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Park Grove Surgery

Burleigh Street,
Barnsley,
South Yorkshire,
S70 1XY

Phase I Desk Study

12864/5006
December 2014

Professional, **I**nnovative,
Practical Solutions

Revision Record

Report Ref: 12864/5006					
Rev	**Description**	**Date**	**Originator**	**Checked**	**Approved**
-	Initial Issue	December 2014	SJBF	RJS	IFL

Prepared For:	**Prepared By:**
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Contents Page

1. Introduction

1.1. General Introduction

This Report presents the findings of a Phase I Desk Study of a site at Burleigh Street, Barnsley, South Yorkshire, S70 1XY (Grid Reference: 434757, 405975) for Park Grove Surgery.

The Desk Study (Phase I) comprised obtaining research/archive information from Emapsite, in the form of a GroundSure Report. The GroundSure Report provides the basic background information including Historical Ordnance Survey Plans, British Geological Survey Plans and Environment Agency Report (including Radon). This report presents the findings of this background information as it relates to the proposed end use of the site and considers the potential for contamination of the site. The Groundsure Report is attached as Appendix I.

1.2. Objectives

This Desk Study was conducted in order to formulate an opinion as to the potential for hazardous substances to exist on, at, or near the vicinity of the site which might affect the future development of the site, appropriate to the proposed end use of the site. It is understood that redevelopment of the site with a surgery is proposed. The "vicinity" of the site for the purposes of this Report is defined as being located within an approximate 250m radius of the site.

The objectives of the Desk Study were aimed to determine:-

- The historic site usage, identifying any factors, based on the Archive Ordnance Survey Maps, which might give rise to the potential for hazardous substances to exist on, at, or near the vicinity of the site.

- The general ground conditions at the site, based on published Geological Maps, identifying any significant geotechnical conditions which might affect the future redevelopment of the site.

- Current operations undertaken within the site and in the immediate vicinity, based on the GroundSure database, which might give rise to the potential for hazardous substances to exist on, at, or near the vicinity of the site and which might affect the future redevelopment of the site.

1.3. Scope of Works

In order to meet the above objectives, Met Engineers obtained research information from Emapsite, which includes data from the following sources: -

- Historical Ordnance Survey Plans
- British Geological Survey Plans and Radon Report
- Environment Agency Report
- Coal Authority Mining Information

This Report presents the findings of the Desk Study as related to the proposed end use of the site. The purpose of the Desk Study is to allow an opinion to be formulated as to the likely GeoEnvironmental conditions at the site and the potential implications for the end use. This report does not quantify those findings nor provide any recommendations for remedial works, mitigation or risk management.

1.4. Limitations of the Report

Park Grove Surgery (the Client) has requested that a Phase I Geo-Environmental Site Assessment be undertaken in order to assess the suitability of the site for redevelopment. The Report is not a comprehensive site characterisation and should not be construed as such.

This Report has been prepared for the sole internal use and reliance of Park Grove Surgery. The Report shall not be relied upon or transferred to any other parties without the express written authority of Met Engineers. If any unauthorised third party comes into possession of the Report, they rely on it at their own risk and the Met Engineers owes them no Duty of Care.

The findings and opinions conveyed via this Report are based on information obtained from a variety of sources as detailed within this Report and which Met Engineers, believes are reliable. Nevertheless, Met Engineers, cannot and does not guarantee the authenticity or reliability of the information it has relied upon. The information contained in this Report is to the best of our knowledge accurate at the date of issue, however, sub-surface conditions, including ground water levels, and may vary over time.

It is possible that the GroundSure Report may not include information from every information source. Assuming such further information sources actually exist, their information has not been considered in the formulation of these findings and opinions; this Report only considers the information contained within the GroundSure Report.

In preparing this Report it has been assumed that all past and present occupants and Third Parties have provided accurate information, especially relating to known or potential hazards. This Report does not identify deficiencies or mistakes in the information provided by the user/owner, or from any other source, except where obvious in the light of other information.

This Report is relevant at the date the report was written and should be read in the light of any subsequent changes in legislation, statutory requirement or industry practices.

The Report represents the technical findings and opinions of Met Engineers, and does not constitute any legal advice. As such, the advice of a Solicitor may also be required.

2. Environmental Setting

A detailed review of the published history, hydrological, geological and available environmental information has been carried out.

The area of land referred to as 'The Site' within this document is indicated in Appendix I.

2.1. Site Description

Site Name	Burleigh Street, Barnsley
Location	Grid Reference: 434757, 405975
Setting	The site is located adjacent to Burleigh Road within the centre of Barnsley. It is irregularly shaped and 0.59 ha in size. The site slopes from the west to the east. The site is currently split into two areas by Burleigh Street. To the north is an area of managed grassland. Mature hedges grow around its edge. The northern boundary is a steep embankment. There is an electricity substation located on the northern boundary. The southern part of the site is currently being used as a car park. It appears to be within a former quarry as a 3 to 5m high wall is located along the southern boundary of the site. Another electricity substation is located along the southern boundary. The surrounding area has predominantly residential and light industrial land use due to its inner city location. A large office is located on the western boundary of the site.
Development Proposal	It is proposed to develop the site with a doctor's surgery with associated hard standing and soft landscaped areas.

2.2. Cartographical Site History

Year (map scale)	Comment
1850 (1:10,560)	The site is located within the centre of Barnsley. Is has already been developed with a row of buildings across the centre of the site and various other buildings towards the boundaries. The surrounding area is the centre of Barnsley and is built up accordingly with residential and industrial buildings. A railway is located 200m north east of the site. There is evidence of quarrying in the locality.
1889 (1:500)	The row of buildings is labelled as Shepherd Street. The south eastern corner of the site is shown as a disused quarry. In addition to many small buildings, sheds and outhouses there are 2No. timber yards located within the site boundary.
1892 (1:2,500)	No significant change to the site or surrounding area.
1906 (1:2,500)	Shepherd street has been extended across the site. Fleet Street has been created to the south of Shepherd Street. A crane is now located within the disused quarry. Much of the surrounding area has been filled in with housing.
1929 (1, 10,560)	Shepherd Street is now labelled as Winter Street. A new road slightly to the north is now labelled as Shepherd Street. No significant change to the surrounding area.
1938 (1:10,560)	No significant change to the site. A large area to the west of the site has been cleared of houses.
1948 (1:10,560)	No significant change to the site. New residential and industrial units have been constructed in the area west of the site.
1951 (1:10,560)	No significant change to the site or surrounding area.
1961 (1:1,250)	No significant change to the site. Houses on the southern boundary have been demolished and the area turned into a car park.

1975 (1:1,250)	Houses along Shepherd Street have been demolished and a new electricity substation built in their place. Many terraced houses in the surrounding area have been demolished and replaced with low rise flats. All buildings immediately north of the site has been removed. A new large roundabout has been built 75m north of the site.
1988 (1:1,250)	The majority of buildings have been removed from the site. Winter street has been completely removed. Shepherd Street has been moved so as to join Fleet Street. The quarry area is labeled as a scrapyard. The northern boundary has been made into an embankment. No significant change to the surrounding area.
1993 (1:1,250)	Shepherd Street and Winter Street are now called Burleigh Street. The remaining buildings along (what was) Fleet Street have been demolished. An electricity substation has been built to the south of the site. Government offices have been built on the eastern boundary of the site.
2002 (1:10,000)	No significant change to the site or surrounding area.
2010 (1:10,000)	No significant change to the site or surrounding area.
2014 (1:10,000)	No significant change to the site or surrounding area.
1854-2014	Those maps not specifically mentioned show no major deviations from the observations made above.

2.3. **Site Historical Overview**

The site has had numerous land uses over the course of the previous century. These include, a quarry, timber yards, residential streets, electricity substations and as a scrapyard. In addition roads have been built and redirected across the site. All buildings apart from the electricity sub stations were removed from site by 1993.

The surrounding area has similarly had numerous land uses due to its inner city location. The majority of which were of residential and light industrial by nature.

2.4. Geological Overview

Geology	Artificial Ground – None beneath the site. Superficial Deposits – None beneath the site. Bedrock Geology – Woolley Edge Rock, Sandstone Faults – An inferred fault is located 210m south east of the site. Coal Outcrops – 6No. coal seams outcrop between 21 and 187m north east of the site. All dip below the site The nearest is the Meltonfield Coal seam and is between 0 and 1.4m thick.
Radon	1 – 3 % of the properties in the area are above the radon action level however no special remedial measures are required.
Ground workings	There are 7No. historic and 2No. current ground workings located within 50m of the site. The nearest is a sandstone working 47m south east of the site. The quarry located on site is also a historic ground working.

Mining

The property is in the likely zone of influence from workings in 2 seams of coal at 150m to 390m depth, and last worked in 1939. Any ground movement from these coal workings should have stopped by now.

In addition the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past.

The Coal Authority state that the property is not affected by any past, present or future opencast works. However as the site was a quarry and given the expected geology, it is likely that coal was removed as part of these works.

There are no mine entries within 20m of the site.

1No. claim for subsidence has been made for a property located 20m South of the site.

The Groundsure report states that rare and localised small scale mining of Iron Ore may also have occurred in the vicinity of the site.

The site is located within a "Development High Risk Area" as defined by The Coal Authority, therefore a coal mining risk assessment is required.

Risk Assessment -

Coal Mining Issue	Yes	No	Risk Assessment
Underground coal mining (recorded at shallow depths)		X	There is no evidence of shallow coal mining voids beneath the site.
Underground coal mining (probable at shallow depths)	X		The Coal Authority believe that it is likely that coal seams are beneath the site at depths of less than 30m which may have been worked in the past.
Mine entries (shafts and adits)		X	There are no known mine entries or adits.
Coal mining geology (fissures)	X		There are 6No. coal seams outcropping within 250m of the site. All dip below the site.
Record of past mine gas emissions or potential		X	No record made by the Coal Authority.
Recorded coal mining surface hazard	X		A property 20m south of the site has claimed for subsidence.
Surface mining (opencast workings)	X		Part of the site was a quarry. Based on expected geology, coal was likely removed as part of these works.

Based on the above information, the risk to the site from shallow depth mine workings is **MODERATE**.

Natural Ground Subsidence

No natural ground subsidence problems are envisaged.

Boreholes	There are 52No. BGS borehole records located within 250m of the site including 7No. of which are actually located within the boundary. They all show made ground at the surface between 2 and 5.3m deep. This is placed directly onto sandstone bedrock.

2.5. Environmental Overview

Environmental Permits	3No. Part B permits and 6No. licenced discharges are located within 250m of the site. None are deemed a risk to the site.
Pollution Incidents	There is 1No. pollution incident located 220m north west of the site. It had a minor impact on the air and is deemed to not affect the site.
Landfill Sites	None within 250m of the site.
Waste Transfer & Processing Stations	The old quarry part of the site is listed as being a scrap yard.
Current Land Use	The site contains 2No. electricity sub stations There are 49No. further potentially contaminative industrial sites within 250m of the site. None are deemed a potential risk to the site.
Hydrogeology	The site is underlain by a Secondary (A) aquifer within the bedrock. There are no source protection zones within 250m of the site. There are no potable water abstraction licences within 250m of the site.
Hydrology	A culvert passes 213m north east of the site.
Flooding	The site is not within a floodplain.
Environmental Sensitivity	The site is within a Nitrate Vulnerable Zone.

2.6. Previous Investigations

We are not aware of any other site investigations and none have been provided.

3. Potential Contamination

3.5. Background

Current Environmental Legislation, in particular Part IIA of the Environmental Protection Act 1990, adopts a risk-based approach to the evaluation of contaminated sites, based on the proposed end use of the site. The commonly accepted approach is to adopt a Source-Pathway-Receptor model where the Source of the contaminant is examined in relation to potential Receptors (i.e. humans, controlled waters etc.) to determine if there is a Pathway (i.e. pollution linkage) connecting them. If any of these elements (i.e. contaminant, pathway or receptor) are absent or removed, then there is no risk.

3.6. Historical Overview of Area

The site has had numerous land uses over the course of the previous century. These include, a quarry, timber yards, residential streets, electricity substations and as a scrapyard. In addition roads have been built and redirected across the site. All buildings apart from the electricity sub stations were removed from site by 1993.

The surrounding area has similarly had numerous land uses due to its inner city location. The majority of which were of residential and light industrial nature.

3.7. Current Situation

The site is located adjacent to Burleigh Road within the centre of Barnsley. It is irregularly shaped and 0.59 ha in size. The site slopes from the west to the east.

The site is currently split into two areas by Burleigh Street. To the north is an area of managed grassland. Mature hedges grow around its edge. The northern boundary is a steep embankment. There is an electricity substation located on the northern boundary.

The southern part of the site is currently being used as a car park. It appears to be within a former quarry as a 3 to 5m high wall is located along the southern boundary of the site. Another electricity substation is located along the southern boundary.

The surrounding area has predominantly residential and light industrial land use due to its inner city location. A large office is located on the western boundary of the site.

3.8. Identified Sources

The site has been used as a quarry, timber yards, residential streets, electricity substations and as a scrapyard. Based on the above, the possible sources of contamination include:

Historical Site Usage	Contaminants
Timber Yard, Quarry, Scrap Yard, Houses, Demolition Site, Roads	Asbestos, Heavy Metals, PAH, Made Ground, Land Gas, TPH, Oil

Historical Neighbours	Contaminants
Residential, Demolition Site, Quarry	Made Ground, Land Gas

Current Site Usage	Contaminants
Car Park, Roads	TPH, Oil

Current Neighbours	Contaminants
Residential, Commercial	None

The above list of possible contaminants has been based solely on the Historic Land Use as identified by the GroundSure Report and should not be considered exhaustive.

3.9. Development Proposal

It is proposed to construct a doctor's surgery on the site.

3.10. Preliminary Risk Assessment

The risks identified in this report are perceived risks relative to the proposed end use. Actual risks can only be fully assessed after a thorough intrusive investigation of the site.

In considering the potential for contamination, the above information has to be assessed with respect to the development of the site for commercial purposes, utilising the source-pathway-receptor methodology. Should one of the three links be absent, the site cannot be considered contaminated under Part IIA of the Environmental Protection Act. The preliminary conceptual risk assessment model undertaken for the site is detailed as follows:

Source

Based on information available there is the potential for contaminants to be present on site.

Pathways

The Potential main pathways specific to the probable future use of the site are:

1. Direct Contact
2. Incidental ingestion
3. Vertical migration of liquids
4. Emission of land gas

Receptors

The following site-specific receptors should be considered:

1. Humans
    a. Site Workers – construction staff involved in works at the site
    b. Maintenance staff – carrying out maintenance on landscaped areas at some point in the future
    c. Long term site users

2. Flora and Fauna
    a. Landscaping / plants

3. Groundwater
    a. Secondary (A) Aquifer

4. Buildings and Infrastructure
    a. Building Substructure
    b. Infrastructure – drainage etc.

Risk to Humans

There is low to moderate potential for End Users to come into contact with contaminated materials. There is moderate potential for Construction workers to come into contact with contaminated materials during construction. There is a risk that land gas may be being generated from any areas of in filled ground within the site

Risk to Flora and Fauna

There is low potential for flora and fauna to be at risk from contamination.

Risk to Groundwater

There is a moderate risk to the groundwater from the identified possible contaminants. However due to the presence of surface drainage at the surface downwards migration of liquids is unlikely.

Risk to Building and Infrastructure

There is a risk to substructures from aggressive materials present within any areas of made ground on site. There is also a slight risk to

substructures from aggressive materials naturally occurring in sub-soil.

3.11. **Conclusion**

Based on the above, it is considered that the site has low to moderate potential to be contaminated.

4. Recommendations

Environmental

Overall, the majority of the site is considered to have low to moderate potential to be contaminated. An intrusive site investigation is recommended to confirm this potential.

The site investigation should cover the full site, as the majority has been developed previously. A general range of contaminants should be tested for including Heavy Metals, Poly-aromatic Hydrocarbons, Total Petroleum Hydrocarbons, Asbestos and Land Gas.

Following the site investigation, options for remediation, if required, can be evaluated. Any remedial measures undertaken will inevitably reduce the environmental risk to future ownership.

Geotechnical

It is likely that 2-5m of made ground is present at the surface of the site based on the archive boreholes and due to the various small scale developments during the previous century. Underneath is likely to be sandstone bedrock.

The intrusive investigation should confirm the immediate sub-surface soil conditions such that foundation recommendations can be made. A series of boreholes and/or trial pits should be undertaken to allow an assessment of the underlying strata. Suitable *in-situ* and laboratory geotechnical tests should be performed as part of the investigation.

It is considered that the risk from shallow depth mining works is moderate. As such, a series of 30m rotary boreholes with water flush will be required in order to assess the risk posed by these potential workings. Based on these findings, remedial measures such as pressure grouting of the ground may be required.

Appendix I

Groundsure Report

emapsite™

Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: County Series Town Plan

Map date: **1889**

Scale: 1:500

Printed at: 1:1,000

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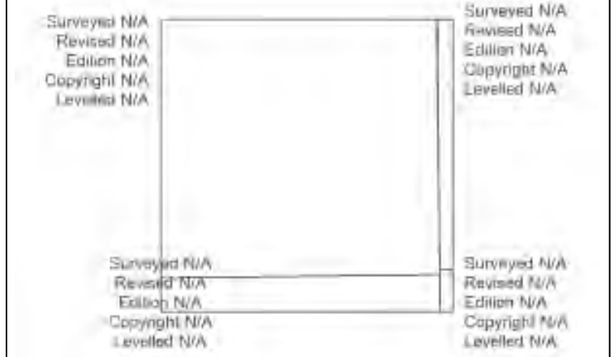

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Production date: 18 November 2014

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: County Series

Map date: **1892-1893**

Scale: 1:2,500

Printed at: 1:2,500

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

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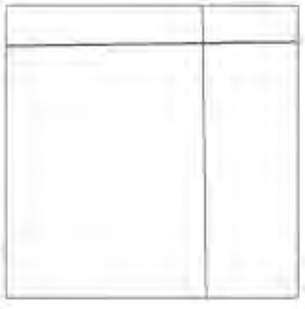

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Surveyed 1892
Revised 1892
Edition N/A
Copyright N/A
Levelled N/A

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SOUTH EAST WARD
Yorkshire Metal Works
Fountain
Foundry
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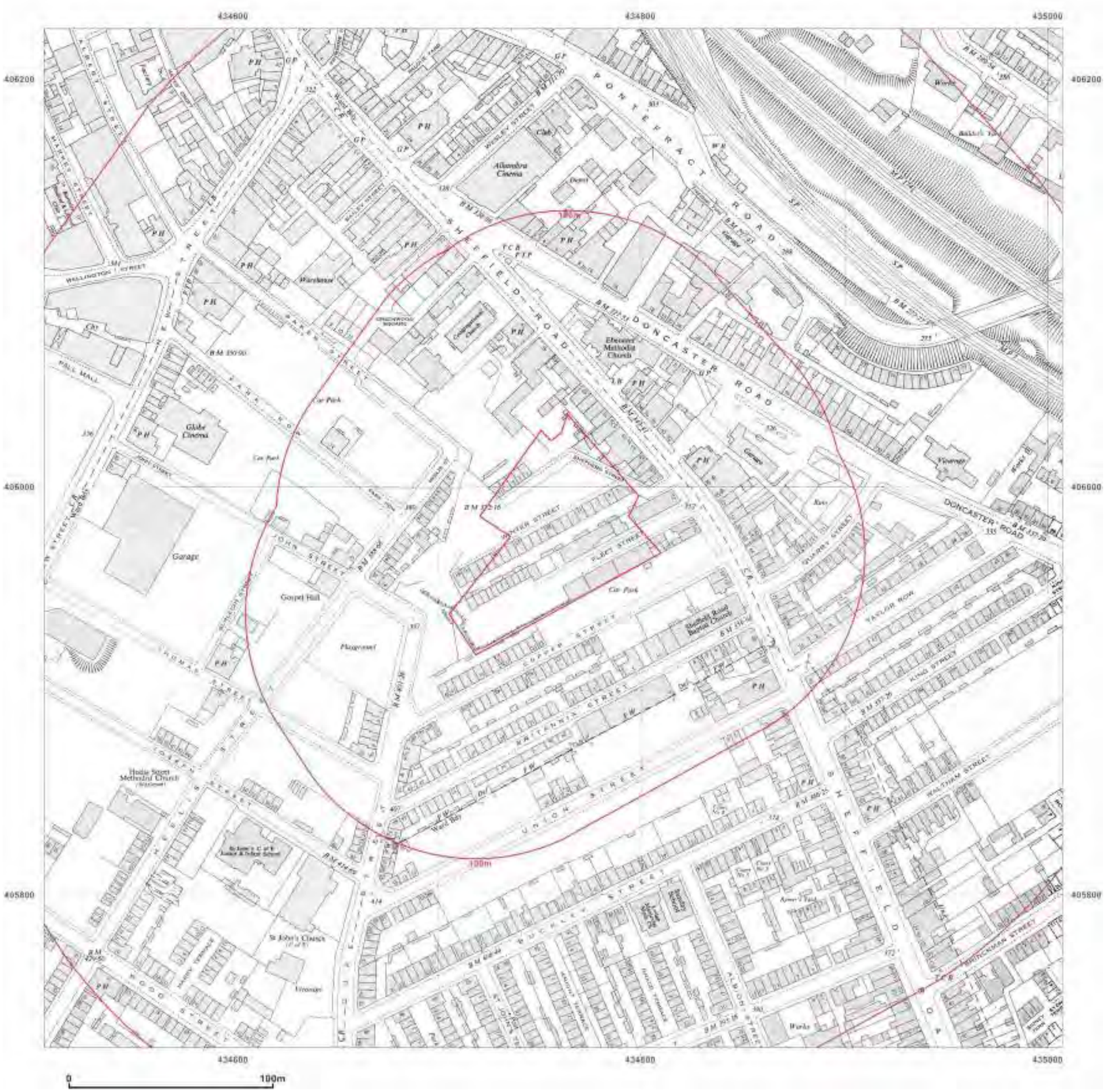

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Park Grove Surgery

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Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1961**

Scale: 1:1,250

Printed at: 1:2,000

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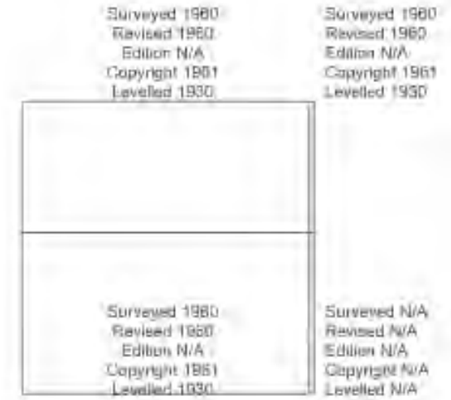

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1960-1962**

Scale: 1:2,500

Printed at: 1:2,500

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

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

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Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1970-1975**

Scale: 1:1,250

Printed at: 1:2,000

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Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1977-1982**

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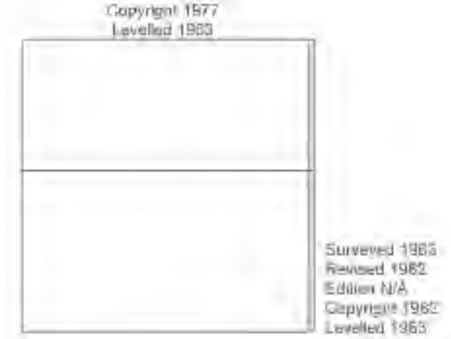

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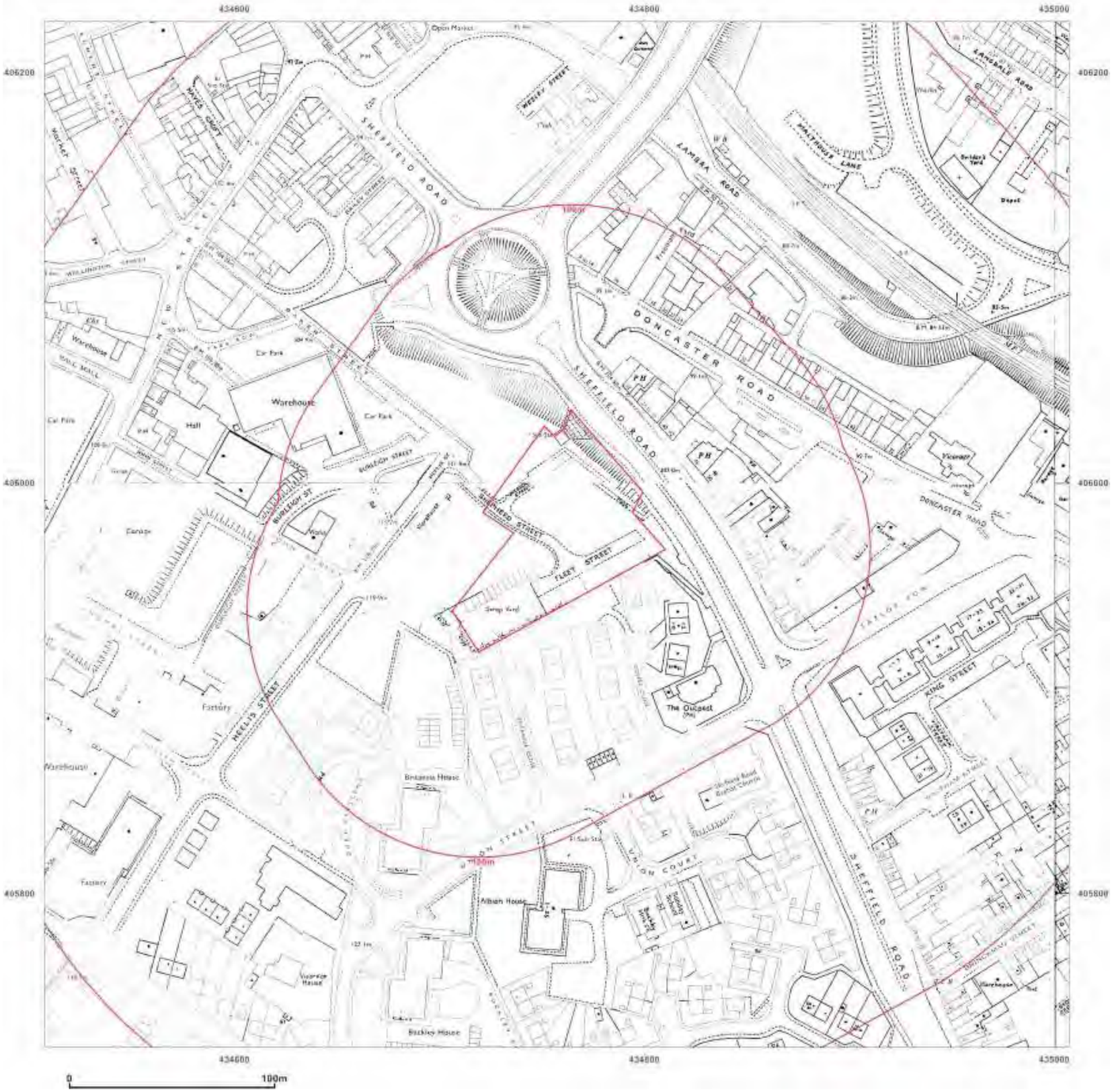

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Park Grove Surgery

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Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

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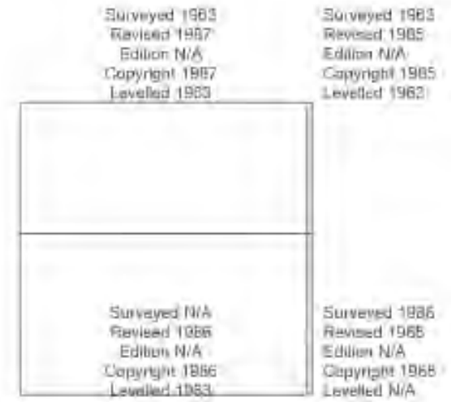

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Production date: 18 November 2014

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1988-1993**

Scale: 1:1,250

Printed at: 1:2,000

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Revised N/A
Edition N/A
Copyright 1991
Levelled 1963

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
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Surveyed N/A
Revised N/A
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Surveyed 1963
Revised 1968
Edition N/A
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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

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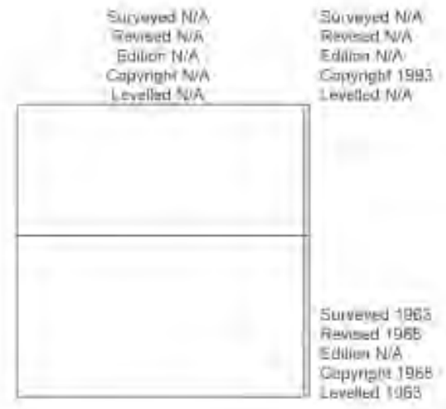

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: County Series

Map date: **1850**

Scale: 1:10,560

Printed at: 1:10,560

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

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: County Series

Map date: **1890**

Scale: 1:10,560

Printed at: 1:10,560

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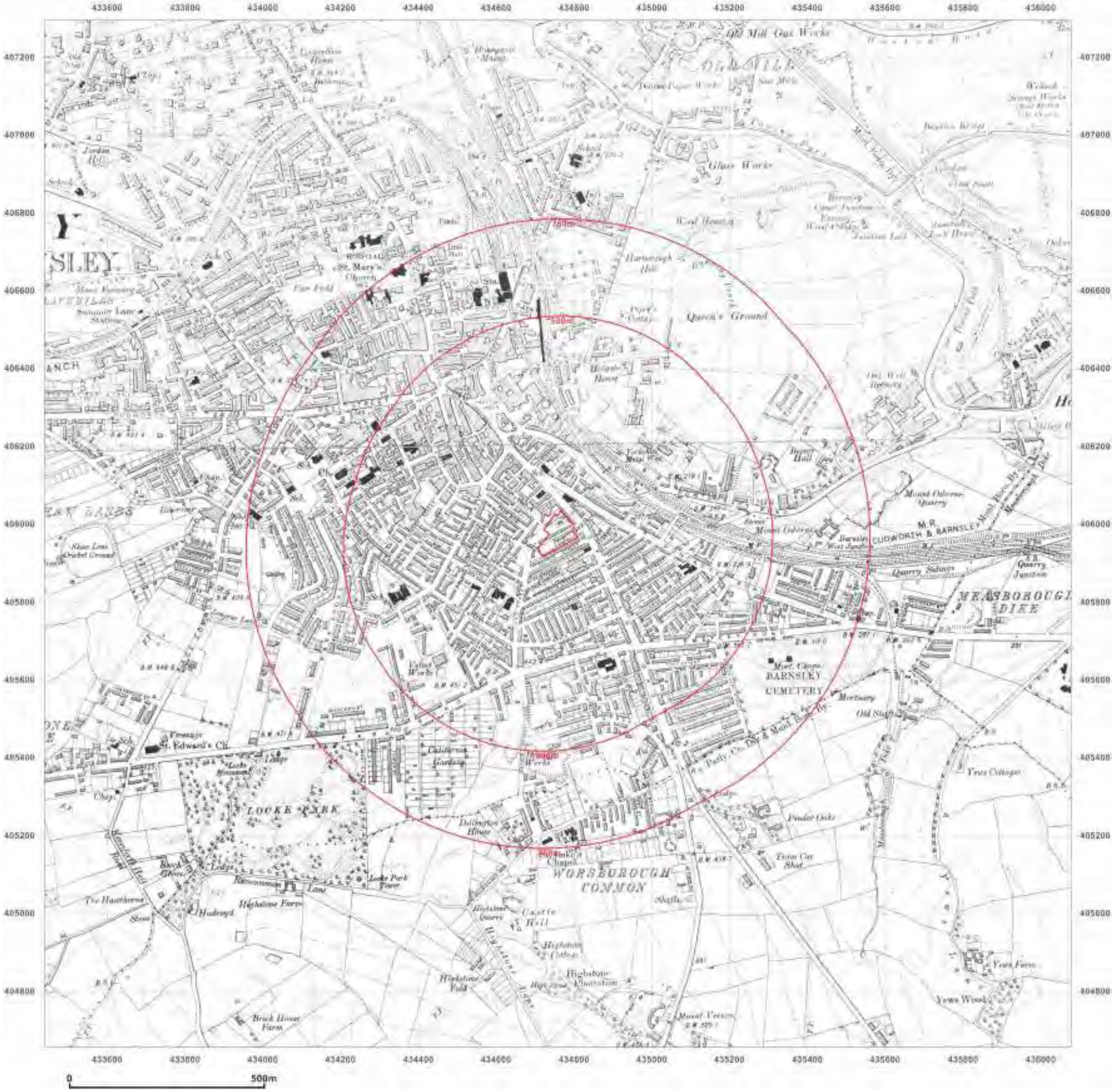

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: County Series

Map date: **1904**

Scale: 1:10,560

Printed at: 1:10,560

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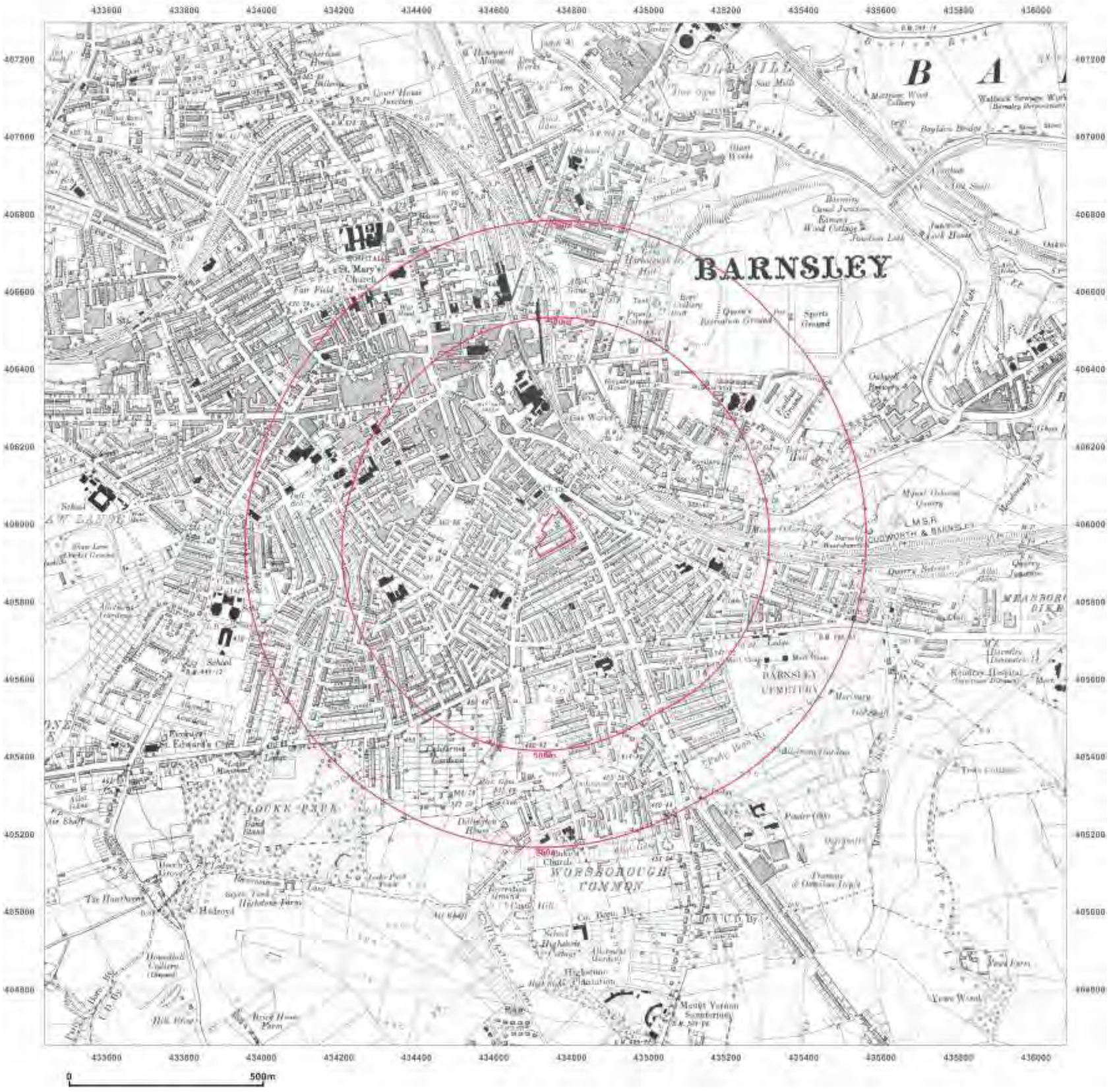

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: County Series

Map date: **1929**

Scale: 1:10,560

Printed at: 1:10,560

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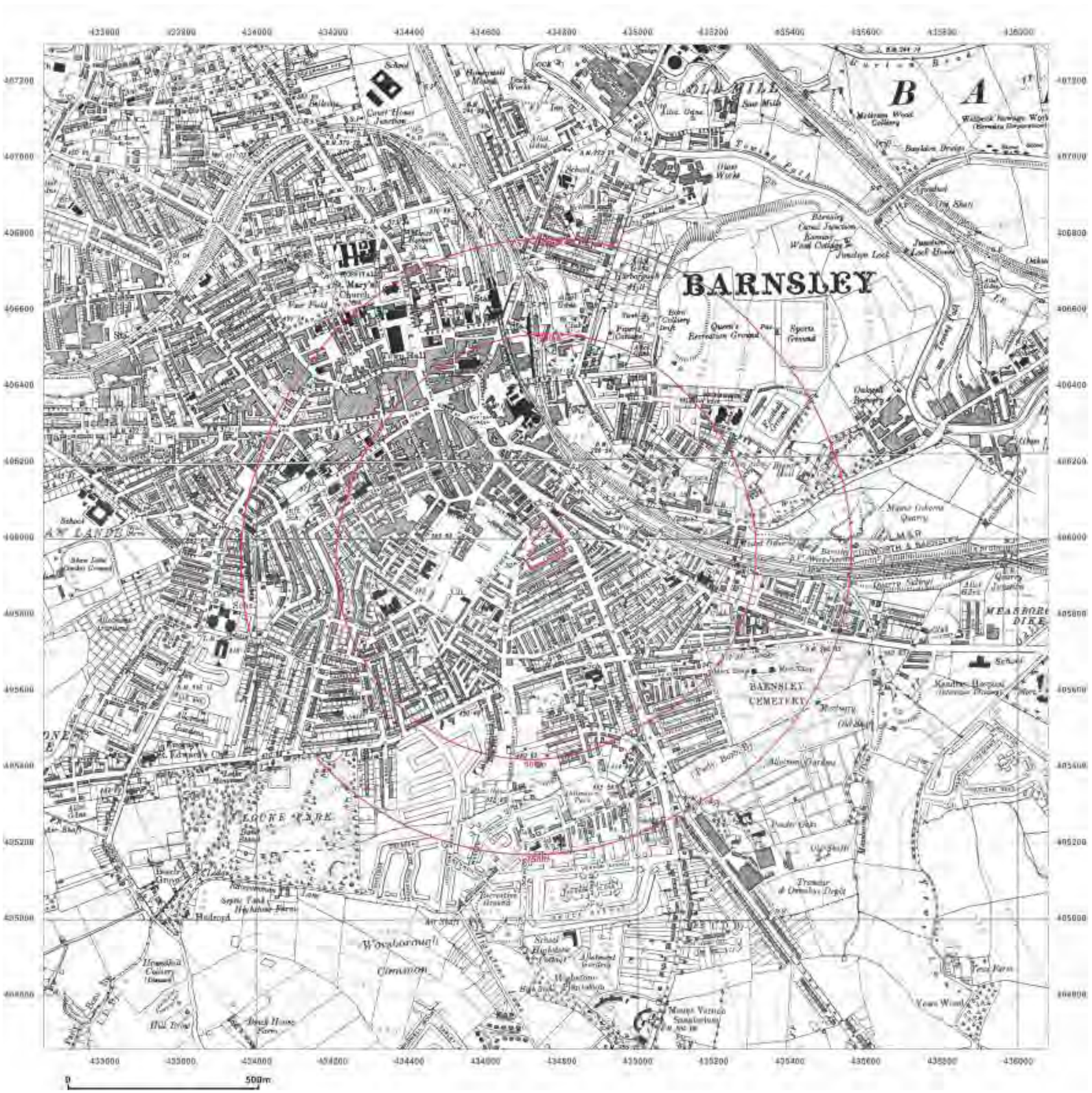
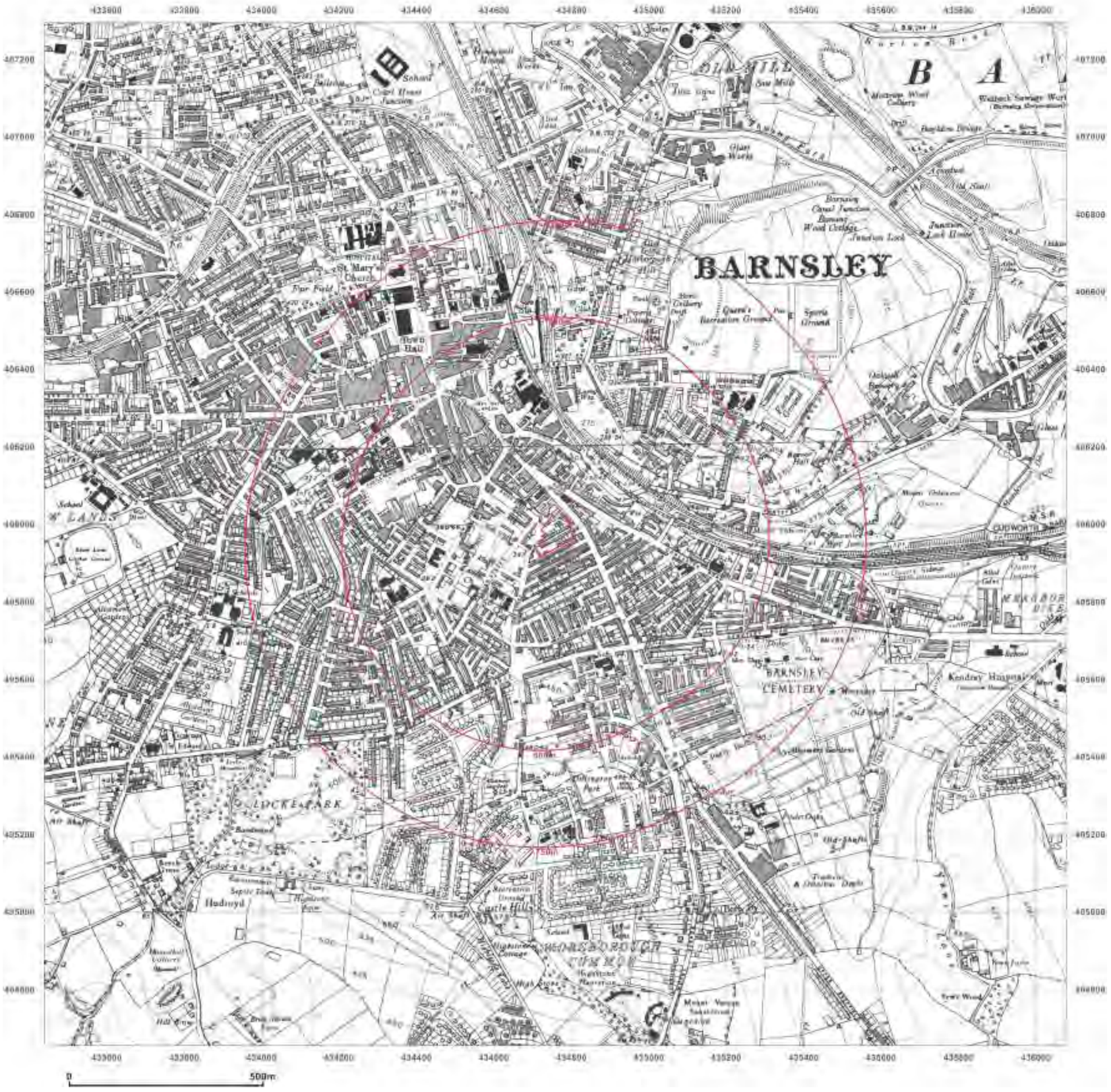

BARNSLEY
Queen's Recreation Ground
Sports Ground
Oakwell Brewery
Oakwell Hall
Mount Osborne Quarry
BARNSLEY CEMETERY
Wentworth Cottages
Wentworth Terrace
Wentworth Gardens
Pontefract Road
Dodworth Road
Park Road
Park Grove
Park Crescent
Park Avenue
Park Drive
Park Parade
Park Gate
Park Mount
Park Terrace
Park Lane
Park Rise
Park Grove Terrace
Park Grove Mount
Park Grove Avenue
Park Grove Drive
Park Grove Gardens
Park Grove Rise
Park Grove Crescent
Park Grove Parade
Park Grove Gate



emapsite™

Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

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Production date: 18 November 2014

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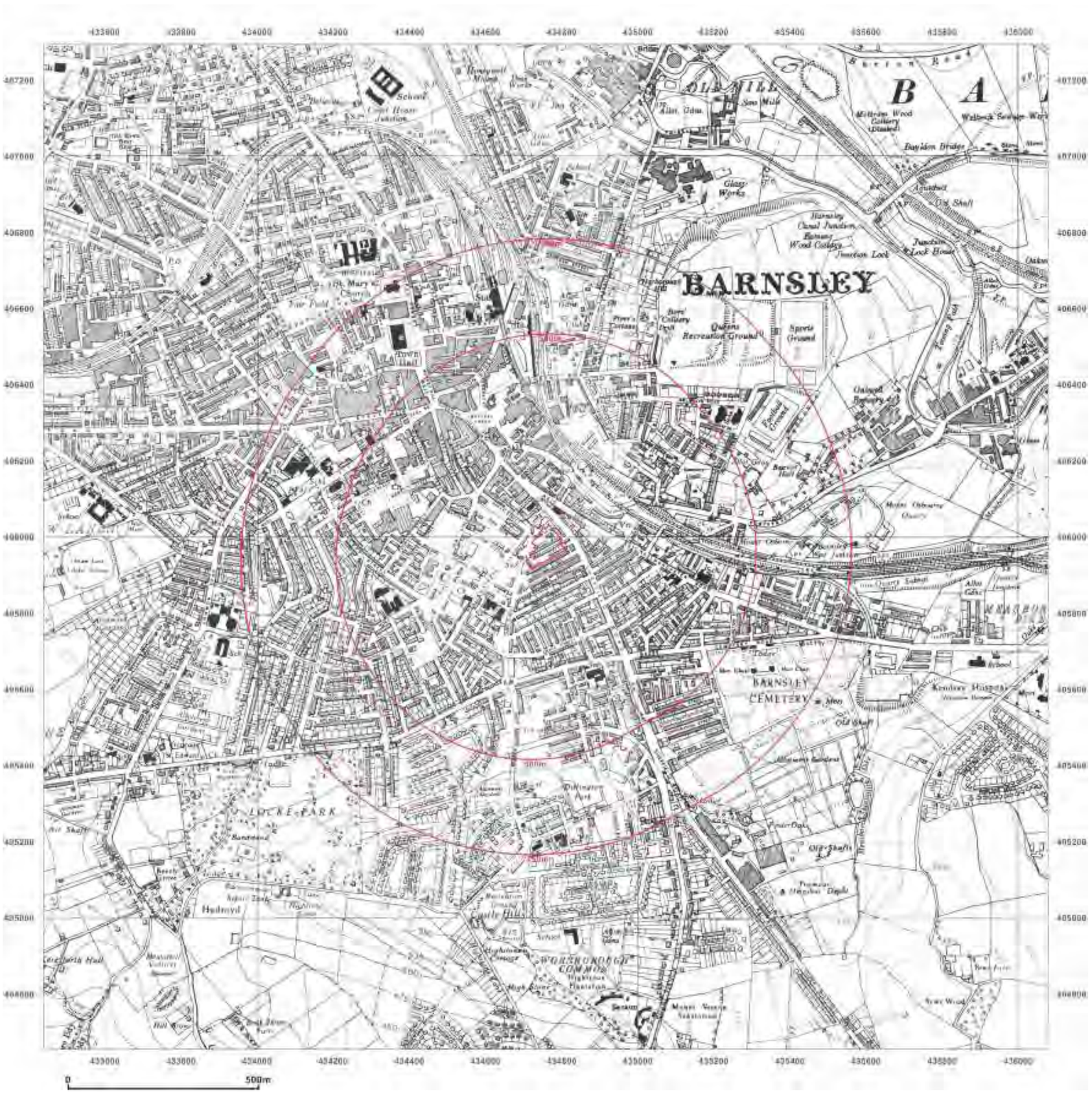
BARNSLEY
BARNSLEY CEMETERY
LOCKE PARK
Hedroyd
WORSBROUGH COMMON
Old Mill
Glass Works
Queens Recreation Ground
Sports Ground
Town Hall
St. Mary's Church
Bayden Bridge
Aqueduct
Junction Lock
Junction & Lock House
Old Shaft
Old Shafts
Bore Hole
Kendray Hospital
Workhouse
Cemetery
Allotments
Tennis Courts
Bowling Green
Bridge
Weir
Mill
Pond
Reservoir
Sewage Works
Gas Works
Pumping Station
Electricity Sub Station
Refuse Disposal Works
Quarry
Old Quarry
Sand Pit
Clay Pit
Coal Mine
Shaft
Adit
Tip
Spoil Heap
Slag Heap
Boundary Stone
Milestone
Pillar Box
Telephone
Post Office
Public House
Church
Chapel
Vicarage
Rectory
Manse
Convent
Monastery
Institute
Library
Museum
Art Gallery
Theatre
Cinema
Hall
Club
Youth Hostel
Camping Ground
Caravan Site
Golf Course
Golf Links
Golf Club House
Golf Practice Ground
Golf Tee
Golf Bunker
Golf Hole
Golf Green
Golf Fairway
Golf Rough
Golf Water Hazard
Golf Out of Bounds
Golf Boundary
Golf Path
Golf Tunnel
Golf Bridge
Golf Footbridge
Golf Ford
Golf Stepping Stones
Golf Gate
Golf Stile
Golf Fence
Golf Wall
Golf Hedge
Golf Ditch
Golf Trees
Golf Woodland
Golf Scrub
Golf Rough Grass
Golf Heather
Golf Bracken
Golf Gorse
Golf Marsh
Golf Reeds
Golf Sand
Golf Shingle
Golf Rock
Golf Cliff
Golf Slope
Golf Contour
Golf Spot Height
Golf Trig Point
Golf Benchmark
Golf Grid Reference
Golf Easting
Golf Northing
Golf Scale
Golf Key
Golf Legend
Golf Title
Golf Date
Golf Surveyed
Golf Revised
Golf Edition
Golf Copyright
Golf Levelled
Golf Printed
Golf Produced
Golf Supplied
Golf Licensed
Golf Partner
Golf Ordnance Survey
Golf GroundSure
Golf Emapsite
Golf Map
Golf Plan
Golf Chart
Golf Atlas
Golf Gazetteer
Golf Index
Golf Table
Golf Figure
Golf Diagram
Golf Photograph
Golf Illustration
Golf Text
Golf Note
Golf Reference
Golf Bibliography
Golf Appendix
Golf Glossary
Golf Abbreviation
Golf Symbol
Golf Colour
Golf Black
Golf White
Golf Red
Golf Blue
Golf Green
Golf Yellow
Golf Brown
Golf Grey
Golf Orange
Golf Purple
Golf Pink
Golf Cyan
Golf Magenta
Golf Transparent
Golf Opaque
Golf Solid
Golf Dashed
Golf Dotted
Golf Thick
Golf Thin
Golf Medium
Golf Bold
Golf Italic
Golf Underline
Golf Strikethrough
Golf Superscript
Golf Subscript
Golf Uppercase
Golf Lowercase
Golf Titlecase
Golf Sentence
Golf Paragraph
Golf Column
Golf Row
Golf Cell
Golf Header
Golf Footer
Golf Margin
Golf Padding
Golf Border
Golf Shadow
Golf Gradient
Golf Texture
Golf Pattern
Golf Image
Golf Logo
Golf Icon
Golf Button
Golf Link
Golf Hyperlink
Golf Email
Golf Phone
Golf Fax
Golf Address
Golf Name
Golf Company
Golf Author
Golf Publication
Golf Publisher
Golf Edition
Golf Volume
Golf Issue
Golf Page
Golf Chapter
Golf Section
Golf Subsection
Golf Table of Contents
Golf Index
Golf Glossary
Golf Bibliography
Golf Appendix

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: Provisional

Map date: **1965-1966**

Scale: 1:10,560

Printed at: 1:10,560

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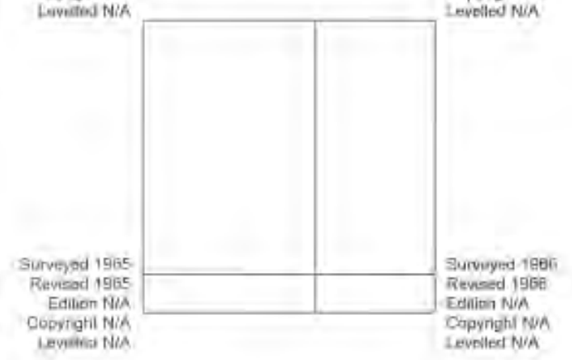

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Production date: 18 November 2014

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Site Details:

Park Grove Surgery

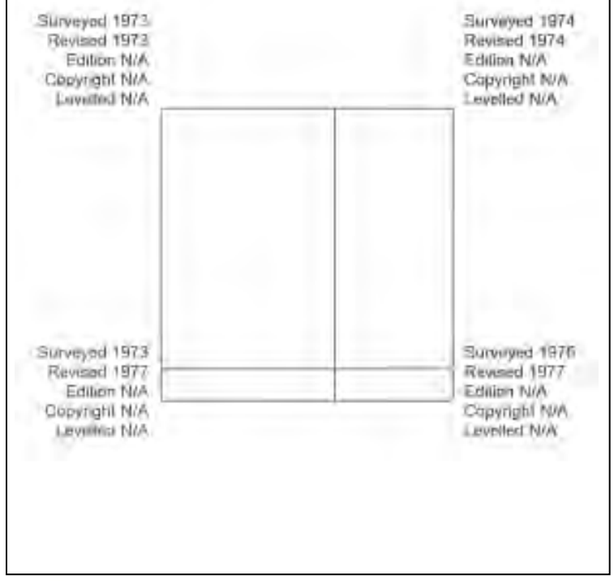
Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1973-1977**

Scale: 1:10,000

Printed at: 1:10,000



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Production date: 18 November 2014

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1982-1987**

Scale: 1:10,000

Printed at: 1:10,000

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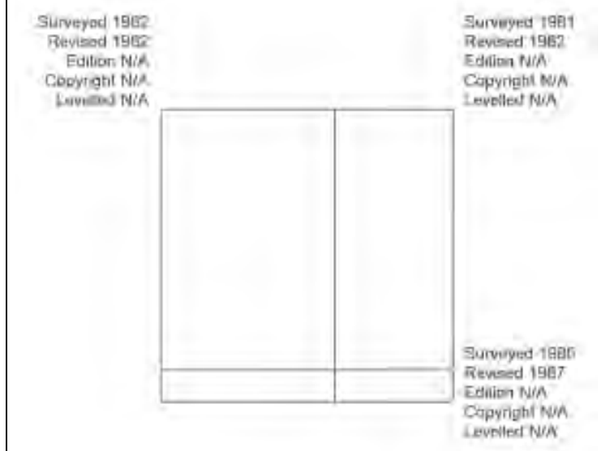

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Production date: 18 November 2014

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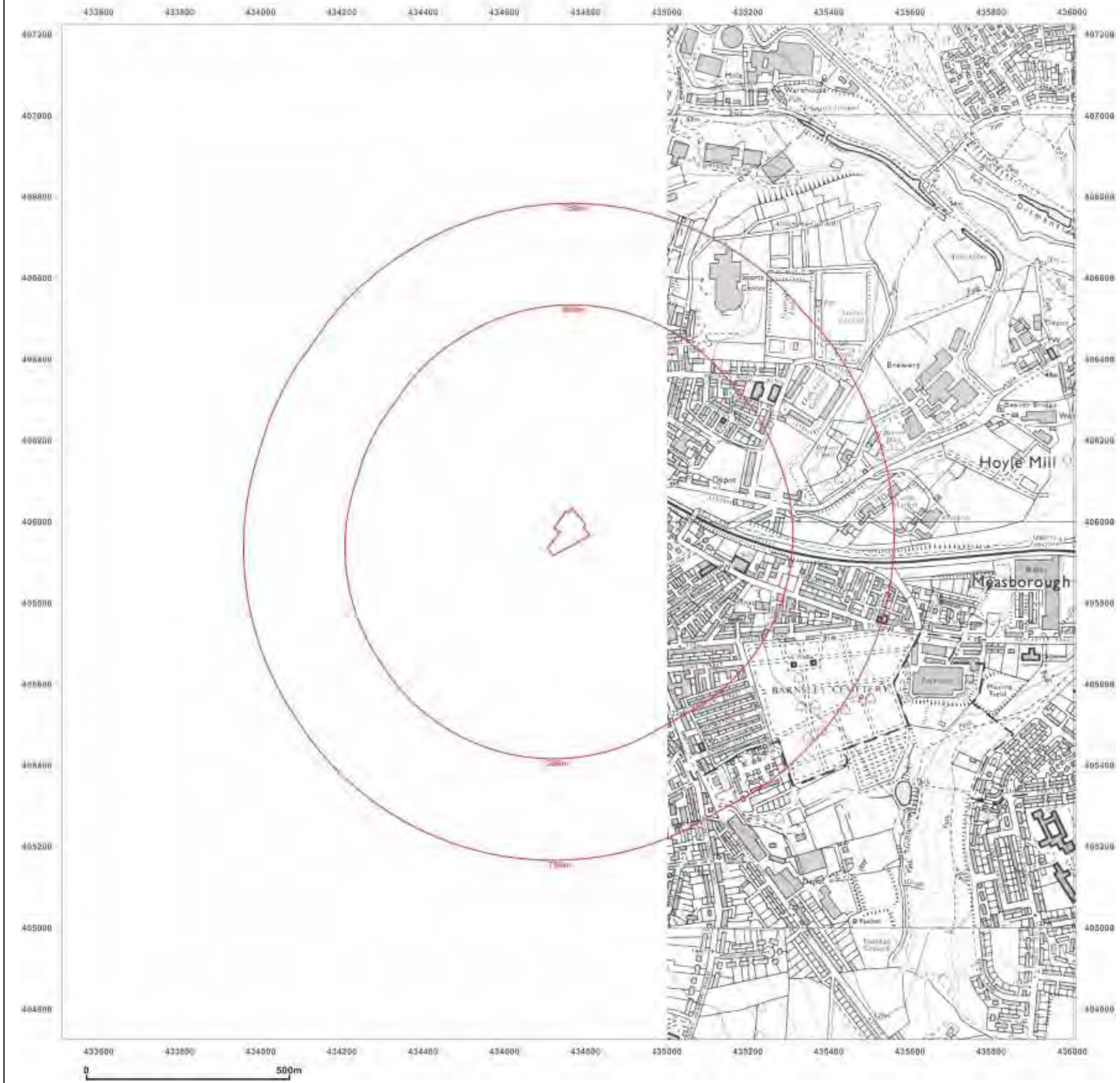

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1987-1992**

Scale: 1:10,000

Printed at: 1:10,000

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Production date: 18 November 2014

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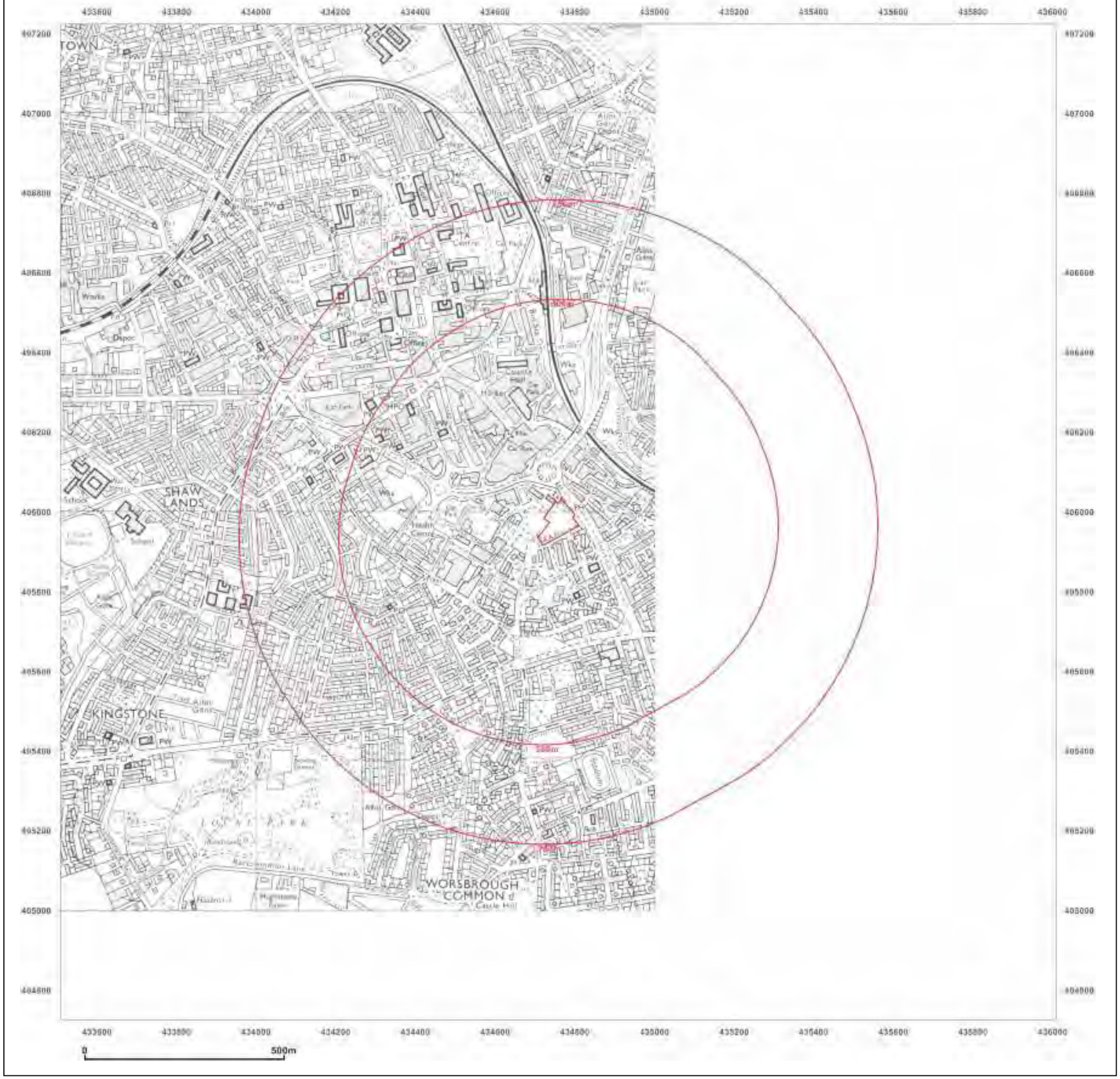

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **1993**

Scale: 1:10,000

Printed at: 1:10,000

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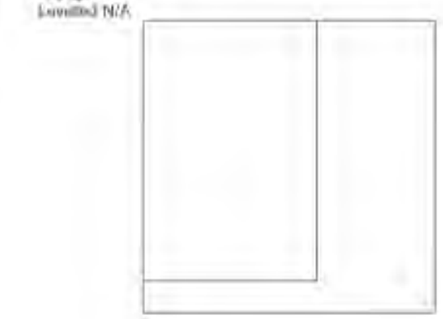

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

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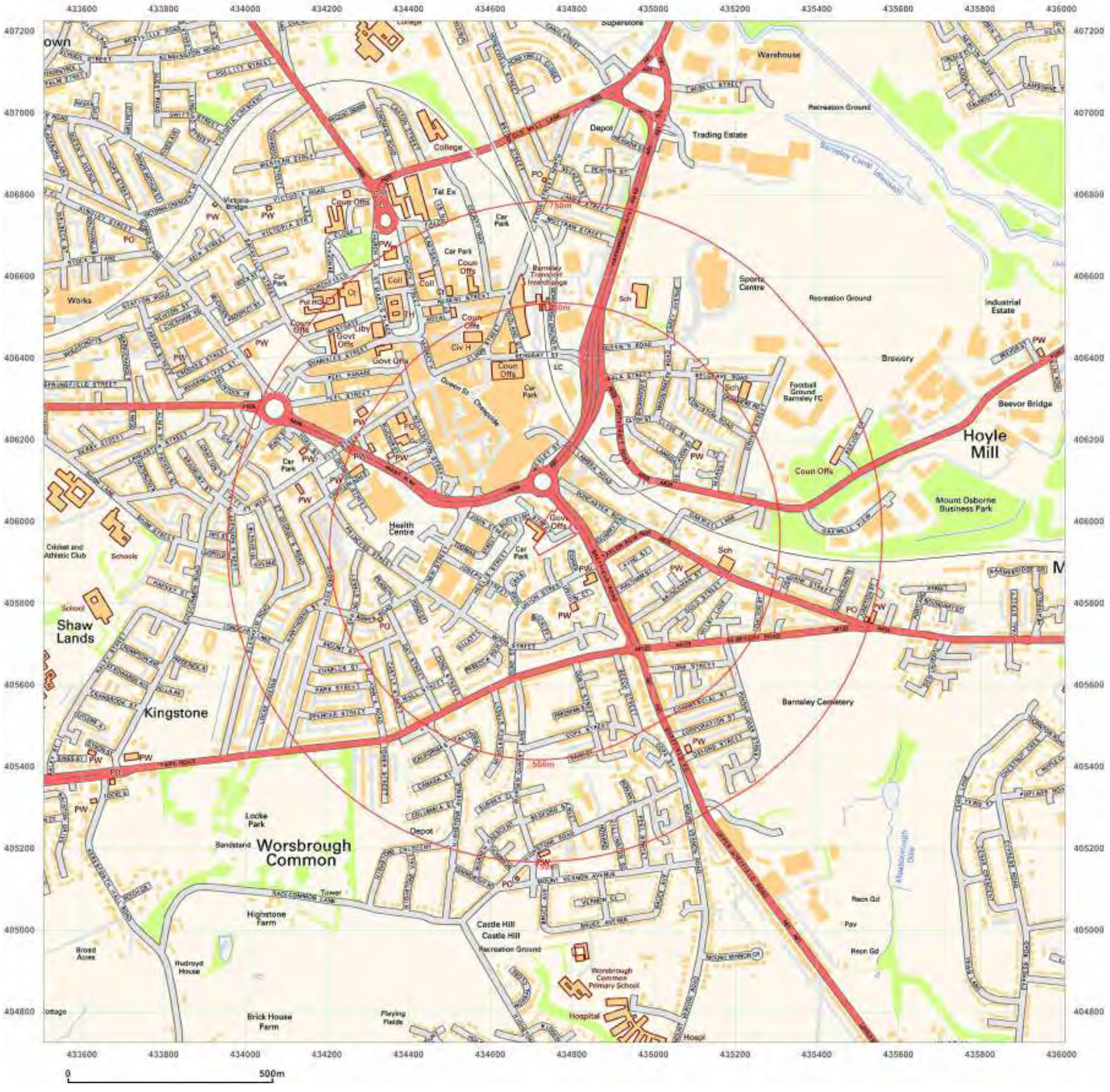
Production date: 18 November 2014

To view map legend click here *Legend*



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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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Production date: 18 November 2014

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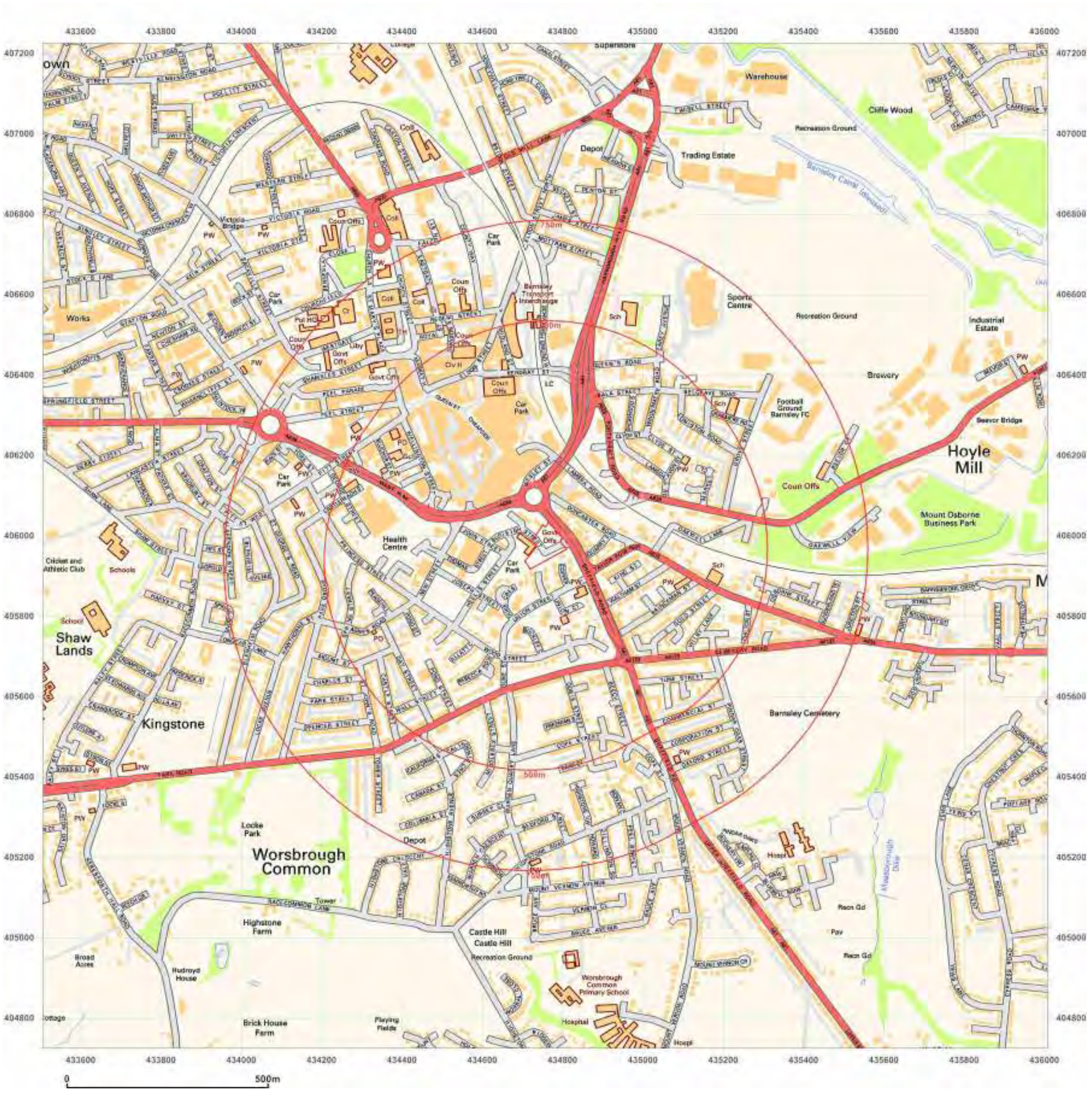

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Site Details:

Park Grove Surgery

Client Ref: EMS_276499_372549
Report Ref: EMS-276499_372549
Grid Ref: 434757, 405975

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

Printed at: 1:10,000

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EmapSite

Masdar House,
Eversley, RG27 0RP

Report Reference: EMS-276499_372550

Your Reference: EMS_276499_372550

Report Date 18 Nov 2014

Report Delivery Method: Email - pdf

GroundSure Geoinsight

Address: Park Grove Surgery,

Dear Sir/ Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure GeoInsight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
GroundSure GeoInsight

GroundSure GeoInsight

Address:	**Park Grove Surgery,**
Date:	**18 Nov 2014**
Reference:	**EMS-276499_372550**
Client:	**EmapSite**

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	26-Mar-2012
Grid Reference:	434757,405975
Site Size:	0.59ha

Contents Page

Overview of Findings

The GroundSure GeoInsight 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 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow 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		
1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	No
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	No
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & 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 relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.4 Radon data	1.4.1 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
	1.4.2 Is the property in an area where Radon Protection Measures 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 2: Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	7	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	1	13
2.3 Current Ground Workings	0	1	1	2	10

Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	1	13

Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.2 Coal Mining	1	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	1	1	2	2	5
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

Section 4: Natural Ground Subsidence	On-site
4.1 Shrink Swell Clay	Negligible
4.2 Landslides	Very Low
4.3 Ground Dissolution of Soluble Rocks	Negligible
4.4 Compressible Deposits	Negligible
4.5 Collapsible Deposits	Very Low
4.6 Running Sand	Negligible

Section 5: Borehole Records	On-site	0-50m	51-250
5 BGS Recorded Boreholes	7	6	39

Section 6: Estimated Background Soil Chemistry	On-site	0-50m	51-250
6 Records of Background Soil Chemistry	2	1	4

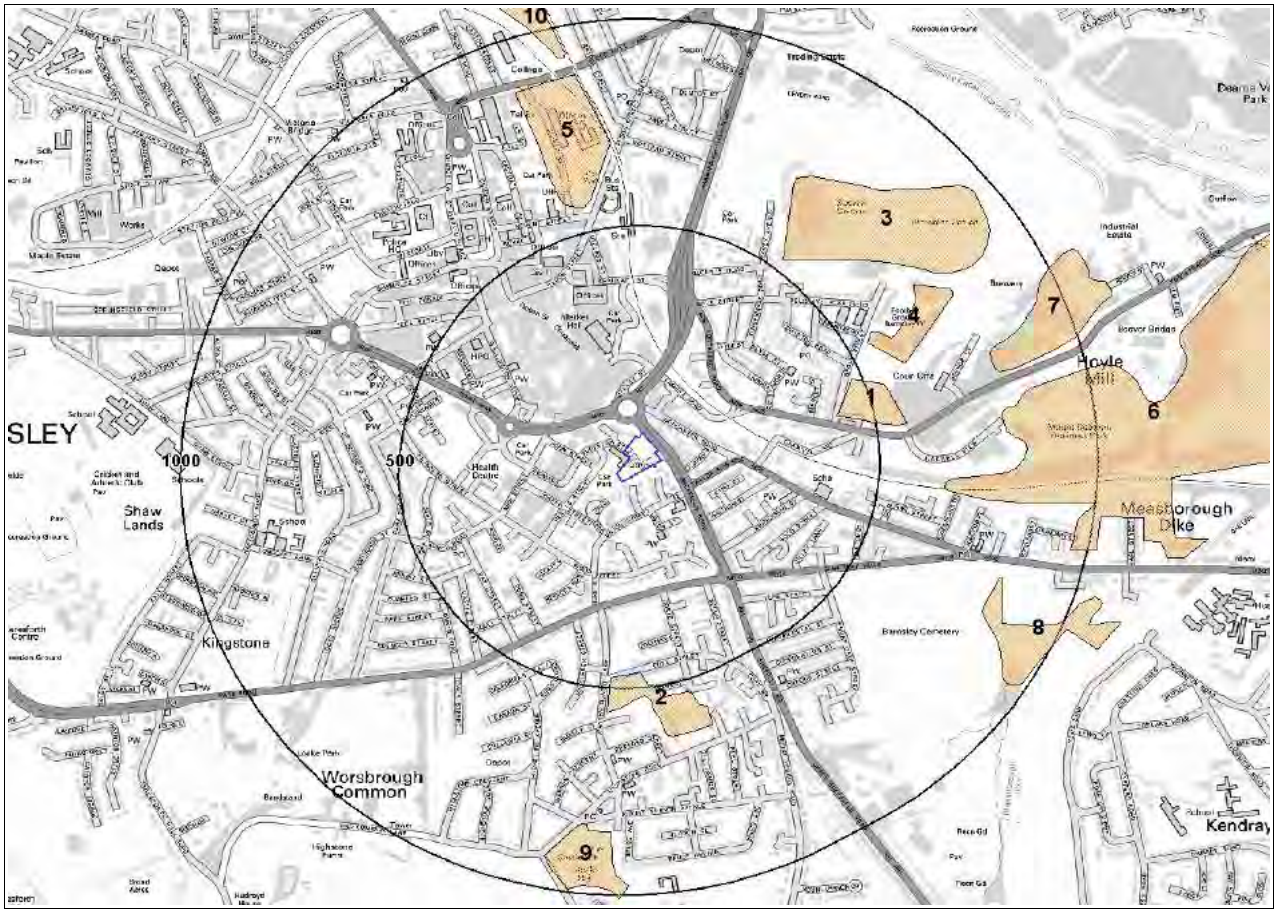
Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500
7.1 Tunnels	0	0	0	Not Searched
7.2 Historical Railway and Tunnel Features	0	0	12	Not Searched
7.3 Historical Railways	0	0	0	Not Searched
7.4 Active Railways	0	0	6	Not Searched

Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500
7.5 Railway Projects	0	0	0	0

1 Geology

1.1 Artificial Ground Map

NW N NE



W E

SW S SE

Artificial Ground Legend

Mapping sourced from Ordnance Survey

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

1.1 Artificial Ground

1.1.1Artificial/ Made Ground

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

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	416.0	E	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	461.0	S	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

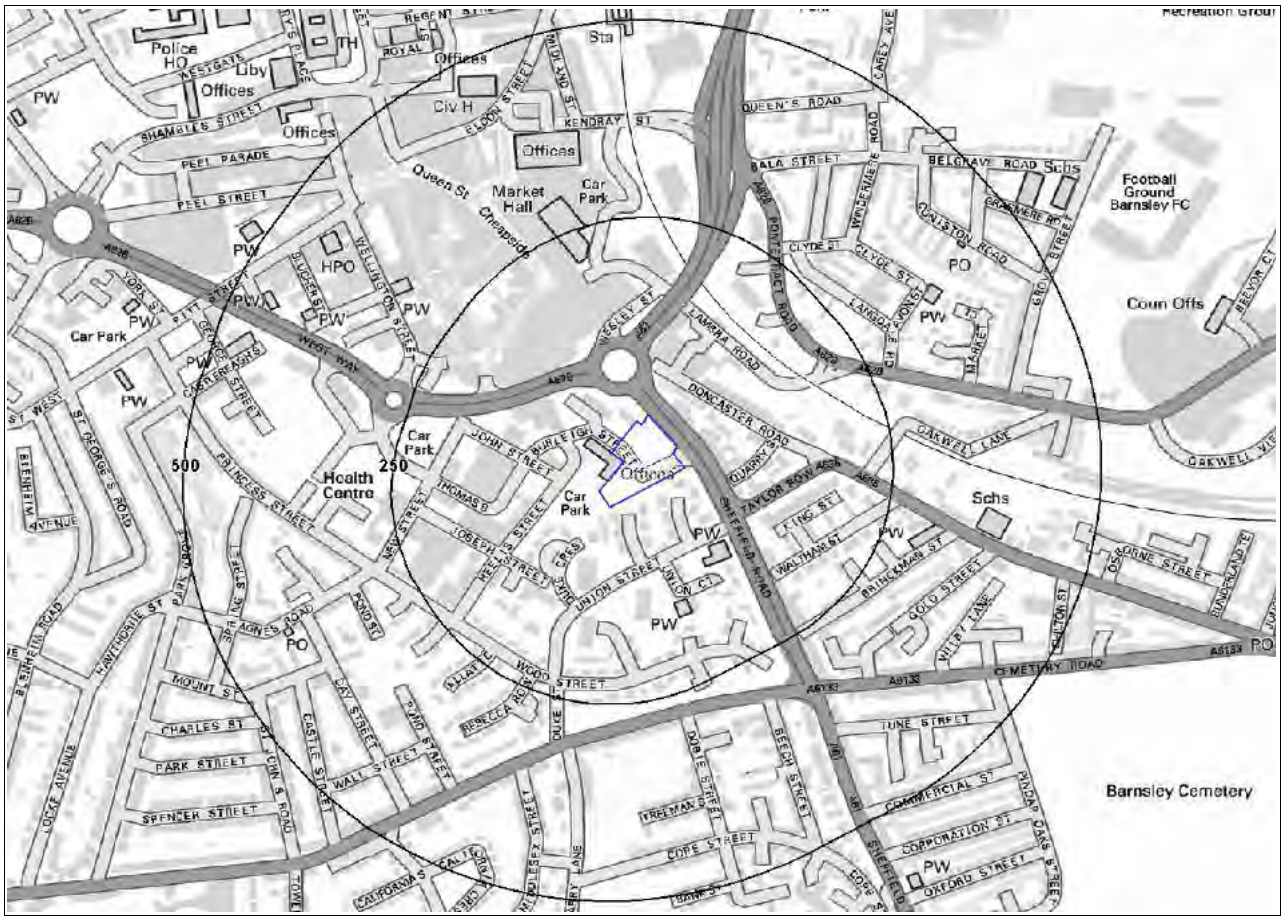
1.1.2 Permeability of Artificial Ground

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

Database searched and no data found.

1.2 Superficial Deposits and Landslips Map

NW N NE



W E

SW S SE

Superficial Deposits and Landslips Legend

Mapping sourced from Ordnance Survey

Site Outline

500
1000
Search Buffers (m)

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? No

Database searched and no data found.

1.2.2 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.

1.2.3 Landslip

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

Database searched and no data found.

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.

1.2.4 Landslip Permeability

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

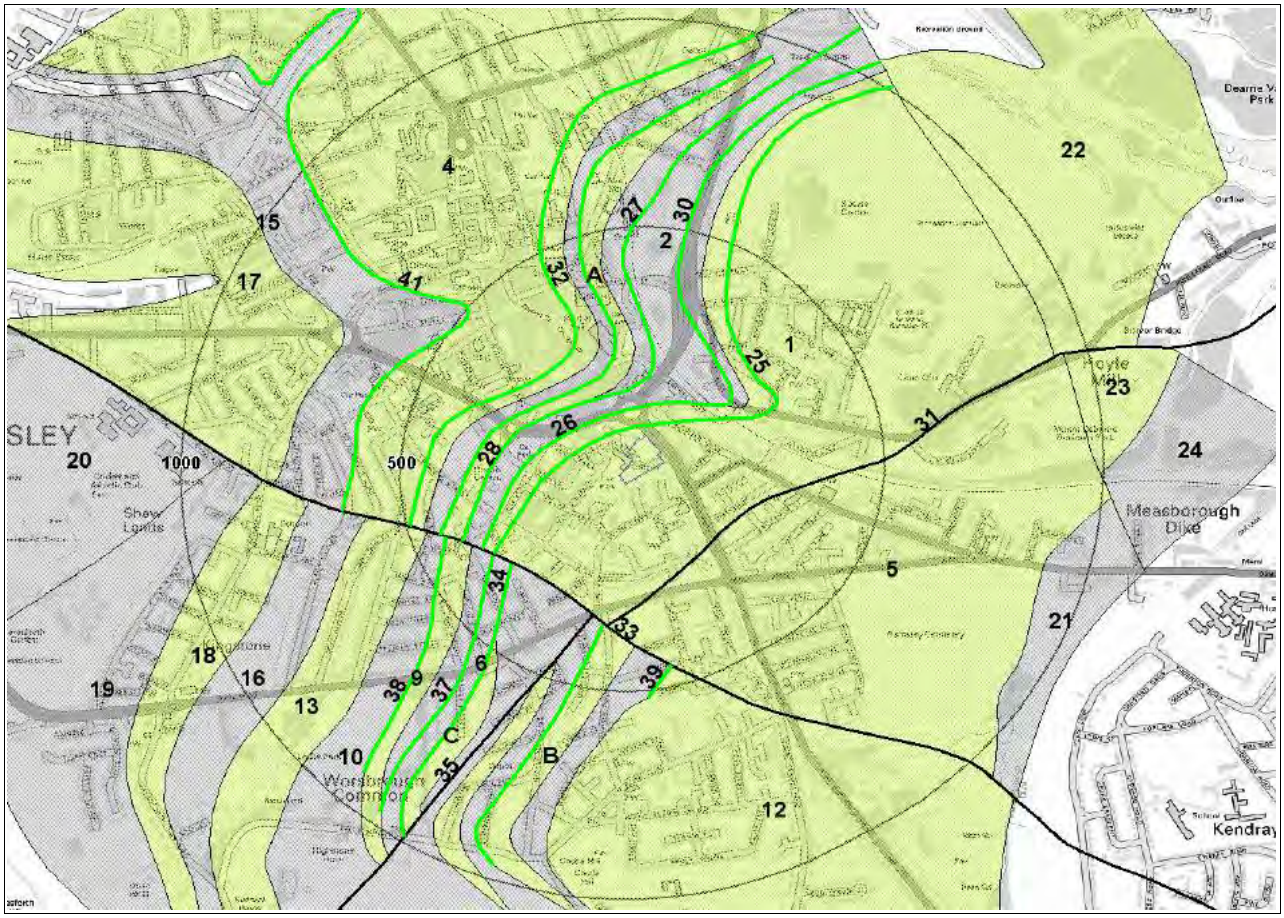
Database searched and no data found.

---

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

1.3 Bedrock and Faults Map

NW N NE



W E

SW S SE

Bedrock and Faults Legend

Mapping sourced from Ordnance Survey

Site Outline

500
1000
Search Buffers (m)

1.3 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

1.3.1 Bedrock/ Solid Geology

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

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian (westphalian B)
2	67.0	N	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
3A	132.0	NW	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
4	209.0	NW	KNR-SDST	Kent's Rock - Sandstone	Duckmantian (westphalian B)
5	210.0	SE	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian (westphalian B)
6	295.0	SW	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
7	324.0	S	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
8B	341.0	S	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
9	375.0	SW	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
10	421.0	W	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
11	446.0	S	ABR-SDST	Abdy Rock - Sandstone	Duckmantian (westphalian B)
12	449.0	S	WE-SDST	Woolley Edge Rock - Sandstone	Duckmantian (westphalian B)
13	458.0	W	KNR-SDST	Kent's Rock - Sandstone	Duckmantian (westphalian B)
14C	468.0	SW	ABR-SDST	Abdy Rock - Sandstone	Duckmantian (westphalian B)
15	487.0	NW	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)

1.3.2 Permeability of Bedrock Ground

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

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

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

1.3.3 Faults

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

ID	Distance (m)	Direction	Category Description	Feature Description
25	21.0	N	ROCK	Coal seam, inferred
26	67.0	N	ROCK	Coal seam, inferred
27	114.0	N	ROCK	Coal seam, inferred
28	152.0	NW	ROCK	Coal seam, inferred
29A	172.0	NW	ROCK	Coal seam, inferred
30	187.0	NE	ROCK	Coal seam, inferred
31	210.0	SE	FAULT	Fault, inferred, displacement unknown
32	254.0	NW	ROCK	Coal seam, inferred
33	295.0	SW	FAULT	Fault, inferred, displacement unknown
34	320.0	SW	ROCK	Coal seam, inferred
35	324.0	S	FAULT	Fault, inferred, displacement unknown
36B	341.0	S	ROCK	Coal seam, inferred
37	343.0	SW	ROCK	Coal seam, inferred
38	421.0	W	ROCK	Coal seam, inferred
39	449.0	S	ROCK	Coal seam, inferred
40C	468.0	SW	ROCK	Coal seam, inferred
41	487.0	NW	ROCK	Coal seam, inferred

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 nationwide coverage.

1.4 Radon Data

1.4.1 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

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1.4.2 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

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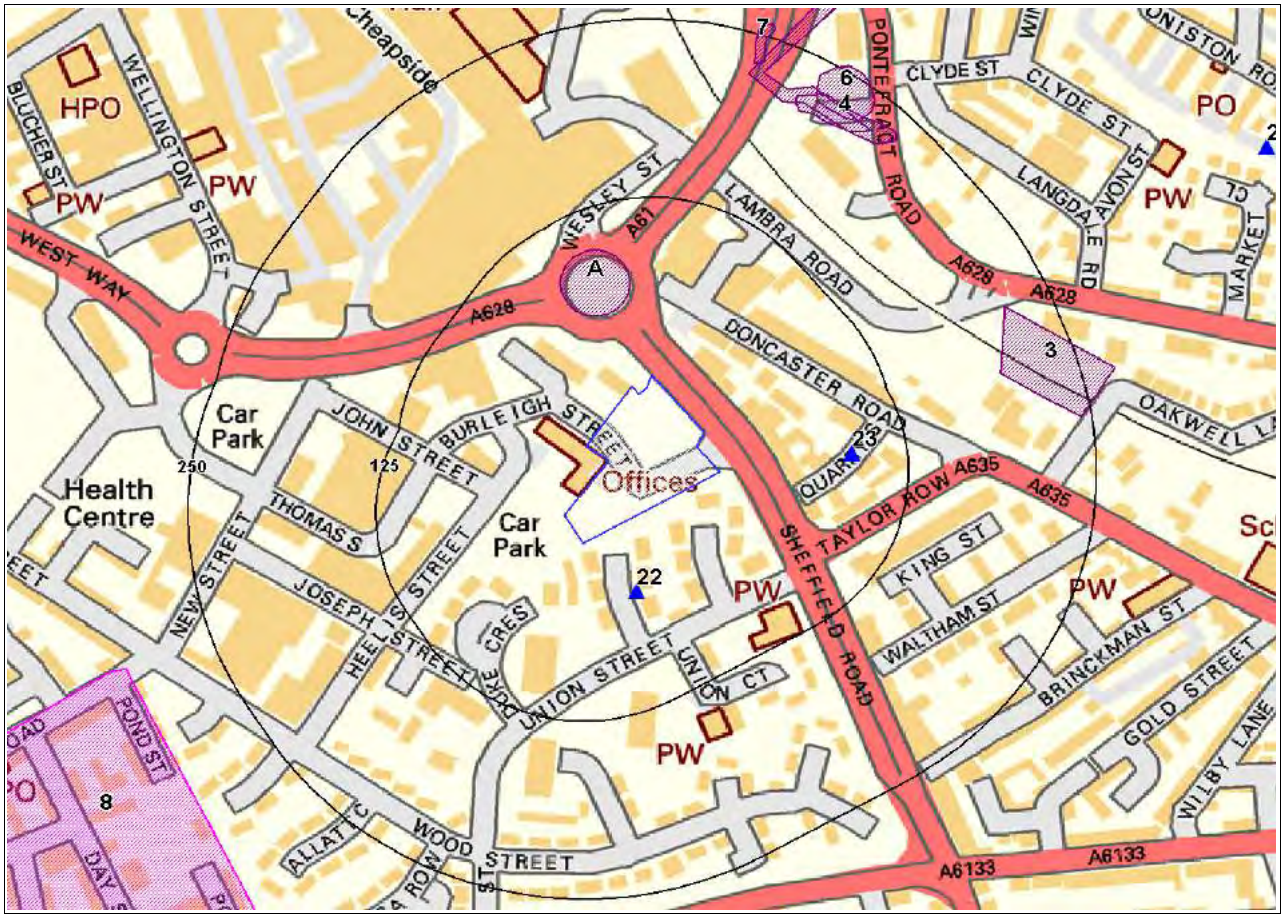
2 Ground Workings Map

NW N NE

W E

SW S SE



Ground Workings Legend

Mapping sourced from Ordnance Survey®

- Site Outline
- Search Buffers (m) — 125 — 250
- Historic Surface Ground Workings
- Historic Underground Workings
- Current Ground Workings

2 Ground Workings

2.1 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

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1A	51.0	NW	434727 406100	Unspecified Pit	1993
2A	51.0	NW	434727 406100	Unspecified Pit	1982
3	199.0	E	435034 406045	Cuttings	1966
4	210.0	NE	434894 406216	Unspecified Ground Workings	1966
5	211.0	NE	434843 406258	Unspecified Ground Workings	1904
6	221.0	NE	434894 406234	Unspecified Pit	1890
7	229.0	N	434840 406269	Unspecified Ground Workings	1973

2.2 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
8	309.0	SW	434408 405657	Colliery	1890
Not shown	556.0	NE	435025 406567	Colliery	1948
Not shown	559.0	NE	435027 406568	Colliery	1951
Not shown	586.0	NE	435072 406541	Unspecified Drift	1951
Not shown	595.0	NE	435046 406567	Disused Air Shaft	1966

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	604.0	NE	435046 406575	Unspecified Drift	1948
Not shown	862.0	SE	435677 405551	Colliery	1890
Not shown	906.0	SE	435089 405049	Colliery	1890
Not shown	938.0	SE	435643 405517	Unspecified Old Shafts	1904
Not shown	938.0	S	434563 404990	Air Shaft	1938
Not shown	943.0	SE	435637 405505	Unspecified Old Shaft	1938
Not shown	958.0	SE	435092 405031	Unspecified Shafts	1904
Not shown	961.0	SE	435101 405033	Unspecified Shafts	1904
Not shown	983.0	SE	435430 405198	Unspecified Old Shafts	1951

2.3 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
22	47.0	SE	434754 405884	Sandstone	Union Street	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
23	88.0	E	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	403.0	S	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
25	424.0	NE	435173 406196	Sandstone	Oakwell	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	513.0	S	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	526.0	E	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	531.0	S	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	773.0	E	435579 406044	Sandstone	Mount Osborne	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	818.0	SE	435044 405167	Sandstone	Worsborough Common	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	906.0	NE	435298 406768	Sandstone	Eaming Wood	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	906.0	S	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	936.0	SW	433983 405340	Sandstone	Kingstone Place	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	964.0	NE	435157 406916	Coal, Deep	Mount Osborne 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	971.0	SE	435677 405531	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