



# Land at Barnsley Road, Upper Cumberworth For Vivly Living

Report no: 5368/1

Date: October 2025



## SUMMARY OF GEOENVIRONMENTAL ISSUES

<b>Job No.</b>	5368	<b>Site area/ha</b>	5.6ha
<b>Client:</b>	Vivly Living	<b>NGR:</b>	SE 209 085
<b>Site:</b>	Barnsley Road, Upper Cumberworth	<b>Nearest postcode:</b>	HD8 8NP

The site is located off Barnsley Road, approximately 11km southeast of Barnsley town centre, and currently comprises a parcel of arable farmland (grassed) with a small (c.1,800m<sup>2</sup>) farmyard in the far west. The site has remained undeveloped throughout its history, with the exception of the farmyard buildings.

Lithos were commissioned by Vivly to provide a preliminary geoenvironmental appraisal of the site. It is understood that the site is to be redeveloped with houses; a proposed layout has been prepared.

Lithos' investigation included an inspection of historical and geological maps and information provided by the Landmark Information Group, the Mining Remediation Authority, and QGIS. In addition, a site inspection has been carried out.

A summary of salient geoenvironmental issues is provided in the table below.

Issue	Remarks
Former uses	The site has remained undeveloped throughout its history with the exception of the farmyard buildings in the far west.
Anticipated ground conditions	Grenoside Sandstone bedrock overlain by Residual Soils (gravelly Clay/clayey Gravel). Localised made ground is likely present within the vicinity of the farmyard.
Anticipated contamination	Possible minor contamination present within the farmyard. Limited contamination anticipated within the fields.
Mining & quarrying	Whilst the site lies within a Mining Remediation Authority Low Risk area, the shallowest significant coal seam lies at depths in excess of 100m; no significant risks have been identified. There are no known quarries within 100m.
Hazardous gas	The site is in an area where less than 1-3% of homes are estimated to be above the radon action level (western field) and less than 1 % of homes are estimated to be above the radon action level (eastern field). Therefore, basic protection measures are not required, but should be considered. A historical landfill is present c.170m northeast, and consequently the site is considered susceptible to migrating hazardous ground gas. Consequently, a period of gas monitoring should be undertaken.
Flooding & drainage	The site lies in Flood Zone 1. Soakaways may provide a suitable drainage solution for surface water run off at the site. Consequently, consideration should be given to undertaking soakaway testing in c.5 trial pits to determine their suitability for use. There may however be a need for surface water balancing.
Preparatory works	Topsoil strip & stockpile Asbestos survey & strip Demolition of existing farm buildings Grubbing up of concrete hardstand in the farmyard Site regrade to create level development platforms
Anticipated foundation solutions	If residual soils are of medium strength (considered reasonably likely), they should provide sufficient bearing capacity to enable the adoption of strip footings for two storey housing.
Recommendations for ground investigation	Machine-excavated trial pits (fields) and window sample boreholes (farmyard) to determine near surface ground conditions including nature, distribution and thickness of shallow soils, suitability of the ground for soakaways and the suitability of the ground for founding structures and highways. Rotary openhole probeholes to allow the installation of wells to monitor for hazardous gas. Geotechnical & chemical testing of soil samples.

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## APPENDICES

### Appendix A – General notes

01	Environmental setting
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### Appendix B – Drawings

Drawing	Revision	Title
5368/1	-	Site Location Plan
5368/2	-	Proposed Layout
5368/3	-	Site Features
5368/4	-	Site Photographs
5368/5	-	Preliminary Conceptual Site Model

### Appendix C - Commission

### Appendix D – Historical OS plans\*

### Appendix E – Search responses\*

From	Date	Content
Landmark	12 <sup>th</sup> March 2025	Envirocheck report
Mining Remediation Authority	12 <sup>th</sup> March 2025	Consultants Mining Report

\* Some of this data is not included within the paper or PDF copies of this report can be provided on request.

## FOREWORD (GEOENVIRONMENTAL APPRAISAL REPORT)

This report has been prepared for the sole internal use and reliance of the Client named on page 1. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Lithos Consulting Limited (Lithos); such authorisation not to be unreasonably withheld. If any unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill.

This report has been reviewed by a Competent Person, as defined in the National Planning Policy Framework. We ensure that all projects are managed by individuals with necessary experience, relevant qualifications, and current membership of a relevant professional organisation. Records of engineers, project managers and reviewers involved in this project are maintained by us. Lithos QA/QC procedures for all our work forms an integral part of our ISO9001 accreditation and as such is regularly audited.

The report presents observations and factual data obtained during our site investigation and provides an assessment of geoenvironmental issues with respect to information provided by the Client regarding the proposed development. Further advice should be sought from Lithos prior to significant revision of the development proposals.

The report should be read in its entirety, including all associated drawings and appendices. Lithos cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context. However, it should be noted that in order to keep the number of pages to a minimum, some information (e.g. full copy of the Landmark/Groundsure Report) is not included in the PDF; by request it can be provided.

The findings and opinions conveyed in this report (including review of any third-party reports) are based on information obtained from a variety of sources as detailed within this report, and which Lithos believes are reliable. Reasonable care and skill has been applied in examining the information obtained. Nevertheless, Lithos cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

Where the report refers to the potential presence of invasive weeds such as Japanese Knotweed, or the presence of asbestos containing materials, it should be noted that the observations are for information only and should be verified by a suitably qualified expert.

Lithos cannot be responsible for the consequences of changing practices, revisions to waste management legislation etc that may affect the viability of proposed remediation options.

The report represents the findings and opinions of experienced geoenvironmental consultants. Lithos does not provide legal advice and the advice of lawyers may also be required.

Lithos standard terms and conditions apply to the report, a copy of the terms and conditions is available on request or can be found with our proposal in Appendix C.

**PRELIMINARY  
GEOENVIRONMENTAL INVESTIGATION  
OF LAND AT  
BARNSELEY ROAD, UPPER CUMBERWORTH**

## **1 INTRODUCTION**

### **1.1 The commission and brief**

- 1.1.1 Lithos Consulting were commissioned by Vivly Living to carry out a Preliminary Geoenvironmental Investigation of land at Barnsley Road, Upper Cumberworth.
- 1.1.2 Correspondence regarding Lithos' appointment, including the brief for this investigation, is included in Appendix C. The agreed scope of works included:
- A site walkover and inspection
  - An assessment of land use history
  - Determination of the site's environmental setting
  - A mining risk assessment in accordance with Mining Remediation Authority<sup>1</sup> guidance.
  - Assessment of anticipated ground conditions, including potential contaminants
  - Assessment of anticipated foundation and engineering issues associated with redevelopment for a residential end-use
  - Provision of recommendations for an appropriate ground investigation
- 1.1.3 This Preliminary Investigation comprises an inspection of historical and geological maps and information provided by the British Geological Survey, the Landmark Information Group, the Mining Remediation Authority, QGIS<sup>2</sup>. In addition, a site inspection has been carried out by Lithos.
- 1.1.4 Primary aims of this investigation were to identify salient geoenvironmental issues affecting the site to enable design and costing of an appropriate intrusive investigation, and to support the submission of a planning application.

### **1.2 The proposed development**

- 1.2.1 It is understood that consideration is being given to redevelopment of the site with 123 two to three storey domestic dwellings, associated gardens, POS and adoptable roads and sewers. A site layout has been provided by Vivly Living (Drawing reference A1073-BOW-A0-ZZ-DR-A-0002 REV P14, dated 21<sup>st</sup> August 2025) which is reproduced as Drawing No. 5368/2 in Appendix B to this report.

### **1.3 Report format and limitations**

- 1.3.1 Standard definitions, procedures and guidance are contained within Appendix A, which includes background, generic information on assessment of the site's environmental setting.
- 1.3.2 General notes and limitations relevant to all Lithos preliminary investigations are described in the Foreword and should be read in conjunction with this report. The text of the report draws specific attention to any modification to these procedures and to any other special techniques employed.

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<sup>1</sup> On 28<sup>th</sup> November 2024, the Coal Authority changed their name to the Mining Remediation Authority.

<sup>2</sup> An Open Source Geographic Information System used by Lithos to access publicly available Government held digital data.

## 2 SITE DESCRIPTION

### 2.1 General

2.1.1 The site's location is shown on Drawing 5368/1 presented in Appendix B to this report. Site details are summarised in the table below.

Detail	Remarks
Location	11 km southeast of Barnsley town centre
NGR	SE 209 085
Area	5.6 ha (13.8 acres)
Known services	Overhead telecoms Overhead electric

### 2.2 Site features

2.2.1 Lithos completed a walkover survey of the site on 11<sup>th</sup> March 2025.

2.2.2 Existing salient features, at the time of the walkover are presented on Drawing 5368/3 in Appendix B to this report, and summarised in the table below.

Feature	Remarks
Current access	Off Barnsley Road
Topography	Slope of 1 in 12 to the northeast (southwest field) Slope of 1 in 14 to the southeast (northeast field)
Approximate areas	800m <sup>2</sup> buildings 700m <sup>2</sup> unmade ground 200m <sup>2</sup> concrete hardstand 54,300m <sup>2</sup> grass
Nature of boundaries	All- wooden post & wire fencing with dilapidated stone walls
Surrounding land uses	North – houses off Carr Hill Road & Barnsley Road East – Barnsley Road & public footpath South – Woodland and public footpath West – house off Park Lane

2.2.3 The site is accessed via Barnsley Road in the northeast via two metal gates. Alternatively, access can be gained through the farmyard off park lane in the southwest.

2.2.4 The site comprises two grassed fields, with a small farmyard (c. 1,900m<sup>2</sup>) in the southwest. The farmyard comprises two 'open' barns and one 'enclosed barn'. The barns comprise block bases with a timber frame and cladding (possible ACM).

2.2.5 The barns contain some farm machinery, however mainly appeared to be empty. The contents of the enclosed barn are unknown.

2.2.6 Concrete hardstand is present to the east of the farmyard, elsewhere the yard is unsurfaced (un-made ground).

2.2.7 Sporadic trees are present in the east and west of site.

2.2.8 The topography of the site is undulating, however, in general falls towards the centre of the site, with the southwestern field sloping 1V in 12H to the northeast and the northeastern field sloping 1V in 14H to the southeast.

2.2.9 A selection of site photographs are included on Drawing 5368/4.

### 3 SITE HISTORY

- 3.1 In order to investigate the development history and previous land uses at the site and immediate surrounding land, site centred extracts from Ordnance Survey (OS) plans dating back to 1851 have been examined. These plans are presented in Appendix D to this report.
- 3.2 The table below provides a summary of the salient points relating to the history of the site with respect to the proposed end use. It is not the intention of this report to describe in detail all the changes that have occurred on or adjacent to the site. Significant former uses/operations are highlighted in **bold** text for ease of reference.

Date	Site	Surrounding land
1851	Open fields Wall? crossing NW-SE through centre of site Cumberworth Lane Head (house) adjacent to southwestern boundary Stephen Wood directly southeast Barnsley Road along northern boundary	Open fields Stephen Wood directly southeast. Barnsley Road along northern Houses & church c.90m north
1893	Cumberworth Lane Head now multiple buildings (farm complex)	Rectory directly east Park Farm 120m east <b>Well</b> 120m north <b>'old quarry'</b> 180m north Graveyard 150m north
1907	Public footpath along eastern boundary	No significant changes
1916	No significant changes	Greenwood Farm 30m east
1948		Houses c.5m west (off Barnsley Road) House c.20m northwest
1959	Building constructed in southwest of site (part of Lane Head) <b>'Issue'</b> in southeastern corner (Issues & sinks)	Houses directly north/northwest
1972	Additional buildings in southwest (Land Head)	Houses constructed north of Barnsley Road.
1994	Buildings in southwest rebuilt with larger footprints	No significant changes

## 4 ENVIRONMENTAL SETTING

### 4.1 General

4.1.1 Notes describing how the site's environmental setting has been assessed are included in Appendix A to this report. Reference has been made to publicly available Government held digital data via QGIS (an Open Source Geographic Information System). The responses received from the Environment Agency, the Mining Remediation Authority, the BGS and extracts from the Landmark Report are presented in Appendix E.

Issue	Data reviewed	Remarks
Geology	1:50,000 BGS map (Sheet 86) 1:10,000 BGS map (Sheet SE20NW)	Made ground – None anticipated. Drift soils – None recorded. Solid (bedrock) – Grenoside Sandstone. Shallowest coal seam – Upper Band Coal at c. 100m depth. Strata Dip – 5 degrees east. Faults – Holme Fault beneath Barnsley Road (adjacent to northern boundary), dipping northeast.
Mining	Mining Remediation Authority BGS maps	This site is located within a Coal Mining Development Low Risk Area, however an area of high risk lies directly north of site. Past and present workings – None recorded. Opencast – Nearest is Bromley Farm Quarry c. 170m northeast. Mine entries – None recorded within 100m of site boundary. Further details in Section 4.2 below.
Quarrying	Historical OS plans	Bromley Farm Quarry (opencast) c.170m northeast. Now backfilled (See Section 4.4)
Radon	Public Health England	The site lies in an area where 1-3% of homes are estimated to be above the radon action level.
Hydrogeology	Environment Agency electronic open data via QGIS	Source Protection Zone? None. Aquifer - Secondary A Aquifer (Solid). Groundwater abstractions? Yorkshire Water abstraction (water undertaking) from Coal Measures bedrock 258m southeast. 682m <sup>3</sup> daily abstraction rate. Licence revoked. Soil leaching potential - High. Pollution incidents? None of significance to site.
Hydrology	Defra Catchment data explorer Envirocheck/ EnviroInsight Report	Nearest watercourse(s) – Park Dike c. 30m south. Part of the Dearne from Source to Bentley Brook Water Body. Water quality – ecologically moderate, chemically failing. Pollution incidents? Nearest is 292m southwest. Unknown sewage into stream/river in September 1992. Category 2 significant incident. Abstractions? None of significance to site. Discharge consents? Nearest is Kitson Quarry site drainage onto land adjacent to the quarry, located 575m east. Consent revoked in 2014.
Flood risk	Environment Agency electronic open data via QGIS	The site lies in Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low. In accordance with Chapter 14 of the National Planning Policy Framework, a site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency).
UXO	Zetica website	Low Risk

## 4.2 Coal & mining

- 4.2.1 In July 2011 the Mining Remediation Authority (MRA) formalised their requirements in relation to planning applications and introduced some new terminology relating to coal mining development areas. This Section provides the necessary mining risk assessment required by the proposed planning application.
- 4.2.2 It should be noted that seam outcrops plotted on geological maps have been known to be inaccurate by distances in excess of 100m.
- 4.2.3 The site lies within a Low Risk Area - within the defined coalfield, but no known defined risks have been recorded by the CA; there may still be unrecorded issues.
- 4.2.4 A MRA mining report states that:
- There is no past underground mining recorded beneath the site
  - There are no probable unrecorded shallow workings beneath the site
  - There are no spine roadways recorded at shallow depth
  - There are no geological faults, fissures and breaklines recorded
  - There is a former opencast mine recorded within 500m of the enquiry boundary
  - The Coal Authority has not received a damage notice or claim for the subject property within 50m of the enquiry boundary, since 31st October 1994.
  - There are no incidences of mines gas recorded within 500m of the enquiry boundary
- 4.2.5 The mining reports suggests there are no known shallow workings (i.e. at less than 30m depth). However, it should be noted that it did not become a statutory requirement to maintain and preserve plans of abandoned mines until the Mine (Coal) Regulations Act of 1872 and consequently there may be mineworkings beneath the site for which the Mining Remediation Authority have no records.
- 4.2.6 Geological maps and BGS Technical Report the Upper Band Coal Seam underlies the site at c.100m depth. No shallow coal seams are anticipated.
- 4.2.7 Whilst the site lies within a Coal Mining Development Low Risk Area, an area of High Risk lies directly north. This is likely due to the presence of the Holme Fault located c.10m north of site. The Holme Fault trends roughly NW-SE and has a recorded displacement of 100m. The Cumberworth Thin Coal and Whinmoor Coal have been uplifted within this fault-block and are shown to have been worked by opencast methods c.170m northeast of site (Bromley Farm Quarry).
- 4.2.8 Given the presence of a named fault which has recorded displacements and dip direction on geological maps (indicating the location of the fault is reasonably accurate), it is unlikely that the mineworkings and associated area of high risk to the north of the site pose a risk to surface stability on site.

## 4.3 Mineral safeguarded areas

- 4.3.1 The site is underlain by **sandstone** and might therefore be considered by the Local Authority to lie within a Mineral Safeguarding Area (MSA).
- 4.3.2 MSAs are areas of known mineral resources that are of sufficient economic or conservation value to warrant protection for generations to come. The purpose of MSAs is not to preclude automatically other forms of development, but to make sure that mineral resources are adequately and effectively considered in land-use planning decisions.
- 4.3.3 Specialist guidance on Mineral Safeguarding "A Guide to Mineral Safeguarding in England" has been produced by The Mining Remediation Authority and the British Geological Survey.

4.3.4 Chapter 17 of the National Planning Policy Framework (NPPF) requires Local Authorities to facilitate the sustainable use of minerals, and planning policies should:

- Safeguard mineral resources by defining Mineral Safeguarding Areas and Mineral Consultation Areas; and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked).
- Set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible, if it is necessary for non-mineral development to take place.

4.3.5 NPPF Chapter 17 notes that when determining planning applications, local planning authorities should give great weight to the benefits of the mineral extraction.

4.3.6 Surface extraction of sandstone here is considered **highly unlikely** to be viable based on the size of the site, and its proximity to adjacent residential properties. Prior extraction of minerals would have the potential to cause unacceptable impacts on neighbouring properties and infrastructure, including noise, air quality, traffic impacts and land stability.

## 4.4 Landfills

4.4.1 Known or suspected areas of landfill in the vicinity of the proposed development site are summarised below:

Location	NGR (proximity to site)	Remarks	Source of data
Bromley Farm Quarry	SE 21338 08492 (171m east)	Licence held by W W M Hepworth Landfill Ltd between 1982 and 1990 & West Yorkshire Waste Management Ltd (unknown dates). Deposited waste included inert, industrial, commercial and household waste. Ref. EAHL30216 Gas and leachate control in place	Envirocheck Report EA electronic open data via QGIS
		EAHL30239 Licence held by West Yorkshire Waste Management Ltd (unknown dates). Deposited waste included inert, industrial, commercial and household waste. Ref. EAHL30239 No gas or leachate control recorded.	

4.4.2 Given the proximity of the landfill to site, and the types of waste accepted, the site may be at risk from migrating hazardous ground gas generated from the two adjacent landfill cells. However, it should be noted that there is a named geological fault (Holme Fault) between the landfills and the site, and therefore, this may provide a preferential pathway for the gas, thereby reducing the risk.

## 4.5 Hazardous gas

### Methane & carbon dioxide

4.5.1 The site might be affected by sources of hazardous gas generation as it is:

- Located within 250m of known former landfill sites

4.5.2 Consequently, monitoring is recommended in order to determine appropriate gas protection measures for the proposed dwellings.

## Radon

- 4.5.3 Requirements with respect to radon measures are set out in Building Regulations Approved Document C. Probability bandings (based on the proportion of properties in a given area that exceed the Action Level; currently 200 Bq.m<sup>-3</sup>) are used to determine whether a property requires no, basic or full measures.
- 4.5.4 At present Approved Document C advocates basic measures for the probability banding 3% to 10% (full measures if >10%). However, the UK Health Security Agency (HSA) would like to see all new build include basic measures.
- 4.5.5 In December 2022, the British Geological Survey (BGS), deployed a revised dataset which increased accuracy and also the number of properties falling within radon affected areas. This revised dataset is now referenced by maps on the HSA website.
- 4.5.6 Information from the HSA website indicates that the east of the site lies in an area where **less than 1%** of homes are estimated to be above the action level. However, the west of the site is in an area where **1% to 3%** of homes are estimated to be above the action level.
- 4.5.7 Consequently, basic radon protection measures are not required. However, in light of HSA advice, the Developer might consider providing all new dwellings with basic radon protection measures.

## 4.6 Agriculture

- 4.6.1 Historical plans show that the site has been occupied by arable farmland. Generally farming is not considered likely to have caused significant ground contamination. However, activities such as slurry spreading, the discharge of chemicals to ground, and unregulated burial are known to have occurred on farmland. Potential contaminants associated with farming activity could include any of the following.

Agricultural activity	Potential contaminant
Sewage farming, slurry spreading	Methane, metals, nitrates, oxygen depletion
Tracks (if built up with crushed demolition rubble etc)	Metals, asbestos, hydrocarbons
Plant & animal protection	Pesticides & herbicides
Soil conditioners	Metals, sulphates, PAH
Fuel storage	Hydrocarbons, methane, oxygen depletion
Equipment maintenance	Hydrocarbons, metals
Derelict buildings	Asbestos
Naturally occurring contaminants	Arsenic, metals

- 4.6.2 Whilst it is likely that pesticides have been applied during arable use of the land, these are not likely to include the persistent organochloride pesticides such as Dieldrin, Aldrin, DDT etc. Pesticides routinely used on arable crops the UK (Phenoxy Acetic acid herbicide or PAAH) rapidly degrade in soils or leach via rainwater infiltration to groundwater. It is highly unlikely these would be detected by soil sampling and therefore it is not proposed to undertake analysis of these.
- 4.6.3 The generation of ground gas in quantities with the potential to impact upon the proposed development would only occur with the presence of significant quantities of organic matter. Ground gas monitoring is not considered necessary unless significant quantities of organic matter are identified during the ground investigation.

## 5 PRELIMINARY CONCEPTUAL SITE MODEL

### 5.1 Potential contaminants

- 5.1.1 No potentially contaminative industrial land uses have been identified. The site is essentially greenfield, although farming activities, and made ground associated with the farmyard, may have given rise to some (likely minor) contamination.
- 5.1.2 A preliminary conceptual site model, presented as Drawing 5368/5 in Appendix B, has been prepared after consideration of all the data presented in Sections 2 to 4 inclusive of this report.
- 5.1.3 Potential contaminant linkages are shown on the preliminary conceptual site model.
- 5.1.4 The most significant potential contaminant **pathways** include:
- Ingestion
  - Dermal contact
  - Inhalation of contaminated particulates
  - Surface water run-off, including existing drainage infrastructure
  - Downward infiltration of leachable/mobile contaminants to groundwater
- 5.1.5 The most significant potential contaminant **receptors** include:
- The environment – Secondary A aquifer and/or Park Dike (watercourse), 30m south.
  - End users of the site (residents)
- 5.1.6 Clearly, the conceptual model will be subject to modification in light of data arising from the proposed intrusive ground investigation.

### 5.2 Anticipated ground conditions & potential issues

- 5.2.1 Based on the data reviewed in Section 4 (Environmental Setting), anticipated ground conditions are expected to comprise:

Anticipated condition	Remarks
Made ground	Localised made ground within area of farmyard.
Natural soils	Residual soils (gravelly Clay/ clayey Gravel).
Bedrock	Sandstone bedrock anticipated at shallow depth (c. 1-2m).
Mineworkings	None.
Groundwater	Perched water possible in residual soils.

- 5.2.2 Based on the data above and that in Sections 2 (Site Description) and 3 (History), potential ground-related issues associated with this site are likely to include:

Type of issue	Specific issue	Remarks
Potential on-site contamination sources	<ol style="list-style-type: none"> <li>1. Reworked topsoil (inorganics, organics)</li> <li>2. Farmyard buildings</li> <li>3. Farmyard use (Fuel/machinery maintenance/material storage etc)</li> </ol>	<ol style="list-style-type: none"> <li>1. Associated with farming</li> <li>2. Asbestos &amp; \or ACMs</li> <li>3. Hydrocarbons, solvents etc</li> </ol>
Potential off-site contamination sources	<ol style="list-style-type: none"> <li>1. Landfill</li> </ol>	<ol style="list-style-type: none"> <li>1. Migrating hazardous ground gas</li> </ol>
Potential geotechnical hazards	<ol style="list-style-type: none"> <li>1. Relict buried obstructions</li> </ol>	<ol style="list-style-type: none"> <li>1. Possible within farmyard</li> </ol>

Type of issue	Specific issue	Remarks
Other potential constraints	1. Topography	1. Site slopes to the centre and will require a regrade to create level development platforms.

## 6 LAND CONTAMINATION – PART IIA & PLANNING

6.1 Local Authorities have responsibilities with respect to land contamination in the context both of Part IIA of the Environmental Protection Act 1990, and Planning.

6.2 The contaminated land regime in Part IIA was introduced specifically to address the historical legacy of land contamination. It applies where there is unacceptable risk, assessed on the basis of the **current** use and the relevant circumstances of the land. It is not directed to assessing risks in relation to a future use of the land that would require a specific grant of planning permission. This is primarily a task for the planning system, which aims to control development and land use in the **future**.

### Planning

6.3 The National Planning Policy Framework (NPPF), supported by web-based planning practice guidance, includes the following with respect to contamination and site investigation:

*“Where a site is affected by contamination or land stability issues, responsibility for securing safe development rests with the developer and/or landowner”.*

6.4 Planning policies and decisions should ensure that:

- The site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses, and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation
- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the environmental protection act 1990
- Adequate site investigation information, prepared by a competent person, is presented'

6.5 Annex 2 of the NPPF states that 'all investigations of land potentially affected by contamination should be carried out in accordance with established procedures (such as BS10175<sup>3</sup>)'.

### This site

6.6 The underlying Grenoside Sandstone is classified as a Secondary A aquifer. The nearest surface watercourse is the River Park Dike, which flows in a western direction, approximately 30m beyond the site's southern boundary. Therefore, the site's environmental setting is considered to be of moderate sensitivity.

6.7 With respect to human health, the proposed end use (residential) is also sensitive.

6.8 However, it is considered that the site should be suitable for the proposed use subject to implementation of appropriate preparatory works.

<sup>3</sup> BS10175 (2011) - Code of practice for the investigation of potentially contaminated sites

## 7 GROUND INVESTIGATION DESIGN

### 7.1 Ground investigation design & strategy

7.1.1 The preliminary conceptual site model has been used as a basis for design of an appropriate ground investigation, the scope of which is summarised below.

Exploratory holes	Purpose
Approx. 30 Trial Pits	To determine the nature, distribution and thickness of shallow natural soils, including suitability of the ground for founding structures and highways. To determine the general nature of localised areas of made ground soils, including the: <ul style="list-style-type: none"> <li>• Nature, distribution and thickness</li> <li>• Nature, degree and extent of any contamination</li> </ul> proportion of undesirable elements e.g. biodegradable matter, foundations etc
Including 5 trial pits	To determine whether soakaways could be utilised for storm water drainage
5 dynamic sampling (mini boreholes)	Within the farmyard (to reduce disturbance) to enable: <ul style="list-style-type: none"> <li>• Inspection of concrete slabs via c. 450mm diameter cored holes</li> <li>• Nature of localised made ground and natural soils</li> </ul>
10 Boreholes	To install monitoring wells across the site in order to: <ul style="list-style-type: none"> <li>• Monitor for hazardous gas</li> <li>• Determine groundwater levels and assess flow direction</li> </ul>

7.1.2 Proposed exploratory hole locations should be selected to provide a representative view of the strata beneath the site and to target potential areas of interest identified in Section 5.2 above. A nominal 40m grid spacing should be appropriate, with additional exploratory locations scheduled as necessary in light of the ground conditions actually encountered.

7.1.3 If ground investigation is not undertaken during drier summer months, it may be necessary to use a tracked excavator.

7.1.4 Representative soil samples of natural and any man-made ground should be taken during the works. The number of soil samples taken should be reflective of the geological complexity actually encountered, but in general about 3 samples should be taken from most exploratory holes.

7.1.5 The investigation should be undertaken in general accordance with:

- BS5930:2015 "Code of practice for site investigation"
- BS10175:2017 "Code of practice for the investigation of potentially contaminated sites"
- "Technical Aspects of Site Investigation" – EA R&D Technical Report P5-065/TR (2000)
- "Development of appropriate soil sampling strategies for land contamination" – EA R&D Technical Report P5-066/TR (2001)

7.1.6 **Trial pitting** will enable determination of:

- Nature, distribution and thickness of shallow soils
- Nature of any made ground (uppermost 3m to 4m), including:
  - visual/olfactory evidence of potential contamination and the proportion of undesirable elements e.g. biodegradable matter, relict foundations etc
  - the proportion of "oversize", boulder-sized material
- Suitability of the ground for soakaways
- Suitability of the ground for founding structures and highways

- 7.1.7 The mechanical excavator should be equipped with a breaker to enable excavation in bedrock for soakaway tests.
- 7.1.8 The in-situ shear strengths of any cohesive soils encountered should be determined by use of a hand-held shear vane.
- 7.1.9 Soakaway testing in 5 pits (ideally with a triple fill, but possibly only 1 or 2 fills) would provide an 'initial sweep' at relatively wide spacings. It should be noted that if the initial soakaway tests yield satisfactory results, in order to obtain approvals from the LLFA, Highways etc, the drainage designer is likely to require further testing: (a) within 25m of proposed chamber locations; and (b) to include 3 fills.
- 7.1.10 Access constraints within the farmyard area it may necessitate the use of **dynamic sampling** techniques (mini-boreholes). It should be noted that window sampling allows only a limited inspection of the ground (cf. trial pitting). Consequently, some uncertainties may remain and a supplementary, post-demolition ground investigation may be required.
- 7.1.11 **Mini-boreholes** will:
- Enable inspection of concrete slabs (thickness & any reinforcement) and underlying sub-base (especially with respect to fragments of ACM). A concrete corer can be used to cut a neat hole.
  - Allow investigation within buildings (including those still in use) and in areas of limited headroom.
  - Minimise disturbance of the surface (a 150mm diameter tarmac/concrete core can be lifted and put to one side), allowing subsequent reinstatement.
- 7.1.12 Routine **geotechnical soils analysis** (moisture content, Atterberg limits, pH, water soluble sulphate) should be scheduled on about 12 samples.
- 7.1.13 The site has not been the subject of a past potentially contaminative industrial land use. However, historical mapping suggests arable farming has been carried out on the site. Sampling of the **topsoil** should be undertaken to confirm its suitability for re-use. At least 12 samples should be taken with analysis to include pH, metals, TOC, speciated PAH and asbestos ID.
- 7.1.14 Appropriate chemical analyses of **made ground** samples recovered from the farmyard area should be allowed for. This is likely to comprise 6 samples for a suite including heavy metals, asbestos ID, TOC, banded TPH (with supplementary speciation where appropriate), and speciated PAH.
- 7.1.15 It would also be prudent to analyse about 3 topsoil samples to check compliance with BS3882<sup>4</sup> requirements, via testing for visible contaminants, sharps and clay/sand/silt content.
- 7.1.16 Monitoring wells should be installed in about 10 shallower probeholes. The generation potential of potential **gas** sources (off-site historical landfill) is considered likely to be Low. Therefore, in accordance with CIRIA Report C665<sup>5</sup>, it would be prudent to initially allow for 9 visits over a 6-month period. A hazardous gas risk assessment should be issued on completion of monitoring.
- 7.1.17 On completion of the fieldwork and laboratory testing a comprehensive bound, factual and interpretative report should be issued. This should contain detailed engineering records, laboratory test results, copies of all relevant correspondence and drawings of the site. The report should also include qualitative risk assessment with respect to both controlled waters and human health.

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<sup>4</sup> BS3882:2015. *Specification for topsoil*. Published by BSI Standards Limited.

<sup>5</sup> CIRIA C665: *Assessing risks posed by hazardous ground gases to buildings (2007)*.

## **8 CONCLUSIONS & RECOMMENDATIONS**

### **8.1 General**

- 8.1.1 The site comprises c. 5.6 hectares of land located off Barnsley Road, Upper Cumberworth about 11km southeast of Barnsley town centre. The site has remained undeveloped throughout its history with the exception of the farmyard (c.1,800m<sup>2</sup>) in the west of site.
- 8.1.2 It is understood that Vivly are considering acquisition of the site with a view to redevelopment with housing.
- 8.1.3 The main issues considered in this report, and in particular in Sections 3 & 4 are based on a review of historical maps and available geological/environmental data. This report provides an assessment of geoenvironmental issues and implications associated with the proposed residential redevelopment of the site.

### **8.2 Mining and quarrying**

- 8.2.1 This site is underlain at depth by Grenoside Sandstone bedrock, and the shallowest coal seams lies at least 100m below the surface. Whilst the site lies within a Mining Remediation Authority Low Risk area, no significant risks have been identified, and an intrusive mining investigation will not be required.

### **8.3 Hazardous gas**

- 8.3.1 The site is in an area where less than 1% of homes are estimated to be above the radon action level in the east of site and between 1-3% of homes are estimated to be above the radon action level in the west of site. Radon protection is not required, but the Developer might consider providing new dwellings with basic measures in light of UK Health Security Agency advice.
- 8.3.2 A historical landfill is present c.170m northeast of site. Consequently, the site is considered to be at potential risk from migrating landfill gas. As such, wells should be installed in boreholes to allow subsequent monitoring for hazardous gas in order to determine appropriate gas protection measures for the proposed dwellings.

### **8.4 Foundations**

- 8.4.1 At present, no geotechnical ground investigation data is available and consequently it is only possible to estimate the ground conditions. Before firm foundation recommendations can be given, it will be necessary to undertake an appropriate ground investigation. However, tentative recommendations are provided below.
- 8.4.2 Made ground is not generally considered a suitable founding material and foundations should be taken through it, into underlying natural in-situ strata of adequate bearing capacity.
- 8.4.3 All concrete slabs and service ducts will require breaking out during the demolition of existing buildings. Foundations of plots that conflict with relict foundations should be taken to greater depth than the relict foundations and into natural ground of adequate bearing capacity.
- 8.4.4 The published geological data suggests that the site is underlain by Grenoside Sandstone at shallow depth. No drift deposits are recorded, however, residual soils (heavily weathered bedrock) are likely to be present.

8.4.5 Residual soils of medium strength should provide sufficient bearing capacity to enable the adoption of strip footings for two storey housing. Reinforcement, as a precaution against differential settlement, is recommended only where foundation excavations encounter significant lateral and vertical variations in strata.

8.4.6 If rock is encountered at shallow depth, foundations should be placed entirely on rock and not partially on rock and partially on residual soil. This may, depending on surface gradient, necessitate significant over deepening of foundations.

## 8.5 Highways and external works

8.5.1 The site slopes towards the centre, with gentle slopes of between 1v in 12h and 1v in 14h. There is likely to be a requirement for a site regrade to create level development platforms.

8.5.2 Natural soils should yield a CBR of at least 3%. This value should be verified prior to or during construction.

## 8.6 Soakaways & drainage

8.6.1 Given anticipated ground conditions, soakaways may provide a viable solution for the disposal of surface water, subject to testing.

8.6.2 Alternative SuDS options (see CIRIA C753<sup>6</sup> for further details) include:

- Pervious Pavements – provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate into subsurface storage, with subsequent infiltration or controlled discharge. Pavement could be porous (water able to infiltrate across entire surface material; e.g. reinforced grass), or permeable (water infiltrates via joints between concrete blocks).
- Swales – linear grassed features in which surface water can be stored or conveyed. Where suitable, swales can be designed to allow infiltration.
- Basins - a ground depression designed to store surface water that is normally dry, except during and immediately following a rainfall event. There are two types:
  - Infiltration – basin designed to store runoff and infiltrate it gradually into the ground.
  - Detention – an outlet restricts flows, so that the basin fills and provides attenuation.
- Ponds – designed to have permanent pool of water, but with capacity to provide temporary storage-controlled discharge.

8.6.3 Yorkshire Water have published a guide<sup>7</sup> for developers and designers outlining their design requirements for surface water attenuation assets. However, further to changes in drainage policy over recent years, independent water authorities (including IWNL, ICOSA, LEEF etc) now adopt more housing schemes than the traditional authorities such as Yorkshire Water. Consequently, CIRIA C753 has become the more commonly used guidance for the design of SuDS features (including attenuation assets).

8.6.4 With respect to detention basins and soakaway tanks, whilst CIRIA C753 does not include explicit guidance on the frequency\duration of groundwater monitoring, it is generally accepted that water table levels should be taken from borehole monitoring wells over 4 consecutive seasons, for at least 3 points in the basin\tank area.

## 8.7 Contamination

8.7.1 The site's environmental setting is considered to be of moderate sensitivity. With respect to human health, the proposed end use (residential) is also sensitive.

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<sup>6</sup> CIRIA C753 (2015) – The SuDS Manual.

<sup>7</sup> Design Requirements for Surface Water Attenuation Assets, February 2017.

8.7.2 No potentially contaminative industrial land uses have been identified. However, arable farming has historically been carried out. The farming activities and made ground associated with the farmyard may have given rise to some (likely minor) contamination.

8.7.3 Consequently, a ground investigation is required in order to assess the degree and extent of any ground contamination, and enable the preparation of a Remediation Strategy.

## **8.8 Potential development constraints**

8.8.1 Given existing topography (much of the site is sloping, with gradients of between 1v in 12h and 1v in 14h), some site regrade is anticipated, with the need for underbuild and retaining walls.

## **8.9 Further investigation**

8.9.1 Whilst the site is considered suitable for its current and proposed use, the proposed change in use will require intrusive investigation.

8.9.2 This would include:

- Machine-excavated trial pits to determine near surface ground conditions including depth to bedrock, the presence of obstructions, groundwater and stability
- Window sample boreholes within the farmyard to gain investigation data with minimal disturbance and allow investigation within the existing barns.
- Probeholes to allow the installation of monitoring wells
- Geotechnical soils analysis to enable foundation recommendations
- Chemical testing on soil samples to assess the significance of contamination, if any
- Gas monitoring and risk assessment

8.9.3 An appropriate ground investigation strategy is presented in Section 7.

**Appendix A**

**General Notes**

## General

Third party information obtained from the British Geological Survey (BGS), the Coal Authority, the Local Authority etc is presented in the "Search Responses" Appendix of this Geoenvironmental Report.

## Geology, mining & quarrying

In order to establish the geological setting of a site, Lithos refer to BGS maps for the area, and the relevant geological memoir. Further information is sourced by reference to current and historical OS plans.

In July 2011, the Coal Authority (CA) formalised their requirements in relation to planning applications and introduced some new terminology. The CA, using its extensive records has prepared plans for all coalfield Local Planning Authorities, which effectively refines the defined coalfield areas into High Risk and Low Risk areas. **High Risk** areas are likely to be affected by a range of legacy issues that pose a risk to surface stability, including: mine entries; shallow coal workings; workable coal seam outcrops; mines gas; and previous surface mining sites. **Low Risk** areas comprise the remainder of the defined coalfield, and are areas where no known defined risks have been recorded; although there may still be unrecorded issues. Where a site lies within either a High or Low Risk area, a mining report is obtained from the CA.

## Landfills

Reference is made to publicly available Government held digital data via **QGIS** (an Open Source Geographic Information System), data from Landmark or Groundsure, and sometimes the Environment Agency and the Local Authority with respect to known areas of landfilling within 250m of the proposed development site.

Historical OS plans are also inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips etc.

## Radon

Radon is a colourless, odourless gas, which is radioactive. It is formed in strata that contain uranium and radium (most notably granite), and can move through fissures eventually discharging to atmosphere, or the spaces under and within buildings. Where radon occurs in high concentrations, it can pose a risk to health.

In order to assess potential risks associated with radon gas, Lithos refer to BRE Report BR211<sup>1</sup>, and the UK Health Protection Agency (HPA) website. In December 2022, the British Geological Survey (BGS), deployed a revised dataset which increased accuracy and also the number of properties falling within radon affected areas. This revised dataset is now referenced by maps on the HSA website.

Advice on the limitation of exposure of the population to radon in buildings was originally published in 1990 by the National Radiological Protection Board (NRPB), which joined the HPA in 2005; the HPA updated NRPB advice in July 2010<sup>2</sup>.

The HPA recommended that the NRPB radon Action Level for homes be retained, and a new Target Level for radon in homes be introduced. The values of the Action Level and Target Level, expressed as the annual average radon concentration in the home, are 200 Bqm<sup>-3</sup> and 100 Bqm<sup>-3</sup> respectively. The Target Level was to provide an objective for remedial action in existing homes and preventive action in new homes.

The term 'radon Affected Area' is defined as those parts of the country with >1% of homes estimated to be above the Action Levels. The level of protection needed is site-specific and can be determined by reference to this mapping on the Public Health England website, which indicates the highest radon potential within each 1km grid square. Each 1km grid square is classified on the basis of the percentage of existing homes within that grid square estimated to have radon concentrations above the Action Level. There are 6 'bands': <1%; 1 to 3%; 3 to 5%; 5 to 10%; 10 to 30%; and >30%.

The NRPB advised that action should be taken to reduce radon concentrations in existing homes if the radon concentration exceeded the Action Level of 200 Bqm<sup>-3</sup> in room air averaged over a year; ten times the average UK domestic radon concentration. NRPB advice informed changes in the requirements for radon protection in new buildings.

- **Basic** preventive measures are required in new buildings, extensions, conversions and refurbishments if the probability of exceeding the Action Level is **>3%** in England and Wales, and >1% in Scotland and Northern Ireland.
- Provision for further preventive (**Full**) measures is required in new buildings if the probability of exceeding the Action Level is **>10%**.

At present Building Regulations Approved Document C advocates basic measures for the probability banding 3% to 10%, and full measures if >10%. However, HPA would like to see all new build include basic measures.

Action & Target Levels should also be applied to non-domestic buildings with public occupancy exceeding 2,000 hrs/yr and to all schools.

## Hydrogeology

Reference is made to publicly available Government held digital data via QGIS, and Landmark or Groundsure with respect to:

- Groundwater quality
- Recorded pollution incidents
- Licensed groundwater abstractions

From April 2010 the EA's Groundwater Protection Policy uses aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply), but also their role in supporting surface water flows and wetland ecosystems. The aquifer designation data is based on geological mapping provided by the British Geological Survey. The maps are split into two different types of aquifer designation:

- Superficial (Drift) - permeable unconsolidated (loose) deposits. For example, sands and gravels
- Bedrock - solid permeable formations e.g. sandstone, chalk and limestone

The maps display the following aquifer designations:

**Principal aquifers:** These are layers of rock or superficial deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

**Secondary aquifers:** These include a wide range of rock layers or superficial deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into three types:

- **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
- **Secondary B** - predominantly lower permeability layers which may store and 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
- Secondary undifferentiated - In most cases, this is because the rock type in question has previously been designated as both a minor and non-aquifer in different locations due to the variable characteristics.

<sup>1</sup> BRE Report BR211, 2023: "Radon: guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects)".

<sup>2</sup> Limitation of Human Exposure to Radon, Documents of the Health Protection Agency - Radiation, Chemical and Environmental Hazards, RCE-15. July 2010.

**Unproductive strata:** These are rock layers or superficial deposits with low permeability that have negligible significance for water supply or river base flow.

The EA maps only display the principal and secondary aquifers as coloured areas. All uncoloured areas on the map will be unproductive strata. However, for uncoloured areas on the superficial (drift) designation map it is not possible to distinguish between areas of unproductive strata and areas where no superficial deposits are present; to do this, it is necessary to consult the published geological survey maps.

For the purposes of the EA's Groundwater Protection Policy the following default position applies, unless there is site specific information to the contrary:

- If no superficial (drift) aquifers are shown, the bedrock designation is adopted
- In areas where the bedrock designation shows unproductive strata (the uncoloured areas) the superficial designation is adopted
- In all other areas, the more sensitive of the two designations is used (e.g. If secondary superficial overlies principal bedrock, an overall designation of principal is assumed)

The EA have also designated groundwater Source Protection Zones, which are based on proximity to a groundwater source (springs, wells and abstraction boreholes). The size of a Source Protection Zone is a function of the aquifer, volume of groundwater abstracted and the effective rainfall, and may vary from tens to several thousand hectares.

### Hydrology

Reference is made to publicly available Government held digital data via QGIS, and Landmark or Groundsure with respect to:

- Surface water quality
- Recorded pollution incidents
- Licensed abstractions (groundwater & surface waters)
- Licensed discharge consents
- Site susceptibility to flooding

The EA have set **water quality** targets for all rivers. These targets are known as River Quality Objectives (RQOs). The water quality classification scheme used to set RQO planning targets is known as the River Ecosystem scheme. The scheme comprises five classes (RE1 to RE5) which reflect the chemical quality requirements of communities of plants and animals occurring in our rivers.

General Quality Assessment (GQA) grades reflect actual water quality. They are based on the most recent analytical testing undertaken by the EA. There are 6 GQA grades (denoted A to F) defined by the concentrations of biochemical oxygen demand, total ammonia and dissolved oxygen.

The susceptibility of a site to **flooding** is assessed by reference to a Flood Map on the Environment Agency's website. These maps show natural floodplains - areas potentially at risk of flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas. There are two different kinds of area shown on the Flood Map:

1. Dark blue areas (Flood Zone 3) could be flooded by the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year, or by a river by a flood that has a 1% (1 in 100) or greater chance of happening each year
2. Light blue areas (Flood Zone 2) show the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Where there is no blue shading (Flood Zone 1), there is less than a 0.1% (1 in 1000) chance of flooding occurring each year.

The maps also show all flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods.

The Agency's assessment of the likelihood of flooding from rivers and the sea at any location is based on the presence and effect of all flood defences, predicted flood levels, and ground levels.

It should also be noted that as the floodplain shown is the 1 in 100 year, areas outside this may be flooded by more extreme floods (e.g. the 1 in 1000 year flood). Also, parts of the areas shown at risk of flooding will be flooded by lesser floods (e.g. the 1 in 5 year flood). In some places due to the shape of the river valley, the smaller floods will flood a very similar extent to larger floods but to a lesser depth.

If a site falls within a floodplain, it is recommended that a flood survey be undertaken by a specialist who can advise on appropriate mitigating measures; i.e. raising slab levels, provision of storage etc. In accordance with Chapter 10 of the National Planning Policy Framework, a site-specific flood risk assessment is required for: proposals of 1 hectare or greater in Flood Zone 1, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and any new development in Flood Zones 2 and 3.

### COMAH & explosive sites

Lithos obtain information from Landmark or Groundsure with respect to Control of Major Accident Hazards (COMAH) or explosive sites within 1km of the proposed development site. Lithos' report refers to any that are present, and recommends that the Client seeks further advice from the HSE.

Areas around COMAH sites (chemical plants etc) are zoned with respect to the implementation of emergency plans. The HSE are a statutory consultee to the local planning authority for all COMAH sites. The COMAH site may have to revise its emergency action plan if development occurs. This might be quite straightforward or could entail significant expenditure. Consequently, the COMAH site may object to a proposed development (although it is the Local Authority who have final say, and they are likely to place more weight on advice from the HSE).

### Preliminary conceptual site model

The site's environmental setting (and proposed end use) is used by Lithos to assess the significance of any contamination encountered during the subsequent ground investigation.

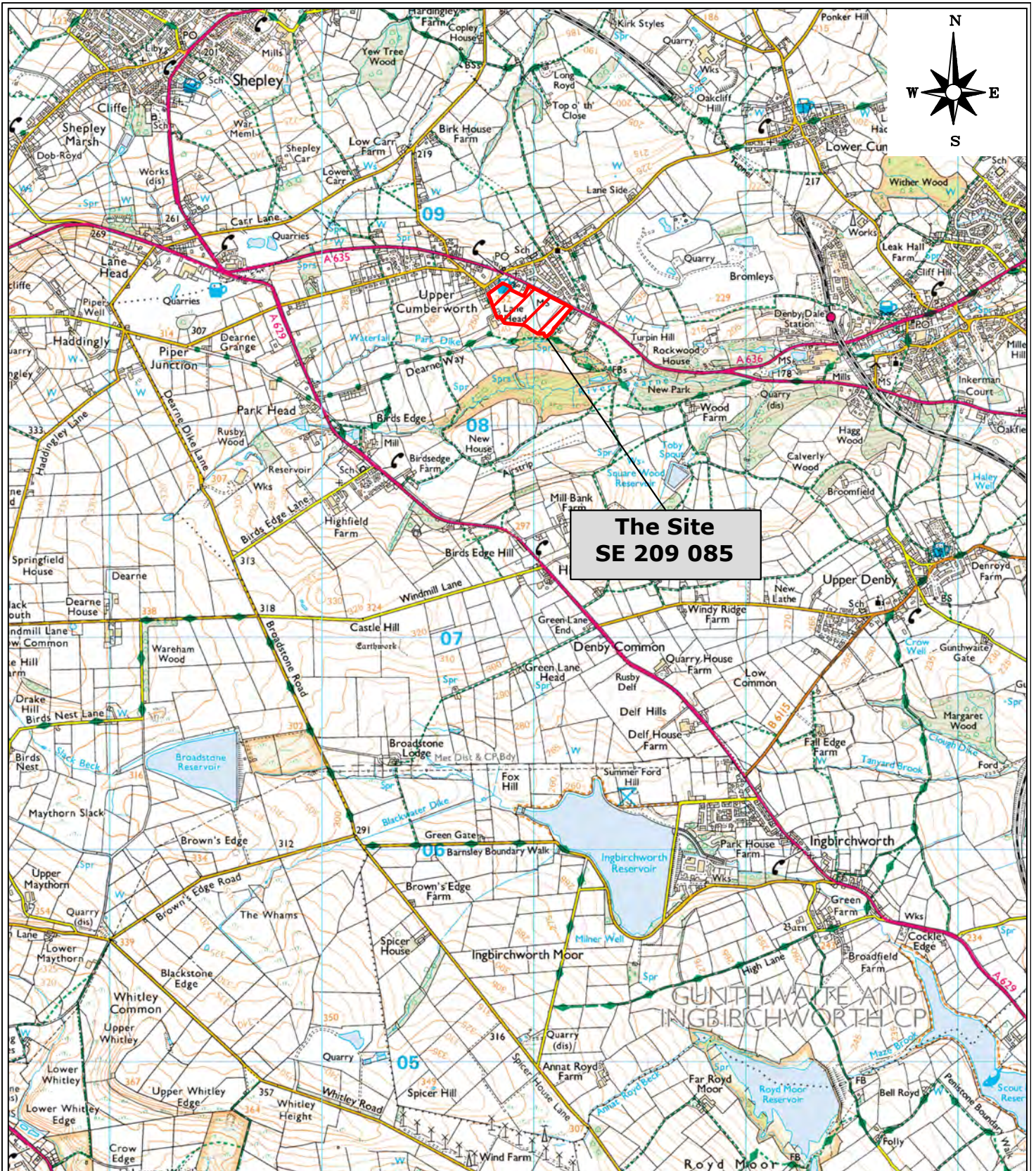
Assessment of contaminated land is based on an evaluation of pollutant linkages (source-pathway-receptor). Contaminants within the near surface strata represent a potential source of pollution. The environment (most notably groundwater), site workers and end users are potential receptors.

Potential pollutant linkages are shown on a preliminary conceptual site model (pCSM). A CSM is essentially a cross-section through a site that reflects both the surface topography and underlying geology, and shows surface features of interest. The most significant sources of contamination are then superimposed onto this cross-section together with potential receptors (human health & controlled waters), and plausible pathways between the two. In addition to environmental issues, the CSM should also highlight geotechnical issues.

A pCSM is prepared after consideration of all available "desk study" data, and before design of the ground investigation. Data reviewed should include historical plans (with superimposition on a current-day plan), previous SI reports, geological maps etc. The pCSM, in conjunction with knowledge of site constraints (buildings, services, slopes etc) is used to design the ground investigation.

The revised CSM takes account of data obtained during the ground investigation, including the distribution of made ground, the nature and distribution of contamination etc.

**Appendix B**  
**Drawings**



**The Site  
SE 209 085**

Reproduced from OS Explorer map 1:25,000 scale by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. Crown copyright. All rights reserved. Licence number 100049696.

info@lithos.co.uk  
www.lithos.co.uk  
Tel 01937 545330

CLIENT  
**VIVLY LIVING**

JOB TITLE  
**BARNSELY ROAD,  
UPPER  
CUMBERWORTH**

DRAWING TITLE  
**SITE LOCATION  
PLAN**

DRAWN <b>CC</b>	DATE 23 04 2025
CHECKED <b>AG</b>	DATE 23 04 2025
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SCALE 1:25,000	SHEET A4
DRAWING NO. 5368/1	REVISION



NOTES

— APPROXIMATE SITE BOUNDARY

REPRODUCED FROM VIVLY LIVING  
DRAWING REFERENCE  
A1073-BOW-A0-ZZ-DR-A-0002 REV P14,  
DATED 20 09 2024, UPDATED 21 08 2025

REV.	DESCRIPTION	DATE



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www.lithos.co.uk  
Tel 01937 545330

CLIENT

VIVLY LIVING

JOB TITLE

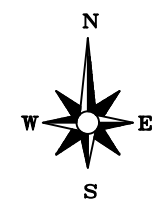
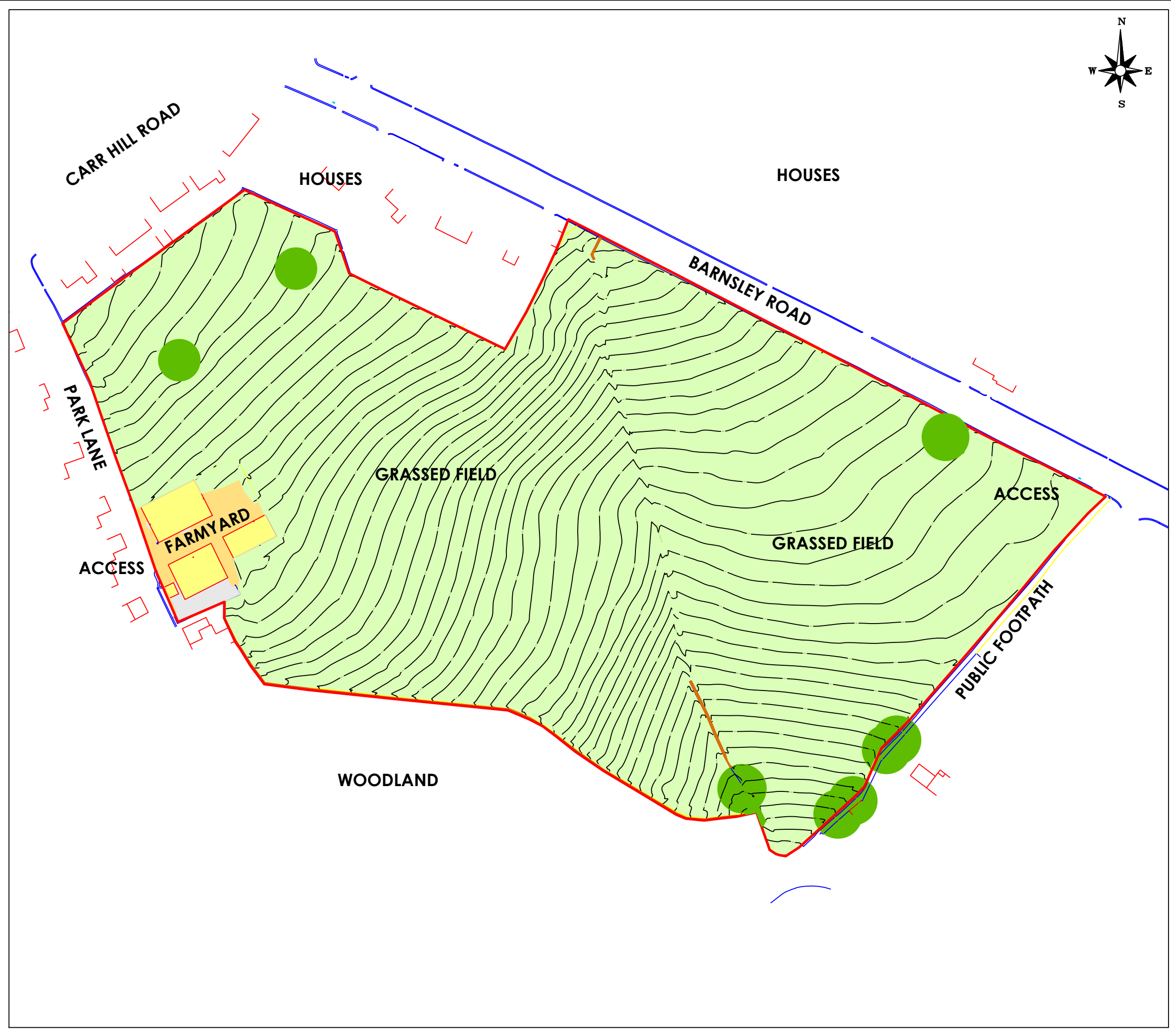
BARNLSLEY ROAD,  
UPPER  
CUMBERWORTH

DRAWING TITLE

PROPOSED SITE LAYOUT

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				REVISION	



NOTES

- GRASS & OVERGROWN AREAS
- BUILDING
- UN-MADE SURFACING
- BUILDING
- WALL
- APPROXIMATE SITE BOUNDARY

REV.	DESCRIPTION	DATE



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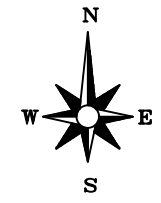
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BARNESLEY ROAD,  
UPPER  
CUMBERWORTH

DRAWING TITLE

SITE FEATURES

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				REVISION	



- NOTES
- GRASS & OVERGROWN AREAS
  - BUILDING
  - UN-MADE SURFACING
  - BUILDING
  - WALL
  - APPROXIMATE SITE BOUNDARY
  - LOCATION & ORIENTATION OF PHOTOGRAPH

REV.	DESCRIPTION	DATE



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JOB TITLE

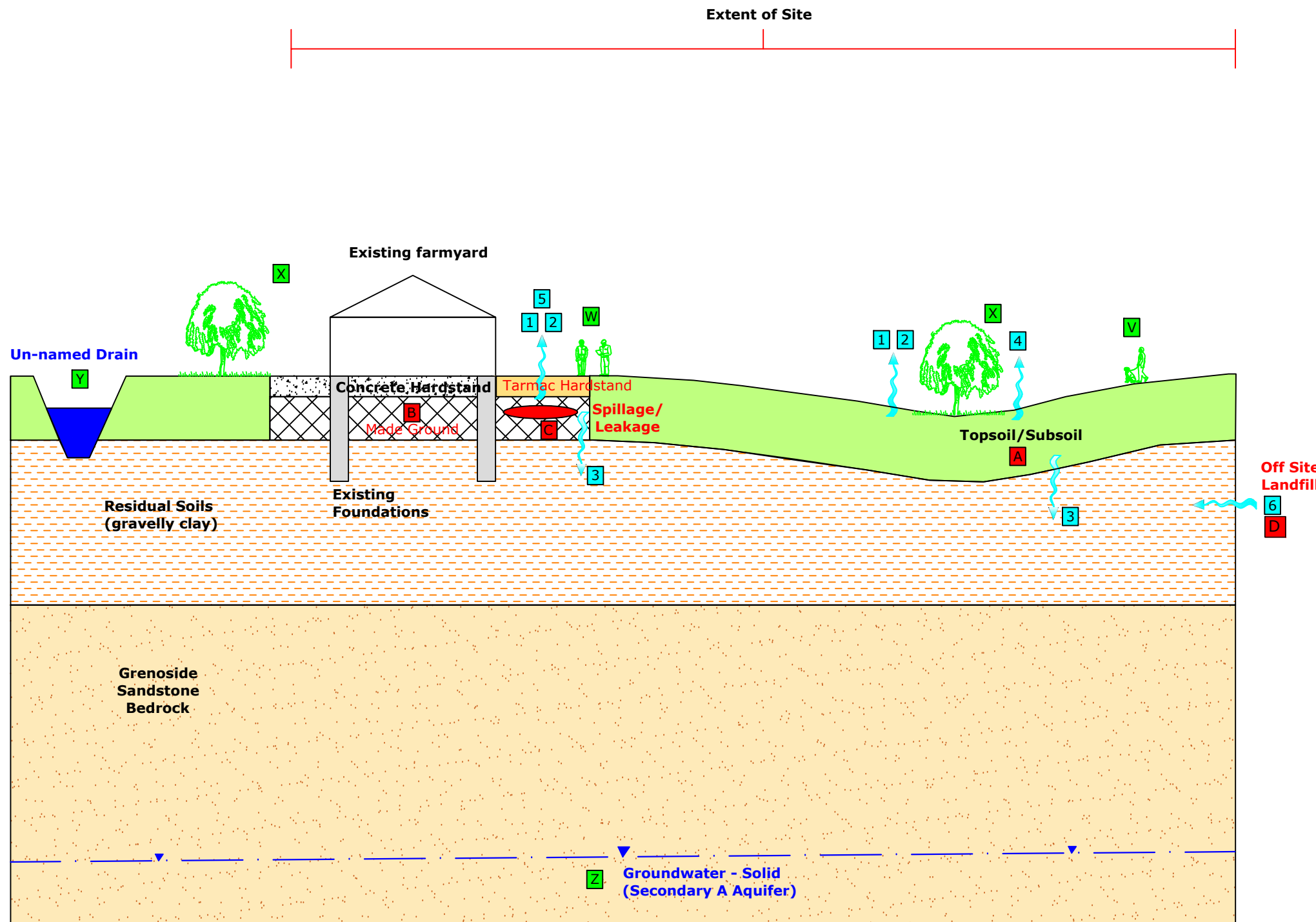
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UPPER  
CUMBERWORTH

DRAWING TITLE

SITE PHOTOGRAPHS

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				DRAFT	<input type="checkbox"/>
				FINAL	<input checked="" type="checkbox"/>

SCALE	SHEET	DRAWING NO.	REVISION
NOT TO SCALE	A3	5368/4	



SOURCES	
<b>A</b>	REWORKED TOPSOIL (INORGANICS)
<b>B</b>	MADE GROUND (INORGANICS)
<b>C</b>	LEAKAGE/SPILLAGE (ORGANICS)
<b>D</b>	OFF SITE LANDFILL (HAZARDOUS GAS)

PATHWAYS	
<b>1</b>	DERMAL CONTACT
<b>2</b>	INGESTION/INHALATION
<b>3</b>	LEACHING OF CONTAMINANTS
<b>4</b>	UPTAKE BY PLANTS
<b>5</b>	VOLATILISATION
<b>6</b>	MIGRATION OF GAS

RECEPTORS	
<b>V</b>	END USERS (RESIDENTS)
<b>W</b>	SITE WORKERS
<b>X</b>	VEGETATION
<b>Y</b>	SURFACE WATERS
<b>Z</b>	GROUNDWATER

NOTES

REV.	DESCRIPTION	DATE



info@lithos.co.uk  
www.lithos.co.uk  
Tel 01937 545330

CLIENT

VIVLY LIVING

JOB TITLE

BARNESLEY ROAD,  
UPPER  
CUMBERWORTH

DRAWING TITLE

PRELIMINARY CONCEPTUAL SITE  
MODEL

DRAWN	CC	DATE	27 06 2025	STATUS	FOR COMMENT <input type="checkbox"/>
CHECKED	AG	DATE	27 06 2025		FOR APPROVAL <input type="checkbox"/>
					DRAFT <input type="checkbox"/>
					FINAL <input checked="" type="checkbox"/>

SCALE	Not to scale	SHEET	A3	DRAWING NO.	5368/5	REVISION	
-------	--------------	-------	----	-------------	--------	----------	--

**Appendix C**  
**Commission**

**From:** [Oliver Bottomley](#)  
**To:** [Adam Gombocz](#); [Chris Sharp](#)  
**Cc:** [Charlotte Copley](#); [Joanne Pearson](#); [Michael Parham](#)  
**Subject:** FW: 5368 - Barnsley Road - Upper Cumberworth  
**Date:** 07 March 2025 10:08:54  
**Attachments:** [image003.png](#)  
[image005.png](#)  
[image006.png](#)  
[002 Let Vivly \(DS Quote\) 07 03 25.pdf](#)

---

Hello Adam

Thank you

I will have a TOPO by the end of W/C 17<sup>TH</sup> March, layout to follow after that.

[@Chris Sharp](#) please place this order for £ for Upper Cumberowrth

Regards



---

**From:** Adam Gombocz <Adam.Gombocz@lithos.co.uk>  
**Sent:** Friday, March 7, 2025 9:37 AM  
**To:** Oliver Bottomley <oliver.bottomley@vivlyliving.com>  
**Cc:** Charlotte Copley <Charlotte.Copley@lithos.co.uk>  
**Subject:** 5368 - Barnsley Road - Upper Cumberworth

Morning Oliver,

DS quote for the above site attached as requested.

Please send across any drawings you may have (topographical survey, layout etc) so we can include within our report.

Is access available for us to undertake a walkover?

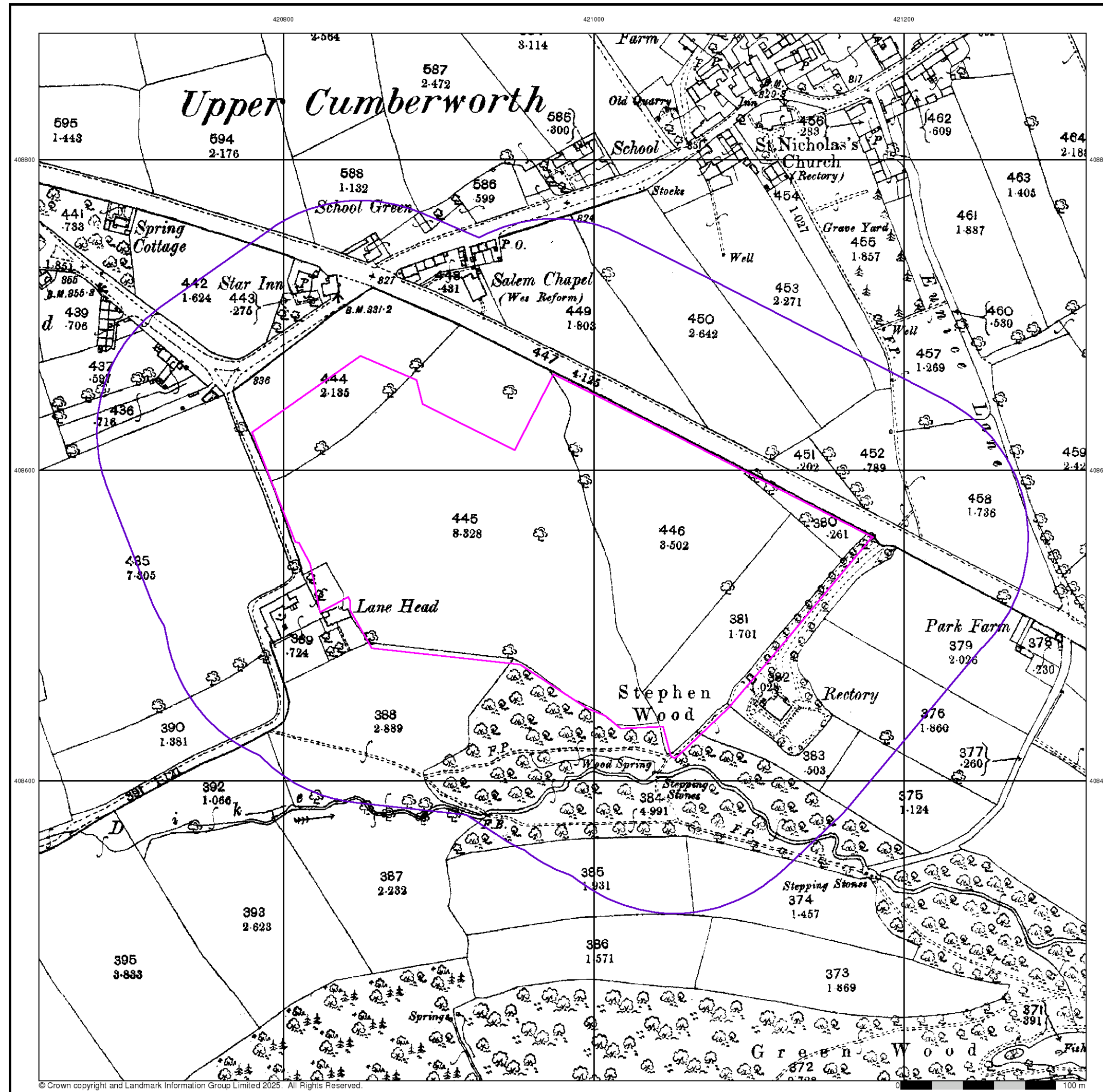
Due to current workloads, I expect to issue the DS report within c. 4 weeks.

Kind regards,

Adam Gombocz  
Director  
Lithos Consulting Ltd  
M 07951 497021  
DD 01937 543353  
[www.lithos.co.uk](http://www.lithos.co.uk)



**Appendix D**  
**Historical OS Plans**



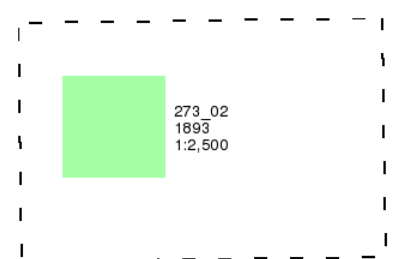
Yorkshire

Published 1893

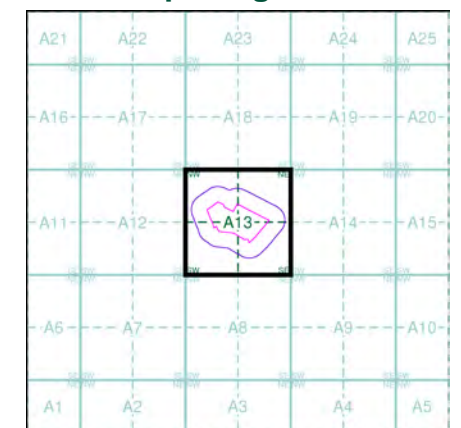
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 371924522\_1\_1  
 Customer Ref: 5368  
 National Grid Reference: 420970, 408560  
 Slice: A  
 Site Area (Ha): 5.67  
 Search Buffer (m): 100

Site Details

Barnsley Road, Upper Cumberworth, Huddersfield, HD8 8NP



Tel: 0844 844 9952  
 Fax: 0844 844 9951  
 Web: www.envirocheck.co.uk



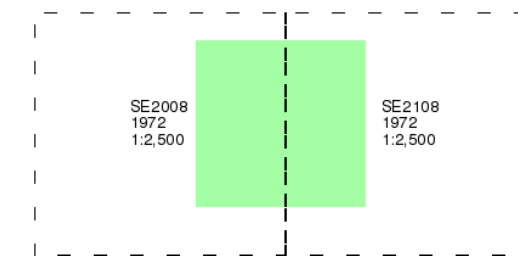
### Ordnance Survey Plan

Published 1972

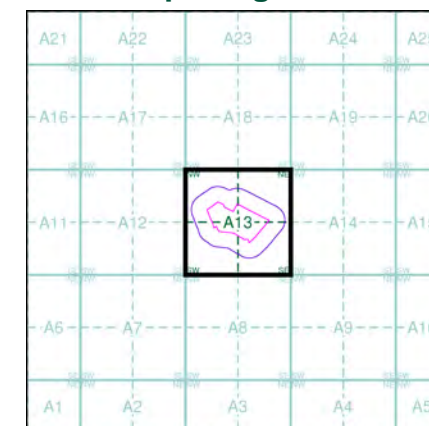
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

### Map Name(s) and Date(s)



### Historical Map - Segment A13



### Order Details

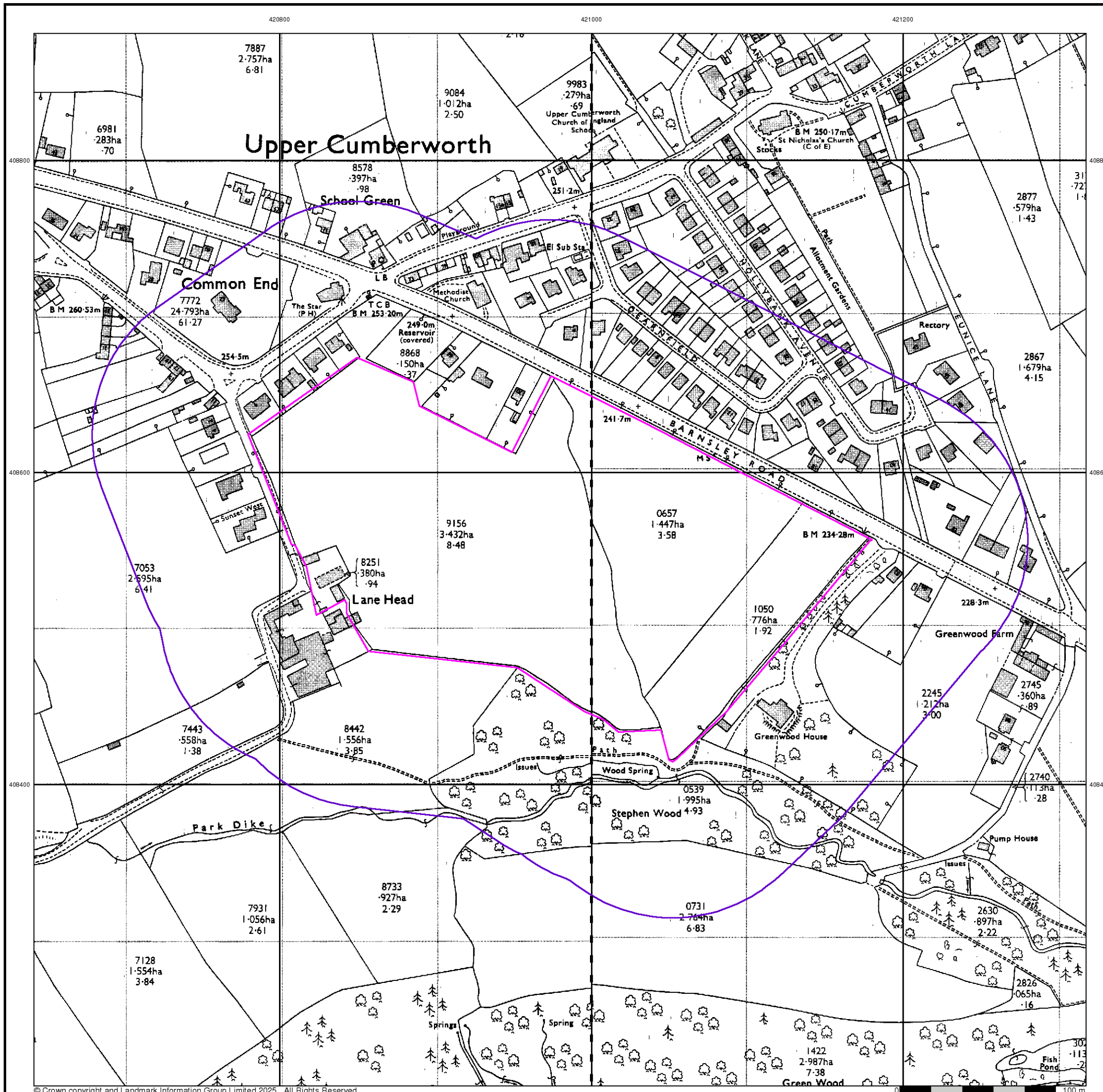
Order Number: 371924522\_1\_1  
Customer Ref: 5368  
National Grid Reference: 420970, 408560  
Slice: A  
Site Area (Ha): 5.67  
Search Buffer (m): 100

### Site Details

Barnsley Road, Upper Cumberworth, Huddersfield, HD8 8NP



Tel: 0844 844 9952  
Fax: 0844 844 9951  
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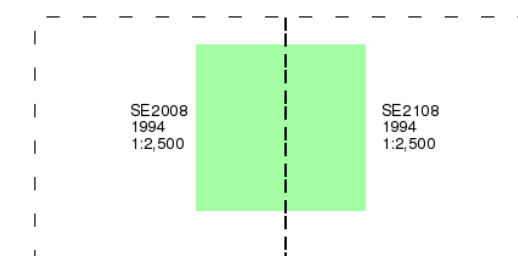
### Large-Scale National Grid Data

Published 1994

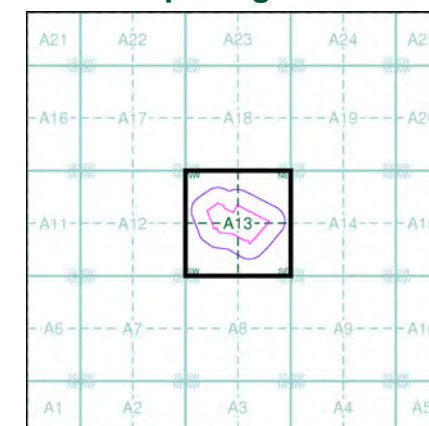
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

### Map Name(s) and Date(s)



### Historical Map - Segment A13



### Order Details

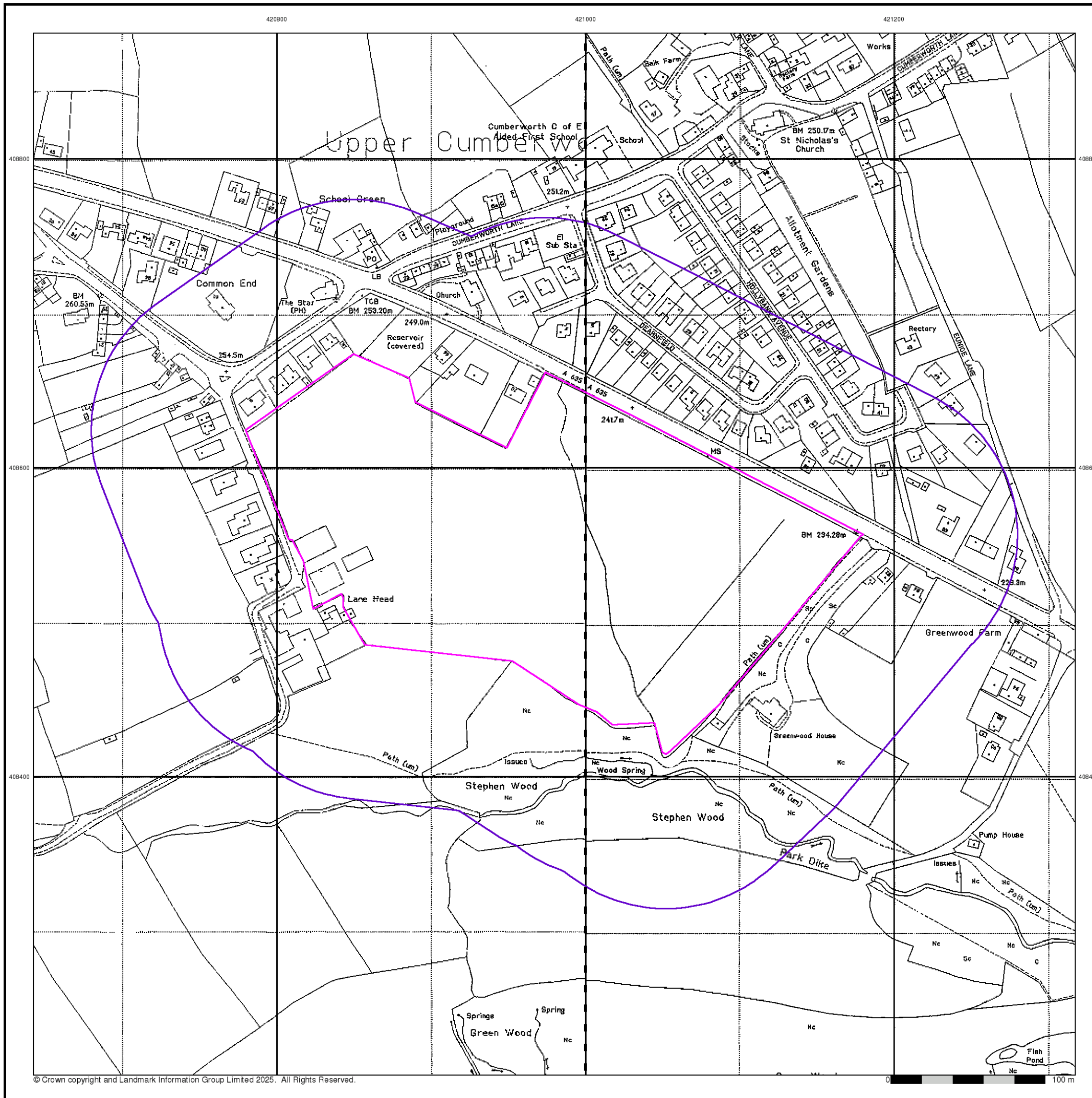
Order Number: 371924522\_1\_1  
Customer Ref: 5368  
National Grid Reference: 420970, 408560  
Slice: A  
Site Area (Ha): 5.67  
Search Buffer (m): 100

### Site Details

Barnsley Road, Upper Cumberworth, Huddersfield, HD8 8NP



Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: www.envirocheck.co.uk



## **Appendix E**

### **Search Responses & other Correspondence**



## Envirocheck<sup>®</sup> Report:

### Datasheet

#### Order Details:

**Order Number:**

371924522\_1\_1

**Customer Reference:**

5368

**National Grid Reference:**

420970, 408560

**Slice:**

A

**Site Area (Ha):**

5.67

**Search Buffer (m):**

1000

#### Site Details:

Barnsley Road  
Upper Cumberworth  
Huddersfield  
HD8 8NP

#### Client Details:

Mr M Perrin  
Lithos Consulting Ltd  
Parkhill  
Walton Road  
Wetherby  
LS22 5DZ

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	42
Hazardous Substances	-
Geological	48
Industrial Land Use	56
Sensitive Land Use	60
Data Currency	61
Data Suppliers	66
Useful Contacts	67

#### Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client. In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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#### Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England. The probability result is only valid for properties above ground. All basement and cellar areas are considered to be at additional risk from high radon levels. If an underground room such as a cellar or basement makes up part of the living or working accommodation, the property should be tested regardless of Radon Affected Area status.

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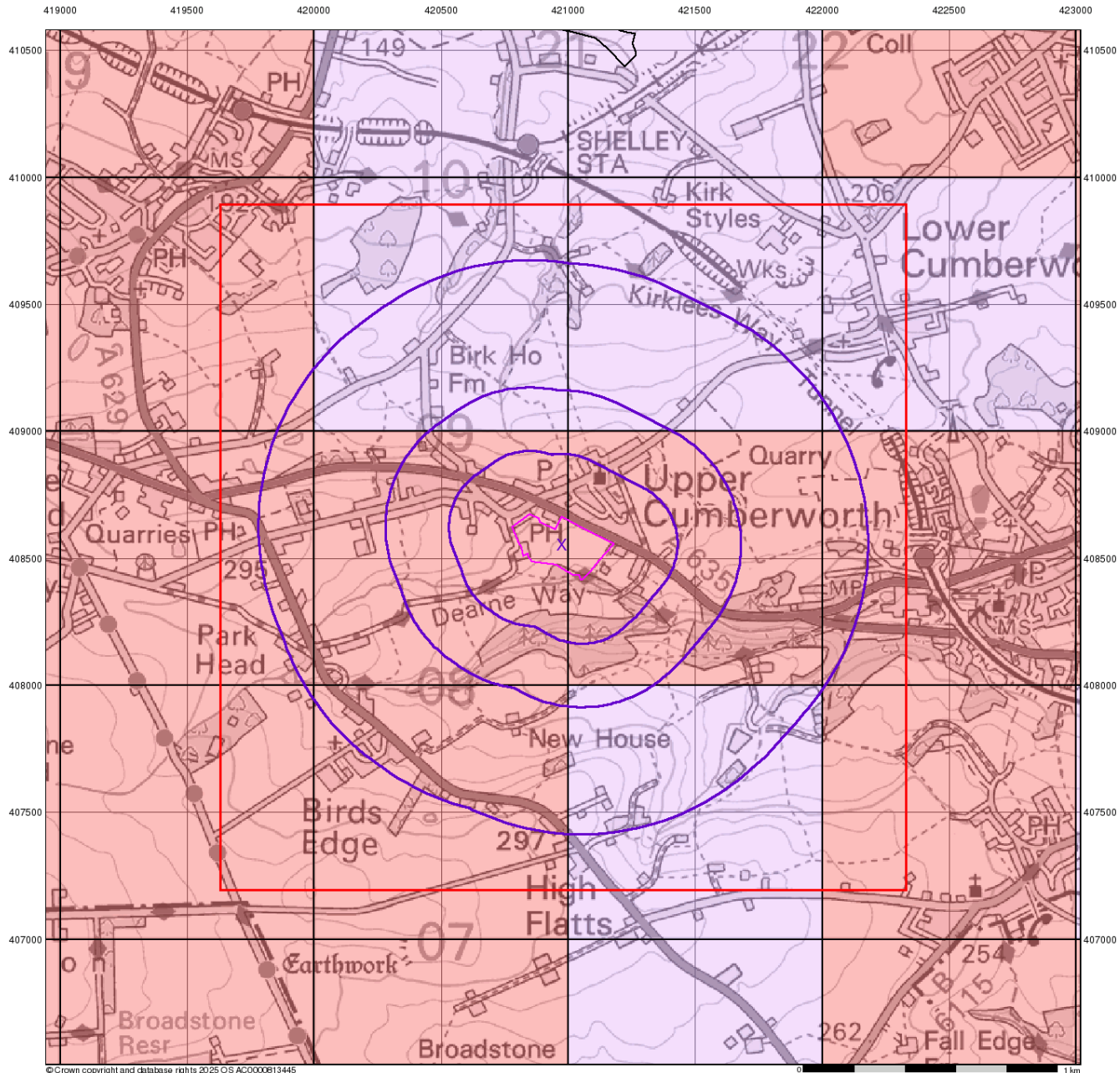
#### Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
<b>Agency &amp; Hydrological</b>					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 3				14
Prosecutions	pg 6				1
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 6			2	1
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 7		Yes		
Pollution Incidents to Controlled Waters	pg 7			2	10
Historical Prosecutions					
Registered Radioactive Substances					
Substantiated Pollution Incident Register	pg 9				7
Water Abstractions	pg 10			2	11 (*35)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 22	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Groundwater Vulnerability - Local Information			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 22	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones	pg 22				2
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 22		17	34	111
Water Framework Directive - Catchment	pg 40	Yes	Yes		
Water Framework Directive - Groundwater	pg 41	Yes	Yes		
Water Framework Directive - Surface Waters					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
<b>Waste</b>					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 42		2		3
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)	pg 43			1	3
Local Authority Landfill Coverage	pg 43	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 43			5	8
Potentially Infilled Land (Water)	pg 44		1	1	5
Registered Landfill Sites	pg 45			1	4
Registered Waste Transfer Sites	pg 47				2
Registered Waste Treatment or Disposal Sites					
<b>Hazardous Substances</b>					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
<b>Geological</b>					
BGS 1:625,000 Solid Geology	pg 48	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 48	Yes			Yes
BGS Recorded Mineral Sites	pg 48		1	9	21
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 53	Yes	n/a	n/a	n/a
Mining Instability	pg 54	Yes	n/a	n/a	n/a
Man-Made Mining Cavities	pg 54			1	1
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 54	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 54	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards				n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 55		Yes	n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
<b>Industrial Land Use</b>					
Contemporary Trade Directory Entries	pg 56		6	1	6
Fuel Station Entries					
Points of Interest - Commercial Services	pg 57		2		2
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 57			7	11
Points of Interest - Public Infrastructure	pg 59				7
Points of Interest - Recreational and Environmental	pg 59		3		1
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
<b>Sensitive Land Use</b>					
Ancient Woodland	pg 60	1		1	
Areas of Adopted Green Belt	pg 60	1			
Areas of Unadopted Green Belt	pg 60	1			
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 60	1			
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					



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## Groundwater Vulnerability

### General

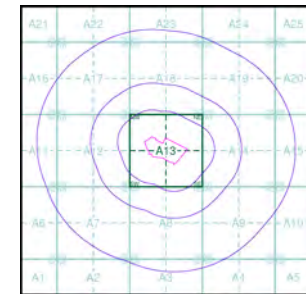
- ▭ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- ▭ Slice
- 8 Map ID

### Agency and Hydrological

- | Bedrock Aquifers   | Superficial Aquifers   |
|--|--|
| <span style="color: red;">■</span> High Vulnerability, Principal Aquifer           | <span style="color: orange;">■</span> High Vulnerability, Principal Aquifer    |
| <span style="color: orange;">■</span> High Vulnerability, Secondary Aquifer        | <span style="color: yellow;">■</span> High Vulnerability, Secondary Aquifer    |
| <span style="color: purple;">■</span> Medium Vulnerability, Principal Aquifer      | <span style="color: magenta;">■</span> Medium Vulnerability, Principal Aquifer |
| <span style="color: lightpurple;">■</span> Medium Vulnerability, Secondary Aquifer | <span style="color: pink;">■</span> Medium Vulnerability, Secondary Aquifer    |
| <span style="color: blue;">■</span> Low Vulnerability, Principal Aquifer           | <span style="color: teal;">■</span> Low Vulnerability, Principal Aquifer       |
| <span style="color: lightblue;">■</span> Low Vulnerability, Secondary Aquifer      | <span style="color: lightteal;">■</span> Low Vulnerability, Secondary Aquifer  |

- Unproductive Aquifer
- ⋯ Soluble Rock

### Site Sensitivity Context Map - Slice A



### Order Details

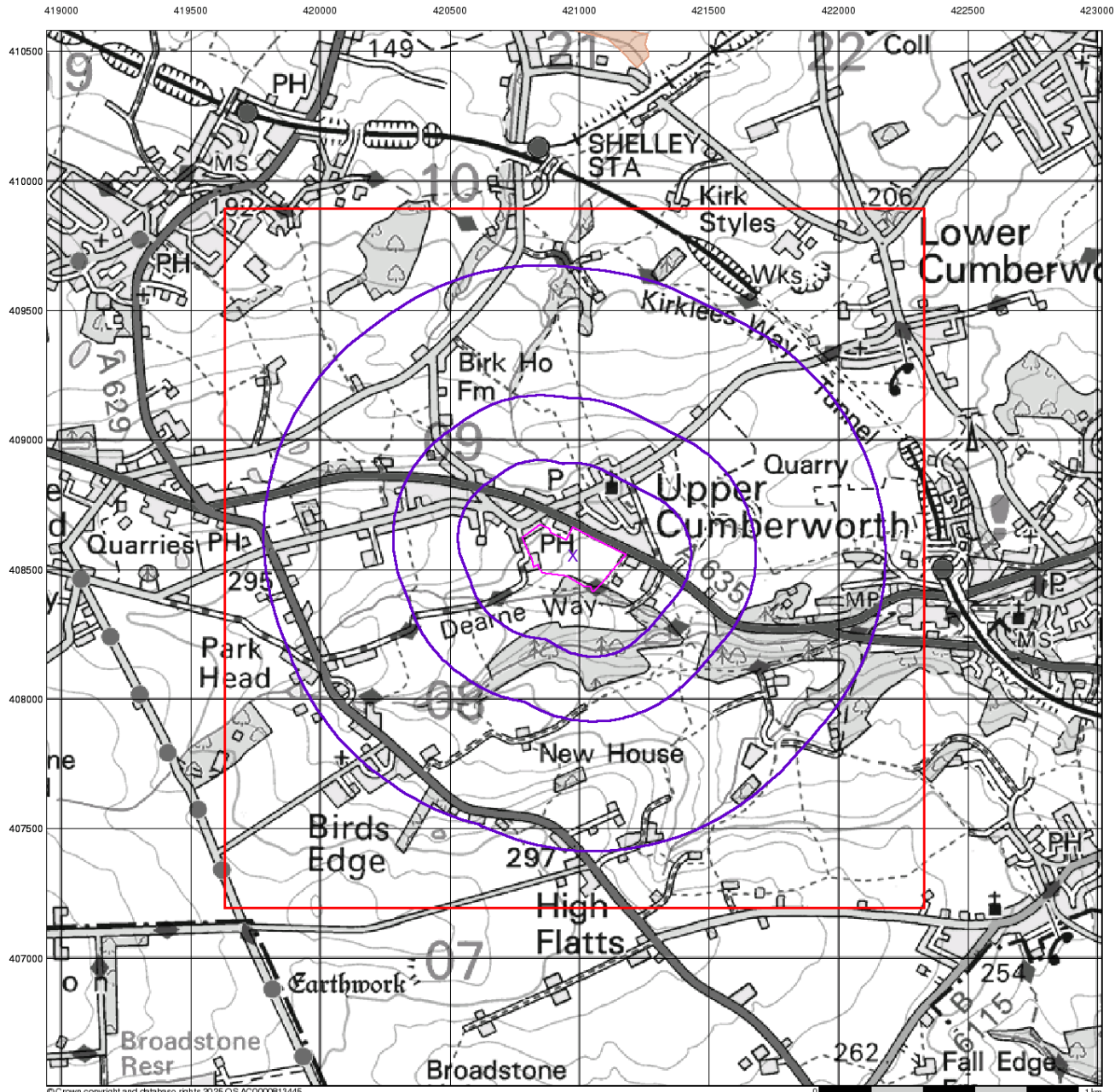
Order Number: 371924522\_1\_1  
 Customer Ref: 5368  
 National Grid Reference: 420970, 408560  
 Slice: A  
 Site Area (Ha): 5.67  
 Search Buffer (m): 1000

### Site Details

Barnsley Road, Upper Cumberworth, Huddersfield, HD8 8NP



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 Fax: 0844 844 9951  
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## Superficial Aquifer Designation

### General

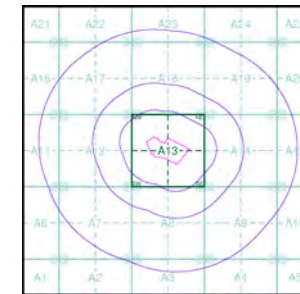
- ◊ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice
- B Map ID

### Agency and Hydrological

#### Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

### Site Sensitivity Context Map - Slice A



### Order Details

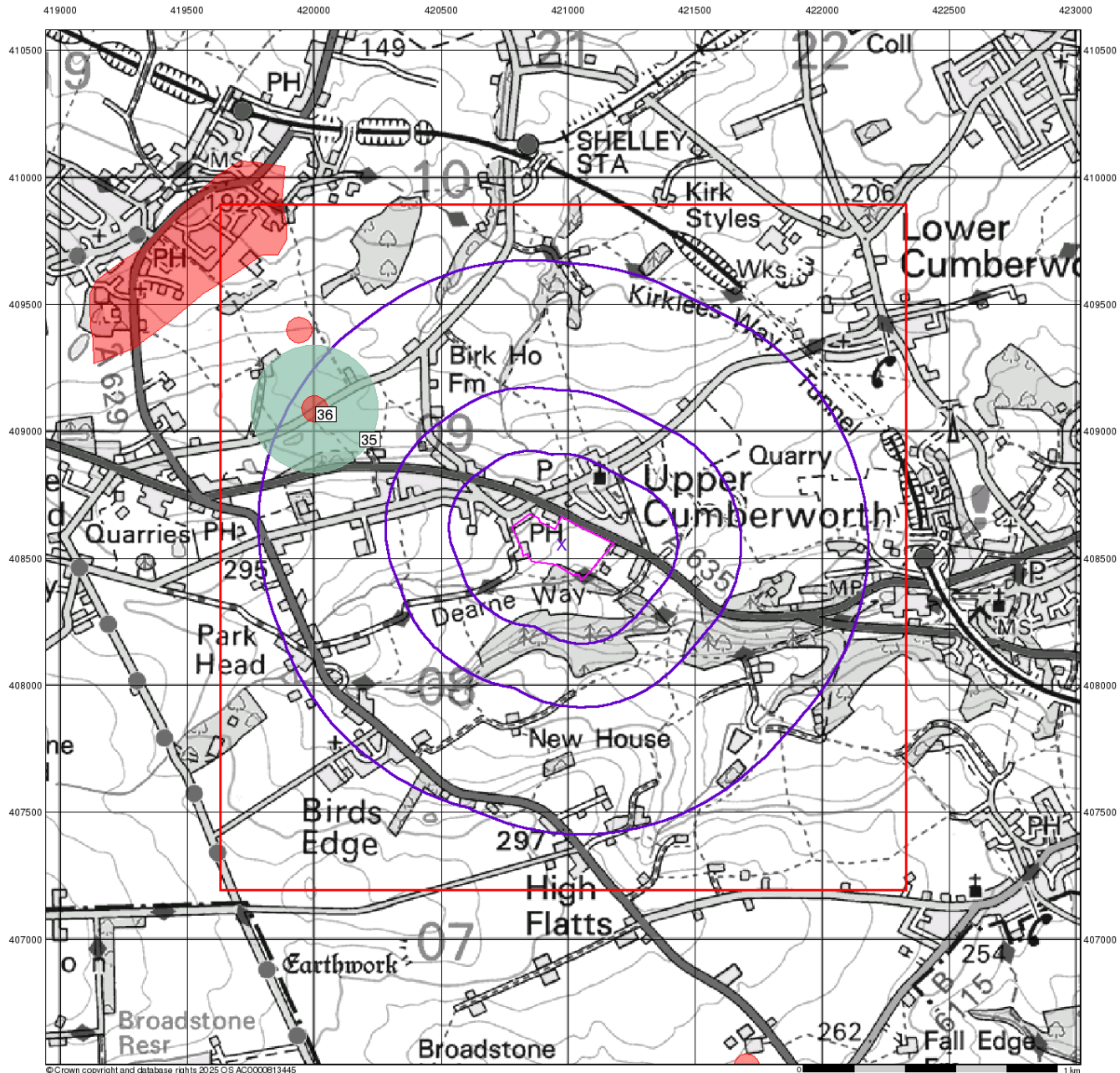
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 Slice: A  
 Site Area (Ha): 5.67  
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### Site Details

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## Source Protection Zones

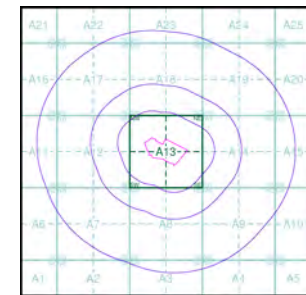
### General

- ◆ Specified Site
- Specified Buffer(s)
- ✕ Bearing Reference Point
- Slice
- Map ID

### Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

### Site Sensitivity Context Map - Slice A



### Order Details

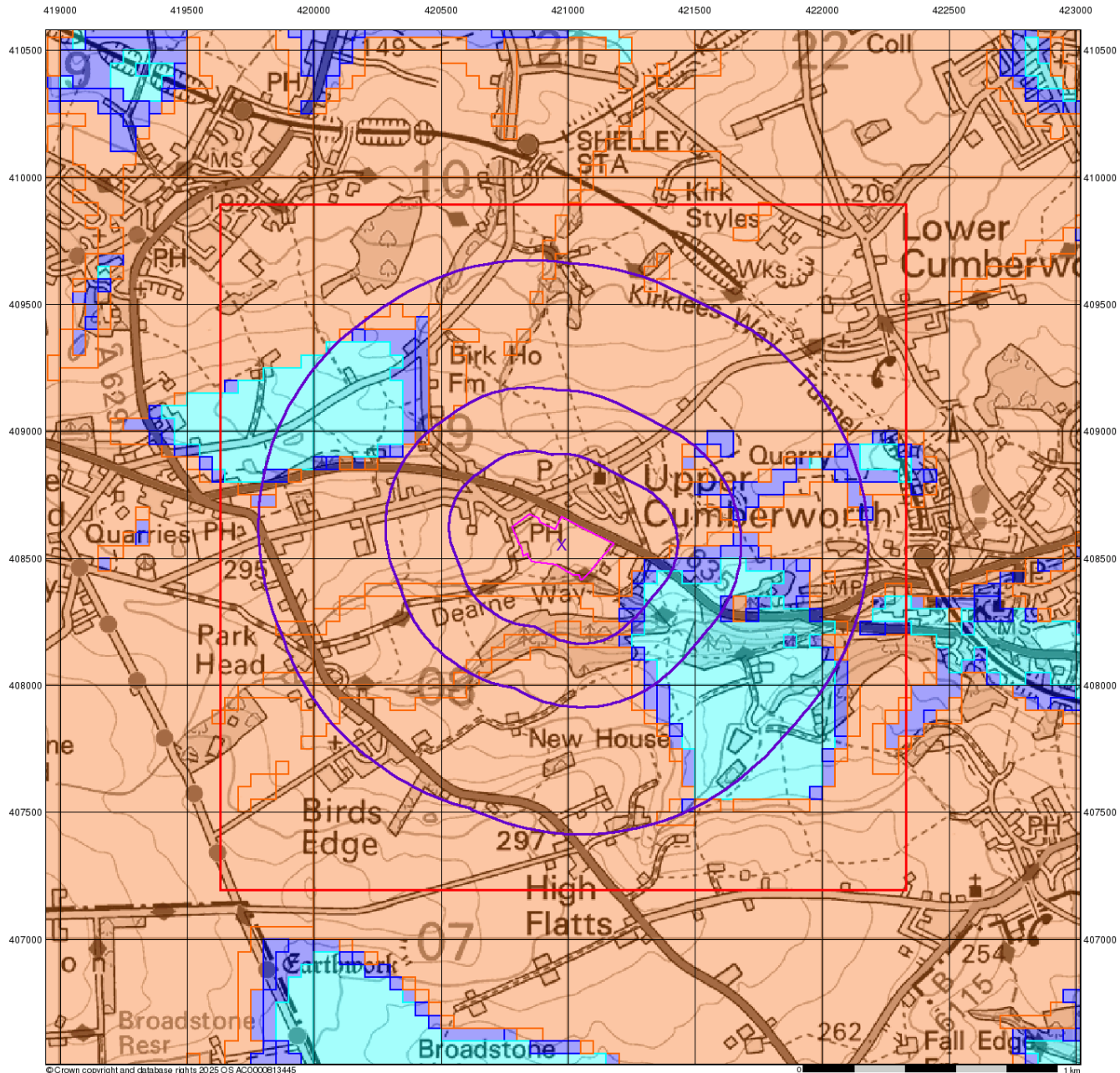
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 Customer Ref: 5368  
 National Grid Reference: 420970, 408560  
 Slice: A  
 Site Area (Ha): 5.67  
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### Site Details

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**BGS Flood GFS Data**

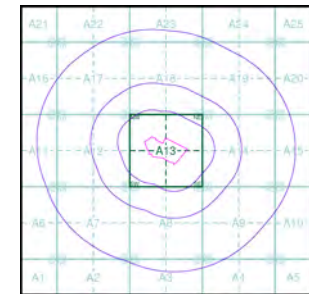
**General**

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice

**Agency and Hydrological (Flood)**

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

**Site Sensitivity Context Map - Slice A**



**Order Details**

Order Number: 371924522\_1\_1  
 Customer Ref: 5368  
 National Grid Reference: 420970, 408560  
 Slice: A  
 Site Area (Ha): 5.67  
 Search Buffer (m): 1000

**Site Details**

Barnsley Road, Upper Cumberworth, Huddersfield, HD8 8NP

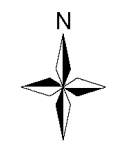
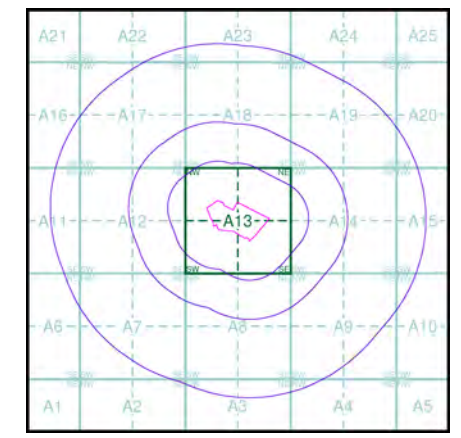


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 Fax: 0844 844 9951  
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- General**
- Specified Site
  - Specified Buffer(s)
  - Bearing Reference Point
  - Map ID
- Agency and Hydrological**
- Contaminated Land Register Entry or Notice (Location)
  - Contaminated Land Register Entry or Notice
  - Discharge Consent
  - Enforcement or Prohibition Notice
  - Integrated Pollution Control
  - Integrated Pollution Prevention Control
  - Local Authority Integrated Pollution Prevention and Control
  - Local Authority Pollution Prevention and Control
  - Local Authority Pollution Prevention and Control Enforcement
  - Pollution Incident to Controlled Waters
  - Historical Prosecutions
  - Prosecutions
  - Registered Radioactive Substance
  - River Network or Water Feature
  - Substantiated Pollution Incident Register
  - Water Abstraction
  - Water Industry Act Referral
- Waste**
- BGS Recorded Landfill Site (Location)
  - BGS Recorded Landfill Site
  - EA Historic Landfill (Buffered Point)
  - EA Historic Landfill (Polygon)
  - Integrated Pollution Control Registered Waste Site
  - Licensed Waste Management Facility (Landfill Boundary)
  - Licensed Waste Management Facility (Location)
  - Local Authority Recorded Landfill Site (Location)
  - Local Authority Recorded Landfill Site
  - Potentially Infilled Land (Non-water)
  - Potentially Infilled Land (Non-water)
  - Potentially Infilled Land (Non-water)
  - Potentially Infilled Land (Water)
  - Potentially Infilled Land (Water)
  - Potentially Infilled Land (Water)
  - Registered Landfill Site (Location)
  - Registered Landfill Site (Point Buffered to 100m)
  - Registered Landfill Site (Point Buffered to 250m)
  - Registered Waste Transfer Site (Location)
  - Registered Waste Transfer Site
  - Registered Waste Treatment or Disposal Site (Location)
  - Registered Waste Treatment or Disposal Site
- Hazardous Substances**
- COMAH Site
  - Explosive Site
  - NIHHS Site
  - Planning Hazardous Substance Consent
  - Planning Hazardous Substance Enforcement
- Geological**
- BGS Recorded Mineral Site

### Site Sensitivity Map - Slice A



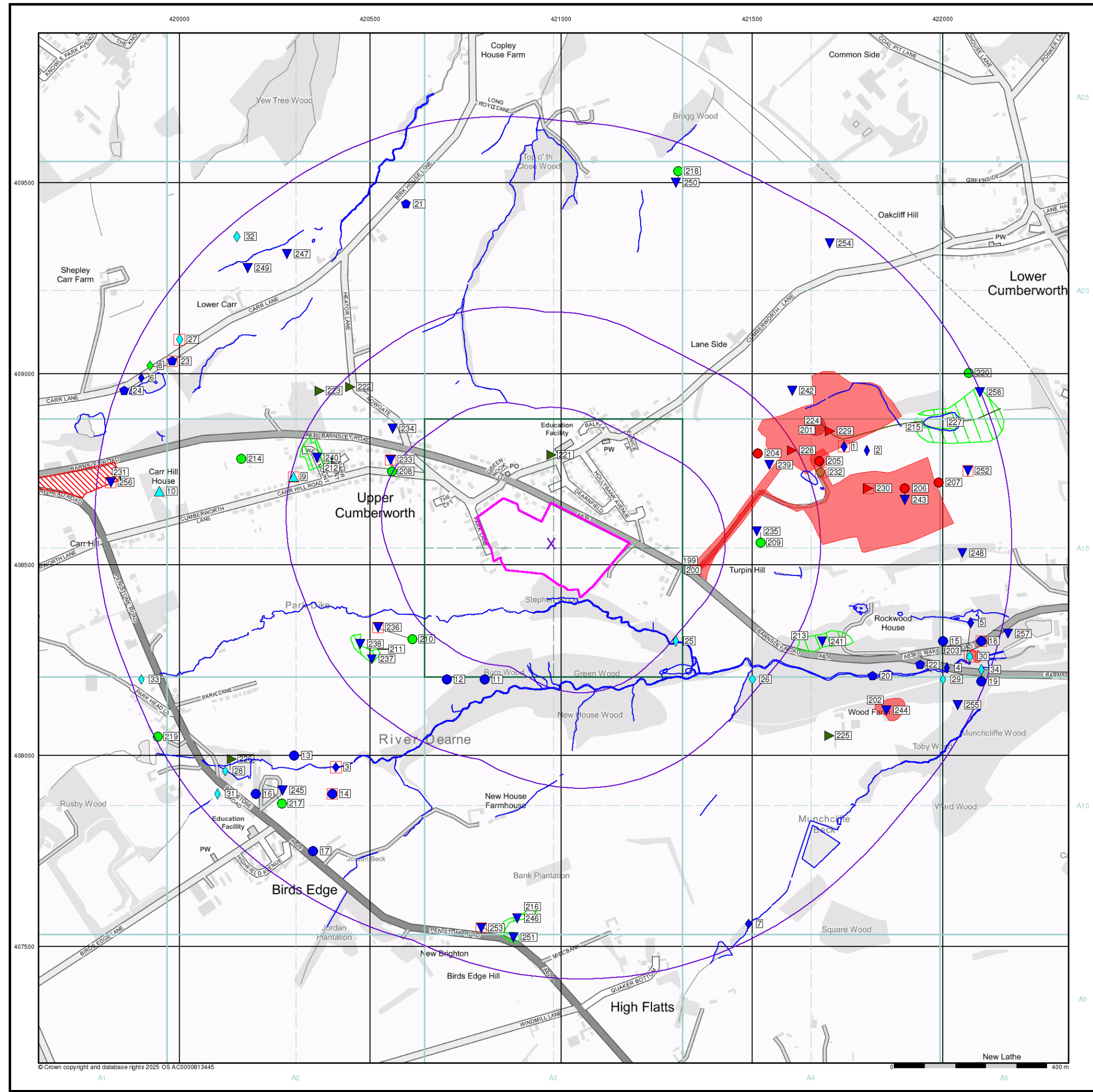
**Order Details**

Order Number: 371924522\_1\_1  
 Customer Ref: 5368  
 National Grid Reference: 420970, 408560  
 Slice: A  
 Site Area (Ha): 5.67  
 Search Buffer (m): 1000

**Site Details**  
 Barnsley Road, Upper Cumberworth, Huddersfield, HD8 8NP

**Landmark**  
 INFORMATION GROUP

Tel: 0844 844 9952  
 Fax: 0844 844 9951  
 Web: www.envirocheck.co.uk



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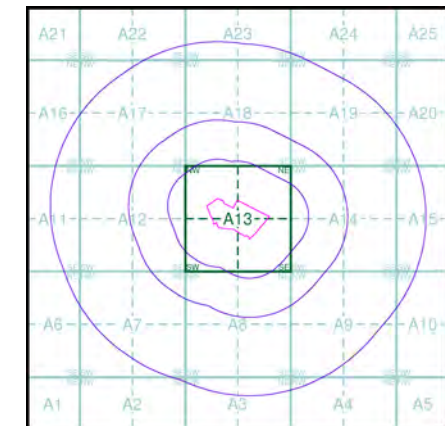
**General**

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

**Agency and Hydrological (Flood)**

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

**Flood Map - Slice A**



**Order Details**

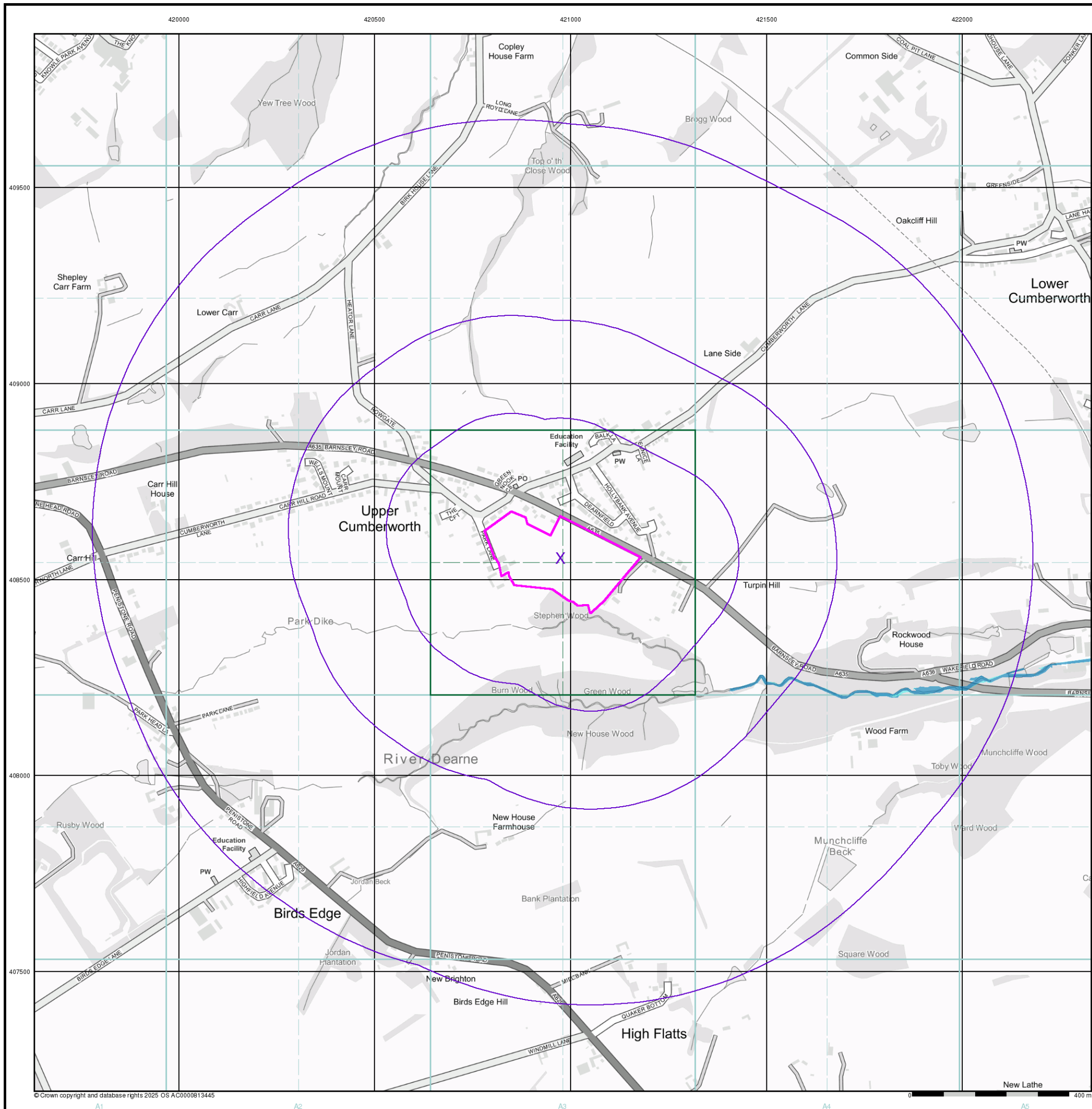
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 Customer Ref: 5368  
 National Grid Reference: 420970, 408560  
 Slice: A  
 Site Area (Ha): 5.67  
 Search Buffer (m): 1000

**Site Details**

Barnsley Road, Upper Cumberworth, Huddersfield, HD8 8NP



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### General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

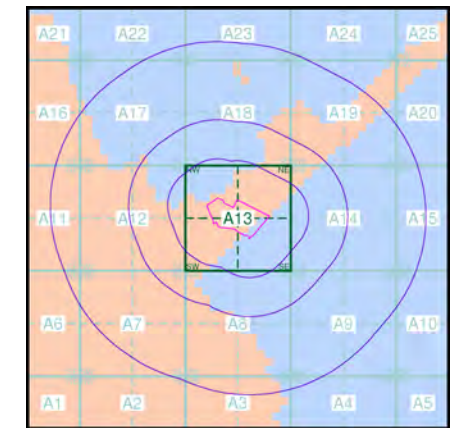
### Risk of Flooding from Surface Water

- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

### Suitability

- See the suitability map below
- National to county
  - County to town
  - Town to street
  - Street to parcels of land
  - Property

### EANRW Suitability Map - Slice A



### Order Details

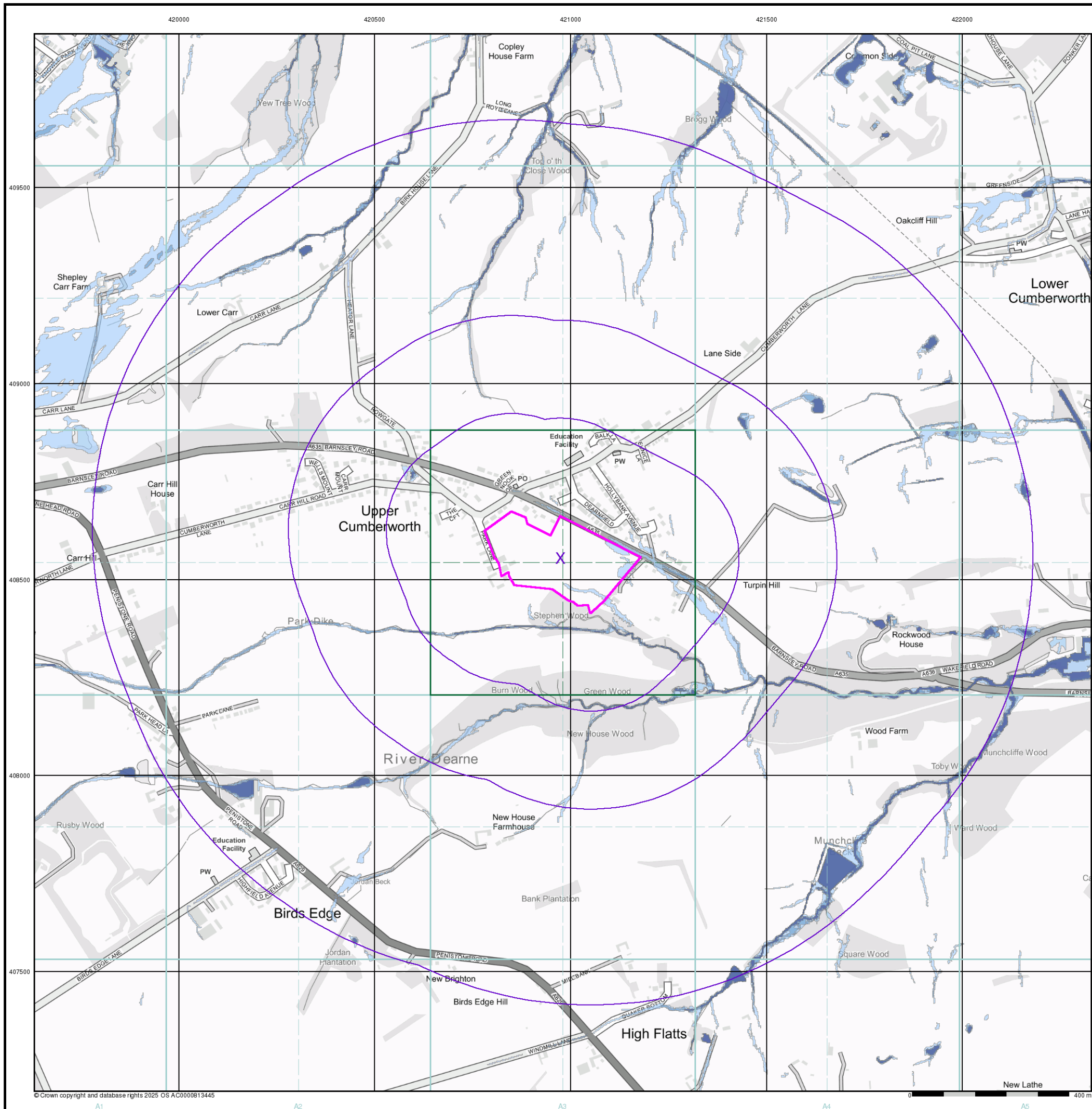
Order Number: 371924522\_1\_1  
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