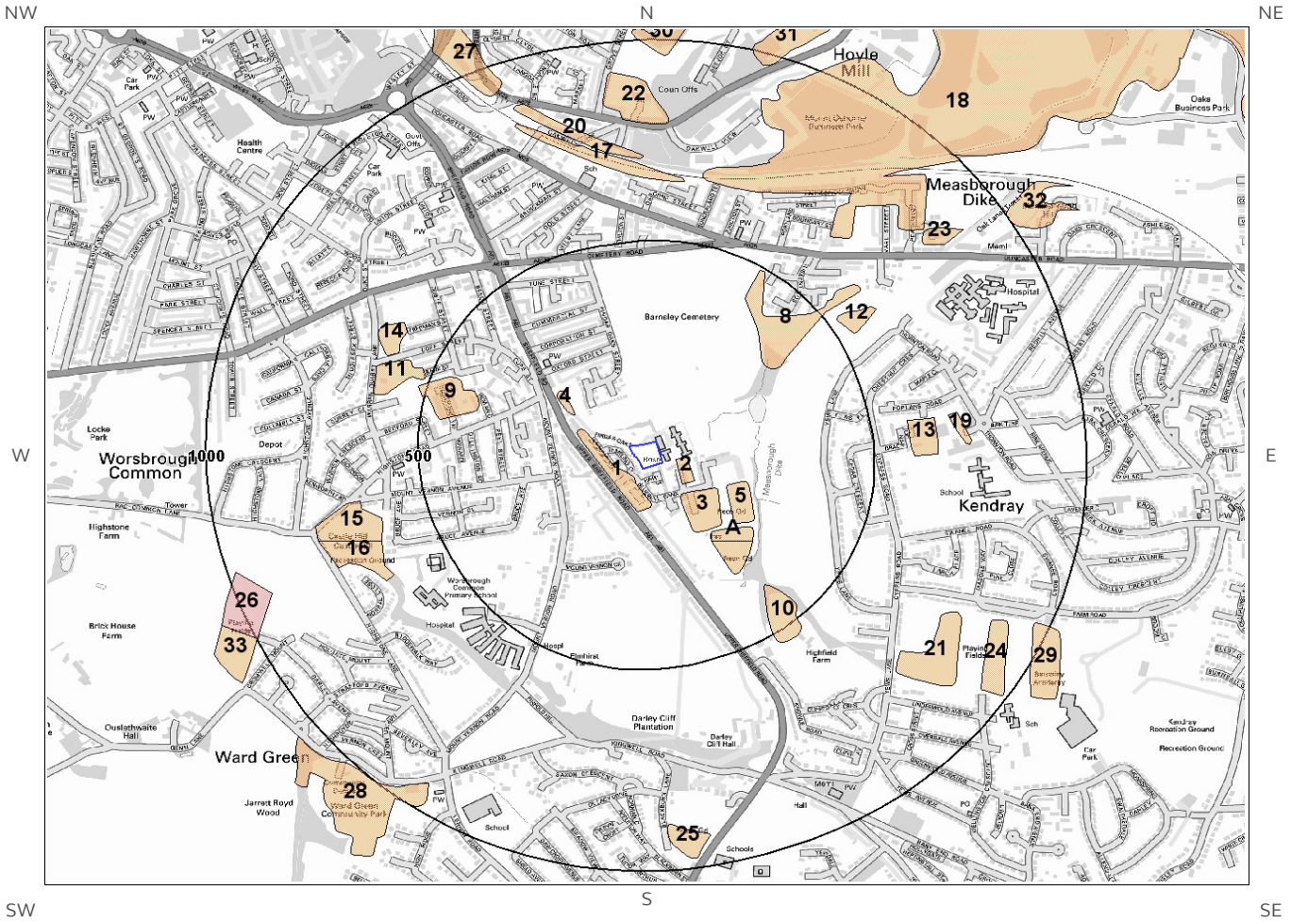
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

1 Geology (1:10,000 scale).

1.1 Artificial Ground Map (1:10,000 scale)



Artificial Ground Legend

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Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Landscaped Ground (undivided)

Infilled Ground

Reclaimed Ground

1. Geology 1:10,000 scale

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

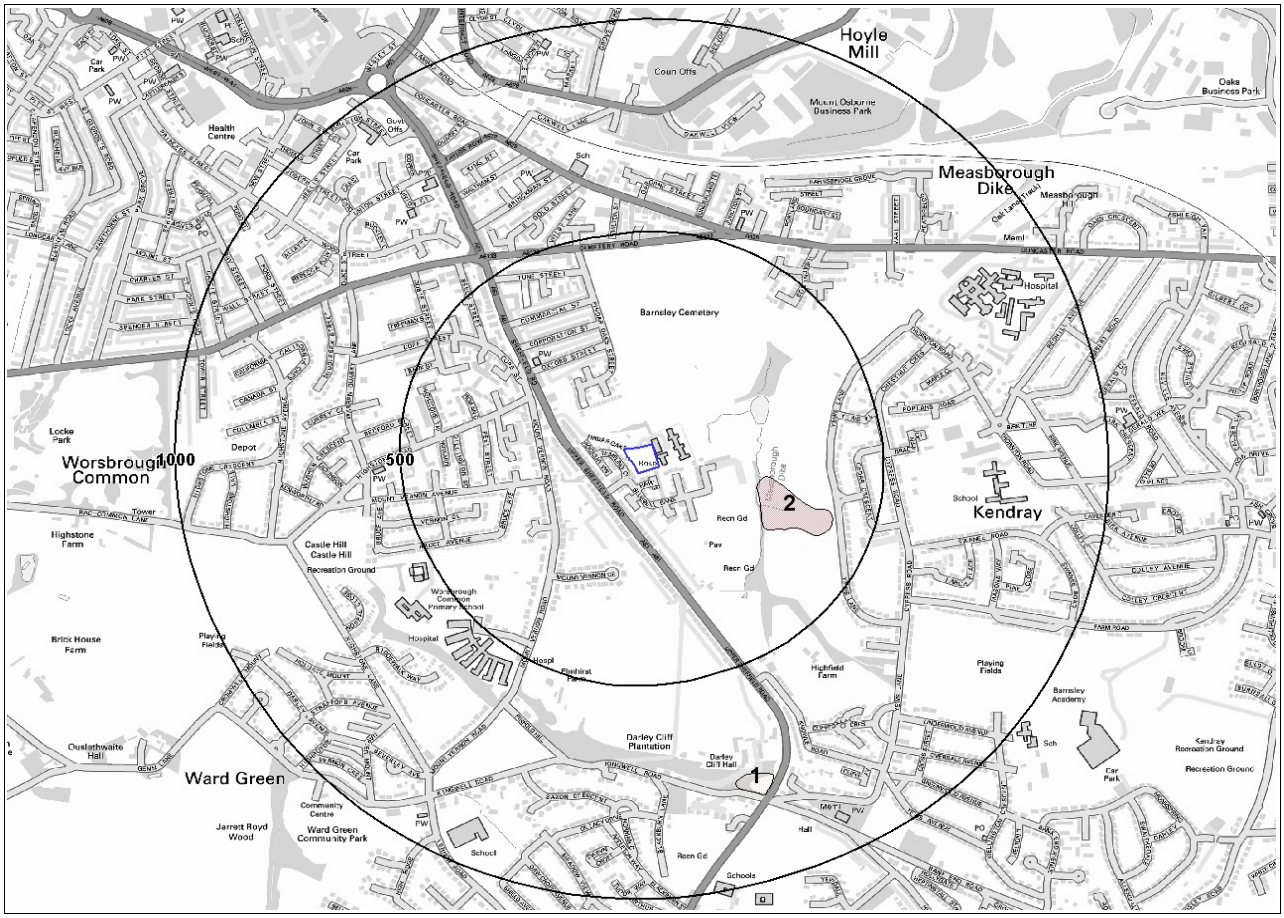
ID	Distance	Direction	LEX Code	Description	Rock Description
1	28.0	SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	32.0	E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	88.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	153.0	NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	161.0	E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6A	206.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
7A	224.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
8	319.0	NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
9	370.0	W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
10	385.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

1.2 Superficial Deposits and Landslips Map (1:10,000 scale)

NW N NE

W E

SW S SE



Artificial Ground Legend

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Site Outline

500
1000
Search Buffers (m)

1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
2	222.0	E	HEAD-DMTN	Head - Diamicton	Diamicton

1.2.2 Landslip

Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale?

No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and Faults Map (1:10,000 scale)

NW N NE

W E

SW S SE



Bedrock and Faults Legend

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Site Outline

500
1000
Search Buffers (m)

1.3 Bedrock and Faults

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian Sub-age
2	53.0	N	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian Sub-age
3	178.0	S	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian Sub-age
4	201.0	E	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
5B	254.0	E	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
6C	258.0	E	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
7	282.0	W	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian Sub-age
8	284.0	E	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
9A	294.0	SE	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
10A	311.0	SE	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
11B	312.0	E	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
12C	313.0	E	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
13	322.0	NW	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian Sub-age
14	337.0	SE	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
15M	342.0	E	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
16	359.0	SW	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian Sub-age
17	366.0	E	OR-SDST	Oaks Rock - Sandstone	Duckmantian Sub-age
18D	369.0	E	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
19	386.0	SE	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
20N	392.0	SE	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
21D	426.0	E	OR-SDST	Oaks Rock - Sandstone	Duckmantian Sub-age
22	442.0	SE	OR-SDST	Oaks Rock - Sandstone	Duckmantian Sub-age
23E	489.0	NW	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age

1.3.2 Faults

Are there any records of Faults within 500m of the study site boundary at 1:10,000 scale? Yes

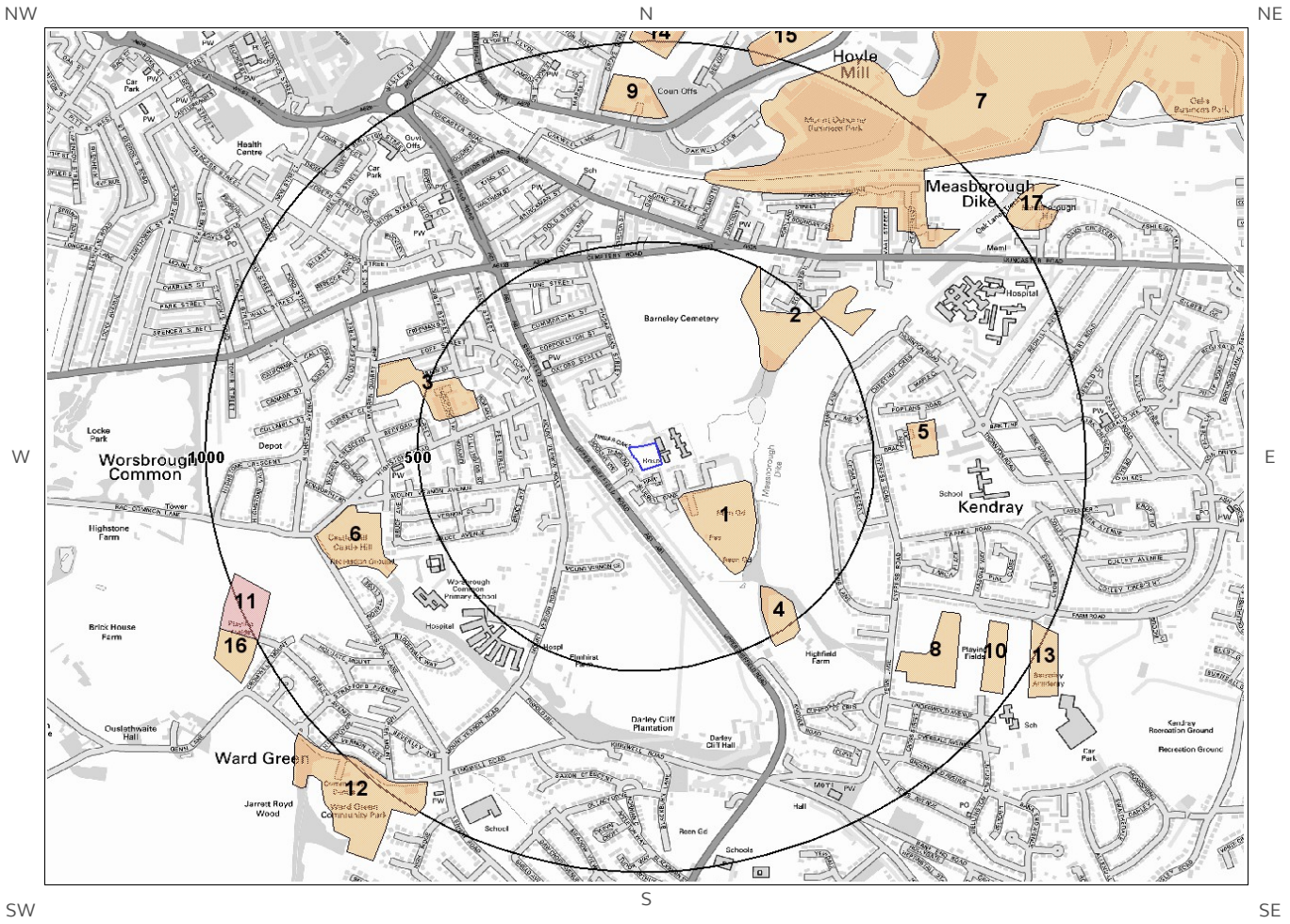
ID	Distance (m)	Direction	Category Description	Feature Description
69	53.0	N	FAULT	Normal fault, inferred
70	211.0	E	ROCK	Coal seam, inferred
71C	273.0	E	ROCK	Coal seam, inferred
72A	307.0	SE	ROCK	Coal seam, inferred
73	322.0	NW	FAULT	Normal fault, inferred
74M	353.0	E	FOSSIL_HORIZON	Fossil horizon, marine band
75D	394.0	E	FOSSIL_HORIZON	Fossil horizon, marine band
76N	415.0	SE	FOSSIL_HORIZON	Fossil horizon, marine band

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground Map



Ground Workings Legend

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Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Landscaped Ground (undivided)

Infilled Ground

Reclaimed Ground

2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 087

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? Yes

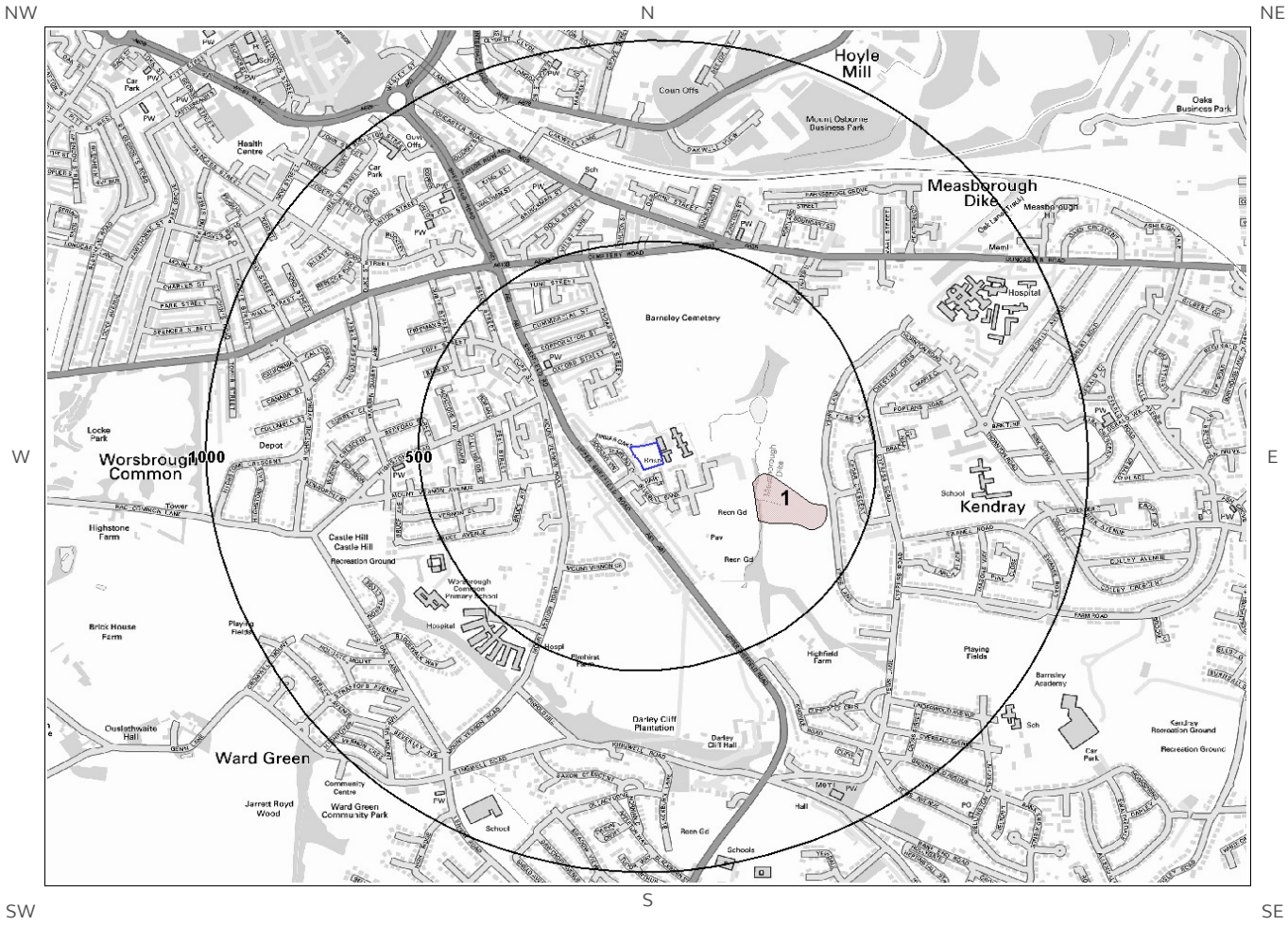
ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	88.0	SE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	316.0	NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
3	369.0	W	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
4	379.0	SE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

2.2 Superficial Deposits and Landslips Map (1:50,000 scale)



Ground Workings Legend

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Site Outline

500
1000
Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	215.0	E	HEAD-DMTN	HEAD	DIAMICTON

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? No

Database searched and no data found.

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

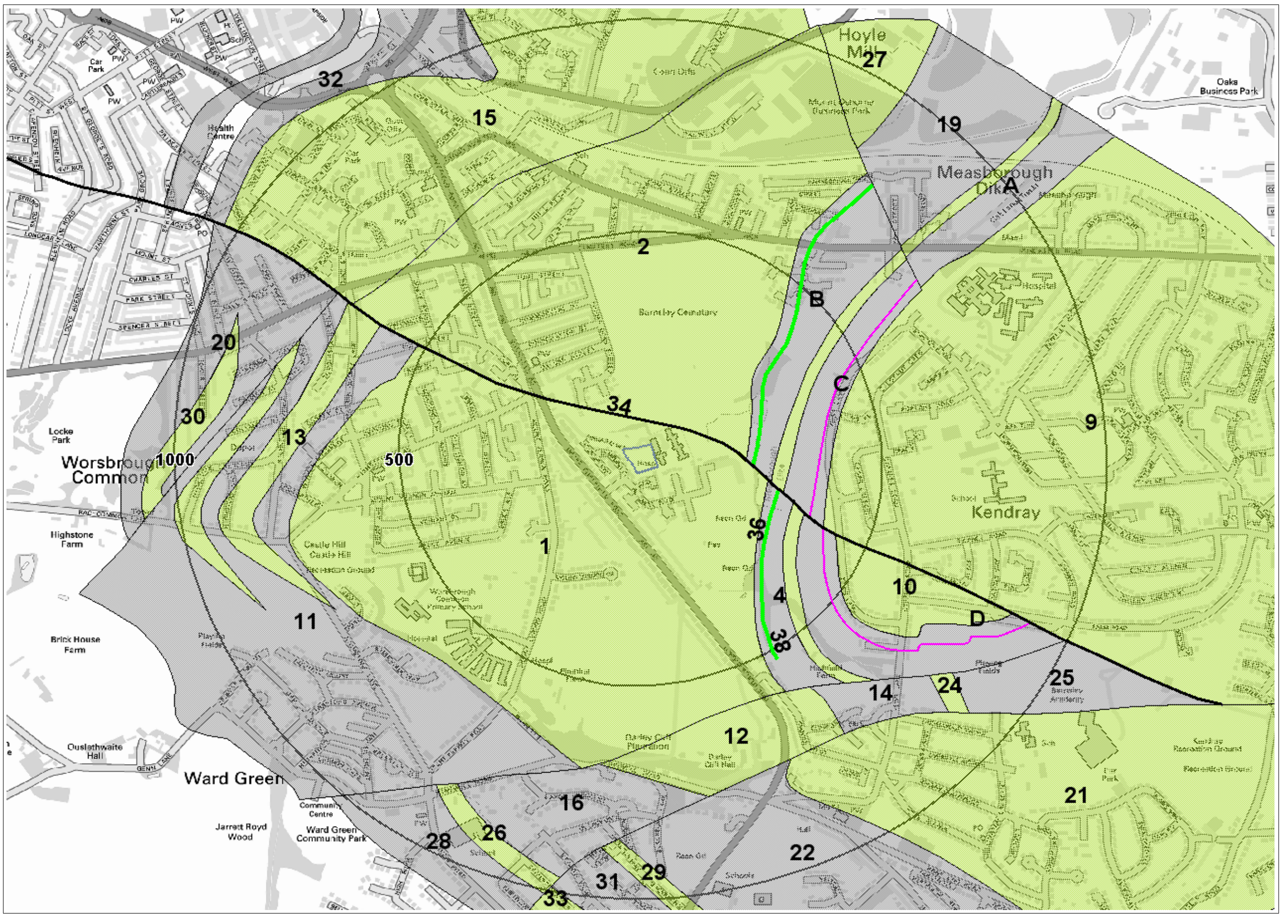
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.

2.3 Bedrock and Faults Map (1:50,000 scale)



Ground Workings Legend

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Site Outline

500 / 1000 Search Buffers (m)

2.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 087

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	WE-SDST	WOOLLEY EDGE ROCK - SANDSTONE	WESTPHALIAN
2	53.0	N	WE-SDST	WOOLLEY EDGE ROCK - SANDSTONE	WESTPHALIAN
3B	197.0	E	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
4	247.0	E	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
5	254.0	E	PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
6C	285.0	E	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
7	312.0	E	PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
8D	342.0	E	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
9	380.0	E	OR-SDST	OAKS ROCK - SANDSTONE	WESTPHALIAN
10	426.0	E	OR-SDST	OAKS ROCK - SANDSTONE	WESTPHALIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	High	Moderate

2.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? Yes

ID	Distance	Direction	Category Description	Feature Description
34	53.0	N	FAULT	Fault, inferred
35B	212.0	E	ROCK	Coal seam, inferred
36	273.0	E	ROCK	Coal seam, inferred
37C	353.0	E	FOSSIL_HORIZON	Marine band
38	379.0	SE	ROCK	Coal seam, inferred
39D	394.0	E	FOSSIL_HORIZON	Marine band

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

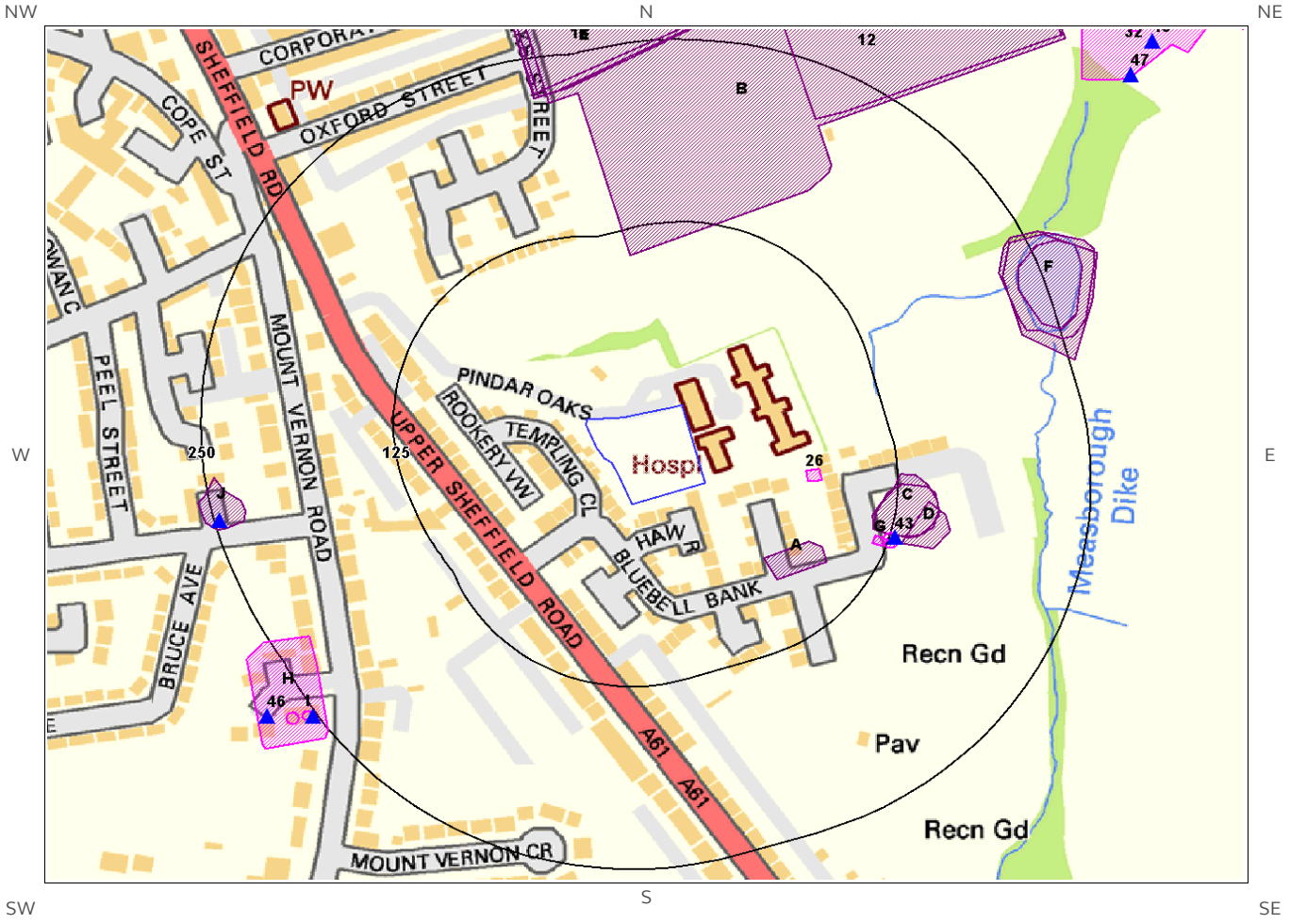
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.

3.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

---

4 Ground Workings Map



Ground Workings Legend

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Site Outline

125
250
Search Buffers (m)

Historic Surface Ground Workings

Historic Underground Workings

Current Ground Workings

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1A	64.0	SE	435418 405140	Unspecified Heap	1966
2A	64.0	SE	435418 405140	Unspecified Heap	1974
3B	107.0	N	435400 405542	Cemetery	1966
4B	107.0	N	435400 405542	Cemetery	1974
5B	107.0	N	435400 405542	Cemetery	1992
6B	107.0	N	435400 405542	Cemetery	1982
7C	111.0	E	435489 405177	Refuse Heap	1938
8C	113.0	E	435490 405173	Refuse Heap	1951
9D	134.0	E	435502 405164	Unspecified Heap	1966
10D	134.0	E	435502 405164	Unspecified Heap	1974
11D	134.0	E	435502 405164	Unspecified Heap	1982
12	214.0	NE	435396 405590	Cemetery	1951
13E	223.0	N	435423 405595	Cemetery	1904
14E	223.0	N	435423 405595	Cemetery	1938
15F	225.0	E	435581 405328	Pond	1904
16F	225.0	E	435581 405328	Pond	1890
17F	225.0	E	435581 405328	Pond	1938
18	225.0	N	435423 405595	Cemetery	1890
19F	225.0	E	435583 405320	Pond	1951
20H	226.0	SW	435089 405049	Colliery	1890
21J	228.0	W	435046 405178	Unspecified Quarry	1890

ID	Distance (m)	Direction	NGR	Use	Date
22F	232.0	E	435583 405328	Pond	1966
23F	232.0	E	435583 405328	Pond	1974
24F	232.0	E	435583 405328	Pond	1982
25F	232.0	E	435583 405328	Pond	1992

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
26	66.0	E	435430 405198	Unspecified Old Shafts	1951
27G	116.0	E	435473 405153	Unspecified Old Shafts	1938
28G	121.0	E	435480 405153	Unspecified Disused Shaft	1982
29H	226.0	SW	435089 405049	Colliery	1890
30I	252.0	SW	435101 405033	Unspecified Shafts	1904
31I	260.0	SW	435092 405031	Unspecified Shafts	1904
32	342.0	NE	435677 405551	Colliery	1890
33	387.0	NE	435637 405505	Unspecified Old Shaft	1938
Not shown	397.0	NE	435643 405517	Unspecified Old Shafts	1904
Not shown	756.0	W	434563 404990	Air Shaft	1938
Not shown	813.0	NW	434408 405657	Colliery	1890
Not shown	848.0	S	435110 404350	Air Shaft	1904
Not shown	849.0	S	435110 404350	Air Shaft	1951
Not shown	850.0	S	435111 404349	Air Shaft	1938
Not shown	934.0	NE	436483 406204	Colliery	1974
Not shown	934.0	NE	436510 406201	Unspecified Mine	1966

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	981.0	NE	436363 406218	Colliery	1951

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

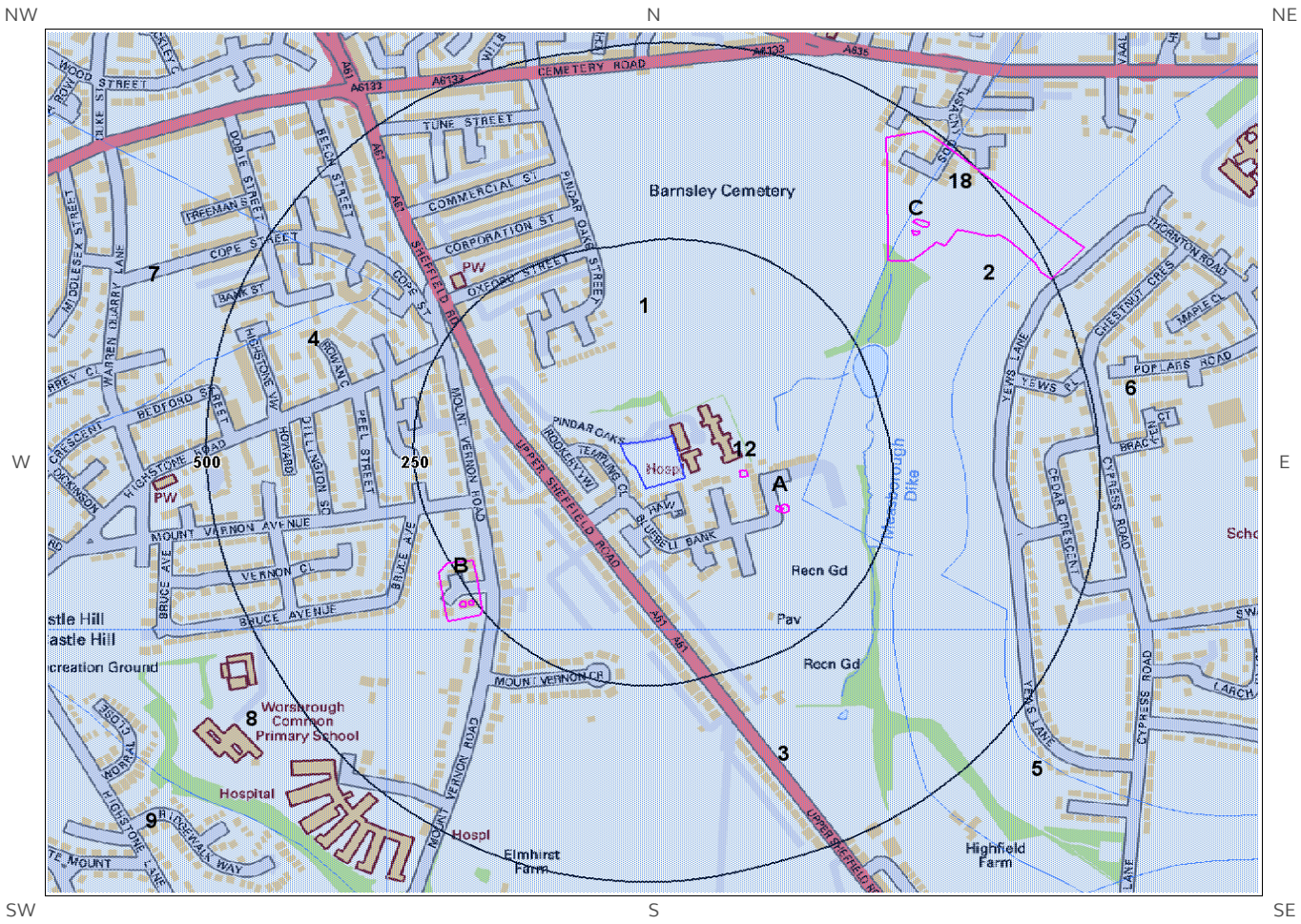
The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
43	128.0	E	435482 405155	Coal, Deep	Pinder Oaks Shaft	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
44J	247.0	W	435044 405167	Sandstone	Worsborough Common	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
45I	253.0	SW	435105 405033	Coal, Deep	Bank Top Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
46	278.0	SW	435075 405033	Coal, Deep	Bank Top Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
47	368.0	NE	435635 405472	Coal, Deep	Pinder Oaks Colliery Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
48	394.0	NE	435649 405495	Coal, Deep	Pinder Oaks Colliery Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	414.0	NE	435667 405505	Coal, Deep	Pinder Oaks Colliery Shaft	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	414.0	NE	435654 405521	Coal, Deep	Pinder Oaks Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	486.0	NE	435719 405555	Coal, Deep	Pinder Oaks Colliery Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	509.0	NE	435728 405580	Coal, Deep	Pinder Oaks Colliery Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	606.0	W	434696 405387	Clay & Shale	Warren Brick Works	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	615.0	SW	434828 404798	Sandstone	High Stone Fold	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	638.0	NW	434709 405515	Clay & Shale	Warren Brick Works	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	647.0	S	435233 404536	Sandstone	King Well	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	672.0	W	434634 405412	Clay & Shale	Warren Brick Works	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	688.0	W	434629 405016	Sandstone	High Stone	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	710.0	SW	435024 404529	Coal, Deep	Ward Green Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	732.0	NE	435825 405798	Coal, Deep	Measborough Dike Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	732.0	NE	435825 405798	Coal, Deep	Measborough Dike Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	791.0	SW	434860 404529	Coal, Deep	Vernon Colliery Drift Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	794.0	SW	434826 404550	Coal, Deep	Vernon Colliery Drift Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	820.0	N	435579 406032	Sandstone	Mount Osborne	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	836.0	NW	434754 405884	Sandstone	Union Street	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	839.0	NW	434897 405981	Sandstone	Taylor Row	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	863.0	SE	435758 404427	Sandstone	Yews Lane	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	863.0	S	435113 404338	Coal, Deep	Bell Ing Colliery Air Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	881.0	N	435560 406100	Sandstone	Mount Osborne	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	919.0	N	435298 406164	Sandstone	Beevor Hall	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	945.0	SE	435828 404372	Sandstone	Yews Lane	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	965.0	N	435173 406196	Sandstone	Oakwell	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	983.0	SW	434630 404470	Coal, Deep	Ward Green Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	993.0	NE	436195 405758	Sandstone	Oaks New Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend

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Site Outline

Search Buffers (m)

250

500

Historical Mining

Non-Coal Mining Cavities

Natural Cavities

Non-Coal Mining

Highly likely

Likely

Unlikely

Highly unlikely

Rare

5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? Yes

The following Historical Mining information is provided by Groundsure:

ID	Distance (m)	Direction	NGR	Details	Date
12	66.0	E	435430 405198	Unspecified Old Shafts	1951
13A	116.0	E	435473 405153	Unspecified Old Shafts	1938
14A	121.0	E	435480 405153	Unspecified Disused Shaft	1982
15B	226.0	SW	435089 405049	Colliery	1890
16B	252.0	SW	435101 405033	Unspecified Shafts	1904
17B	260.0	SW	435092 405031	Unspecified Shafts	1904
18	342.0	NE	435677 405551	Colliery	1890
19C	387.0	NE	435637 405505	Unspecified Old Shaft	1938
20C	397.0	NE	435643 405517	Unspecified Old Shafts	1904
Not shown	756.0	W	434563 404990	Air Shaft	1938
Not shown	813.0	NW	434408 405657	Colliery	1890
Not shown	848.0	S	435110 404350	Air Shaft	1904
Not shown	849.0	S	435110 404350	Air Shaft	1951
Not shown	850.0	S	435111 404349	Air Shaft	1938
Not shown	934.0	NE	436483 406204	Colliery	1974
Not shown	934.0	NE	436510 406201	Unspecified Mine	1966
Not shown	981.0	NE	436363 406218	Colliery	1951

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? Yes

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Sheffield Area	Vein Mineral/Iron ore	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
2	143.0	E	Not available	Iron Ore (Bedded)	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
3	178.0	S	Sheffield Area	Vein Mineral/Iron ore	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
4	282.0	W	Sheffield Area	Vein Mineral/Iron ore	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
5	316.0	SE	Not available	Iron Ore (Bedded)	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
6	328.0	E	Sheffield Area	Vein Mineral/Iron ore	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
7	353.0	NW	Not available	Iron Ore (Bedded)	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
8	359.0	SW	Sheffield Area	Vein Mineral/Iron ore	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
9	614.0	SW	Not available	Iron Ore (Bedded)	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
Not shown	630.0	SW	Not available	Iron Ore (Bedded)	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
Not shown	930.0	N	Not available	Iron Ore (Bedded)	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

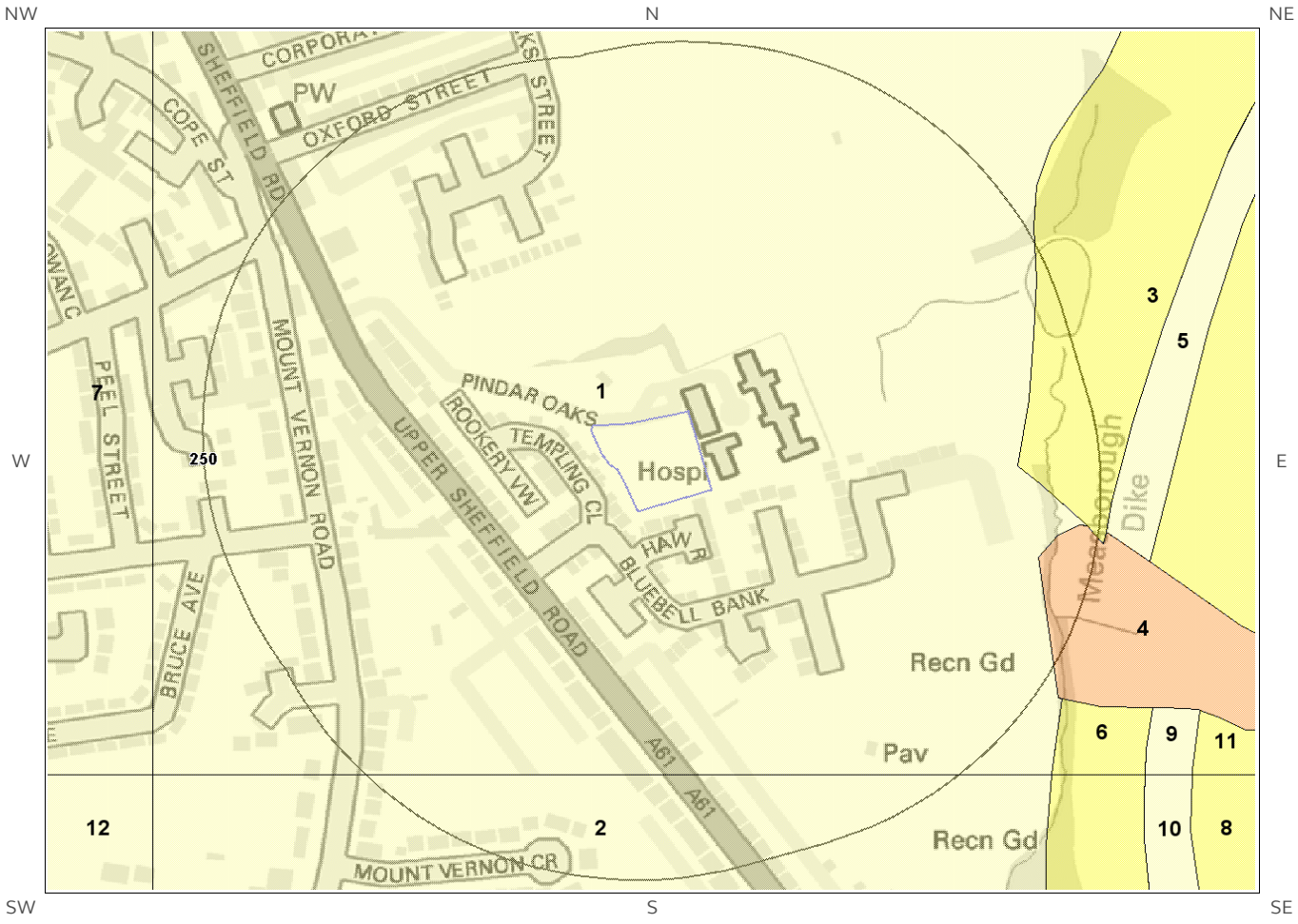
Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay Map

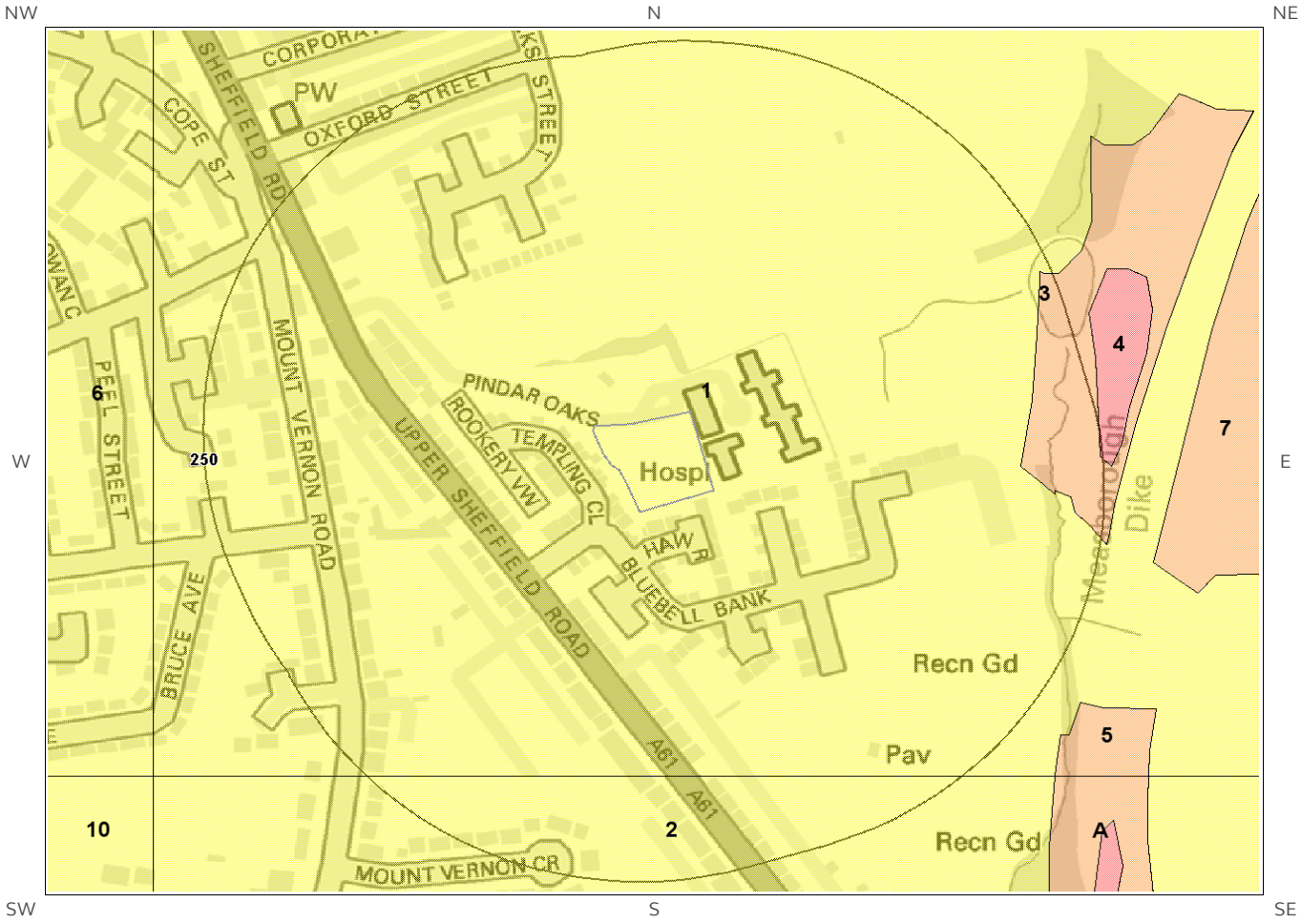


Shrink Swell Clay Legend

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6.2 Landslides Map



Landslides Legend

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6.3 Ground Dissolution of Soluble Rocks Map

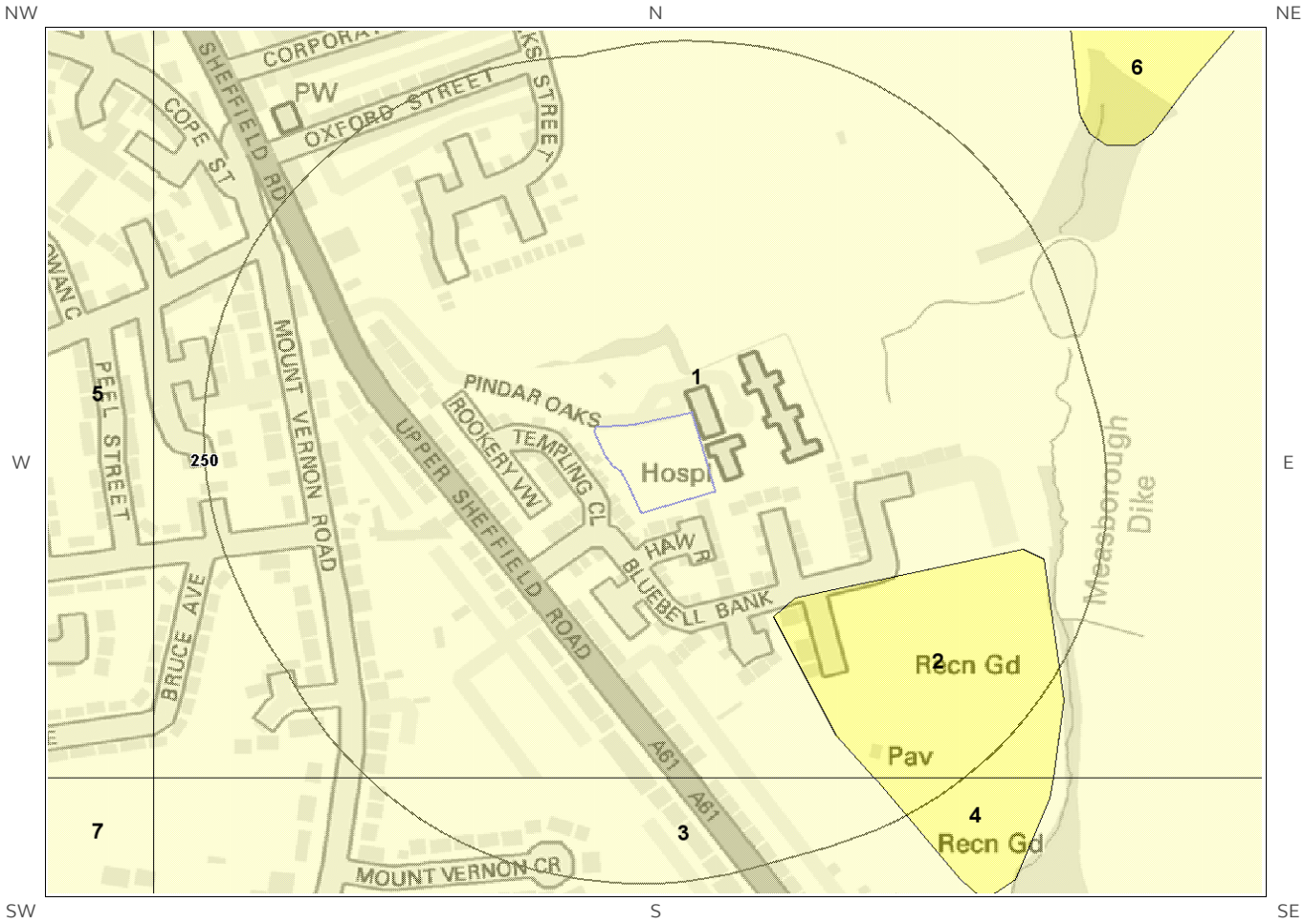


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Ground Dissolution Soluble Rocks Legend



6.4 Compressible Deposits Map



Compressible Deposits Legend

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6.5 Collapsible Deposits Map

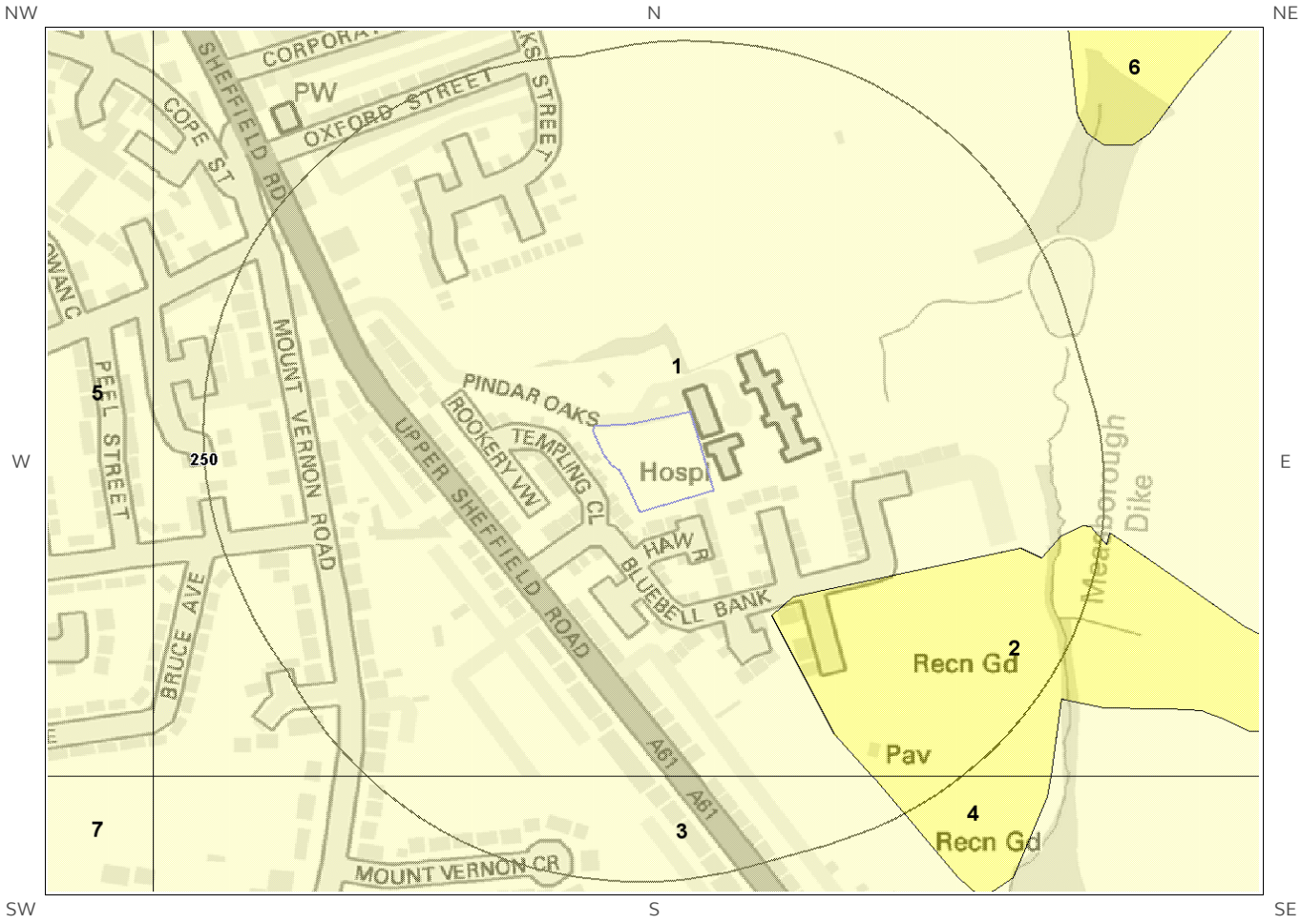


Collapsible Deposits Legend

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6.6 Running Sand Map



Running Sand Legend

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6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site*[*] boundary? Very Low

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This includes an automatically generated 50m buffer zone around the site

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

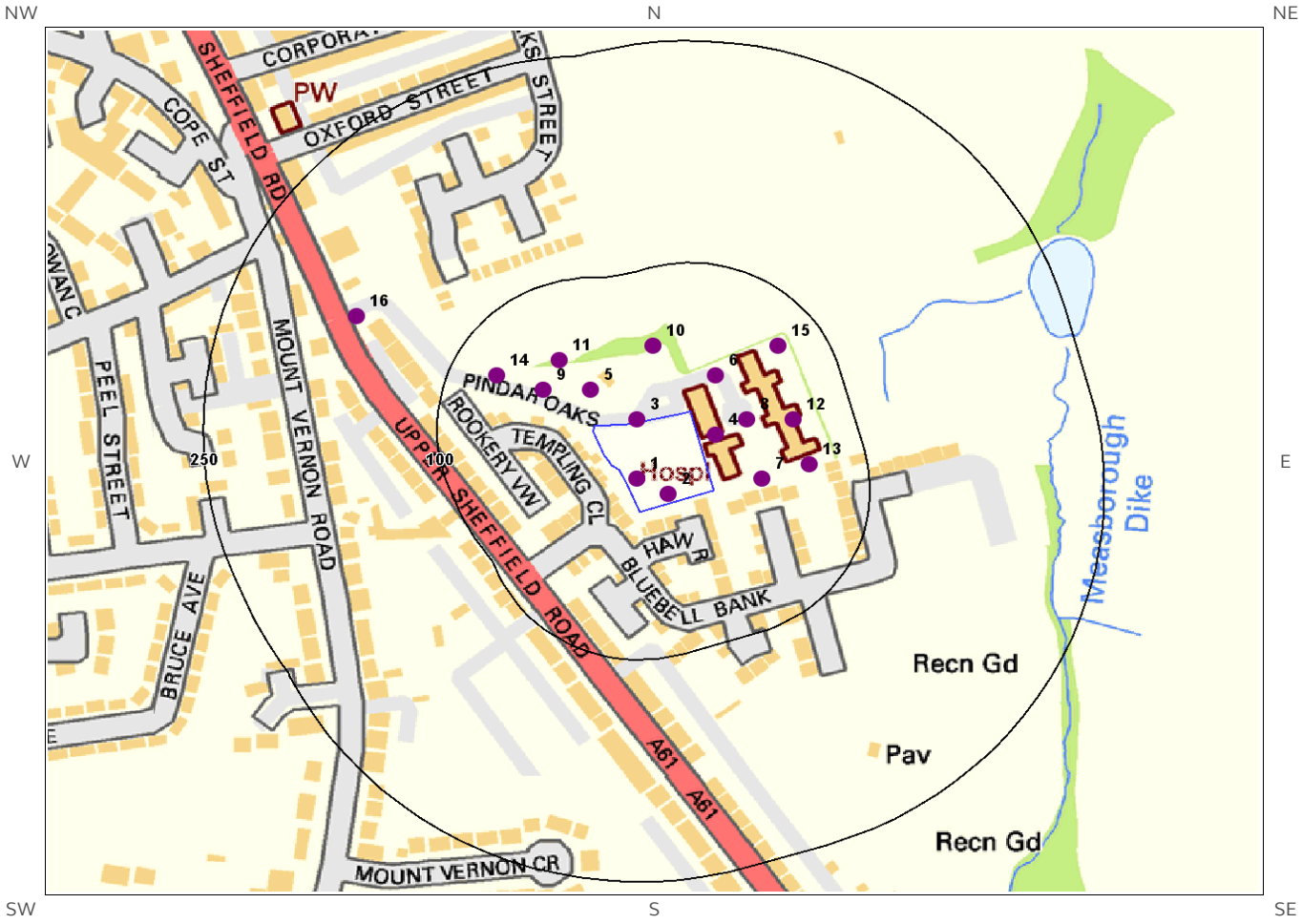
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

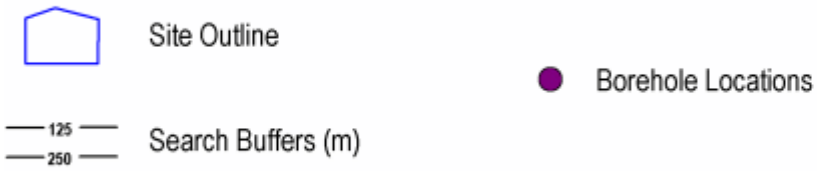
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records Map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary: 16

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	0.0	On Site	435310 405200	SE30NE435	-1.0	SHEFFIELD ROAD BARNSLEY TP12
2	0.0	On Site	435330 405190	SE30NE436	-1.0	SHEFFIELD ROAD BARNSLEY TP13
3	2.0	N	435310 405240	SE30NE431	-1.0	SHEFFIELD ROAD BARNSLEY TP8
4	11.0	E	435360 405230	SE30NE433	-1.0	SHEFFIELD ROAD BARNSLEY TP10
5	24.0	N	435280 405260	SE30NE428	-1.0	SHEFFIELD ROAD BARNSLEY TP5
6	29.0	NE	435360 405270	SE30NE429	-1.0	SHEFFIELD ROAD BARNSLEY TP6
7	31.0	E	435390 405200	SE30NE437	-1.0	SHEFFIELD ROAD BARNSLEY TP14
8	33.0	E	435380 405240	SE30NE432	-1.0	SHEFFIELD ROAD BARNSLEY TP9
9	40.0	NW	435250 405260	SE30NE427	-1.0	SHEFFIELD ROAD BARNSLEY TP4
10	49.0	N	435320 405290	SE30NE426	-1.0	SHEFFIELD ROAD BARNSLEY TP3
11	49.0	NW	435260 405280	SE30NE425	-1.0	SHEFFIELD ROAD BARNSLEY TP2
12	62.0	E	435410 405240	SE30NE434	-1.0	SHEFFIELD ROAD BARNSLEY TP11
13	63.0	E	435420 405210	SE30NE438	-1.0	SHEFFIELD ROAD BARNSLEY TP15
14	71.0	NW	435220 405270	SE30NE424	-1.0	SHEFFIELD ROAD BARNSLEY TP1
15	71.0	NE	435400 405290	SE30NE430	-1.0	SHEFFIELD ROAD BARNSLEY TP7
16	169.0	NW	435130 405310	SE30NE439	-1.0	SHEFFIELD ROAD BARNSLEY TP16

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

8 Estimated Background Soil Chemistry

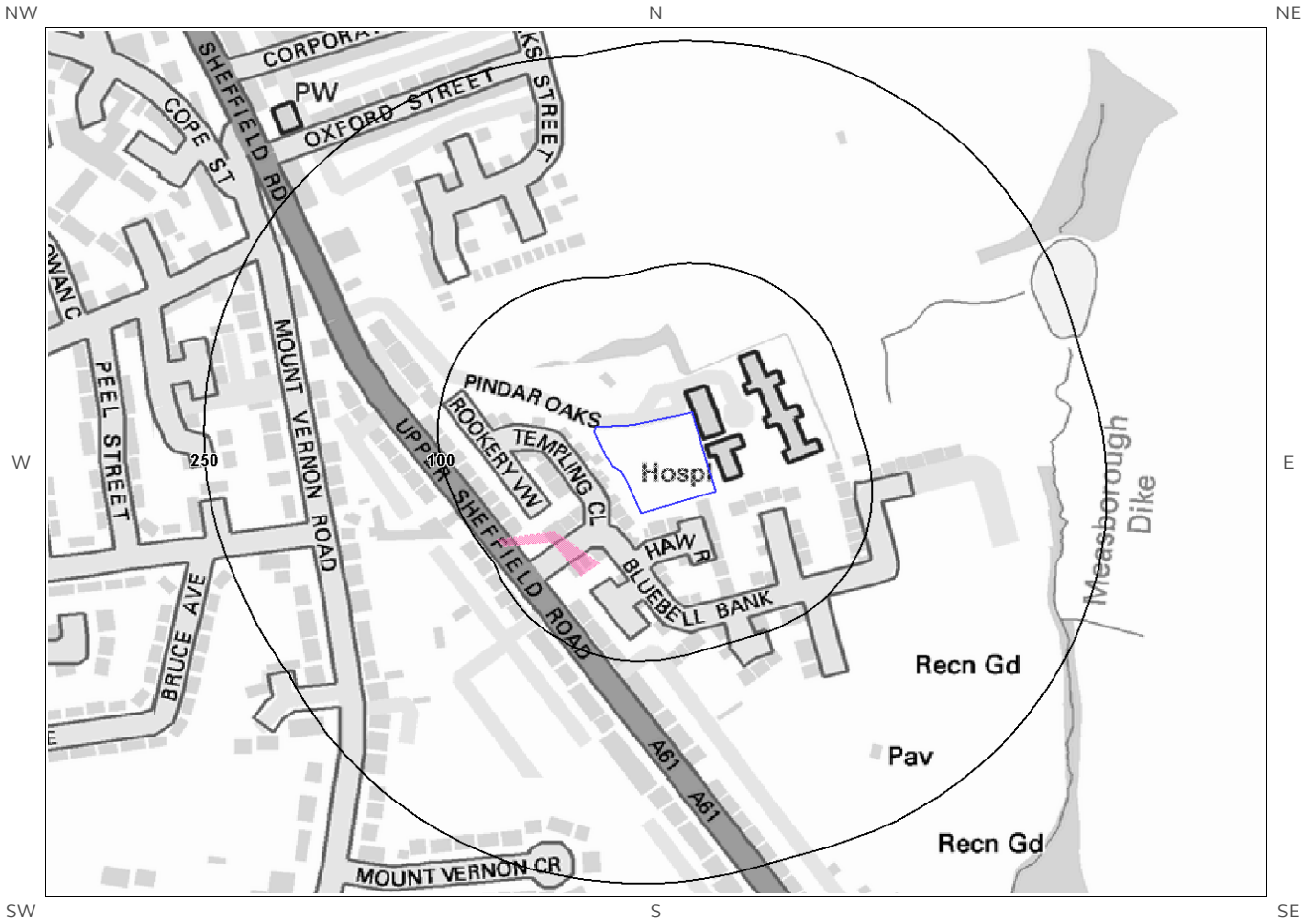
Records of background estimated soil chemistry within 250m of the study site boundary: 2

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
7.0	NE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels Map



Railways and Tunnels Legend

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- Site Outline
- Search Buffers (m) — 250 — 500
- Underground or Partially Underground Railway / Subway System
- Railway Tunnel (OS Mapping)
- Abandoned or Dismantled Railway (OpenStreetMap)
- Railway Track (OS Mapping)
- Railway Track (OpenStreetMap)
- High Speed 2
- High Speed 2 Revised Proposed Route
- Crossrail 1
- Railway and/or Tunnel Feature from Historical Mapping

9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	43	SW	435268 405151	Tramway Sidings	1906

Any records that have been identified are represented on the Railways and Tunnels Map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary?	No
Have any historical railway lines been identified within 250m of the study site boundary?	No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels Map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary?	No
Have any active railway lines been identified within 250m of the study site boundary?	No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels Map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project?	Yes
Is the study site within 500m of the route of the Crossrail 1 rail project?	No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

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https://www.groundsure.com/terms-and-conditions-sept-2016/

Rogers Geotechnical Services

Barncliffe Mills, NEAR BANK,
HUDDERSFIELD, HD8 8LU

Groundsure Reference:	GS-4296377
Your Reference:	J4044_17_EDS
Report Date	25 Sep 2017
Report Delivery Method:	Email - pdf

Enviro Insight

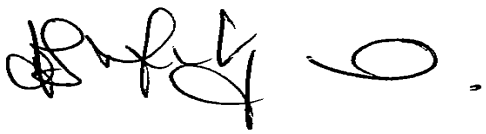
Address: ACORN LODGE, UPPER SHEFFIELD ROAD, BARNSLEY, S70 4PL

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Enviro Insight

Address:	**ACORN LODGE, UPPER SHEFFIELD ROAD, BARNSLEY, S70 4PL**
Date:	**25 Sep 2017**
Reference:	**GS-4296377**
Client:	**Rogers Geotechnical Services**

NW N NE

W E



SW S SE

Aerial Photograph Capture date:	07-Jun-2013
Grid Reference:	435327,405215
Site Size:	0.33ha

Report Reference: GS-4296377
Client Reference: J4044_17_EDS

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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	3	5	28	46
1.2 Additional Information – Historical Tank Database	0	0	6	3
1.3 Additional Information – Historical Energy Features Database	0	0	2	0
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	5	0
1.6 Potentially Infilled Land	0	0	36	20

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	2	1
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	2	0
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	4	1
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	2	3	5
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	1	2
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	3	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	1	0	3	1

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	0	6	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	2	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	None
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m
6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	5
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	10
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	4
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	0	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site?	No	No	No	No	No	No
6.10 Detailed River Network entries within 500m of the site	0	0	5	3	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Are there any Enviroment Agency Zone 2 floodplains within 250m of the study site?	No
7.2 Are there any Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	No
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	Very Low
7.4 Are there any Flood Defences within 250m of the study site?	No
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Limited potential
7.8 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Low

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	1
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	3
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	1	0	0	0	0	0
8.14 Records of Green Belt land	0	1	0	1	0	0

Section 9: Natural Hazards

9.1 What is the maximum risk of natural ground subsidence?	Very Low
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Negligible
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Negligible
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Negligible
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Very Low
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Negligible
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Are there any coal mining areas within 75m of the study site?	Yes
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	Yes
10.3 Are there any brine affected areas within 75m of the study site?	No

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

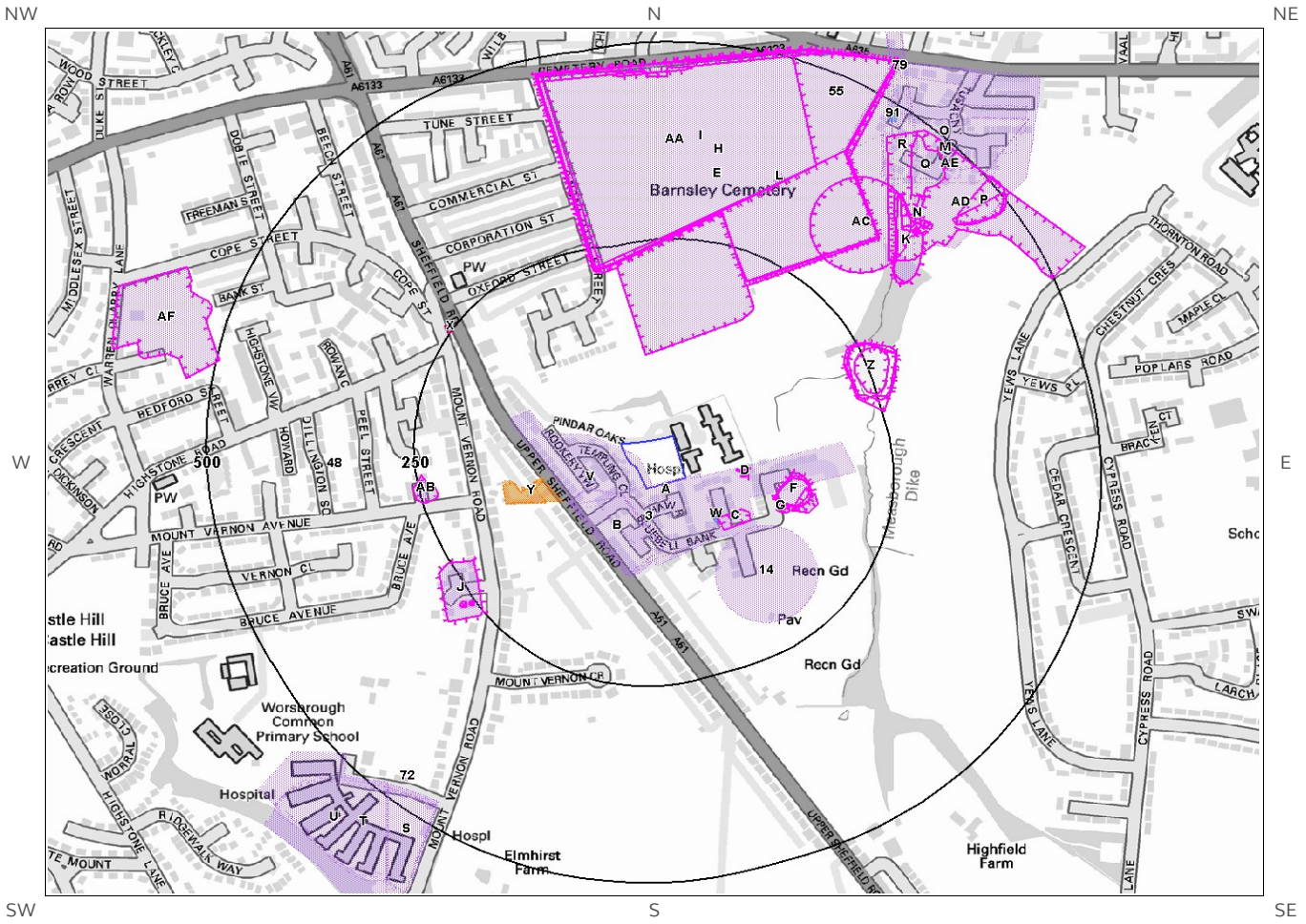
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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Site Outline

250
500
Search Buffers (m)

Historical 1:10,000 and 1:10,560 scale mapping

Industrial Land Use

Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

Energy Features

Petrol Stations

Tanks

Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 82

ID	Distance [m]	Direction	Use	Date
1A	0	On Site	Unspecified Depot	1982
2A	0	On Site	Unspecified Depot	1992
3	0	On Site	Tramcar and Omnibus Depot	1948
4B	27	SW	Tramcar and Omnibus Depot	1938
5B	28	SW	Tram Car Depot	1951
6B	28	SW	Omnibus Depot	1966
7B	28	SW	Omnibus Depot	1974
8B	29	SW	Tram Car Shed	1904
9C	64	SE	Unspecified Heap	1966
10C	64	SE	Unspecified Heap	1974
11D	66	E	Unspecified Old Shafts	1951
12D	68	E	Unspecified Old Shafts	1948
13D	68	E	Unspecified Old Shafts	1948
14	94	SE	Tramcar and Omnibus Depot	1951
15E	107	N	Cemetery	1966
16E	107	N	Cemetery	1992
17E	107	N	Cemetery	1982
18E	107	N	Cemetery	1974
19F	111	E	Refuse Heap	1948
20F	111	E	Refuse Heap	1948
21F	111	E	Refuse Heap	1938
22F	113	E	Refuse Heap	1951
23G	116	E	Unspecified Old Shafts	1938
24G	117	E	Unspecified Old Shafts	1948
25G	117	E	Unspecified Old Shafts	1948
26G	121	E	Unspecified Disused Shaft	1982
27F	134	E	Unspecified Heap	1966
28F	134	E	Unspecified Heap	1982
29F	134	E	Unspecified Heap	1974
30H	214	NE	Cemetery	1951
31H	214	NE	Cemetery	1948
32I	223	N	Cemetery	1904

33I	223	N	Cemetery	1938
34AA	225	N	Cemetery	1890
35J	226	SW	Colliery	1890
36AB	228	W	Unspecified Quarry	1890
37J	252	SW	Unspecified Shafts	1904
38J	260	SW	Unspecified Shafts	1904
39AC	289	NE	Unspecified Old Shaft	1951
40K	332	NE	Unspecified Pit	1938
41K	337	NE	Unspecified Pit	1948
42K	337	NE	Unspecified Pit	1948
43L	339	N	Mortuary	1951
44AD	342	NE	Colliery	1890
45L	343	N	Mortuary	1948
46L	343	N	Mortuary	1904
47L	343	N	Mortuary	1938
48	345	W	Unspecified Pump	1850
49R	349	NE	Railway Sidings	1890
50M	353	NE	Unspecified Factories	1966
51M	353	NE	Unspecified Factories	1974
52N	381	NE	Unspecified Ground Workings	1974
53N	381	NE	Unspecified Ground Workings	1992
54N	381	NE	Unspecified Ground Workings	1982
55	384	NE	Hospital	1890
56K	387	NE	Unspecified Old Shaft	1938
57N	397	NE	Unspecified Old Shafts	1904
58N	401	NE	Unspecified Old Shaft	1948
59N	401	NE	Unspecified Old Shaft	1948
60O	412	NE	Unspecified Factories	1992
61O	412	NE	Unspecified Factories	1982
62O	414	NE	Unspecified Commercial/Industrial	1948
63O	414	NE	Infectious Diseases Hospital	1951
64Q	419	NE	Refuse Heap	1890
65P	433	NE	Unspecified Pit	1904
66P	433	NE	Unspecified Pit	1938
67P	434	NE	Unspecified Pit	1948
68P	434	NE	Unspecified Pit	1948
69Q	452	NE	Unspecified Tanks	1938
70R	460	NE	Railway Sidings	1938
71R	460	NE	Railway Sidings	1904
72	465	SW	Unspecified Pump	1850
73S	468	SW	Sanatorium	1951
74AE	471	NE	Unspecified Tanks	1938

75T	472	SW	Sanatorium	1948
76S	474	SW	Hospital	1977
77S	474	SW	Hospital	1987
78T	475	SW	Sanatorium	1938
79	484	NE	Railway Sidings	1948
80U	485	SW	Hospital	1977
81U	488	SW	Sanatorium	1951
82AF	496	W	Brick Works	1904

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 9

ID	Distance (m)	Direction	Use	Date
83V	51	SW	Tanks	1960
84V	51	SW	Tanks	1961
85W	54	SE	Tanks	1961
86W	57	SE	Tanks	1983
87W	58	SE	Tanks	1960
88W	58	SE	Tanks	1961
89K	389	NE	Unspecified Tank	1892
90K	389	NE	Unspecified Tank	1906
91	476	NE	Tanks	1973

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 2

ID	Distance (m)	Direction	Use	Date
92X	247	NW	Electricity Substation	1993
93X	248	NW	Electricity Substation	1983

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 5

ID	Distance (m)	Direction	Use	Date
94Y	95	SW	Garage	1960
95Y	105	SW	Garage	1993
96Y	105	W	Garage	1983
97Y	112	SW	Garage	1961
98Y	112	SW	Garage	1961

1.6 Potentially Infilled Land

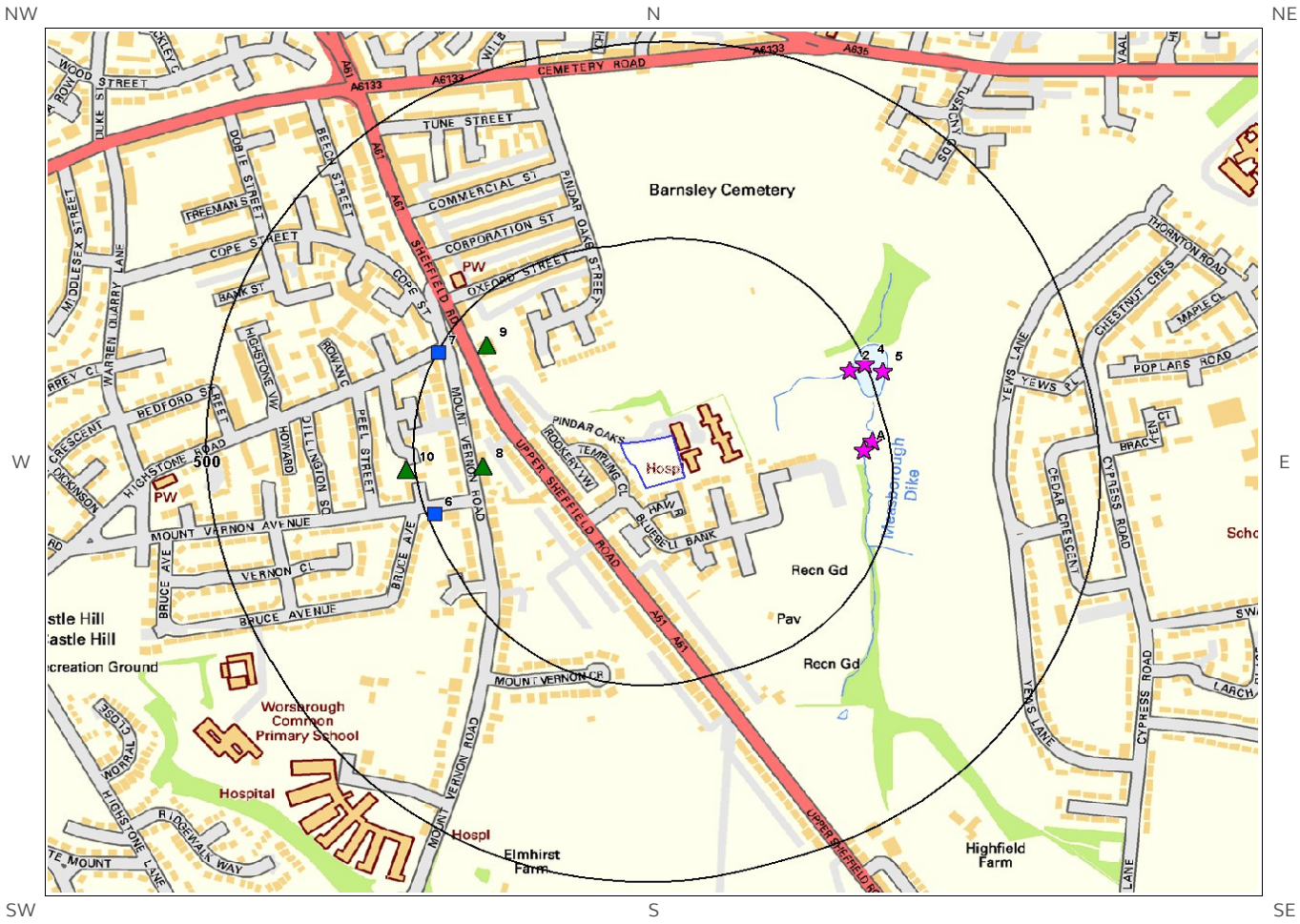
Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 56

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
99C	64	SE	Unspecified Heap	1974
100C	64	SE	Unspecified Heap	1966
101D	66	E	Unspecified Old Shafts	1951
102D	68	E	Unspecified Old Shafts	1948
103D	68	E	Unspecified Old Shafts	1948
104E	107	N	Cemetery	1966
105E	107	N	Cemetery	1974
106E	107	N	Cemetery	1982
107E	107	N	Cemetery	1992
108F	111	E	Refuse Heap	1948
109F	111	E	Refuse Heap	1948
110F	111	E	Refuse Heap	1938
111F	113	E	Refuse Heap	1951
112G	116	E	Unspecified Old Shafts	1938
113G	117	E	Unspecified Old Shafts	1948
114G	117	E	Unspecified Old Shafts	1948
115G	121	E	Unspecified Disused Shaft	1982
116F	134	E	Unspecified Heap	1974
117F	134	E	Unspecified Heap	1966

118F	134	E	Unspecified Heap	1982
119H	214	NE	Cemetery	1951
120H	214	NE	Cemetery	1948
121H	223	N	Cemetery	1938
122H	223	N	Cemetery	1904
123Z	225	E	Pond	1938
124Z	225	E	Pond	1890
125Z	225	E	Pond	1904
126AA	225	N	Cemetery	1890
127Z	225	E	Pond	1951
128J	226	SW	Colliery	1890
129Z	227	E	Pond	1948
130AB	228	W	Unspecified Quarry	1890
131Z	232	E	Pond	1966
132Z	232	E	Pond	1974
133Z	232	E	Pond	1982
134Z	232	E	Pond	1992
135J	252	SW	Unspecified Shafts	1904
136J	260	SW	Unspecified Shafts	1904
137AC	289	NE	Unspecified Old Shaft	1951
138K	332	NE	Unspecified Pit	1938
139K	337	NE	Unspecified Pit	1948
140K	337	NE	Unspecified Pit	1948
141AD	342	NE	Colliery	1890
142N	381	NE	Unspecified Ground Workings	1982
143N	381	NE	Unspecified Ground Workings	1992
144N	381	NE	Unspecified Ground Workings	1974
145K	387	NE	Unspecified Old Shaft	1938
146N	397	NE	Unspecified Old Shafts	1904
147N	401	NE	Unspecified Old Shaft	1948
148N	401	NE	Unspecified Old Shaft	1948
149AE	419	NE	Refuse Heap	1890
150AD	433	NE	Unspecified Pit	1938
151AD	433	NE	Unspecified Pit	1904
152AD	434	NE	Unspecified Pit	1948
153AD	434	NE	Unspecified Pit	1948
154AF	496	W	Brick Works	1904

2. Environmental Permits, Incidents and Registers Map



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Site Outline

250
500
Search Buffers (m)

Recorded Pollution Incident

Dangerous Substances (List 1)

Dangerous Substances (List 2)

Water Industry Referrals

Licenced Discharge Consents

Red List Discharge Consents

RAS 3 & 4 Authorisations

Part A(1) Authorised Processes and Historic IPC Authorisations

Part A(2) and Part B Authorised Processes

COMAH / NIHHS Sites

Sites Determined as Contaminated Land

Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

3

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
8	170	W	435115 405204	Address: Action Stations, Upper Sheffield Rd, Barnsley, S70 4PN Process: Petrol Vapour Recovery Process Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
9	203	NW	435120 405358	Address: Barnsley Service Station, Upper Sheffield Road, Barnsley, S70 4PN Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
10	261	W	435023 405200	Address: Save Serv Station, Upper Sheffield Rd, Barnsley, S70 4FN Process: Petrol Vapour Recovery Process Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

2

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
6	241	W	435057 405146	Address: UNDEFINED SITE, SEE OUTLET NGR OR COMMENTS, FOR MORE INFO ABOUT THE SITE, (DO NOT CHANGE THESE DETAILS), ., NK Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: S/CB/8 Permit Version: 1	Receiving Water: VARIES WITH OUTLET Status: TRANSFERRED FROM R(PP)A 1951-1961 Issue date: 29/05/1963 Effective Date: 29-May-1963 Revocation Date: 31/03/2005

ID	Distance (m)	Direction	NGR	Details	
7	249	NW	435062 405351	Address: UNDEFINED SITE, SEE OUTLET NGR OR COMMENTS, FOR MORE INFO ABOUT THE SITE, (DO NOT CHANGE THESE DETAILS), ., NK Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: S/CB/8 Permit Version: 1	Receiving Water: VARIES WITH OUTLET Status: TRANSFERRED FROM R(PP)A 1951-1961 Issue date: 29/05/1963 Effective Date: 29-May-1963 Revocation Date: 31/03/2005

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

5

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1A	217	E	435574 405227	Incident Date: 14-Oct-2002 Incident Identification: 114596 Pollutant: Oils and Fuel Pollutant Description: Unidentified Oil	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

ID	Distance (m)	Direction	NGR	Details	
2	229	E	435557 405329	Incident Date: 22-Oct-2002 Incident Identification: 116105 Pollutant: Oils and Fuel Pollutant Description: Hydraulic Oils	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
3A	229	E	435584 405238	Incident Date: 09-Sep-2003 Incident Identification: 188600 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
4	248	E	435575 405337	Incident Date: 25-Apr-2003 Incident Identification: 154036 Pollutant: Organic Chemicals/Products Pollutant Description: Hydrocarbons	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
5	266	E	435597 405328	Incident Date: 24-Oct-2001 Incident Identification: 38925 Pollutant: Oils and Fuel Pollutant Description: Unidentified Oil	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

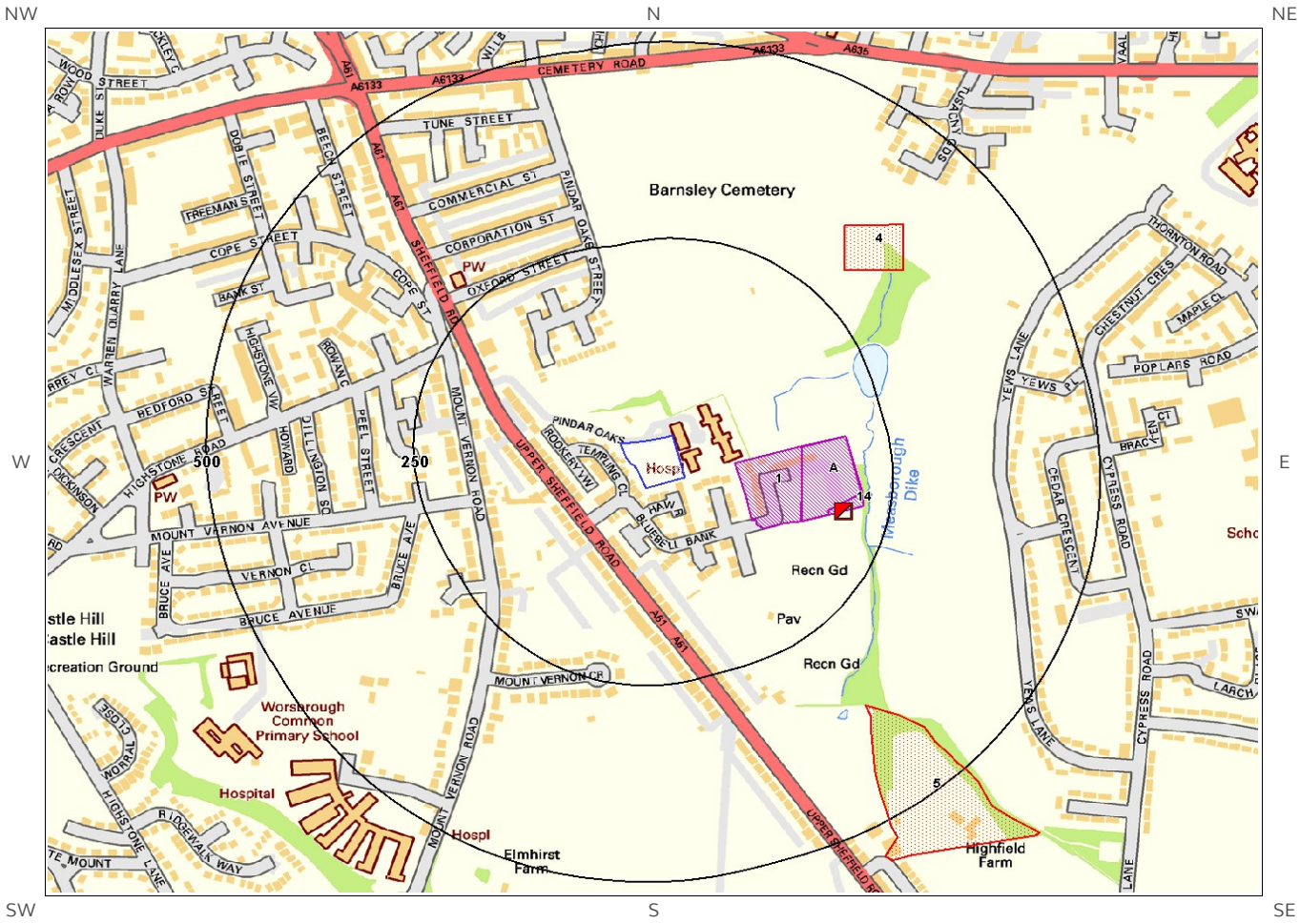
Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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Site Outline

250 Search Buffers (m)
500

EA/NRW Active Landfill

EA/NRW Historic Landfill

BGS / DoE Survey Landfill

Historic and Planned Waste Sites

EA/NRW Licensed Waste Site

Local Authority/Historical Mapping Landfill Records

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

10

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
4	295	NE	435500 405400	Site Address: South East Corner Cemetery Road, Barnsley Cemetery, Barnsley Waste Licence: - Site Reference: 4400/(148) Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: Barnsley Metropolitan Borough Council Licence Holder: Barnsley Metropolitan Borough Council First Recorded: 31-Dec-1964 Last Recorded: -
5	362	SE	435600 404700	Site Address: Highfield Farm, Knowle Road, Barnsley Waste Licence: Yes Site Reference: WD20 B311, 4400/B311, 20B311(78) Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 16-Jan-1981 Licence Surrendered: Licence Holder Address: Highfield Farm, Knowle Road, Barnsley Operator: R J Norman Licence Holder: R J Norman First Recorded: 31-Jan-1981 Last Recorded: 31-Dec-1983
Not shown	828	NW	434900 406000	Site Address: The Old Vicarage, Doncaster Road, Barnsley Waste Licence: Yes Site Reference: WD20 B812, 20B812 Waste Type: Commercial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 17-Jul-1991 Licence Surrendered: 17-Jan-1994 Licence Holder Address: Oak House, Doncaster Road, Barnsley Operator: - Licence Holder: Mr K Sykes - Aytee Portable Equiptment Limited First Recorded: - Last Recorded: -

ID	Distance (m)	Direction	NGR	Details	
Not shown	839	N	435500 406000	Site Address: Mount Osborne Industrial Park, Barnsley, South Yorkshire Waste Licence: Yes Site Reference: 4400/B62 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 11-Jul-1995 Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: Barnsey Group First Recorded: - Last Recorded: -
Not shown	957	NE	436200 405800	Site Address: Monument Field, Measborough Hill, Doncaster Road, Barnsley Waste Licence: Yes Site Reference: WD20 B37, 4400/B37, 20B37(41) Waste Type: Industrial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 07-Sep-1979 Licence Surrendered: 14-May-1982 Licence Holder Address: 22 Hunningley Lane, Stairfoot, Barnsley Operator: Frank Green and Sons Limited Licence Holder: Frank Green and Sons Limited First Recorded: - Last Recorded: -
Not shown	1004	N	435400 406200	Site Address: Barnsley Football Ground, Oakwell Road, Barnsley Waste Licence: - Site Reference: 4400/(164) Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: Mowlem Construction Licence Holder: Mowlem Construction First Recorded: 01-Jun-1995 Last Recorded: 31-Aug-1995
Not shown	1060	SW	434500 404300	Site Address: Land to rear of Ward Green, Communtiy Centre, Genn Lane, Ward Green, Barnsley Waste Licence: Yes Site Reference: WD20 B327, 4400/B327, CS/WG, 20B327(11) Waste Type: Inert, Industrial, Commercial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 28-Jul-1981 Licence Surrendered: 22-Apr-1993 Licence Holder Address: - Operator: Barnsley Metropolitan Borough Council Licence Holder: Public Services Dept, Barnsley Metropolitan Borough Council First Recorded: 31-Jul-1981 Last Recorded: 31-Dec-1989
Not shown	1138	NW	434300 405800	Site Address: Spring Street, Barnsley Waste Licence: - Site Reference: 4400/(159), (159)B, WD24 B343, WD34.16.16 Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: Mr A J Shaw Licence Holder: Mr A J Shaw First Recorded: 31-Dec-1993 Last Recorded: 31-Dec-1993
Not shown	1324	NE	435900 406500	Site Address: Land to the rear of Chapel Street-Beever Street, Glasstip, Railway Cutting, Beevor Street Waste Licence: Yes Site Reference: WD20 B6(I), 4400/B6, 20B6(38), 4400/0573 Waste Type: Inert, Industrial, Special Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 05-Dec-1977 Licence Surrendered: 31-Dec-1984 Licence Holder Address: Borough Flint Glassworks, Barnsley, South Yorkshire Operator: Barnsley Metropolitan Borough Council Licence Holder: Wood Brothers Glass Company Limited First Recorded: 05-Dec-1977 Last Recorded: 31-Dec-1984
Not shown	1329	NE	435900 406500	Site Address: Former Wood Brothers Tip, Glasstip, Railway Cutting, Beevor Street, Hoyle Mill, Barnsley Waste Licence: Yes Site Reference: WD20 B353, 4400/B353, 20B353, WD20 B353a Waste Type: Commercial, Special Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 22-Mar-1982 Licence Surrendered: 09-May-1984 Licence Holder Address: High Holborn Road, Codnor Gate Industrial Estate, Ripley, Derbyshire Operator: - Licence Holder: Nuttall Lighting Limited First Recorded: - Last Recorded: -

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

3

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Site Address	Source	Data Type
Not shown	732	W	434568 405008	Refuse Tip	1969 mapping	Polygon
Not shown	1137	NW	434273 405813	Spring Street	Barnsley Metropolitan Borough Council	Point
Not shown	1186	N	435798 406428	Refuse Tip	1970 mapping	Polygon

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

3

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details		
1	63	E	435459 405179	Type of Site: Scrap Yard Site Address: N/A	Planning Application Reference: N/A Date: 1993	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon
2A	141	E	435536 405191	Type of Site: Scrap Yard Site Address: N/A	Planning Application Reference: N/A Date: 1993	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon
3A	141	E	435537 405190	Type of Site: Breaker's Yard Site Address: N/A	Planning Application Reference: N/A Date: 1988	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon

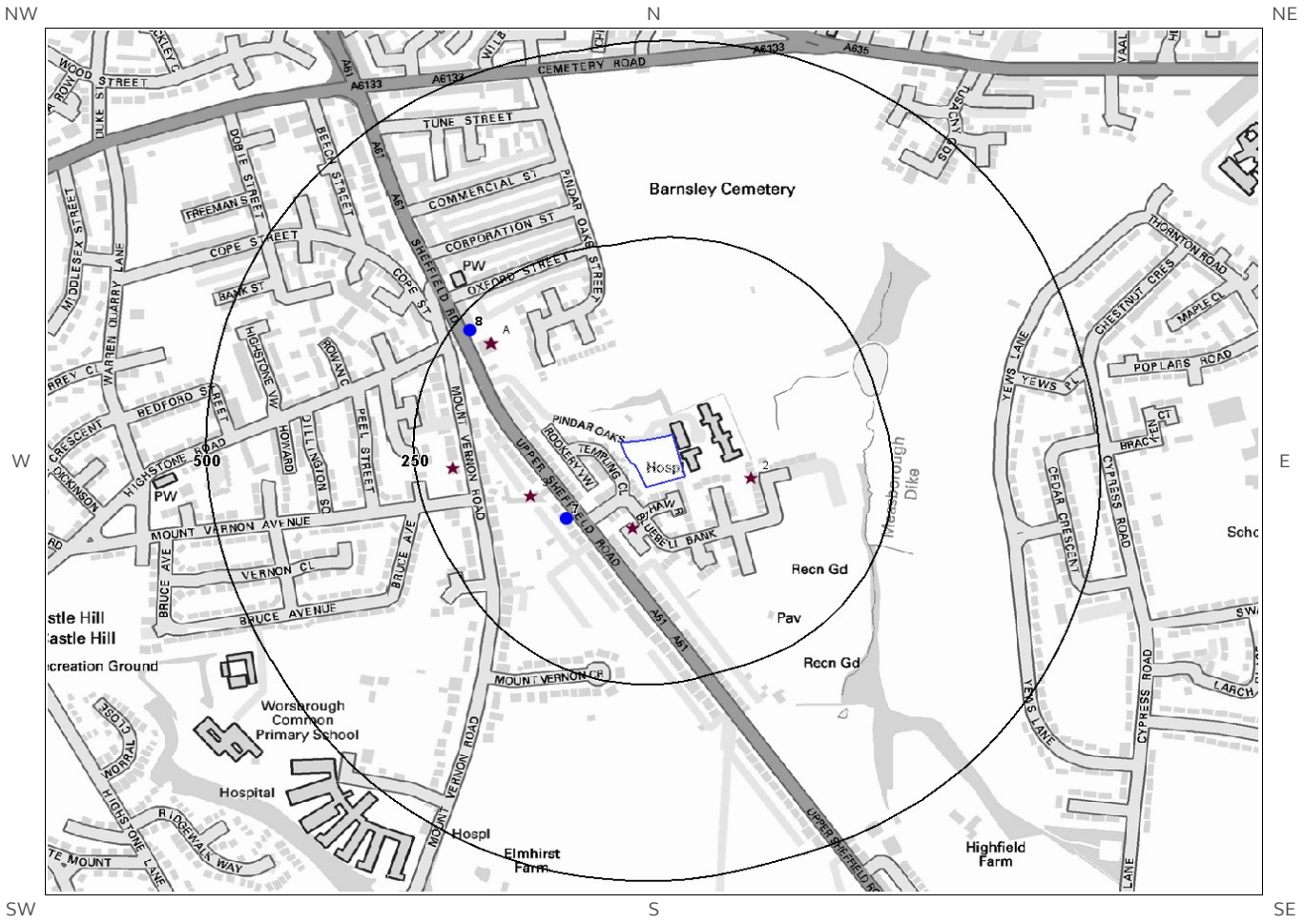
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

5

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
14	195	E	435550 405150	Site Address: Vernon Works, Upper Sheffield Road, Barnsley, South Yorkshire, S70 4PN Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CSO002 EPR reference: EA/EPR/WP3490ZY/S005 Operator: C Soar & Sons Waste Management licence No: 60541 Annual Tonnage: 0.0	Issue Date: 15/07/1993 Effective Date: - Modified: - Surrendered Date: 2.0121e+016 Expiry Date: 0 Cancelled Date: 0 Status: Surrendered Site Name: Vernon Works Correspondence Address: -
Not shown	786	E	436100 405460	Site Address: Kendray Hospital, Doncaster Road, Kendray, Barnsley, South Yorkshire, S70 3RD Type: Special Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BAR002 EPR reference: EA/EPR/JP3890ZV/S003 Operator: Barnsley Primary Care Trust Waste Management licence No: 60603 Annual Tonnage: 0.0	Issue Date: 17/10/1994 Effective Date: - Modified: - Surrendered Date: 2.01309e+016 Expiry Date: 0 Cancelled Date: 0 Status: Surrendered Site Name: Kendray Hospital Correspondence Address: -
Not shown	935	N	435650 406130	Site Address: Unit 5, Oakwell Business Centre, Oakwell View, Barnsley, South Yorkshire, S71 1HX Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SRW001 EPR reference: - Operator: S R Waste Recycling Ltd Waste Management licence No: 100239 Annual Tonnage: 0.0	Issue Date: 12/03/2008 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: S R Waste Recycling Ltd Correspondence Address: 5, Oakwell Business Centre, Oakwell View, Barnsley, South Yorks, S71 1HX
Not shown	935	N	435650 406130	Site Address: Unit 5, Oakwell Business Centre, Oakwell View, Barnsley, South Yorkshire, S71 1HX Type: 75kte WEEE Treatment Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SRW001 EPR reference: EA/EPR/BP3598EY/A001 Operator: S R Waste Recycling Ltd Waste Management licence No: 100239 Annual Tonnage: 4999.0	Issue Date: 12/03/2008 Effective Date: - Modified: - Surrendered Date: 0 Expiry Date: 0 Cancelled Date: 0 Status: Revoked Site Name: S R Waste Recycling Ltd Correspondence Address: -
Not shown	1494	N	434800 406650	Site Address: Harborough Hill Road, Harborough, Barnsley, South Yorkshire, S71 1BD Type: - Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: YOR005 EPR reference: EA/EPR/JP3390ZX/S002 Operator: Yorkshire Electricity Waste Management licence No: 60598 Annual Tonnage: 0.0	Issue Date: 14/09/1992 Effective Date: - Modified: - Surrendered Date: 1.99905e+016 Expiry Date: 0 Cancelled Date: 0 Status: Surrendered Site Name: - Correspondence Address: -

4. Current Land Use Map



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Site Outline

Search Buffers (m)
250
500

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 6

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	54	S	Electricity Sub Station	435295 405127	S70	Electrical Features	Infrastructure and Facilities
2	79	E	Works	435438 405191	S70	Unspecified Works Or Factories	Industrial Features
3	126	SW	Hand Car Wash & Valeting	435172 405168	38-40, Upper Sheffield Road, Barnsley, S70 4PN	Vehicle Cleaning Services	Personal, Consumer and Other Services
4A	201	NW	Texaco	435125 405362	Sheffield Road, Barnsley, S70 4PJ	Petrol and Fuel Stations	Road and Rail
5A	201	NW	Co-Op Upper Sheffield Road Service Station	435125 405362	Sheffield Road, Barnsley, S70 4PN	Petrol and Fuel Stations	Road and Rail
6	205	W	C A Wilson Electrical	435078 405203	29, Mount Vernon Road, Barnsley, S70 4DH	Electronic Equipment	Industrial Products

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 2

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
7	103	SW	435217 405138	Obsolete	Jet Intake 2 Service Station, Upper Sheffield Road, Upper Sheffield Road, Barnsley, South Yorkshire, S70 4PN	Not Applicable	Obsolete
8	231	NW	435100 405379	Texaco	Hks Sheffield Road, 38, Upper Sheffield Road, Upper Sheffield Road, Barnsley, South Yorkshire, S70 4PJ	No	Open

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

---

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.3 Bedrock and Solid Geology

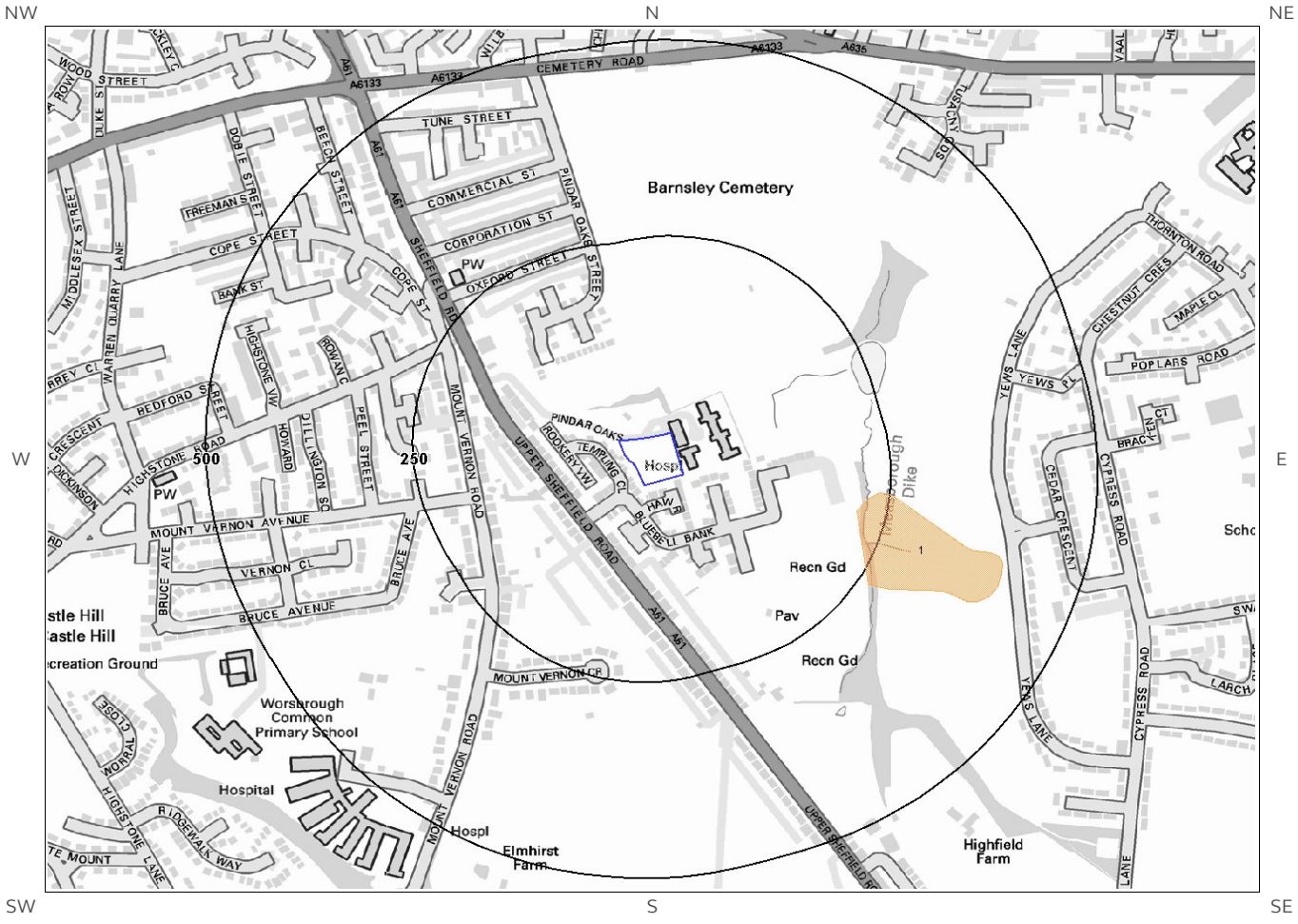
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
WE-SDST	WOOLLEY EDGE ROCK	SANDSTONE

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

6a. Aquifer Within Superficial Geology



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Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

6b. Aquifer Within Bedrock Geology and Abstraction Licenses



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Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

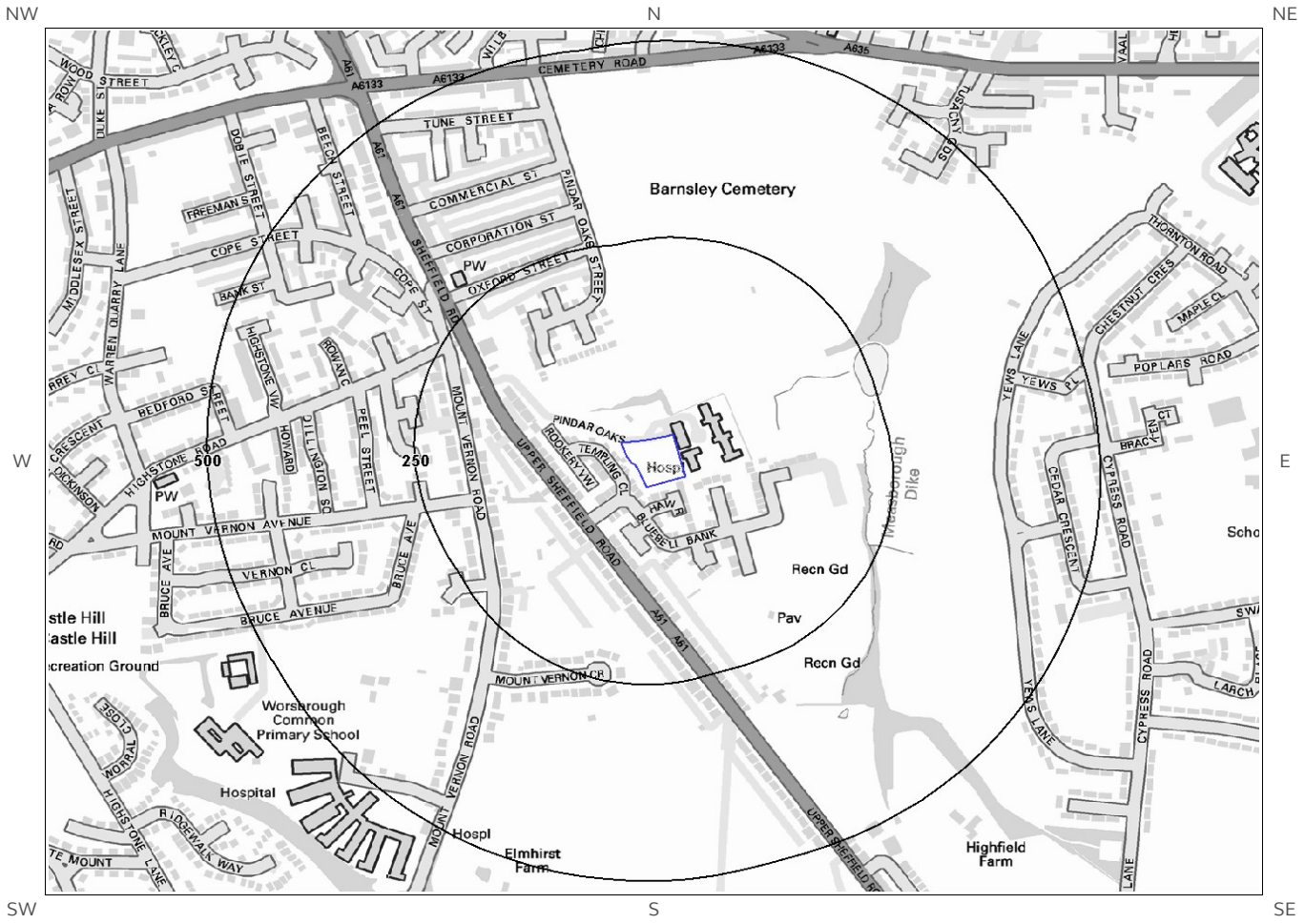
Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

Surface Water Abstraction Licence

6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



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Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

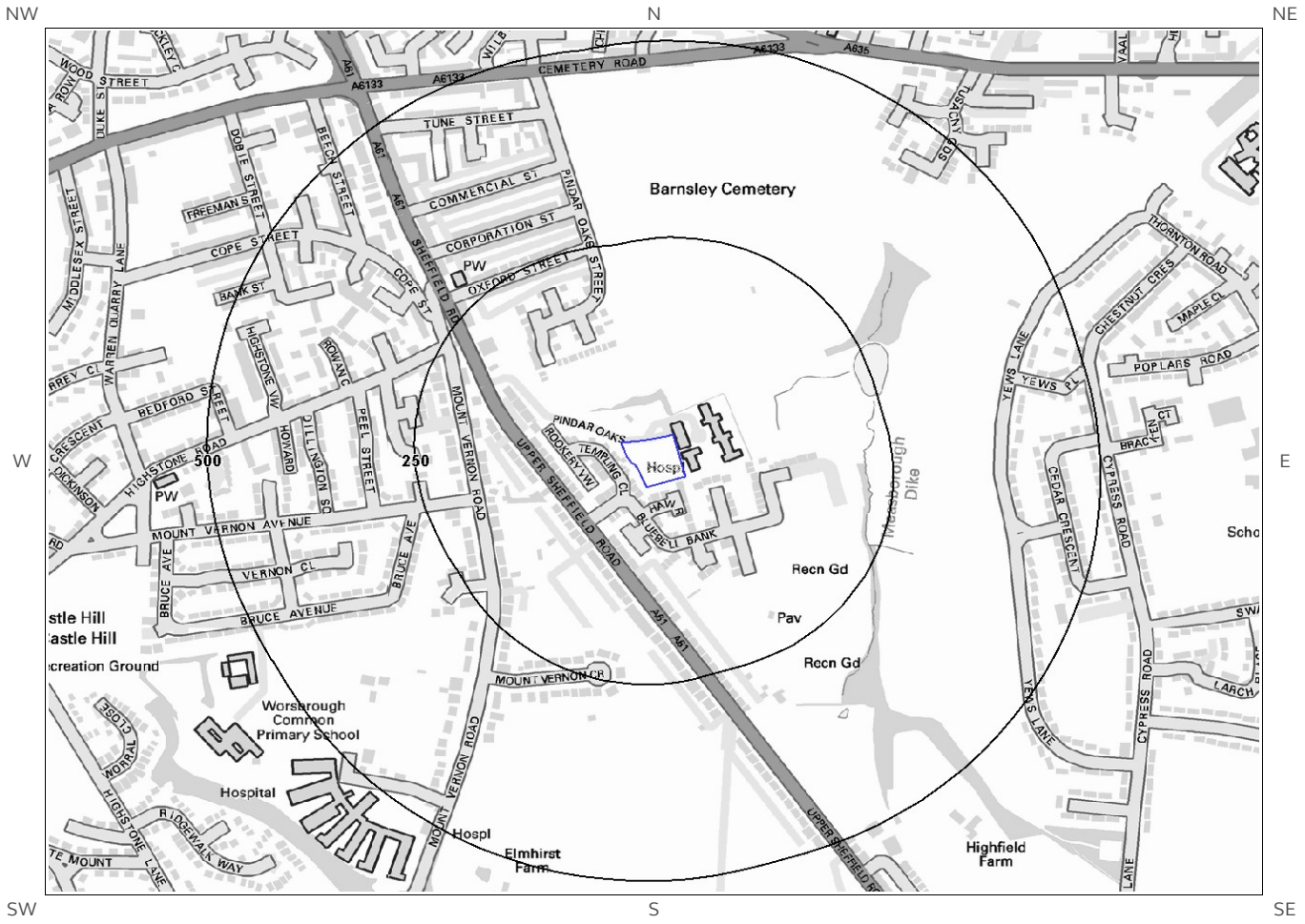
Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

6d. Hydrogeology – Source Protection Zones within confined aquifer



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Site Outline

250
500
Search Buffers (m)

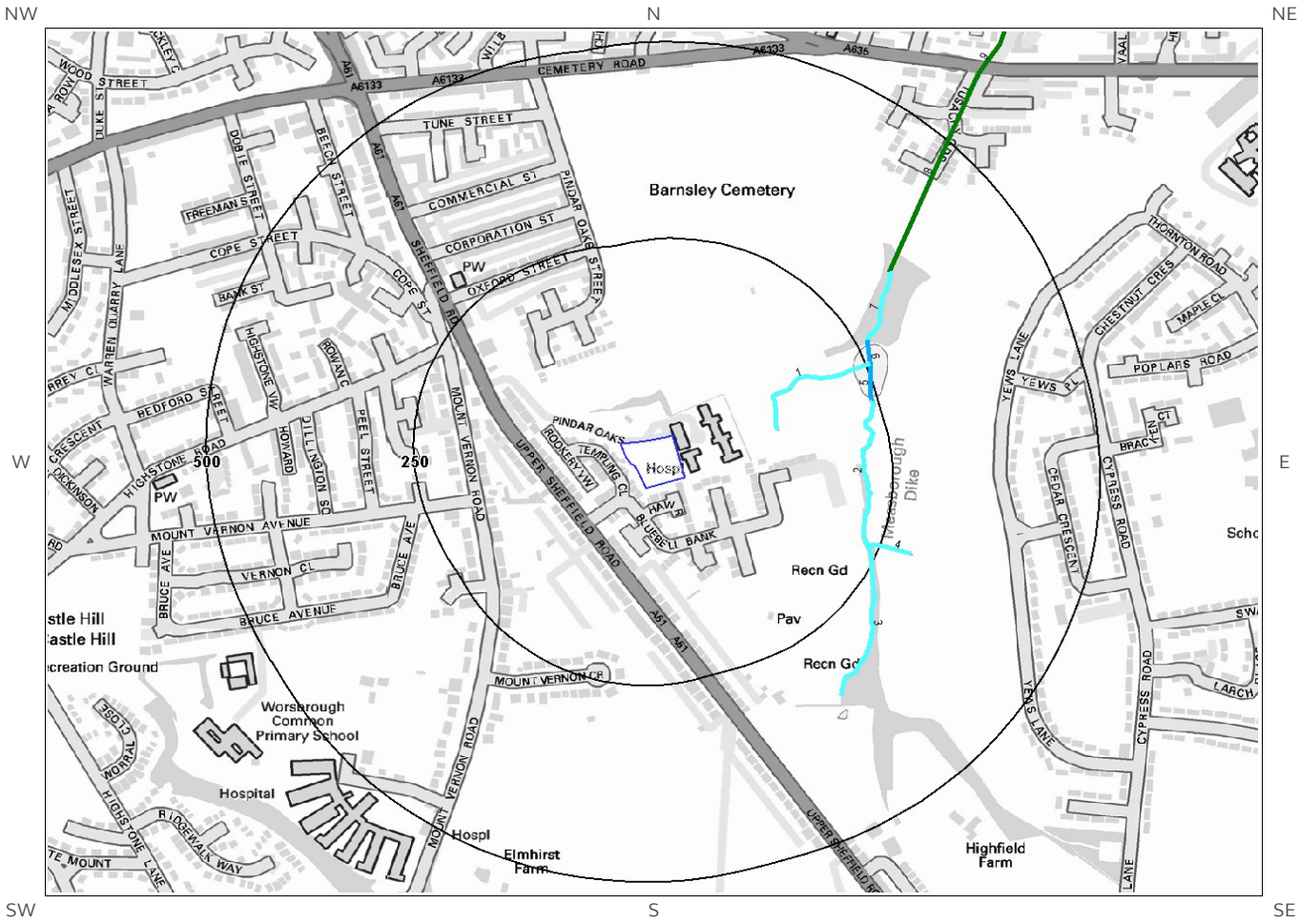
Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

Source Protection Zone 3C - Total Catchment within Confined Aquifer

Potable Water Abstraction Licence

6e. Hydrology – Detailed River Network and River Quality



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Site Outline

250 — 500 — Search Buffers (m)

Primary River
Secondary River
Tertiary River
Lake/Reservoir
Underground River (inferred)
General Quality Assessment: Biology
General Quality Assessment: Chemistry

Canal
Canal Tunnel
Culvert
Multiple Channel Culvert
Underground River (Potential Sewer)
Underground River (local knowledge)

6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	214	E	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

6.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	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	178	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
3	282	W	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
4	359	SW	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

6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1195	N	435336 406441	Status: Active Licence No: NE/027/0008/014 Details: Spray Irrigation - Direct Direct Source: Groundwaters Point: Borehole - Coal Measures - Oakwell Road - Barnsley Data Type: Point Name: Barnsley Football Club 2002 Ltd	Annual Volume (m^3): 21400 Max Daily Volume (m^3): 100 Original Application No: NPS/WR/016056 Original Start Date: 29/6/2015 Expiry Date: 31/3/2029 Issue No: 1 Version Start Date: 29/6/2015 Version End Date:
Not shown	1757	NW	433700 406000	Status: Historical Licence No: 2/27/08/110 Details: Water Bottling Direct Source: Groundwaters Point: Well/spring - Sandstone/middle Coal Measures - Shaw Lane Data Type: Point Name: SHELDALE WATER LIMITED	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 6598 Original Start Date: 23/3/1994 Expiry Date: 31/12/2003 Issue No: 100 Version Start Date: 1/12/1999 Version End Date:
Not shown	1757	NW	433700 406000	Status: Historical Licence No: 2/27/08/110 Details: Water Bottling Direct Source: Groundwaters Point: Spring-sandstone/middle Coal Measures-shaw Lane Data Type: Point Name: SHELDALE DEVELOPMENTS LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 6598 Original Start Date: 23/3/1994 Expiry Date: 31/12/2003 Issue No: 101 Version Start Date: 8/4/2003 Version End Date:
Not shown	1784	NW	433700 406060	Status: Historical Licence No: 2/27/08/133 Details: Water Bottling Direct Source: Groundwaters Point: Spring-sandstone/middle Coal Measures-shaw Lane Data Type: Point Name: SHELDALE DEVELOPMENTS LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 08082 Original Start Date: 1/1/2004 Expiry Date: 31/3/2017 Issue No: 1 Version Start Date: 1/1/2004 Version End Date:
Not shown	1784	NW	433700 406060	Status: Historical Licence No: 2/27/08/133 Details: Water Bottling Direct Source: Groundwaters Point: Spring - Sandstone&middle Coal Measures - Barnsley Data Type: Point Name: SHELDALE DEVELOPMENTS LTD	Annual Volume (m^3): 350000 Max Daily Volume (m^3): 1400 Original Application No: 8082 Original Start Date: 1/1/2004 Expiry Date: 31/3/2017 Issue No: 1 Version Start Date: 1/1/2004 Version End Date:

6.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1645	N	435710 406850	Status: Historical Licence No: 2/27/08/122 Details: Make-Up or Top Up Water Direct Source: Surface Water Point: River Dearne Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: 6891 Original Start Date: 7/10/1998 Expiry Date: 31/10/2006 Issue No: 101 Version Start Date: 1/8/2002 Version End Date:
Not shown	1645	N	435710 406850	Status: Historical Licence No: 2/27/08/141 Details: Make-Up Or Top Up Water Direct Source: Surface Water Point: River Dearne Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): 7800 Max Daily Volume (m^3): 86.6 Application No: 8254 Original Start Date: 13/3/2007 Expiry Date: 31/3/2017 Issue No: 1 Version Start Date: 1/4/2008 Version End Date:
Not shown	1645	N	435710 406850	Status: Historical Licence No: 2/27/08/122 Details: Make-Up or Top Up Water Direct Source: Surface Water Point: River Dearne Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): 7800 Max Daily Volume (m^3): 86.6 Application No: 6891 Original Start Date: 7/10/1998 Expiry Date: 31/10/2006 Issue No: 101 Version Start Date: 1/8/2002 Version End Date:
Not shown	1872	S	435000 403300	Status: Historical Licence No: 2/27/08/129 Details: Spray Irrigation - Direct Direct Source: Surface Water Point: Inland Water - River Dove Data Type: Line Name: WORSBROUGH BRIDGE SPORTS & DEVELOPMENT ASSOCIATION	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: - Original Start Date: 4/9/2002 Expiry Date: 31/3/2017 Issue No: 1 Version Start Date: 4/9/2002 Version End Date:
Not shown	1923	S	434900 403300	Status: Historical Licence No: 2/27/08/118 Details: Milling & Water Power Other Than Electricity Generation Direct Source: Surface Water Point: Worsborough Mill Pond Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): 45359 Max Daily Volume (m^3): 633 Application No: 6681 Original Start Date: 4/7/1997 Expiry Date: 31/12/2007 Issue No: 102 Version Start Date: 1/8/2002 Version End Date:
Not shown	1923	S	434900 403300	Status: Historical Licence No: 2/27/08/143 Details: Milling & Water Power Other Than Electricity Generation Direct Source: Surface Water Point: Worsborough Mill Pond Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): 45359 Max Daily Volume (m^3): 1125 Application No: 8294 Original Start Date: 14/2/2008 Expiry Date: 31/3/2017 Issue No: 1 Version Start Date: 14/2/2008 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1947	S	434800 403300	Status: Historical Licence No: 2/27/08/118 Details: Make-Up Or Top Up Water Direct Source: Surface Water Point: Worsborough Reservoir Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): 45359 Max Daily Volume (m^3): 633 Application No: 6681 Original Start Date: 4/7/1997 Expiry Date: 31/12/2007 Issue No: 102 Version Start Date: 1/8/2002 Version End Date:
Not shown	1947	S	434800 403300	Status: Historical Licence No: 2/27/08/118 Details: Milling & Water power other than electricity generation Direct Source: Surface Water Point: Worsborough Reservoir Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: 6681 Original Start Date: 4/7/1997 Expiry Date: 31/12/2007 Issue No: 100 Version Start Date: 4/7/1997 Version End Date:
Not shown	1947	S	434800 403300	Status: Historical Licence No: 2/27/08/143 Details: General Use Relating To Secondary Category (Very Low Loss) Direct Source: Surface Water Point: Worsborough Reservoir Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): 45359 Max Daily Volume (m^3): 1125 Application No: 8294 Original Start Date: 14/2/2008 Expiry Date: 31/3/2017 Issue No: 1 Version Start Date: 14/2/2008 Version End Date:
Not shown	1947	S	434800 403300	Status: Historical Licence No: 2/27/08/118 Details: Lake & Pond Throughflow Direct Source: Surface Water Point: Worsborough Reservoir Data Type: Point Name: BARNSLEY METROPOLITAN BOROUGH COUNCIL	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: 06681 Original Start Date: 4/7/1997 Expiry Date: 31/12/2007 Issue No: 102 Version Start Date: 1/8/2002 Version End Date:

6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? Yes

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1757	NW	433700 406000	Status: Historical Licence No: 2/27/08/110 Details: Water Bottling Direct Source: Groundwaters Point: Well/spring - Sandstone/middle Coal Measures - Shaw Lane Data Type: Point Name: SHELDALE WATER LIMITED	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 6598 Original Start Date: 23/3/1994 Expiry Date: 31/12/2003 Issue No: 100 Version Start Date: Version End Date:
Not shown	1757	NW	433700 406000	Status: Historical Licence No: 2/27/08/110 Details: Water Bottling Direct Source: Groundwaters Point: Spring-sandstone/middle Coal Measures-shaw Lane Data Type: Point Name: SHELDALE DEVELOPMENTS LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 6598 Original Start Date: 23/3/1994 Expiry Date: 31/12/2003 Issue No: 101 Version Start Date: Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1784	NW	433700 406060	Status: Historical Licence No: 2/27/08/133 Details: Water Bottling Direct Source: Groundwaters Point: Spring - Sandstone&middle Coal Measures - Barnsley Data Type: Point Name: SHELDALE DEVELOPMENTS LTD	Annual Volume (m^3): 350000 Max Daily Volume (m^3): 1400 Original Application No: 8082 Original Start Date: 1/1/2004 Expiry Date: 31/3/2017 Issue No: 1 Version Start Date: Version End Date:
Not shown	1784	NW	433700 406060	Status: Historical Licence No: 2/27/08/133 Details: Water Bottling Direct Source: Groundwaters Point: Spring-sandstone/middle Coal Measures-shaw Lane Data Type: Point Name: SHELDALE DEVELOPMENTS LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 08082 Original Start Date: 1/1/2004 Expiry Date: 31/3/2017 Issue No: 1 Version Start Date: Version End Date:

6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? No

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site? No

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.

6.9 River Quality

Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site? No

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? Yes

The following Detailed River Network records are represented on the Hydrology Map (6e):

ID	Distance (m)	Direction	Details	
1	123	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
2	215	E	River Name: Maesborough Dike Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
3	236	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
4	236	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
5	243	E	River Name: Maesborough Dike Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
6	255	E	River Name: Maesborough Dike Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
7	264	NE	River Name: Maesborough Dike Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
8	334	NE	River Name: Maesborough Dike Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined

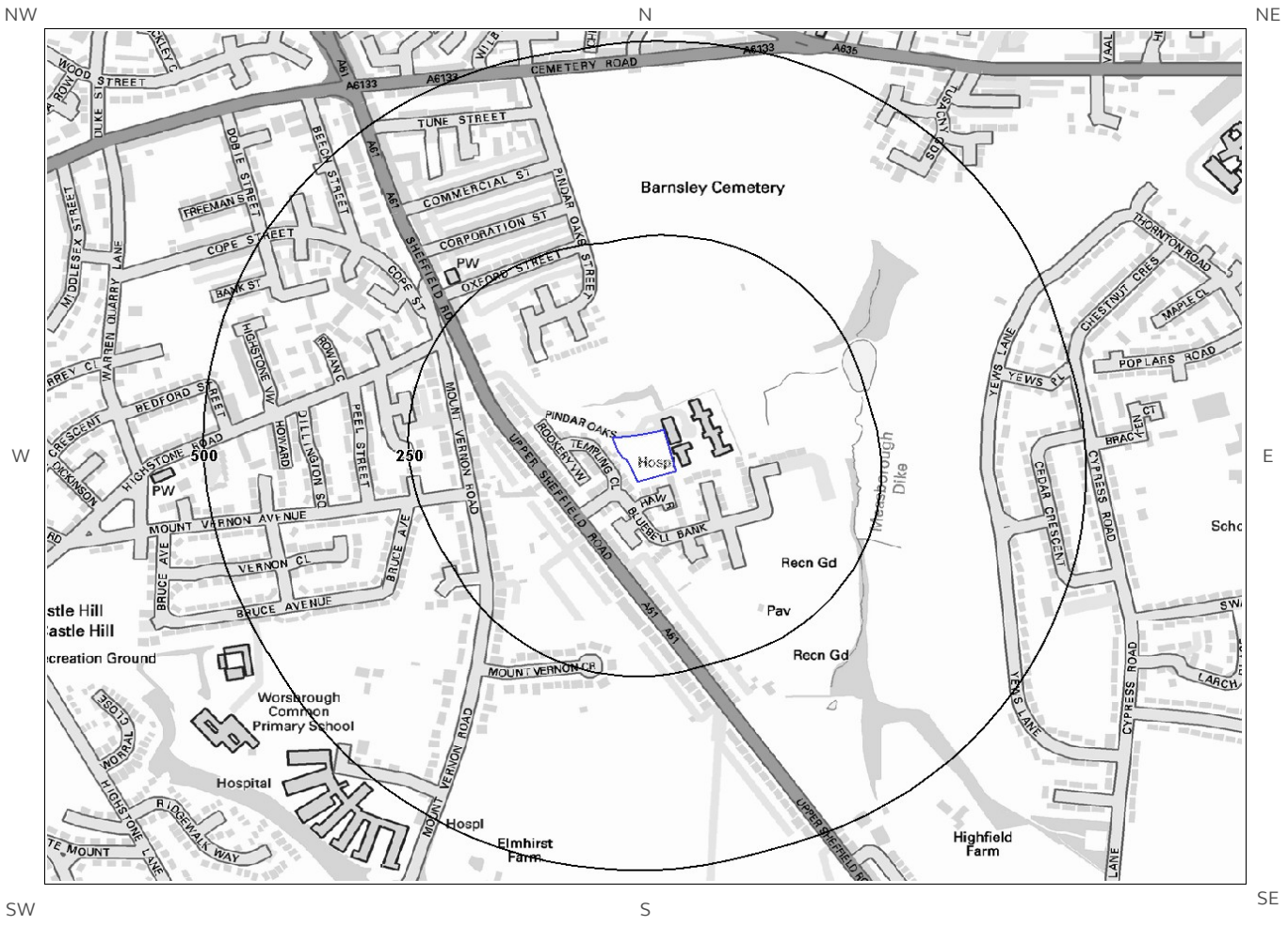
6.11 Surface Water Features

Are there any surface water features within 250m of the study site? Yes

The following surface water records are not represented on mapping:

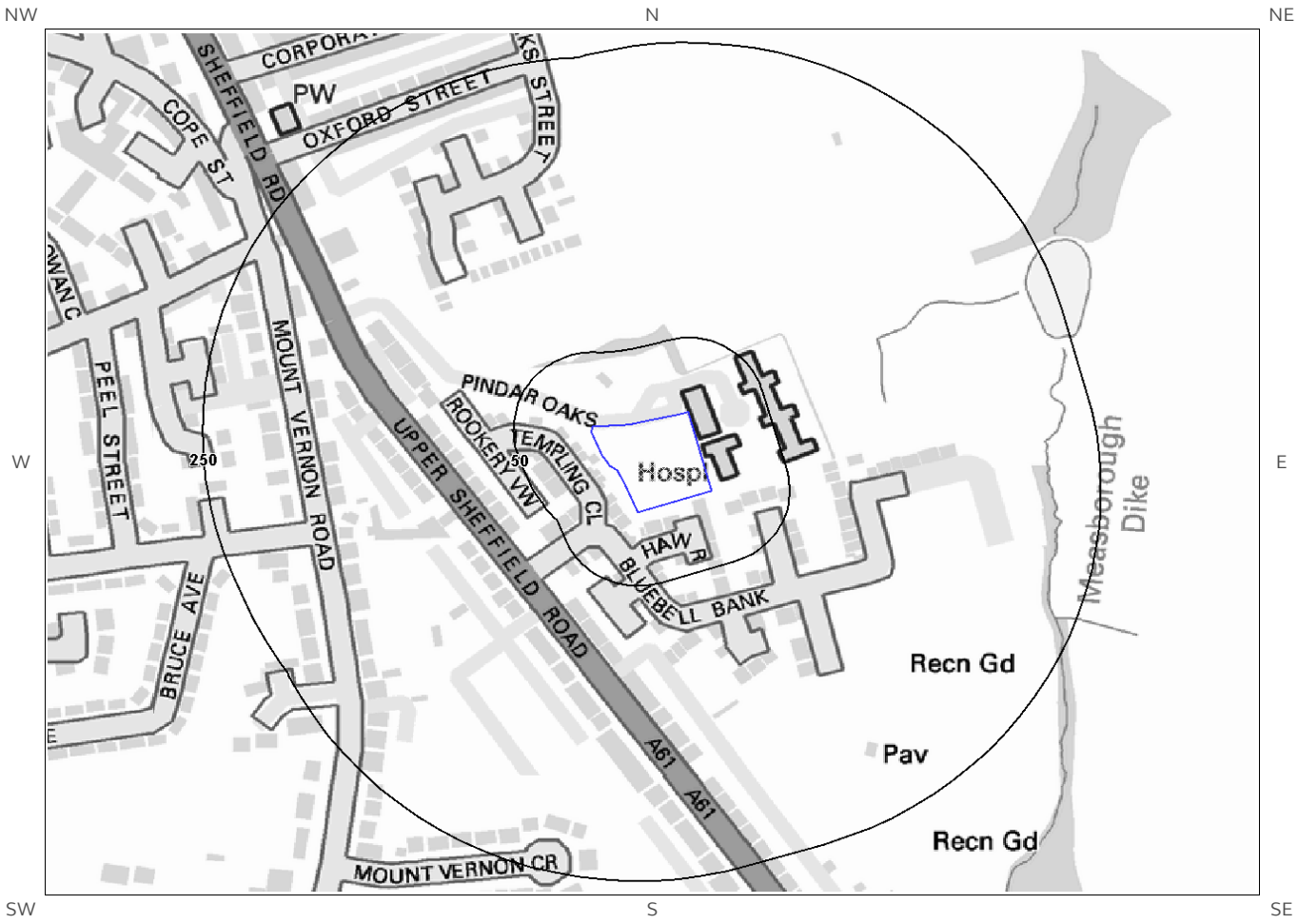
Distance (m)	Direction
123	E
216	E
232	E
236	E
236	E

7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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Site Outline

100
250
Search Buffers (m)

RoFRaS Rating

- Very Low
- Low
- Medium
- High

7 Flooding

7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 2 floodplain? No

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 3 floodplain? No

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

What is the highest risk of flooding onsite? Very Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? No

Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Limited potential

Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard.

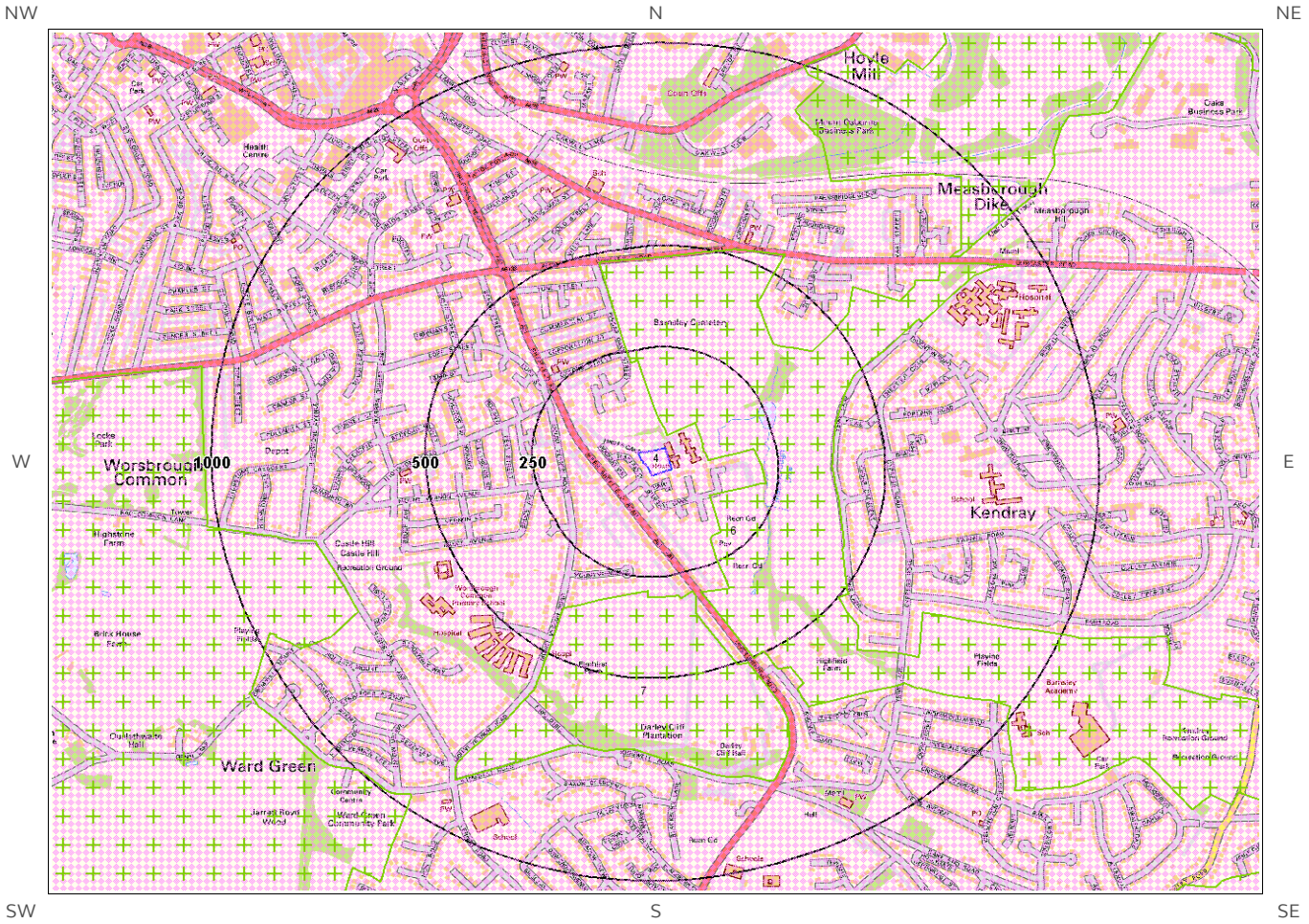
7.8 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? Low

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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Site Outline

100
250
Search Buffers (m)

AONB

National Park

SSSI

Special Protection Areas

Nitrate Vulnerable Zones

Green Belt

Environmentally Sensitive Areas

Special Areas of Conservation

World Heritage Sites

Nitrate Sensitive Areas

Ancient Woodland

National Nature Reserve

Local Nature Reserves

Ramsar Sites

8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site?	Yes

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

1

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
Not shown	1721	S	UNKNOWN	Ancient and Semi-Natural Woodland

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

3

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
Not shown	1370	NE	Dearne Valley Park	Natural England
Not shown	1610	S	Worsborough Country Park	Natural England
Not shown	1688	S	Worsborough Country Park	Natural England

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

1

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
4	0	On Site	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

2

Green Belt data contains Ordnance Survey data © Crown copyright and database right [2015].

ID	Distance	Direction	Green Belt Name	Local Authority Name
6	32	N	Liverpool, Manchester and West Yorks Greenbelt	Barnsley District (B)
7	284	S	Liverpool, Manchester and West Yorks Greenbelt	Barnsley District (B)

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our website. The following information has been found:

9.1.1 Shrink Swell

What is the maximum Shrink-Swell*[*] hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

9.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

What is the maximum Running Sand** hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.

* This indicates an automatically generated 50m buffer and site.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing
ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Are there any coal mining areas within 75m of the study site? Yes

The following coal mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

Distance (m)	Direction	Name	Commodity	Assessment of likelihood
0.0	On Site	Sheffield Area	Vein Mineral/Iron ore	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

Past underground mine workings may occur. The rock types present in these areas are such that small mineral veins may be present on which it is possible that small scale mining has been undertaken and/or it is possible that limited underground extraction of other materials may have occurred. All such occurrences are likely to be of minor localised extent and infrequent. It should be noted, however, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. However, if in a coalfield area you should still consider a Coal Authority mining search for the area of interest.

10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No
Guidance: No Guidance Required.

Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com

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Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Environment Agency
National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 03708 506 506
Web: **www.environment-agency.gov.uk**
Email: enquiries@environment-agency.gov.uk

Public Health England
Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe
Email:**enquiries@phe.gov.uk**
Main switchboard**: 020 7654 8000**

The Coal Authority
200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey
Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority
Authority: Barnsley Metropolitan Borough Council
Phone: 01226 770770
Web: http://www.barnsley.gov.uk/
Address: PO Box 634, Barnsley, South Yorkshir, S70 9GG

Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444

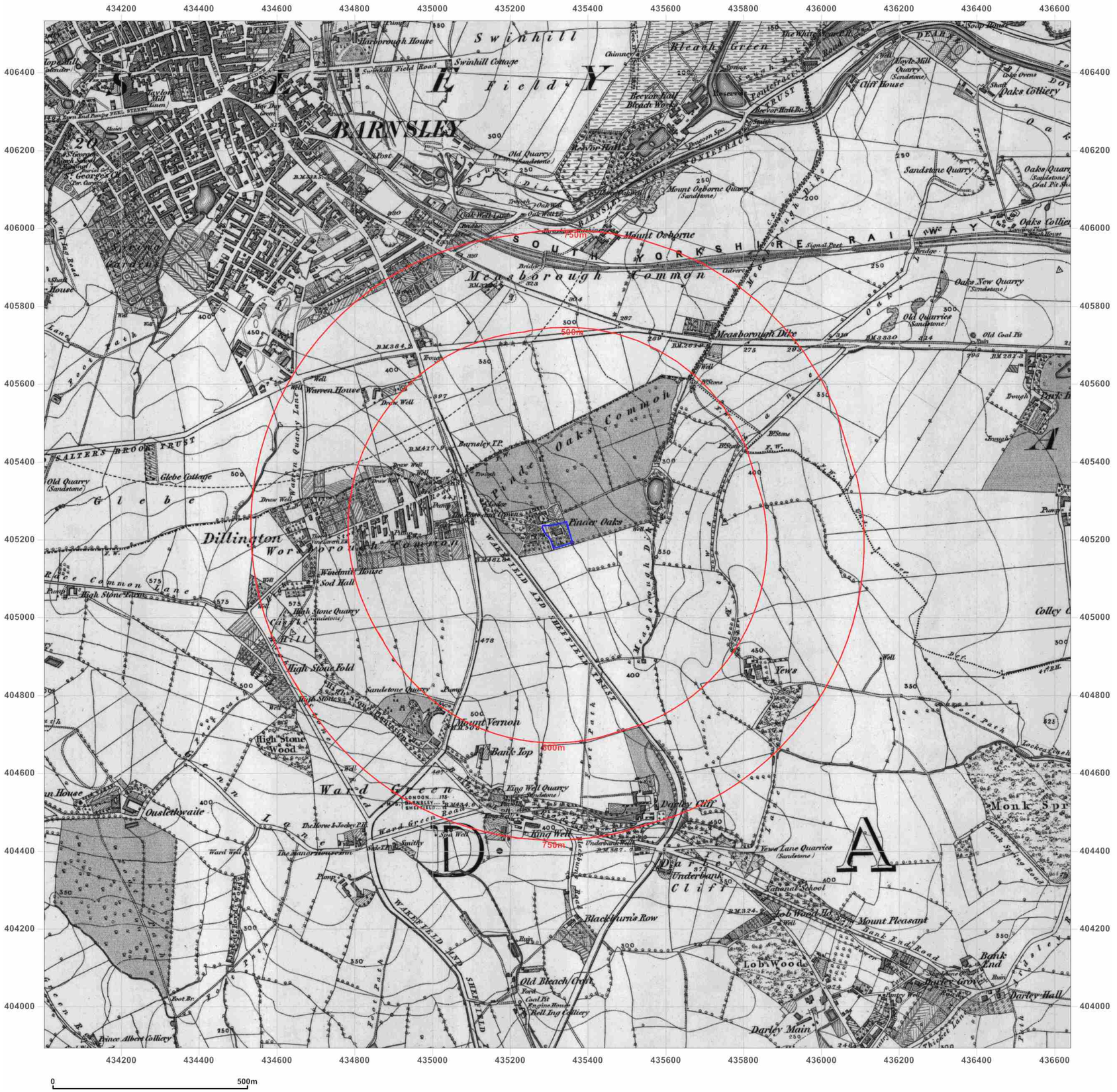
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https://www.groundsure.com/terms-and-conditions-sept-2016

Appendix 2

Historical Maps



Groundsure INSIGHTS

Site Details:

ACORN LODGE, UPPER
SHEFFIELD ROAD, BARNSLEY,
S70 4PL

Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: County Series

Map date: **1850**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1851
Revised N/A
Edition 1850
Copyright N/A
Levelled N/A

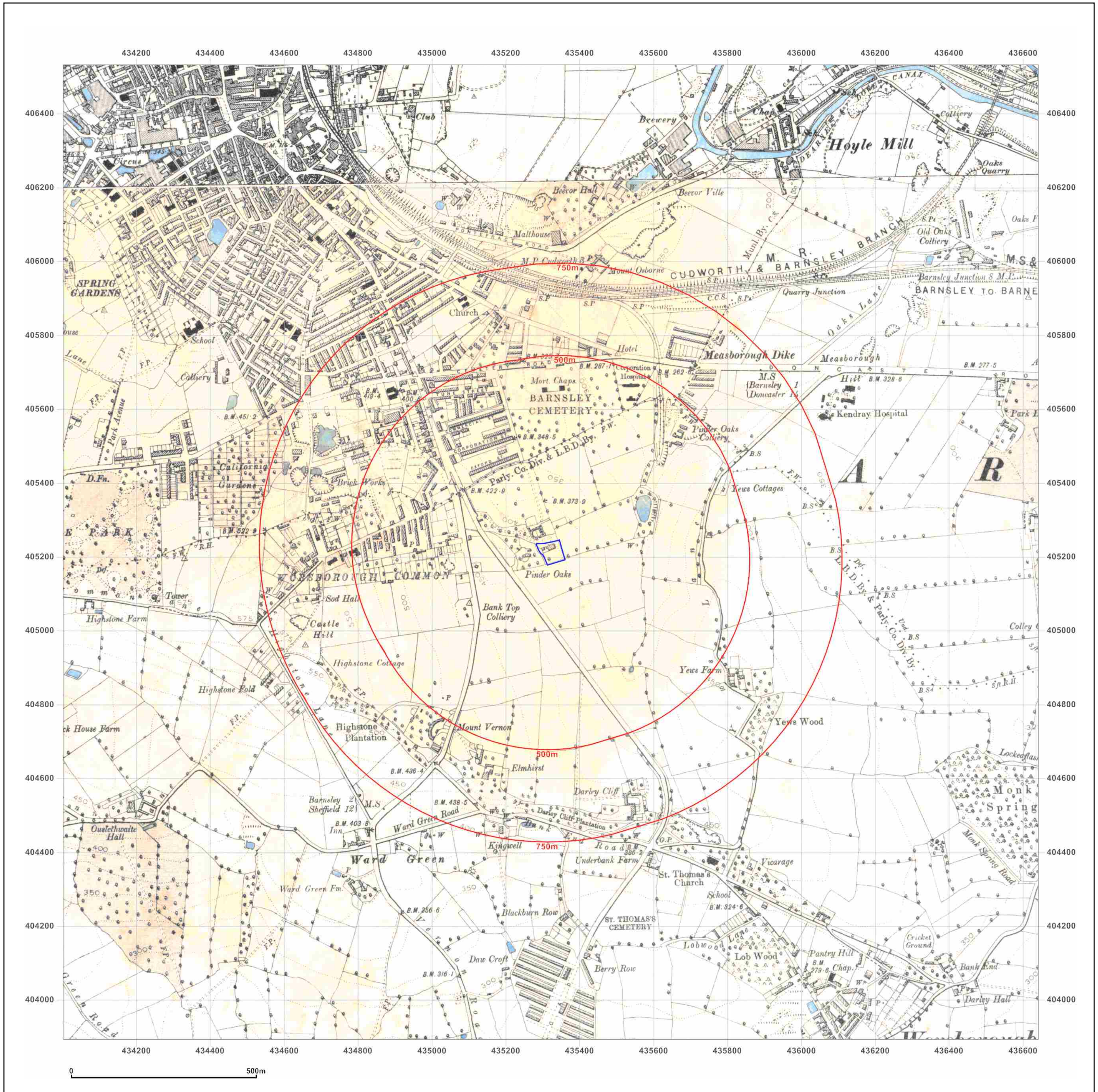
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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: County Series

Map date: **1890**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1890
Revised 1890
Edition 1890
Copyright N/A
Levelled N/A

Surveyed 1890
Revised 1890
Edition 1890
Copyright N/A
Levelled N/A

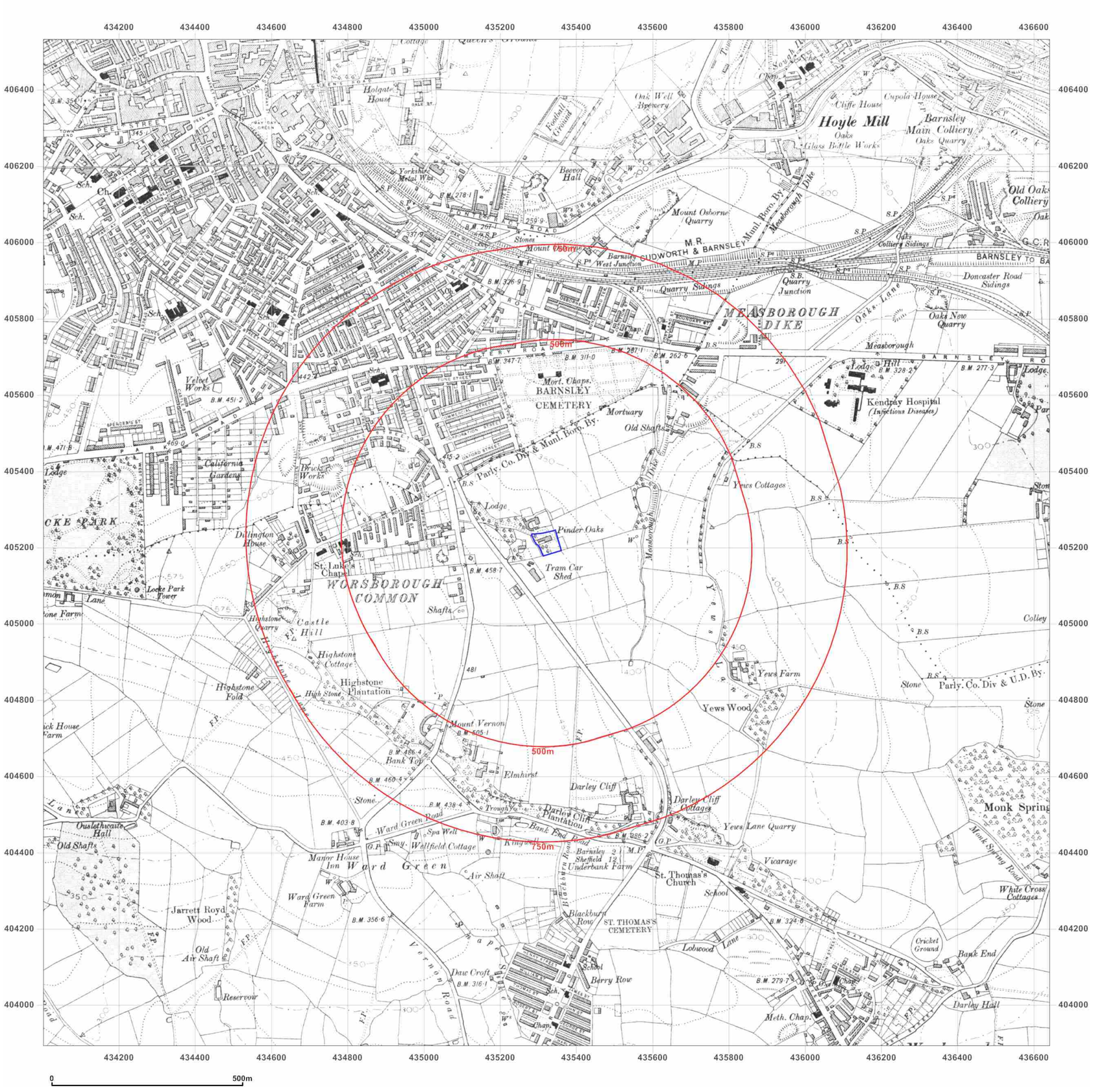
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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: County Series

Map date: **1904**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1891
Revised 1904
Edition 1904
Copyright N/A
Levelled N/A

Surveyed 1890
Revised 1904
Edition 1904
Copyright N/A
Levelled N/A

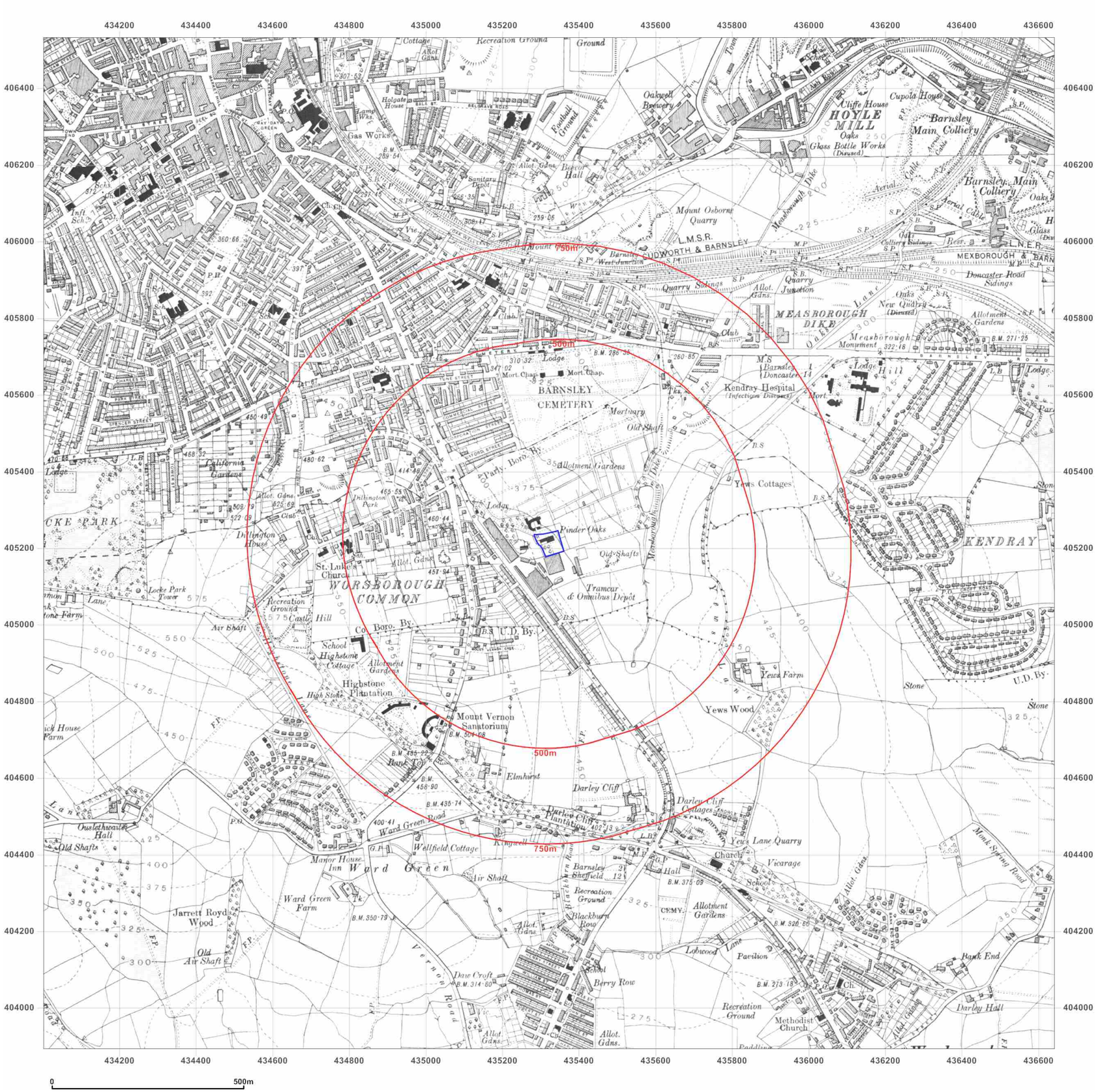
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Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: County Series

Map date: **1929**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1851
Revised 1929
Edition 1929
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Levelled 1915

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Revised 1929
Edition 1929
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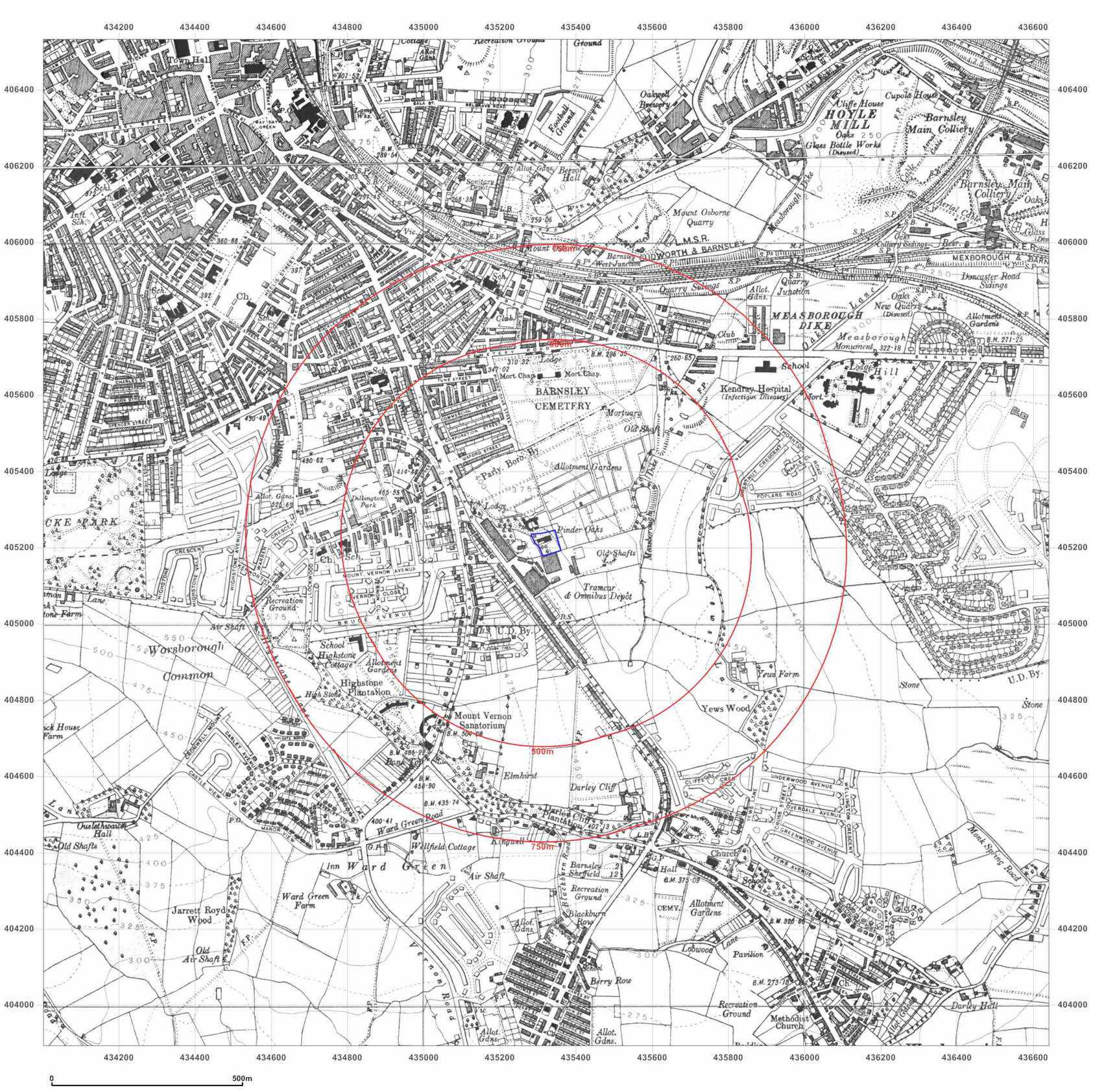
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Client Ref: J4044_17_EDS
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Grid Ref: 435321, 405212

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

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Revised 1948
Edition 1948
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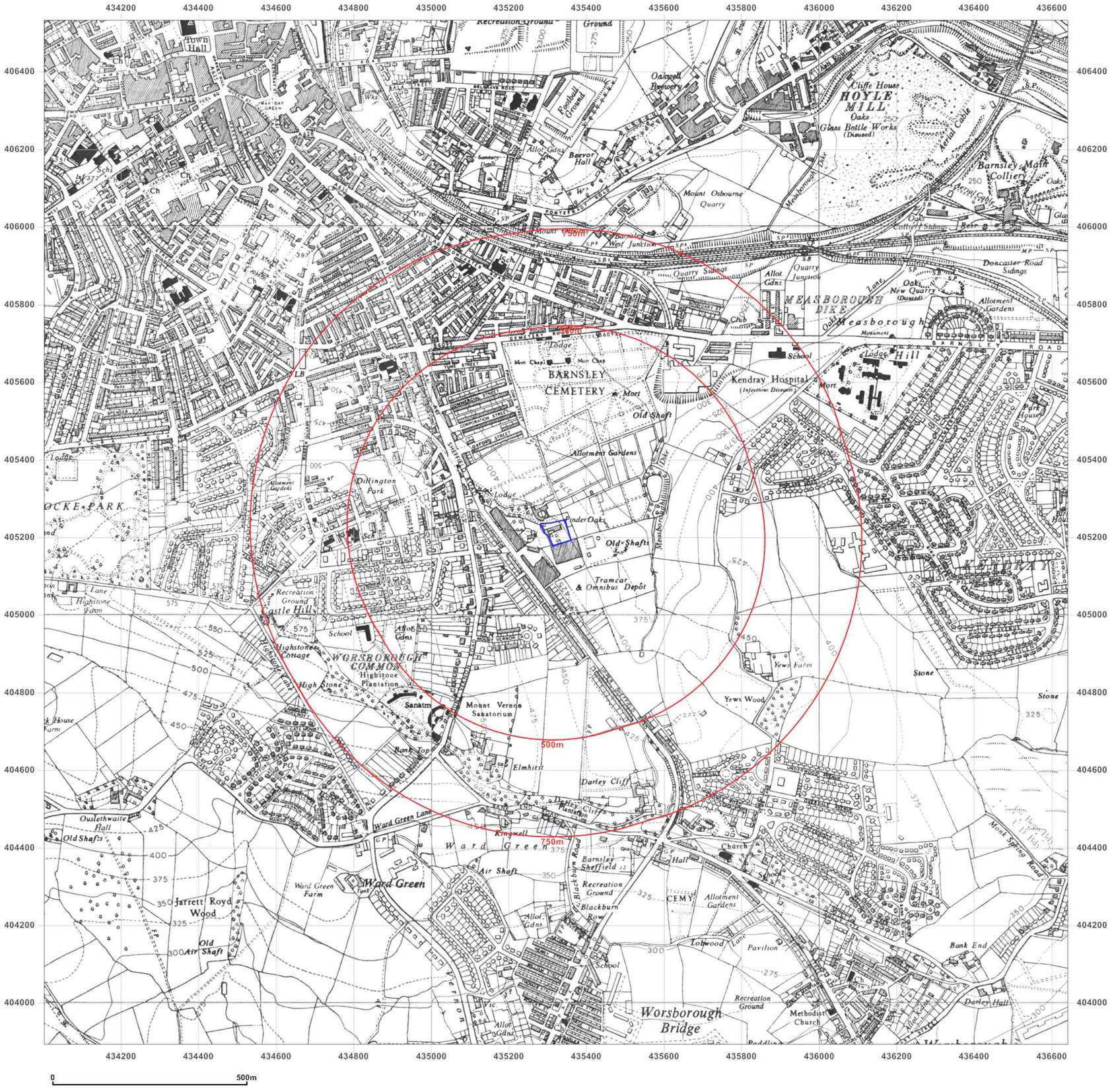
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Grid Ref: 435321, 405212

Map Name: Provisional

Map date: **1951-1956**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed N/A
Revised 1955
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Copyright 1956
Levelled N/A

Surveyed N/A
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Edition N/A
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Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: Provisional

Map date: **1965-1966**

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Printed at: 1:10,560

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Edition N/A
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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **1973-1977**

Scale: 1:10,000

Printed at: 1:10,000

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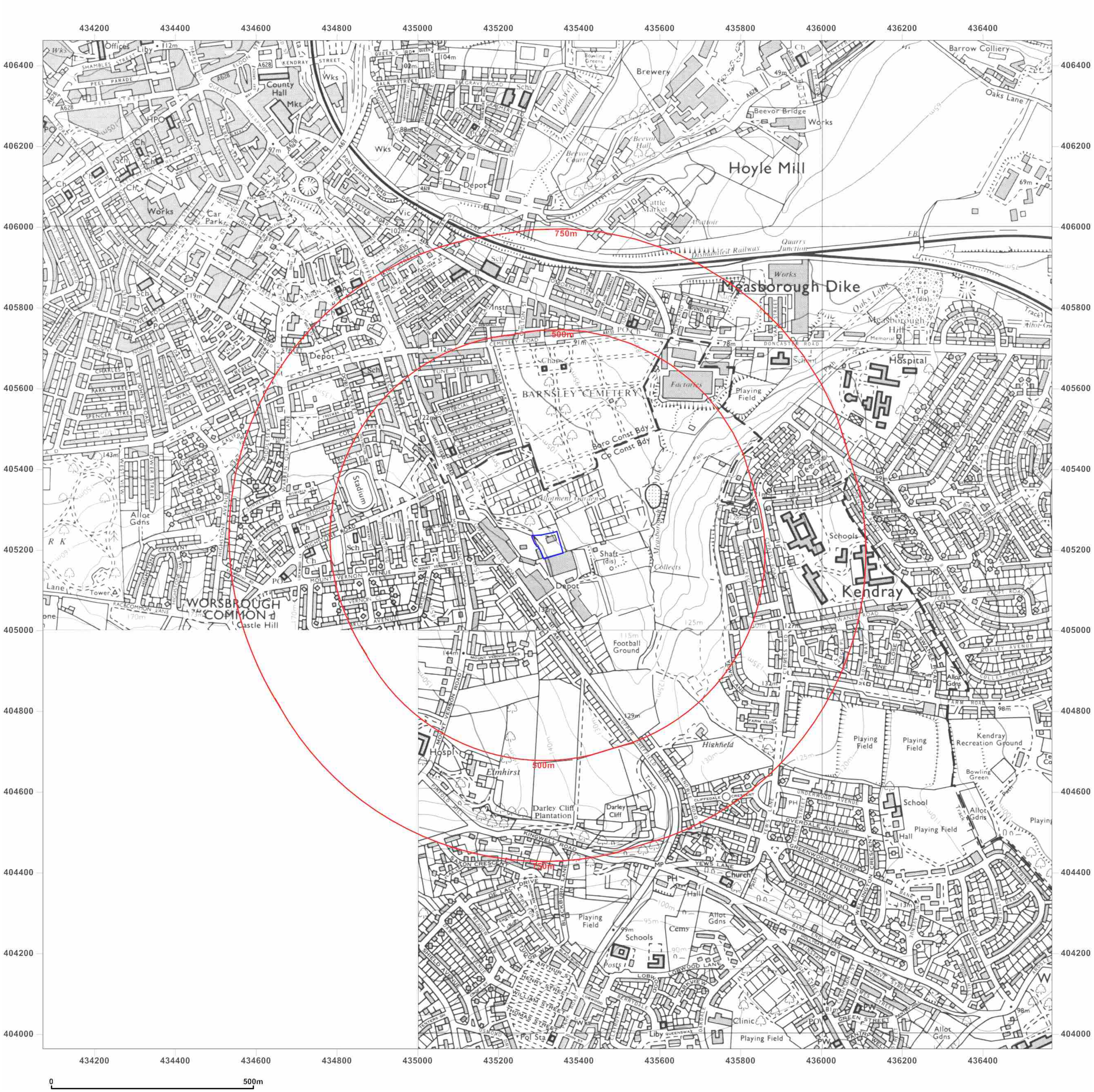
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Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **1982-1987**

Scale: 1:10,000

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Edition N/A
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Levelled N/A

Surveyed 1981
Revised 1982
Edition N/A
Copyright 1983
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Surveyed 1986
Revised 1987
Edition N/A
Copyright 1988
Levelled 1978

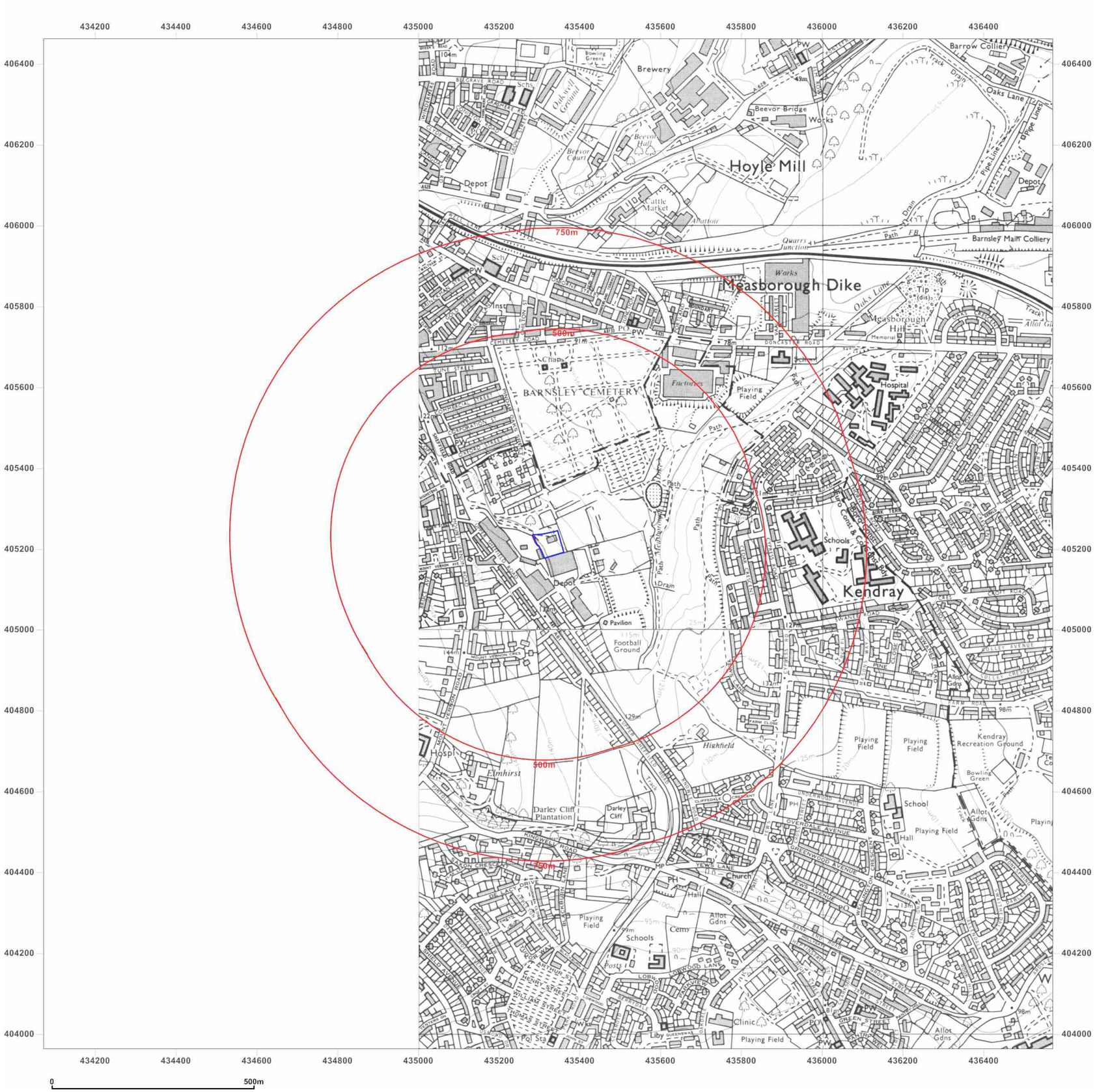
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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

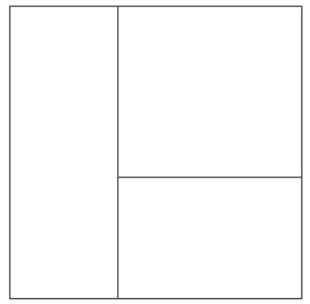
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Printed at: 1:10,000

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Revised 1992
Edition N/A
Copyright 1993
Levelled 1978



Surveyed 1986
Revised 1987
Edition N/A
Copyright 1988
Levelled 1978

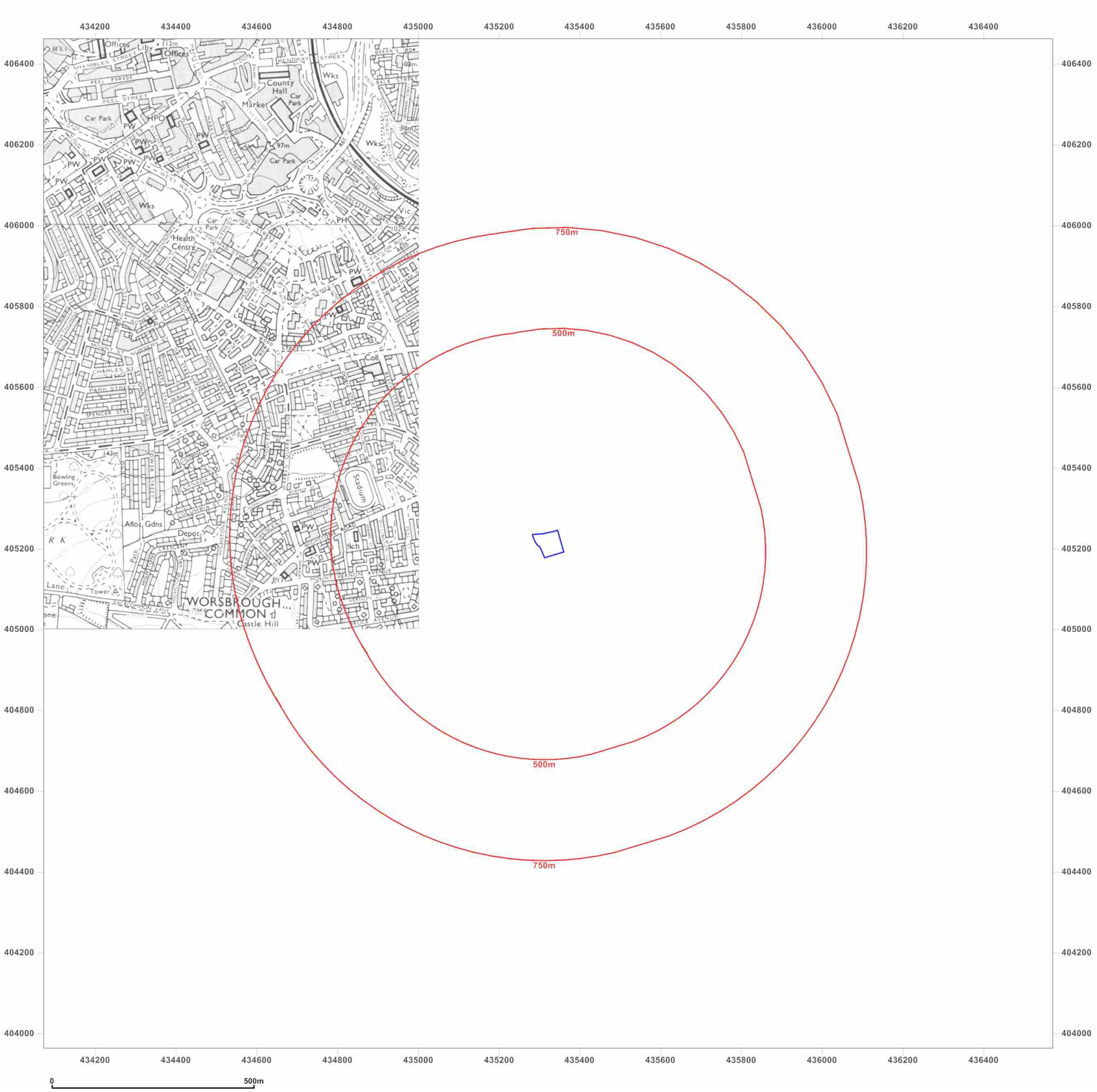
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Groundsure INSIGHTS

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S70 4PL

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Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

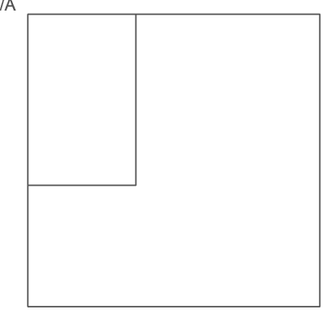
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Scale: 1:10,000

Printed at: 1:10,000

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Site Details:

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S70 4PL

Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

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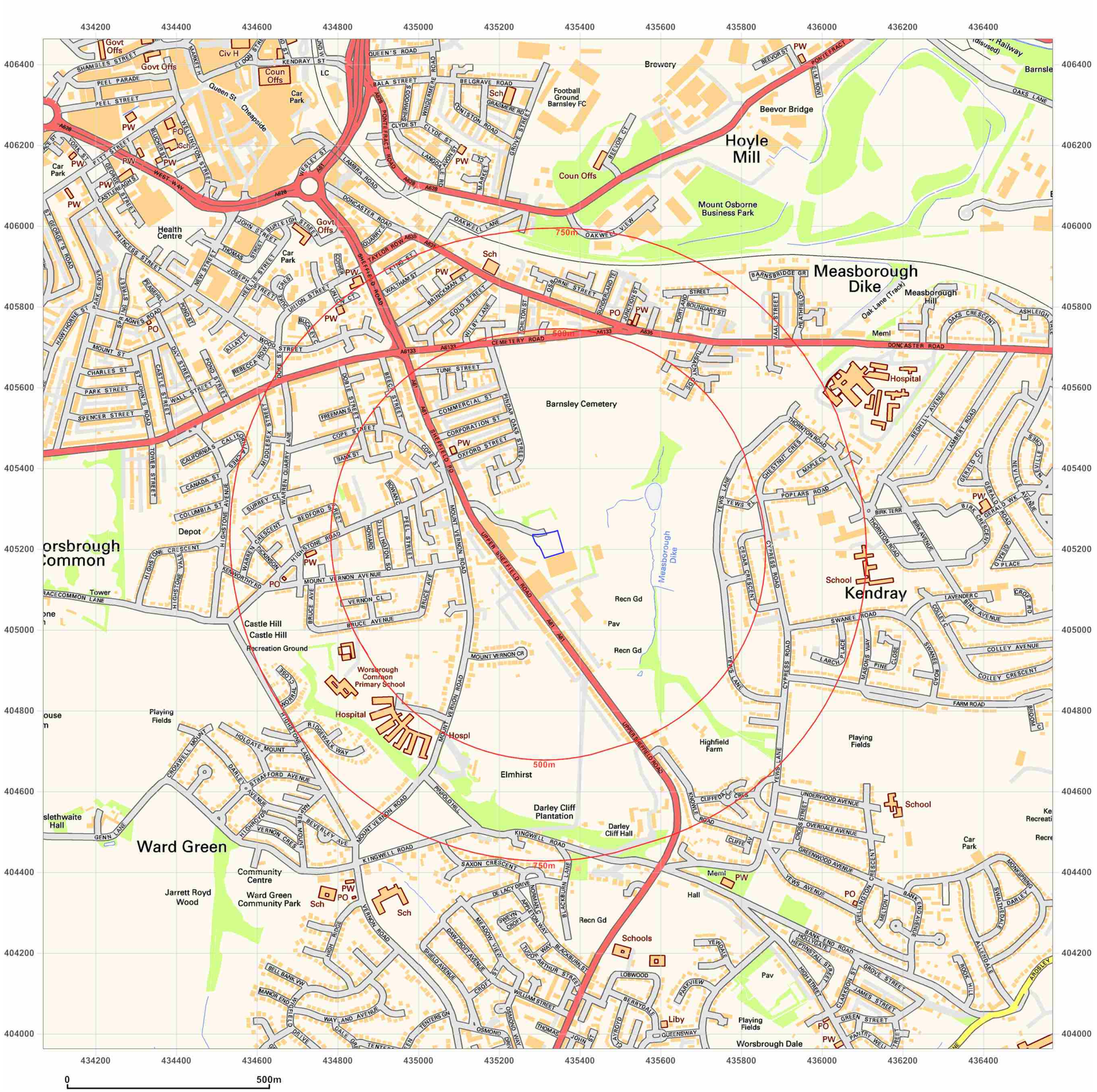
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S70 4PL

Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

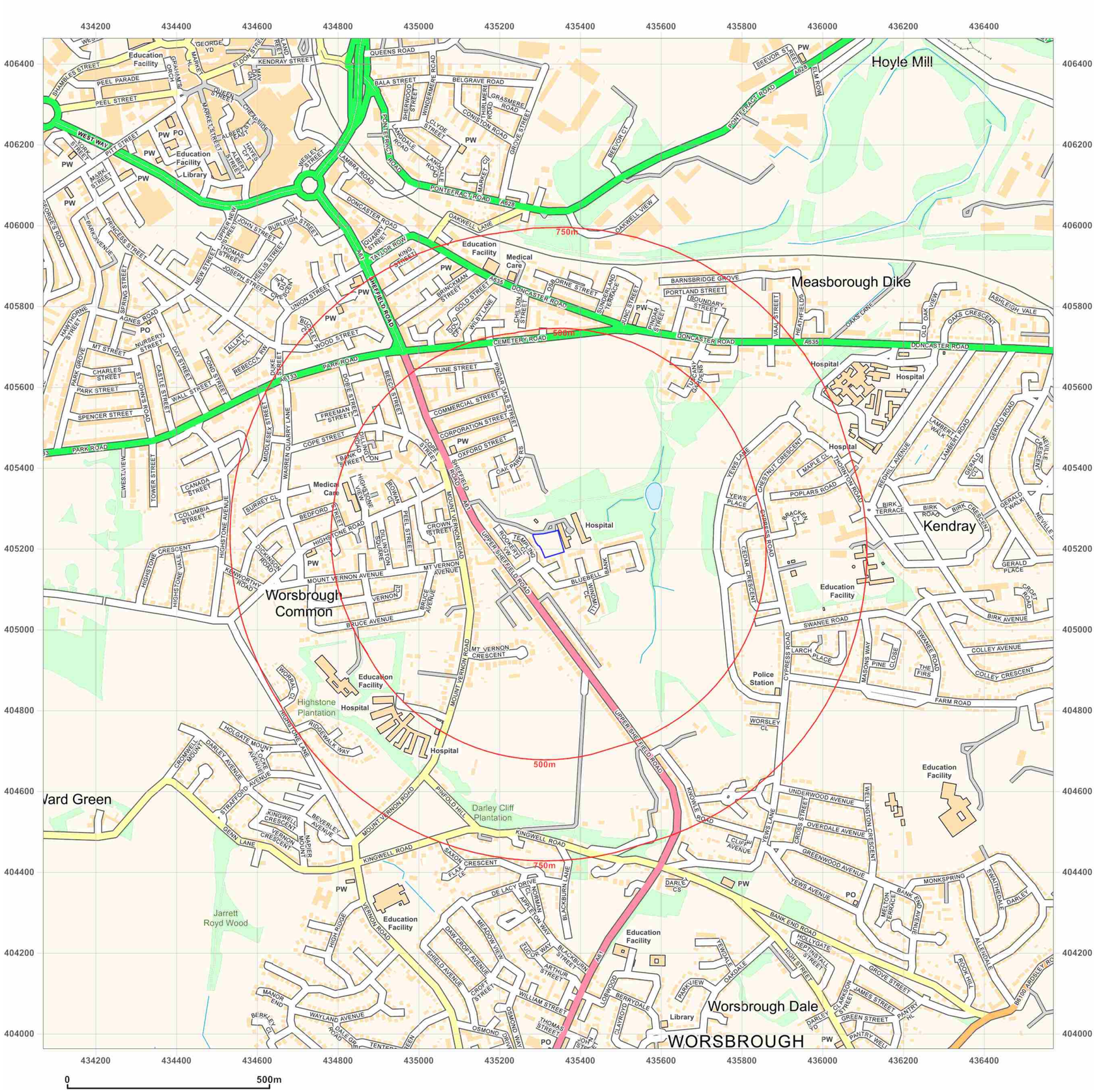
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Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid
Map date: **2014**
Scale: 1:10,000
Printed at: 1:10,000

N W E S

2014

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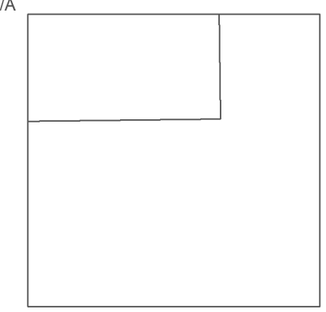
ACORN LODGE, UPPER
SHEFFIELD ROAD, BARNSLEY,
S70 4PL

Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: County Series Town Plan
Map date: **1889**
Scale: 1:500
Printed at: 1:1,000

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Surveyed 1889
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



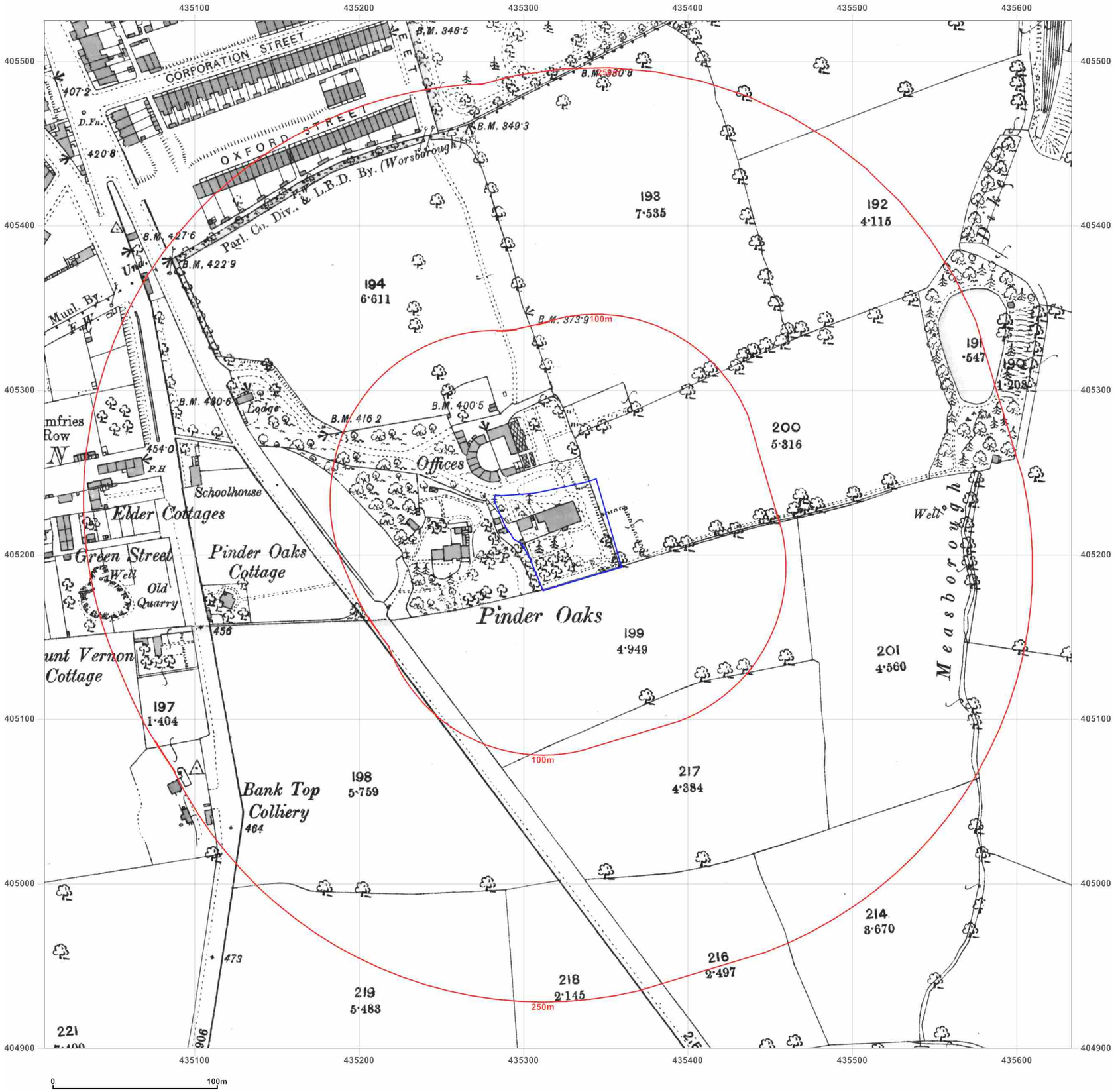
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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: County Series

Map date: **1892**

Scale: 1:2,500

Printed at: 1:2,500

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

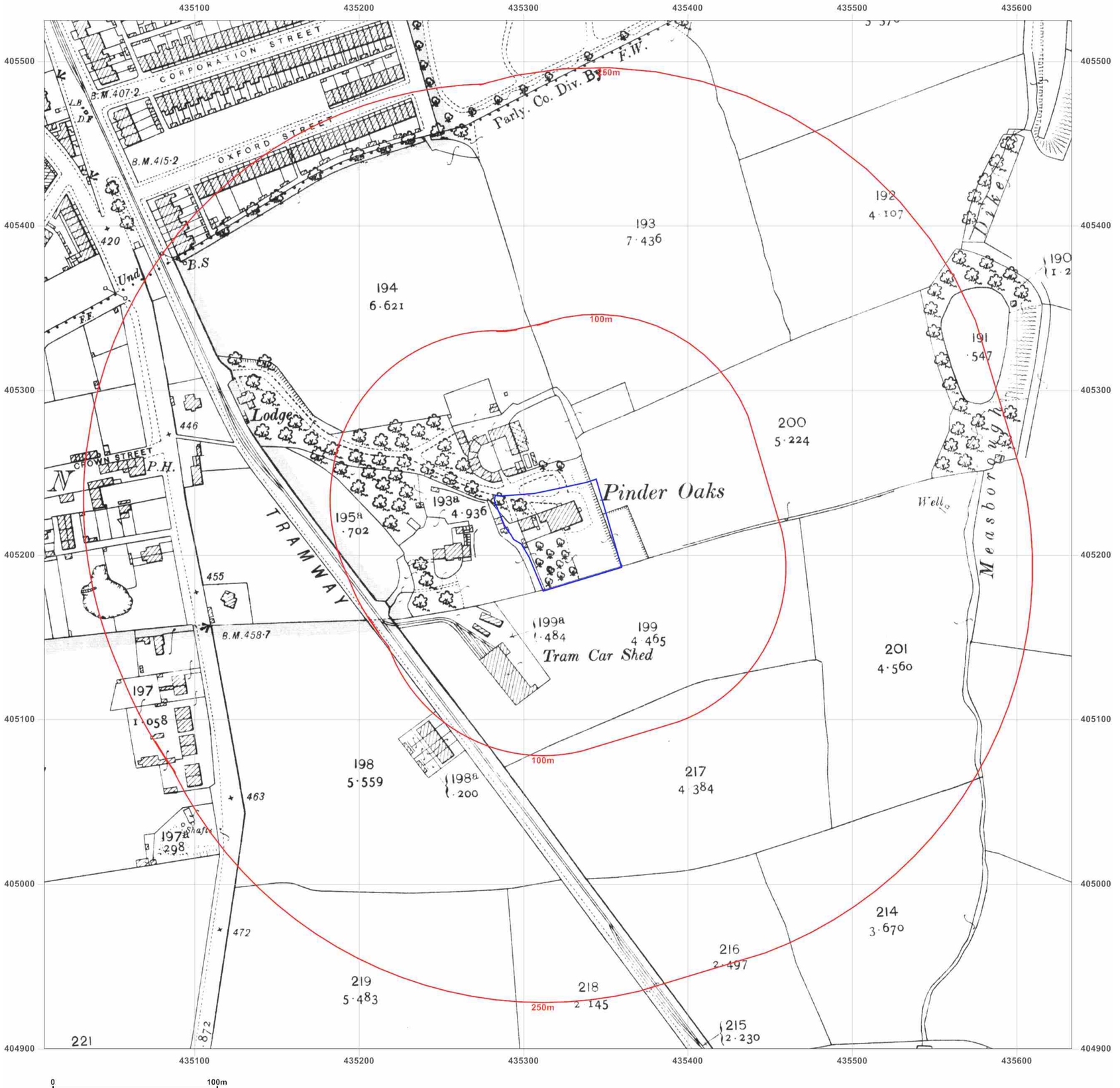
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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: County Series

Map date: **1906**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1890
Revised 1904
Edition N/A
Copyright N/A
Levelled N/A

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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **1960**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1930

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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **1960-1961**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1960 Revised 1960 Edition N/A Copyright 1961 Levelled 1963	Surveyed 1960 Revised 1960 Edition N/A Copyright 1961 Levelled 1930
Surveyed 1959 Revised 1959 Edition N/A Copyright 1960 Levelled 1930	Surveyed 1959 Revised 1959 Edition N/A Copyright 1960 Levelled 1930

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S70 4PL

Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **1961**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1930

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Site Details:

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Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **1959-1962**

Scale: 1:2,500

Printed at: 1:2,500

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

Surveyed 1959
Revised 1959
Edition 1961
Copyright 1961
Levelled 1930

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Site Details:

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S70 4PL

Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **1978-1983**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1963
Revised 1983
Edition N/A
Copyright 1983
Levelled 1963

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

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Site Details:

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S70 4PL

Client Ref: J4044_17_EDS
Report Ref: GS-4296379
Grid Ref: 435321, 405212

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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

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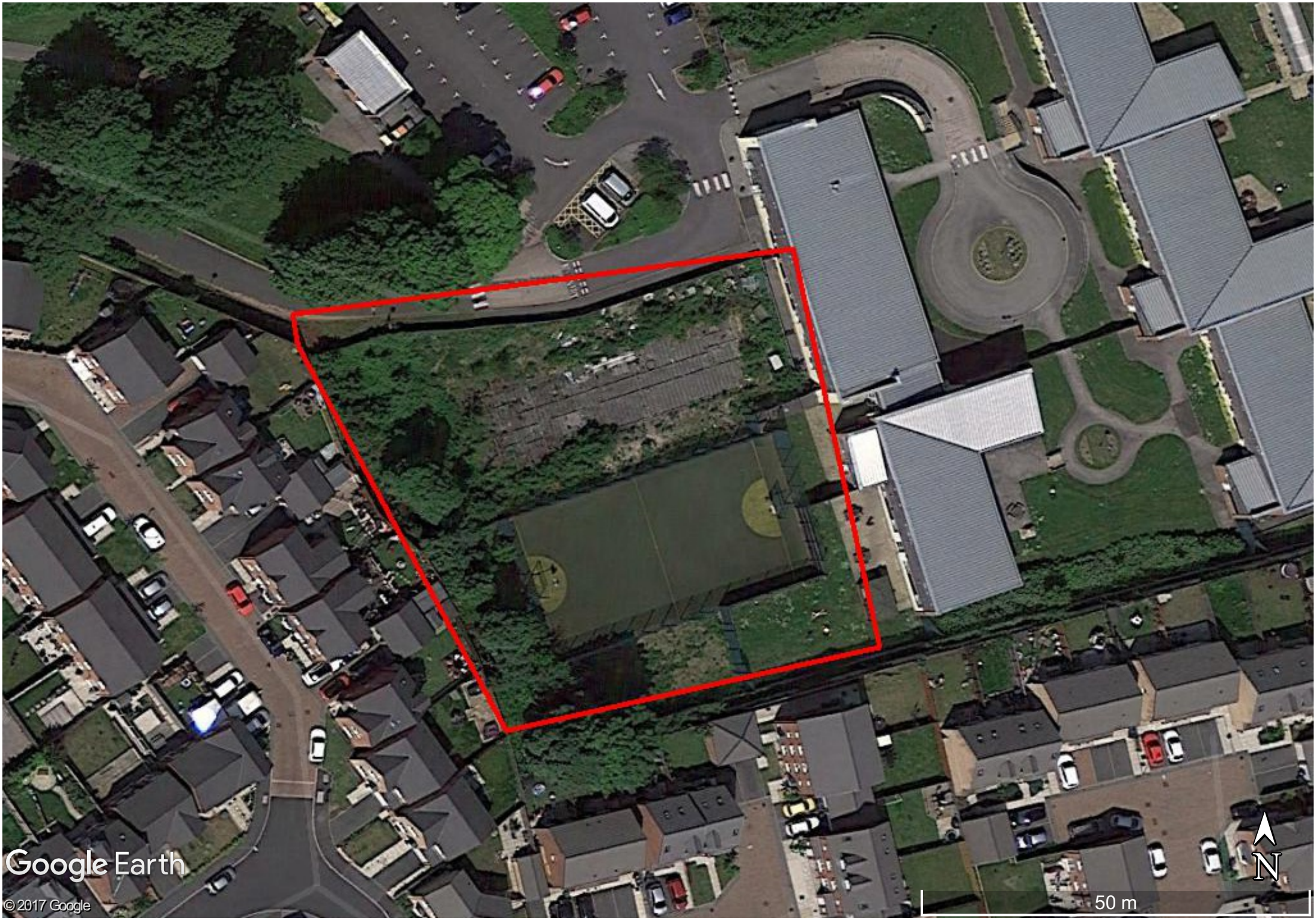
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Appendix 3

Site Plans


Google Earth
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Environmental Geotechnical Specialists

RGS

Appendix 4

Photographs



Photo 1 : Basketball court in southern section of the site.



Photo 2 : Footprint of demolished building.

Appendix 5

Coal Authority Report

The Coal Authority

Resolving the impacts of mining

CON29M Non-Residential Mining Report





ACORN LODGE UPPER SHEFFIELD ROAD
BARNSLEY
S70 4PL



Date of enquiry:	25 September 2017
Date enquiry received:	25 September 2017
Issue date:	25 September 2017
Our reference:	51001629224001
Your reference:	J4044/17/EDS

CON29M Non-Residential Mining Report

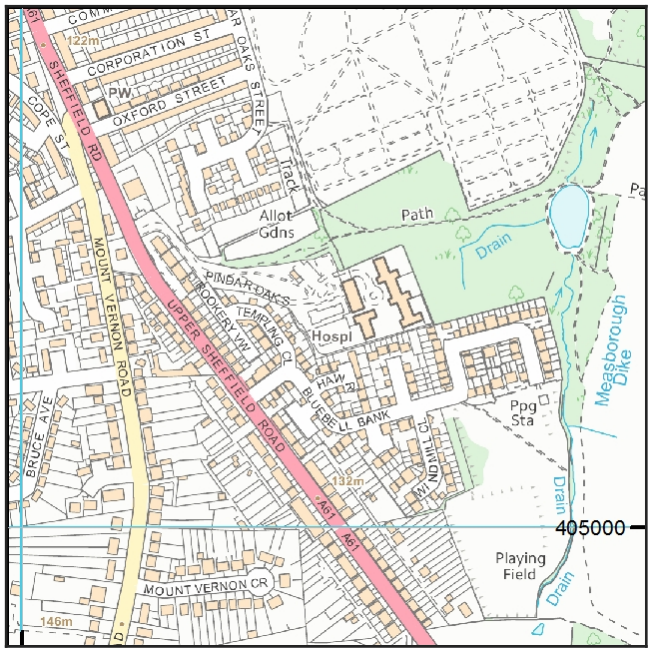
This report is based on, and limited to, the records held by the Coal Authority and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Client name

ROGERS GEOTECHNICAL SERVICES LTD

Enquiry address

ACORN LODGE UPPER SHEFFIELD ROAD,
BARNSLEY, S70 4PL



Approximate position of property

Map data

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Mansfield
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NG18 4RG

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/thecoalauthority
/coalauthority

Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	Yes
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	No
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	No
13	Working facilities order	No
14	Payments to owners of former copyhold land	No
15	Information from the Cheshire Brine Subsidence Compensation Board	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is in a surface area that could be affected by underground mining in 6 seams of coal at 190m to 530m depth, and last worked in 1974.

Any movement in the ground due to coal mining activity should have stopped.

2. Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

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

4. Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

5. Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6. Past opencast coal mining
The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining
The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8. Future opencast coal mining
There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9. Coal mining subsidence
The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, 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.

10. Mine gas
The Coal Authority has no record of a mine gas emission requiring action.

11. Hazards related to coal mining
The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

12. Withdrawal of support
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.

13. Working facilities order
The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14. 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.

15. Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

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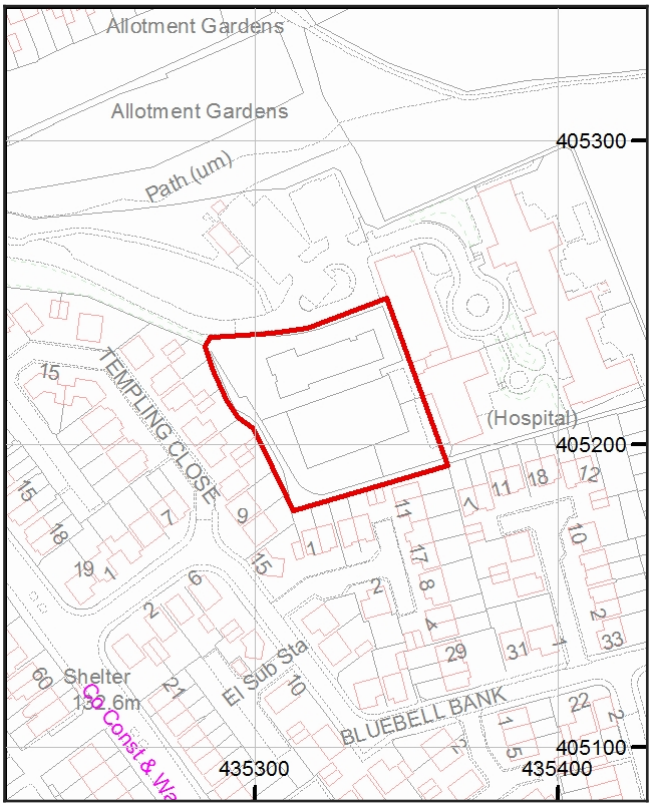
Alternative formats

If you would like this report in an alternative format, please contact our communications team.

Enquiry boundary

Key

Approximate position of enquiry boundary shown



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NG18 4RG

www.groundstability.com

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/thecoalauthority
/coalauthority

VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	25 September 2017
Issued to	ROGERS GEOTECHNICAL SERVICES LTD BARNCLIFFE MILLS NEAR BANK SHELLEY HUDDERSFIELD KIRKLEES HD8 8LU
Property search for	ACORN LODGE UPPER SHEFFIELD ROAD BARNSLEY S70 4PL
Reference number	51001629224001
Date of issue	25 September 2017
Cost	£78.30
VAT @ 20%	£15.66
Total received	£93.96
VAT registration	598 5850 68