

A photograph of a stream bed with rocks and green algae, overlaid with a semi-transparent green box containing the title text.

Preliminary Geoenvironmental Investigation

Land at Bradley Villa Farm, Huddersfield For Redrow Homes

Report no: 3319/2B

Date: April 2021



BRADLEY VILLA FARM, HUDDERSFIELD SUMMARY OF GEOENVIRONMENTAL ISSUES

Job No.	3319	Site area/ha	10.1 Ha (25 Acres)
Client:	Redrow Homes	NGR:	SE 151 205
Site:	Bradley Villa Farm, Huddersfield	Nearest postcode:	HD2 2JY

The site is located off Bradley Road, approximately 2km south of Brighouse town centre, and currently comprises three parcels of grassland are used for the grazing of cattle.

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

Lithos' investigation included an inspection of historical and geological maps and information provided by Landmark and the Coal Authority, 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.
Anticipated ground conditions	Topsoil underlain by Residual soils. Coal Measures bedrock anticipated at shallow depth (c. <2m).
Anticipated contamination	The site is essentially greenfield and no significant contamination is anticipated.
Mining & quarrying	This majority of the site is located within a Coal Mining Development Low Risk Area (area of proposed residential redevelopment). However, immediately north there is a High Risk Area (within the footprint of the proposed drainage infrastructure). There is an area of 'made ground' shown on the BGS plan in the south-east recorded as a former 'sand pit'.
Hazardous gas	No radon measures required. Low risk of hazardous gas from mineworkings at depth. A period of gas monitoring is recommended.
Flooding & drainage	The site is located within Flood Zone 1. Soakaways might provide a suitable drainage solution for surface water run-off.
Preparatory works	Topsoil strip & stockpile
Anticipated foundation solutions	It is likely all plots will be founded on traditional strip foundations within Residual Soils or on bedrock.
Recommendations for ground investigation	About 35 trial pits (with soakaway testing in 5 pits) to examine the nature, distribution and thickness of shallow soils and the suitability of the ground for soakaways, founding structures and highways. About 6 trial trenches along the line of the Better Bed coal seam outcrop in the north to determine its precise location, depth and thickness. About 11 probeholes to determine the presence of any shallow mineworkings beneath the area of proposed drainage infrastructure. About 16 probeholes to allow for the installation of gas and groundwater monitoring wells. Gas and groundwater monitoring on 6 occasions over a 3 month period.

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APPENDICES

Appendix A – General notes

01	Environmental setting
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Appendix B – Drawings

Drawing	Rev.	Title
3319/11		Site location plan
3319/12	B	Proposed layout
3319/13		Site features
3319/14		Site photos
3319/15		Preliminary conceptual site model
3319/18		Site Geology

Appendix C - Commission

Appendix D – Historical OS plans*

Appendix E – Search responses*

From	Date	Content
Landmark	January 19	Envirocheck report
Coal Authority	January 19	Mining report & response from planning advice (residential area)
Coal Authority	October 20	Mining report (drainage area)

* Some of this data is not included within the paper or PDF copies of this report; by request, it can be provided on a CD.

FOREWORD (preliminary geoenvironmental investigation report)

This report has been prepared for the sole use and reliance of the Client named on page 1 and cannot be relied upon by any other parties without the express written authorisation of Lithos Consulting Limited (Lithos). Any unauthorized third party relies on this report at their own risk and the authors owe them no duty of care.

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 sheets of paper in the hard copy to a minimum, some information (e.g. full copy of the Landmark/Groundsure Report) is only included within the "electronic", PDF Report on the accompanying CD.

The findings and opinions conveyed in any Desk Study section of the report (including review of any third party reports) are based on information obtained from the sources listed, which Lithos understands are reliable. Reasonable skill, care and diligence has been applied in examining the information obtained. However, Lithos accept no responsibility for inaccuracies in the data supplied or for opinions based on any such inaccurate data.

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 reserve the right to amend their conclusions and recommendations in the light of further information that may become available.

**PRELIMINARY
GEOENVIRONMENTAL INVESTIGATION
OF LAND AT
BRADLEY VILLA FARM, HUDDERSFIELD**

1 INTRODUCTION

1.1 The commission and brief

- 1.1.1 Lithos Consulting were commissioned by Redrow Homes to carry out a preliminary investigation of land at Bradley Villa Farm, Huddersfield.
- 1.1.2 This document is a revision of the Geoenvironmental Appraisal (Report 3319/2) issued by Lithos in September 2020; Report 3319/2 is now superseded. This document now includes the latest layout, with the only significant revisions to 3319/2 having been made to Drawing 3319/12.
- 1.1.3 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 the land use history
 - Determination of the site's environmental setting
 - A mining risk assessment in accordance with Coal Authority 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
- 1.1.4 This Preliminary Investigation comprised an inspection of historical and geological maps and information provided by the British Geological Survey, and the Landmark Information Group, the Coal Authority, QGIS¹, and the Environment Agency. In addition, a site inspection has been carried out by Lithos.
- 1.1.5 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 270 traditional 2 storey domestic dwellings, associated gardens, POS and adoptable roads and sewers. A site layout has been provided by Redrow Homes (Drawing reference BVF-16-02-03, dated 18th March 2021) which is reproduced as Drawing No. 3319/12 in Appendix B to this report.
- 1.2.2 An attenuation pond is also proposed in the far north of site. The location of the proposed attenuation pond is shown on Drawing 3319/11 in Appendix B to this report.

¹ An Open Source Geographic Information System used by Lithos to access publicly available Government held digital data.

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.

2 SITE DESCRIPTION

2.1 General

- 2.1.1 The site's location is shown on Drawing 3319/11 presented in Appendix B to this report. Site details are summarised in the table below.

Detail	Remarks
Location	2 km south of Brighouse town centre
NGR	SE 151 205
Area	10.1 ha (25 acres) – residential redevelopment 0.8ha (2 acres) – drainage infrastructure
Known services	Underground and overhead electric.

2.2 Site features

- 2.2.1 Lithos completed a walkover survey of the site on 13th February 2019.
- 2.2.2 Existing salient features, at the time of the walkover are presented on Drawing 3319/13 in Appendix B to this report, and summarised in the table below.

Feature	Remarks
Current access	Off Bradley Road
Topography	Gently undulating, with a 'dome' shaped topography in the east. Slopes in the north-east reach up to c. 1 in 7 gradient, with slopes up to 1 in 4 present in the south-west associated with a 'hollow'.
Approximate areas	101,000 m ² grass
Nature of boundaries	North – Hedgerows and wooden posts with wire fencing East – Hedgerows and wooden posts with wire fencing with Shepherds Thorn Lane beyond South – Garden fences of adjacent housing West – Post & rail fencing with access track beyond
Surrounding land uses	North – Open fields East – Shepherds Thorn Lane with Bradley Park Golf Club and Driving Range beyond South – Bradley Road (housing) with college beyond West – A641 road with open fields (north-west) and housing (south-west) beyond

2.2.3 Access is via one of 3 roads at 3 points (suitable for wheeled traffic) around the site boundary:

- Bradford Road (A641) runs 10m west of the western boundary, oriented north to south. Access is via a double metal 5 bar gate which is reached via a rough track surfaced with granular hardstand.
- Bradley Road (A6107) runs along the southern boundary, oriented east to west. Access is between two stone buildings, with the Villa Farm Shop and Café sign adjacent.
- Shepherds Thorn Lane runs along the eastern boundary, oriented north to south. Access is via a metal 5 bar gate on the western side of the road. Further north there is an entrance to the adjacent Bradley Park Golf Club and Driving Range.

2.2.4 A selection of site photographs are included on Drawing 3319/14.

2.3 Site Description

2.3.1 The site comprises arable farmland used for the grazing of cattle associated with Villa Farm. Sparsely distributed trees, hedgerows and wooden posts & wire fencing divide the site into 3 separate fields.

2.3.2 Topography undulates and domes in the centre-east. The ground slopes away from the top of the dome with a 1 in 20 slope to the southeast and up to 1 in 7 in the north-east. In the south eastern corner, a smooth hollow is present within a slope of around 1 in 4 on its western edge. Anecdotal evidence suggests the hollow is a recent feature.

2.3.3 In the far north, towards the area of proposed drainage infrastructure a line of intermittent mature trees is present with a c. 2m drop in topography on its northern boundary.

2.3.4 A blue water pipe protrudes from the ground on the eastern boundary of the most western field. Discussion with the landowner suggests this pipe runs west to the entrance off Bradford Road and also runs south towards the farmyard, parallel to a known existing electricity utility. A plastic black pipe (probably water) was also found to run along the northern boundary of site at the base of the hedgerow.

2.3.5 Towards the south-western corner there is a large manure heap and the land becomes slightly waterlogged.

2.3.6 A selection of site photographs is included on Drawing 3319/14.

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 1854 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
1854	Open fields	Open fields. Bradley Villa adjacent to southwest corner Shepherd Thorn 60 northwest of site.
1930	No significant changes	Housing built east of site off Bradley Road
1938		Housing built along western boundary of site off Huddersfield Road
1948		Housing built south of site off Bradley Road
1958		Additional buildings constructed within Bradley Villa
1959	Trough shown in western field	Bradley Bar Roundabout built
1971	No significant changes	Additional buildings constructed within Bradley Villa
1973		Construction of the M62 motorway c. 300m north-west.
1977		All Saints Catholic College built to 60m south beyond Bradley Road
1982		'Bradley Villa Farm' shown in south-west with additional buildings .
1988		Bradley Park Golf Course Club House built 350m east of site.
2019		Additional large building to the north of farmyard

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 Coal Authority and extracts from the Landmark Report are presented in Appendix E.

Issue	Data reviewed	
Geology	1:50,000 BGS map (Sheet 77) 1:10,000 BGS map (Sheet SE 12 SE & SE 12 SW) BGS Memoir\Technical Report	Drift – none. Solid – Pennine Lower Coal Measures with Sandstone in the west and Mudstone, Siltstone and Sandstone in the centre. Thick Stone (Sandstone) present in the east. Shallowest coal seam – Better Bed Coal likely at c. 20m depth in north of site, see further details in Section 4.2 below. Strata dip – 3° east. Faults – one fault running parallel to eastern boundary, dipping east.
Mining	Coal Authority BGS maps	The proposed area of residential development is located within a Coal Mining Development Low Risk Area. However, there is a High Risk Area immediately north (vicinity of the proposed attenuation pond). Past and present workings - none. Opencast - none. Mine entries – none within 100m. Further details in Section 4.2 below.
Quarrying	Historical OS plans	Area of 'made ground' shown on the BGS plan in the south-east; recorded as former 'sand pit'.
Landfills	Envirocheck	No known landfills within 250m
Radon	Public Health England	The site lies in an area where less than 1% of homes are estimated to be above the action level. Therefore radon measures are not required.
Hydrogeology	Environment Agency electronic open data via QGIS	Groundwater Source Protection Zone? No. Aquifer: Secondary A Aquifer (Solid). Groundwater abstractions? Nearest is 62m northeast, Kirklees Active Leisure for golf course spray irrigation. Soil leaching potential - Low. Pollution incidents? None within 1km.
Hydrology	Envirocheck Report	Nearest watercourse(s) – Tributary of Bradley Park Dike 150m northeast feeding River Colne. Water quality -moderate. Pollution incidents? Nearest is 757m southwest, foul sewer into freshwater stream/river Abstractions? None within 1km. Discharge consents? Nearest is 656m east, Yorkshire Water storm tank.
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 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).

4.2 Coal & mining

4.2.1 In July 2011 the Coal Authority (CA) formalised their requirements in relation to planning applications and introduced some new terminology relating to coal mining development areas.

Area of proposed housing development

4.2.2 The area of site proposed for housing is located within a Coal Mining Development Low Risk Area - within the defined coalfield, but no known defined risks have been recorded by the Coal Authority; there may still be unrecorded issues.

4.2.3 A CA mining report obtained for the proposed housing development states that:

- *There is no past mining recorded*
- *There are no probable unrecorded shallow workings and no spine roadways recorded at shallow depth*
- *There are no mine entries recorded within 100m of the site boundary*
- *There are no outcrops recorded and no faults, fissures or breaklines recorded.*
- *There are no opencast mines or Coal Authority managed tips within 500m of the site boundary.*
- *The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50m of the enquiry boundary, since 31st October 1994.*
- *There are no recorded incidences of mine gas within 500m of the boundary*
- *The property is not in an area where a notice to withdraw support has been given.*

4.2.4 The mining report suggests there is no past mining recorded. 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 Coal Authority have no records.

4.2.5 The 1:10,000 BGS plans suggest that the Better Bed Coal seam outcrops between 160m and 200m north-west of the housing site, with an associated Coal Mining Development High Risk Area. The Better Bed coal seam and site geology are shown on Drawing 3319/18.

4.2.6 Strata are shown on the BGS plan as dipping at 2° to the east.

4.2.7 It should be noted that seam outcrops plotted on geological maps have been known to be inaccurate by distances in excess of 100m.

4.2.8 Based on surrounding topography and the position of the Better Bed outcrop, this seam will underlie the entire site. It has a maximum recorded thickness of 0.7m. Review of the Geological Memoir *Geology of the Country around Huddersfield and Halifax -Sheet 77* suggests that there is no mining of any fireclay/seatearth associated with this seam.

4.2.9 In order to ascertain the likely depth of the Better Bed beneath the housing site (most notably in areas of lower topography and/or areas closer to the outcrop), strike lines for this seam have been interpolated. This was done using the position of its outcrop across the surrounding area (within the same fault block) and comparing it with topographic contours. This exercise has yielded the following:

- The seam dips at c. 2.2° east
- It is shallowest in the west, c. 145mAOD, reaching c. 125mAOD on the eastern boundary
- It is around 19m depth at its shallowest point
- It is around 30m depth at its deepest point

- 4.2.10 CIRIA ('Construction over abandoned mine workings', 1989) suggest a thickness of solid rock through which a void can migrate as 7h to 10h above the roof of the workings, where h is the height of the workings (generally assumed to be similar to the seam thickness). The lower end of this range (7h) is generally only applicable where the overlying strata are predominantly thickly bedded sandstones.
- 4.2.11 The succession here is likely to comprise mudstones and sandstones, therefore it is considered appropriate to use a figure of 10 h for void migration calculations (7m for the Better Bed).
- 4.2.12 Based on the above and the likely depth of the Better Bed, there should be sufficient competent cover in place above any workings within the Better Bed coal seam so as to not pose a significant risk of subsidence at surface.
- 4.2.13 In addition to the above, Lithos have liaised with the CA's Planning Advice team regarding coal risks on this site. Their response is included within Appendix E, but in summary the CA are satisfied that the High Risk Area associated with the Better Bed seam does not extend beneath the proposed area of housing.
- 4.2.14 Given findings of the CA report, liaison with the CA and Lithos' mining risk assessment, any workings within the Better Bed coal should not pose a significant risk of subsidence at surface beneath proposed housing.
- 4.2.15 There are no other coal seams within influencing depth beneath the Better Bed.

Area of off-site drainage infrastructure

- 4.2.16 The area of proposed drainage infrastructure lies 130m north of the proposed area of residential redevelopment and is within a Coal Mining Development High Risk Area - an area with specific mining legacy risks to the surface, including mine entries, shallow coal workings etc.
- 4.2.17 The 1:10000 BGS plan suggests that the Better Bed Coal seam outcrops within the footprint of the proposed attenuation basin and associated pipework.
- 4.2.18 The Coal Authority online interactive viewer suggests the area of High Risk is associated with known (and probable, but unrecorded) shallow mineworkings within the Better Bed Coal seam. The extent of known and possible workings are shown on Drawing 3319/18 presented in Appendix B.
- 4.2.19 Given the above, an intrusive mining investigation will be required within this area (see section 6.3).

4.3 Mineral safeguarded areas

- 4.3.1 The site is underlain by coal 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 Coal Authority and the British Geological Survey.

- 4.3.4 Paragraph 204 of the National Planning Policy Framework (NPPF) requires Local Authorities, when preparing Local Plans to:
- Define Minerals Safeguarding Areas and adopt appropriate policies in order that known locations of specific minerals resources of local and national importance are not needlessly sterilised by non-mineral development, whilst not creating a presumption that resources defined will be worked; and define Minerals Consultation Areas based on these Minerals Safeguarding Areas.
 - 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 Paragraph 144 notes that when determining planning applications, local planning authorities should give weight to the benefits of the mineral extraction.
- 4.3.6 As a consequence of the NPPF, and the presence of coal beneath the site, the Local Authority may require Redrow Homes to consider the opportunity to recover (extract) the coal.
- 4.3.7 However, it is worth noting that the UK market for coal is changing (driven by government carbon emission targets) – most notably very few power stations are still burning coal. Consequently, prior extraction of coal has become less attractive in recent times.
- 4.3.8 Applicants submitting planning applications may need to demonstrate to the Local Authority that they will extract the coal, unless:
- It can be shown it is not economically viable to do so, or
 - It is not environmentally acceptable to do so, or
 - The need for the development outweighs the need to extract the coal, or
 - The coal will not be sterilised by the development

4.4 Hazardous gas

Methane & carbon dioxide

- 4.4.1 The site is believed to be affected by sources of hazardous gas generation as it is:
- Located within the vicinity of possible former underground coal mineworkings.
- 4.4.2 Consequently, a period of gas monitoring is recommended; see Section 6.3.

Radon

- 4.4.3 Requirements with respect 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⁻³) are used to determine whether a property requires no, basic or full measures. At present Approved Document C advocates basic measures for the probability banding 3% to 10% (full measures if >10%).
- 4.4.4 Information from Landmark suggests that radon protection measures are not required. This is confirmed by the Public Health England UK radon map which indicates that the site lies in an area where **less than 1%** of homes are estimated to be above the action level.
- 4.4.5 As such, no special precautions against radon are required on this site.

4.5 Preliminary conceptual site model

- 4.5.1 The historical plans show that the site has been occupied by arable farmland which is not considered likely to have caused significant ground contamination.
- 4.5.2 A preliminary conceptual site model is presented as Drawing 3319/15 in Appendix B to this report. Clearly, the conceptual model will be subject to modification in light of data arising from the proposed intrusive ground investigation.

5 LAND CONTAMINATION - PART IIA & PLANNING

- 5.1.1 Local Authorities have responsibilities with respect to land contamination in the context both of Part IIA of the Environmental Protection Act 1990, and Planning.
- 5.1.2 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

- 5.1.3 As of 27th March 2012, Planning Policy Statement (PPS23) was replaced by the National Planning Policy Framework (NPPF). The NPPF (updated in July 2018) includes the following with respect to contamination and site investigation:
- 5.1.4 'Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.
- 5.1.5 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; and
 - Adequate site investigation information, prepared by a competent person, is presented'.
- 5.1.6 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 - 2017, Code of Practice for the Investigation of Potentially Contaminated Sites)'.

This site

- 5.1.7 The underlying Pennine Lower Coal Measures is classified as a Secondary A aquifer. The nearest surface watercourse is a tributary of Bradley Park Dike 150m northeast feeding the river Colne. Therefore, the site's environmental setting is considered to be moderate sensitivity.
- 5.1.8 With respect to human health, the proposed end use (residential) is also sensitive.
- 5.1.9 It is considered that the site should be suitable for the proposed use.

6 GROUND INVESTIGATION DESIGN

6.1 Anticipated ground conditions & potential issues

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

Anticipated condition	Remarks
Made ground	None anticipated
Natural soils	Topsoil with residual soils below (clay/sand/gravel)
Bedrock	Pennine Lower Coal Measures with Sandstone in the west and Mudstone, Siltstone and Sandstone in the centre. Thick Stone (Sandstone) present in the east likely at shallow depths (<3m).
Mineworkings	None anticipated within at least 20m depth.
Groundwater	Likely at depth within bedrock.

- 6.1.2 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	1. Farming related activities	1. Soil conditioners, inorganics, organics
Potential off-site contamination sources	1. Bradley Villa Farm	1. Likely shallow made ground beneath buildings and hardstand, inorganics, organics, asbestos.
Potential geotechnical hazards	1. Former sand pit	1. Deep made ground, inorganics, organics
Other potential constraints	1. Underground and overhead Northern Powergrid utility 2. Shallow bedrock	1. Likely to require easement during planning and construction stages 2. Difficulty in excavating

6.2 Preliminary conceptual site model

- 6.2.1 A preliminary conceptual site model, presented as Drawing No 3319/15 in Appendix B, has been prepared after consideration of all the data presented in Sections 2 to 6.1 inclusive of this report.
- 6.2.2 Historical plans show that the site has been occupied by arable farmland which is not considered likely to have caused significant ground contamination. Nonetheless, activities such as slurry spreading, the discharge of chemicals to ground, and unregulated burial have all occurred on farmland. Potential pollutants associated with farming activity might include any of the following:

Agricultural activity	Potential contaminant
Slurry pits, manure heaps, septic tanks	Methane, metals, nitrates, oxygen depletion
Sewage farming, slurry spreading	Methane, metals, nitrates, oxygen depletion
Plant & animal protection	Pesticides & herbicides
Soil conditioners	Metals, sulphates, PAH
Equipment maintenance	Hydrocarbons, metals
Naturally occurring contaminants	Arsenic, metals

- 6.2.3 Potential pollutant linkages are shown on the preliminary conceptual site model.

6.3 Ground investigation design & strategy

6.3.1 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
Trial Pits 1 to 35	To determine the general nature of soils underlying the site, including the: nature, distribution and thickness of shallow soils, including any made ground suitability of the ground for founding structures and highways
5 Trial Pits	To determine whether soakaways could be utilised for storm water drainage
6 Trial Trenches	To determine the location of the Better Bed Coal Seam outcrop within the footprint of the proposed attenuation pond
11 Probeholes	To check for the presence of voids or broken ground associated with possible unrecorded shallow mine workings within the footprint of the proposed attenuation pond
16 Probeholes	To install monitoring wells across the site in order to: • Monitor for hazardous gas • Determine groundwater levels and assess flow direction

6.3.2 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 6.2.2 above. A nominal 30m grid spacing should be appropriate, with additional exploratory locations scheduled as necessary in light of the ground conditions actually encountered.

6.3.3 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.

6.3.4 The investigation should be undertaken in general accordance with:

- BS5930:2015 "Code of practice for site investigation"
- BS10175:2017 "Code of practice for the identification 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)

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

- Nature, distribution and thickness of shallow soils
- Suitability of the ground for soakaways
- Suitability of the ground for founding structures and highways

6.3.6 The mechanical excavator should be equipped with a breaker to enable excavation where necessary, in bedrock for soakaway tests.

6.3.7 The in-situ shear strengths of any cohesive soils encountered should be determined by use of a hand-held shear vane.

6.3.8 The ground is expected to predominantly comprise Cohesive Residual Soils underlain by shallow Sandstone bedrock, and consequently soakaways may work. Testing should be carried out in at least 5 trial pits in order to assess the suitability of **soakaways** as a solution for the discharge of surface water run-off

6.3.9 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.

6.3.10 **Trial Trenching** will enable the determination of:

- The location, depth and thickness of the Better Bed coal seam beneath the proposed drainage infrastructure.

6.3.11 Routine **geotechnical soils analysis** (moisture content, Atterberg limits, pH, water soluble sulphate) should be scheduled on about 15 samples.

6.3.12 The site is essentially Greenfield, and therefore testing of potentially **contaminated** samples should only be required if made ground is encountered in the exploratory holes. Analysis of at least 12 samples of topsoil should be undertaken in order to confirm its suitability for re-use. Analysis should include pH, metals, TOC, speciated PAH and asbestos ID.

6.3.13 Whilst it is highly unlikely that PAAH pesticides will be detected by soil sampling, it would be prudent to confirm this via analysis of 2 topsoil samples.

6.3.14 Eleven **probeholes** should be sufficient to determine whether or not old mineworkings are present in the Better Bed coal seam. If present, 11 probeholes should also suffice to determine whether or not mineworkings pose a significant risk to surface stability of the site (via assessment of seam depths, thicknesses and thicknesses of overlying competent bedrock). However, if a potential risk is perceived to exist, further probeholes may be required to delineate the extent of workings in order to obtain fixed price quotations for the necessary consolidation works.

6.3.15 It will be necessary to submit an application (with the associated fee) to the Coal Authority (CA) for 'Permission to enter CA mining interests'.

6.3.16 Monitoring wells should be installed in about 16 shallower probeholes. The generation potential of potential **gas** sources (possible mineworkings) is considered likely to be Low. Therefore, in accordance with CIRIA Report C665, it would be prudent to initially allow for 6 visits over a 3 month period. A hazardous gas risk assessment should be issued on completion of monitoring.

6.3.17 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.

7 CONCLUSIONS & RECOMMENDATIONS

7.1 General

- 7.1.1 The site comprises c. 10.1 hectares of land located off Bradley Road approximately 2km south of Brighouse town centre.
- 7.1.2 It is understood that Redrow Homes are considering acquisition of the site with a view to redevelopment with housing and an underground storage tank, attenuation basin and sewer run in the far north.
- 7.1.3 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.

7.2 Mining and quarrying

- 7.2.1 The majority of the site is located within a Coal Mining Development Low Risk Area, with the exception of an area of High Risk in the far north within the footprint of proposed drainage infrastructure.
- 7.2.2 Lithos' mining risk assessment has concluded that beneath the area of proposed residential development the shallowest seam is the Better Bed, with a maximum thickness of 0.7m and at a minimum depth of c. 19m. At such depth, any workings within this seam should not pose a significant risk to surface stability.
- 7.2.3 There are no coal seams within influencing depth beneath the Better Bed.
- 7.2.4 Within the area of proposed residential development no significant risks have been identified and an intrusive mining investigation will not be required.
- 7.2.5 Within the area of proposed drainage infrastructure, 130m north of the proposed residential development, the Better Bed Coal outcrops east to west and this area lies within a High Risk Area due to known and probable shallow workings within the coal seam. An intrusive mining investigation will be required in this area.
- 7.2.6 If old mineworkings are present in the Better Bed Coal seam within the area of proposed drainage, and are considered to pose a significant risk to surface stability, mitigation of the risks posed will be required; this could be achieved in one of two ways:
- Extraction of the remaining coal
 - Consolidation, via drilling & grouting
- 7.2.7 A former 'sand pit' is shown in the south-east on the BGS plan.

7.3 Hazardous gas

- 7.3.1 The site is in an area where less than 1% of homes are estimated to be above the radon action level.
- 7.3.2 The site is potentially underlain by shallow mineworkings. Consequently, the site is considered to be at potential risk from migrating mines gas.
- 7.3.3 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.

7.4 Foundations

- 7.4.1 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.
- 7.4.2 The published geological data suggests that the site is underlain by Pennine Lower Coal Measures in the west and Thick Stone (sandstone) in the east at shallow depth (c. <2m).
- 7.4.3 Weathered Coal Measures 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.
- 7.4.4 If shallow mineworkings underlie the site, and require treatment, NHBC typically require foundations to be at least 300mm thick and reinforced. If the workings are at a depth of less than 5 times the seam thickness, then raft foundations may be required.
- 7.4.5 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.

7.5 Highways and external works

- 7.5.1 Given the relatively level nature of the site, there should be no requirement for retaining walls, underbuild, tanking etc.
- 7.5.2 Residual soils should yield a CBR of at least 3%. This value should be verified prior to or during construction.

7.6 Soakaways & drainage

- 7.6.1 Given anticipated ground conditions, soakaways may provide a viable solution for the disposal of surface water, subject to on testing.
- 7.6.2 If the site does not lend itself to the adoption of discrete soakaways, ground should have the capacity to absorb surface water run-off, and systems which spread infiltration over a wider area (e.g. an infiltration basin, swales and/or pervious paving) may provide the best solution.
- 7.6.3 Alternative SUDS options (see CIRIA C697:2007 for further details) include:
- Swales – linear grassed features in which surface water can be stored or conveyed. Where suitable, swales can be designed to allow infiltration.
 - 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).
 - Ponds – designed to have permanent pool of water, but with capacity to provide temporary storage controlled discharge.

7.7 Contamination

- 7.7.1 The site's environmental setting is considered to be of low sensitivity. With respect to human health, the proposed end use (residential) is also sensitive.
- 7.7.2 The site has been occupied by pastoral land, which is considered unlikely to have caused significant ground contamination. Nonetheless, activities such as the discharge of chemicals to ground and burning of waste may have occurred.
- 7.7.3 Sampling of topsoil (and any made ground, if encountered) is required in order to confirm its suitability for retention and re-use.

7.8 Potential development constraints

- 7.8.1 The proposed drainage infrastructure in the north (underground storage tank, attenuation basin and sewer runs) lie within a High Risk Area due to the presence of the Better Bed Coal seam. Consolidation works may be necessary if ground investigation within this area identifies shallow mineworkings.
- 7.8.2 The underground electric utility in the southwest of site may require easement/diversion.
- 7.8.3 Shallow bedrock across the site may result in difficulties excavating beyond c.2m depth.

7.9 Further investigation

- 7.9.1 Whilst the site is considered suitable for its current and proposed use, the proposed change in use will require intrusive investigation.
- 7.9.2 This would include:
- Machine-excavated trial pits to determine near surface ground conditions including depth to bedrock, the presence of obstructions, groundwater and stability
 - Machine-excavated trial trenches along the line of the Better Bed Coal seam outcrop within the footprint of the proposed drainage infrastructure in the north of site
 - Geotechnical soils analysis to enable foundation recommendations
 - Chemical testing on soil and if necessary, groundwater samples to assess the significance of contamination, if any, as a result of former industrial land use
 - Rotary probeholes to confirm depths and seam thicknesses in order to assess risks associated with possible old mineworkings and surface stability
 - Gas monitoring and risk assessment
- 7.9.3 An appropriate ground investigation strategy is presented in Section 5.2.

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 BR211¹, and the Public Health England 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 Health Protection Agency (HPA) in 2005; the HPA updated NRPB advice in July 2010². The HPA became part of Public Health England in 2013.

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⁻³ and 100 Bqm⁻³ 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 NRPB first indicated which parts of the country should be regarded as radon Affected Areas in 1990. A more detailed mapping method was developed by the HPA in conjunction with the British Geological Survey in 2007³. 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⁻³ 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, Public Health England 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.

¹ BRE Report BR211, 2015: "Radon: guidance on protective measures for new buildings.

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

³ Miles JCH, Appleton JD, Rees DM, Green BMR, Adlam KAM and Myers AH (2007). Indicative Atlas of Radon in England and Wales. Chilton, HPA-RPD-033.

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.

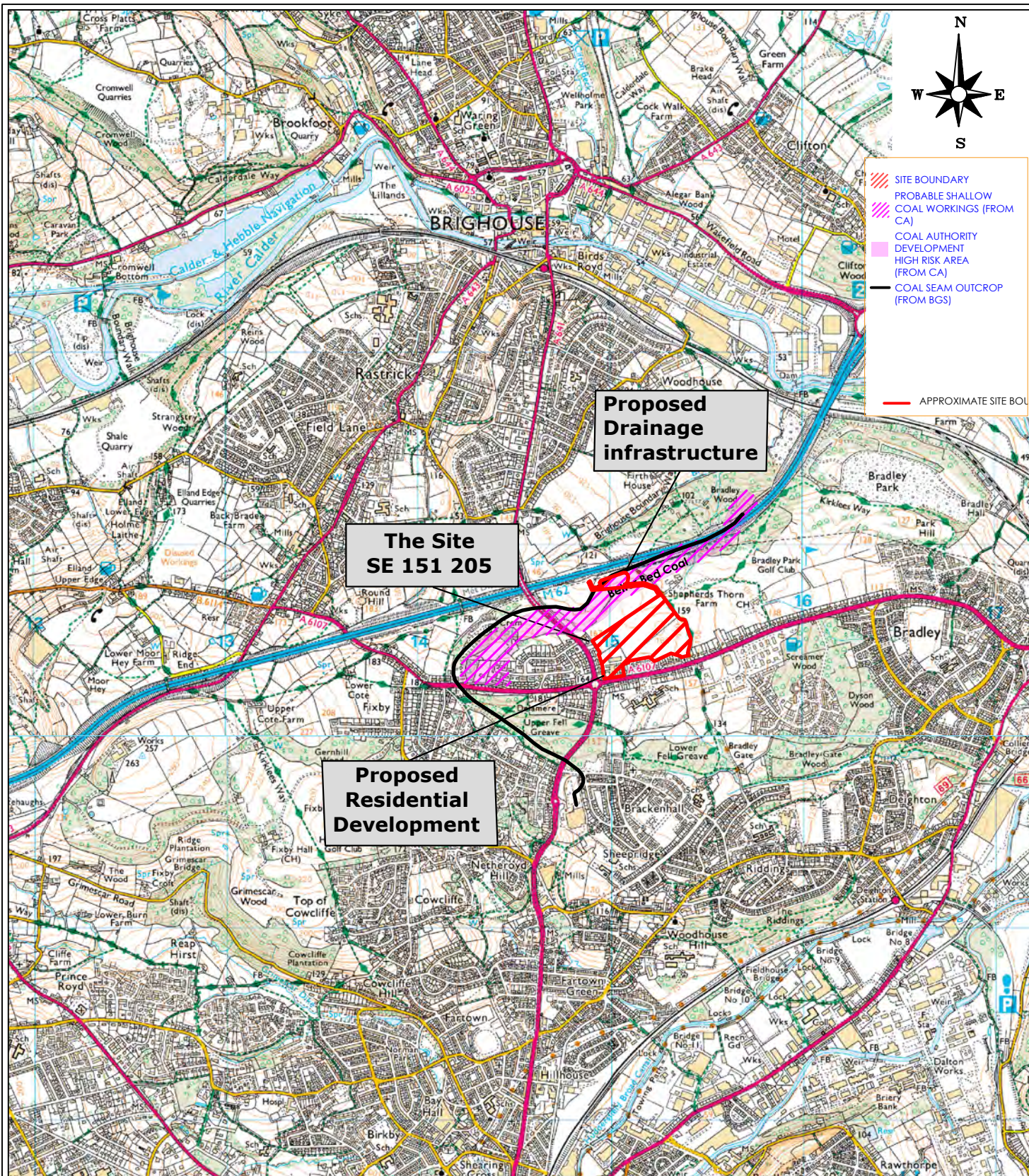
Potential pollutant linkages are shown on a preliminary conceptual site model (pCSM). A CSM is essentially a cross-section through a site that reflects both the surface topography and underlying geology, and shows surface features of interest. The most significant sources of contamination are then superimposed 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



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www.lithos.co.uk
Tel 01937 545330

CLIENT

REDROW
HOMES

JOB TITLE

VILLA FARM,
BRADLEY

DRAWING TITLE

SITE LOCATION
PLAN

DRAWN

CC

DATE

21/02/19

CHECKED

REG

DATE

21/02/19

STATUS

FOR COMMENT ☐

DRAFT ☐

FOR APPROVAL ☐

FINAL ☒

SCALE

1:25,000

SHEET

A4

DRAWING NO.

3319/11

REVISION

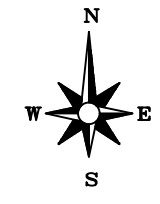
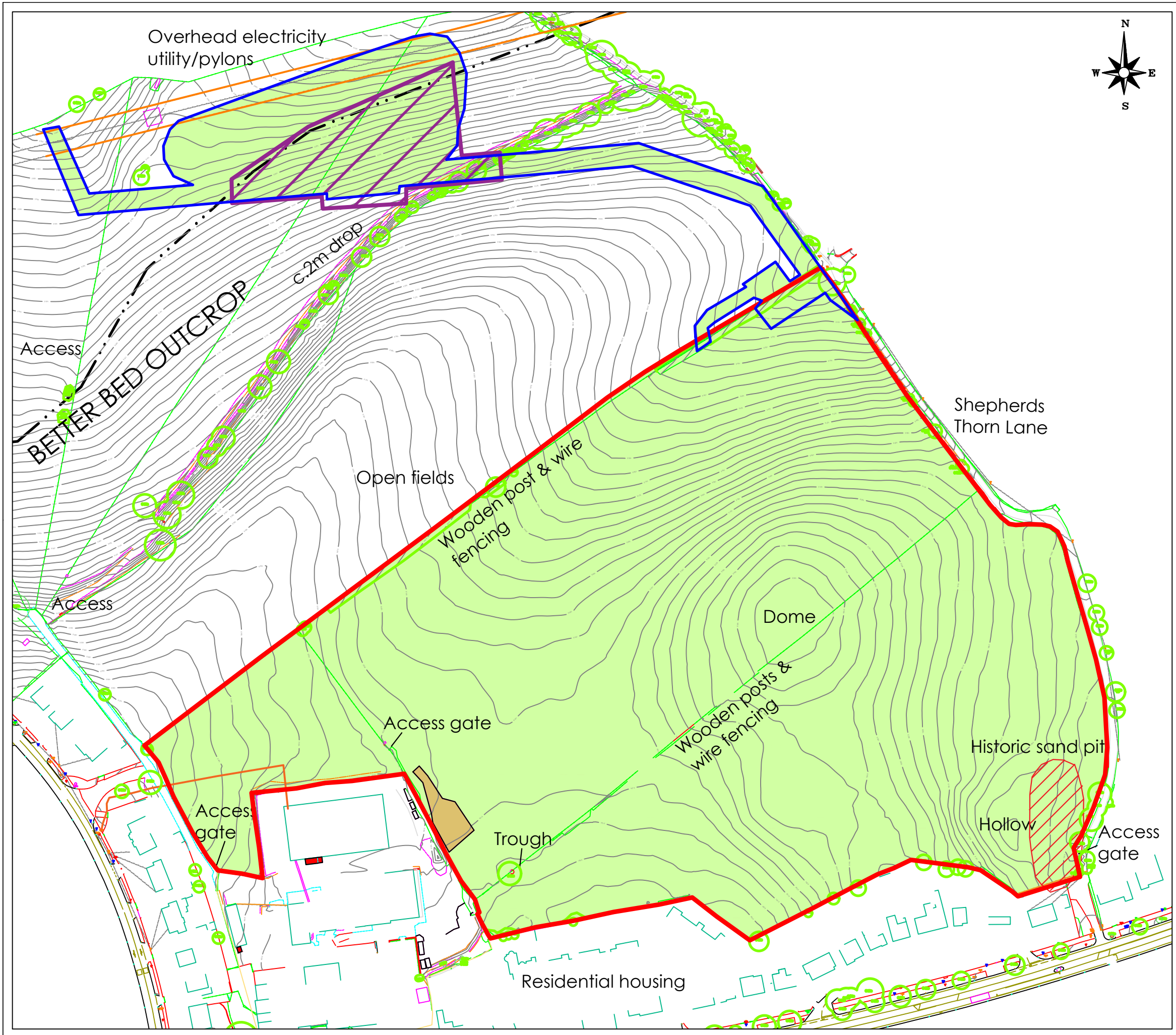


NOTES		
— APPROXIMATE SITE BOUNDARY		
REPRODUCED FROM REDROW HOMES HOMES DRAWING REFERENCE BVF-16-02-03, DATED 18 03 2021		
B	REVISED LAYOUT	04/05/2021
A	REVISED LAYOUT	24/03/2021
REV.	DESCRIPTION	DATE



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Tel 01937 545330

CLIENT		
REDROW HOMES		
JOB TITLE		
VILLA FARM, BRADLEY		
DRAWING TITLE		
PROPOSED SITE LAYOUT		
DRAWN	CC	DATE 23 09 20
CHECKED	REG	DATE 23 09 20
		STATUS
		FOR COMMENT ☐
		FOR APPROVAL ☐
		DRAFT ☐
		FINAL ☒
SCALE	1:2500	SHEET A3
DRAWING NO.	3319/12	REVISION



NOTES		
	GRASS & OVERGROWN AREAS	
	TREES	
	MANURE HEAP	
	BETTER BED COAL OUTCROP	
	DRAINAGE AT POTENTIAL RISK FROM MINeworkINGS	
	HISTORICAL SAND PIT (FROM BGS)	
	APPROXIMATE RESIDENTIAL SITE BOUNDARY	
	APPROXIMATE DRAINAGE SITE BOUNDARY	
	LINE OF ELECTRICITY UTILITY	
REV.	DESCRIPTION	DATE



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CLIENT		
REDROW HOMES		
JOB TITLE		
VILLA FARM, BRADLEY		
DRAWING TITLE		
SITE FEATURES		
DRAWN	CC	DATE 21/02/19
CHECKED	REG	DATE 21/02/19
		STATUS
		FOR COMMENT ☐
		FOR APPROVAL ☐
		DRAFT ☐
		FINAL ☒
SCALE	1:2000	SHEET A3
DRAWING NO.	3319/13	REVISION



NOTES		
	GRASS & OVERGROWN AREAS	
	APPROXIMATE SITE BOUNDARY (RESIDENTIAL)	
	APPROXIMATE SITE BOUNDARY (DRAINAGE INFRASTRUCTURE)	
	LOCATION & ORIENTATION OF PHOTOGRAPH	
	LINE OF ELECTRICITY UTILITY	
REV.	DESCRIPTION	DATE



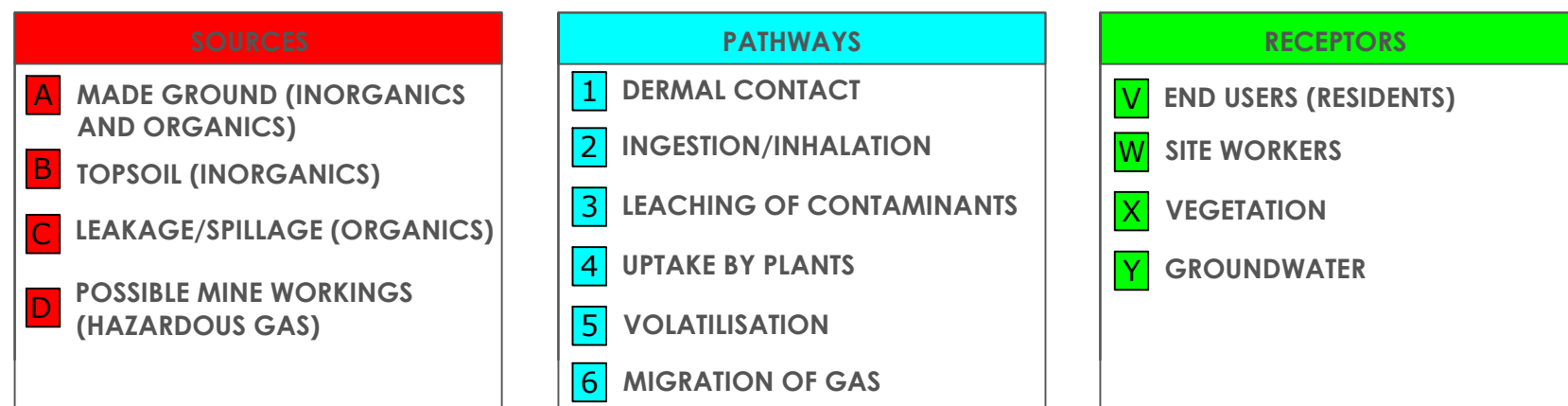
info@lithos.co.uk
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Tel 01937 545330

CLIENT
REDROW HOMES

JOB TITLE
VILLA FARM, BRADLEY

DRAWING TITLE
SITE PHOTOGRAPHS

DRAWN	CC	DATE	19/02/19	STATUS	FOR COMMENT	☐
CHECKED	REG	DATE	19/02/19	FOR APPROVAL	DRAFT	☐
				FINAL		☒
SCALE	NOT TO SCALE	SHEET	A3	DRAWING NO.	3319/14	REVISION



SCALE	SHEET	DRAWING NO.	REVISION
Not to scale	A3	3319/15	

Appendix C

Commission

Charlotte Copley

Subject: FW: 3319 - Bradley Villa Farm - Desk Study

From: David Faraday <david.faraday@redrow.co.uk>

Sent: 17 September 2020 16:22

To: Reg <Reg@lithos.co.uk>

Subject: RE: Bradley Villa Farm - Planning Info

Hi Reg,

It's worth doing so please proceed – I don't need it anytime soon as we're not submitting till December ish.

Thanks,

David

From: Reg <Reg@lithos.co.uk>

Sent: 17 September 2020 15:59

To: David Faraday <david.faraday@redrow.co.uk>

Subject: RE: Bradley Villa Farm - Planning Info

Hi David

At present all we have is the SI Report. If you wanted, we could extract data to create a standalone Desk Study Report for a small fee; say £***+VAT.

ta

Mark Perrin
Director
Lithos Consulting Ltd
M 07703 396 635
DD 01937 545 331



www.lithos.co.uk

From: David Faraday <david.faraday@redrow.co.uk>

Sent: 17 September 2020 15:08

To: Reg <Reg@lithos.co.uk>

Subject: Bradley Villa Farm - Planning Info

Hi Reg,

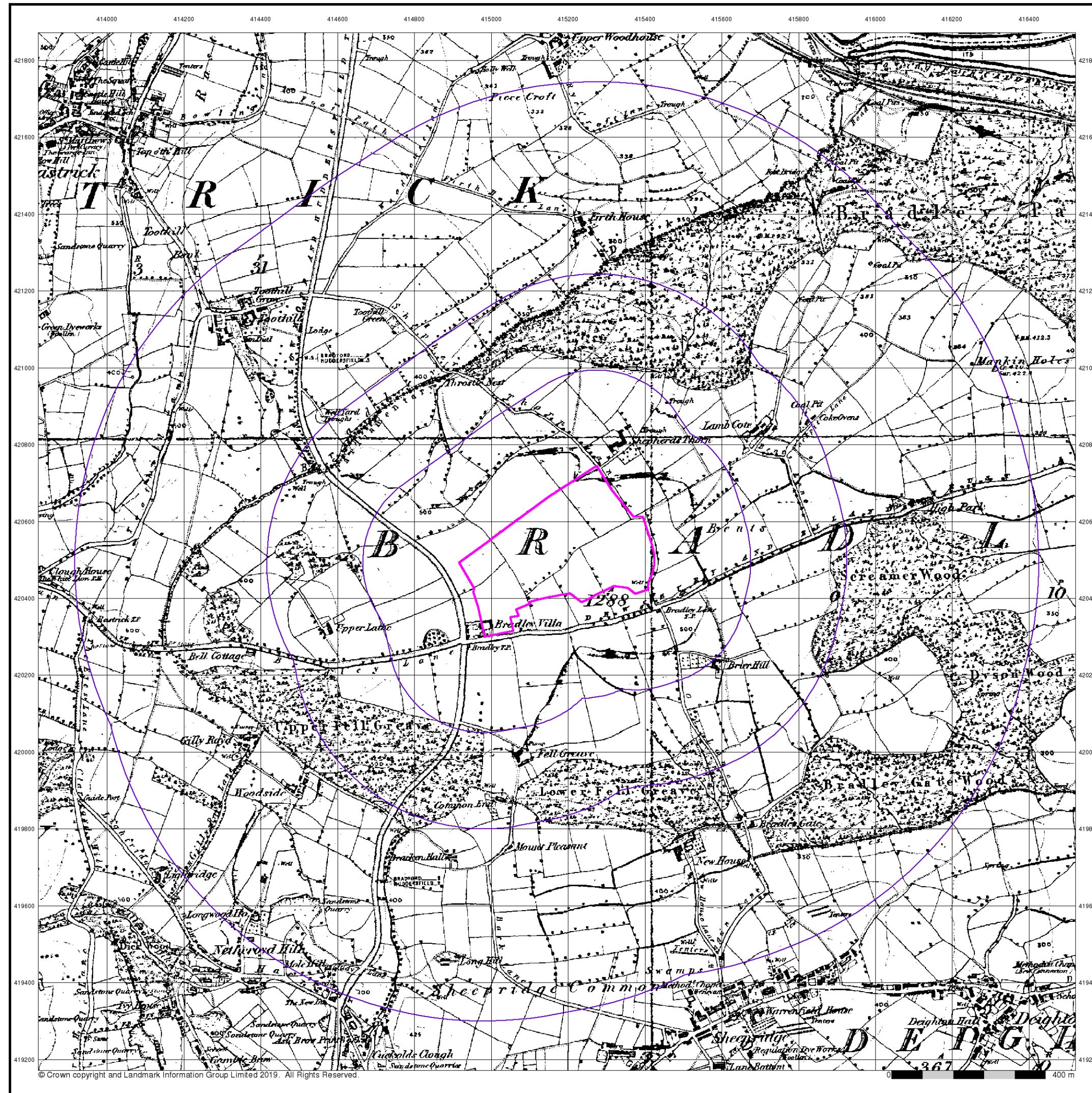
Have you done a standard Phase 1 Desktop for the above?

Just thinking ahead to the planning application. We have a Phase 2 but we normally wouldn't submit this level of detail at the planning stage.

Regards,

Appendix D

Historical OS Plans



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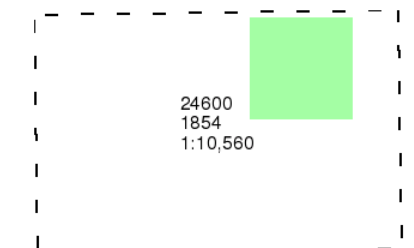
Yorkshire

Published 1854

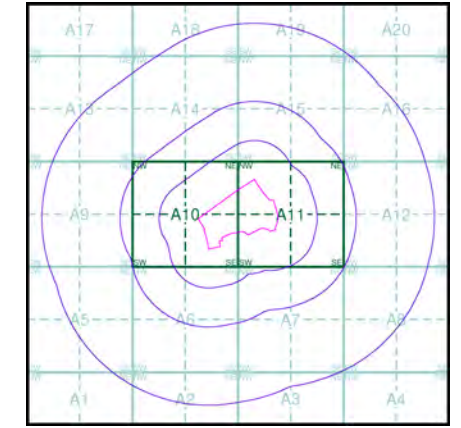
Source map scale - 1:10,560

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

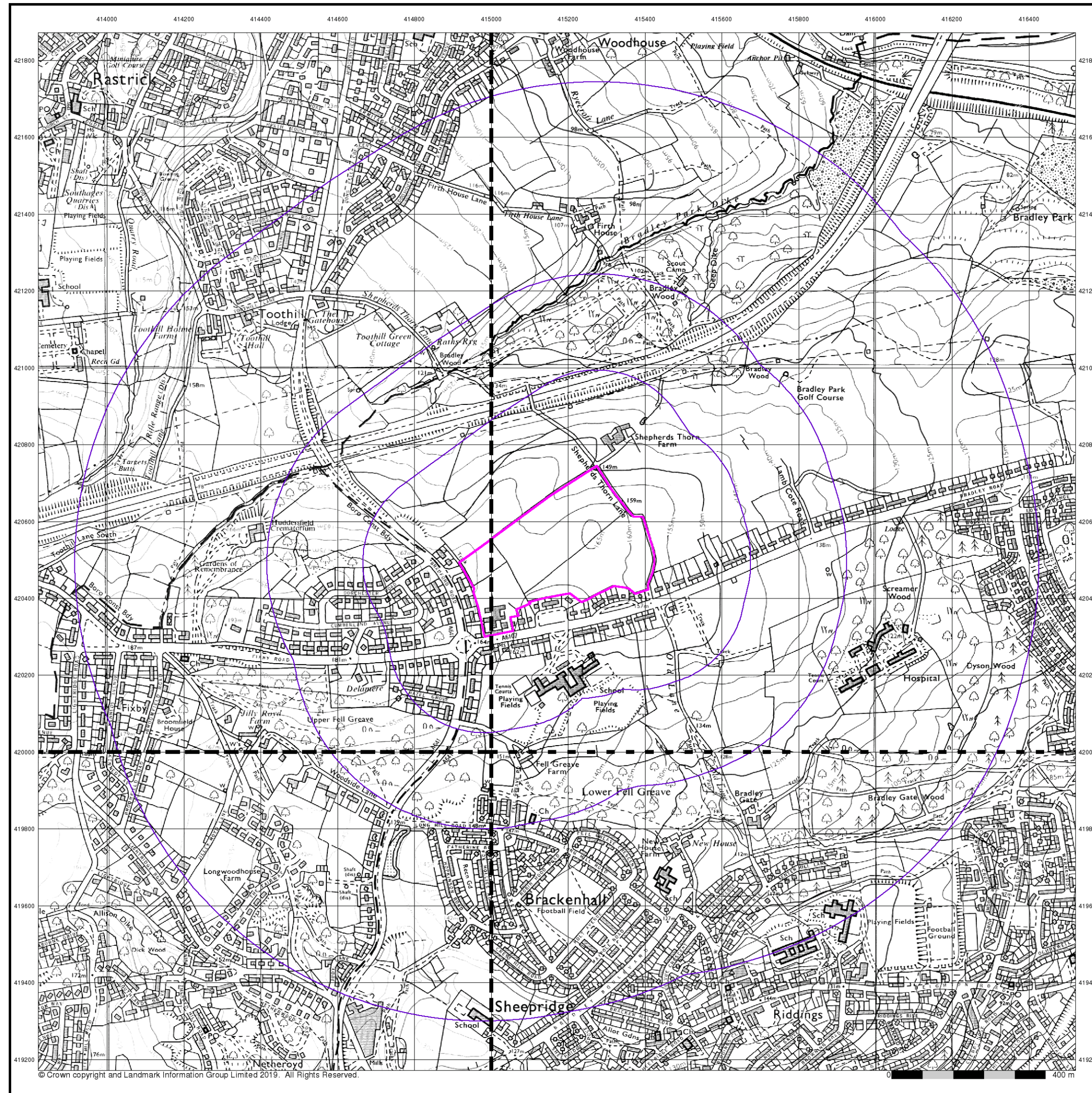
Order Number: 192531415_1_1
Customer Ref: PO14098/JW/3319
National Grid Reference: 415180, 420500
Slice: A
Site Area (Ha): 11.85
Search Buffer (m): 1000

Site Details

13, Torcote Crescent, HUDDERSFIELD, HD2 2JU



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Fax: 0844 844 9951
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Ordnance Survey Plan

Published 1976 - 1978

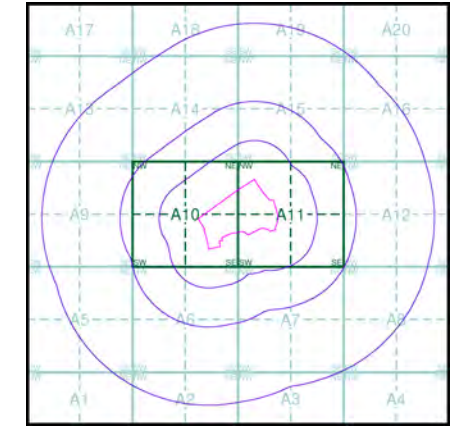
Source map scale - 1:10,000

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SE12SW	SE12SE
1978	1977
1:10,000	1:10,000
SE11NW	SE11NE
1978	1976
1:10,000	1:10,000

Historical Map - Slice A



Order Details

Order Number: 192531415_1_1
Customer Ref: PO14098/JW/3319
National Grid Reference: 415180, 420500
Slice: A
Site Area (Ha): 11.85
Search Buffer (m): 1000

Site Details

13, Torcote Crescent, HUDDERSFIELD, HD2 2JU



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Appendix E

Search Responses & other Correspondence



Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

192531415_1_1

Customer Reference:

PO14098/JW/3319

National Grid Reference:

415180, 420500

Slice:

A

Site Area (Ha):

11.85

Search Buffer (m):

1000

Site Details:

13, Torcote Crescent

HUDDERSFIELD

HD2 2JU

Client Details:

Mr M Perrin

Lithos Consulting Ltd

Parkhill

Walton Road

Wetherby

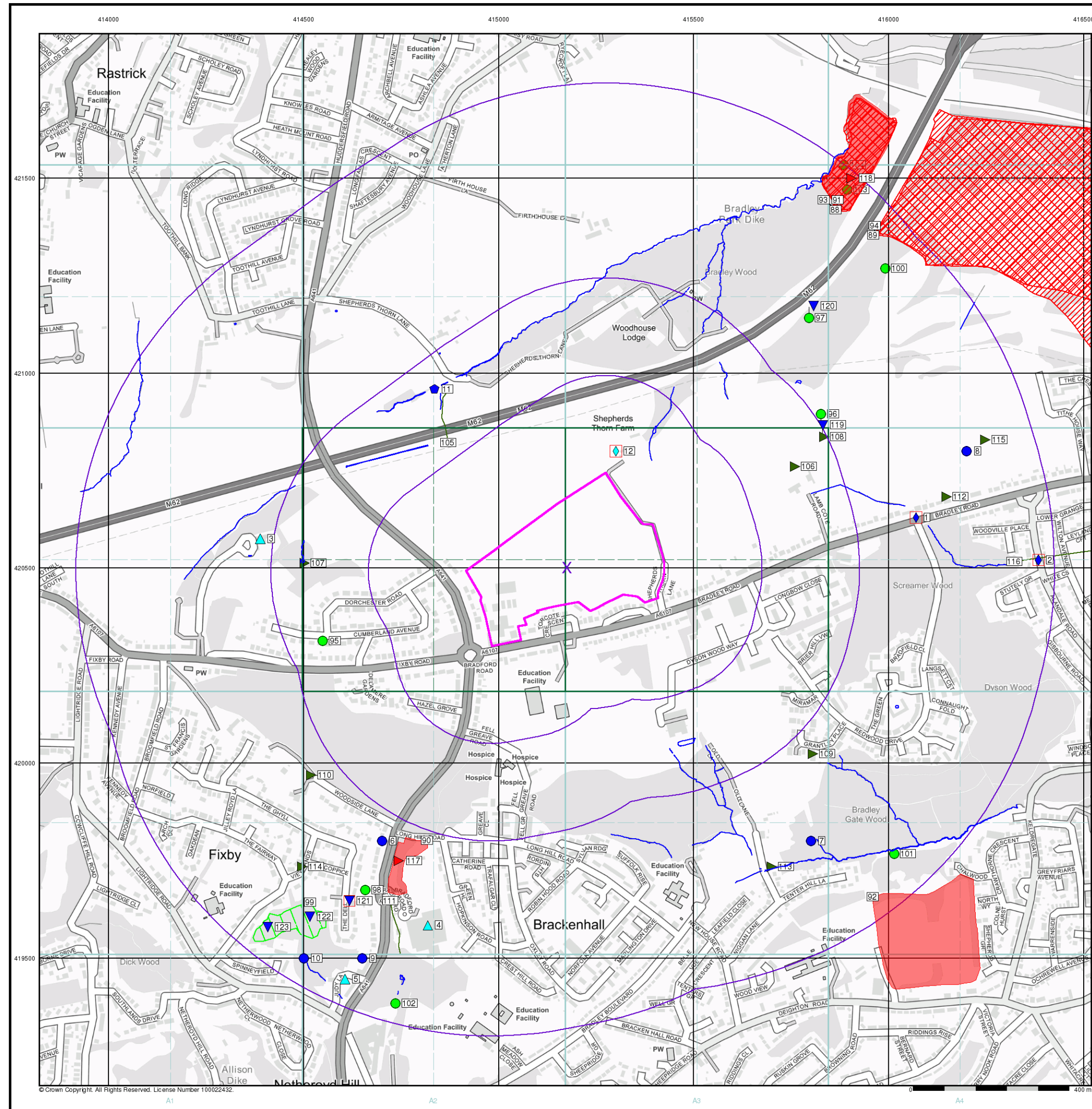
LS22 5DZ

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 3				11
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
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				3
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 6		Yes		
Pollution Incidents to Controlled Waters	pg 7				5
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 7			1	
Water Abstractions	pg 8		4		(*23)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 14	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 14	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones					
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 15		3	34	38

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites	pg 24				2
Historical Landfill Sites	pg 24				3
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)	pg 24				2
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage		1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 25			1	9
Potentially Infilled Land (Water)	pg 25			3	9
Registered Landfill Sites	pg 26				2
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
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)
Geological					
BGS 1:625,000 Solid Geology	pg 28	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 28	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites	pg 35				6
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 36	Yes	n/a	n/a	n/a
Mining Instability	pg 36	Yes	n/a	n/a	n/a
Man-Made Mining Cavities	pg 36				1
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 36		Yes	n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 36	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 36		Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 36	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 37		Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 37	Yes	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
Industrial Land Use					
Contemporary Trade Directory Entries	pg 38		3	13	11
Fuel Station Entries	pg 40				1
Points of Interest - Commercial Services	pg 40			1	5
Points of Interest - Education and Health	pg 41			1	
Points of Interest - Manufacturing and Production	pg 41	1		1	
Points of Interest - Public Infrastructure	pg 41				9
Points of Interest - Recreational and Environmental	pg 42				4
Gas Pipelines					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 43		1	3	
Areas of Adopted Green Belt	pg 43	1		1	
Areas of Unadopted Green Belt	pg 43	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					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					



- General**

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

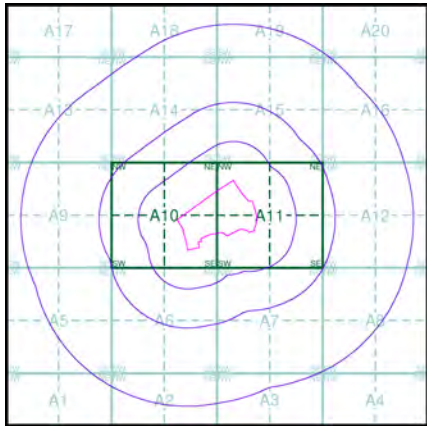
Several of Type at Location
- Agency and Hydrological**

 - 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
 - Prosecution Relating to Authorised Processes
 - Prosecution Relating to Controlled Waters
 - Registered Radioactive Substance
 - River Network or Water Feature
 - River Quality Sampling Point
 - 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
 - BGS Recorded Mineral Site

Site Sensitivity Map - Slice A



Order Details

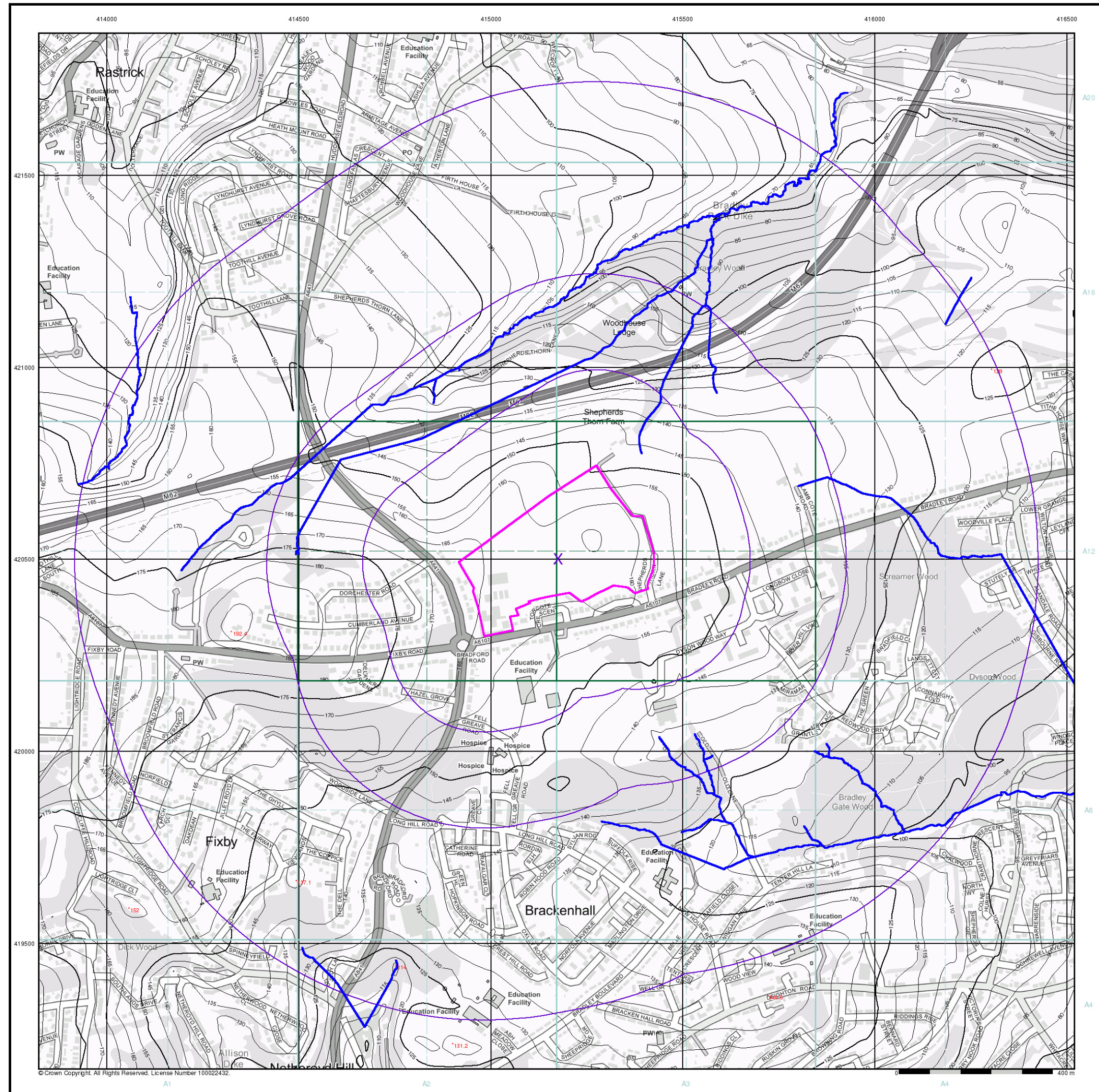
Order Number: 192531415_1_1
Customer Ref: PO14098/JW/3319
National Grid Reference: 415180, 420500
Slice: A
Site Area (Ha): 11.85
Search Buffer (m): 1000

Site Details

13, Torcote Crescent, HUDDERSFIELD, HD2 2JU



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

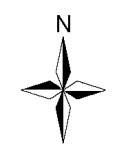
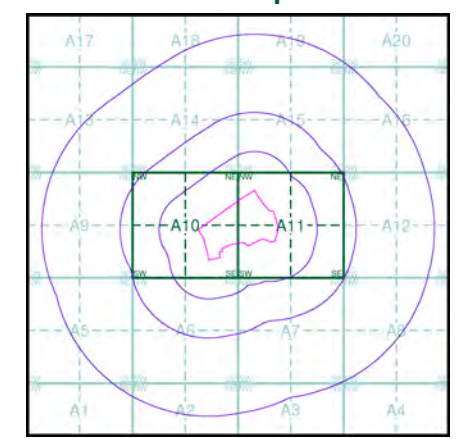


- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point

- OS Water Network Data**
- | | |
|--------------|-------------------------|
| Canal | Drain |
| Reservoir | Other |
| Foreshore | Lake |
| Marsh | Transfer |
| Tidal River | Lock Or Flight Of Locks |
| Inland River | Sea |

- Contours (height in meters)**
- Standard Contour 105 100 95
- Master Contour
- Spot Height 167.3
- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



Order Details

Order Number: 192531415_1_1

Customer Ref: PO14098/JW/3319

National Grid Reference: 415180, 420500

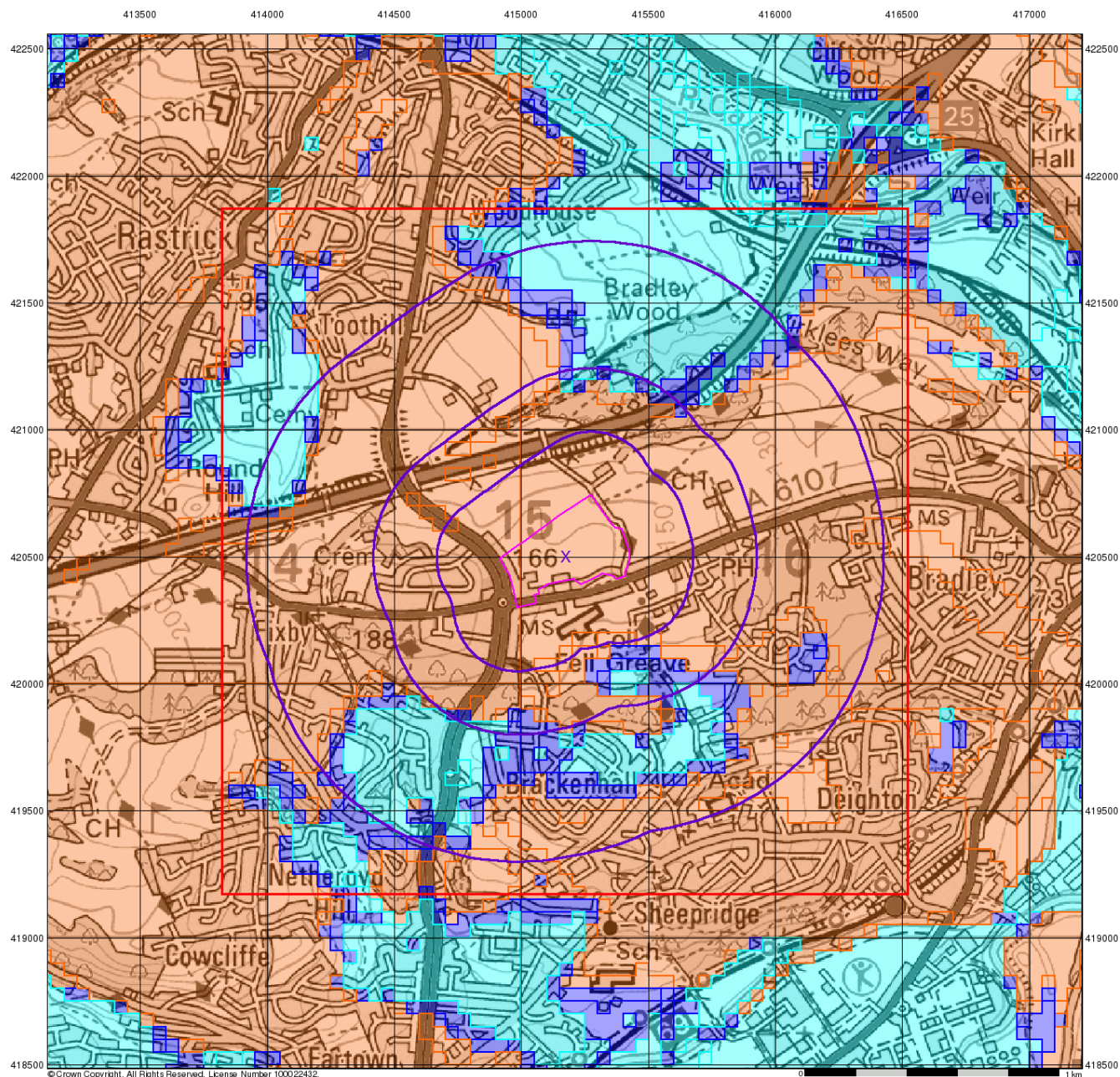
Slice: A

Site Area (Ha): 11.85

Search Buffer (m): 1000

Site Details

13, Torcote Crescent, HUDDERSFIELD, HD2 2JU



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BGS Flood GFS Data

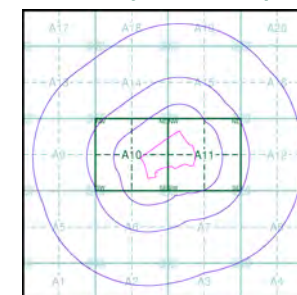
General

- 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: 192531415 1 1
 Customer Ref: PO14098/JW/3319
 National Grid Reference: 415180, 420500
 Slice: A
 Site Area (Ha): 11.85
 Search Buffer (m): 1000

Site Details

13, Torcote Crescent, HUDDERSFIELD, HD2 2JU



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 Fax: 0844 844 9951
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Source Protection Zones

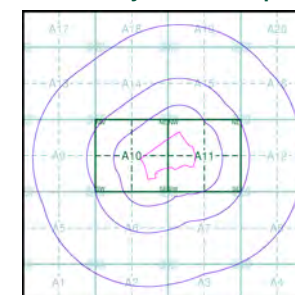
General

- 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

Order Number: 192531415 1 1
 Customer Ref: PO14098/JW/3319
 National Grid Reference: 415180, 420500
 Slice: A
 Site Area (Ha): 11.85
 Search Buffer (m): 1000

Site Details

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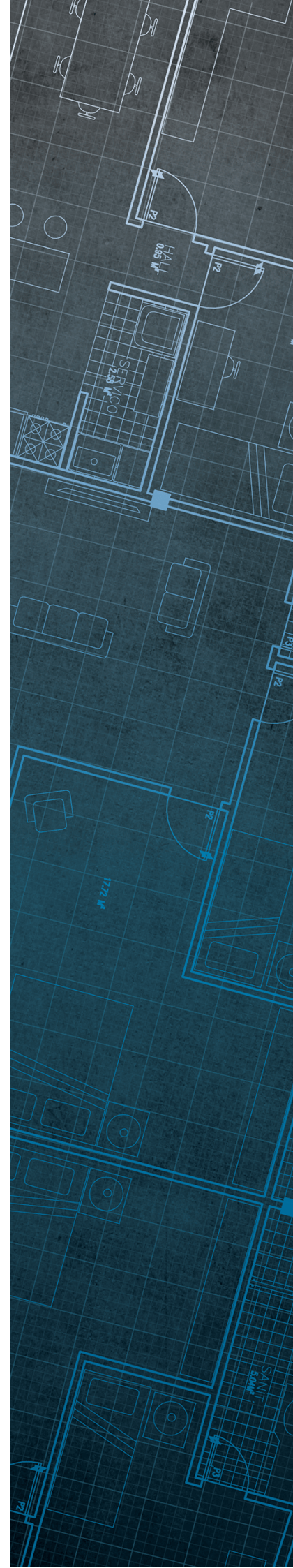


The Coal
Authority

Consultants Coal Mining Report

Bradley Villa Farm
Huddersfield
HD2 2JY

Date of enquiry:	30 January 2019
Date enquiry received:	30 January 2019
Issue date:	30 January 2019
Our reference:	51002003374001
Your reference:	PO14102/JW/3319



Consultants

Coal Mining Report

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

Client name

LITHOS CONSULTING LTD

Enquiry address

Bradley Villa Farm
Huddersfield
HD2 2JY

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

No past mining recorded.

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

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

1167	FGB272	1801
7712	4299	FGB274
11052	PO0	6698

Our records show we have more plans than those shown above which could affect the enquiry boundary.

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

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

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

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

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

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

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

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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

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

Payments to owners of former copyhold land

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

Section 4 – Further information

Based on the responses in this report, no further information has been highlighted.

Section 5 – Data definitions

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

Past underground coal mining

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

Probable unrecorded shallow workings

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

Spine roadways at shallow depth

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

Mine entries

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

Abandoned mine plan catalogue numbers

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

Outcrops

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

Geological faults, fissures and breaklines

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

Opencast mines

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

Coal Authority managed tips

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

Site investigations

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

Remediated sites

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

Coal mining subsidence

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

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

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

Mine gas

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

Mine water treatment schemes

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

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

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

Future underground mining

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

Coal mining licensing

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

Court orders

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

Section 46 notices

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

Withdrawal of support notices

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

Payment to owners of former copyhold land

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

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

Key

Approximate position of the enquiry boundary shown 

How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com





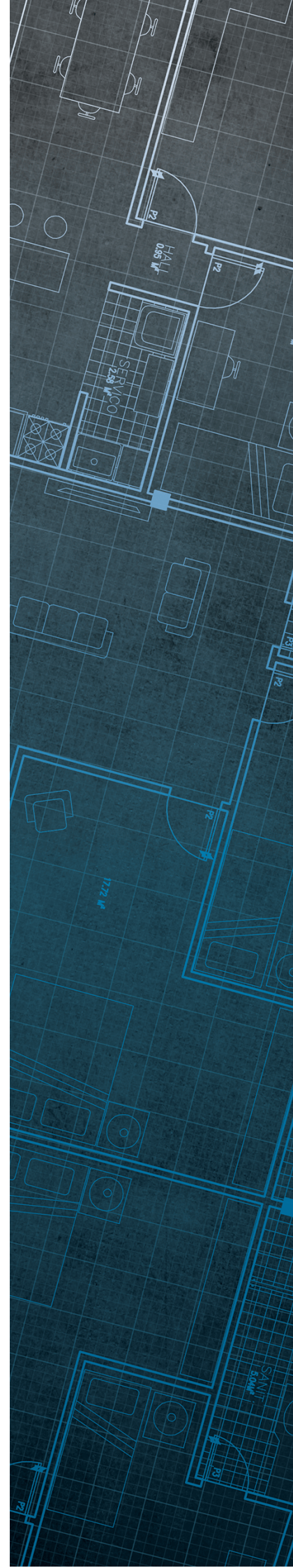
The Coal
Authority

Consultants Coal Mining Report

Kirklees Active Leisure
Bradley Park Golf Club
Bradley Park Golf Course
Bradley Road
Bradley
Huddersfield
Kirklees
HD2 1PZ

Date of enquiry:	2 October 2020
Date enquiry received:	2 October 2020
Issue date:	2 October 2020

Our reference:	51002313134001
Your reference:	3319



Consultants

Coal Mining Report

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

Client name

LITHOS CONSULTING LTD

Enquiry address

Kirklees Active Leisure
Bradley Park Golf Club
Bradley Park Golf Course
Bradley Road
Bradley
Huddersfield
Kirklees
HD2 1PZ

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

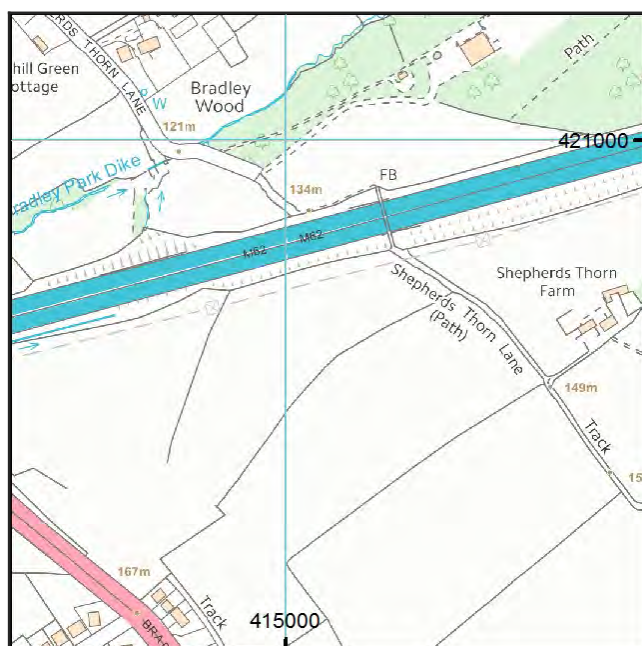
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

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 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	BETTER BED	Coal	6HD3	10	Beneath Property	1.4	South-East	56	1881

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	414420-008	414944 420741		Coal	
Adit	414420-009	414963 420748		Coal	
Adit	415420-001	415099 420867		Coal	
Shaft	415420-002	415093 420861		Coal	

Abandoned mine plan catalogue numbers

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

7712	6698	1493
------	------	------

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

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
BETTER BED	Coal	Yes	Within	N/A	41
BETTER BED	Coal	Yes	Within	N/A	240

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

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

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

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

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

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

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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

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

Payments to owners of former copyhold land

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

Section 4 – Further information

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

Development advice

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

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

Section 5 – Data definitions

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

Past underground coal mining

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

Probable unrecorded shallow workings

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

Spine roadways at shallow depth

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

Mine entries

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

Abandoned mine plan catalogue numbers

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

Outcrops

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

Geological faults, fissures and breaklines

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

Opencast mines

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

Coal Authority managed tips

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

Site investigations

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

Remediated sites

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

Coal mining subsidence

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

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

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

Mine gas

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

Mine water treatment schemes

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

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

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

Future underground mining

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

Coal mining licensing

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

Court orders

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

Section 46 notices

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

Withdrawal of support notices

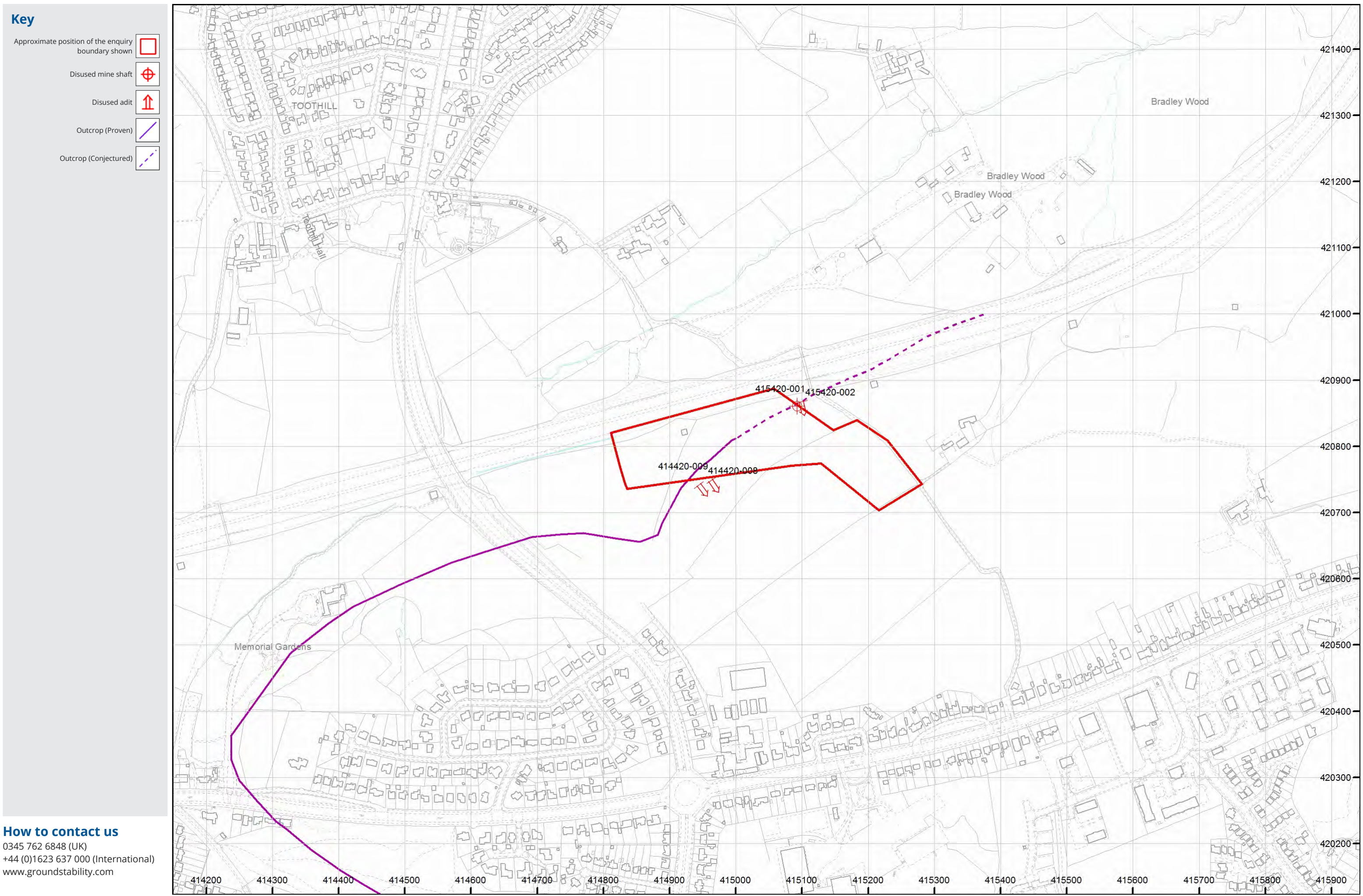
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

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

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



From: [Steve Meredith](#)
To: [Charlotte Copley](#)
Cc: [Matt Thompson](#); [James Smith](#); [Philip Smith](#)
Subject: FW: [External] FW: Planning and technical advice
Date: 14 March 2019 16:16:00
Attachments: [image002.jpg](#)
[image004.jpg](#)
[image001.png](#)

Good afternoon,

RE: Bradley Villa Farm, Huddersfield, HD2 2JY

Thank you for your enquiry on the email below. After chatting briefly to you while you were on site and then at length with Matt I thought it best to cover what was said in an email.

I can confirm that the Coal Authority are happy with the extent of our Development High Risk Area. The Better Bed coal seam outcrops to the north of your site and while we generally give a 50m buffer on the dipside of an outcrop, I notice that in this case it is extended a further 70m by an area of probable shallow workings. This brings it to within 60m of the north western corner of your site.

However, as discussed on the phone with Matt, our datasets are inherited from British Coal and it is impractical for us to check and validate everything. If you feel that there is a chance that there is shallow coal beneath your site then we would advise you to investigate this possibility to the best of your professional abilities.

I hope this information is of some use to you.

Many thanks,

Steve



Steve Meredith
Mining Information Manager
T : (01623) 637 317
W : www.gov.uk/coalauthority

From: Planning Advice
Sent: 26 February 2019 08:28
To: Steve Meredith
Subject: FW: [External] FW: Planning and technical advice

Morning Steve

Hope you're well.

I understand that Huddersfield is in your neck of the woods, so I'm hoping you'll be able to help

Charlotte Copley at Lithos.

She's emailed the Planning and Technical Advice inbox (chargeable service), however, her enquiry relates entirely to matters regarding the reasoning behind the extent of the Development High / Low Risk Areas relative to her study site. As such, the enquiry relates to our data and Planning and Permitting would not have anything of use to feed back at this stage of the development proposals.

Are you/MI able to provide Charlotte with some comments re how we defined the DHRA and DLRAs? If this represents a chargeable service, please let her know.

Thanks

James

From: Charlotte Copley [mailto:Charlotte.Copley@lithos.co.uk]
Sent: 22 February 2019 12:14
To: Planning Advice
Subject: [External] FW: Planning and technical advice

Apologies for a second email, however, I just noticed a typo- the coal outcrops 200m north of site, not 20m.

Many thanks,
Charlotte
Charlotte Copley
Graduate Engineer
Lithos Consulting Ltd
M 07507 503 333
DD 01937 545 359



www.lithos.co.uk

From: Charlotte Copley
Sent: 22 February 2019 12:09
To: 'planningadvice@coal.gov.uk' <planningadvice@coal.gov.uk>
Cc: Matt Thompson <Matt.thompson@lithos.co.uk>
Subject: Planning and technical advice

Good Afternoon,

Please could I request a pre-application advice service.

We are a geoenvironmental consultancy providing advice on proposed housing developments and currently have a site 'Villa Farm, Bradley'. The site lies within a Coal Mining Development Low Risk Area, however, a Coal Authority Development High Risk Area lies just beyond the northern and eastern boundary of site.

The High Risk Area to the north contains the Better Bed Coal Seam and has associated probable shallow workings. The High risk area to the east does not contain any probable shallow workings.

From looking at BGS maps the Better Bed Coal seam outcrops around 20m north of the site , with rocks younging to the south. Using the GVS we have estimated that the Better Bed Coal seam will be around 5-10m depth below the north of the site.

Due to the coal appearing to be very shallow in the north of site, is there a reason why the site (particularly the north) is a Low Risk area/ is unlikely to have been mined underneath the site if the coal is likely to be at a shallow depth, and why the area to the east is also classed as high risk even though there are no probable shallow workings?

The postcode for the site is HD2 2JT.

Please find attached and OS Map with the site and CA/BGS data overlain and the Coal Authority Report. If any terms and conditions need to be signed, please don't hesitate to contact me.

Before starting on this, please could you give me the cost of the work?

I look forward to hearing from your response,

Kind Regards,
Charlotte
Charlotte Copley
Graduate Engineer
Lithos Consulting Ltd

Parkhill
Walton Road
Wetherby, LS22 5DZ

M 07507 503 333
DD 01937 543 359



www.lithos.co.uk

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