



COAL MINING RISK ASSESSMENT

**LAND ADJACENT TO
129 CROFT LANE,
BURY,
BL9 8QH**

Prepared for:

DIAB MGT LTD

By:

ENVIROSOLUTION LTD

The Quay Suite 5

No. 12 Princess Docks

Liverpool Waters

Liverpool

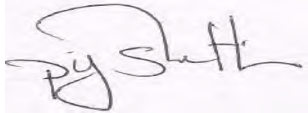
L3 1DL

Date:

23rd November 2021



EnviroSolution Ltd Document Verification

Site Address	Land adjacent to 129 Croft Lane, Bury, BL9 8QH		
Report Title	Coal Mining Risk Assessment		
Job Number	CL101	Document Ref.	CL101
Date Issued	23 rd November 2021	Report Version	2
Prepared by	Tom Craig MSc, BSc (Hons), FGS	Signature	
Checked by	Phil Shelton PhD BSc CEng MIMMM FGS	Signature	

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1 Introduction

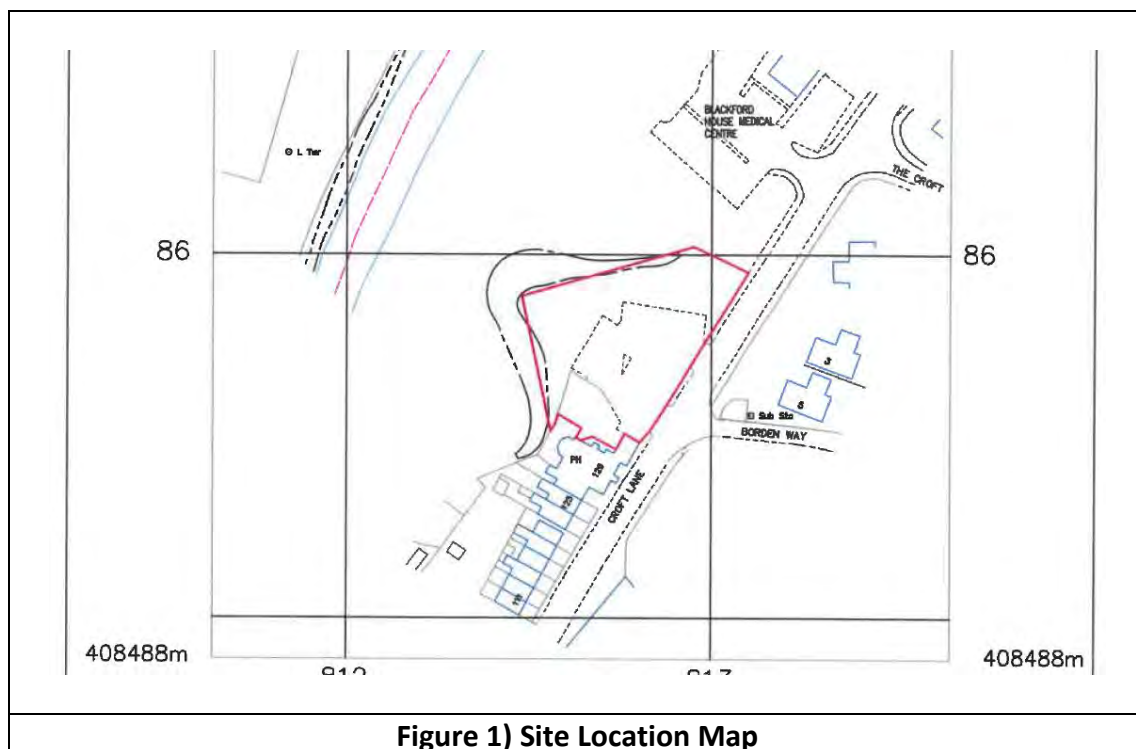
1.1 Site Location and Description

The site for the proposed new children's nursery development is located at land adjacent to 129 Croft Lane, Bury, BL9 8QH. The British National Grid Reference for the approximate site centre is GR: 381270 408575.

The site is irregular in shape and covers an approximate area of 1,820 square metres. The site is currently vacant but is used as a small rear car park to the neighbouring public house and a permit holder car park which is fenced off. The majority of the site is covered in tarmacadam hardstanding with areas of landscaping around the perimeter.

The site is generally flat but slopes gently southwest towards the River Roch from about 79m aOD to about 75m aOD. Vehicle access is gained from Croft Lane to the east. A height limit of 6ft 6" applies to the permit car park.

A plan showing the location of the site is shown in **Figure 1**.



1.2 Development Proposal

It is understood that the development proposal includes the construction of a three-storey children's nursery which includes an external play area to the north and vehicle parking to the west and south of the building.

The development plans are included in **Figure 3** in **Appendix A**.

1.3 Scope of Coal Mining Risk Assessment

EnviroSolution Ltd has been commissioned to prepare a Coal Mining Risk Assessment Report (CMRA) for the proposed development site, in order to provide the Local Planning Authority with information on the coal mining legacy risk(s), an assessment of their potential impact on land stability, and provide recommendations for the need to carry out any further investigations (including intrusive boreholes) to address these risk(s).

The CMRA has been undertaken in accordance with the principles of best practice including the Coal Authority's guidance document "Risk Based Approach to Development Management - Resources for Developers Version 3" (2014) (Ref. 1), CIRIA "SP32 Construction over Abandoned Mine Workings" (2002) (Ref. 2) and CIRIA "C758D Abandoned Mine Workings Manual" (2019) (Ref. 3).

The purpose of the CMRA Report is to:

- present a desk-based review of available information on the coal mining issues that are relevant to the application site;
- use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact issues;
- set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development; and
- demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of National Planning Policy with regard to development on unstable land.

1.4 Sources of Information

This report is based on current information of past mining activities relevant to the site. The following information sources have been used:

- Consultants Mining Report dated 24th November 2020 (Ref: 51002321944001 **Appendix C**);
- BGS Geoindex geological map;
- BGS geological 1:50,000 England and Wales Sheet 85 Manchester;
- Coal Authority Interactive Website;
- Historical Ordinance Survey maps.

2 Environmental Setting

2.1 Historic Coal Mining Activity

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area are summarised in Table 1. Copies of the historical OS maps are included in **Appendix D**.

Table 1 - Historic Mapping Review

Date	Scale	Historic Mining Activity
1851	1:10,560	- The site is undeveloped and lies within a vacant plot of land. - Reservoir 10m southeast of the site. - River Roch 60m west of the site. - Bleach works 90m south of the site. - Hollins Brook 95m south of the site. - Bleach works 190m east of the site.
1893	1:2,500	- Residential development directly south of the site.
1957	1:10,560	- The site appears to be used as a car park.

2.2 Geological Context

The BGS geological mapping (Geoindex and BGS Sheet 85 Manchester) show that the site lies directly above the boundary of a diamicton sheet, head deposits and alluvium which are of Quaternary age. All of which may be present beneath the site to some extent.

The underlying bedrock consists of the Trencherbone Sandstone Member of the Pennine Lower Coal Measures Formation which is of Carboniferous age. The Pennine Lower Coal Measures Formation generally consists of interbedded grey mudstones and siltstones with pale grey sandstones and numerous coal seams. According to the BGS, the bedrock has a regional dip of about 10° towards the south – **See Appendix E**. However, nearby faulting could result in significant local variations.

The nearest geological fault intersects the site along the south-western site boundary. The fault has an approximate trend of 145° (Whole Circle Bearing) and downthrows towards the northeast.

Two BGS borehole records (SD80NW211 and SD80NW212) have been obtained from BGS online records. These are located along the western site boundary and 10m east of the site respectively. Borehole SD80NW211 records 3.40m of Made Ground overlying loose silty sand, soft grey sandy silty clay to depths of 10.60m bgl. Dense sand and gravel is recorded at 11.80m bgl. Borehole SD80NW212 shows 4.50m of Made Ground overlying soft to firm silty

sandy clays to 11.30m bgl. Stiff sandy gravelly clay (probably diamicton) is encountered at 11.30m bgl. Bedrock was not encountered. The location of the boreholes are shown in **Figure 2**.

Coal outcrops are shown to be located north of the site (see **Figure 2**) that may be encountered at shallow depths beneath the site and could potentially have unrecorded abandoned workings. Using the recorded regional dip of 10° to the south and the trigonometric relationship below, the depth of the coal seams beneath the site can be estimated. None of the proximate coal seams in this area have a history of spontaneous combustion.

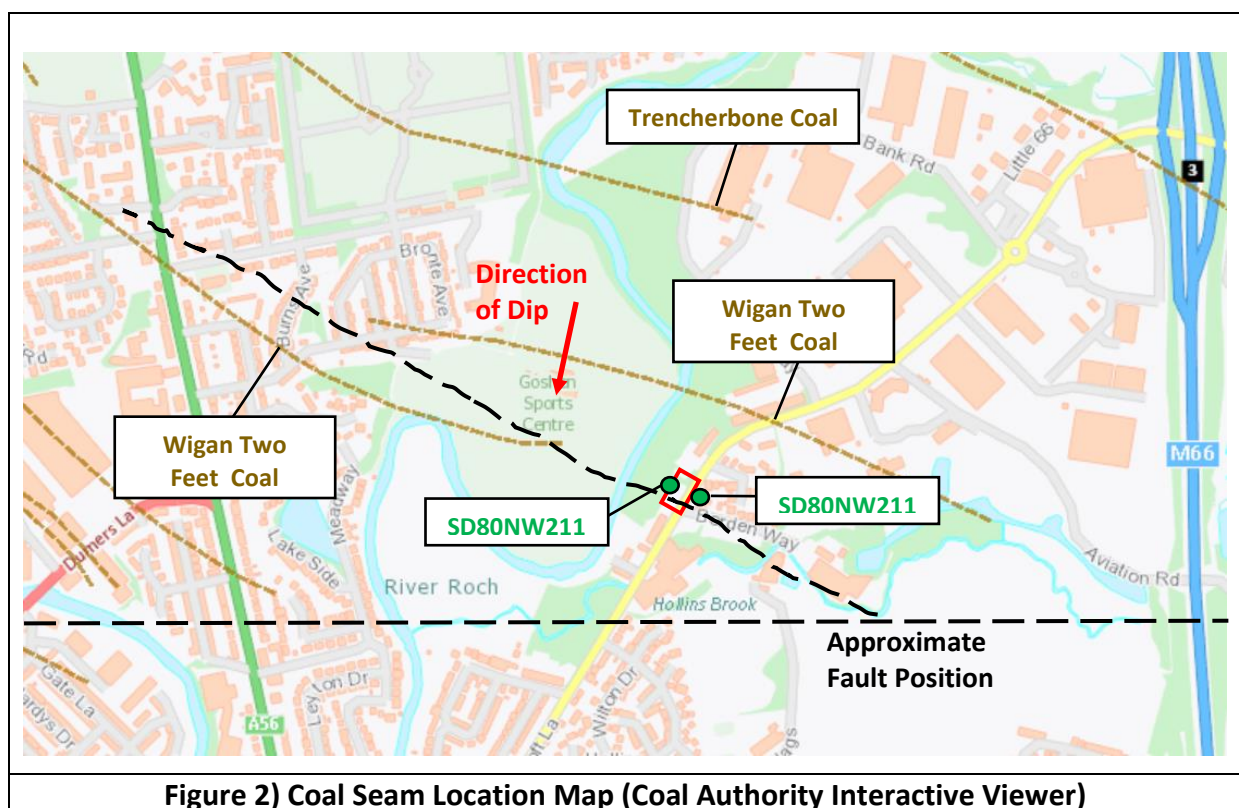
Wigan Two Feet Coal

$\tan 10^\circ \times 160\text{m} + 12\text{m}$ (minimum superficial thickness) - 5m (elevation change) = 40m

Trencherbone Coal

$\tan 10^\circ \times 440\text{m} + 12\text{m}$ (minimum superficial thickness) - 5m (elevation change) = 90m

The Wigan Two Feet Coal is juxtaposed on the southern side of the fault and could be present at shallow depths.



The site is situated within a Primary Opencast Coal Resource Area (**Appendix G**). The Primary Opencast Coal Resource Area is defined by the BGS as “an area that constitutes the main target for opencast coal extraction and comprises a relatively closely spaced succession of variable but generally thick coals. Notwithstanding this, it is considered to be very unlikely

that there will be any interest in developing open cast coal mining operations at this location in the short or medium-term.

3 Identification and Assessment of Site-Specific Coal Mining Risks

Table 2 below summarises the potential risks associated with coal mining legacy for the proposed development site, which have been identified from list sources of information.

Table 2 - Coal Mining Hazards Summary

Coal Mining Issues	Yes	No
Coal outcrops		X
Underground coal mining (recorded at shallow depths)		X
Underground coal mining (probable at shallow depths)	X	
Recorded mine entries (shafts and adits)		X
Unrecorded mine entries (shafts and adits)	X	
Coal mining geology (fissures)		X
Record of past gas emissions		X
Recorded coal mining surface hazard		X
Surface mining (opencast workings)		X

The Coal Authority Interactive Map Viewer (**Appendix H**) has identified that the northern and southern parts of the site lies within a Development High Risk Area associated with the potential presence of a shallow coal seams (Wigan Two Feet Coal) beneath the site.

The report obtained from the Coal Authority (Consultants Coal Mining Report, reference 51002321944001, dated 24th November 2020) states that the property is not in a surface area that could be affected by recorded underground mining.

However, the Coal Authority report states that the property is in an area where the Coal Authority believe there is coal at or close to the surface which may have been worked in the past (see Section 2.2). The Coal Authority has drawn attention to this and has stated that the presence of unrecorded shallow coal should be considered. As presented in Section 2.2, the coal seams that subcrop to the north of the site (Trencherbone and Wigan Two Feet Coal) can be discounted due to the depth of the seams beneath the surface. However, the Wigan Two Feet Coal juxtaposed on the southern side of the fault is likely to be present at shallow depths and could present a risk of surface instability.

The Coal Authority report states that they are not aware of any recorded mine entries within 100m of the development site boundary. Notwithstanding this, there may be mine entries in the vicinity that have not been recorded.

The Coal Authority mining report states the property is not within the boundary of a historic or current opencast site, and there are no license requests outstanding to remove coal via this method in the future. The risk posed to the site from opencast mining methods is therefore considered to be negligible.

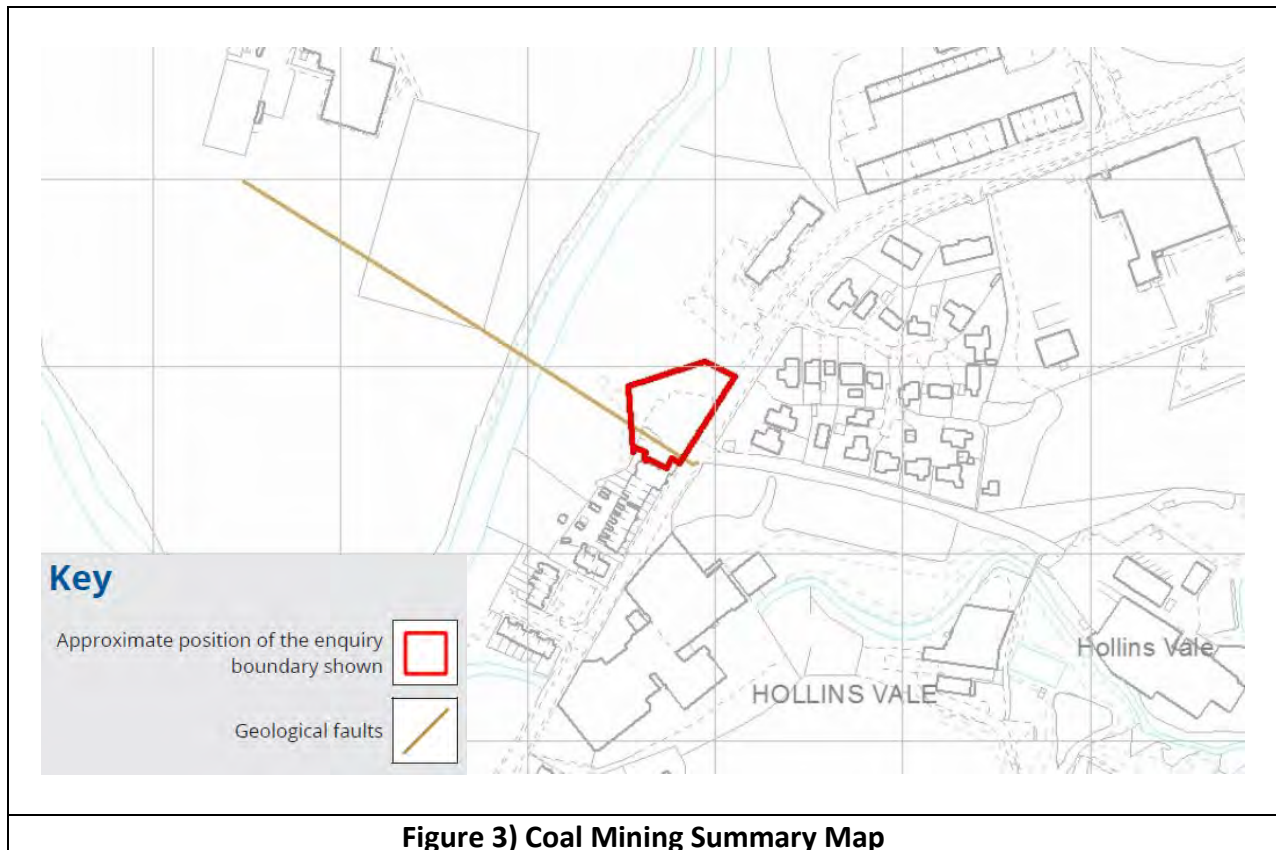


Figure 3) Coal Mining Summary Map

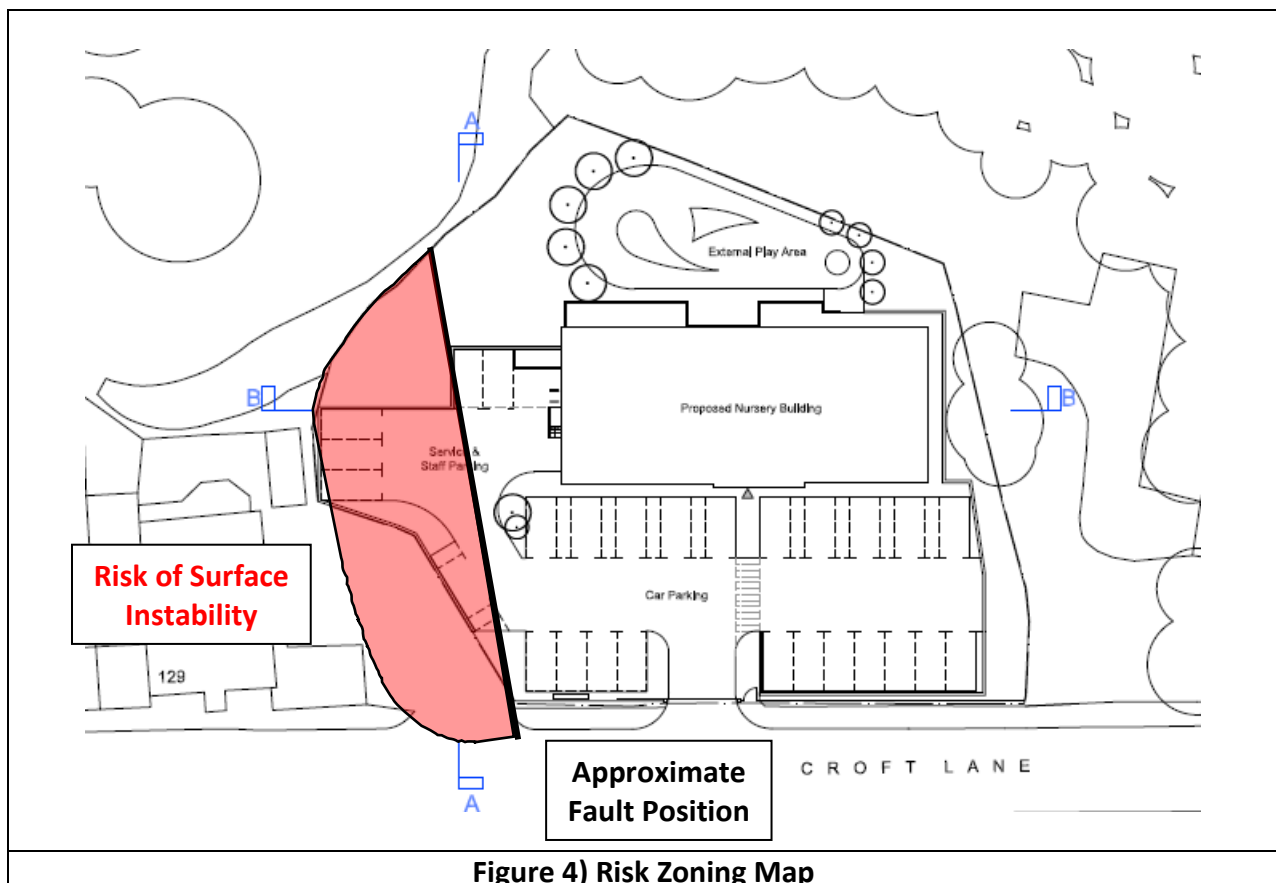


Figure 4) Risk Zoning Map

4 Proposed Mitigation Strategy

- The possibility of unrecorded mine shafts has been highlighted in the Coal Authority report. Historical maps do not show evidence of shafts within the site boundary. The potential risk can be dealt with through vigilance during the earthworks stage of construction.
- If future revisions of the proposed development plan include built development within the high risk zone, it is recommended that a minimum of 3 no. rotary boreholes are advanced to a minimum depth of 30m below ground level in this area. Water flush should be used to safeguard against oxidation and potential spontaneous combustion of shallow coal. In order to undertake these works it will be necessary to obtain a drilling permit from The Coal Authority.

5 Conclusions

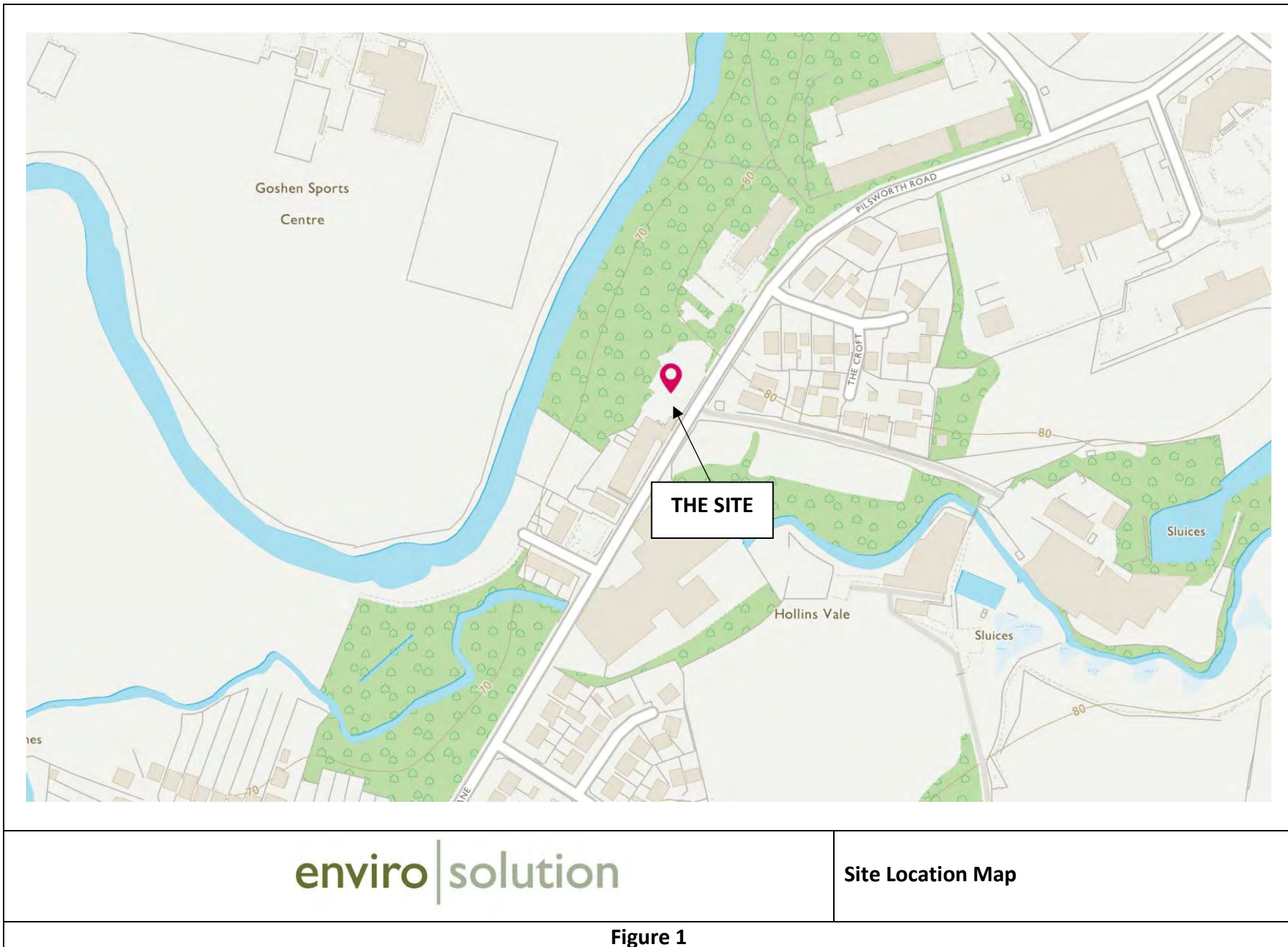
The Coal Mining Risk Assessment for the proposed nursery development at Croft Lane in Bury has concluded that the risk associated with coal mining related issues are low based on information from the Coal Authority and geological interpretation and can be suitably mitigated through informed professional practice and vigilance during construction.

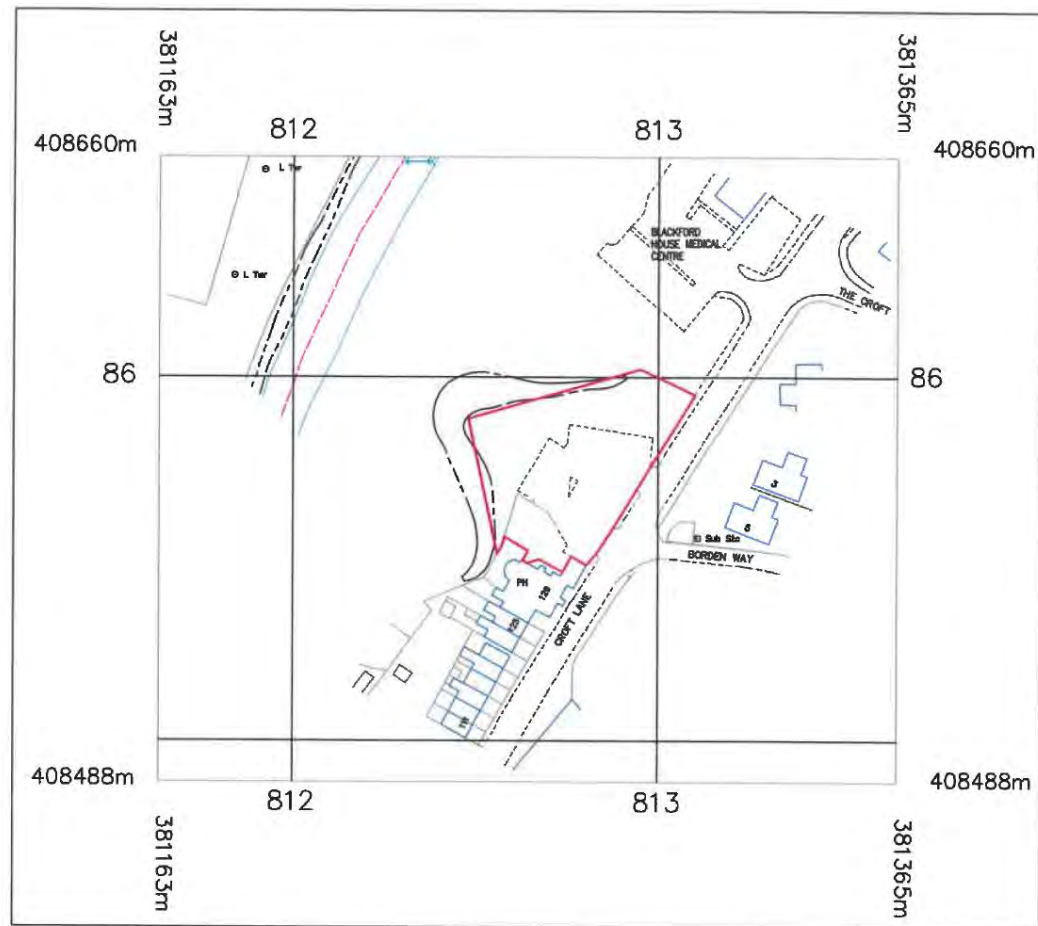
No further investigative or remedial works are deemed necessary for the proposed development.

6 References

1. Coal Authority, 2014, Risk Based Approach to Development Management Resources for Developers, Version 3.
2. CIRIA, 2002, SP32 Construction over Abandoned Mine Workings.
3. CIRIA, 2019, C758D Abandoned Mine Workings Manual.
4. CIRIA, Publication C665, Assessing risks posed by hazardous ground gases to buildings.

Appendix A – Site Location and Site Plan



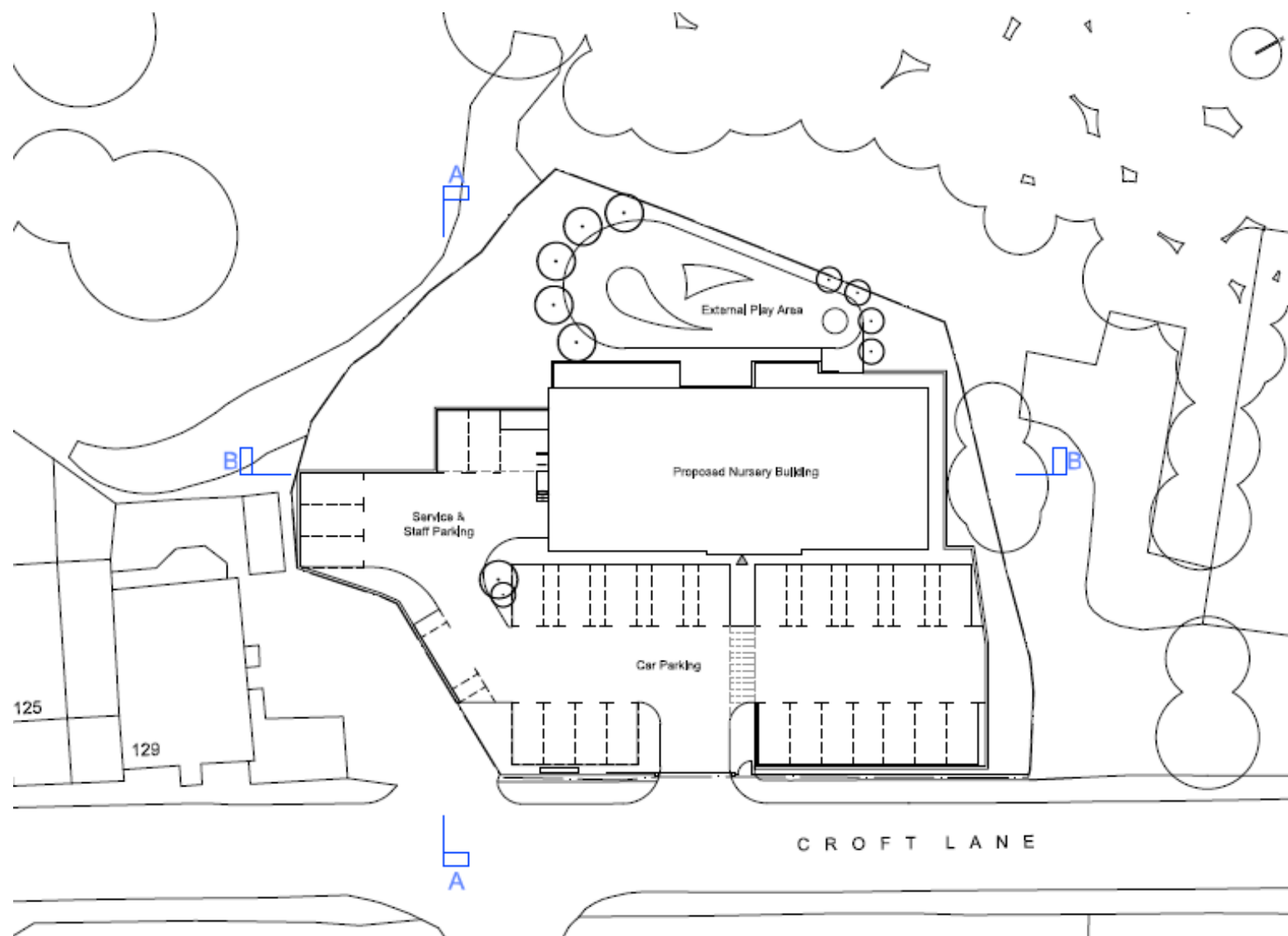


LOCATION PLAN 1:1250

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Existing Site Plan

Figure 2



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Proposed Development Plan

Figure 3

Appendix B – Site Photographs



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View of site looking west



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Site entrance



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View of site looking southwest



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Raised grass verge along northern site boundary



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View of site looking west



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View of site looking southwest

Appendix C – Coal Authority Consultants Mining Report



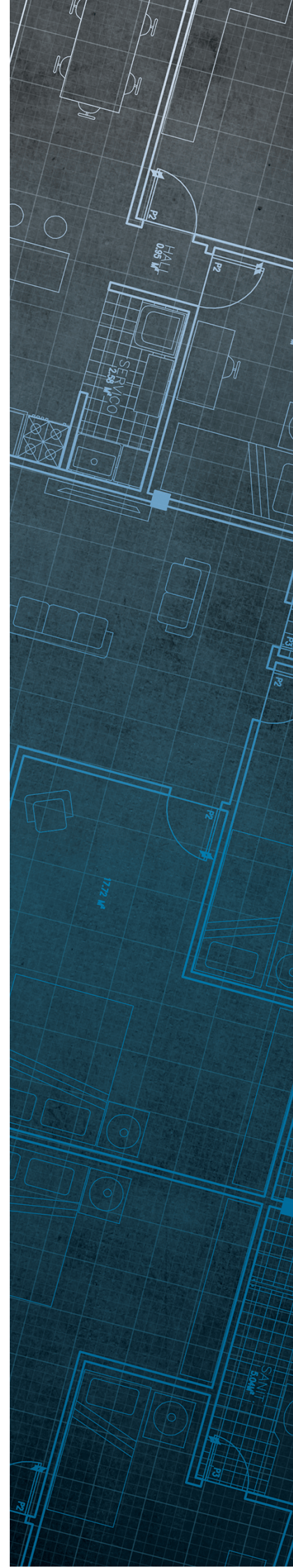
The Coal
Authority

Consultants Coal Mining Report

Car Park Opposite Borden Way
Croft Lane
Bury
BL9 8QH

Date of enquiry:	24 November 2020
Date enquiry received:	24 November 2020
Issue date:	24 November 2020

Our reference:	51002321944001
Your reference:	ES241120



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

EnviroSolution Limited

Enquiry address

Car Park Opposite Borden Way
Croft Lane
Bury
BL9 8QH

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

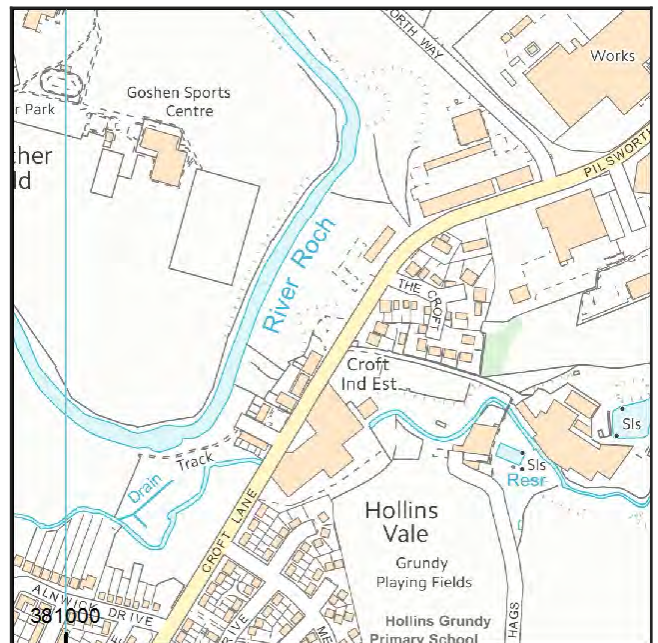
www.groundstability.com

 @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

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

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

16820		
-------	--	--

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

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

Fault under or close to the property recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

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

Site investigations

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.

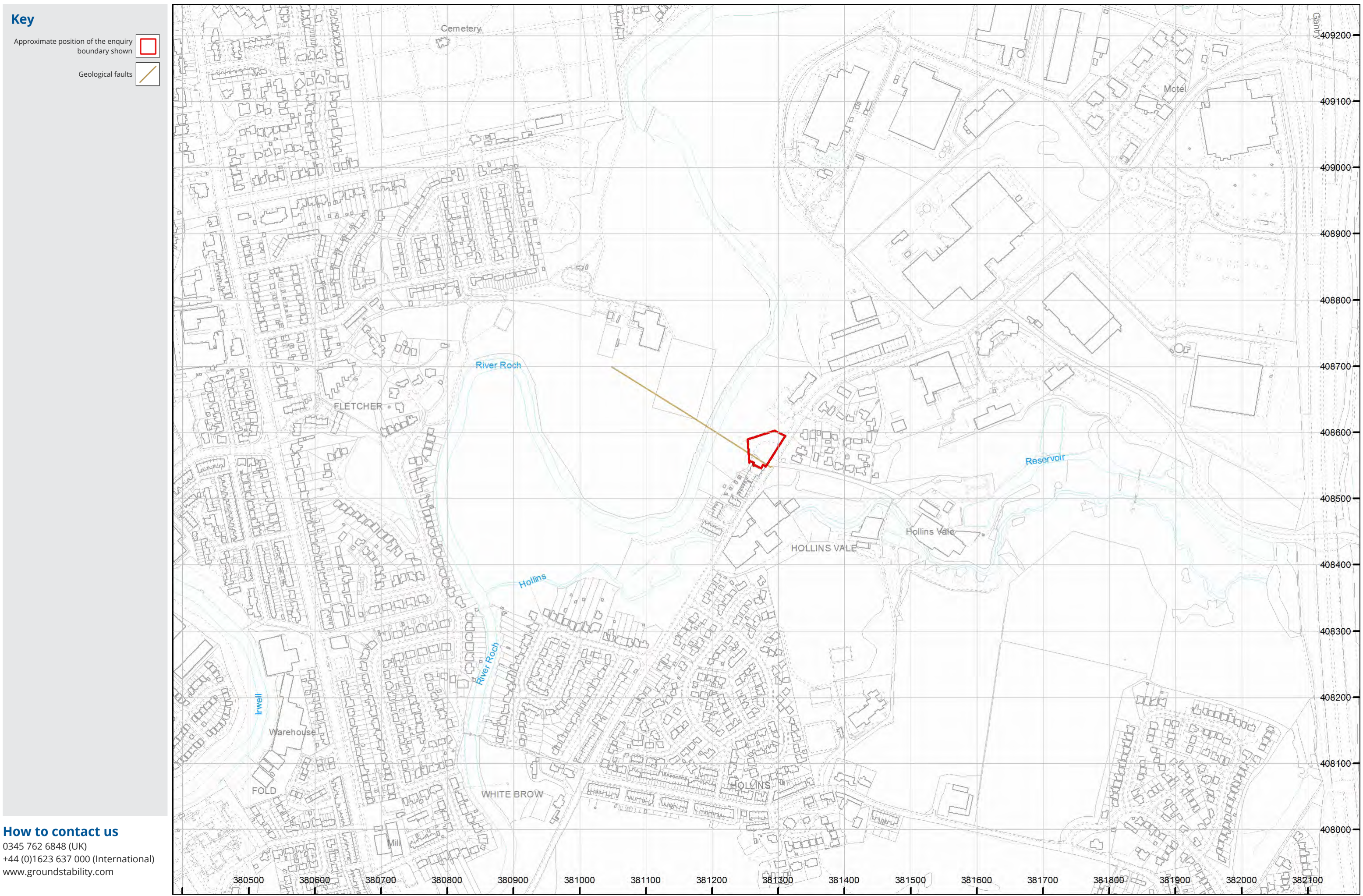
Withdrawal of support notices

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.

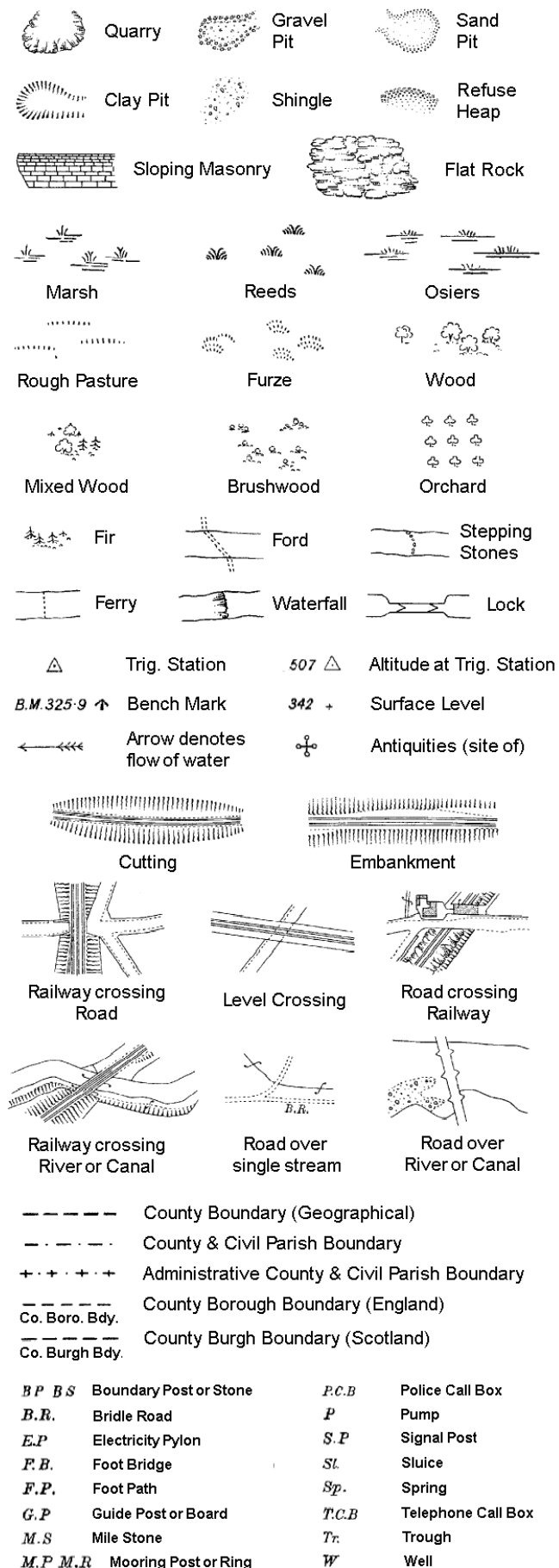
The map highlights any specific surface or subsurface features within or near to the boundary of the site.



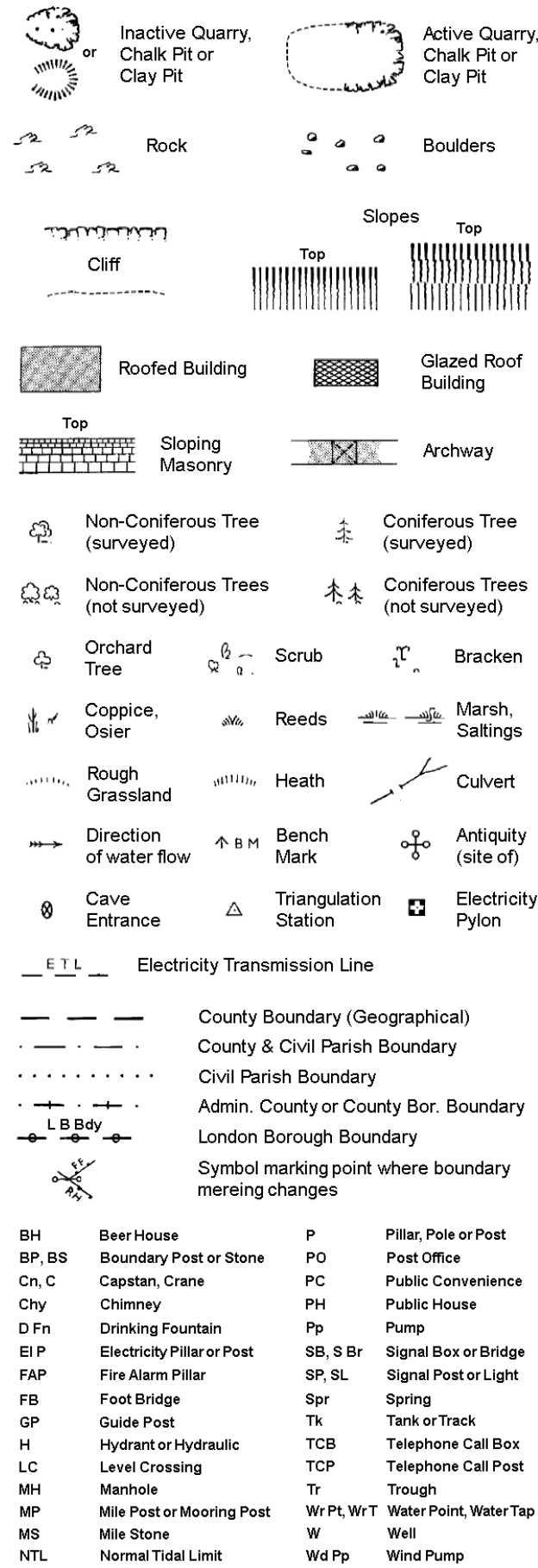
Appendix D - Historical Maps

Historical Mapping Legends

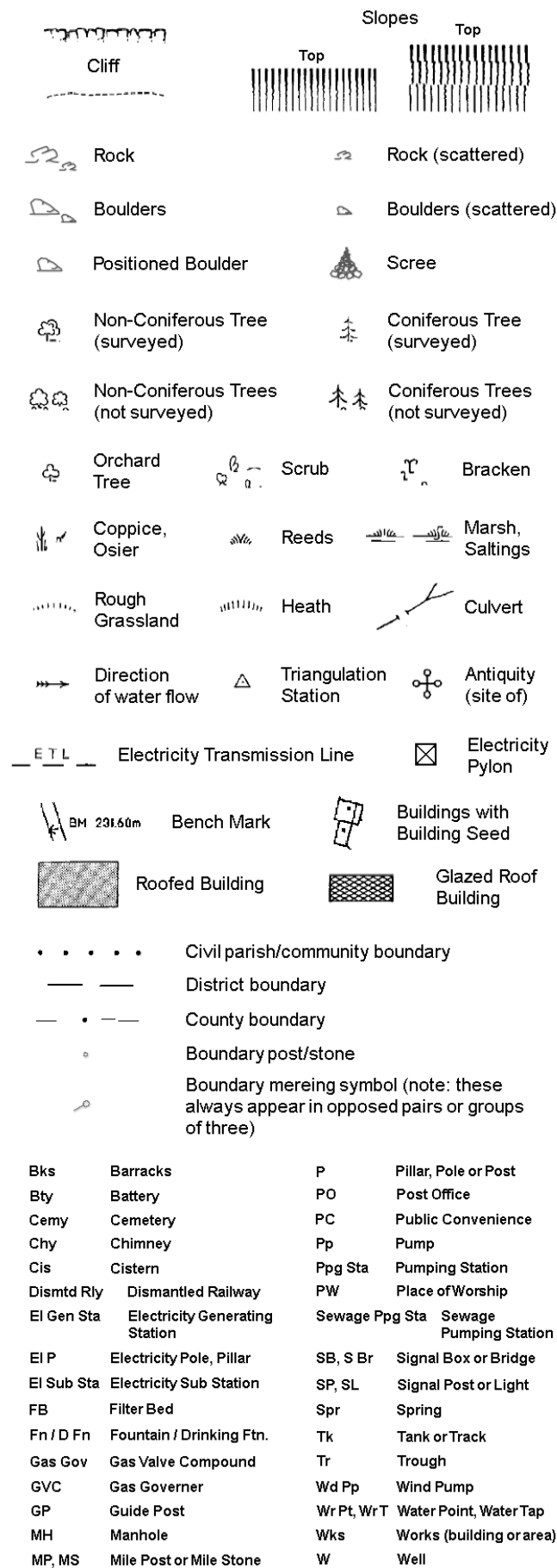
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



Large-Scale National Grid Data 1:2,500 and 1:1,250



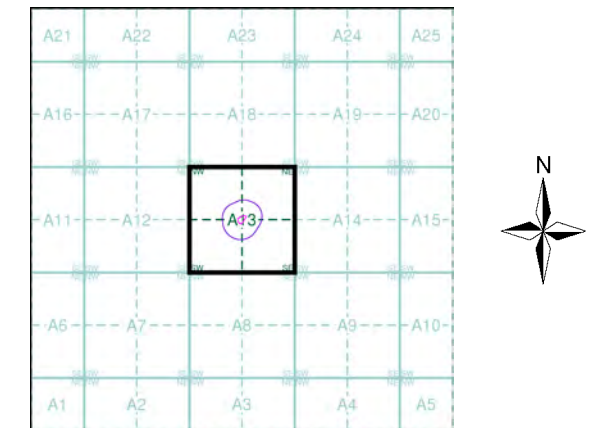
Envirocheck®

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1893	2
Lancashire And Furness	1:2,500	1910	3
Lancashire And Furness	1:2,500	1930	4
Lancashire And Furness	1:2,500	1937	5
Ordnance Survey Plan	1:2,500	1957	6
Ordnance Survey Plan	1:1,250	1957	7
Ordnance Survey Plan	1:1,250	1967 - 1975	8
Ordnance Survey Plan	1:1,250	1970 - 1990	9
Ordnance Survey Plan	1:2,500	1971	10
Additional SIMs	1:1,250	1977 - 1985	11
Ordnance Survey Plan	1:1,250	1982	12
Additional SIMs	1:1,250	1988 - 1991	13
Large-Scale National Grid Data	1:1,250	1992	14
Large-Scale National Grid Data	1:1,250	1995	15
Large-Scale National Grid Data	1:1,250	1996	16
Large-Scale National Grid Data	1:1,250	1996	17
Large-Scale National Grid Data	1:1,250	1996	18

Historical Map - Segment A13



Order Details

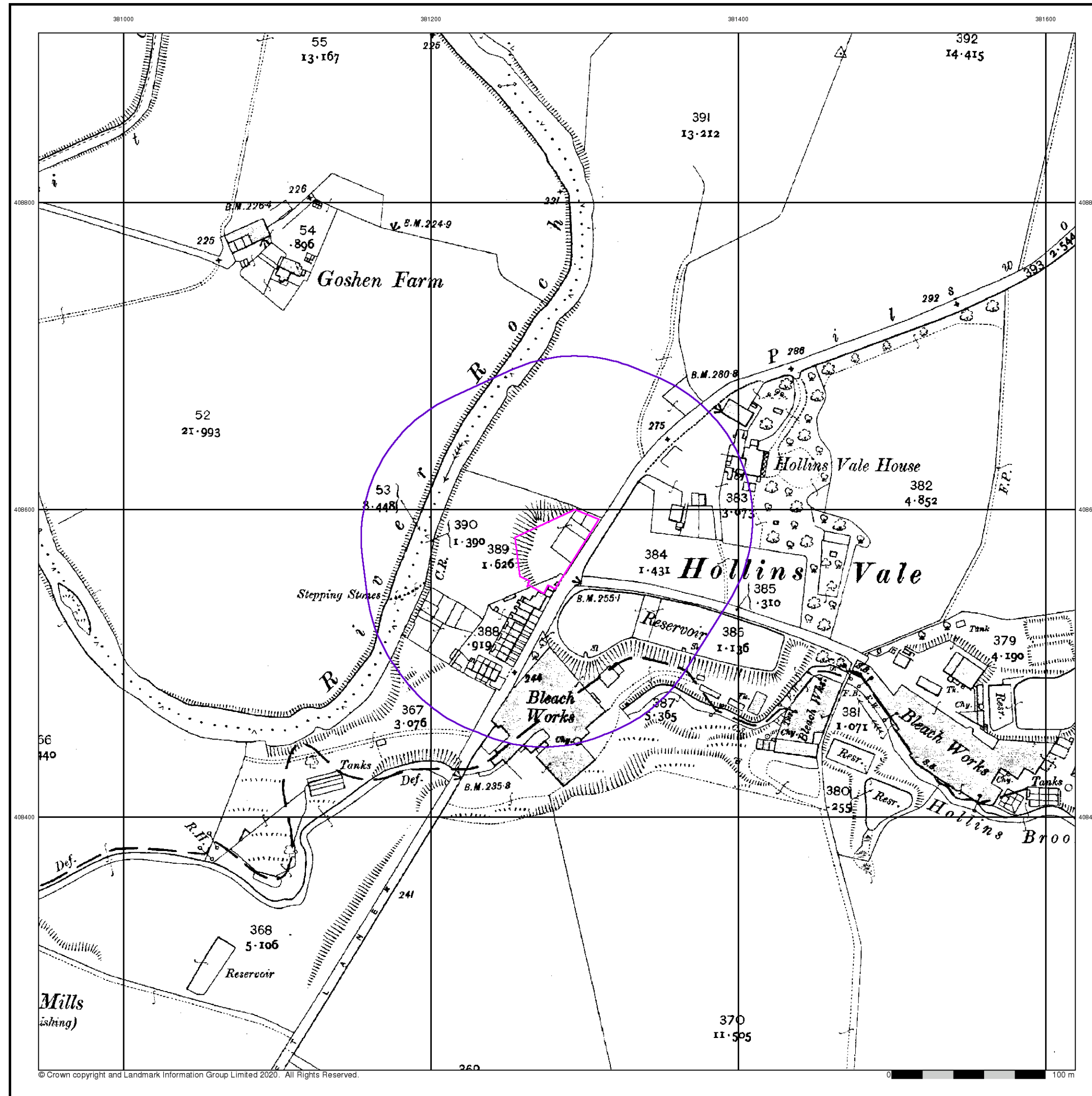
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Customer Ref: ES171120
National Grid Reference: 381280, 408570
Slice: A
Site Area (Ha): 0.17
Search Buffer (m): 100

Site Details

Decor Effects Ltd, 129, Croft Lane, BURY, BL9 8QH

Landmark
INFORMATION GROUP

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



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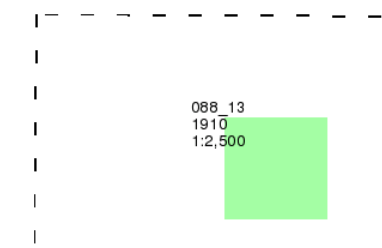
Lancashire And Furness

Published 1910

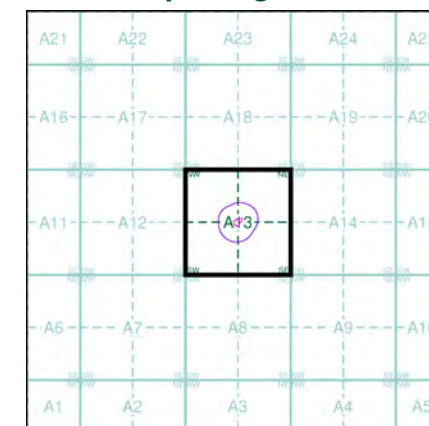
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

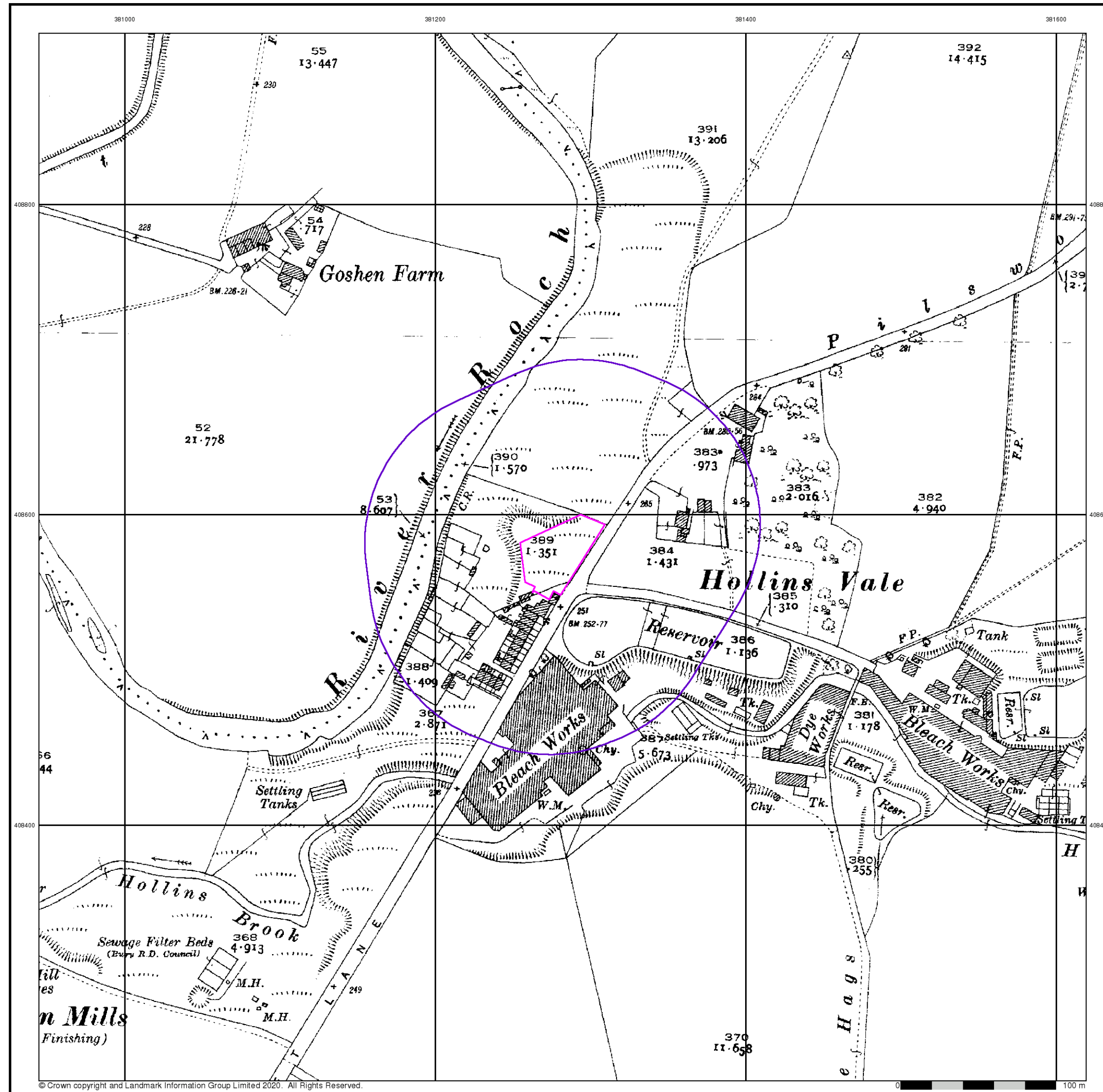
Order Number: 267601181_1_1
Customer Ref: ES171120
National Grid Reference: 381280, 408570
Slice: A
Site Area (Ha): 0.17
Search Buffer (m): 100

Site Details

Decor Effects Ltd, 129, Croft Lane, BURY, BL9 8QH

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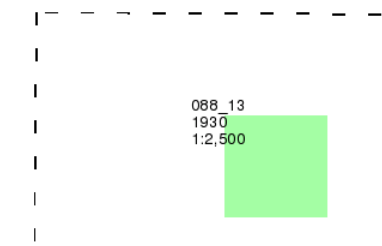
Lancashire And Furness

Published 1930

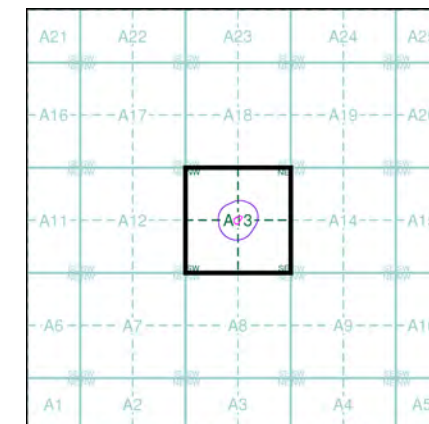
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13

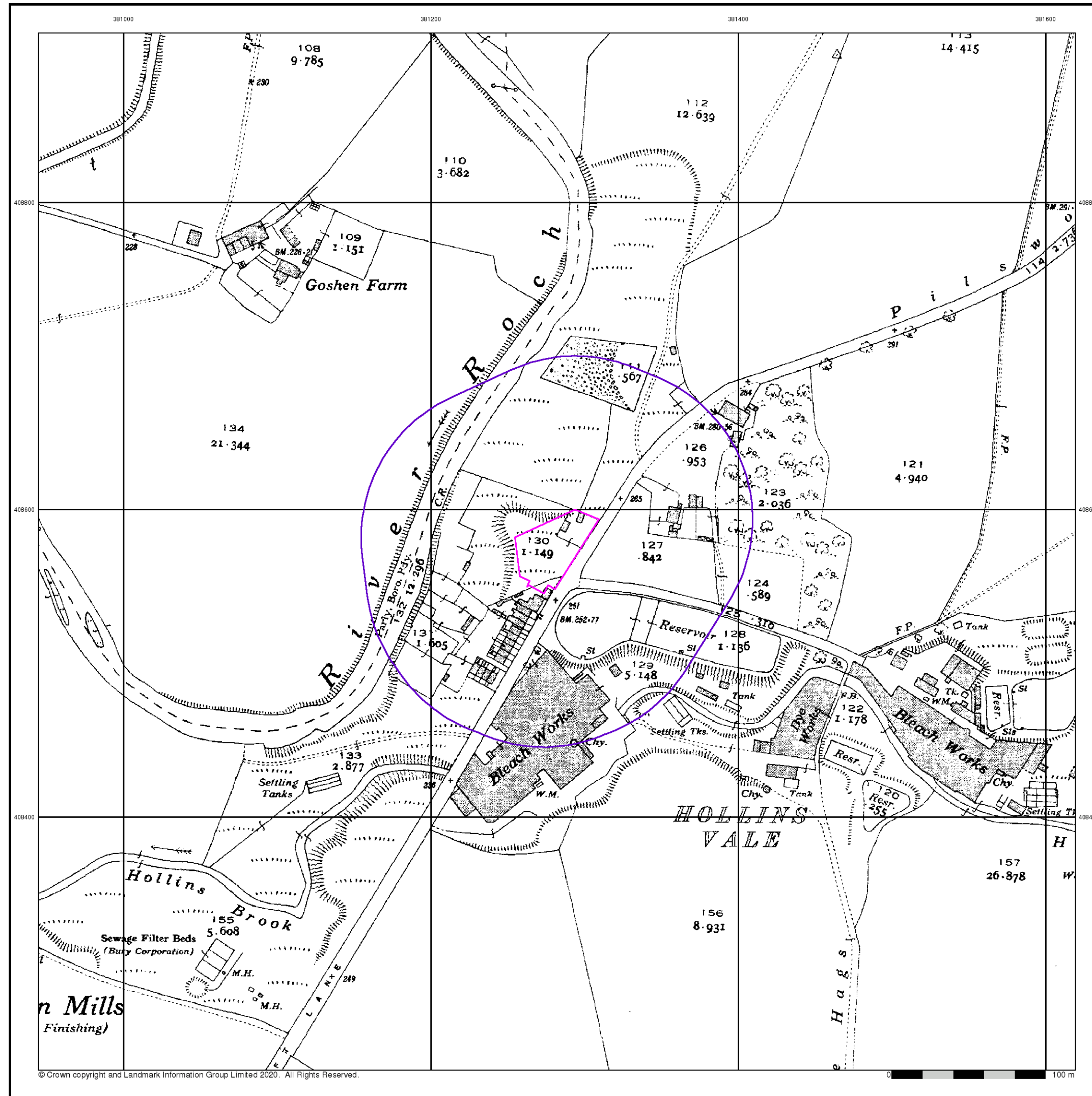


Order Details

Order Number: 267601181_1_1
Customer Ref: ES171120
National Grid Reference: 381280, 408570
Slice: A
Site Area (Ha): 0.17
Search Buffer (m): 100

Site Details

Decor Effects Ltd, 129, Croft Lane, BURY, BL9 8QH



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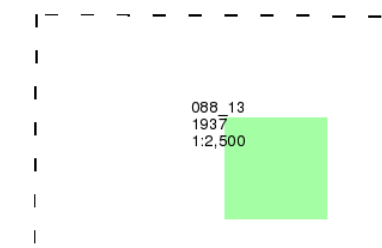
Lancashire And Furness

Published 1937

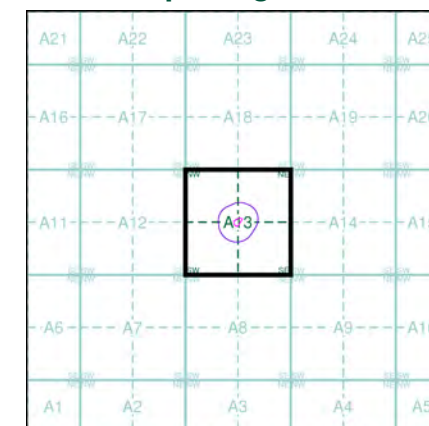
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13

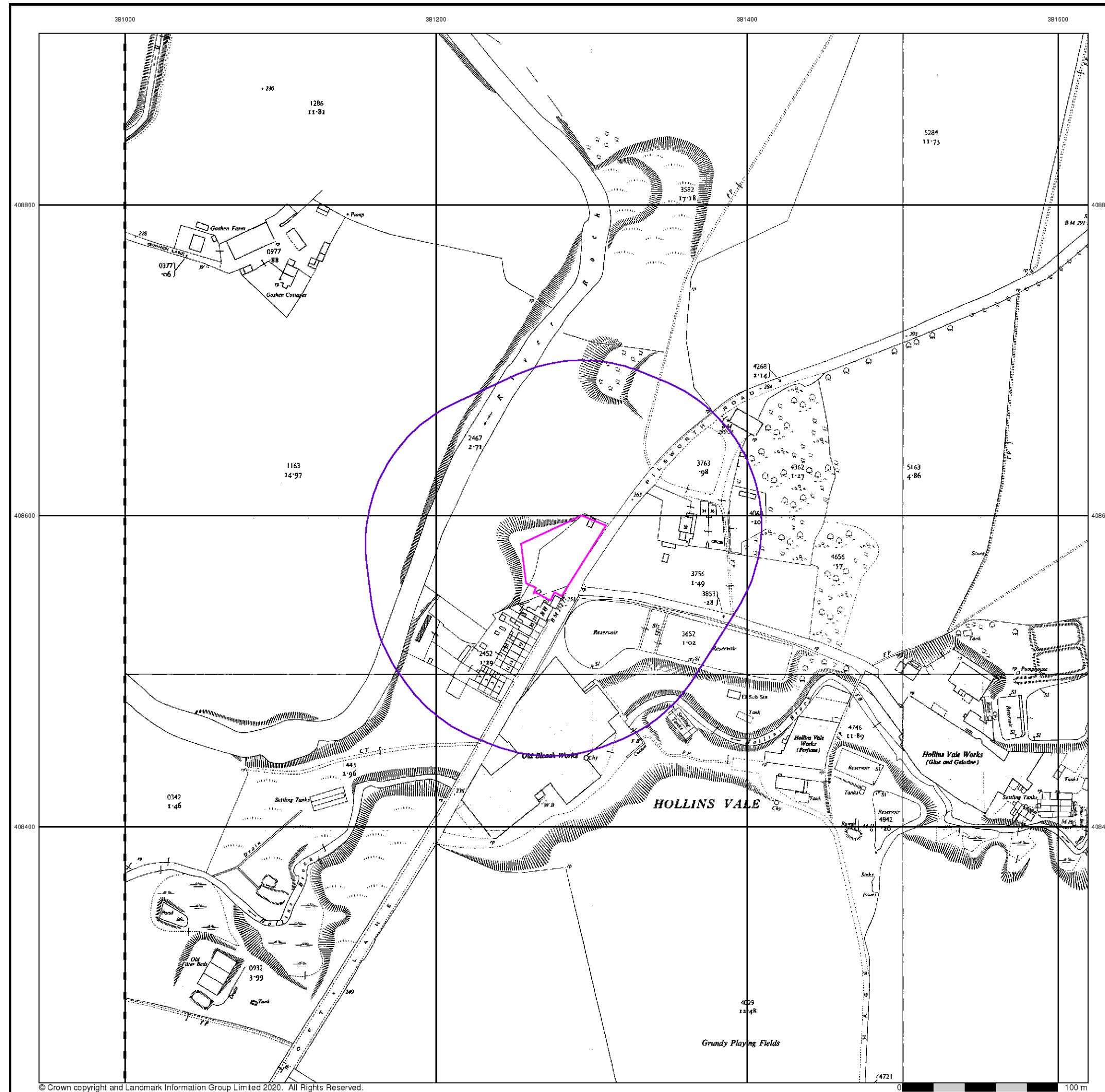


Order Details

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National Grid Reference: 381280, 408570
Slice: A
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Site Details

Decor Effects Ltd, 129, Croft Lane, BURY, BL9 8QH



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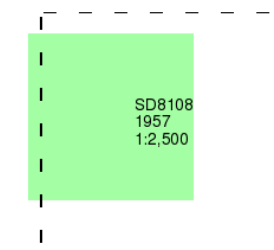
Ordnance Survey Plan

Published 1957

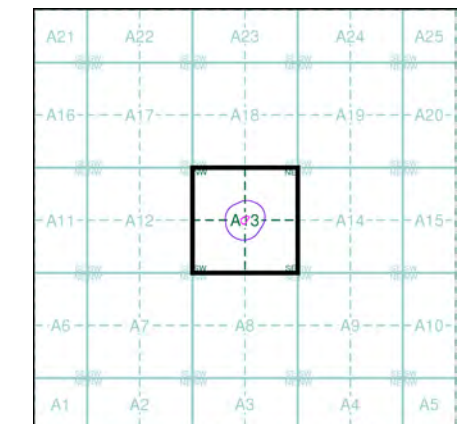
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13

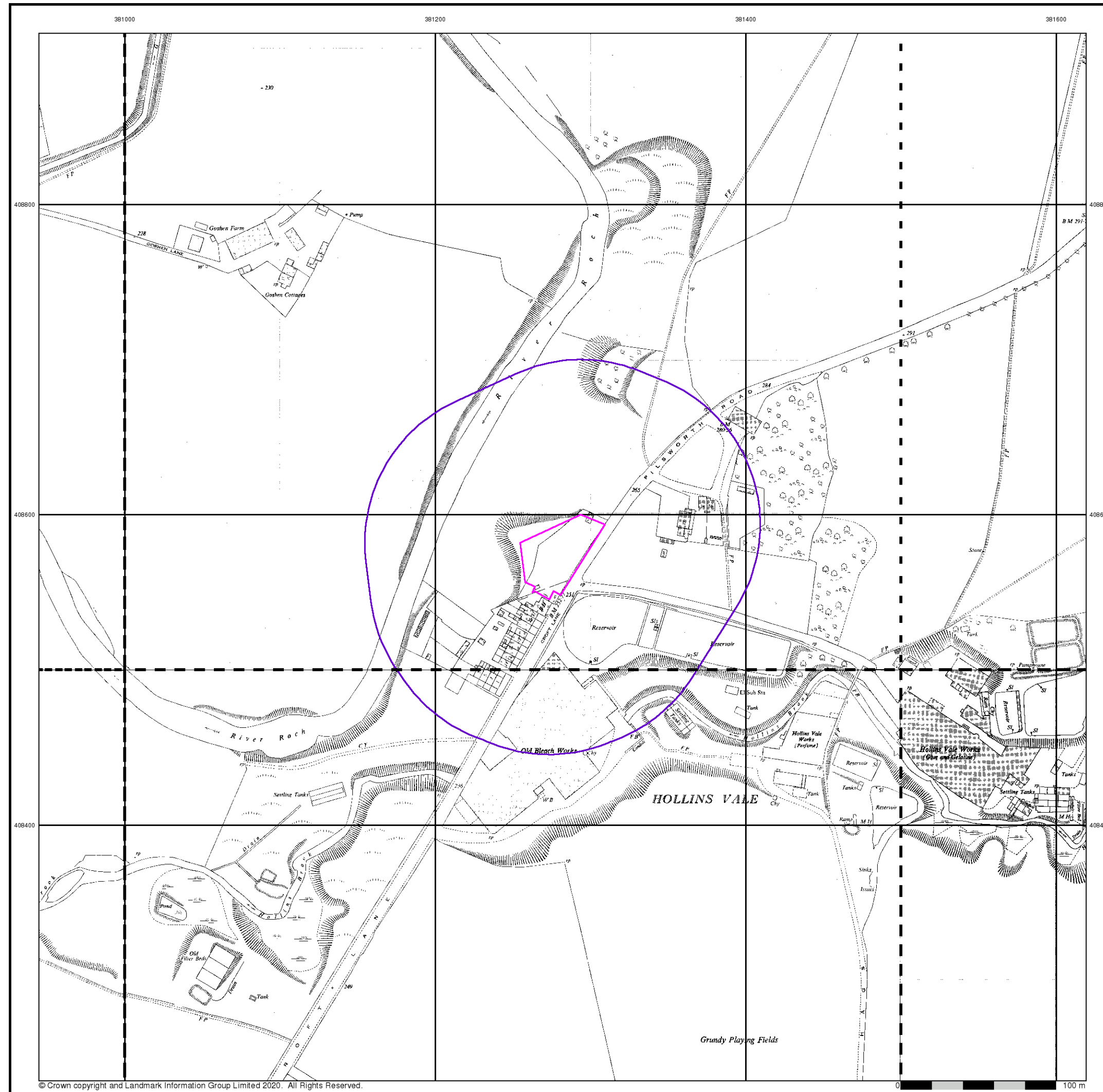


Order Details

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Customer Ref: ES171120
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Slice: A
Site Area (Ha): 0.17
Search Buffer (m): 100

Site Details

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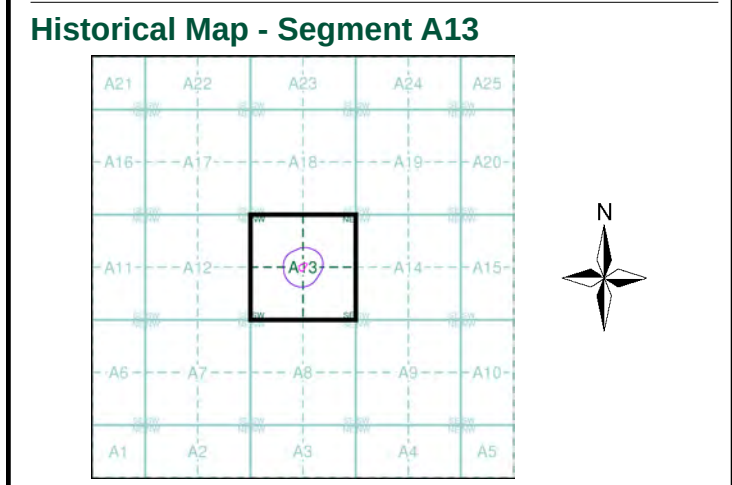


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Ordnance Survey Plan
Published 1957
Source map scale - 1:1,250

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

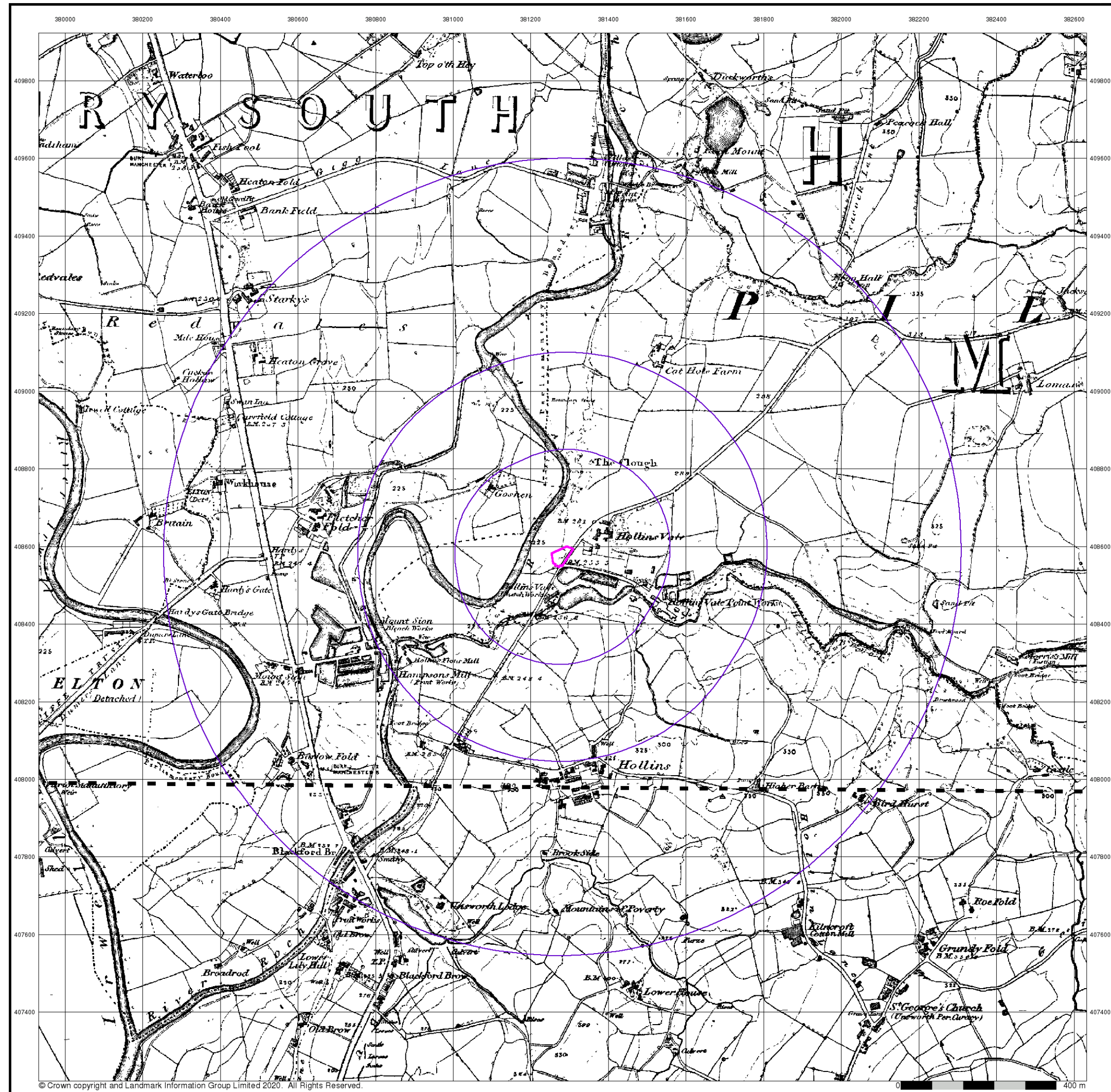
Map Name(s) and Date(s)		
SD8008NE 1957 1:1,250	SD8108NW 1957 1:1,250	SD8108NE 1957 1:1,250
SD8008SE 1957 1:1,250	SD8108SW 1957 1:1,250	SD8108SE 1957 1:1,250



Order Details

Order Number: 267601181_1_1
Customer Ref: ES171120
National Grid Reference: 381280, 408570
Slice: A
Site Area (Ha): 0.17
Search Buffer (m): 100

Site Details
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Lancashire And Furness

Published 1848 - 1851

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)

08800
1851
1:10,560
09600
1848
1:10,560

Historical Map - Slice A

Order Details

Order Number:	267601181_1_1
Customer Ref:	ES171120
National Grid Reference:	381280, 408570
Slice:	A
Site Area (Ha):	0.17
Search Buffer (m):	1000

Site Details

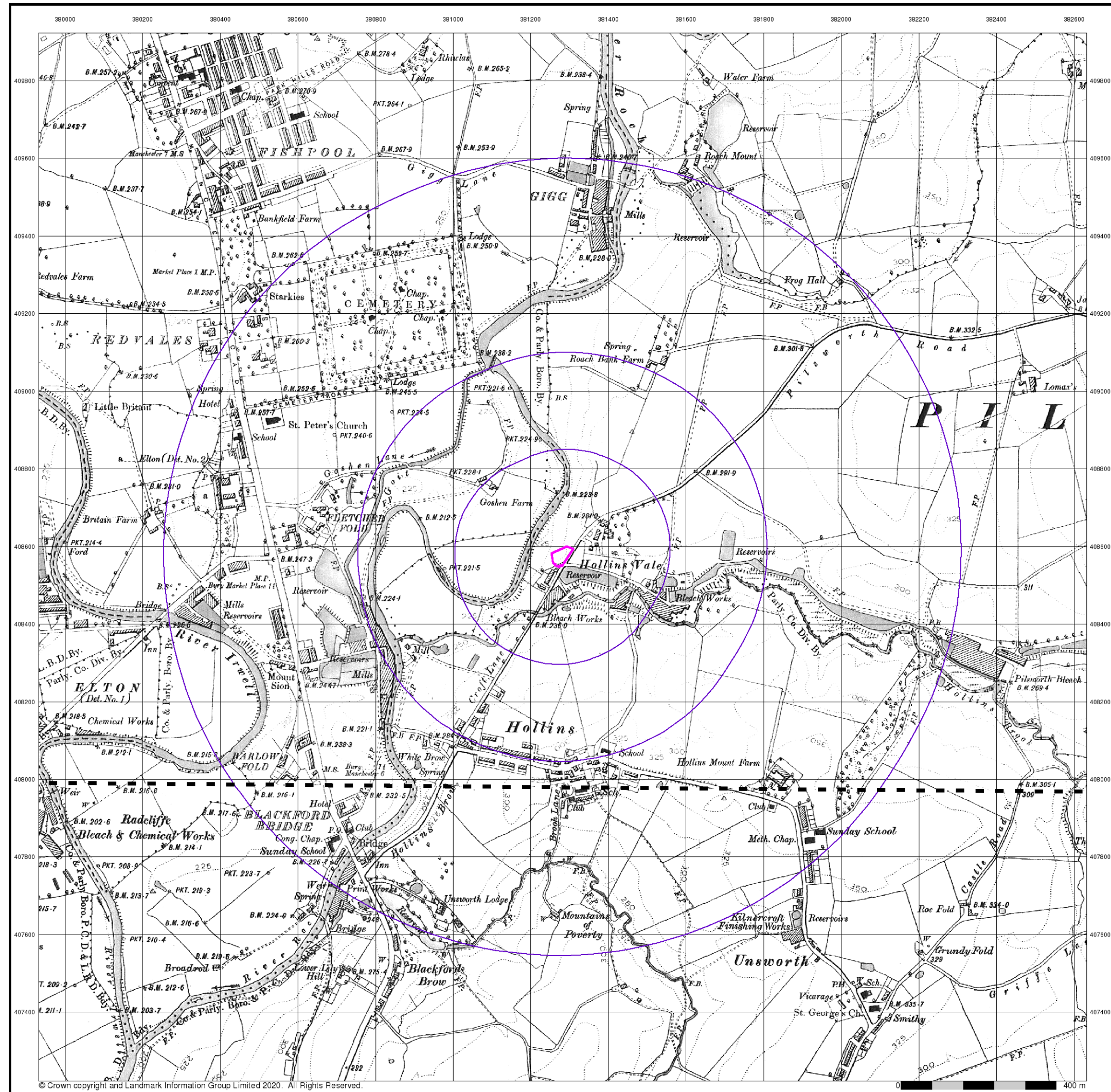
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Lancashire And Furness

Published 1894

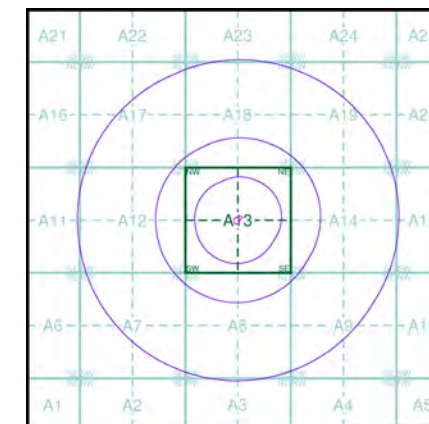
Source map scale - 1:10,560

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)

088SW
1894
1:10,560
096NW
1894
1:10,560

Historical Map - Slice A



Order Details

Order Number:	267601181_1_1
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Site Details

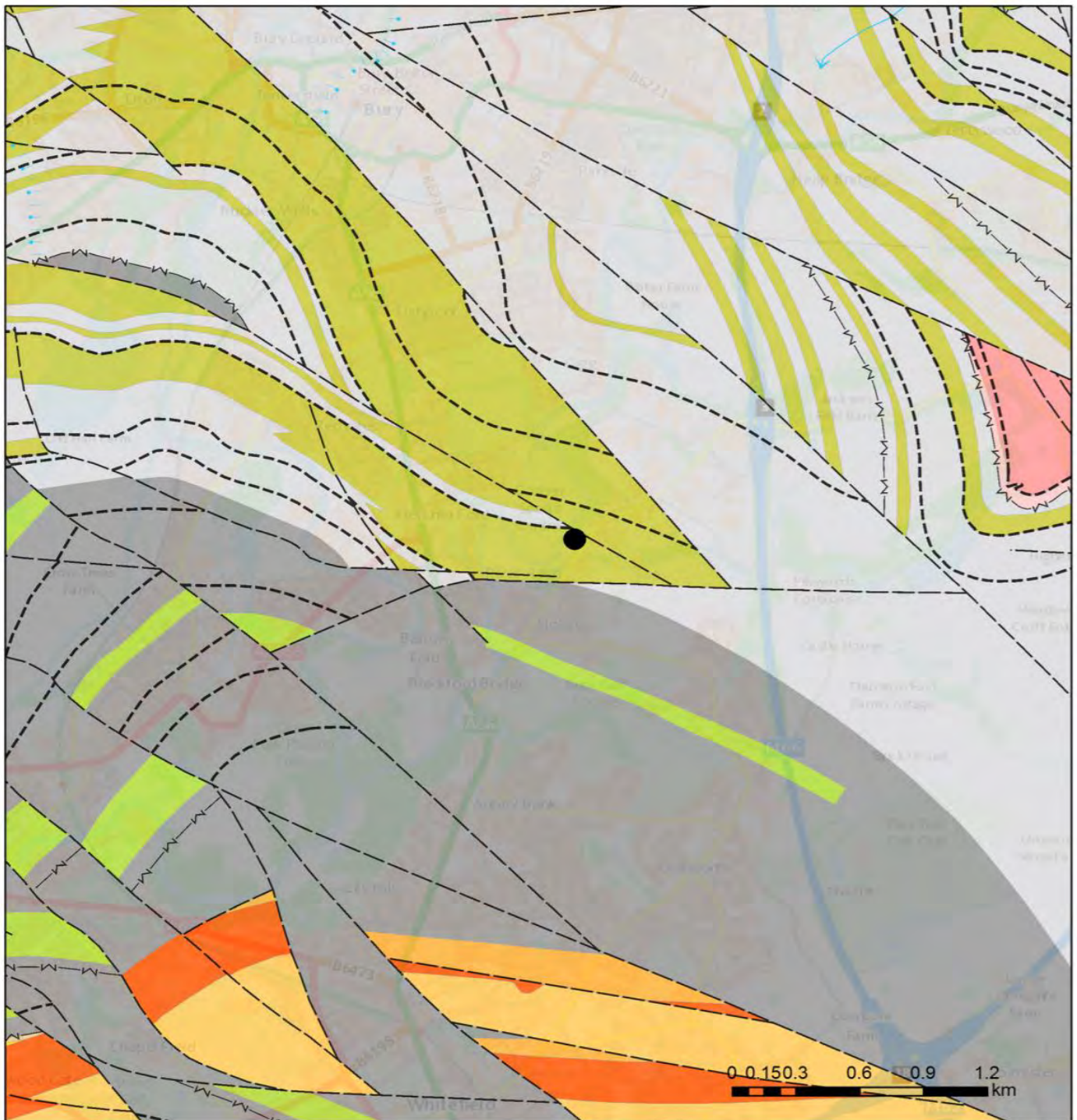
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Appendix E – Geological Maps

Bedrock Geology



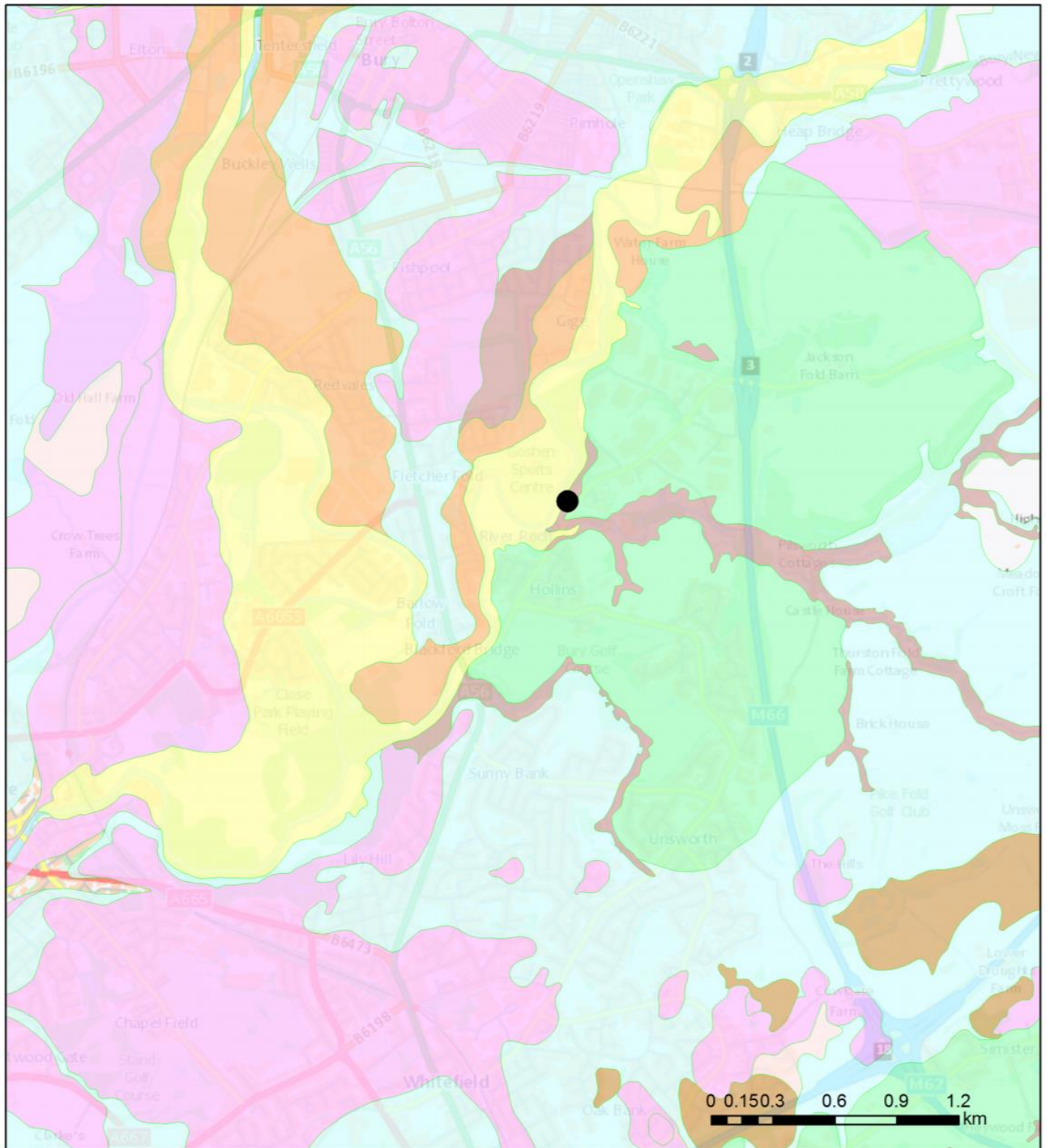
Bedrock geology 1:50,000 scale

- [PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE](#)
- [ROSSENDALE FORMATION - MUDSTONE AND SILTSTONE](#)
- [ROUGH ROCK - SANDSTONE](#)
- [PENNINE UPPER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE](#)
- [PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE](#)
- [CHESTER FORMATION - SANDSTONE](#)
- [COLLYHURST SANDSTONE FORMATION - SANDSTONE](#)
- [BLNFIRE ROCK - SANDSTONE](#)
- [NEWTON HEATH SANDSTONE - SANDSTONE](#)
- [WORSLEY DELF ROCK - SANDSTONE](#)
- [MANCHESTER MARLS FORMATION - MUDSTONE](#)

Linear features 1:50,000 scale

- Coal_seam_Inf
- Coal_seam_Obs
- Fault_Inf_Crossmark_on_downthrow_side
- Fault_Obs_Crossmark_on_downthrow_side
- Marine_band

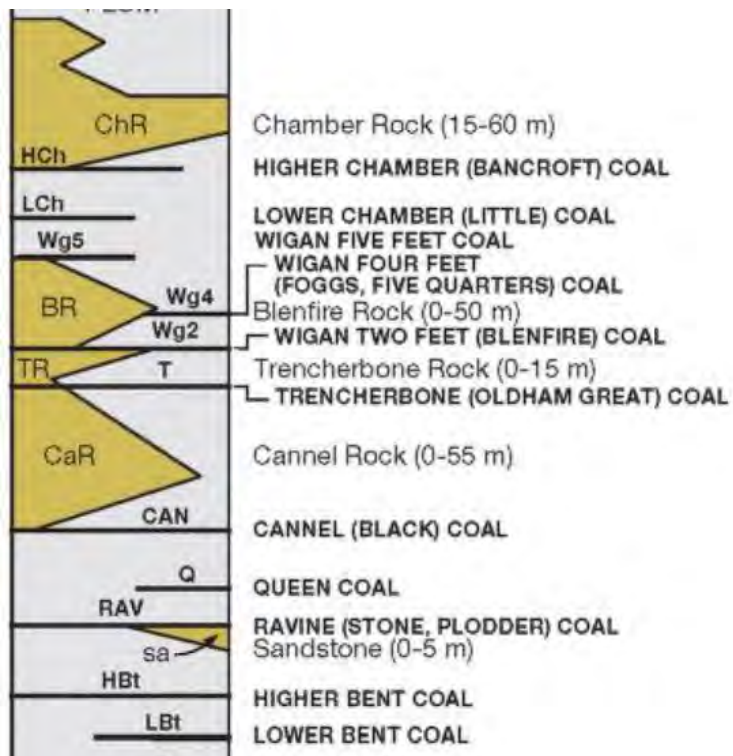
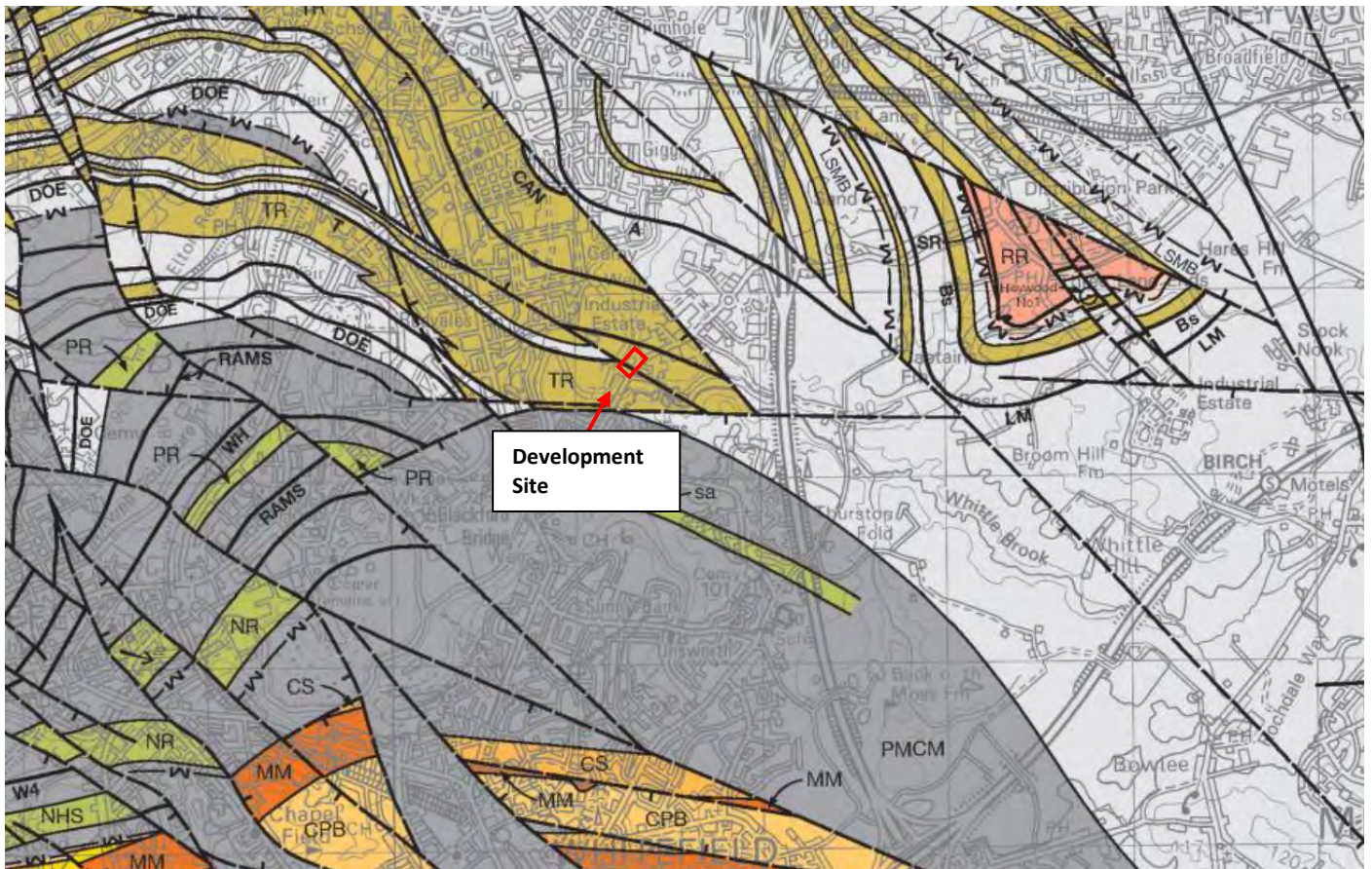
Superficial Geology



Superficial deposits 1:50,000 scale

- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- TILL, DEVENSIAN - DIAMICTON
- GLACIOLACUSTRINE DEPOSITS, DEVENSIAN - CLAY AND SILT
- HUMMOCKY (MOUNDY) GLACIAL DEPOSITS, DEVENSIAN - DIAMICTON
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- HEAD - CLAY, SILT, SAND AND GRAVEL
- RIVER TERRACE DEPOSITS, 1 - SAND AND GRAVEL
- LACUSTRINE DEPOSITS - SAND AND GRAVEL
- PEAT - PEAT

BGS Geological Survey 1:50,000 Series England and Wales Sheet 85 Manchester



Appendix F – BGS Borehole Logs

SD80NW211

Norwest Holst Soil Engineering Ltd.						Borehole No. 1	
BOREHOLE LOG				Sheet 1 of 2			
Contract No. F4767 Location Pilsworth - Bury Client Metropolitan Borough of Bury Method of Boring Percussion Diameter of Borehole 150mm				Chainage _____ Ground Level 76.9 m.A.O.D. Date 28/10/80 - 29/10/80			
SD80NW 211 8127 6858							
Description of Strata	Legend	Depth Below G.L.(m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D. %	Daily Progress
MADEGROUND : Hardcore, ash, brick with some clay		0.90	76.0		0.50	63	
MADEGROUND : Ash and clay with some brick and gravel		2.00	74.9		1.50 2.00	12	
MADEGROUND : Soft grey very sandy clay		3.40	73.5		3.00 3.50	12	
Loose brown silty SAND with some clay and peaty clay (madeground?)		6.30	70.6		4.50 5.50	11	
Soft light grey mottled very sandy CLAY with small roots		8.00	68.9		6.50 7.50 8.00	12	
Soft light brown very sandy silty CLAY					9.00		
Type of Sample Is S.P.T. Undisturbed Ic. C.P.T. X Vane O Jar Δ Water ● Split □ Disturbed		Remarks (Observations of Ground Water etc.) Water seepage from 3.40m - dried up Water standing at 6.20m, in morning casing 7.0m Strong flow from lower gravel Piezometer installed at 9.50m seals at 8.00 Piezometer standing level 13/Nov. 4.60m " " " 4/Dec. 4.00m					

1

BOREHOLE LOG

Diameter of Borehole.....

Date.....28/10/80 - 29/10/80.....

50
for
25mm

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

Remarks (Observations of Ground Water etc.)

Norwest Holst Soil Engineering Ltd.

Borehole No.

2

Contract No. F4767

BOREHOLE LOG

Location Pilsworth - Bury

Sheet 1 of 2

Client Metropolitan Borough of Bury

Chainage

Method of Boring Percussion

Ground Level 79.8 m.A.O.D.

Diameter of Borehole 150 mm

Date 5/11/80

SD80NW 212
8131 0857

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D.%	Daily Progress
TOPSOIL		0.20	79.6				
MADEGROUND: Loose ash.					0.50	4	
					1.50	4	
					2.50	4	
		3.30	76.5				
MADEGROUND?					3.50		
Soft dark grey brown very sandy silty clay.		4.50	75.3		4.50		
Soft brown very silty CLAY.		5.50	74.3		5.50		
Firm grey very sandy very silty CLAY with numerous bands of slightly clayey SILT notably from 9.0 m - 10.8m with occasional laminations and fine gravel.					6.50		
					7.50		
					8.50		
					9.50		

Type of Sample

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

Remarks (Observations of Ground Water etc.)

Water seepage from 3.30 m.
Standing level 3.0 m.

2

BOREHOLE LOG

SD80NW 212

Sheet....2...of....2.....

Chainage.....

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

Method of Boring..... 150 mm
Diameter of Borehole.....

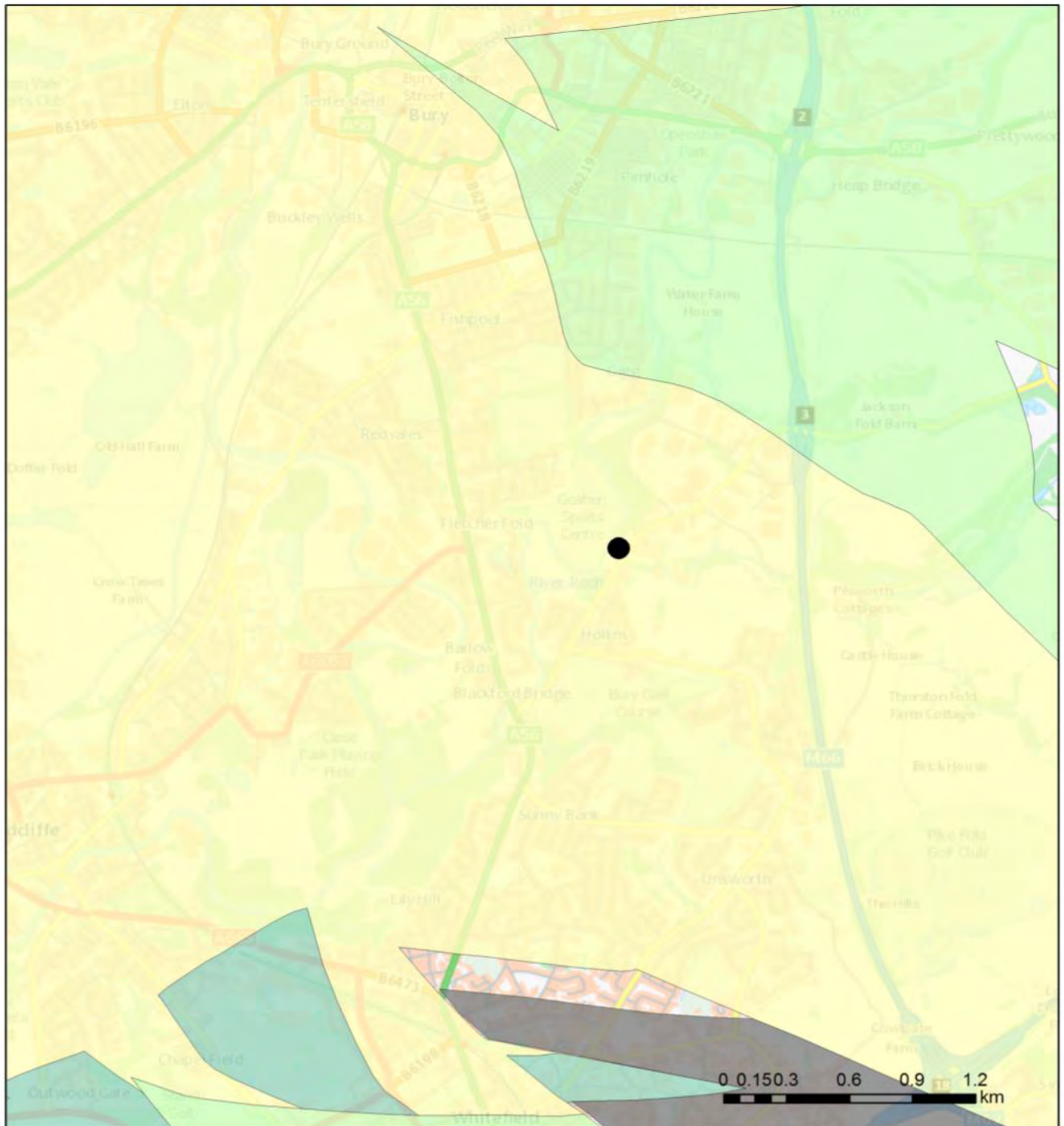
Date 5/11/80

[illegible]

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

Remarks (Observations of Ground Water etc.)

Appendix G – Coal Resource Map



Deep Coal

- Deep coal at more than 1200m
- Deep coal between 50m and 1200m

Shallow Coal

- Buried coal resource overlain by up to 50m overburden
- Primary opencast coal resource area
- Secondary opencast coal resource area
- Tertiary opencast coal resource area

Appendix H – Coal Mining Summary Map

