

Wales and West Housing Association

Desk Study Report

For

Pen Y Cae, Wrexham

May 2021

REPORT NO: 21WWH003/DS

- *Desk Studies and Site Walkovers*
- *Intrusive Contaminated Land Investigations*
- *Geotechnical Appraisals and Ground Investigations*
- *Landfill Gas Assessments and Remedial Design*
- *Remediation Design and Implementation*
- *Remediation Project Management and Supervision*
- *Site Abnormal Assessments (Foundations and Contaminated Land)*

GEOTECHNICAL - CONTAMINATED LAND - FLOOD RISK

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CONTENTS

1	EXECUTIVE SUMMARY	1
2	SITE DESCRIPTION	3
	2.1 Introduction	
	2.2 Site Location	
	2.3 Site Description	
3	SITE HISTORY	5
	3.1 Site History from Ordnance Survey Maps	
	3.2 Summary of Site History	
4	GEOLOGY	9
	4.1 Published Geology	
	4.2 Geological Features	
	4.3 Radon	
	4.4 Hydrogeological and Hydrological Features	
5	ENVIRONMENTAL DATA	16
	5.1 Current Industrial Land Use	
	5.2 Past Land Use	
6	SUMMARY OF ENVIRONMENTAL SENSITIVITY	19
	6.1 Sources	
	6.2 Pathways and Receptors	
7	INITIAL CONTAMINATION CONCEPTUAL MODEL	20
	7.1 Source-Pathway-Receptor-Linkages	
	7.2 Contamination Summary	
	7.3 Geotechnical Constraints	
8	SCOPE OF GROUND INVESTIGATION	24
	8.1 Objectives of the Ground Investigation	
	8.2 Proposed Initial Ground Investigation Scope	
9	REFERENCES	25
	APPENDIX A	
	i) Site Location Plan	
	ii) Site Photographs	
	APPENDIX B	
	i) Historical Mapping	
	APPENDIX C	
	i) Groundsure Report	
	ii) The Coal Authority Report	
	APPENDIX D	

- i) Conceptual Model
- APPENDIX E
- i) Notes on Limitations

1 EXECUTIVE SUMMARY

Note – The following summary is not exhaustive and is to be used for guidance purposes only. The full report should be consulted for full details.

Site Location

The site is located off Groesfann, Pen Y Cae, Wrexham, LL14 2RP. The coordinates on the National Grid Reference is 328034, 345080. The site is approximately 2.41 hectares in total.

Proposed Development

The proposed development consists of residential housing and associated infrastructure.

Site Description

On Site

A site visit was undertaken on the 16th June 2021 by an experienced geo-environmental engineer. Access to the site was gained via Cristionydd Lane where there was a gate and a kissing gate. There were noted to be two other access points on foot from the fields to the south and the east.

The site has metal wire fencing all around which was mostly in good condition. There were several hedges and semi mature trees around the east, south and west, with one tree along the northern boundary. There was noted to be a large stump next to the tree on the northern boundary and an animal trough. There was no other evidence of animals being kept on site. The site was covered in long grass which was approximately knee height.

The site is a roughly rectangular and was surrounded by fields on the south and west. The northern half of the site is generally slopes downwards towards the north. The south of the site is undulating and a higher level than the north of the site as the levels increase slightly from the southern boundary and then levels off before sloping down to the north. The northern corner of the site which is not due to be developed contains a domestic property and garden. To the south of the house is a mounded area which contains trees and hedges and is fenced off from the rest of the site.

There was no evidence of any services on site however, Cristionydd Lane / the gate entrance directly onto site had overhead phone lines running along the eastern boundary.

Site History

On Site

The earliest map from Tithe map (unknown year) shows the site is a field until 1873 when there is a pond in the north east of the site and a track going from north west to south east. No major changes occur until 1900 when there is a mound along the eastern boundary. No major changes occur until 1962 when there is no longer a pond and there is a police station in the corner of the site which is no longer labelled as a police station by 2003. No further major changes occur onsite until 2010 when there is no stockpile present however, during the site walkover this was confirmed as a mound with trees and is fenced off from the rest of the site.

Published Geology

The BGS map shows the geology (1:50,000) beneath the site as the following:

- Artificial Ground – present in the area of the coal shaft
- Drift – North eastern third - Till – Devensian, rest of site – glaciofluvial deposits – sand and gravel
- Solid – Pennine lower coal measures formation – mudstone, siltstone and sandstone

Coal Mining

The map from the Coal Authority shows that there are two coal outcrops on site, one in the east and one in the west, both of which run in the north to south direction dipping southeast. These are the Yard Coal and the Wall and Bench Coal. **Wall and Bench was a thin coal extracted with it's underlying fire clay. 20m below the Wall and Bench Coal there is also the Llwyneion Half Yard Coal which was also worked however given the depth (89m) it's unlikely this seam was worked here.**

The shafts were part of the Plas Bennion and Cristionydd Colliery, opened by the British Iron Company after 1843 and abandoned in 1875. There are records suggesting that the colliery was drowned by Plas Madoc Colliery workings in 1868. The British Iron

Company was established in 1824 with a high investment from established mining and iron making companies but ran into financial difficulties and was re-formed as the New British Iron Company in 1843. In 1857 the mines and works in the Ruabon area were sold off to Plas Issa Ironworks of Acrefair which finally closed in 1887. Several of the Cristionydd pits on the mineplan have a depth to the Half Yard annotated, perhaps there was an proposal to mine the seam after the Wall & Bench Coal was worked out although the workings were becoming flooded by 1868.

The Wall and Bench seam appears to have been worked up to the outcrop. The Yard Coal outcropping in the centre of the site was worked by Cristionydd and Plasbennion east of the road but the coal was found to be unviable due to intensive faulting. Given the above information, the significant risk of shallow coal workings on the site is classed as HIGH and intrusive investigation is recommended

Radon Protection

The site lies within a low-risk area of radon where 10-30% of homes are estimated to be above the action level, based on the BRE 211 guidance. Full radon protection will be required onsite

Summary of Environmental Data

Possible Contamination Sources;

- Current Site Use – Unoccupied – Significant Risk; Unlikely
- Former Pond – Onsite – Significant Risk; Possible (localised)
- Unspecified heaps – Onsite – Significant Risk; Possible (localised)
- Electrical Substation – 43 and 77 m N – Significant Risk; Unlikely
- Historical Tank – 129 m S – Significant Risk; Unlikely
- Historical Coal Mining – Directly east and below site – Possible (Localised)

- Pathways and Receptors
- Aquifers – Below Site – Significant Risk; Possible
- Site End Users – Onsite – Significant Risk; Possible (Localised)

Qualitative Risk Assessment:

In this qualitative risk assessment, a generally Low – Moderate (Localised) risk for contamination and ground gas exists onsite. SI is required to confirm the risk potential and design remedial actions where necessary.

Proposed Ground Investigation Scope:

- One day of trial pitting (circa 10 locations) to approximately 3 m bgl
- 20 No. soil samples taken for chemical assessment - depending on ground conditions encountered this should include testing (topsoil, made ground and natural) to benchmark contamination levels across the site and allow for a re-use assessment. Proposed testing will include but not be limited to the following; heavy metals suite (comprising; As, Cd (low level), Cr Vi, Pb, Hg, Se, Ni, Cu, Zn), Organic Matter, Sulphate, pH, speciated polycyclic aromatic hydrocarbons and TPH CWG. Asbestos testing within topsoil and Made Ground (if present) with quantification for positive samples. There will also be additional testing for ammonia, semi-volatile and volatile organic compounds.
- If significant Made Ground is noted during the trial pitting then a further investigation will be required. This will involve approximately 8 No. window sample boreholes extended to 3-5mbgl installed with 3 months (6 visits) of follow-on gas and water monitoring.
- Leachate testing within the Made Ground and natural strata (if encountered) in order to assess the impact of leachable contamination which may be migrating onto site
- Geotechnical analysis if clay strata is encountered for tree heave protection and concrete design classification.
- Intrusive Coal Mining Investigation to circa 45m to assess the risk of previously unknown mine workings on site.

The scope of works should be agreed with the Local Authority prior to the intrusive ground investigation and as such may change. Depending on the results of the initial investigation, further site investigation may be required.

2 SITE DESCRIPTION

2.1 Introduction

This investigation was carried out on the instruction of Wales and West Housing Association. The purpose of the work was to carry out a Desk Study to provide preliminary geotechnical and contamination risk assessment information to support a planning application for proposed residential development. The site red edge can be seen below;



2.1.1 Proposed Development

The proposed development consists residential dwellings, public open space and associated infrastructure.

2.2 Site Location

The site is located off Groesfann, Pen Y Cae, Wrexham, LL14 2RP. The coordinates on the National Grid Reference is 328034, 345080. The site is approximately 2.41 hectares in total. See Site Location Plan in Appendix A.

2.3 Site Description

2.3.1 On Site

A site visit was undertaken on the 16th June 2021 by an experienced geo-environmental engineer. Access to the site was gained via Cristionydd Lane where there was a gate and a kissing gate. There were noted

to be two other access points on foot from the fields to the south and the east.

The site has metal wire fencing all around which was mostly in good condition. There were several hedges and semi mature trees around the east, south and west, with one tree along the northern boundary. There was noted to be a large stump next to the tree on the northern boundary and an animal trough. There was no other evidence of animals being kept on site. The site was covered in long grass which was approximately knee height.

The site is a roughly rectangular and was surrounded by fields on the south and west. The northern half of the site is generally slopes downwards towards the north. The south of the site is undulating and a higher level than the north of the site as the levels increase slightly from the southern boundary and then levels off before sloping down to the north. The northern corner of the site which is not due to be developed contains a domestic property and garden. To the south of the house is a mounded area which contains trees and hedges and is fenced off from the rest of the site.

There was no evidence of any services on site however, Cristionydd Lane / the gate entrance directly onto site had overhead phone lines running along the eastern boundary.

Photographs taken during the site walkover can be found in Appendix A.

2.3.2 Surrounding Area

Surrounding land uses for the site are as follows:

- North – Directly north is the road Groesfan, 0 – 250 m residential housing, 250 m Trefechan Brook (east to west direction), 250 – 500 m residential housing and fields
- East – Directly east is Cristionydd, 250 – 500 m east residential housing and fields, 250 m Educational Facility
- South – 0 – 500 m fields, 400 m Plas Issa Farm
- West – 0 – 500 m residential housing and fields

3 SITE HISTORY

3.1 Site History from Ordnance Survey Maps

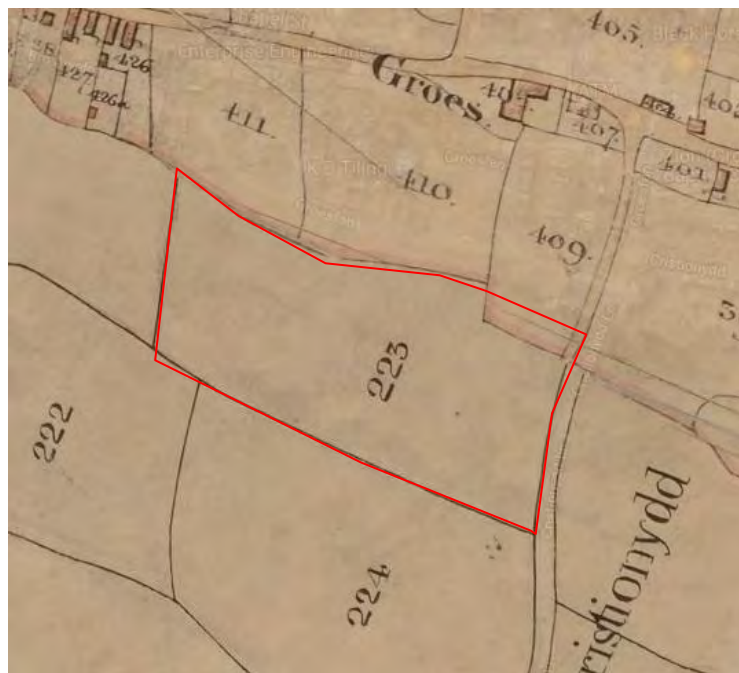
A search of available historic maps was undertaken to establish the land use history of the site. Extracts of the maps are discussed below and can be found in full in Appendix B of this report. All maps are Ordnance Survey unless otherwise stated. All distances quoted on OS maps are taken from the site boundary, which is marked on the map.

3.2 Summary of Site History

3.2.1 On Site

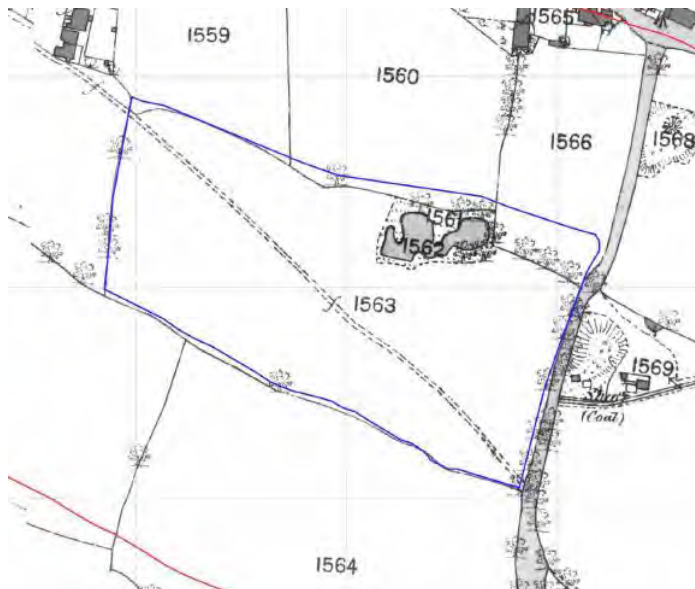
The earliest available map is the Tithe map which shows site occupying multiple fields. An extract of this map is shown below;

Tithe Map (Unknown year)



No major changes occur onsite until the 1873 1:2,500 map which shows a pond in the north east of the site and a track going from north west to south east. An extract of this map is shown below;

1873 1:2,500 Map



No further major changes occur onsite until the 1900 1:2,500 map when there is a mound along the eastern boundary. An extract of this map is shown below;

1900 1:2,500 Map



No further major changes occur onsite until 1962 1:2,500 map when there is a police station (no longer labelled by 2003) in the north east corner of the site and the pond is no longer present. An extract of this map is shown below;

1962 1:2,500 Map



No further major changes occur onsite until 2010 1:10,000 map when there is no stockpile present however, during the site walkover this was confirmed as a mound with trees and is fenced off from the rest of the site. An extract of this map is shown below;

2010 1:10,000 Map



No further major changes occur onsite up to present.

3.2.2 Surrounding Area

The following table summarises the significant changes in historical use surrounding the site:

Date First Shown	Land Uses
Tithe Map	All around – fields and roads
1873	Directly east – coal shaft, last present on the 2003 maps 400 m east – coal shaft, in 1898 has become surface workings 250 m south east – well, in 1898 appears to be surface workings 400 m south – well, in 1898 appears to not be labelled 250 m north east – well, present until 1977 250 m south – buildings, assumed to be farm buildings, still present today
1898	400 m south – surface workings, no longer present on 2001 map
1949	50 m north east / east – two long buildings which expand to north of the site in 1960, in the 1977 map these show as residential buildings
1975	<50 m east – three buildings adjacent to the coal shaft, there is another building present by 1991. Only 1 building present by 2010.

4 GEOLOGY

The following section details the published and available geological data available for the site and the surrounding area. All data is taken from the Groundsure Data report located in Appendix C unless otherwise stated. This report should be referred to for full details.

4.1 Published Geology

The documented geology of the site is summarised on the British Geological Survey map principally, with further site-specific details detailed below.

Geology	Artificial Ground & Land Slip	Drift	Solid
1:10,000	Area on site in coal shaft area	North eastern third - Till – Devensian Rest of site – Glaciofluvial Deposits – sand and gravel	Pennine lower coal measures formation – mudstone, siltstone and sandstone

Superficial Geology

ID	Location	LEX Code	Description	Rock description
1	On site	TILL-DMTN	Till - Diamicton	Diamicton
2	On site	GFDU-XSV	Glaciofluvial Deposits - Sand And Gravel	Sand And Gravel



Bedrock Geology

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age



4.1.1 Linear Features

There are two linear features which are coal seams and a further three coal seams within 250 m of site. An extract is provided below:

ID	Location	Category	Description
2	On site	ROCK	Coal seam, inferred
3	On site	ROCK	Coal seam, inferred
4	11m E	ROCK	Coal seam, inferred
5	226m E	ROCK	Coal seam, inferred
6	228m W	ROCK	Coal seam, inferred

4.1.2 Historic Borehole Records

There are records of 2 No. historic boreholes onsite and a further 18 No. boreholes within 250 m of site. Only one of the records of the boreholes on / nearby the site is available. This shows that there is 20 m of clay.

4.2 Geological Features

Several ground workings have been noted on and within 250 m of site, further details are provided in the sections below.

4.2.1 BritPits

The records show one BritPit within 250 m of site which was 16 m east. An extract from the Groundsure report is provided below;

ID	Location	Details	Description
A	16m E	Name: Plas-isaf Address: Penycae, WREXHAM, Denbighshire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

4.2.2 Surface ground workings

The Groundsure report shows there are 13 No. surface ground workings on site and a further 12 No. within 250 m of site. The surface ground workings on site relate to ponds and unspecified heaps. The offsite surface ground workings were from unspecified heaps, graveyard and unspecified ground workings.

Further details can be found in the Groundsure report.

4.2.3 Coal Mining

The site is located within a coal mining area as defined by The Coal Authority. A coal mining report has been obtained from The Coal Authority. A detailed abstract of the main findings can be found below;

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	WALL AND BENCH	Coal	380X	52	Beneath Property	6.0	South-East	110	1860
unnamed	WALL AND BENCH	Coal	3810	56	North-East	6.0	South-East	110	1850

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
Shaft	328345-115	328115 345055		Coal	
Shaft	328345-450	328157 345179		Coal	

Abandoned mine plan catalogue numbers

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

13859	14882	14896
16713	14885	14880
PO0	14891	NW1418

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
RUABON YARD (SOFT 5 QTRS)	Coal	Yes	Within	N/A	17
WALL AND BENCH	Coal	Yes	Within	N/A	15

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry 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.

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.

The map from the Coal Authority shows that there are two coal outcrops on site, one in the east and one in the west, both of which run in the north to south direction dipping southeast. These are the Yard Coal and the Wall and Bench Coal. Wall and Bench was a thin coal extracted with its underlying fire clay. 20m below the Wall and Bench Coal there is also the Llwyneion Half Yard Coal which was also worked however

given the depth (89m) it's unlikely this seam was worked here. .

The shafts were part of the Plas Bennion and Cristionydd Colliery, opened by the British Iron Company after 1843 and abandoned in 1875. There are records suggesting that the colliery was drowned by Plas Madoc Colliery workings in 1868. The British Iron Company was established in 1824 with a high investment from established mining and iron making companies but ran into financial difficulties and was re-formed as the New British Iron Company in 1843. In 1857 the mines and works in the Ruabon area were sold off to Plas Issa Ironworks of Acrefair which finally closed in 1887. Several of the Cristionydd pits on the mineplan have a depth to the Half Yard annotated, perhaps there was an proposal to mine the seam after the Wall & Bench Coal was worked out although the workings were becoming flooded by 1868.

The Wall and Bench seam appears to have been worked up to the outcrop. The Yard Coal outcropping in the centre of the site was worked by Cristionydd and Plasbennion east of the road but the coal was found to be unviable due to intensive faulting.

Given the above information, the significant risk of shallow coal workings on the site is classed as HIGH and intrusive investigation is recommended

4.2.4 Mineral Planning

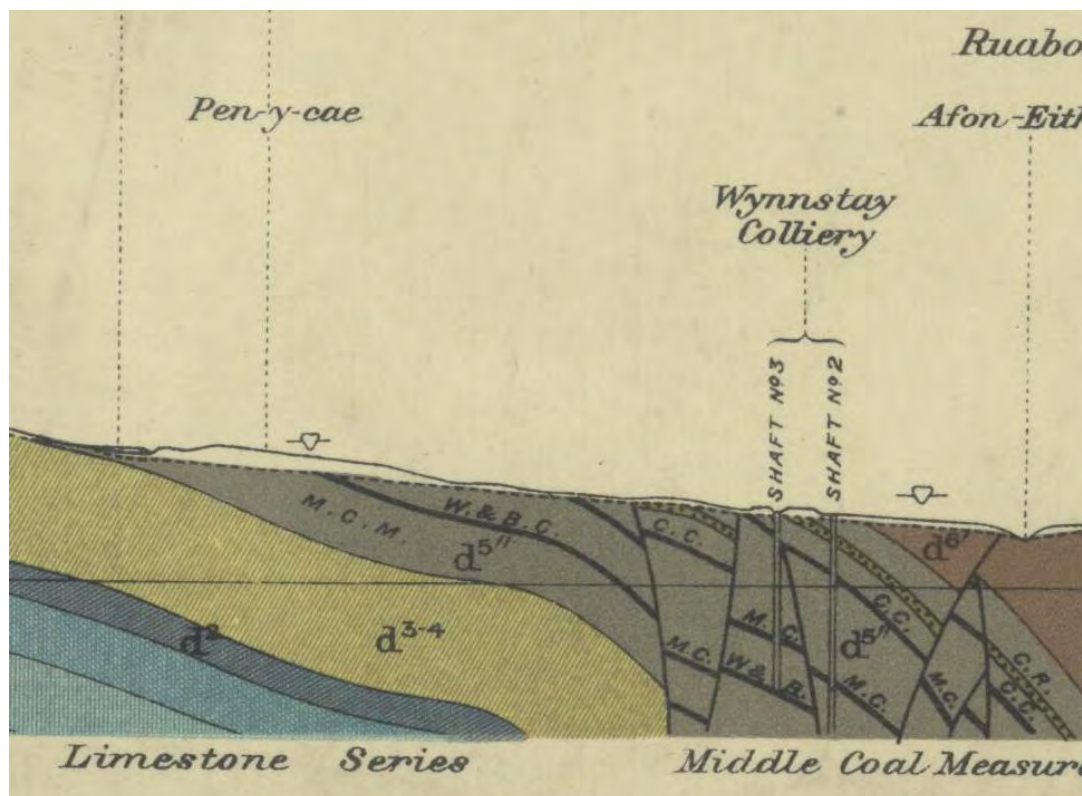
There are no records for historic mineral planning within 250 m of site.

4.2.5 Non-coal mining

There is one record for non-coal mining on site and a further record 5 m from site. An extract is provided below:

ID	Location	Name	Commodity	Class	Likelihood
1	On site	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
2	5m S	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

As you can see from the below the Cefn y Fedw sandstone (yellow) and limestones beneath it which were mined for iron (and silver) are beneath the coal measures. The depth suggests low risk from metalliferous mining.



The Coal Authority Report can be found in Appendix C.

4.3 Radon

According to the Groundsure report, the site lies within a high-risk area of radon where between 10-30% of homes are estimated to be above the action level (99% of site). Full radon protection will be required onsite.

4.4 Hydrogeological and Hydrological Features

The table below summarises the presence/absence of any hydrological licences and incidents within 500m of the proposed site. If entries are present within 250m, further details are provided in the relevant subsection below;

Data Type	On Site	0 – 250m	250 – 500m
Hydrogeology & Hydrology			
Licensed Discharge Consents	-	-	5
Pollutant Release to Surface Waters (Red List Discharge Consents)	-	-	-
Groundwater Abstraction Licences	-	1	-
Surface Water Abstraction Licences	-	-	-
Potable Water Abstraction Licences	-	-	-
Source Protection Zones	-	-	-
Groundwater Vulnerability & Soil Leaching Potential	Identified within 50 m of site		
Surface Water Features	-	4	Not Searched

4.4.1 Groundwater Abstraction Licences

There is one record for groundwater abstraction licences within 250 m of site.

4.4.2 Hydrogeology

- The superficial deposits of Till are designated as a Secondary Undifferentiated Aquifer and the superficial glaciofluvial deposits are designated as Secondary A Aquifers.
- The bedrock deposits Pennine lower coal measures formation – mudstone, siltstone and sandstone are designated as Secondary A Aquifers
- The site does not lie within a Source Protection Zone as defined by the Environment Agency.
- There are no licenced water abstractions within 250m of site.
- There are no surface water features onsite and the nearest surface water feature is 167 m north west of site
- The site is within a Water Framework Directive River WB catchment area on site for the Dee - Ceiriog to Alwen

5 ENVIRONMENTAL DATA

The following section details environmental data available for the site and the surrounding area. Full details can be found in the Groundsure Report by located in Appendix C.

The table below summarises the presence/absence of any waste, hazardous substance sites of industrial land uses within 500m of the proposed site. If entries are present within 250m, further details are provided in the relevant section below.

Data Type	On Site	0 – 250m	250 – 500m
Current Industrial Land Use			
Historic Integrated Pollution Control Authorisations	-	-	-
Part A (2) & Part B Activities and Enforcements	-	-	-
Licensed Pollutant Release (Part A (2)/B)	-	-	-
Radioactive Substances Authorisations	-	-	-
Hazardous Substance Storage / Usage	-	-	-
EA/NRW Pollution Incidents	-	-	-
Control of Major Accident Hazards (COMAH)	-	-	-
Electricity Cables	-	-	-
Gas Pipelines	-	-	-
Recent Industrial Land Uses	-	3	-
Current or recent petrol stations	-	-	-
Waste and Landfill			
Active or recent landfill (EA/NRW)	-	-	-
Historic Landfill (LA)	-	-	-
Historic Landfill (BGS)	-	-	-
Historic Landfill (EA/ NRW)	-	-	1
Historical Waste Sites (LA / OS records)	-	-	-
Waste Exemptions	-	-	-
Licenced Waste Sites (EA / NRW)	-	-	-
Past Land Use			
Historical Industrial Land Uses	6	18	57
Historical Tanks	-	1	1
Historical Energy Features	-	1	3
Historical Petrol Stations	-	-	-
Historical Garages	-	1	-
Historical Military Land	-	-	-
Environmental Designations			
Sites of Special Scientific Interest (SSSI)	-	-	-

National Nature Reserves (NNR)	-	-	-
Special Areas of Conservation (SAC)	-	-	-
Special Protection Areas (SPA)	-	-	-
Areas of Outstanding Natural Beauty (AONB)	-	-	-
National Parks	-	-	-
Green Belt Land	-	-	-
Nitrate Vulnerable Zones	-	-	-

5.1 Current Industrial Land Use

5.1.1 Recent Industrial Land Uses

There are three entries for recent industrial land uses within 250m of site, the extract is provided below;

ID	Location	Company	Address	Activity	Category
1	43m N	Electricity Sub Station	Clwyd, LL14	Electrical Features	Infrastructure and Facilities
2	77m N	Electricity Sub Station	Clwyd, LL14	Electrical Features	Infrastructure and Facilities
3	239m NW	J K Davies & Son	2, Church Street, Penycae, Wrexham, Clwyd, LL14 2RL	Fuel Distributors and Suppliers	Household, Office, Leisure and Garden

5.2 Past Land Use

5.2.1 Historical Industrial Land Uses

There are 6 No. entries for historical industrial land uses onsite and a further 18 No. within 250m of site. The onsite historical industrial use is labelled as police station and unspecified heaps. The details of the offsite historical land uses are below:

A	6m E	Unspecified Heap	1898 - 1909	937278
A	6m E	Unspecified Heap	1960 - 1974	904023
A	8m E	Unspecified Heap	1949	918147
A	14m E	Unspecified Commercial/Industrial	1873	796379
A	17m E	Railway Sidings	1873	794399
A	20m E	Unspecified Heap	1873	850001
A	25m E	Coal Shaft	1873	830820
1	38m NE	Unspecified Heap	1873	802424
2	58m W	Grave Yard	1873	957727
B	217m N	Unspecified Mill	1960	849626
B	220m N	Flour Mill	1909	859927

B	221m N	Flour Mill	1873	964783
B	224m N	Flour Mill	1949	880065
B	224m N	Unspecified Mill	1898	887600
B	231m N	Flour Mill	1938	908604
D	240m E	Unspecified Heap	1873	802729
S	242m NE	Unspecified Ground Workings	1873	799145
C	249m E	Unspecified Heap	1873	802730

5.2.2 Historical Tanks

There is one entry for historical tanks within 250m of site which is an unspecified tank 129 m south.

5.2.3 Historical Energy Features

There is one entry for historical energy features within 250m of site and comprise electricity substations from 76 m north.

6 SUMMARY OF ENVIRONMENTAL SENSITIVITY

The following section is a review of the environmental sensitivity of the site as discussed in Sections 2 - 5. Significant potential risks are discussed in the following subsections and will then be evaluated as part of the Site Conceptual Model in Section 7.

Sources are defined as where pollution comes from, pathways are a route in which the pollution travels and receptors are anything affected by a pollutant. Further details on Source-Pathway-Receptor methodology can be found in Appendix D.

The table in section 6.1 focuses on significant site-specific sources, pathways and receptors. More 'generic' pathways and receptors (such as site end uses) will be covered as part of the full Site Conceptual Model in Section 7.

6.1 Sources

Source	Distance/ Direction	Details	Significant Risk
Current Site Use – Unoccupied	Onsite	No widespread significant contamination anticipated from unoccupied land use.	Unlikely
Former Pond	Onsite	There was a pond along the northern boundary of the site towards the north east of the site. The pond was later backfilled potentially with Made Ground with could produce biogenic gases. Made Ground is a potential source for contamination such as asbestos, hydrocarbons, volatiles and heavy metals.	Possible (localised)
Unspecified Heaps	Onsite	The unspecified heaps on site may related to the ground excavated during coal mining during the exaction of the shaft. The excavated ground is a potential source of contamination.	Possible (localised)
Electrical Substation	43 and 77 m N	Potential source of PCB contamination which may migrate onto site. This is unlikely as the electrical substation is likely to be a maintained asset and low environmental mobility.	Unlikely
Historical tank	129 m S	There is an unspecified historical tank which is assumed to be within the Cristionydd farm buildings. The tank is therefore a potential source of contamination such as hydrocarbons, chemical fertiliser and heavy metals. Due to the distance from the site and it is unlikely that any potential contamination will migrate onto site.	Unlikely
Historical Coal Mining	Directly east and below site	If there was coal worked underneath the site then there is a risk of ground gas.	Possible (localised)

6.2 Pathways and Receptors

Pathways and Receptors	Distance/ Direction	Details	Significant Risk
Aquifers	Below Site	The majority of the site (~66%) is a Secondary A Aquifer and the remaining area is a Secondary Undifferentiated Aquifer. As the potential sources of contamination are within the area of the glacial till this will limit the vertical migration.	Possible
Site End Users	On Site	Site end use residential presenting a sensitive receptor and there are potential sources of localised contamination onsite.	Possible (Localised)

7 INITIAL CONTAMINATION CONCEPTUAL MODEL

For details on how the conceptual model is evaluated please refer to Appendix D.

This section of the report aims to identify land which could potentially be affected by contamination, such that it could affect the value or re-use of the land, or such that mitigation would be required for certain proposed end uses of the land.

Potential contamination sources and environmentally sensitive receptors have been discussed in Section 6. Potentially significant risks are evaluated as part of the subsequent sub-sections.

7.1 Source-Pathway-Receptor-Linkages

The risk assessment uses a **'Source-Pathway-Receptor'** methodology for assessing whether a source of contamination could potentially lead to harmful consequences. This means that there needs to be a pollutant linkage from source to receptor for harm to be caused, this linkage consisting of; a source of pollution; a pathway for the pollutant to move along; a receptor that is affected by the pollutant.

The current potential risks to site arising from various Source-Pathway-Receptor linkages are assessed below. A risk may be considered significant if all three of the stages are present and therefore providing a pollution linkage. The various sources, pathways and receptors are considered separately. The assessment is based on the future use, which is understood to be residential with home grown produce.



Type of Contamination	Potential Sources	Potential Pathway	Potential Receptors	Pollution Linkage	Comment	Estimated Level of Risk
Ground Gas	Former Pond	Inhalation of Vapours	Construction/Maintenance Workers	Active	Former pond and historical coal mining areas have potentially been backfilled with Made Ground. Unspecified heap in the north west could contain Made Ground but is currently grassed over. Made Ground is a potential source of biogenic ground gas. The areas of potential Made Ground are covered by cohesive superficial deposits which should limit migration of the gases. If there is coal worked beneath the site then there is potentially a ground gas risk.	Low – Moderate (localised)
	Unspecified Heap				Potential significant ground gas risk can be targeted with window sample boreholes and ground gas monitoring.	
Ground Gas	Historical Coal Mining	Vapours Penetrating Unprotected Buildings	Future Site Users	Active	Former pond and historical coal mining areas have potentially been backfilled with Made Ground. Unspecified heap in the north west could contain Made Ground but is currently grassed over. Made Ground is a potential source of biogenic ground gas. The areas of potential Made Ground are covered by cohesive superficial deposits which should limit migration of the gases. Ground gas risk will need to be assessed. If there is coal worked beneath the site then there is potentially a ground gas risk.	Low – Moderate (localised)
					Potential significant ground gas risk can be targeted with window sample boreholes and ground gas monitoring.	
Surface and Near Surface Contaminants Within Soils	Former Pond Unspecified Heap Historical Coal Mining	Ingestion, Inhalation, Dermal Contact	Current Site Users	Potentially Active	As the site is currently vacant the risk to current site users is low.	Low
			Construction Workers	Active	Potential for localised contamination anticipated within the former pond, unspecified heaps and historical mining areas. Suitable PPE to protect workers.	Low – Moderate (localised)
			Future Site Users	Active	Potential for localised contamination anticipated within the former pond, unspecified heaps and historical mining areas. It is therefore likely that there could be near surface contamination on site.	Low – Moderate (localised)
		Direct Contact	Adjacent Land Users	Potentially Active	Potential for localised contamination anticipated within the former pond, unspecified heaps and historical mining areas. The contamination onsite may migrate offsite the areas of potential contamination are within cohesive superficial deposits which will limit the lateral migration offsite.	Low – Moderate (localised)
			Structures	Potentially Active	Potential for localised contamination anticipated within the former pond, unspecified heaps and historical mining areas. Ground investigation to confirm if there is any contamination which may affect structures.	Low – Moderate (localised)
			Plants	Potentially Active	Potential for localised contamination anticipated within the former pond, unspecified heaps and historical mining areas. Future site use is residential with homegrown produce therefore is a high sensitivity proposed site end use. Direct absorption of contamination is likely as the contaminated materials are likely to be near the surface.	Low – Moderate (localised)

Type of Contamination	Potential Sources	Potential Pathway	Potential Receptors	Pollution Linkage	Comment	Estimated Level of Risk
Mobile Contaminants, Leachables e.g. from Pollution Sources Adjacent to Site/On Site	Former Pond	Leaching into Groundwater	Groundwater	Potentially Active	Potential for localised contamination anticipated within the former pond, unspecified heaps and historical mining areas. Site investigation to confirm the presence of leachate on site. Potential for vertical migration into groundwater due to present of granular cohesive deposits on site and Secondary A Aquifer bedrock deposits.	Low – Moderate (localised)
	Unspecified Heap	Off-site Migration in Groundwater	Abstractions	Potentially Active	There are no groundwater abstractions identified within 250m of site. Site does not lie within Groundwater Source Protection Zone.	Low - Moderate
	Historical Coal Mining		Controlled Waters	Potentially Active	The nearest controlled waters are 167 m north west of the site. Due to the distance from site it is unlikely that any leachable contamination will migrate to the controlled waters. Site investigation to confirm the presence of leachate on site.	Low
Organic and Inorganic Contaminants Within Soils / Groundwater	Former Pond Unspecified Heap Historical Coal Mining	Potable Water Supply Pipes	Utilities Workers	Potentially Active	No significant widespread contamination anticipated onsite. Onsite potential sources have low – moderate potential for widespread mobilizable contamination generation due to granular superficial deposits and site topography. No widespread significant contamination anticipated onsite. Requirement for UU Assessment not anticipated.	Low – Moderate (localised)

7.2 Contamination Summary

In this qualitative risk assessment, a generally Low – Moderate (localised) risk for contamination and ground gas exists onsite. SI is required to confirm the risk potential and design remedial actions where necessary.

7.3 Geotechnical Constraints

- Possible service easements – liaison with utility providers advised
- Possible tree heave in areas of cohesive superficial deposits
- Potential mine workings beneath site

8 SCOPE OF GROUND INVESTIGATION

8.1 Objectives of the Ground Investigation

The objectives of the intrusive ground investigation will be to:

- Clarify **the 'Initial Contamination Conceptual Model'**.
- Clarify the initial risk assessment.
- Benchmark the contamination status of the site.
- Provide data for the design of any remedial works that may be required.
- Provide a geotechnical appraisal for the site.

8.2 Proposed Initial Ground Investigation Scope

On assessing the potential risks on site, we have compiled the following recommendations for investigation;

- One day of trial pitting (circa 10 locations) to approximately 3 m bgl
- 20 No. soil samples taken for chemical assessment - depending on ground conditions encountered this should include testing (topsoil, made ground and natural) to benchmark contamination levels across the site and allow for a re-use assessment. Proposed testing will include but not be limited to the following; heavy metals suite (comprising; As, Cd (low level), Cr Vi, Pb, Hg, Se, Ni, Cu, Zn), Organic Matter, Sulphate, pH, speciated polycyclic aromatic hydrocarbons and TPH CWG. Asbestos testing within topsoil and Made Ground (if present) with quantification for positive samples. There will also be additional testing for ammonia, semi-volatile and volatile organic compounds.
- If significant Made Ground is noted during the trial pitting then a further investigation will be required. This will involve approximately 8 No. window sample boreholes extended to 3-5mbgl installed with 3 months (6 visits) of follow-on gas and water monitoring.
- Leachate testing within the Made Ground and natural strata (if encountered) in order to assess the impact of leachable contamination which may be migrating into aquifer
- Geotechnical analysis if clay strata is encountered for tree heave protection and concrete design classification.
- Intrusive Coal Mining Investigation to circa 45m to assess the risk of previously unknown mine workings on site.

The scope of works should be agreed with the Local Authority prior to the intrusive ground investigation and as such may change. Depending on the results of the initial investigation, further site investigation may be required.

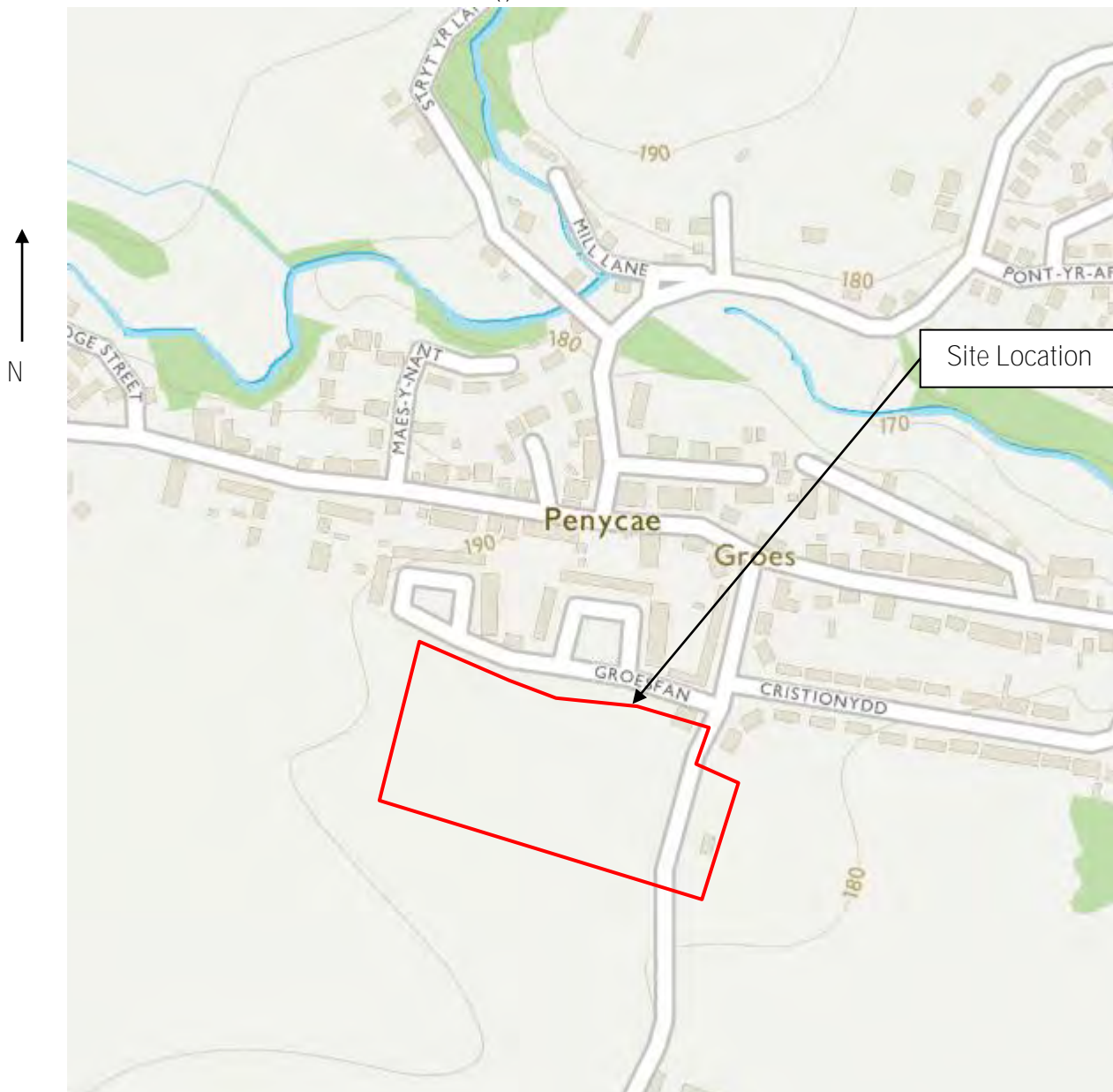
Notes on limitations of this report can be found in Appendix E.

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- 9.5 R & D Publication CLR 8 (March 2002) Assessment of Risks to Human Health from Land Contamination: An Overview of the Development of Soil Guideline Values and Related Research. Environment Agency.
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- 9.14 CIRIA **C665** 'Assessing risks posed by hazardous ground gases for buildings' 2007 - for high rise residential / flats.
- 9.15 **BS8485:2015** 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.
- 9.16 BRE 414 'Protective measures for housing on gas-contaminated land' Roger Johnson, Parkman Environment 2001.
- 9.17 BS 8500-2:2015+A1:2016 'Concrete British Standard to BS EN 206. Specification for constituent materials and concrete'.
- 9.18 CLR11 'Model Procedures for the Management of Land Contamination' DEFRA 2004.

APPENDIX A

(i) Site Location Plan



Site Location Plan
The site is located off Groesfann, Pen Y Cae, Wrexham, LL14 2RP. The coordinates on the National Grid Reference is 328034, 345080. The site is approximately 2.41 hectares in total.

(ii) Site Photographs



Photo 1: Access off Cristonydd Lane



Photo 2: south east corner facing north west



Photo 3: South east corner facing central west



Photo 4: Southern boundary



Photo 5: South eastern corner facing north eastern corner, mounded area circled



Photo 6: North east corner and site entrance



Photo 7: Gate along southern boundary



Photo 8: Centre of site facing north west



Photo 9: Centre of site facing north east



Photo 10: View across site facing east



Photo 11: Gate in south west corner



Photo 12: Mounded area close up

APPENDIX B

(i) Historical Mapping

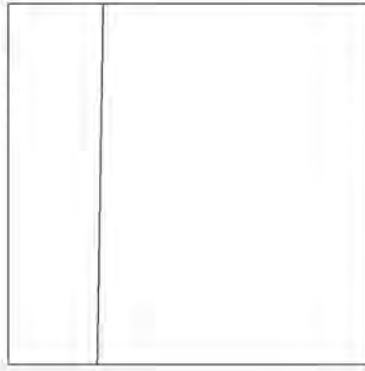
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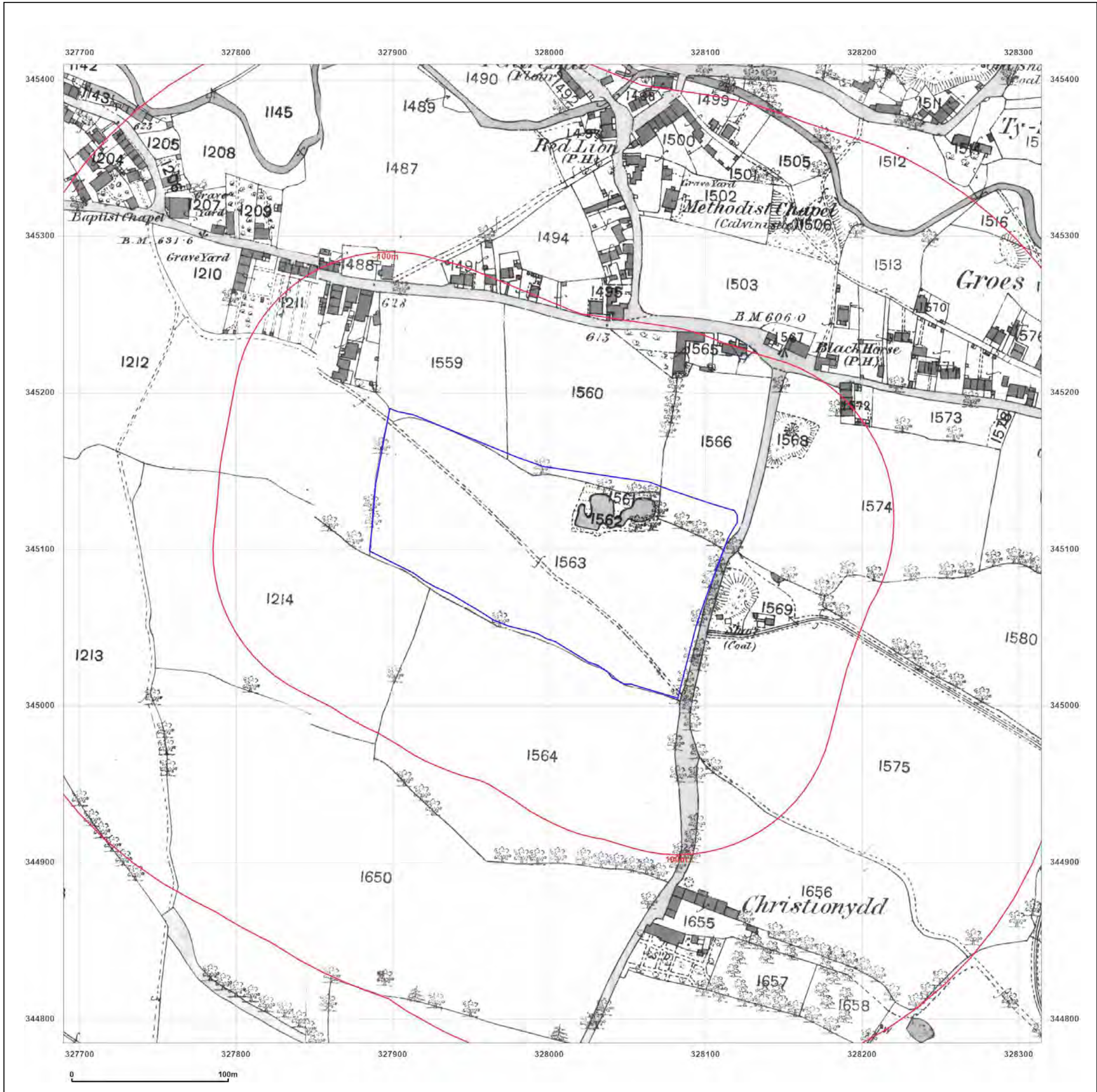
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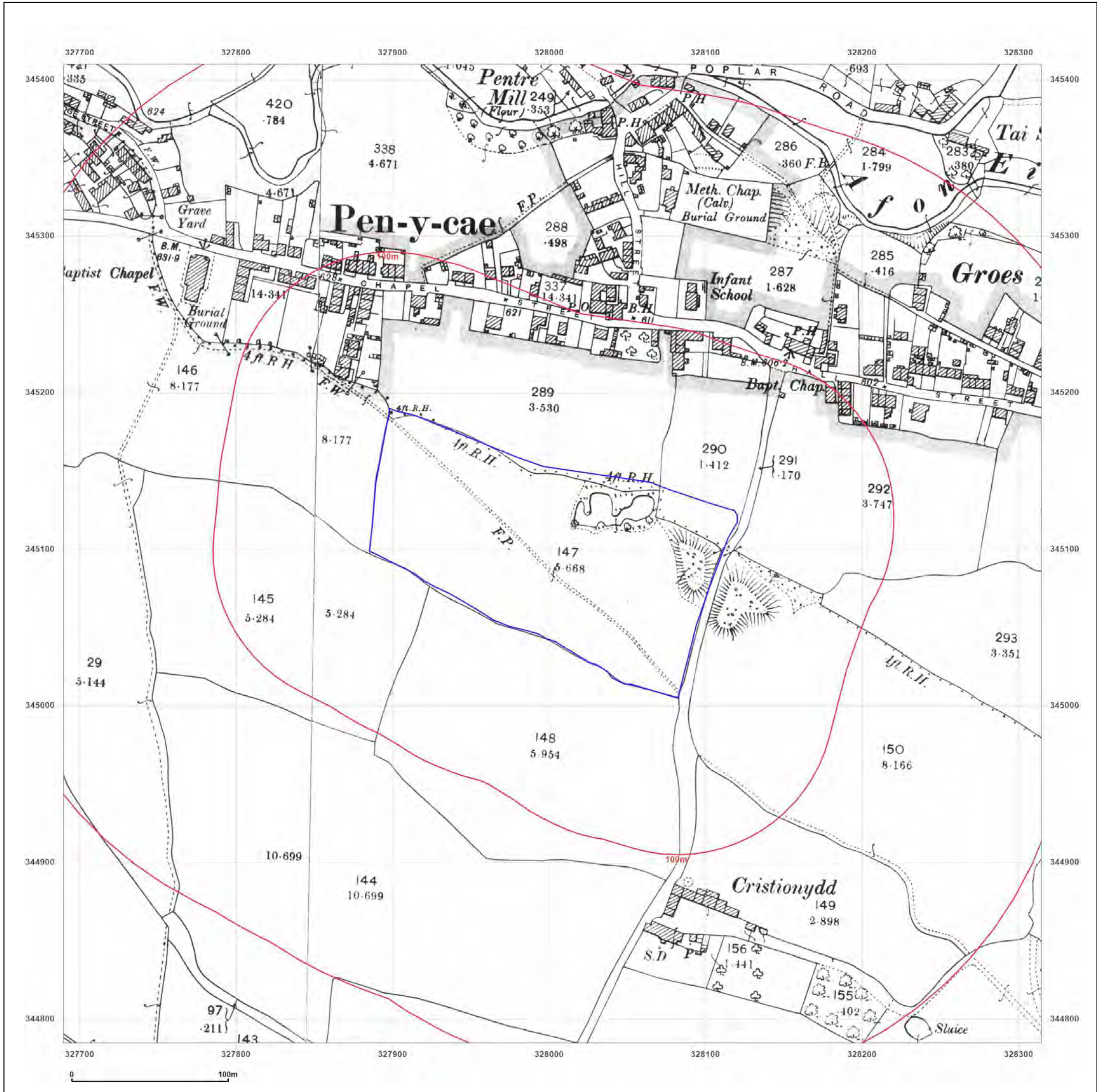


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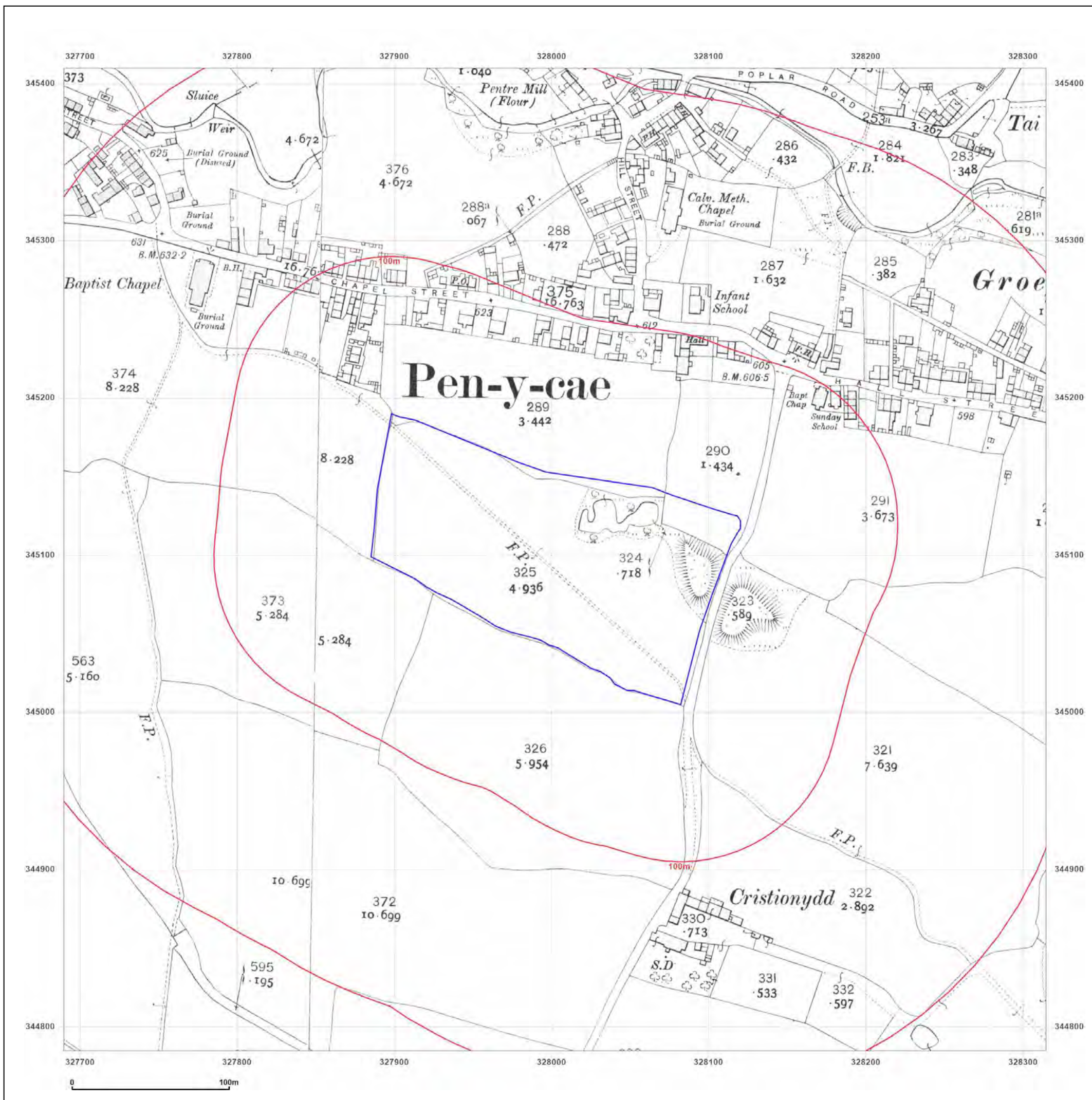


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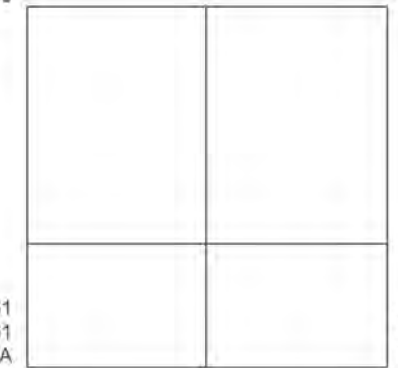
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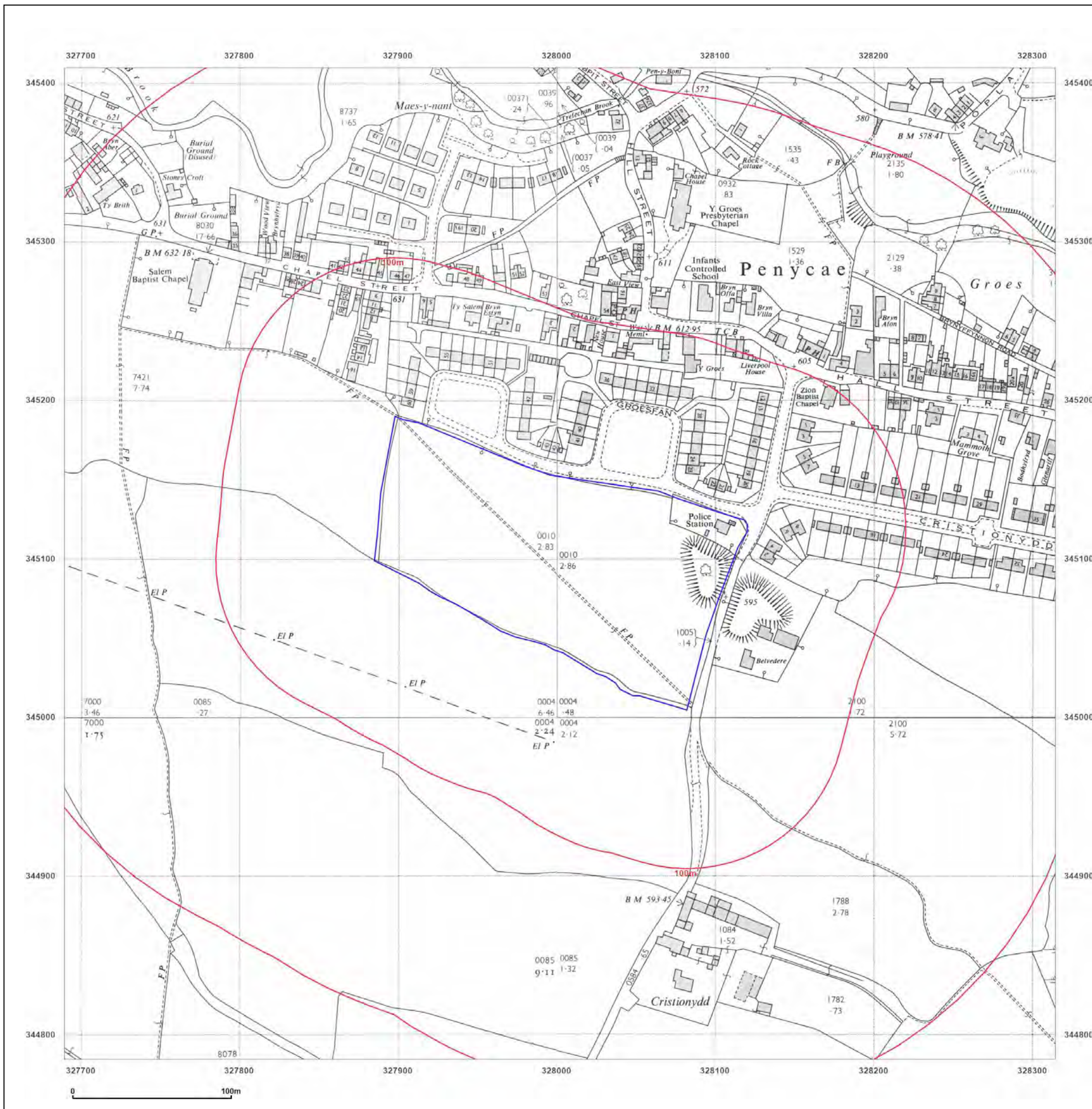


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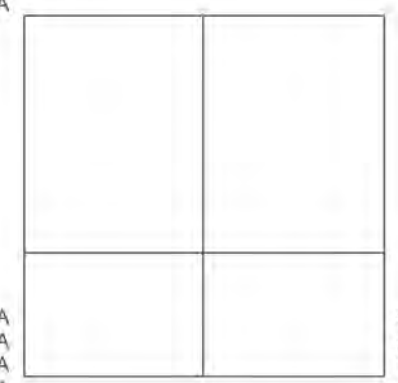
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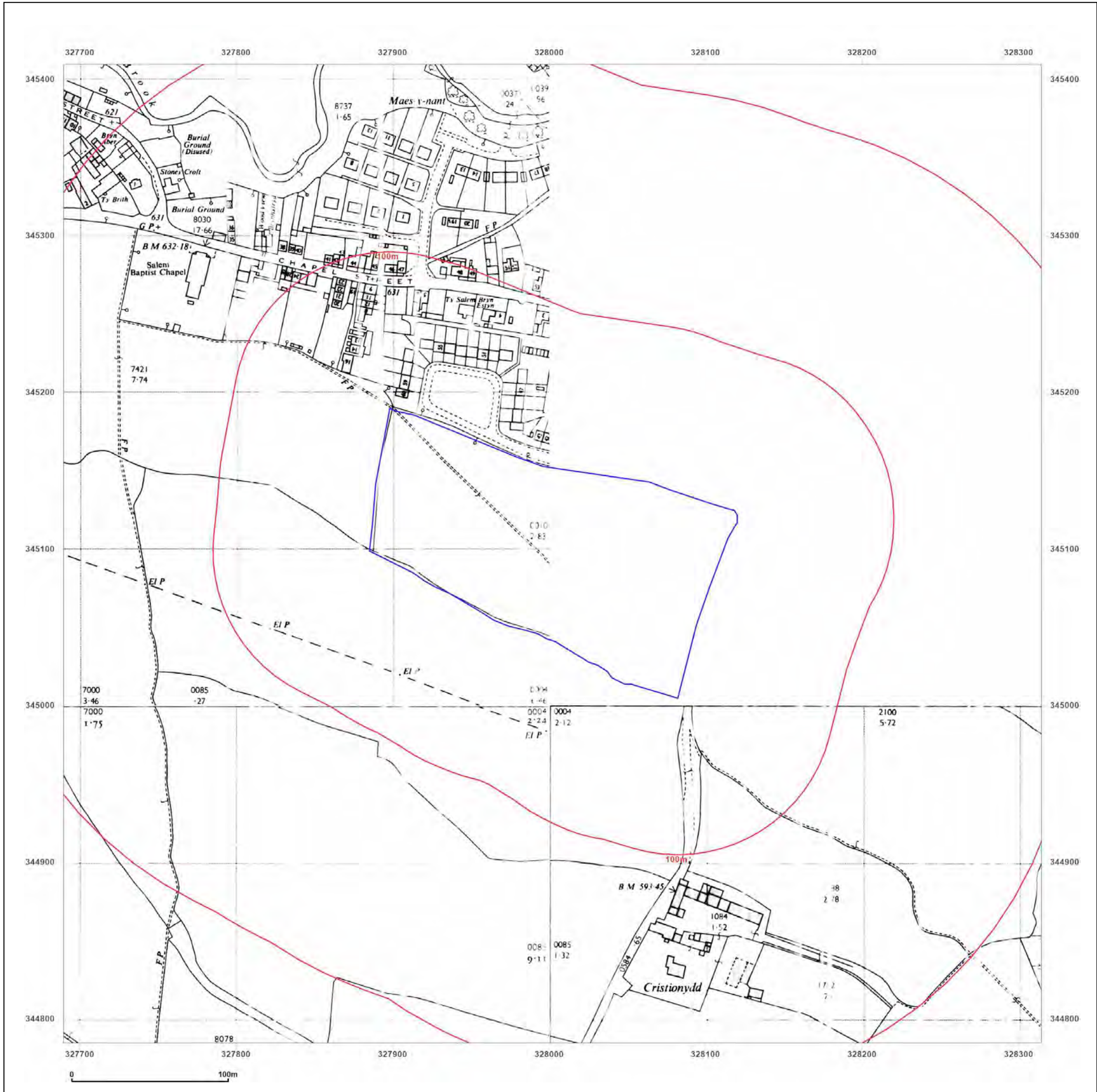


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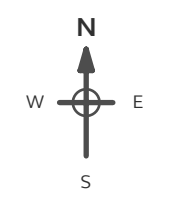
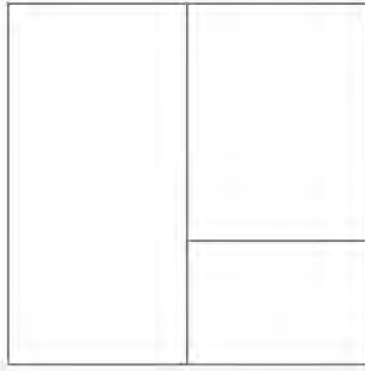


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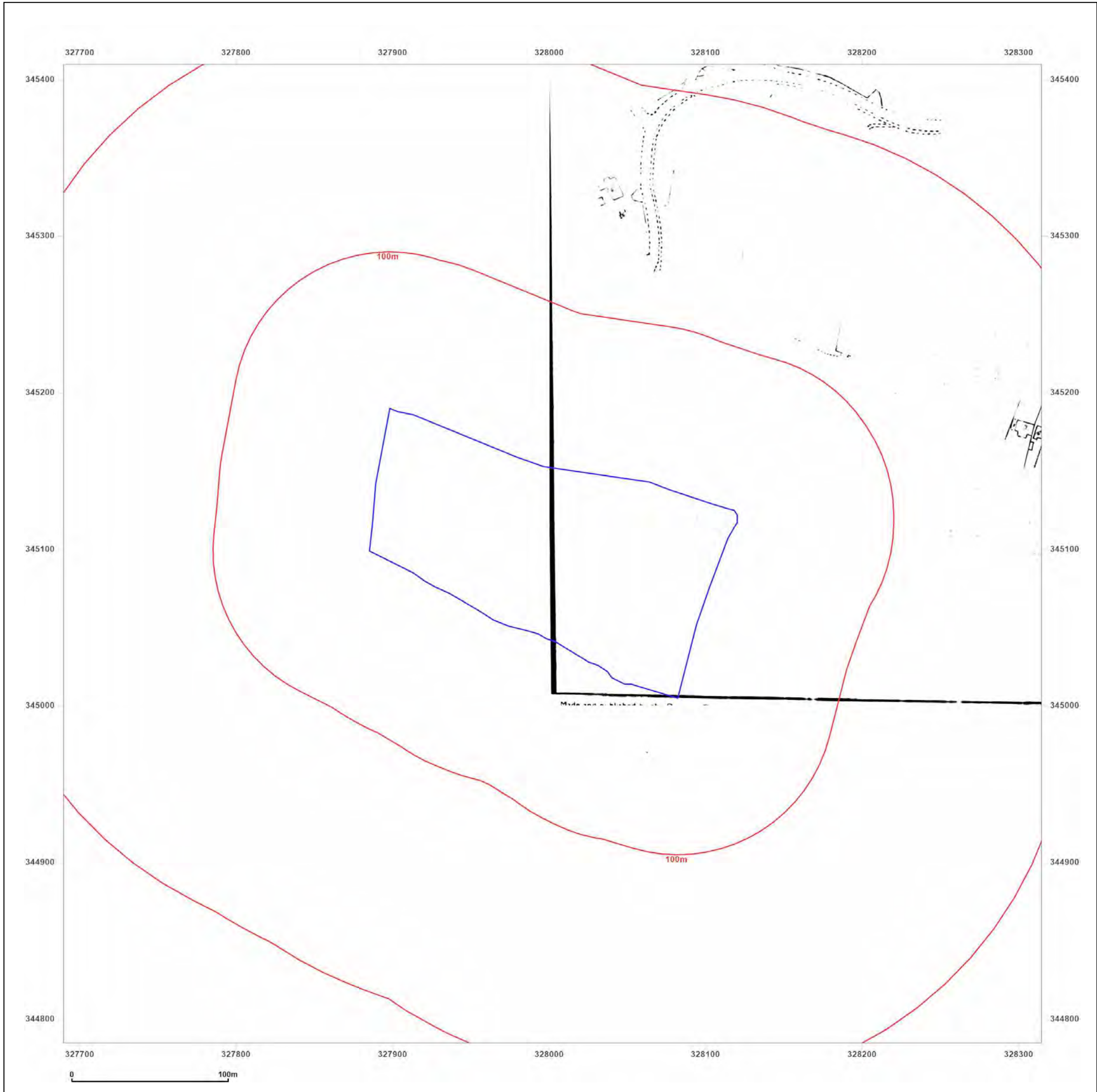
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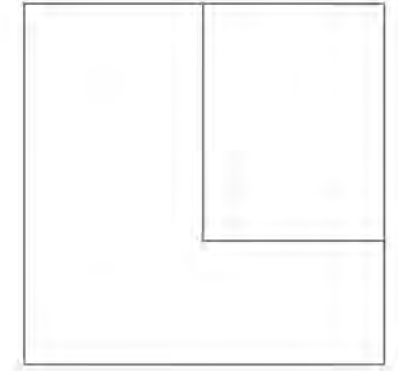
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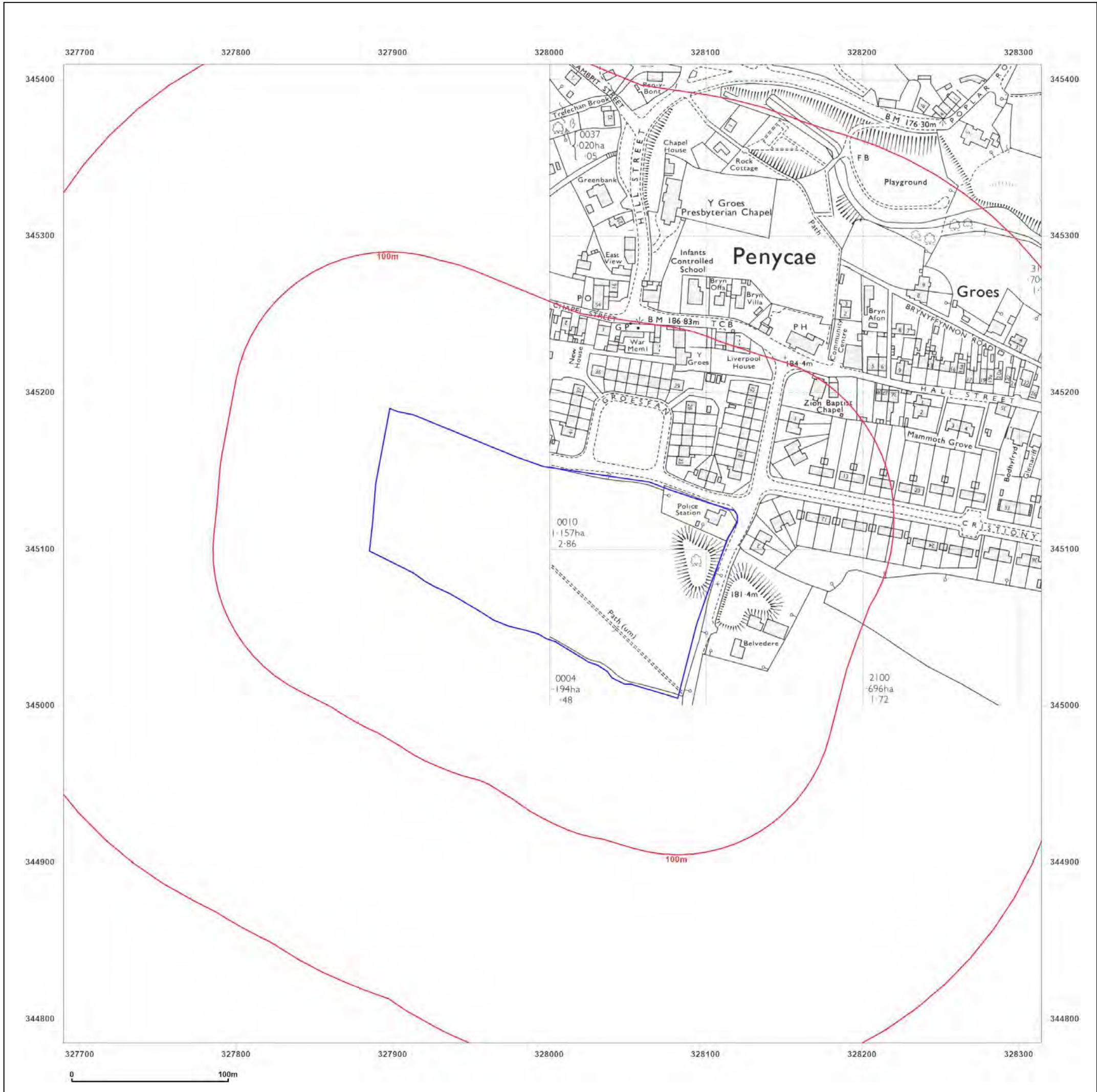


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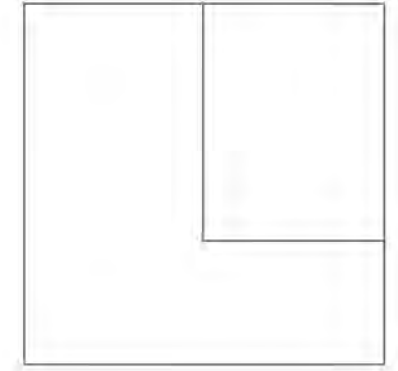
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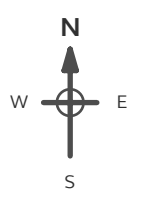
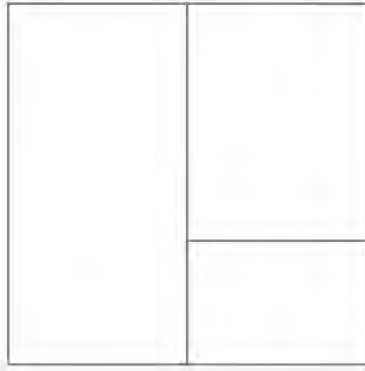


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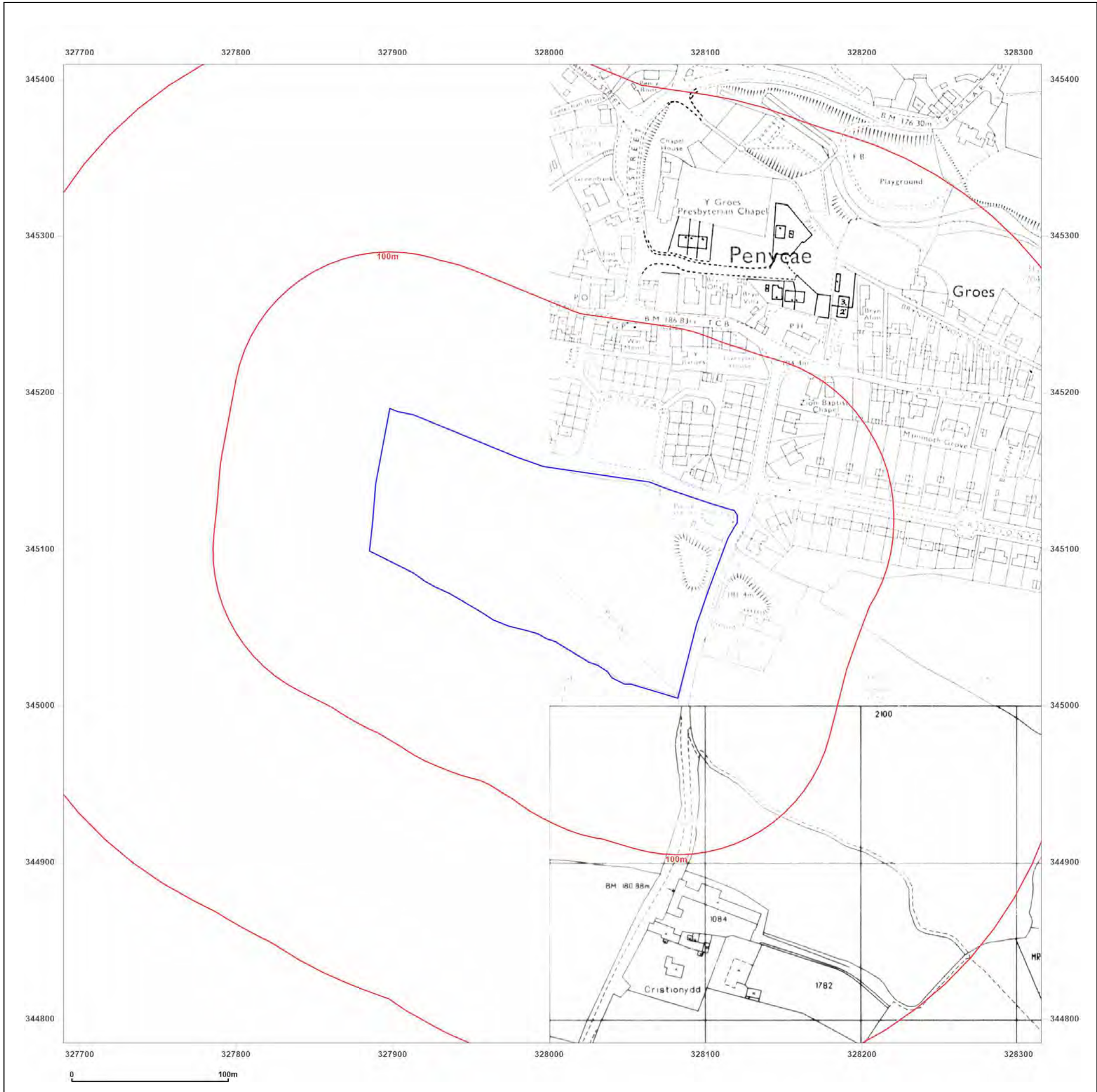
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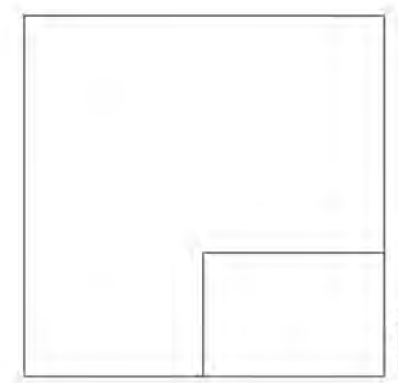
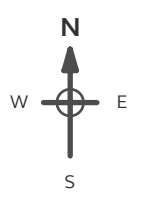
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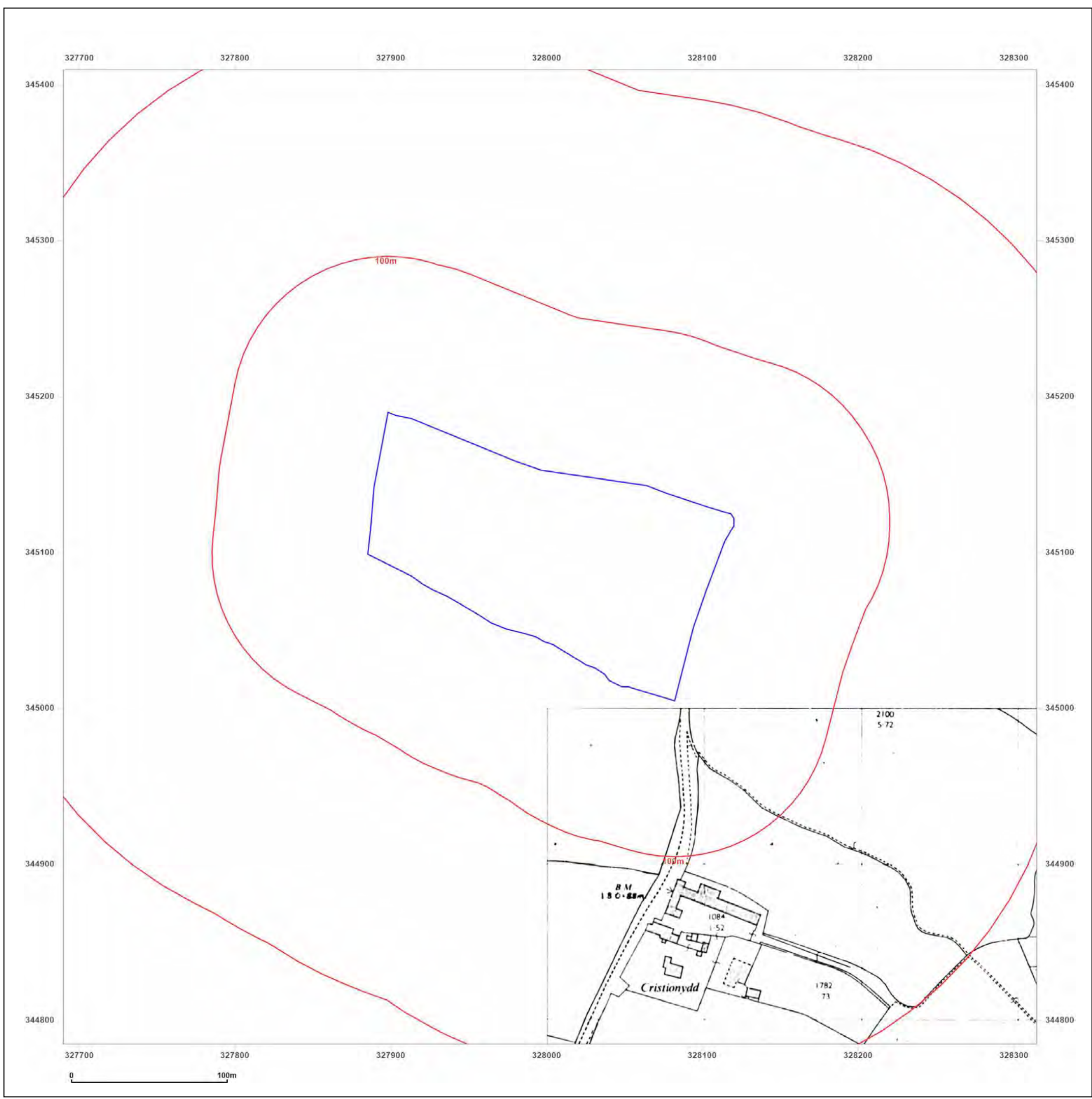


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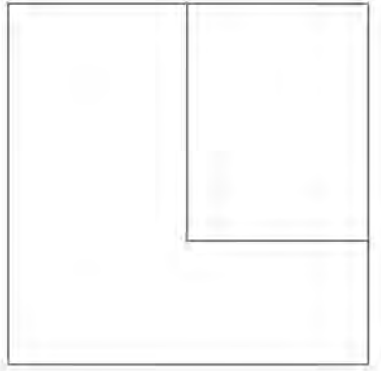
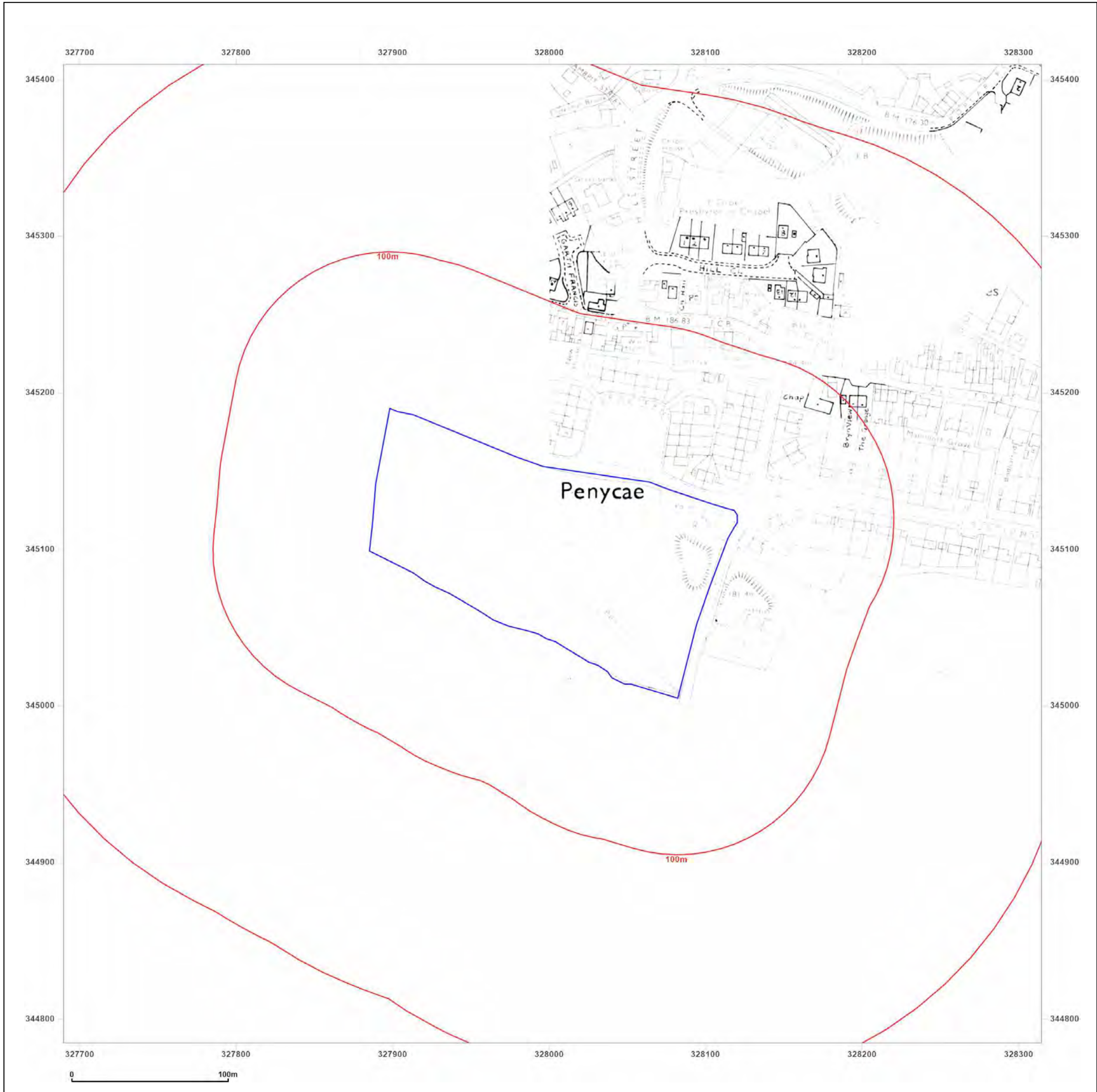
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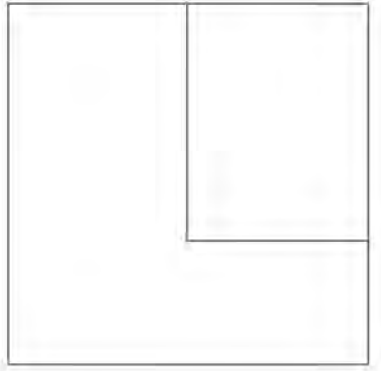
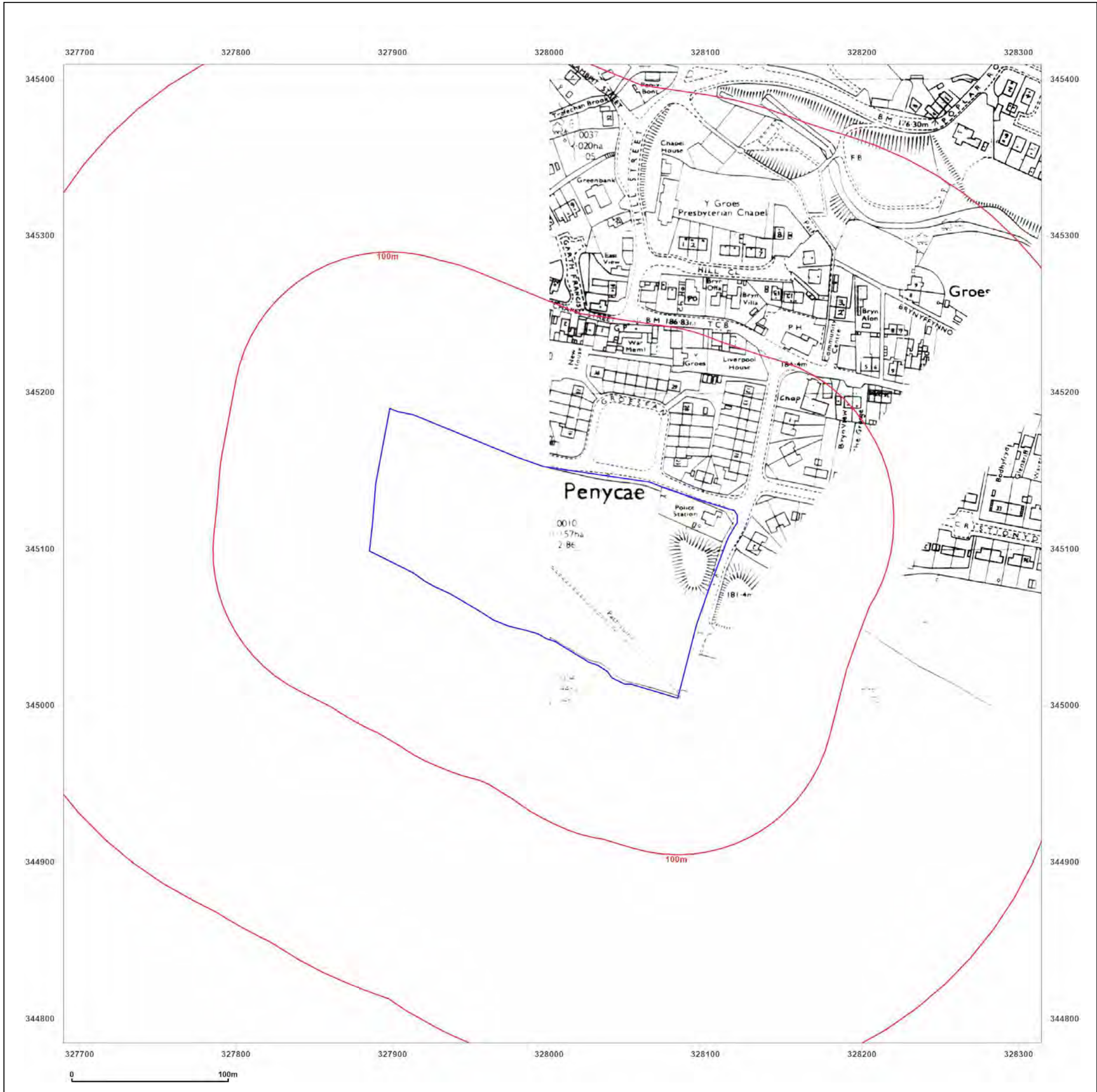
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 LAND AT GROESFAN,
 PENYCAE, WREXHAM, LL14
 2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid
Map date: 1990
Scale: 1:2,500
Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
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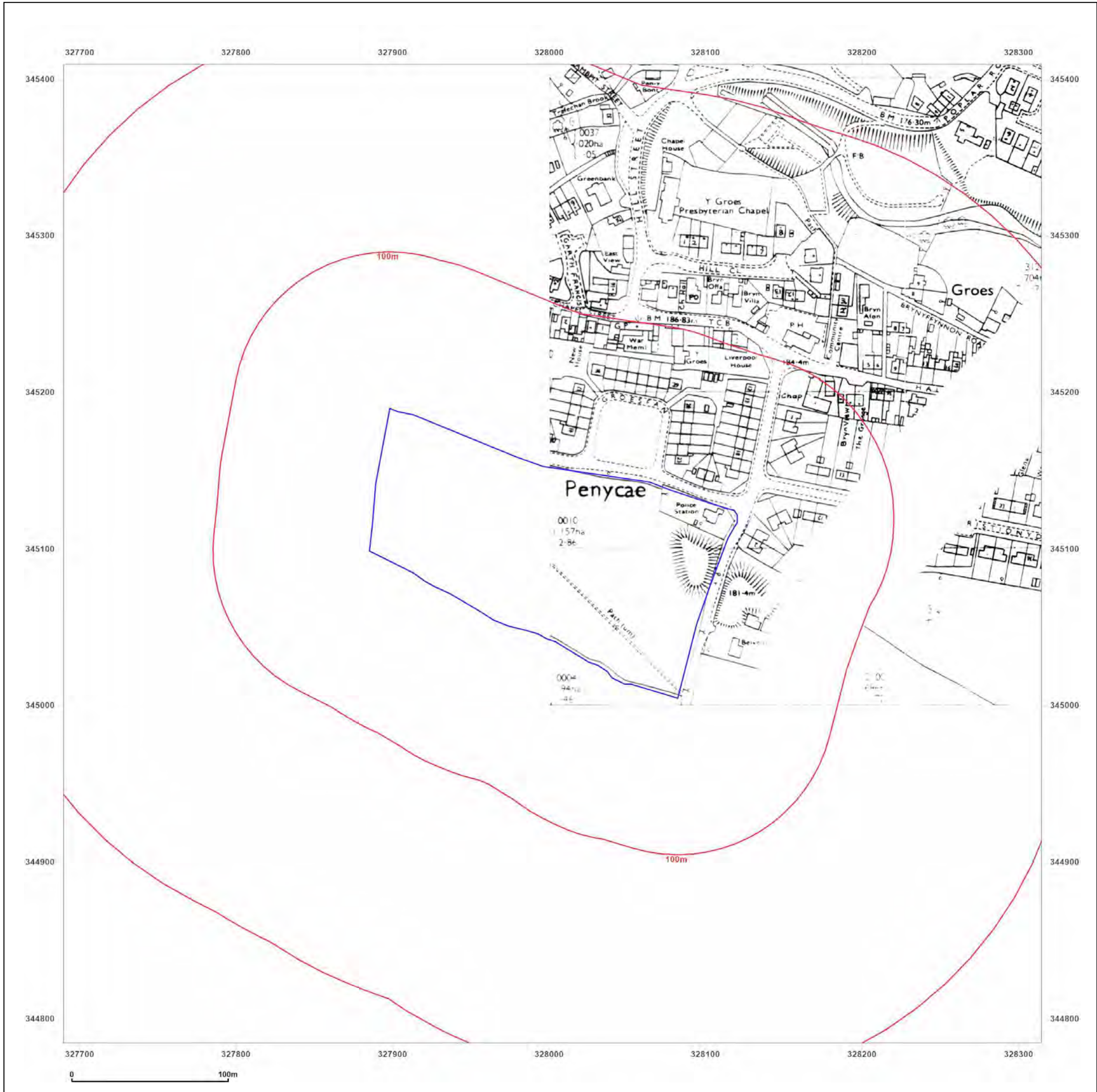
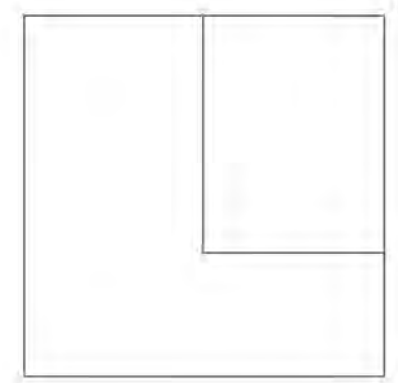
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 PENYCAE, WREXHAM, LL14
 2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid
Map date: 1990
Scale: 1:2,500
Printed at: 1:2,500



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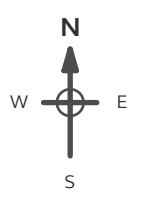
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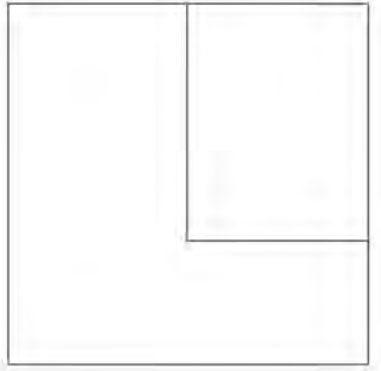
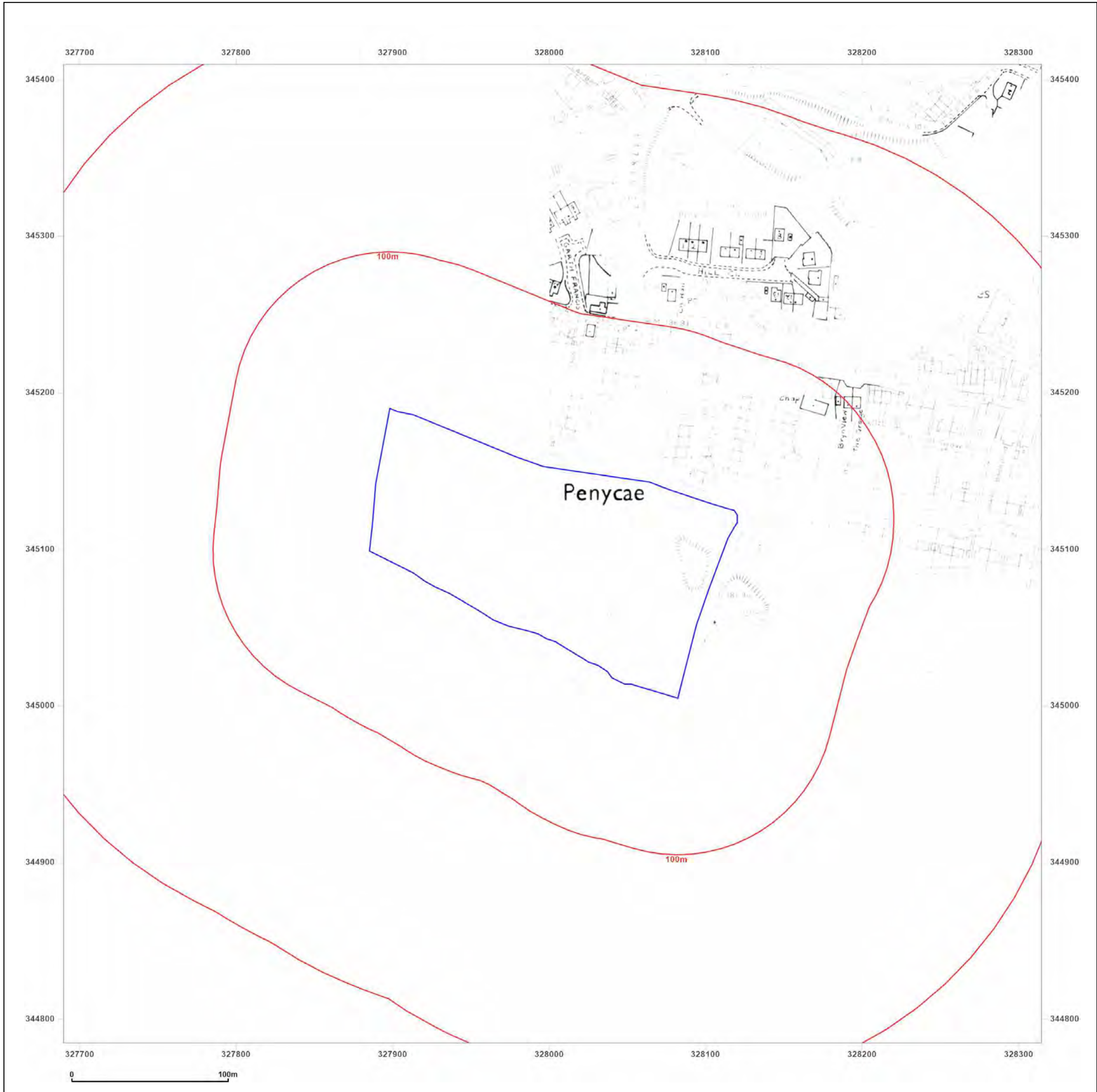
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PENYCAE, WREXHAM, LL14
2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid
Map date: 1990
Scale: 1:2,500
Printed at: 1:2,500



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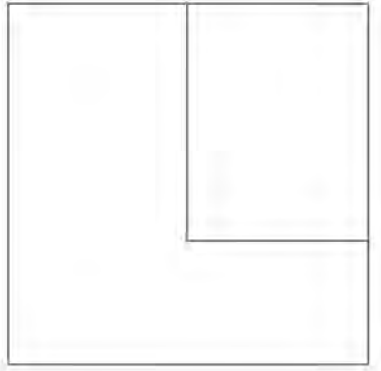
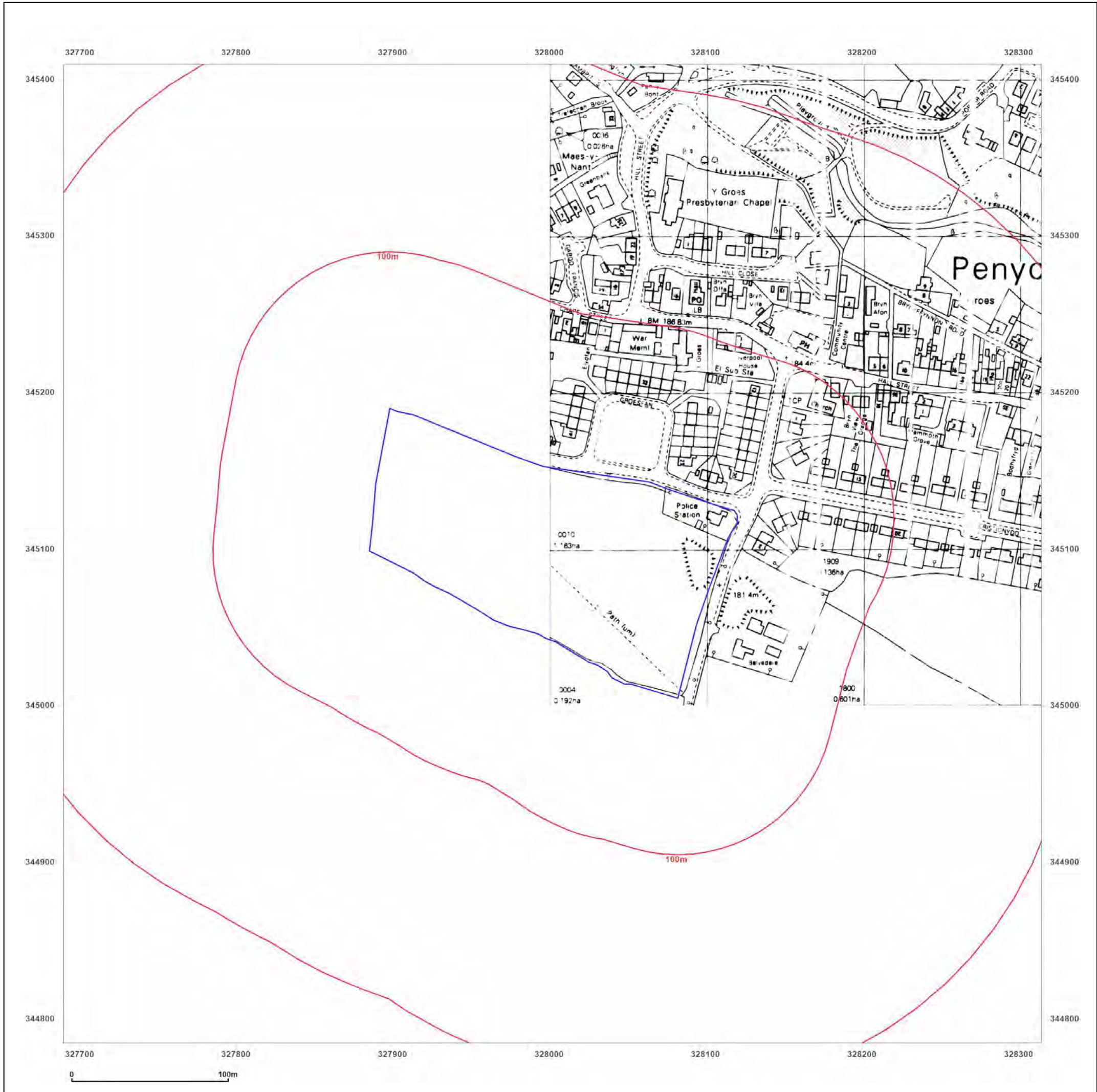
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 PENYCAE, WREXHAM, LL14
 2RP

Client Ref: 21WWH03_-BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid
Map date: 1991
Scale: 1:2,500
Printed at: 1:2,500



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 Revised N/A
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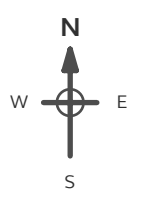
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Site Details:

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2RP

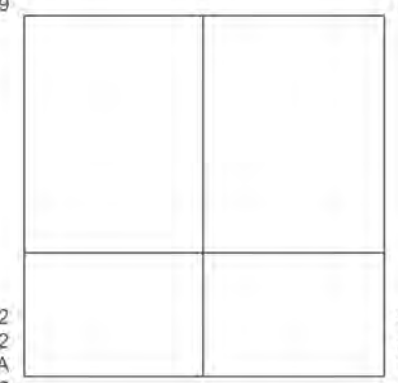
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Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid
Map date: 1988-1992
Scale: 1:2,500
Printed at: 1:2,500



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Revised 1988
Edition N/A
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Levelled 1959



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Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

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

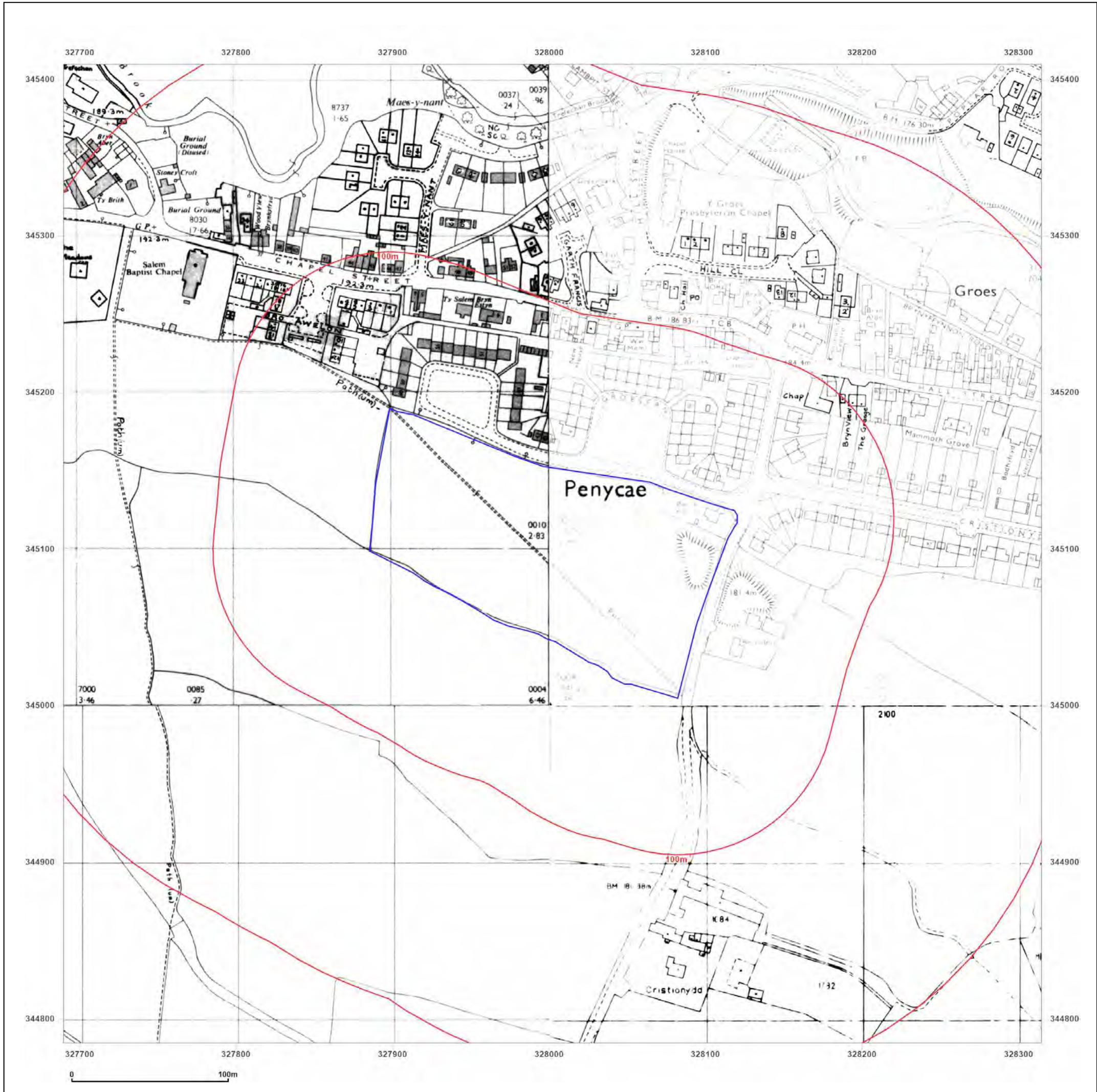


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2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid

Map date: 1990-1993

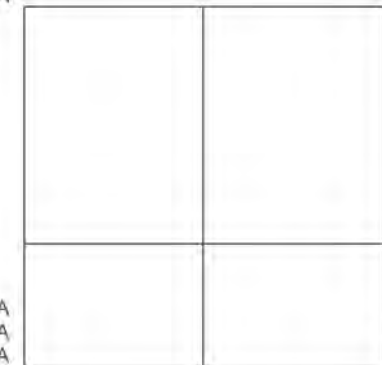
Scale: 1:2,500

Printed at: 1:2,500



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Revised N/A
Edition N/A
Copyright 1993
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Surveyed 1990
Revised 1990
Edition N/A
Copyright 1991
Levelled N/A



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

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

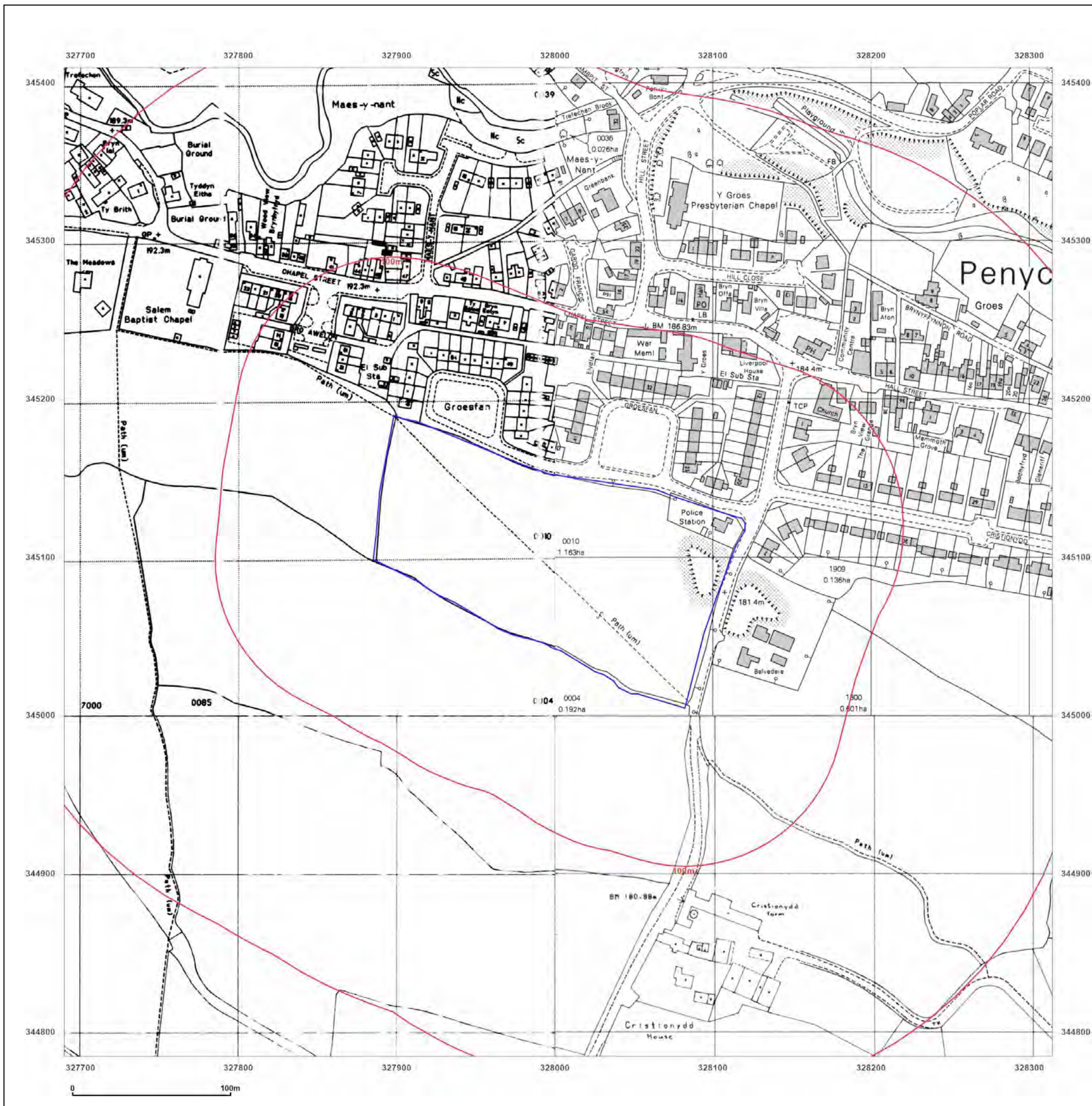


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2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid

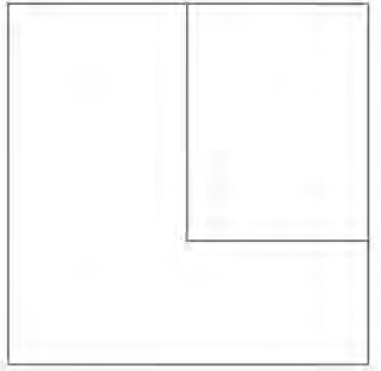
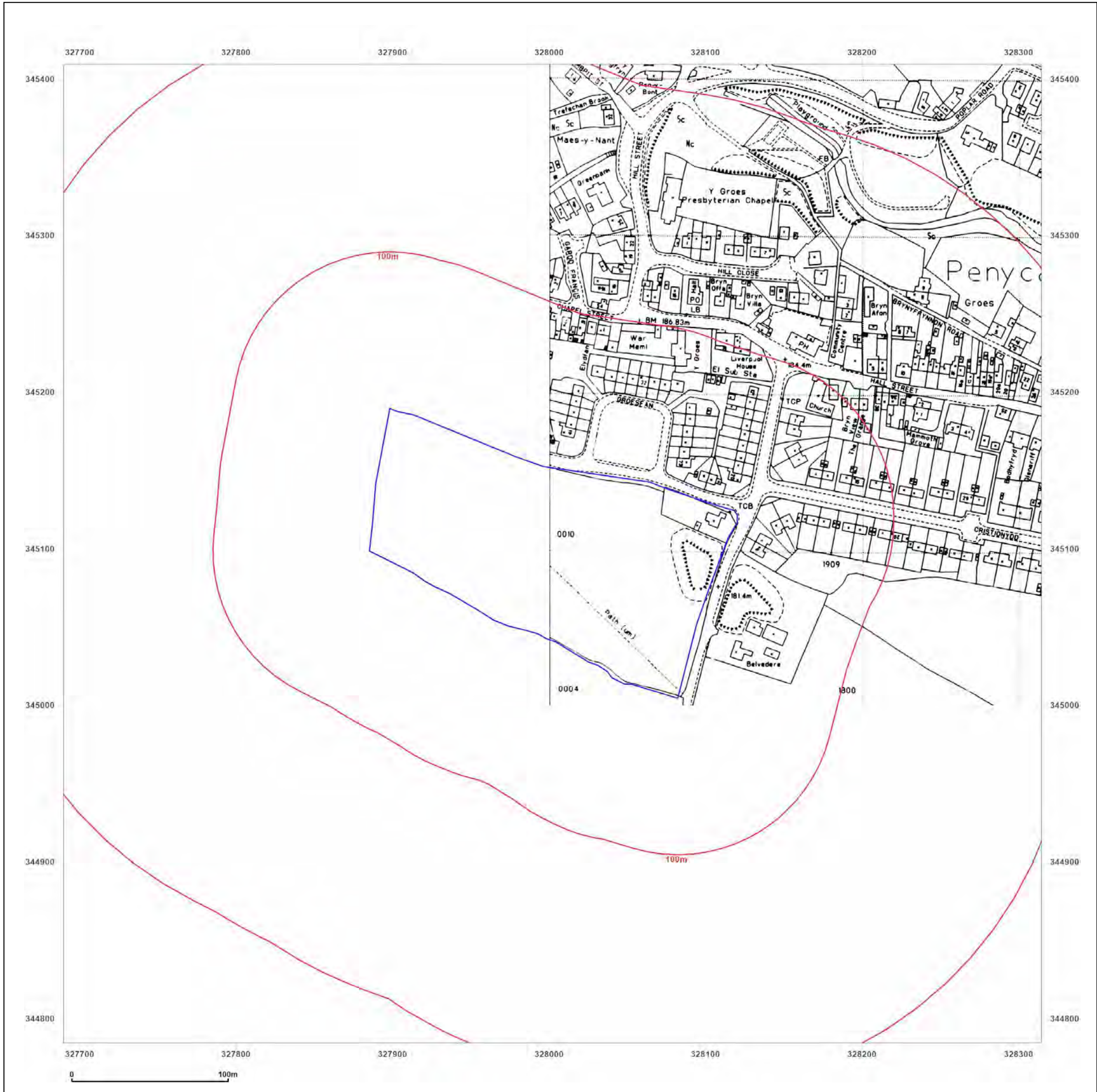
Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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 2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid
Map date: 1990-1994
Scale: 1:2,500
Printed at: 1:2,500



	Surveyed N/A Revised N/A Edition N/A Copyright 1990 Levelled 1959
Surveyed 1994 Revised N/A Edition N/A Copyright 1994 Levelled N/A	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A

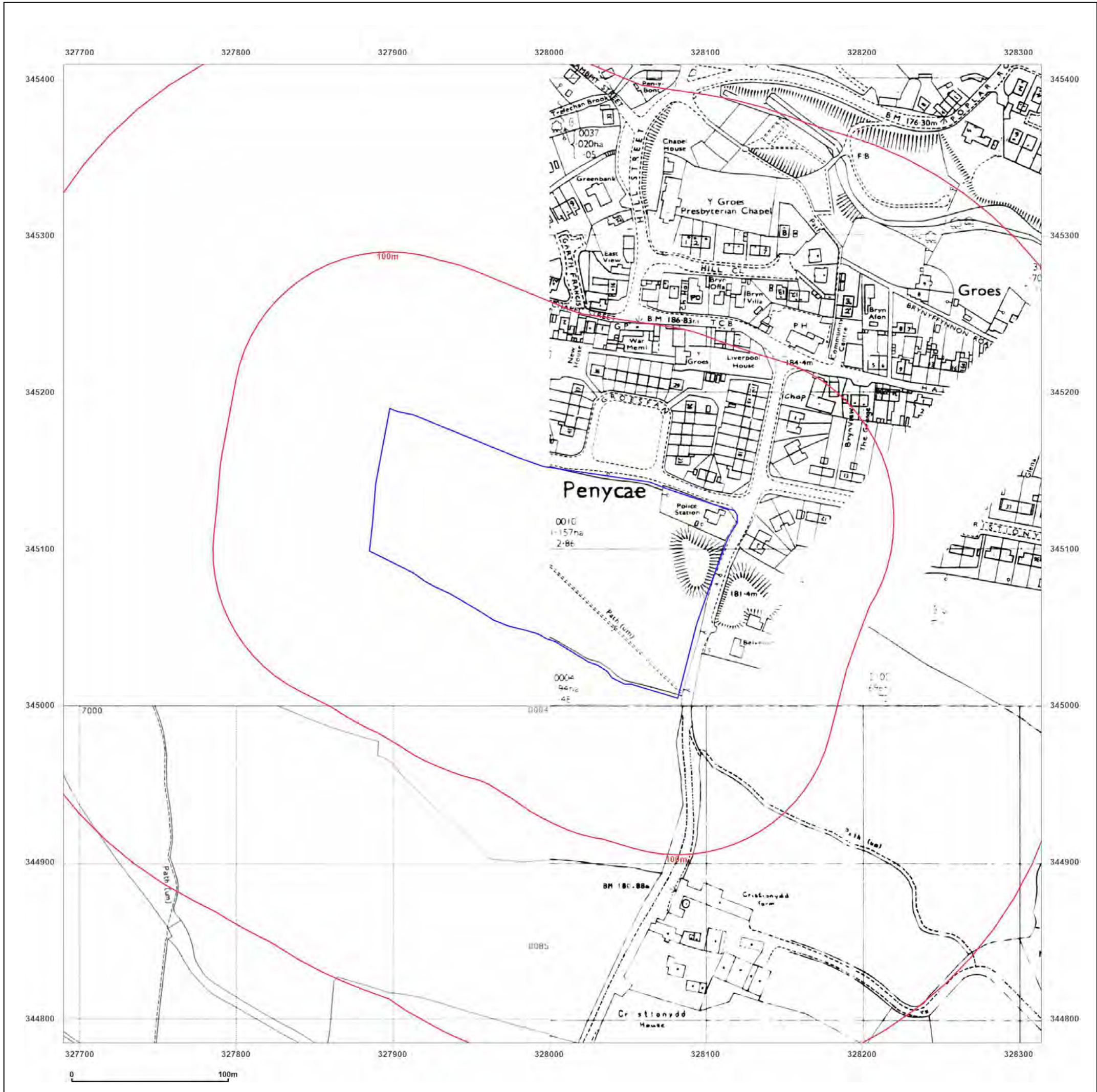
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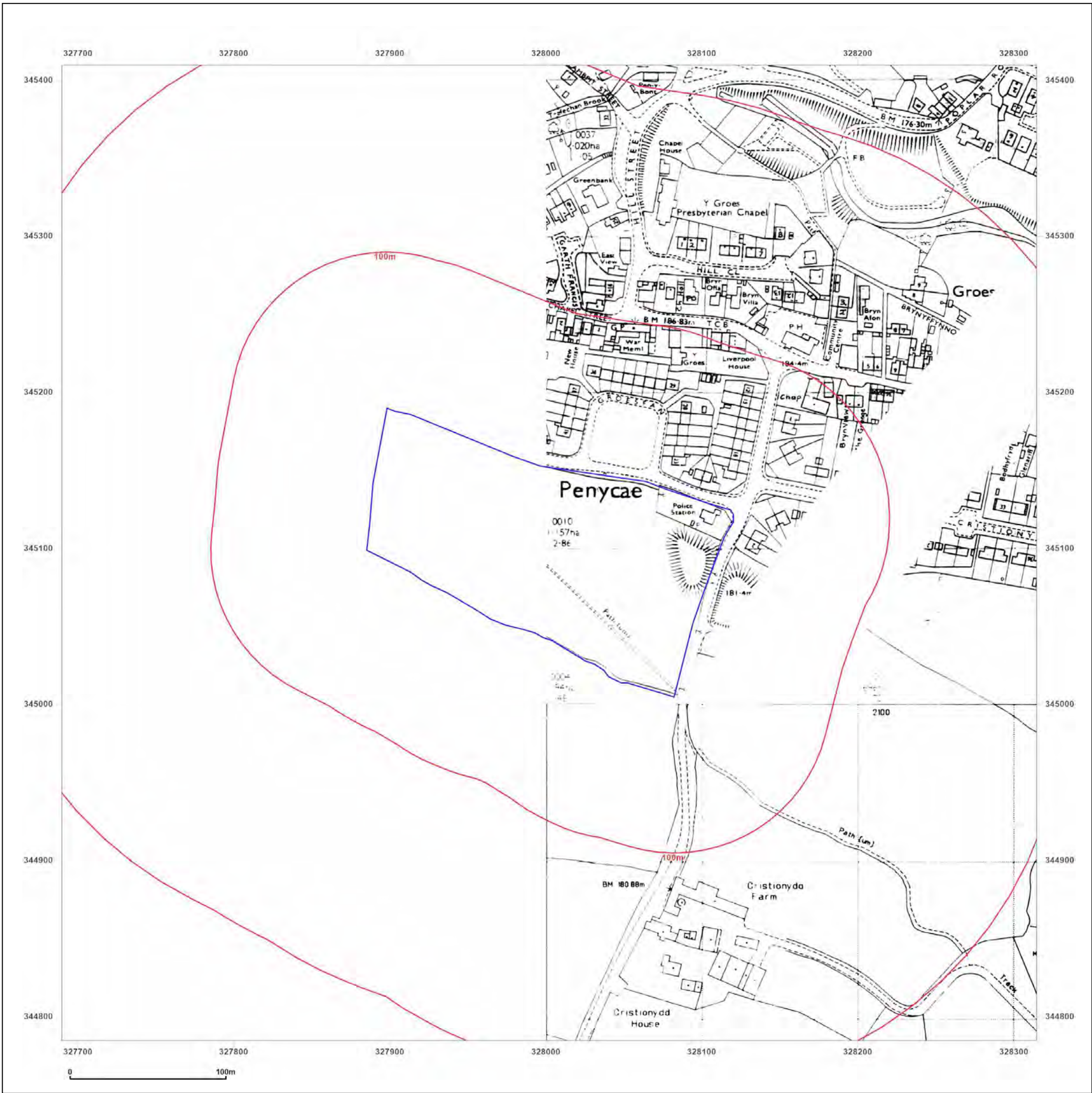

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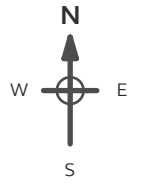
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Map Name: National Grid

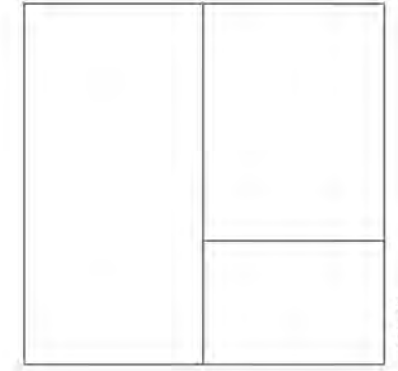
Map date: 1990-1994

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
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Edition N/A
Copyright 1990
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Revised N/A
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Client Ref: 21WWH03_-_BG4170
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Grid Ref: 328002, 345097

Map Name: National Grid

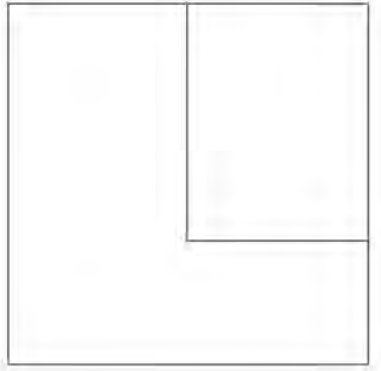
Map date: 1994

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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Client Ref: 21WWH03_-_BG4170
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Grid Ref: 328002, 345097

Map Name: National Grid

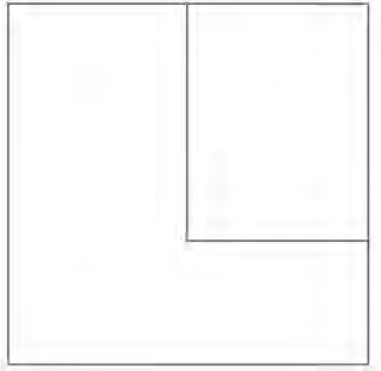
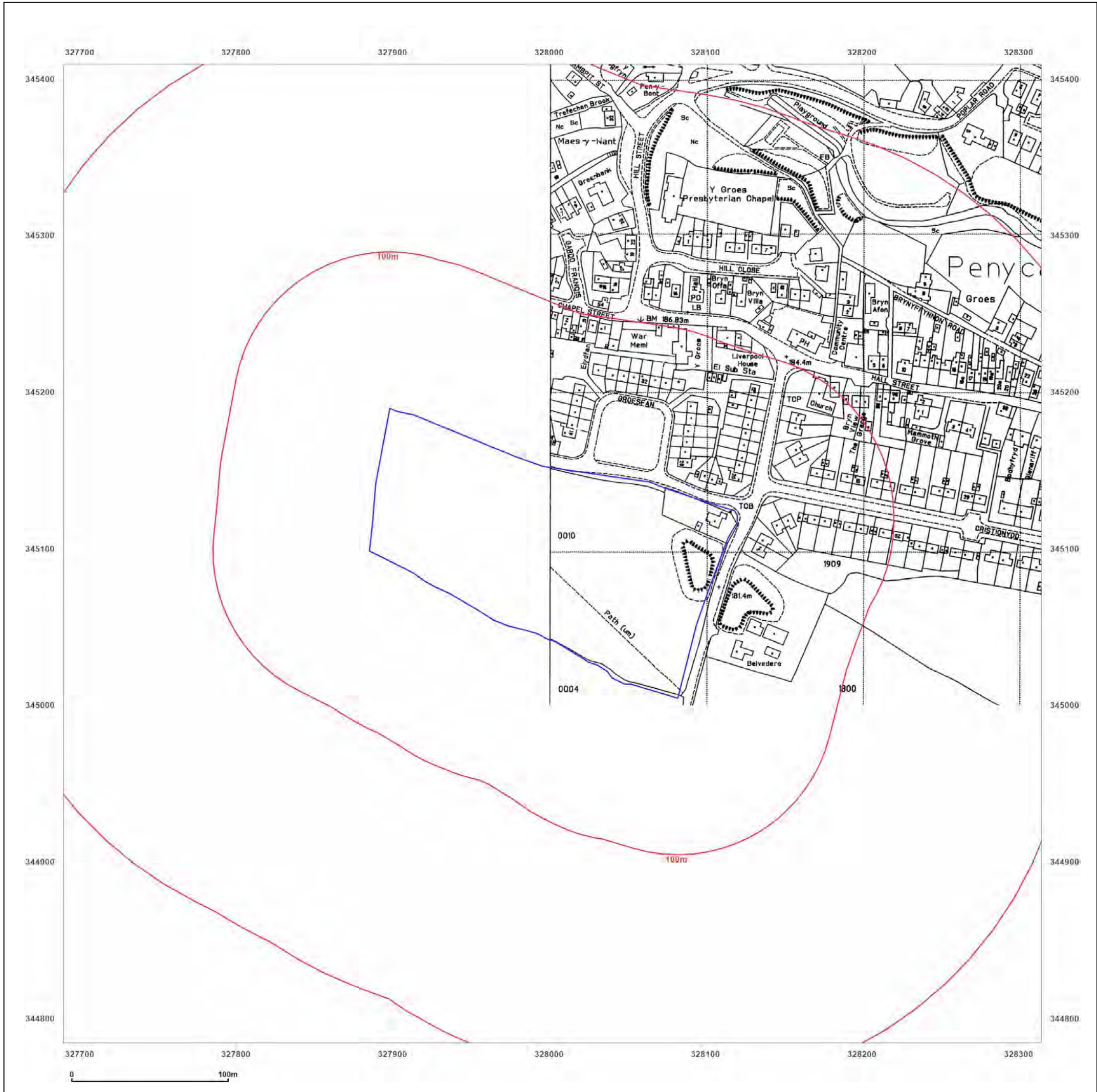
Map date: 1994

Scale: 1:2,500

Printed at: 1:2,500



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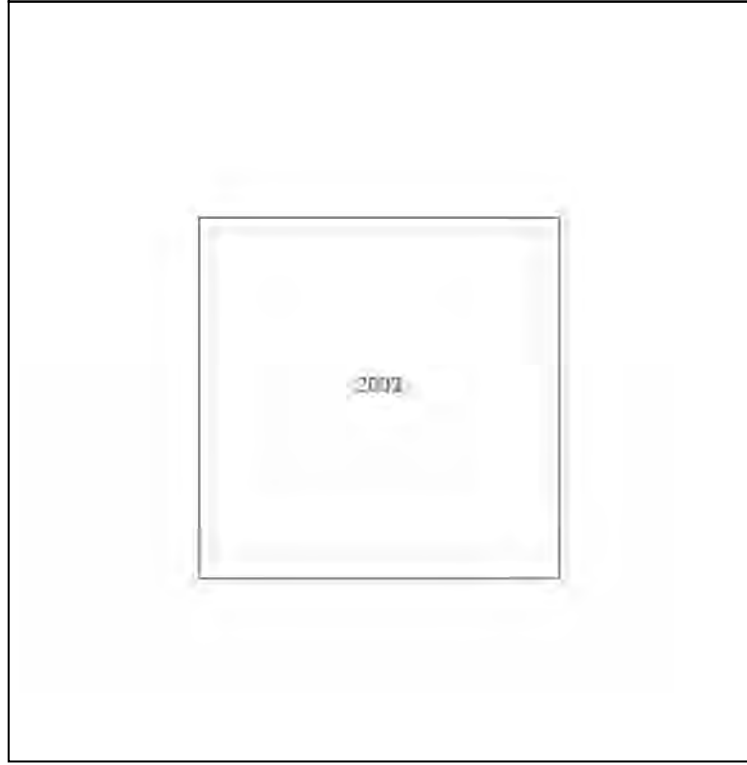
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Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250

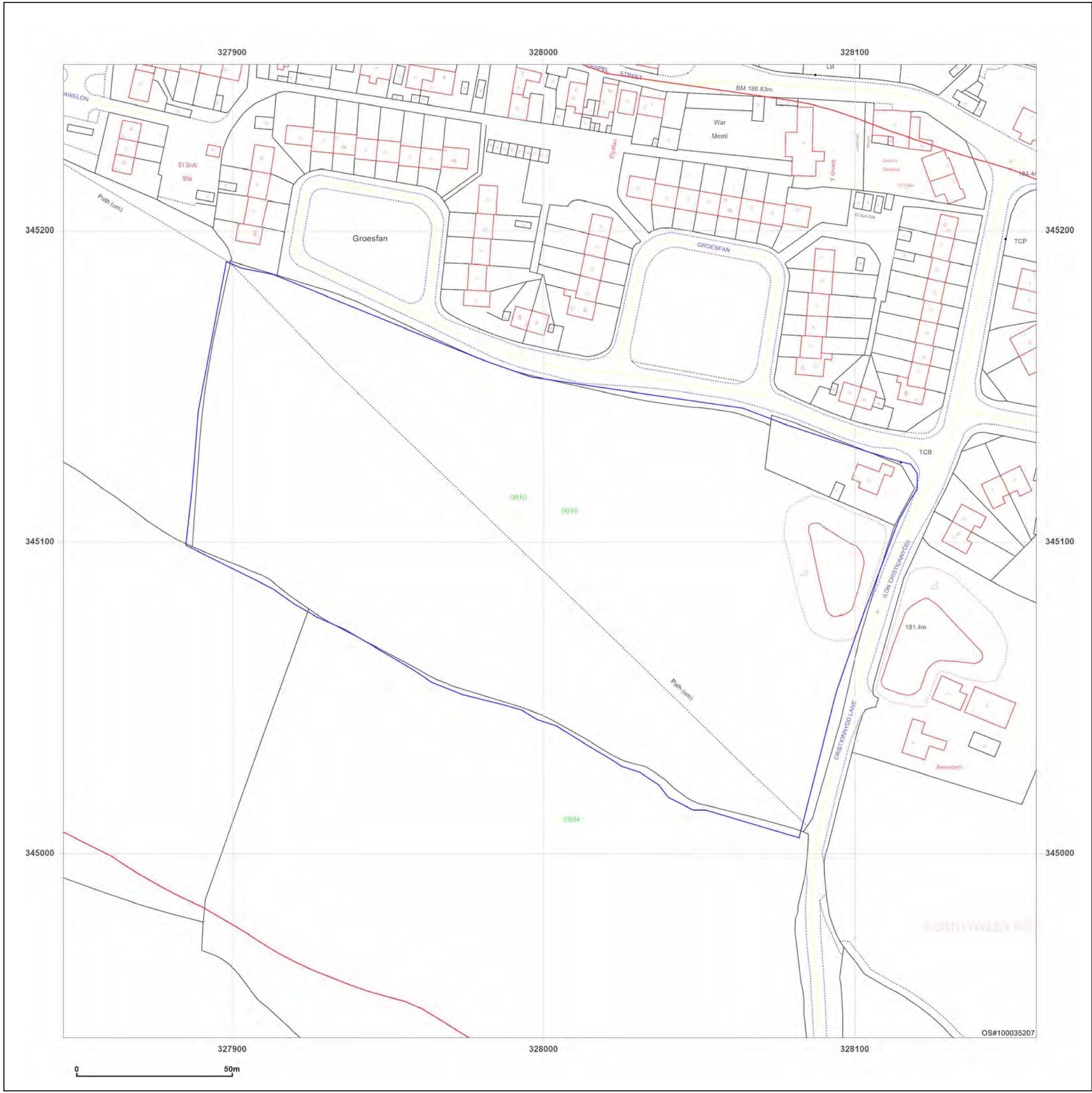


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Grid Ref: 328002, 345097

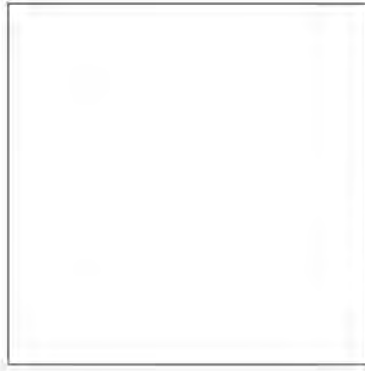
Map Name: County Series

Map date: 1873

Scale: 1:10,560

Printed at: 1:10,560





Surveyed 1873
Revised 1873
Edition N/A
Copyright N/A
Levelled N/A

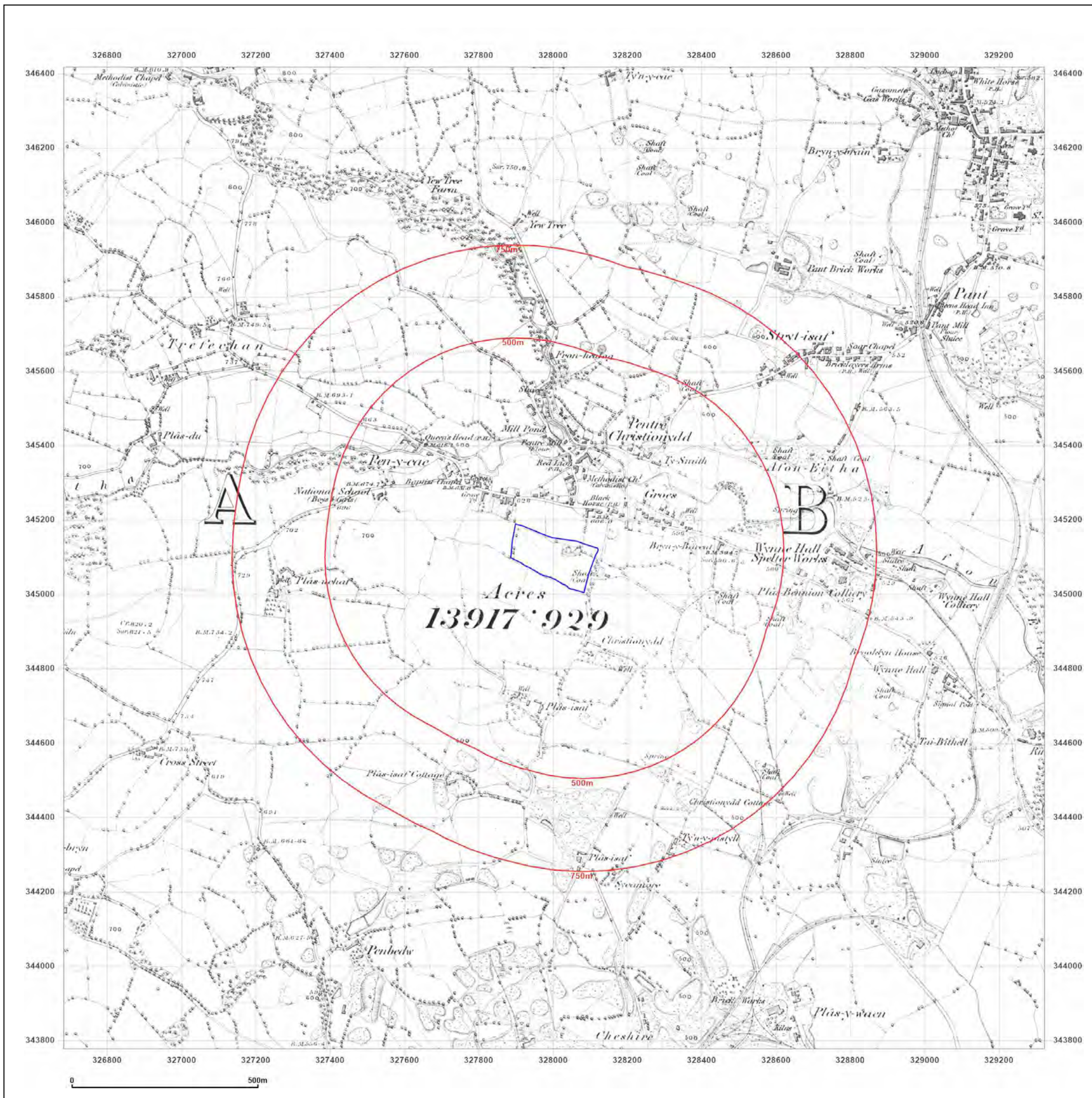


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2RP

Client Ref: 21WWH03_-BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: County Series

Map date: 1898

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1872
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

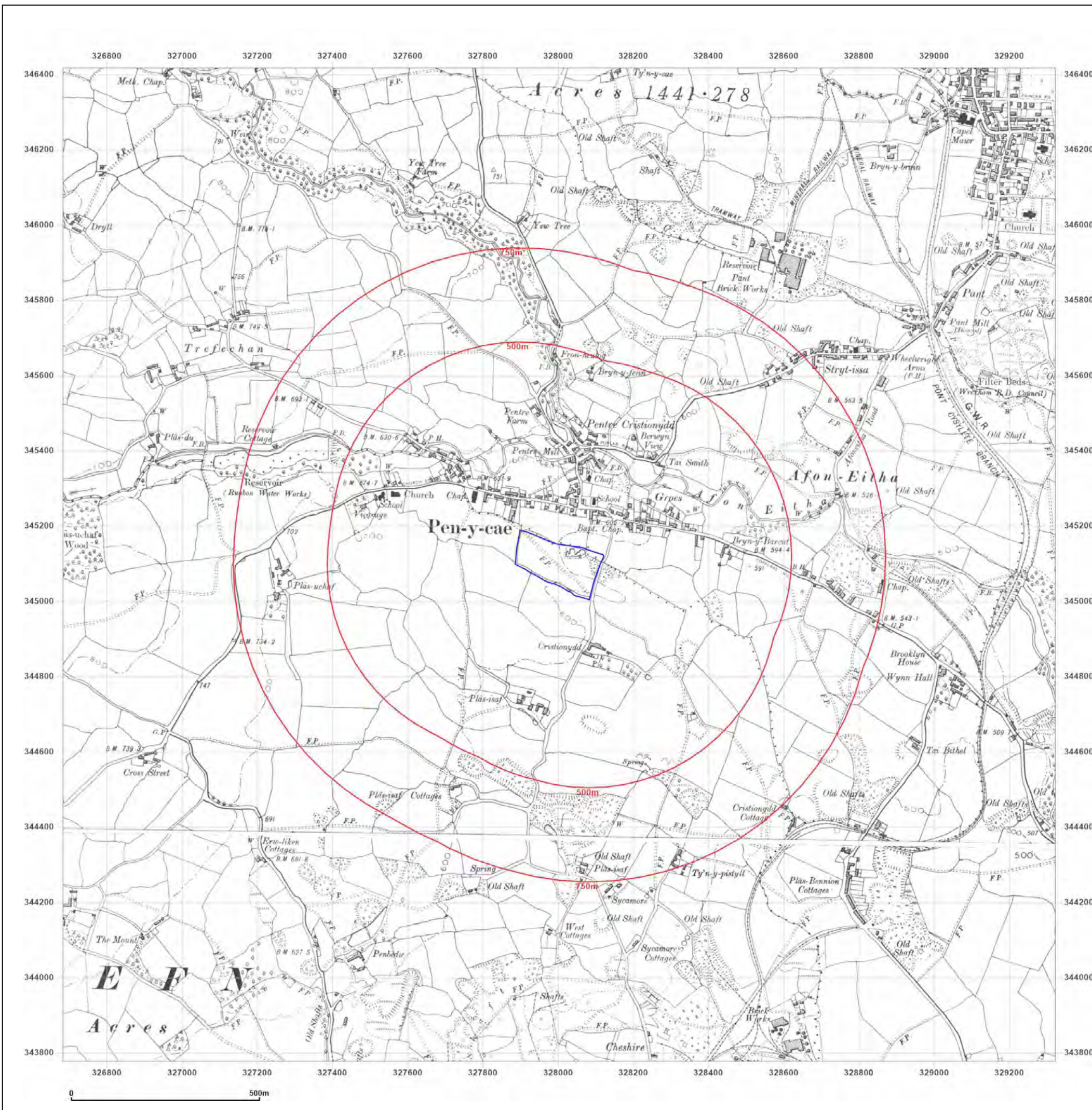


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2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: County Series

Map date: 1909-1910

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1872
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1872
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

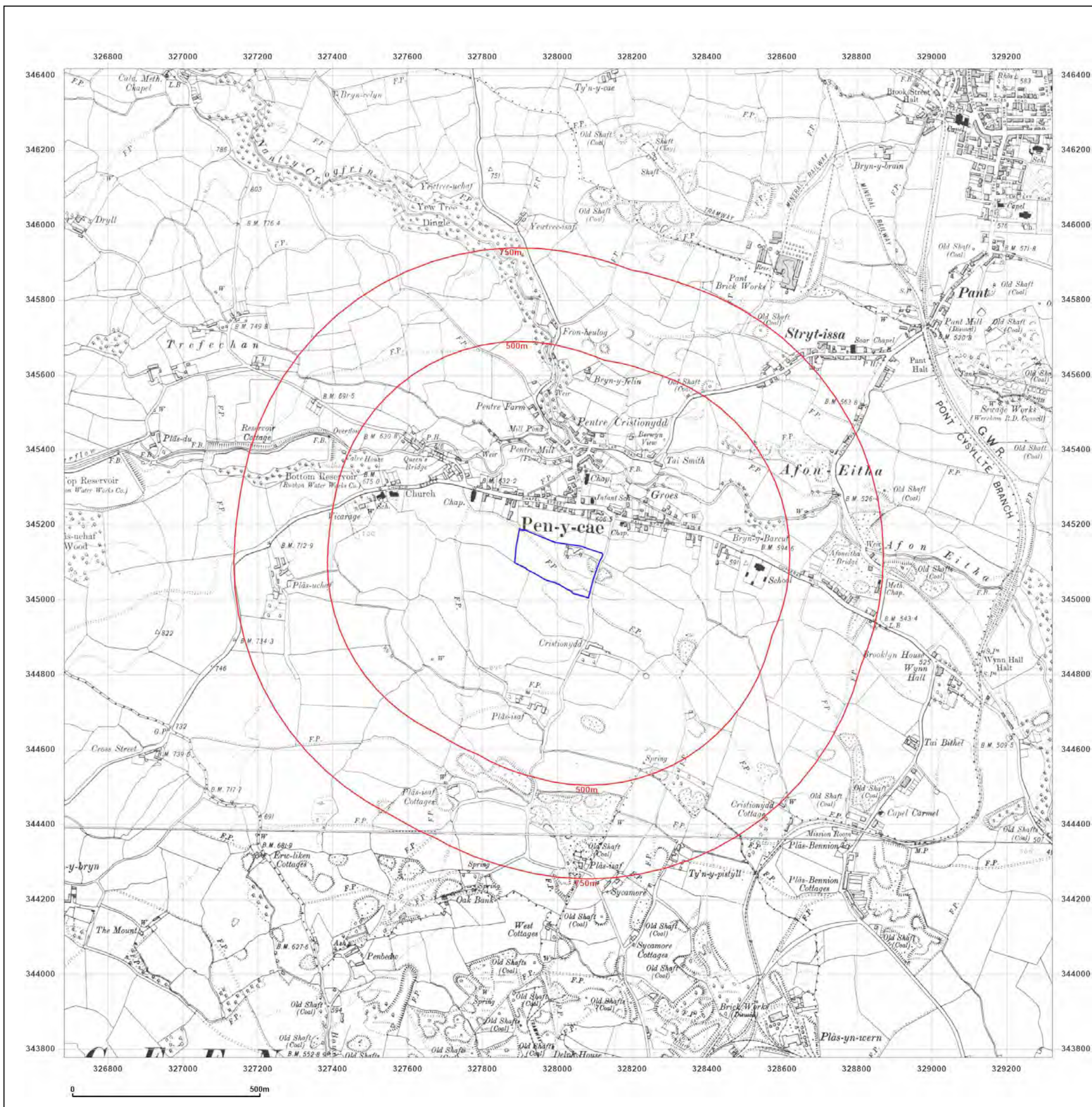


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2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1938
Edition 1938
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Surveyed 1872
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

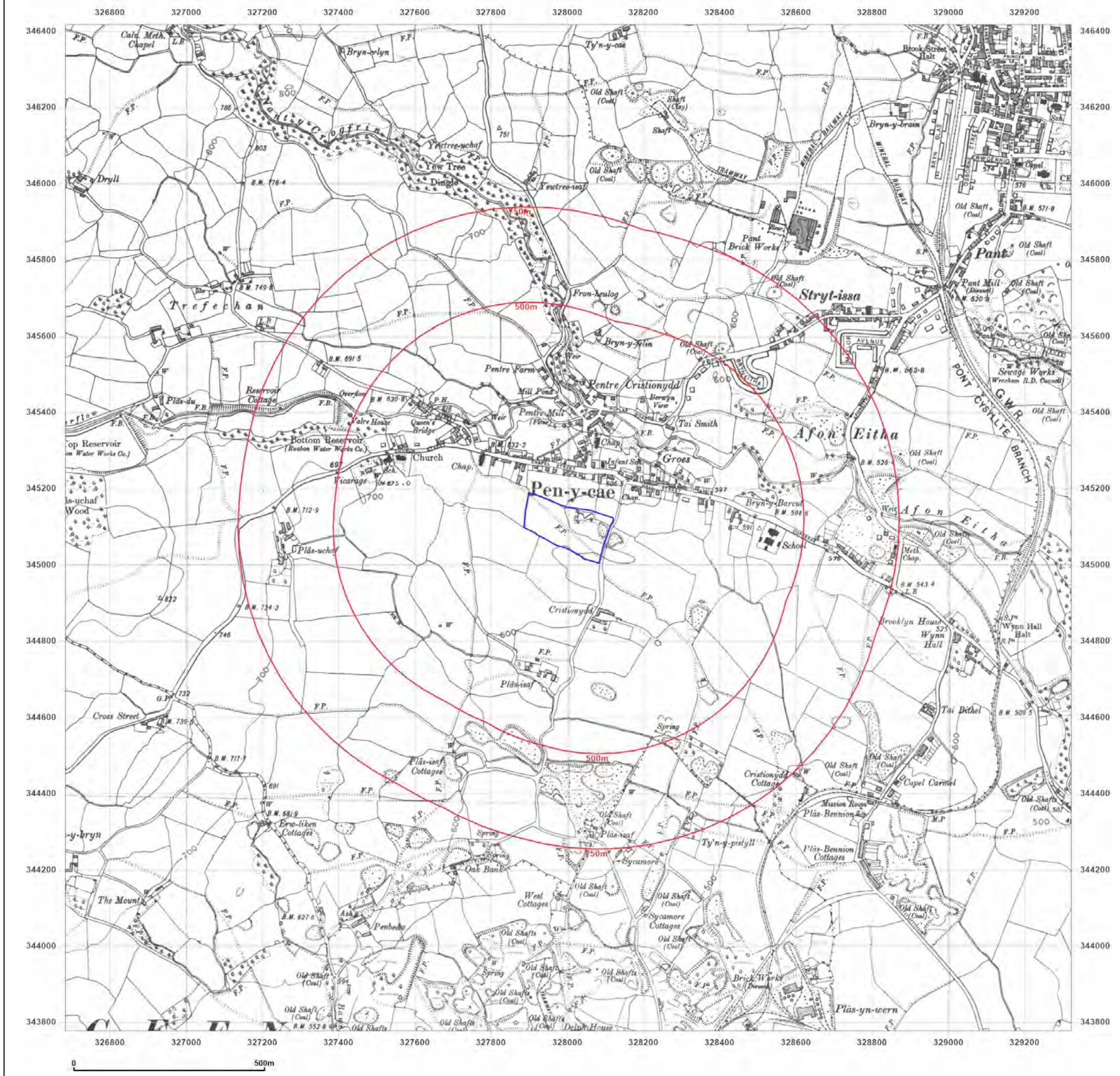


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2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: County Series

Map date: 1949

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1872
Revised 1949
Edition N/A
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Surveyed 1872
Revised 1949
Edition N/A
Copyright N/A
Levelled N/A

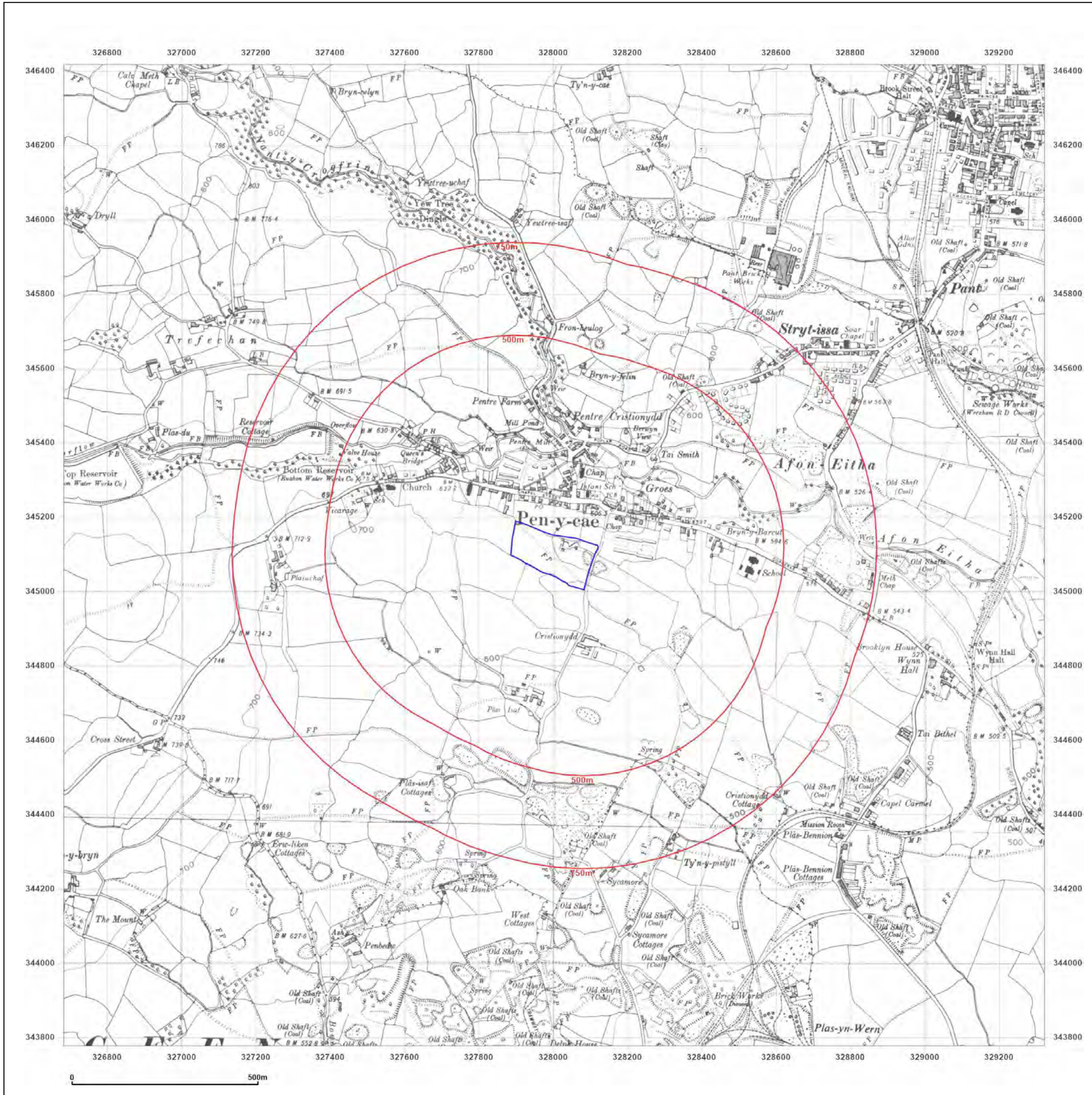


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2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: Provisional

Map date: 1960

Scale: 1:10,560

Printed at: 1:10,560



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

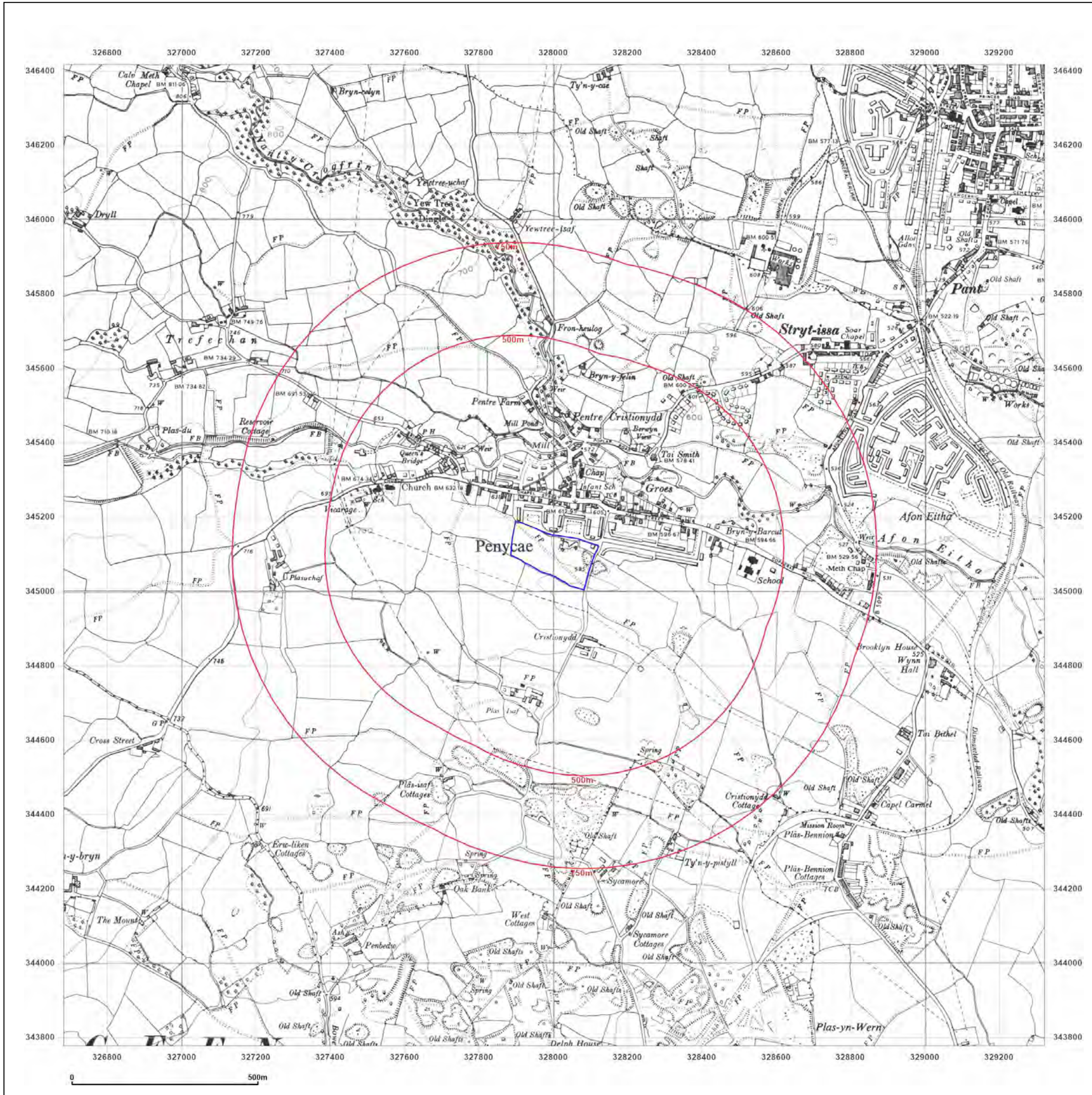


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2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid

Map date: 1976-1977

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1975
Edition N/A
Copyright 1976
Levelled 1973

Surveyed 1971
Revised 1976
Edition N/A
Copyright 1977
Levelled 1973

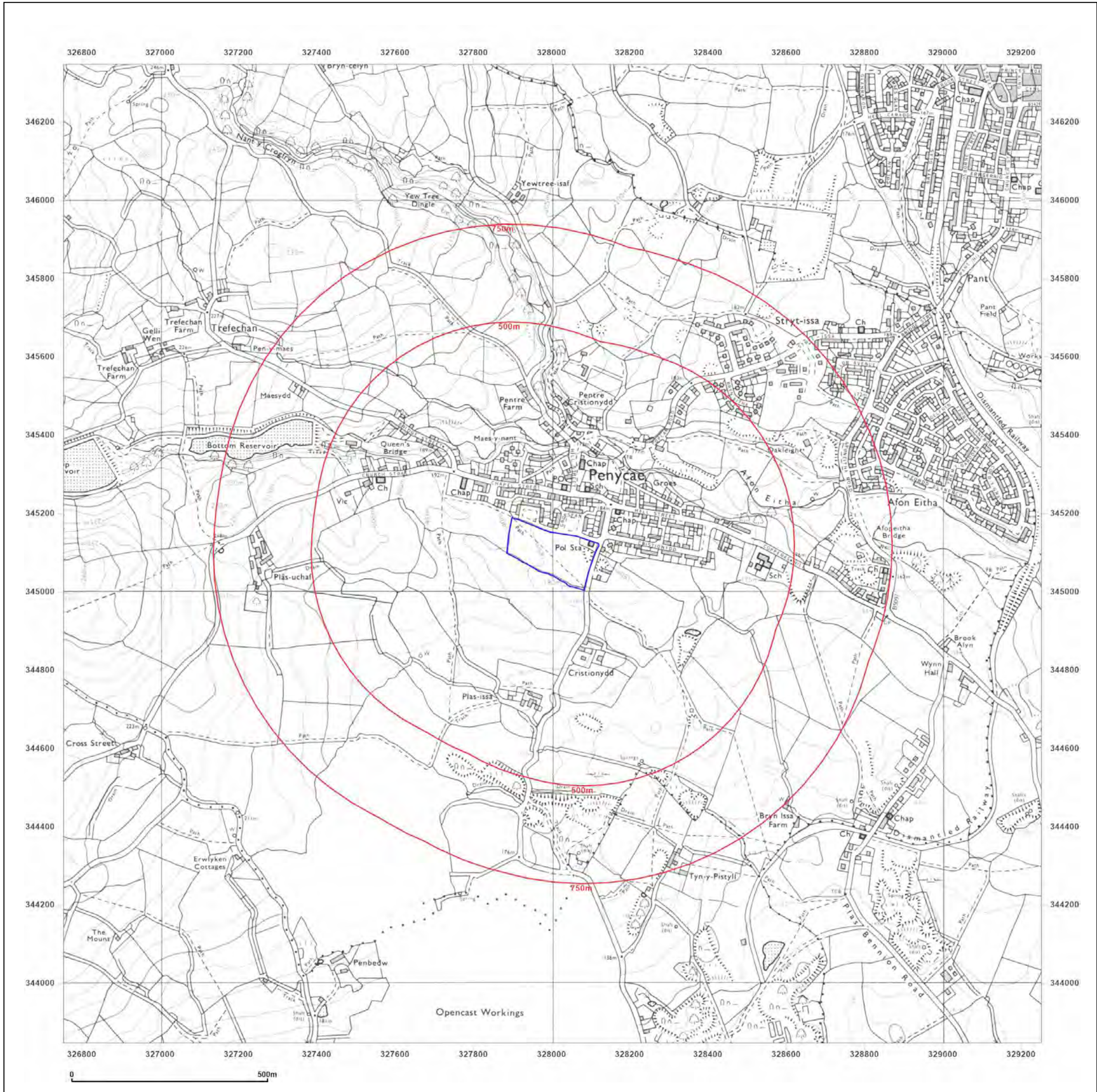


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2RP

Client Ref: 21WWH03_-_BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid

Map date: 1985

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1971
Revised 1985
Edition N/A
Copyright N/A
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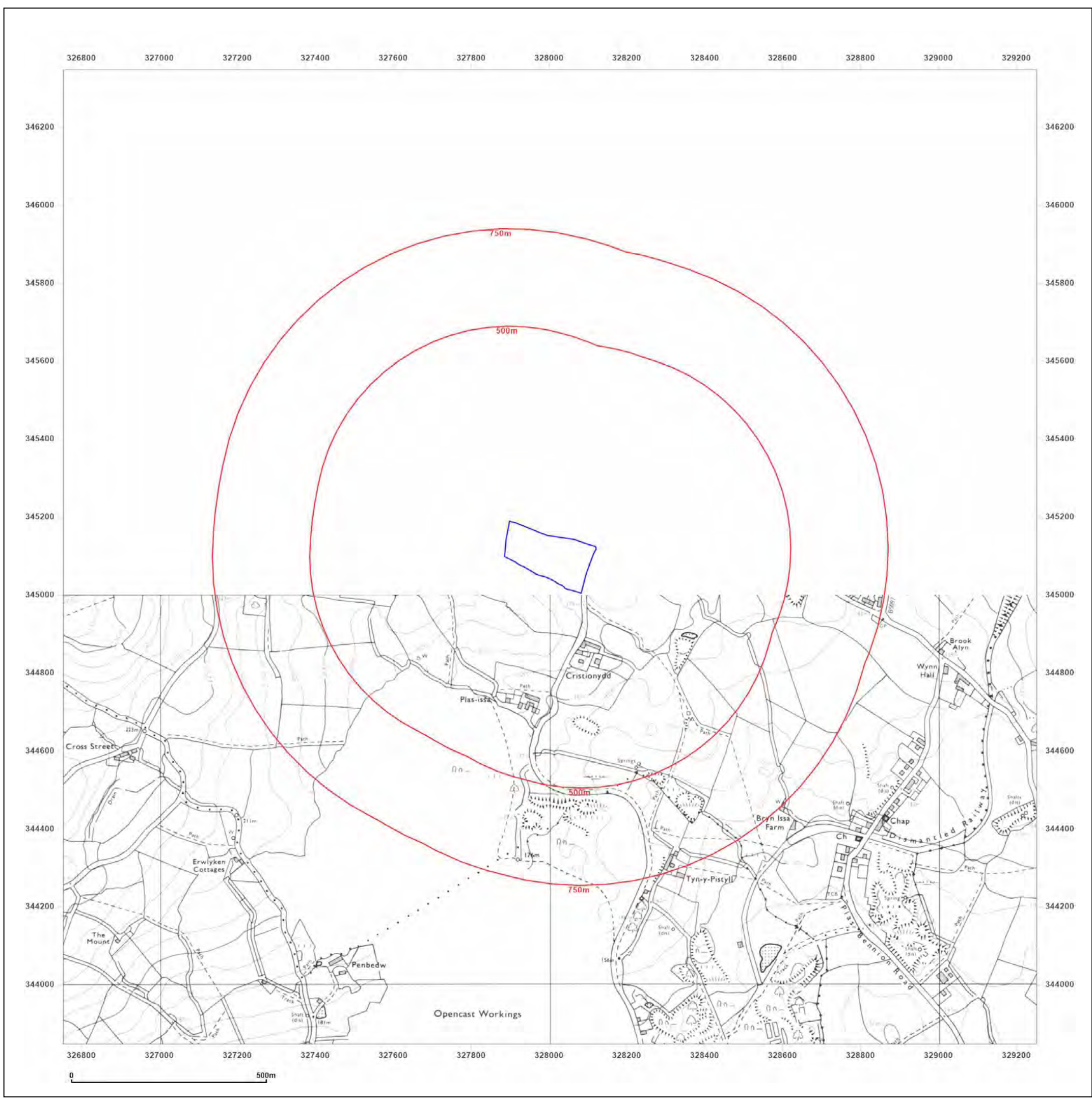


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2RP

Client Ref: 21WWH03_-BG4170
Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid

Map date: 1994

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1971
Revised 1994
Edition N/A
Copyright N/A
Levelled N/A

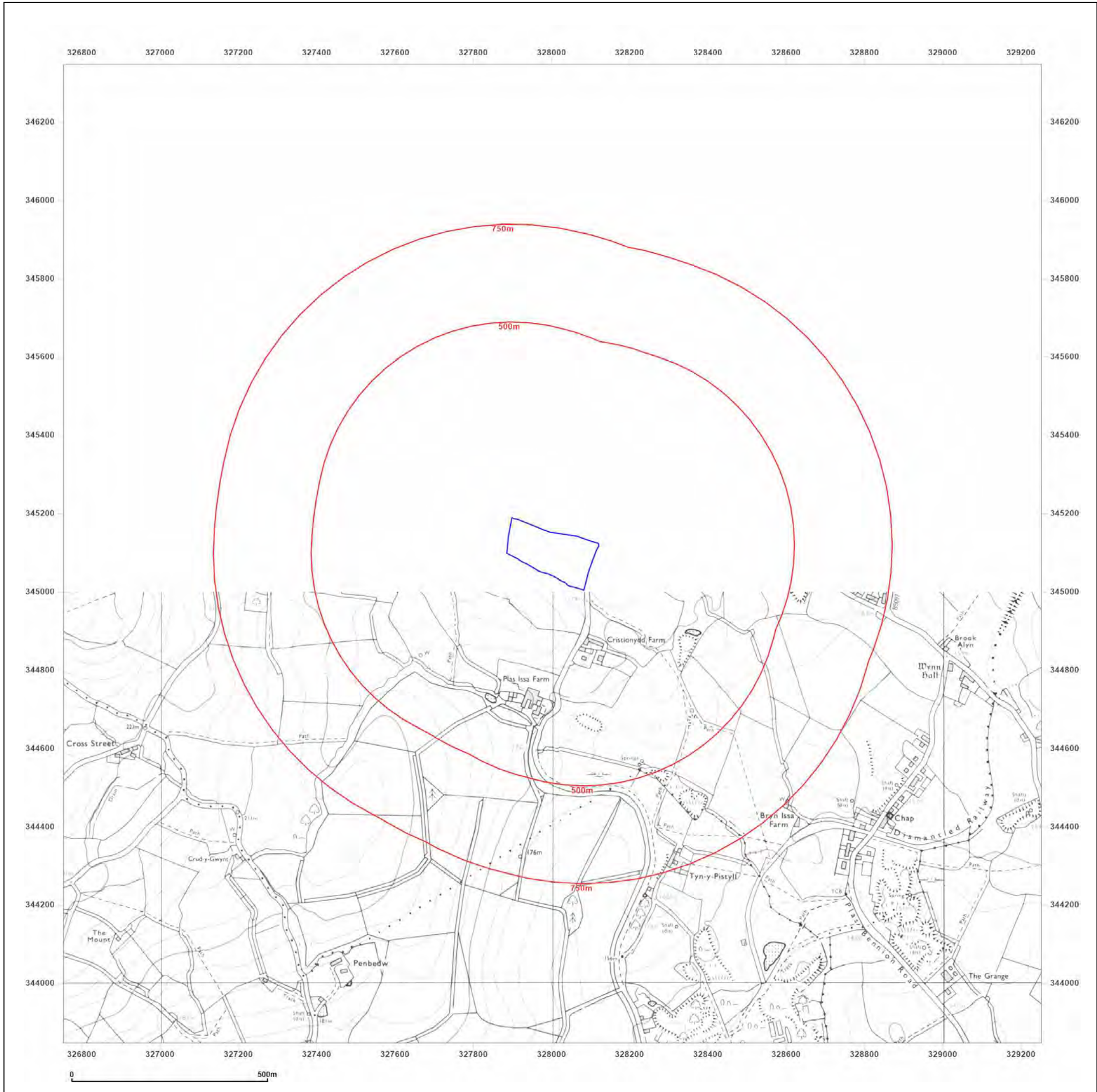


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Site Details:

LAND AT GROESFAN,
PENYCAE, WREXHAM, LL14
2RP

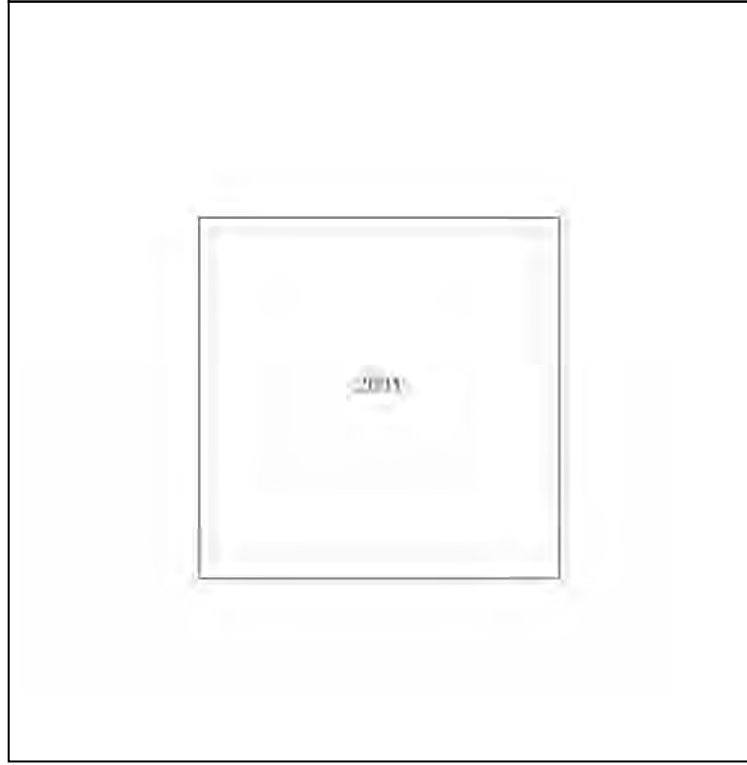
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Report Ref: GS-7838405
Grid Ref: 328002, 345097

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

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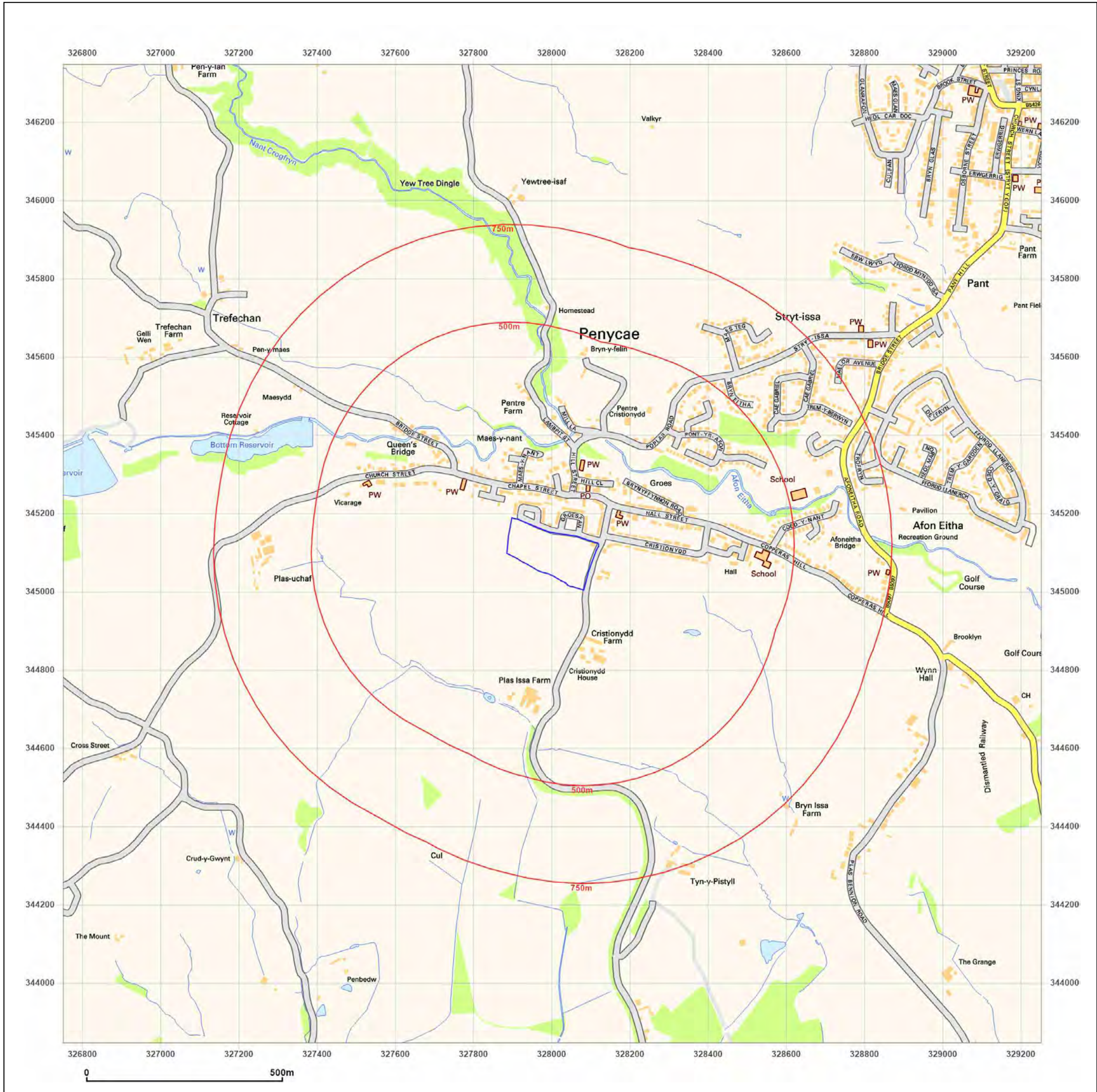


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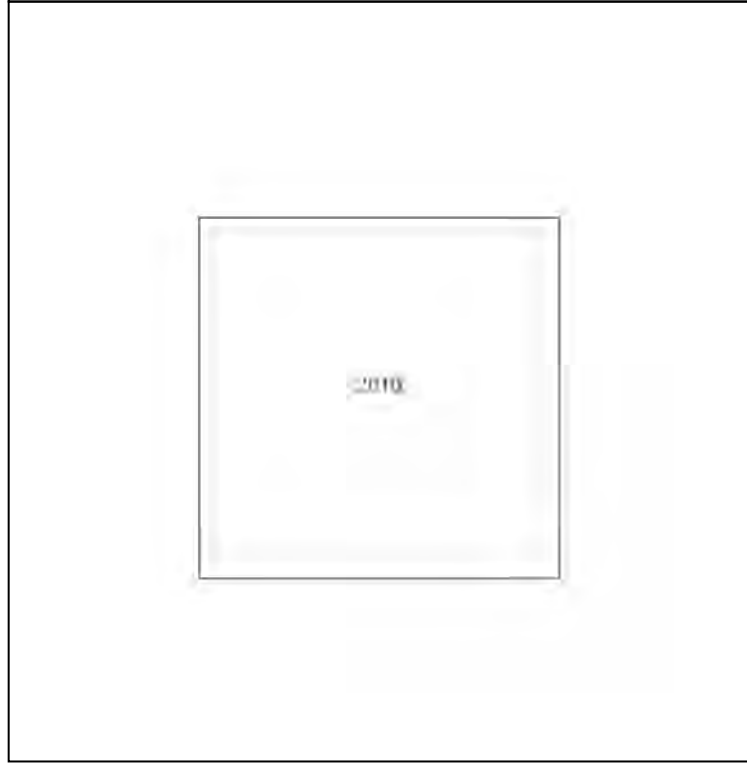
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Grid Ref: 328002, 345097

Map Name: National Grid

Map date: 2010

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Printed at: 1:10,000

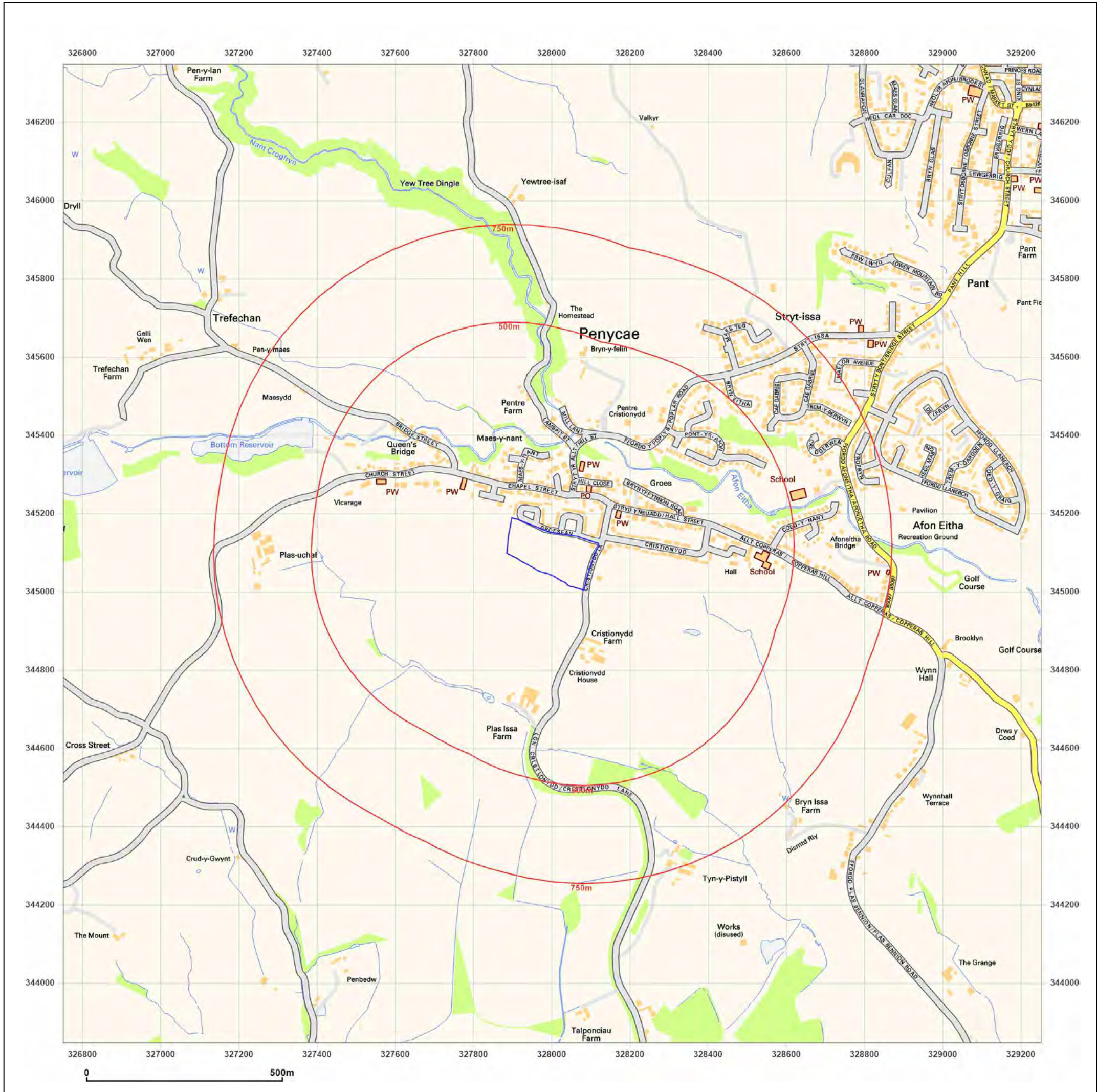


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2RP

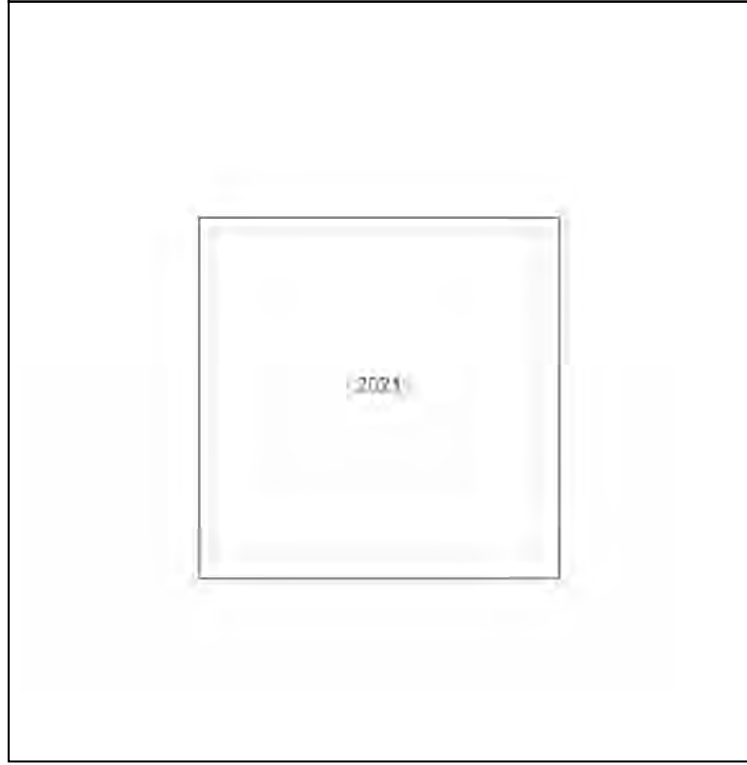
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Grid Ref: 328002, 345097

Map Name: National Grid

Map date: 2021

Scale: 1:10,000

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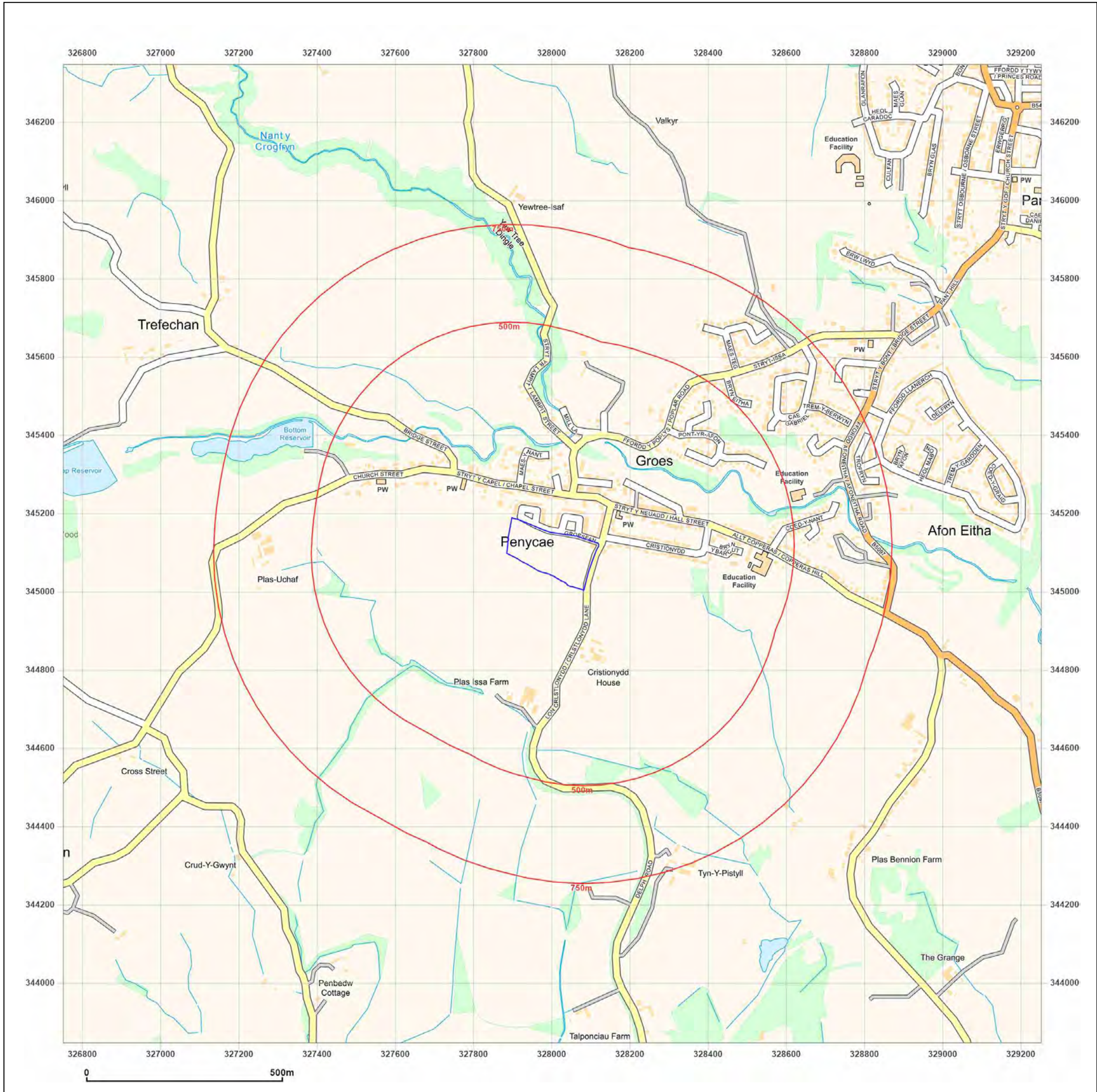


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APPENDIX C

- (i) Groundsure Report
- (ii) Coal Authority Report

LAND AT GROESFAN, PENYCAE, WREXHAM, LL14 2RP

Order Details

Date: 10/05/2021
Your ref: 21WWH03_-_BG4170
Our Ref: GS-7838407
Client: Betts Geo Ltd

Site Details

Location: 328034 345080
Area: 2.41 ha
Authority: [Wrexham - Wrexham County Borough Council](#)



Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.13

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Contact us with any questions at:

info@groundsure.com

08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	<u>Historical industrial land uses</u>	6	8	10	57	-
18	1.2	<u>Historical tanks</u>	0	0	1	1	-
18	1.3	<u>Historical energy features</u>	0	0	1	3	-
19	1.4	Historical petrol stations	0	0	0	0	-
19	1.5	<u>Historical garages</u>	0	0	1	0	-
19	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
20	2.1	<u>Historical industrial land uses</u>	8	10	11	81	-
25	2.2	<u>Historical tanks</u>	0	0	2	2	-
25	2.3	<u>Historical energy features</u>	0	0	2	8	-
26	2.4	Historical petrol stations	0	0	0	0	-
26	2.5	<u>Historical garages</u>	0	0	1	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
27	3.1	Active or recent landfill	0	0	0	0	-
27	3.2	Historical landfill (BGS records)	0	0	0	0	-
28	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
28	3.4	<u>Historical landfill (EA/NRW records)</u>	0	0	0	1	-
28	3.5	Historical waste sites	0	0	0	0	-
28	3.6	Licensed waste sites	0	0	0	0	-
29	3.7	<u>Waste exemptions</u>	0	0	0	13	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
31	4.1	<u>Recent industrial land uses</u>	0	1	2	-	-
32	4.2	Current or recent petrol stations	0	0	0	0	-
32	4.3	Electricity cables	0	0	0	0	-
32	4.4	Gas pipelines	0	0	0	0	-
32	4.5	Sites determined as Contaminated Land	0	0	0	0	-



32	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
33	4.7	Regulated explosive sites	0	0	0	0	-
33	4.8	Hazardous substance storage/usage	0	0	0	0	-
33	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
33	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
33	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
34	4.12	Radioactive Substance Authorisations	0	0	0	0	-
34	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	0	5	-
35	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
35	4.15	Pollutant release to public sewer	0	0	0	0	-
35	4.16	List 1 Dangerous Substances	0	0	0	0	-
35	4.17	List 2 Dangerous Substances	0	0	0	0	-
35	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
36	4.19	Pollution inventory substances	0	0	0	0	-
36	4.20	Pollution inventory waste transfers	0	0	0	0	-
36	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
37	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
39	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
41	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
43	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
43	5.5	Groundwater vulnerability- local information	None (within 0m)				
44	5.6	<u>Groundwater abstractions</u>	0	0	1	0	1
45	5.7	<u>Surface water abstractions</u>	0	0	0	0	4
46	5.8	<u>Potable abstractions</u>	0	0	0	0	4
47	5.9	Source Protection Zones	0	0	0	0	-
48	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
49	6.1	<u>Water Network (OS MasterMap)</u>	0	0	5	-	-



50	6.2	<u>Surface water features</u>	0	0	4	-	-
50	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
51	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
51	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
52	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
52	7.2	Historical Flood Events	0	0	0	-	-
52	7.3	Flood Defences	0	0	0	-	-
52	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
53	7.5	Flood Storage Areas	0	0	0	-	-
54	7.6	Flood Zone 2	None (within 50m)				
54	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
55	8.1	<u>Surface water flooding</u>	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
57	9.1	<u>Groundwater flooding</u>	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
58	10.1	<u>Sites of Special Scientific Interest (SSSI)</u>	0	0	0	0	3
59	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
59	10.3	<u>Special Areas of Conservation (SAC)</u>	0	0	0	0	3
60	10.4	Special Protection Areas (SPA)	0	0	0	0	0
61	10.5	National Nature Reserves (NNR)	0	0	0	0	0
61	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
61	10.7	<u>Designated Ancient Woodland</u>	0	0	0	6	19
62	10.8	Biosphere Reserves	0	0	0	0	0
62	10.9	Forest Parks	0	0	0	0	0
63	10.10	Marine Conservation Zones	0	0	0	0	0
63	10.11	Green Belt	0	0	0	0	0
63	10.12	Proposed Ramsar sites	0	0	0	0	0



63	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
63	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
64	10.15	Nitrate Sensitive Areas	0	0	0	0	0
64	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
65	10.17	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
66	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
67	11.1	World Heritage Sites	0	0	0	-	-
68	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
68	11.3	National Parks	0	0	0	-	-
68	11.4	<u>Listed Buildings</u>	0	0	2	-	-
69	11.5	<u>Conservation Areas</u>	0	0	1	-	-
69	11.6	Scheduled Ancient Monuments	0	0	0	-	-
69	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
70	12.1	<u>Agricultural Land Classification</u>	Grade 3b (within 250m)				
71	12.2	Open Access Land	0	0	0	-	-
71	12.3	Tree Felling Licences	0	0	0	-	-
71	12.4	Environmental Stewardship Schemes	0	0	0	-	-
72	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
73	13.1	Priority Habitat Inventory	0	0	0	-	-
73	13.2	Habitat Networks	0	0	0	-	-
73	13.3	Open Mosaic Habitat	0	0	0	-	-
73	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
74	14.1	<u>10k Availability</u>	Identified (within 500m)				
75	14.2	<u>Artificial and made ground (10k)</u>	1	1	1	6	-
77	14.3	<u>Superficial geology (10k)</u>	2	0	3	4	-



78	14.4	Landslip (10k)	0	0	0	0	-
79	14.5	<u>Bedrock geology (10k)</u>	1	0	0	1	-
80	14.6	<u>Bedrock faults and other linear features (10k)</u>	2	1	2	3	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
81	15.1	<u>50k Availability</u>	Identified (within 500m)				
82	15.2	<u>Artificial and made ground (50k)</u>	0	0	0	2	-
83	15.3	Artificial ground permeability (50k)	0	0	-	-	-
84	15.4	<u>Superficial geology (50k)</u>	2	0	2	6	-
85	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
85	15.6	Landslip (50k)	0	0	0	0	-
86	15.7	Landslip permeability (50k)	None (within 50m)				
87	15.8	<u>Bedrock geology (50k)</u>	1	0	0	0	-
88	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
88	15.10	<u>Bedrock faults and other linear features (50k)</u>	2	1	2	5	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
89	16.1	<u>BGS Boreholes</u>	2	5	13	-	-
Page	Section	Natural ground subsidence					
91	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
93	17.2	<u>Running sands</u>	Very low (within 50m)				
95	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
96	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
97	17.5	<u>Landslides</u>	Very low (within 50m)				
99	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
101	18.1	Natural cavities	0	0	0	0	-
102	18.2	<u>BritPits</u>	0	1	0	1	-
102	18.3	<u>Surface ground workings</u>	13	7	5	-	-
103	18.4	<u>Underground workings</u>	0	1	0	1	56
106	18.5	Historical Mineral Planning Areas	0	0	0	0	-



106	18.6	<u>Non-coal mining</u>	1	1	0	0	0
107	18.7	Mining cavities	0	0	0	0	0
107	18.8	JPB mining areas	None (within 0m)				
107	18.9	<u>Coal mining</u>	Identified (within 0m)				
107	18.10	Brine areas	None (within 0m)				
108	18.11	Gypsum areas	None (within 0m)				
108	18.12	Tin mining	None (within 0m)				
108	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
109	19.1	<u>Radon</u>	Between 10% and 30% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
111	20.1	<u>BGS Estimated Background Soil Chemistry</u>	6	6	-	-	-
112	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
112	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
113	21.1	Underground railways (London)	0	0	0	-	-
113	21.2	Underground railways (Non-London)	0	0	0	-	-
114	21.3	Railway tunnels	0	0	0	-	-
114	21.4	<u>Historical railway and tunnel features</u>	0	2	0	-	-
114	21.5	Royal Mail tunnels	0	0	0	-	-
114	21.6	Historical railways	0	0	0	-	-
115	21.7	Railways	0	0	0	-	-
115	21.8	Crossrail 1	0	0	0	0	-
115	21.9	Crossrail 2	0	0	0	0	-
115	21.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 10/04/2020

Site Area: 2.41ha



Recent site history - 2017 aerial photograph

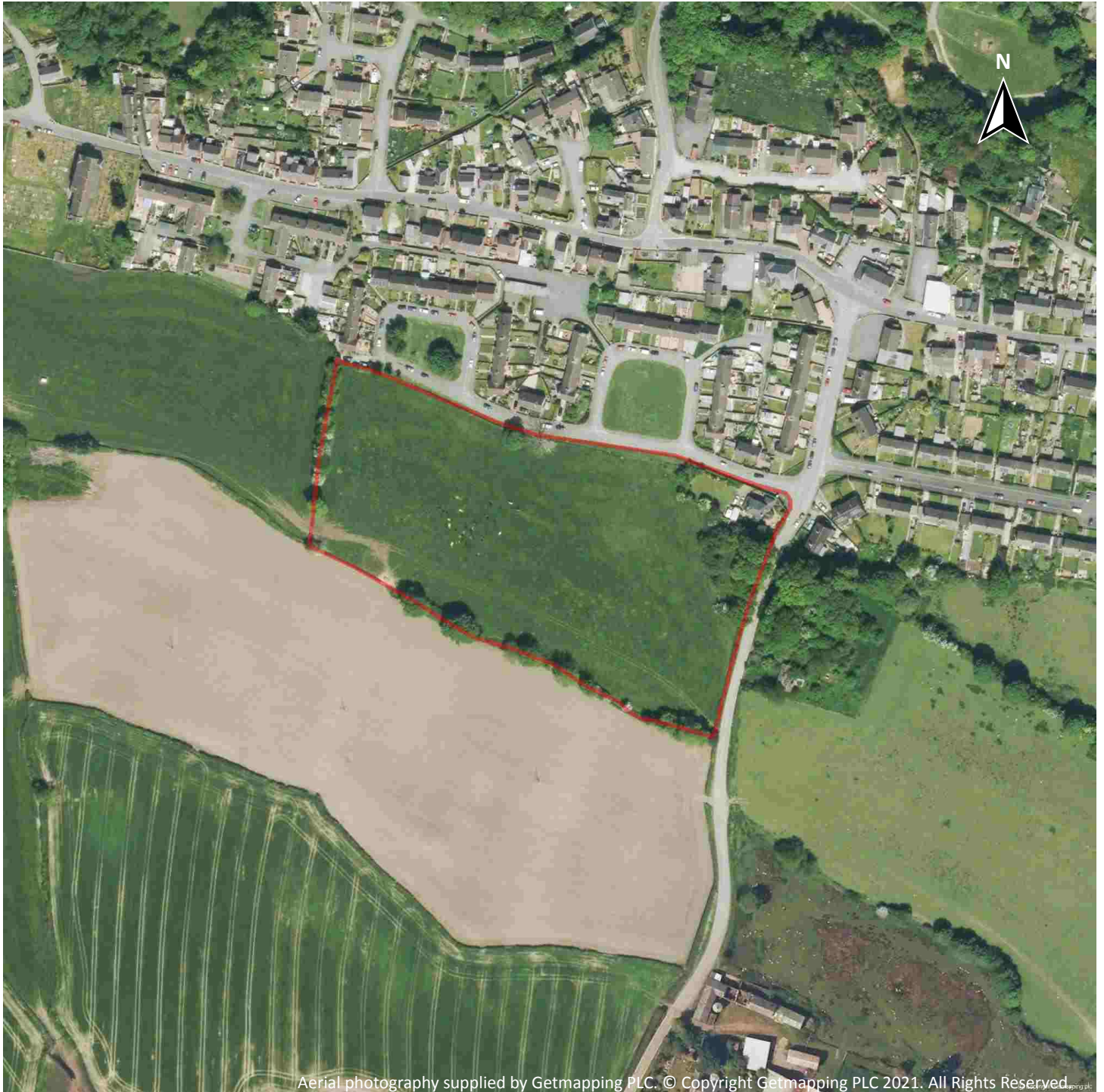


Capture Date: 07/05/2017

Site Area: 2.41ha



Recent site history - 2013 aerial photograph



Capture Date: 09/06/2013

Site Area: 2.41ha



Recent site history - 2009 aerial photograph



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Capture Date: 01/06/2009

Site Area: 2.41ha



Recent site history - 2001 aerial photograph



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Capture Date: 28/07/2001

Site Area: 2.41ha



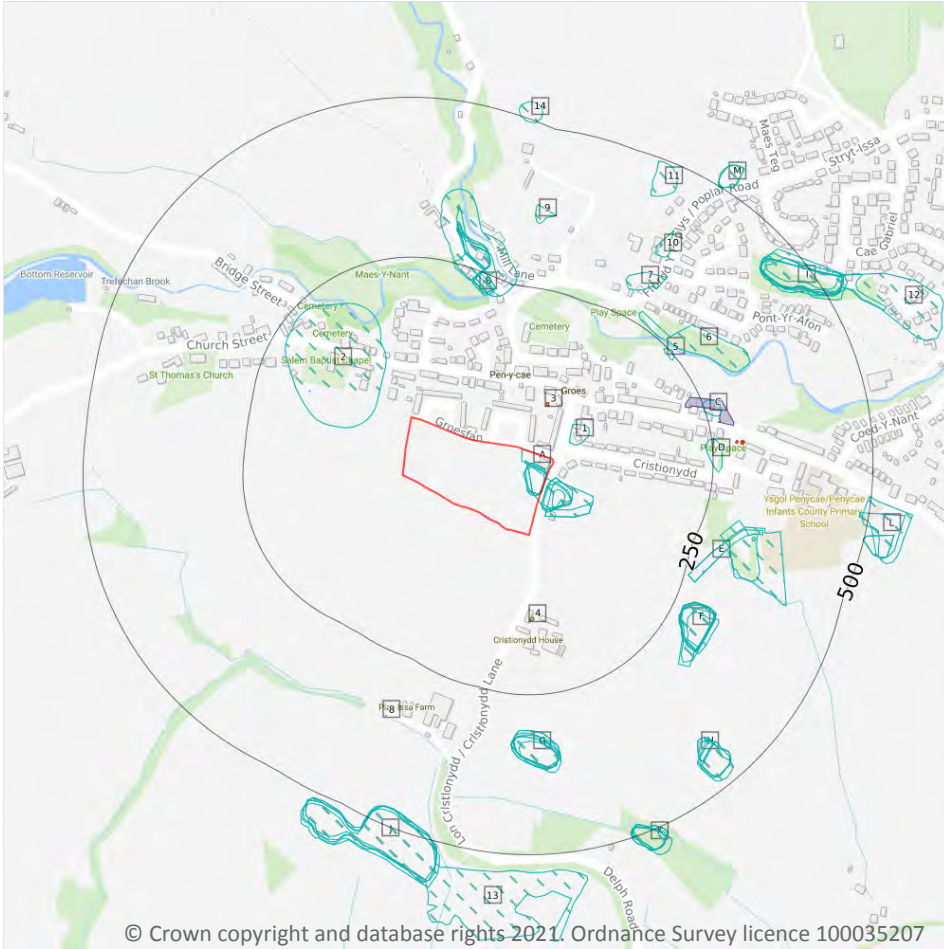
OS MasterMap site plan



Site Area: 2.41ha



1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

1.1 Historical industrial land uses

Records within 500m **81**

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
A	On site	Police Station	1974	832465



ID	Location	Land use	Dates present	Group ID
A	On site	Unspecified Heap	1960 - 1974	881704
A	On site	Unspecified Heap	1909	907859
A	On site	Unspecified Heap	1949	941347
A	On site	Unspecified Heap	1898	966887
A	On site	Unspecified Heaps	1938	988379
A	6m E	Unspecified Heap	1898 - 1909	937278
A	6m E	Unspecified Heap	1960 - 1974	904023
A	8m E	Unspecified Heap	1949	918147
A	14m E	Unspecified Commercial/Industrial	1873	796379
A	17m E	Railway Sidings	1873	794399
A	20m E	Unspecified Heap	1873	850001
A	25m E	Coal Shaft	1873	830820
1	38m NE	Unspecified Heap	1873	802424
2	58m W	Grave Yard	1873	957727
B	217m N	Unspecified Mill	1960	849626
B	220m N	Flour Mill	1909	859927
B	221m N	Flour Mill	1873	964783
B	224m N	Flour Mill	1949	880065
B	224m N	Unspecified Mill	1898	887600
B	231m N	Flour Mill	1938	908604
D	240m E	Unspecified Heap	1873	802729
5	242m NE	Unspecified Ground Workings	1873	799145
C	249m E	Unspecified Heap	1873	802730
B	251m N	Mill Pond	1873	850376
6	253m NE	Unspecified Heap	1974	802731
B	253m N	Mill Pond	1960	990822
B	255m N	Mill Pond	1938 - 1949	984700
E	257m E	Railway Sidings	1873	794398



ID	Location	Land use	Dates present	Group ID
E	257m E	Unspecified Commercial/Industrial	1873	796377
B	257m N	Mill Pond	1909	881995
F	265m SE	Unspecified Heap	1898	914436
F	265m SE	Unspecified Heap	1949 - 1974	918160
F	266m SE	Unspecified Heap	1909	961614
F	266m SE	Unspecified Heap	1985	874915
F	267m SE	Unspecified Heap	1938	869130
F	268m SE	Unspecified Heap	1994	909383
F	280m SE	Unspecified Heap	1873	892037
E	285m SE	Unspecified Heap	1873 - 1898	962057
7	291m NE	Unspecified Heap	1873	802430
G	306m S	Unspecified Heap	1949	851038
G	306m S	Unspecified Heap	1898	949780
G	310m S	Unspecified Heap	1909	867271
G	313m S	Unspecified Heap	1938	968132
G	316m S	Unspecified Heap	1960 - 1974	881935
G	316m S	Unspecified Heap	1985 - 1994	963356
G	323m S	Unspecified Heap	1873	973365
E	332m E	Coal Shaft	1873	830829
9	350m N	Unspecified Heap	1873	802423
10	359m NE	Unspecified Ground Workings	1873	799143
H	416m SE	Unspecified Heap	1985 - 1994	845627
H	416m SE	Unspecified Heap	1974	903517
H	421m SE	Unspecified Heap	1873	861077
H	424m SE	Unspecified Heap	1909	845544
H	428m SE	Unspecified Heap	1938 - 1960	860505
H	434m SE	Unspecified Heap	1898	918992
I	436m NE	Unspecified Heaps	1960	978313



ID	Location	Land use	Dates present	Group ID
I	437m NE	Unspecified Heap	1949	852471
I	439m NE	Unspecified Ground Workings	1909	869370
I	440m NE	Unspecified Heap	1898	955395
I	440m NE	Unspecified Heap	1873	857640
11	440m N	Unspecified Heap	1873 - 1898	948708
I	440m NE	Unspecified Heap	1974	987766
12	441m NE	Unspecified Heaps	1938	960096
J	471m S	Unspecified Heap	1873 - 1898	849302
J	471m S	Unspecified Heap	1949	958886
J	472m SW	Unspecified Heap	1909	913456
13	473m SW	Unspecified Heaps	1938	871195
J	477m S	Unspecified Heaps	1960 - 1974	853081
K	483m S	Unspecified Heap	1938 - 1949	855119
K	483m S	Unspecified Heap	1873 - 1898	891338
K	485m S	Unspecified Heap	1909	926961
L	486m E	Unspecified Ground Workings	1898	799157
K	487m S	Unspecified Heap	1960 - 1974	948220
K	487m S	Unspecified Heap	1985 - 1994	953455
L	490m E	Unspecified Heap	1873	876526
14	495m N	Unspecified Heap	1873	802422
M	499m NE	Unspecified Heap	1960 - 1974	989436
L	499m E	Unspecified Heap	1974	851189
L	499m E	Unspecified Heap	1985 - 1994	897447
M	499m NE	Unspecified Heap	1949	902093

This data is sourced from Ordnance Survey / Groundsure.



1.2 Historical tanks

Records within 500m

2

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
4	129m S	Unspecified Tank	1992 - 1994	145237
8	346m SW	Tank or Trough	1873 - 1900	122906

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

4

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
3	76m N	Electricity Substation	1990 - 1994	84758
D	286m E	Electricity Substation	1990	82197
D	294m E	Electricity Substation	1990	66586
D	295m E	Electricity Substation	1994	80614

This data is sourced from Ordnance Survey / Groundsure.



1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

1

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
C	223m E	Garage	1994	19943

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

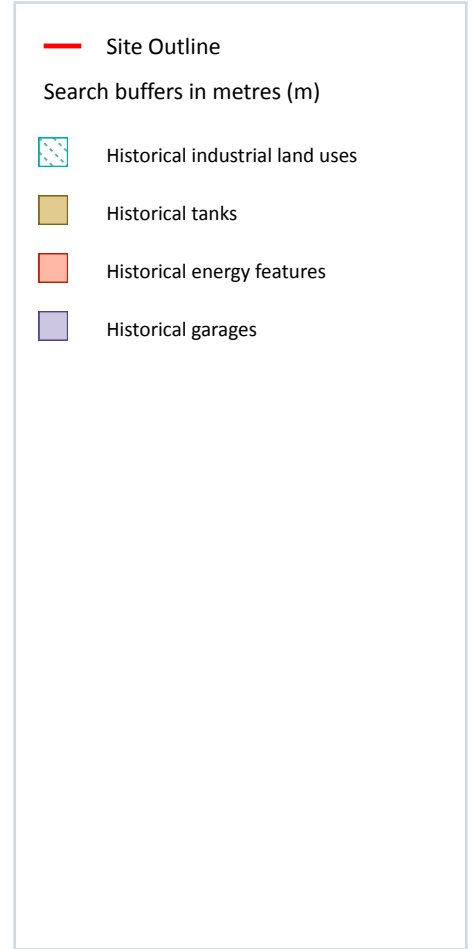
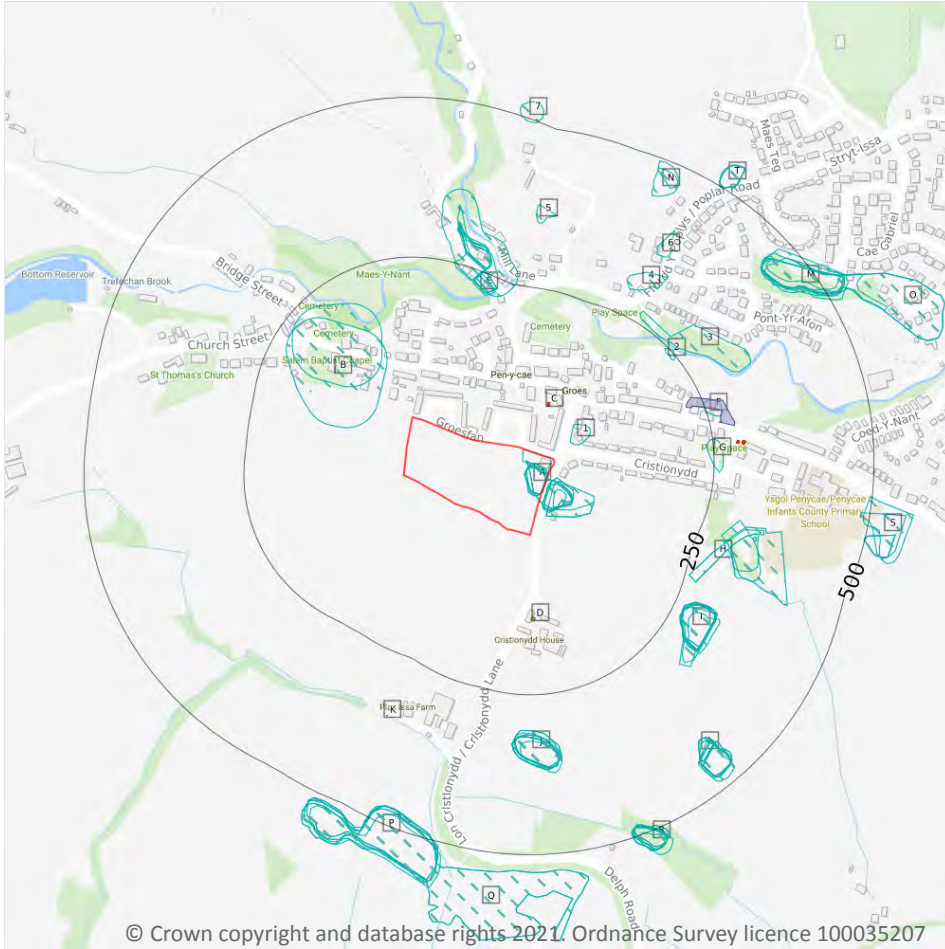
0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



2 Past land use - un-grouped



2.1 Historical industrial land uses

Records within 500m	110
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Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
A	On site	Unspecified Heap	1909	907859
A	On site	Unspecified Heap	1949	941347
A	On site	Unspecified Heap	1898	966887

ID	Location	Land Use	Date	Group ID
A	On site	Police Station	1974	832465
A	On site	Unspecified Heap	1974	881704
A	On site	Unspecified Heap	1960	881704
A	On site	Unspecified Heaps	1938	988379
A	On site	Unspecified Heaps	1938	988379
A	6m E	Unspecified Heap	1909	937278
A	6m E	Unspecified Heap	1974	904023
A	6m E	Unspecified Heap	1960	904023
A	8m E	Unspecified Heap	1949	918147
A	8m E	Unspecified Heap	1898	937278
A	14m E	Unspecified Commercial/Industrial	1873	796379
A	17m E	Railway Sidings	1873	794399
A	20m E	Unspecified Heap	1873	850001
A	25m E	Coal Shaft	1873	830820
1	38m NE	Unspecified Heap	1873	802424
B	58m W	Grave Yard	1873	957727
B	88m NW	Grave Yard	1873	957727
E	217m N	Unspecified Mill	1960	849626
E	220m N	Flour Mill	1909	859927
E	221m N	Flour Mill	1873	964783
E	224m N	Flour Mill	1949	880065
E	224m N	Unspecified Mill	1898	887600
E	231m N	Flour Mill	1938	908604
G	240m E	Unspecified Heap	1873	802729
2	242m NE	Unspecified Ground Workings	1873	799145
F	249m E	Unspecified Heap	1873	802730
E	251m N	Mill Pond	1873	850376
3	253m NE	Unspecified Heap	1974	802731



ID	Location	Land Use	Date	Group ID
E	253m N	Mill Pond	1960	990822
E	255m N	Mill Pond	1949	984700
E	256m N	Mill Pond	1938	984700
H	257m E	Railway Sidings	1873	794398
H	257m E	Unspecified Commercial/Industrial	1873	796377
E	257m N	Mill Pond	1909	881995
I	265m SE	Unspecified Heap	1949	918160
I	265m SE	Unspecified Heap	1898	914436
I	266m SE	Unspecified Heap	1909	961614
I	266m SE	Unspecified Heap	1974	918160
I	266m SE	Unspecified Heap	1985	874915
I	266m SE	Unspecified Heap	1960	918160
I	267m SE	Unspecified Heap	1938	869130
I	267m SE	Unspecified Heap	1938	869130
I	268m SE	Unspecified Heap	1994	909383
I	280m SE	Unspecified Heap	1873	892037
H	285m SE	Unspecified Heap	1898	962057
4	291m NE	Unspecified Heap	1873	802430
H	305m SE	Unspecified Heap	1873	962057
J	306m S	Unspecified Heap	1949	851038
J	306m S	Unspecified Heap	1898	949780
J	310m S	Unspecified Heap	1909	867271
J	313m S	Unspecified Heap	1938	968132
J	313m S	Unspecified Heap	1938	968132
J	316m S	Unspecified Heap	1994	963356
J	316m S	Unspecified Heap	1974	881935
J	316m S	Unspecified Heap	1985	963356
J	316m S	Unspecified Heap	1960	881935



ID	Location	Land Use	Date	Group ID
J	323m S	Unspecified Heap	1873	973365
H	332m E	Coal Shaft	1873	830829
5	350m N	Unspecified Heap	1873	802423
6	359m NE	Unspecified Ground Workings	1873	799143
L	416m SE	Unspecified Heap	1994	845627
L	416m SE	Unspecified Heap	1974	903517
L	416m SE	Unspecified Heap	1985	845627
L	421m SE	Unspecified Heap	1873	861077
L	424m SE	Unspecified Heap	1909	845544
L	428m SE	Unspecified Heap	1960	860505
L	428m SE	Unspecified Heap	1938	860505
L	428m SE	Unspecified Heap	1938	860505
L	434m SE	Unspecified Heap	1949	860505
L	434m SE	Unspecified Heap	1898	918992
M	436m NE	Unspecified Heaps	1960	978313
M	437m NE	Unspecified Heap	1949	852471
M	439m NE	Unspecified Ground Workings	1909	869370
M	440m NE	Unspecified Heap	1898	955395
M	440m NE	Unspecified Heap	1873	857640
N	440m N	Unspecified Heap	1873	948708
M	440m NE	Unspecified Heap	1974	987766
O	441m NE	Unspecified Heaps	1938	960096
O	441m NE	Unspecified Heaps	1938	960096
N	461m NE	Unspecified Heap	1898	948708
P	471m S	Unspecified Heap	1949	958886
P	471m S	Unspecified Heap	1898	849302
P	472m SW	Unspecified Heap	1909	913456
Q	473m SW	Unspecified Heaps	1938	871195



ID	Location	Land Use	Date	Group ID
Q	473m SW	Unspecified Heaps	1938	871195
P	477m S	Unspecified Heaps	1974	853081
P	477m S	Unspecified Heaps	1960	853081
P	481m S	Unspecified Heap	1873	849302
R	483m S	Unspecified Heap	1949	855119
R	483m S	Unspecified Heap	1898	891338
R	485m S	Unspecified Heap	1909	926961
R	486m S	Unspecified Heap	1938	855119
R	486m S	Unspecified Heap	1938	855119
S	486m E	Unspecified Ground Workings	1898	799157
R	487m S	Unspecified Heap	1994	953455
R	487m S	Unspecified Heap	1974	948220
R	487m S	Unspecified Heap	1985	953455
R	487m S	Unspecified Heap	1960	948220
S	490m E	Unspecified Heap	1873	876526
7	495m N	Unspecified Heap	1873	802422
R	498m S	Unspecified Heap	1873	891338
T	499m NE	Unspecified Heap	1974	989436
T	499m NE	Unspecified Heap	1960	989436
S	499m E	Unspecified Heap	1994	897447
S	499m E	Unspecified Heap	1974	851189
S	499m E	Unspecified Heap	1985	897447
T	499m NE	Unspecified Heap	1949	902093

This data is sourced from Ordnance Survey / Groundsure.



2.2 Historical tanks

Records within 500m

4

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
D	129m S	Unspecified Tank	1992	145237
D	130m S	Unspecified Tank	1994	145237
K	346m SW	Tank or Trough	1873	122906
K	346m SW	Tank or Trough	1900	122906

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

10

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
C	76m N	Electricity Substation	1990	84758
C	77m N	Electricity Substation	1994	84758
G	286m E	Electricity Substation	1990	82197
G	286m E	Electricity Substation	1990	82197
G	286m E	Electricity Substation	1990	82197
G	294m E	Electricity Substation	1990	66586
G	295m E	Electricity Substation	1994	80614
G	295m E	Electricity Substation	1990	66586
G	295m E	Electricity Substation	1990	66586
G	295m E	Electricity Substation	1990	66586



This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m

1

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
F	223m E	Garage	1994	19943

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0
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Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	1
---------------------	----------

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 27**

ID	Location	Details		
2	342m SW	Site Address: The Delph Licence Holder Address: -	Waste Licence: Yes Site Reference: WMBC L/32 Waste Type: Inert, Industrial, Household, Special Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 05/08/1981 Licence Surrender: 31/12/1986	Operator: - Licence Holder: Northern Strip Mining First Recorded 30/11/1981 Last Recorded: 31/12/1986

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	0
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Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m	0
---------------------	----------

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m

13

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 27**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	308m W	Plas Ucha Farm, Church Street, Penycae, Wrexham, Wrexham, Clwyd, LL14 2RL	NRW-WME049546	Using waste exemption	On a farm	Use of waste in construction
A	308m W	Plas Ucha Farm, Church Street, Penycae, Wrexham, Wrexham, Clwyd, LL14 2RL	NRW-WME049546	Treating waste exemption	On a farm	Preparatory treatments (baling, sorting, shredding etc)
A	308m W	Plas Ucha Farm, Church Street, Penycae, Wrexham, Wrexham, Clwyd, LL14 2RL	NRW-WME049546	Disposing of waste exemption	On a farm	Burning waste in the open
A	308m W	Plas Ucha Farm, Church Street, Penycae, Wrexham, Wrexham, Clwyd, LL14 2RL	NRW-WME049546	Storing waste exemption	On a farm	Storage of waste in a secure place
A	308m W	Plas Ucha Farm, Church Street, Penycae, Wrexham, Wrexham, Clwyd, LL14 2RL	NRW-WME049546	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
A	308m W	Plas Ucha Farm, Church Street, Penycae, Wrexham, Wrexham, Clwyd, LL14 2RL	NRW-WME049546	Using waste exemption	On a farm	Use of mulch
A	308m W	JN & GM Pugh, Plas Ucha Farm, Church Street, Penycae, Wrecsam, LL142RL	NRW-WME020976	Disposing of waste exemption	On a farm	Burning waste in the open
A	308m W	JN & GM Pugh, Plas Ucha Farm, Church Street, Penycae, Wrecsam, LL142RL	NRW-WME020976	Storing waste exemption	On a farm	Storage of waste in a secure place
A	308m W	JN & GM Pugh, Plas Ucha Farm, Church Street, Penycae, Wrecsam, LL142RL	NRW-WME020976	Treating waste exemption	On a farm	Preparatory treatments (baling, sorting, shredding etc)
A	308m W	JN & GM Pugh, Plas Ucha Farm, Church Street, Penycae, Wrecsam, LL142RL	NRW-WME020976	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit



ID	Location	Site	Reference	Category	Sub-Category	Description
A	308m W	JN & GM Pugh, Plas Ucha Farm, Church Street, Penycae, Wreccsam, LL142RL	NRW-WME020976	Using waste exemption	On a farm	Use of waste in construction
A	308m W	JN & GM Pugh, Plas Ucha Farm, Church Street, Penycae, Wreccsam, LL142RL	NRW-WME020976	Using waste exemption	On a farm	Use of mulch
1	317m N	Bryn Y Felin, Poplar Road, Wrexham, Wreccsam, LL142py	NRW-WME001598	Disposing of waste exemption	Waste Exemption - Non-Agricultural	Deposit of waste from a portable sanitary convenience

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Licensed Discharges to controlled waters

4.1 Recent industrial land uses

Records within 250m

3

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 31**

ID	Location	Company	Address	Activity	Category
1	43m N	Electricity Sub Station	Clwyd, LL14	Electrical Features	Infrastructure and Facilities
2	77m N	Electricity Sub Station	Clwyd, LL14	Electrical Features	Infrastructure and Facilities
3	239m NW	J K Davies & Son	2, Church Street, Penycae, Wrexham, Clwyd, LL14 2RL	Fuel Distributors and Suppliers	Household, Office, Leisure and Garden



This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m **0**

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m **0**

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m **0**

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m **0**

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m **0**

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.



4.7 Regulated explosive sites

Records within 500m

0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m

0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m

0

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from Local Authority records.



4.12 Radioactive Substance Authorisations

Records within 500m

0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m

5

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 31**

ID	Location	Address	Details	
4	289m NW	PEN Y CAE BRIDGE STREET - SSO, LL14 2RH	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: CM0176301 Permit Version: 2 Receiving Water: Afon Eitha	Status: Surrendered Issue date: 08/09/2010 Effective Date: 08/09/2010 Revocation Date: -
5	415m E	Penycae West End School Field Land CSO, Pont Yr Afon, PENYCAE, Wrexham, LL14 2PG	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: CM0176401 Permit Version: 3 Receiving Water: Afon Eitha	Status: Effective Issue date: 18/09/2019 Effective Date: 18/09/2019 Revocation Date: -
6	419m NE	WREXHAM (PENYCAE)	Effluent Type: UNSPECIFIED Permit Number: CM0147201 Permit Version: 1 Receiving Water: AFON EITHA	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 21/03/1986 Effective Date: 01/04/1986 Revocation Date: 24/09/1992
A	432m NW	PEN-Y-CAE WTW	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: CM0108501 Permit Version: 1 Receiving Water: AFON EITHA	Status: REVOKED - UNSPECIFIED Issue date: 29/03/1965 Effective Date: 01/01/1967 Revocation Date: 03/05/1993
A	432m NW	PEN-Y-CAE WTW	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: CM0108501 Permit Version: 2 Receiving Water: AFON EITHA	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 04/05/1993 Effective Date: 04/05/1993 Revocation Date: 12/01/1996

This data is sourced from the Environment Agency and Natural Resources Wales.



4.14 Pollutant release to surface waters (Red List)

Records within 500m 0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m 0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m 0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m 0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m 0

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

This data is sourced from the Environment Agency and Natural Resources Wales.



4.19 Pollution inventory substances

Records within 500m

0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m

0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m

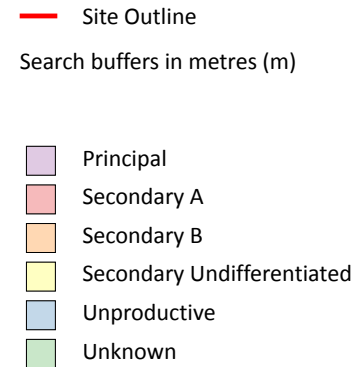
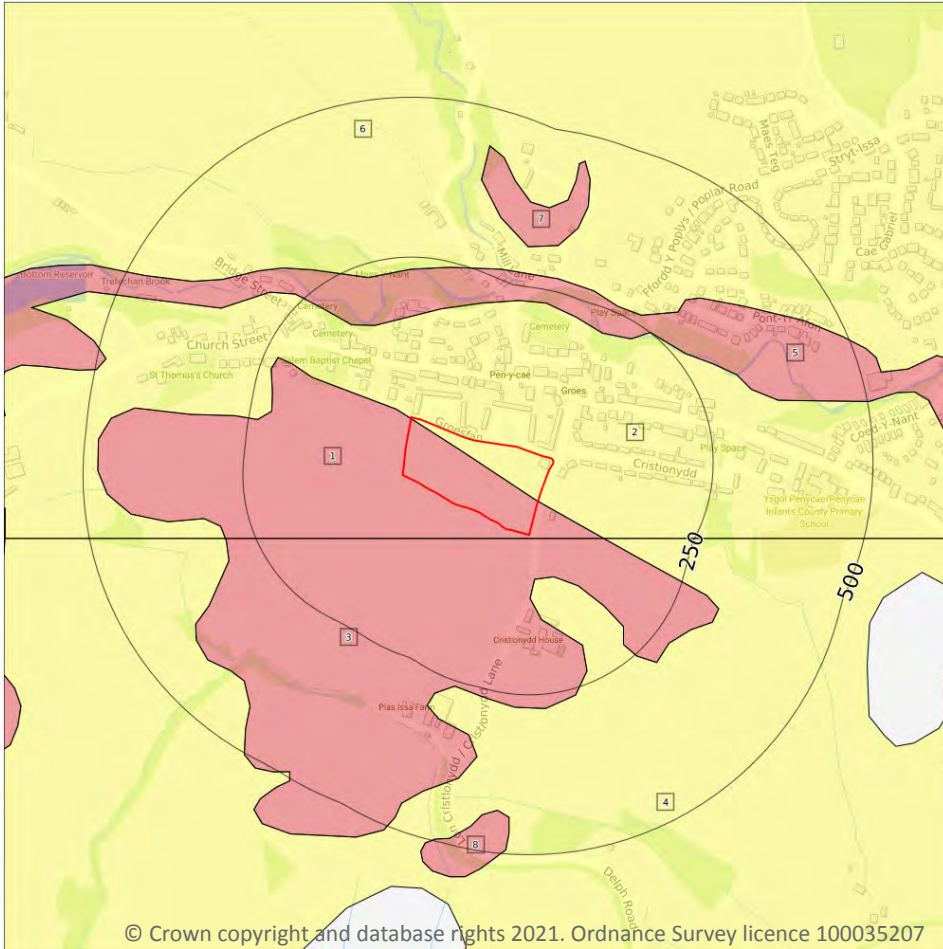
0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



5 Hydrogeology - Superficial aquifer



5.1 Superficial aquifer

Records within 500m

8

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 37**

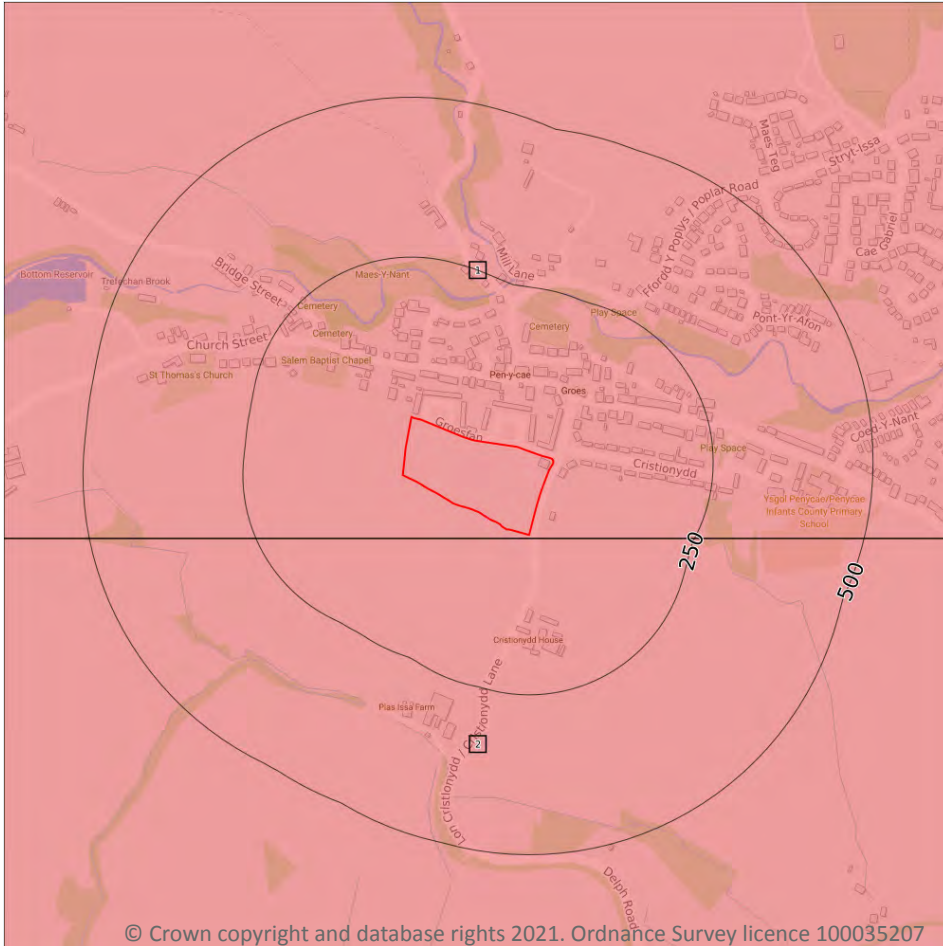
ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

ID	Location	Designation	Description
3	5m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	70m S	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
5	153m N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
6	227m N	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
7	312m N	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
8	433m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m

2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 39**

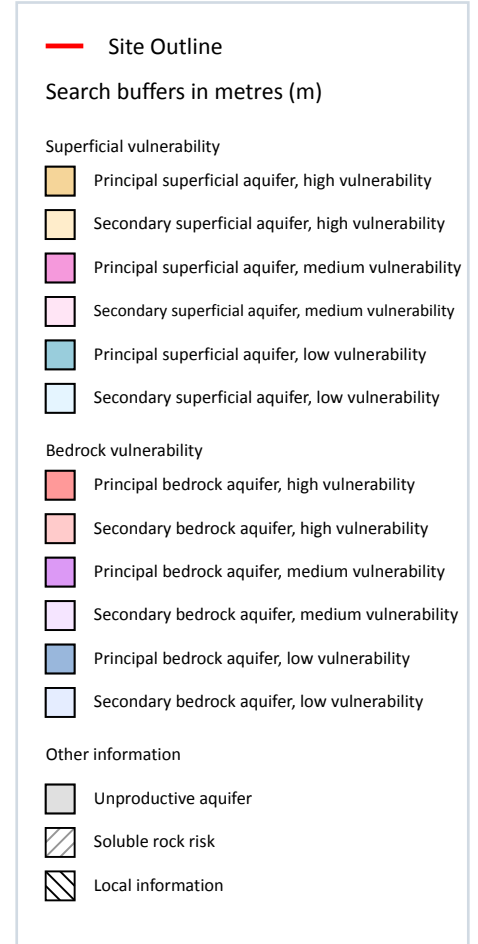
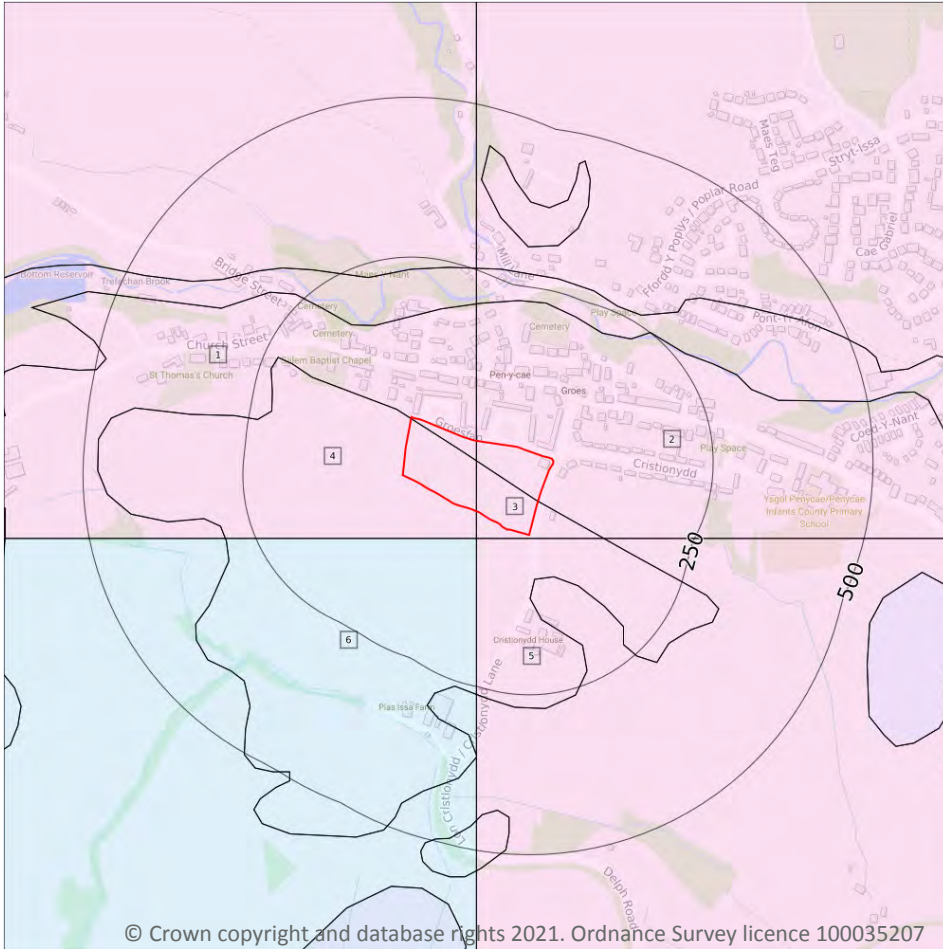
ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	5m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers



This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

6

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 41**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
3	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
4	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
5	5m S	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
6	36m SW	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures



This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site

0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.



Abstractions and Source Protection Zones



5.6 Groundwater abstractions

Records within 2000m

2

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 44**

ID	Location	Details	
1	206m S	Status: Historical Licence No: 24/67/5/0046 Details: General Farming & Domestic Direct Source: EAW Groundwater Point: 35 FT DEEP, 8FT DIA. WELL Data Type: Point Name: Lloyd Easting: 328100 Northing: 344800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 12/10/1973 Expiry Date: - Issue No: 100 Version Start Date: 12/10/1973 Version End Date: -
-	1270m SW	Status: Historical Licence No: 24/67/5/0009 Details: General Farming & Domestic Direct Source: EAW Groundwater Point: WELL Data Type: Point Name: Philips Easting: 326830 Northing: 344390	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 09/08/1966 Expiry Date: - Issue No: 100 Version Start Date: 09/08/1966 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m

4

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 44**

ID	Location	Details	
A	550m W	Status: Historical Licence No: 24/67/5/0003 Details: Potable Water Supply - Direct Direct Source: EAW Surface Water Point: PENYCAEBOTTOM RESERVOIR Data Type: Point Name: Dee Valley Water Plc Easting: 327390 Northing: 345400	Annual Volume (m ³): 909200 Max Daily Volume (m ³): 3409.5 Original Application No: - Original Start Date: 05/07/1966 Expiry Date: - Issue No: 100 Version Start Date: 05/07/1966 Version End Date: -



ID	Location	Details	
A	550m W	Status: Active Licence No: 24/67/5/0003 Details: Pottable Water Supply - Direct - Medium Direct Source: Penycae Reservoirs Point: - Data Type: Point Name: - Easting: 327390 Northing: 345400	Annual Volume (m ³): 909,200 Max Daily Volume (m ³): - Original Application No: - Original Start Date: Dec 5 2018 12:00AM Expiry Date: Mar 31 2027 12:00AM Issue No: - Version Start Date: - Version End Date: -
-	1058m W	Status: Historical Licence No: 24/67/5/0003 Details: Potable Water Supply - Direct Direct Source: EAW Surface Water Point: PENYCAETOP RESERVOIR Data Type: Point Name: Dee Valley Water Plc Easting: 326850 Northing: 345340	Annual Volume (m ³): 909200 Max Daily Volume (m ³): 3409.5 Original Application No: - Original Start Date: 05/07/1966 Expiry Date: - Issue No: 100 Version Start Date: 05/07/1966 Version End Date: -
-	1100m W	Status: Active Licence No: 24/67/5/0003 Details: Pottable Water Supply - Direct - Medium Direct Source: Penycae Reservoirs Point: - Data Type: Point Name: - Easting: 326800 Northing: 345300	Annual Volume (m ³): 909,200 Max Daily Volume (m ³): - Original Application No: - Original Start Date: Dec 5 2018 12:00AM Expiry Date: Mar 31 2027 12:00AM Issue No: - Version Start Date: - Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m

4

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 44**



ID	Location	Details	
A	550m W	Status: Historical Licence No: 24/67/5/0003 Details: Potable Water Supply - Direct Direct Source: EAW Surface Water Point: PENYCAEBOTTOM RESERVOIR Data Type: Point Name: Dee Valley Water Plc Easting: 327390 Northing: 345400	Annual Volume (m ³): 909200 Max Daily Volume (m ³): 3409.5 Original Application No: - Original Start Date: 05/07/1966 Expiry Date: - Issue No: 100 Version Start Date: 05/07/1966 Version End Date: -
A	550m W	Status: Active Licence No: 24/67/5/0003 Details: Pottable Water Supply - Direct - Medium Direct Source: Penycae Reservoirs Point: - Data Type: Point Name: - Easting: 327390 Northing: 345400	Annual Volume (m ³): 909,200 Max Daily Volume (m ³): - Original Application No: - Original Start Date: Dec 5 2018 12:00AM Expiry Date: Mar 31 2027 12:00AM Issue No: - Version Start Date: - Version End Date: -
-	1058m W	Status: Historical Licence No: 24/67/5/0003 Details: Potable Water Supply - Direct Direct Source: EAW Surface Water Point: PENYCAETOP RESERVOIR Data Type: Point Name: Dee Valley Water Plc Easting: 326850 Northing: 345340	Annual Volume (m ³): 909200 Max Daily Volume (m ³): 3409.5 Original Application No: - Original Start Date: 05/07/1966 Expiry Date: - Issue No: 100 Version Start Date: 05/07/1966 Version End Date: -
-	1100m W	Status: Active Licence No: 24/67/5/0003 Details: Pottable Water Supply - Direct - Medium Direct Source: Penycae Reservoirs Point: - Data Type: Point Name: - Easting: 326800 Northing: 345300	Annual Volume (m ³): 909,200 Max Daily Volume (m ³): - Original Application No: - Original Start Date: Dec 5 2018 12:00AM Expiry Date: Mar 31 2027 12:00AM Issue No: - Version Start Date: - Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m

0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.



5.10 Source Protection Zones (confined aquifer)

Records within 500m

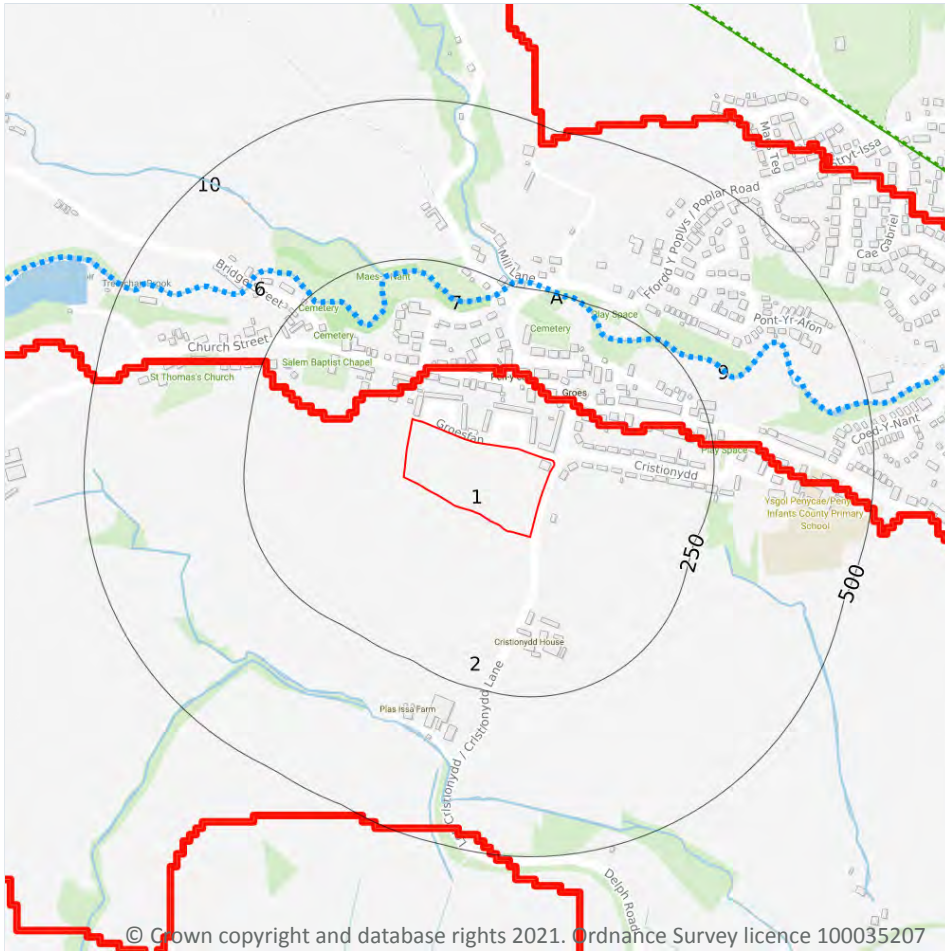
0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.



6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

5

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 49**

ID	Location	Type of water feature	Ground level	Permanence	Name
6	162m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Trefechan Brook

ID	Location	Type of water feature	Ground level	Permanence	Name
7	197m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Trefechan Brook
9	211m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Afon Eitha
10	225m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	248m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Afon Eitha

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

4

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 49**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site

1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 49**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
2	On site	River WB catchment	Dee - Ceiriog to Alwen	GB111067052060	Dee Middle Ceiriog to Alwen	Dee

This data is sourced from the Environment Agency and Natural Resources Wales.



6.4 WFD Surface water bodies

Records identified

1

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site.

Features are displayed on the Hydrology map on **page 49**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	3154m S	River	Dee - Ceiriog to Alwen	GB111067052060	Moderate	Fail	Good	2016

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site

1

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place.

Features are displayed on the Hydrology map on **page 49**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
1	On site	Dee Silurian/Ordovician	GB41102G200200	Good	Good	Good	2016

This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m

0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m

0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m

0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



7.5 Flood Storage Areas

Records within 250m

0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m

0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m

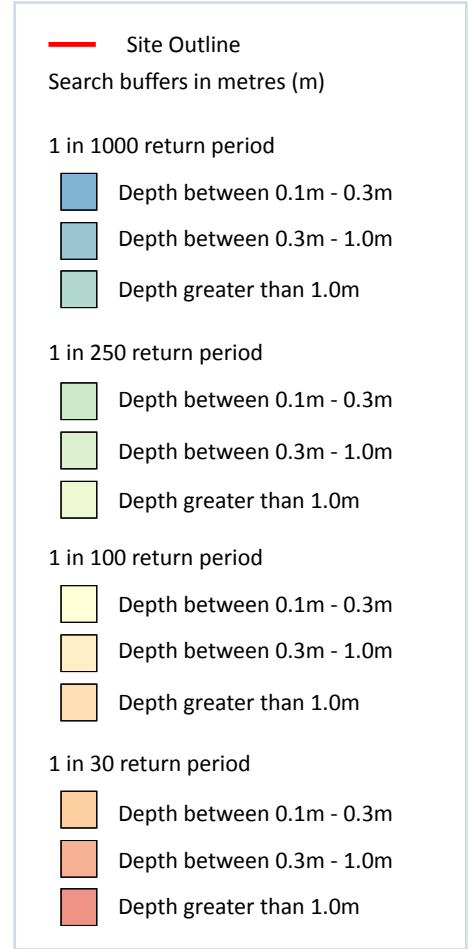
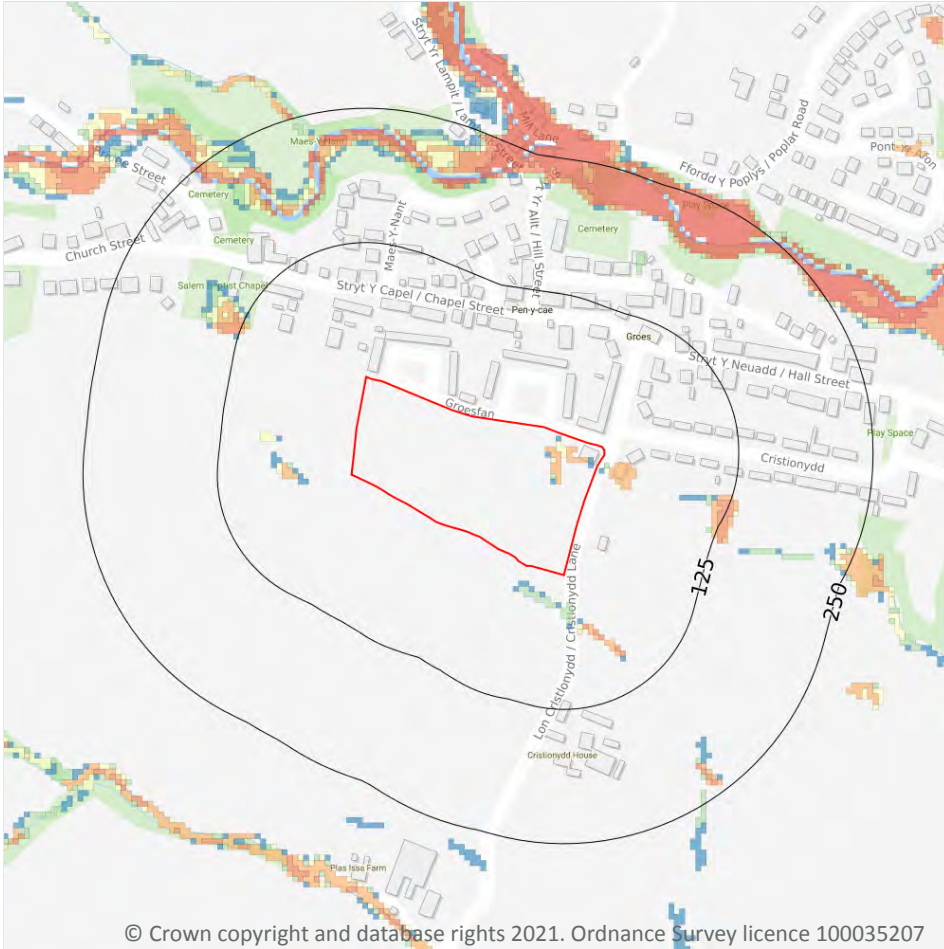
0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.1m - 0.3m

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 55**

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

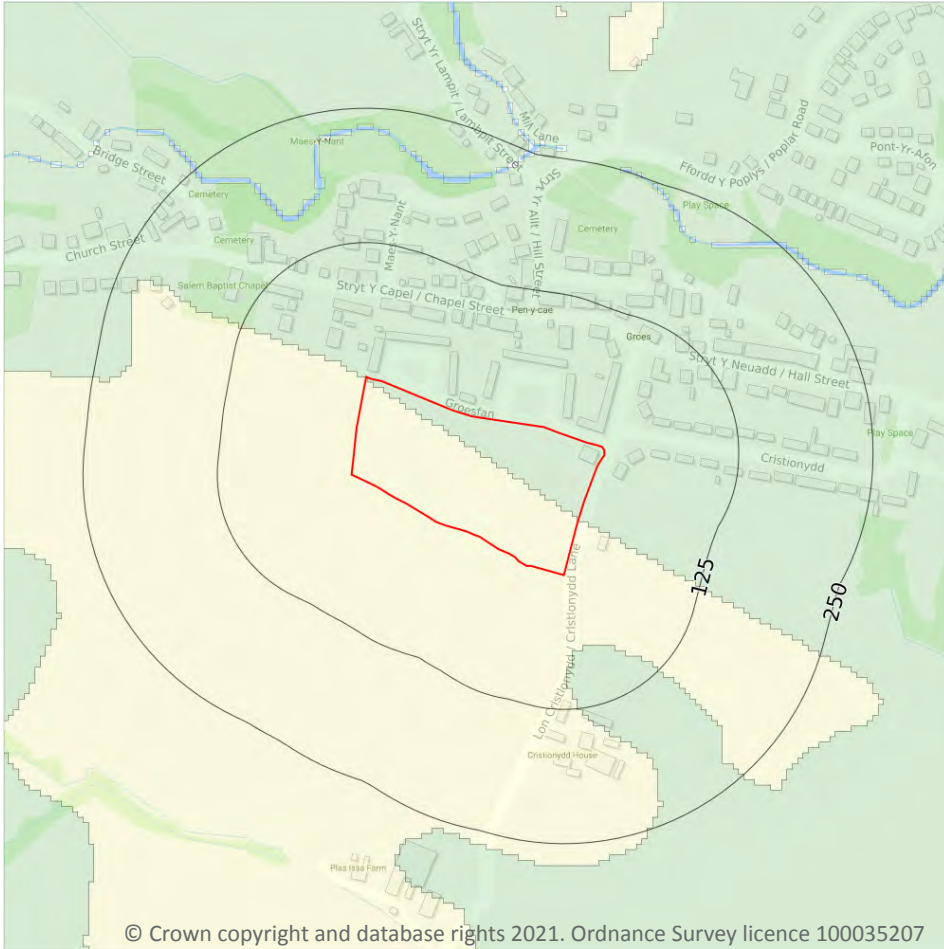
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Moderate

Highest risk within 50m

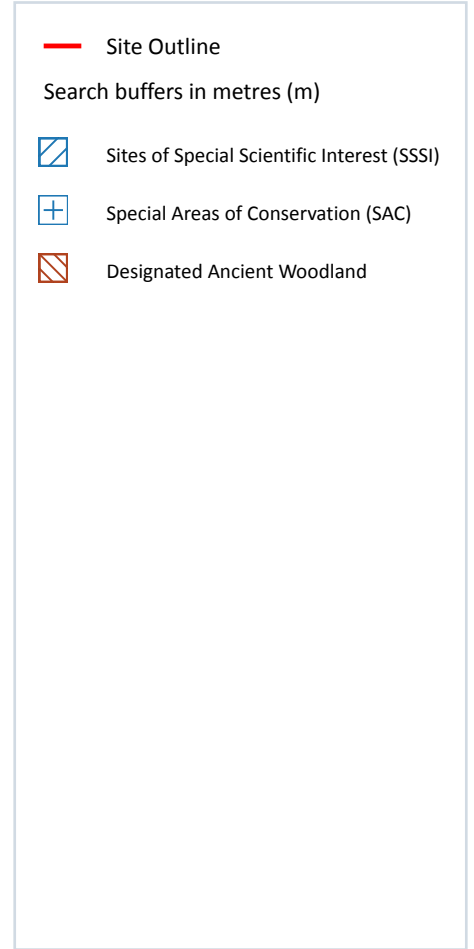
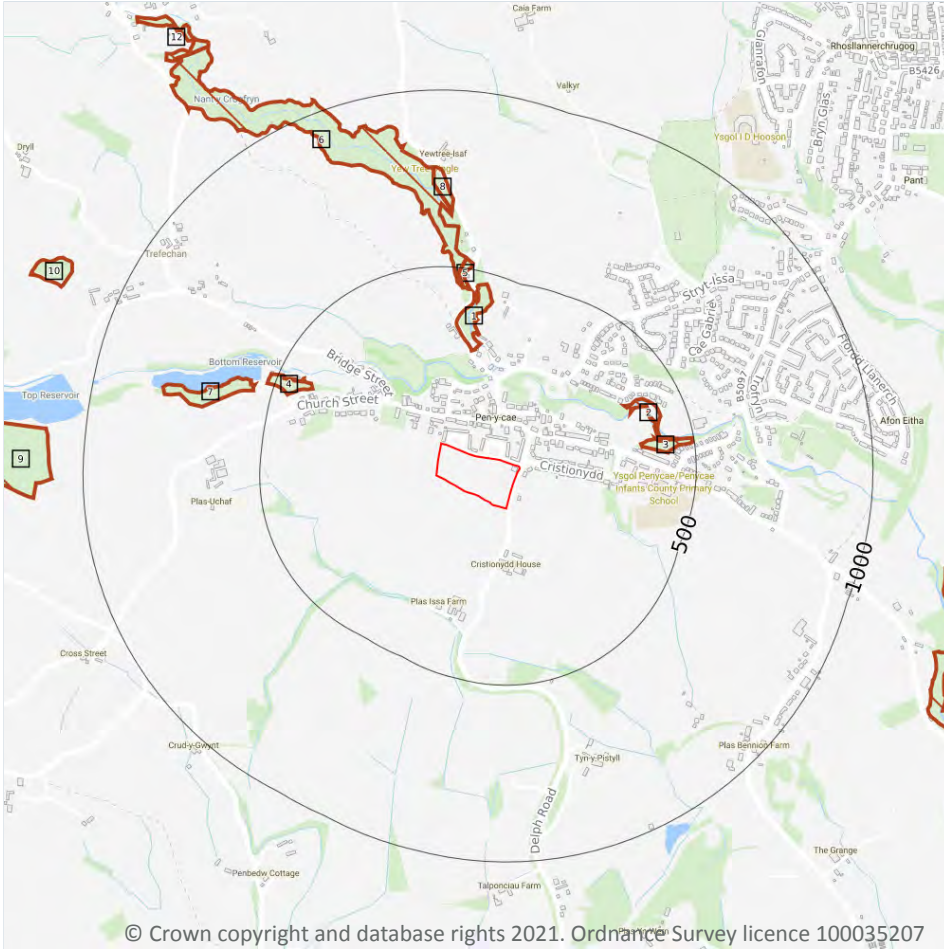
Moderate

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 57**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

3

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 58**

ID	Location	Name	Data source
-	1666m E	Stryt Las A'r Hafod	Natural Resources Wales

ID	Location	Name	Data source
-	1778m E	Stryt Las A'r Hafod	Natural Resources Wales
-	1962m NW	Ruabon/Ilantysilio Mountains And Minera	Natural Resources Wales

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0
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Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	3
-----------------------------	----------

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

Features are displayed on the Environmental designations map on **page 58**

ID	Location	Name	Features of interest	Habitat description	Data source
-	1666m E	Johnstown Newt Sites	Great crested newt.	Bogs, Marshes, Water fringed vegetation, Fens; Improved grassland; Heath, Scrub, Maquis and Garrigue, Phygrana; Broad-leaved deciduous woodland; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural Resources Wales

ID	Location	Name	Features of interest	Habitat description	Data source
-	1778m E	Johnstown Newt Sites	Great crested newt.	Bogs, Marshes, Water fringed vegetation, Fens; Improved grassland; Heath, Scrub, Maquis and Garrigue, Phygrana; Broad-leaved deciduous woodland; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural Resources Wales
-	1962m NW	Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains	Wet heathland with cross-leaved heath; Dry heaths; Alpine and subalpine heaths; Grasslands on soils rich in heavy metals; Dry grasslands and scrublands on chalk or limestone; Blanket bog; Very wet mires often identified by an unstable `quaking` surface; Calcium-rich springwater-fed fens; Acidic scree; Base-rich scree; Plants in crevices in base-rich rocks; Limestone pavements; Caves not open to the public; Mixed woodland on base-rich soils associated with rocky slopes; Western acidic oak woodland; Great crested newt; Lesser horseshoe bat.	Bogs, Marshes, Water fringed vegetation, Fens; Improved grassland; Inland rocks, Scree, Sands, Permanent Snow and ice; Heath, Scrub, Maquis and Garrigue, Phygrana; Coniferous woodland; Humid grassland, Mesophile grassland; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Dry grassland, Steppes; Inland water bodies (Standing water, Running water); Broad-leaved deciduous woodland	Natural Resources Wales

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m

0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.



10.5 National Nature Reserves (NNR)

Records within 2000m

0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m

0

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m

25

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 58**

ID	Location	Name	Woodland Type
1	276m N	Unknown	Ancient Semi Natural Woodland
2	344m NE	Unknown	Ancient Semi Natural Woodland
3	350m E	Unknown	Ancient Semi Natural Woodland
4	395m NW	Unknown	Ancient Semi Natural Woodland
5	444m N	Unknown	Ancient Semi Natural Woodland
6	445m N	Unknown	Ancient Semi Natural Woodland
7	552m W	Unknown	Ancient Semi Natural Woodland
8	660m N	Unknown	Ancient Semi Natural Woodland
9	1088m W	Unknown	Ancient Woodland Site of Unknown Category
10	1152m NW	Unknown	Ancient Semi Natural Woodland



ID	Location	Name	Woodland Type
11	1238m E	Unknown	Ancient Semi Natural Woodland
12	1302m NW	Unknown	Ancient Semi Natural Woodland
-	1307m W	Unknown	Plantation on Ancient Woodland Site
-	1372m E	Unknown	Ancient Semi Natural Woodland
-	1396m N	Unknown	Ancient Semi Natural Woodland
-	1527m E	Unknown	Ancient Semi Natural Woodland
-	1547m W	Unknown	Restored Ancient Woodland Site
-	1564m NW	Unknown	Ancient Semi Natural Woodland
-	1611m E	Unknown	Ancient Semi Natural Woodland
-	1662m E	Unknown	Ancient Semi Natural Woodland
-	1690m W	Unknown	Plantation on Ancient Woodland Site
-	1697m SW	Unknown	Restored Ancient Woodland Site
-	1699m SW	Unknown	Restored Ancient Woodland Site
-	1746m W	Unknown	Restored Ancient Woodland Site
-	1883m NW	Unknown	Restored Ancient Woodland Site

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m

0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m

0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.



10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m

0

Areas designated to prevent urban sprawl by keeping land permanently open.

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.



10.15 Nitrate Sensitive Areas

Records within 2000m

0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

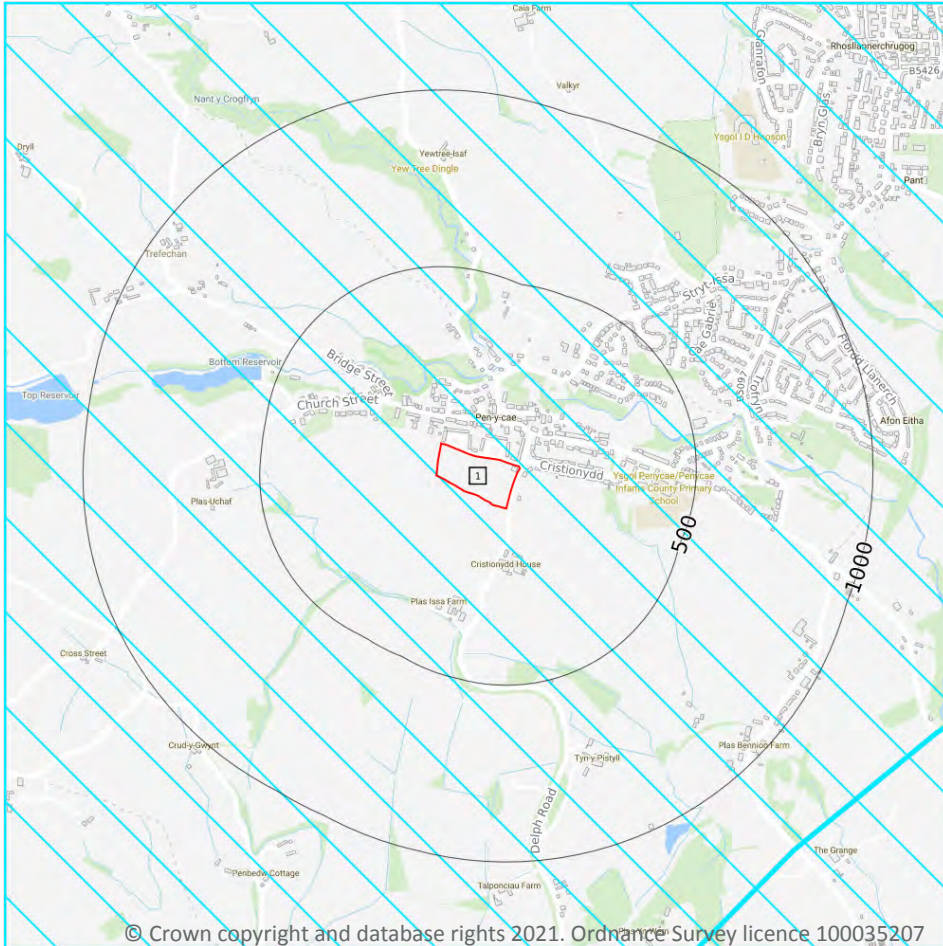
0

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 65**

ID	Location	Type of developments requiring consultation
1	On site	Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 4000m². Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m

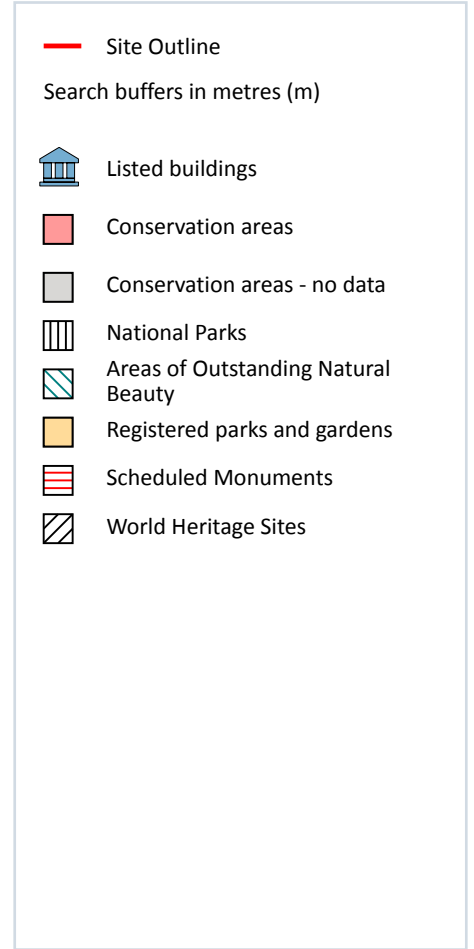
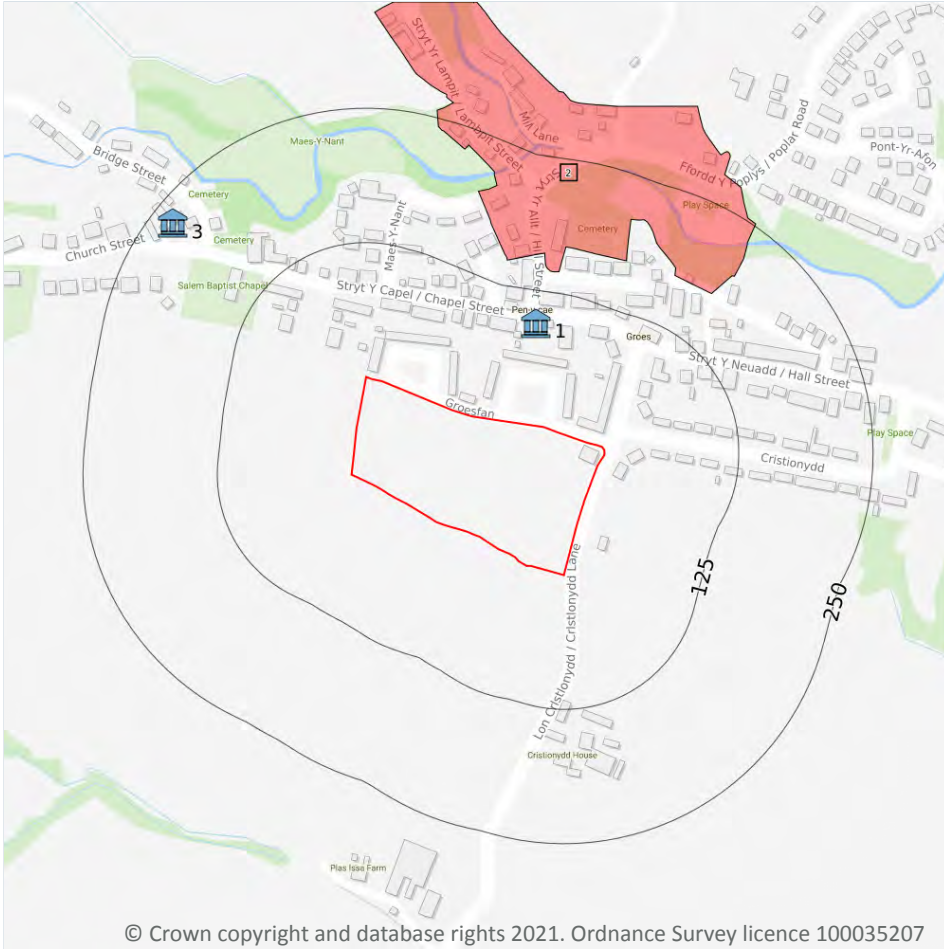
0

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.



11 Visual and cultural designations



11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

2

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on **page 67**

ID	Location	Name	Grade	Reference Number	Listed date
1	95m N	War Memorial, Opposite Hill Street At The Centre Of The Village	II	17088	15/01/1996
3	230m NW	Ty Brith, Close To The Junction Of Church Street And Bridge Street, At An Angle To The Road	II	16846	15/01/1996

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



11.5 Conservation Areas

Records within 250m

1

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

Features are displayed on the Visual and cultural designations map on **page 67**

ID	Location	Name	District	Date of designation
2	144m N	Penycae	WREXHAM	1976-02-13

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m

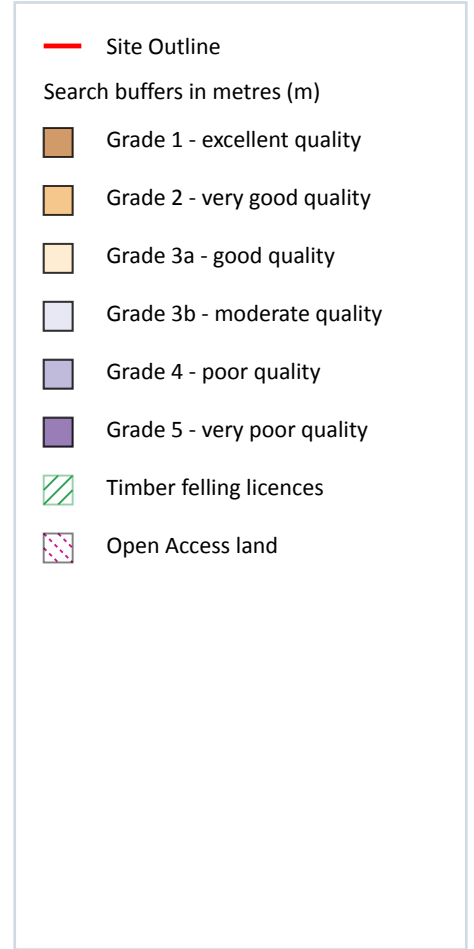
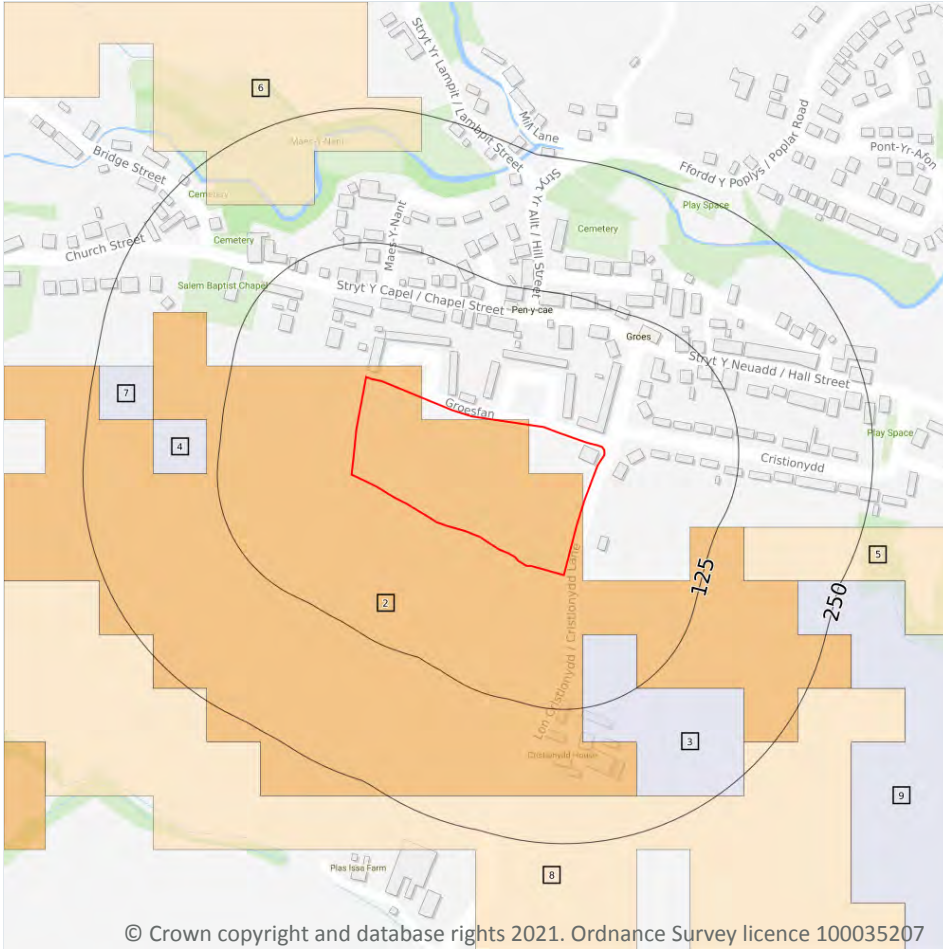
0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



12 Agricultural designations



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12.1 Agricultural Land Classification

Records within 250m

8

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 70**

ID	Location	Classification	Description
2	On site	Grade 2	Good quality agricultural land
3	58m S	Grade 3b	Moderate quality agricultural land
4	135m W	Grade 3b	Moderate quality agricultural land

ID	Location	Classification	Description
5	146m SE	Grade 3a	Good to moderate quality agricultural land
6	167m N	Grade 3a	Good to moderate quality agricultural land
7	189m W	Grade 3b	Moderate quality agricultural land
8	205m S	Grade 3a	Good to moderate quality agricultural land
9	212m E	Grade 3b	Moderate quality agricultural land

This data is sourced from Natural Resources Wales.

12.2 Open Access Land

Records within 250m

0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m

0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.



12.5 Countryside Stewardship Schemes

Records within 250m

0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.



13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m	0
---------------------	---

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0
---------------------	---

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0
---------------------	---

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

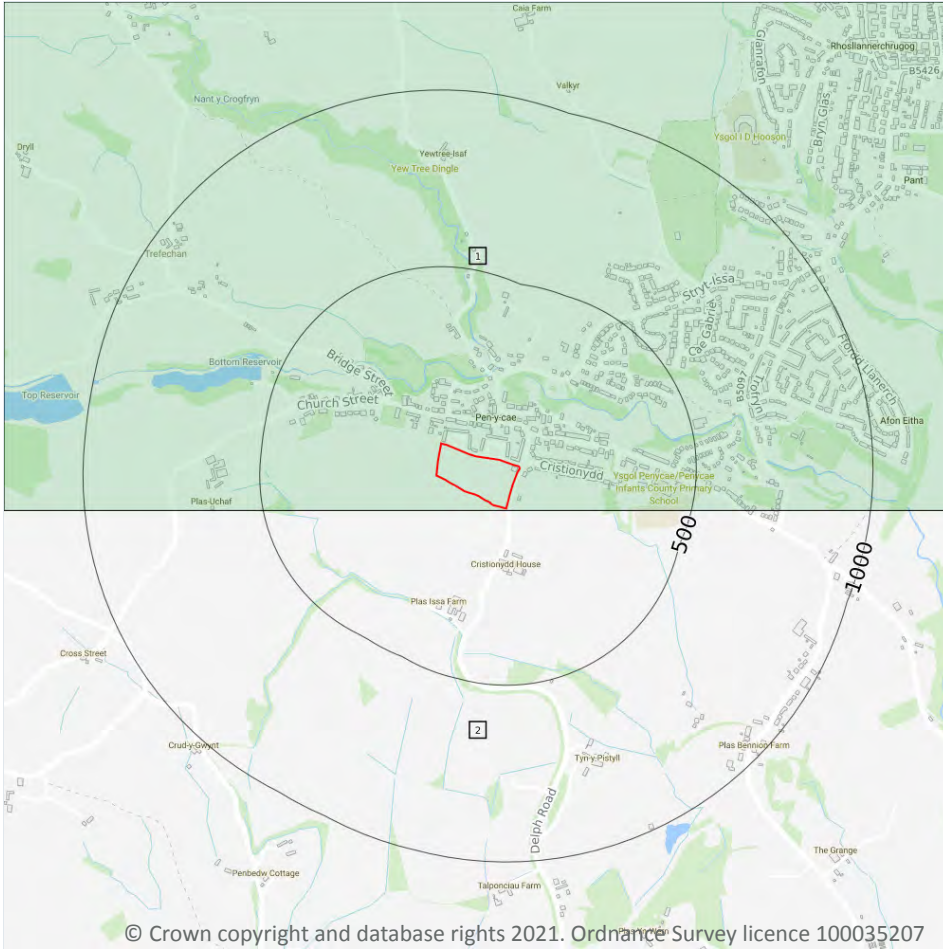
Records within 250m	0
---------------------	---

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



— Site Outline
 Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

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14.1 10k Availability

Records within 500m

2

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

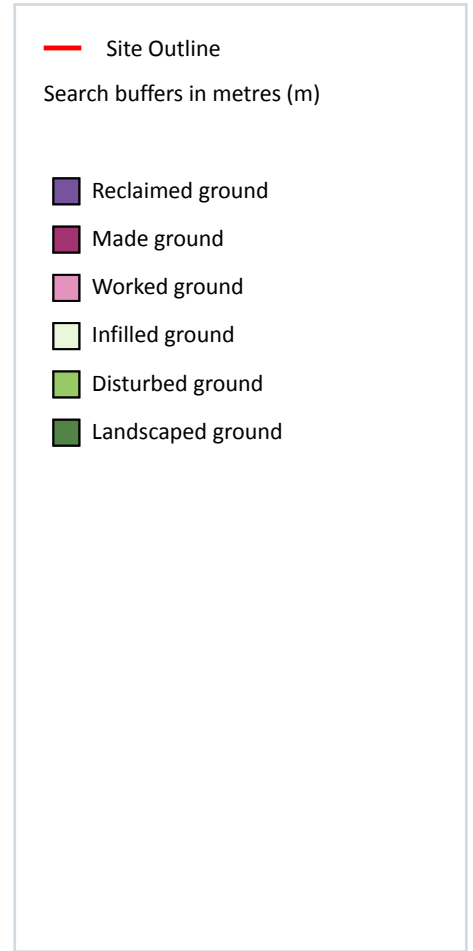
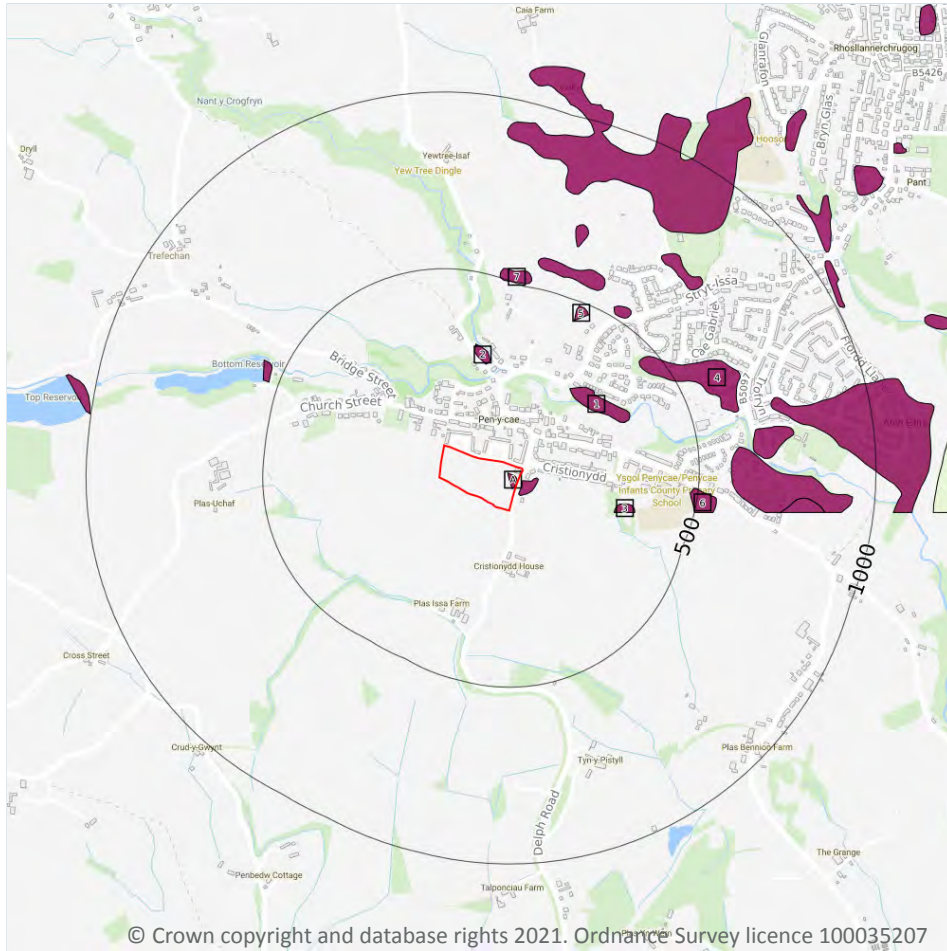
Features are displayed on the Geology 1:10,000 scale - Availability map on **page 74**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	SJ24NE
2	5m S	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Artificial and made ground



14.2 Artificial and made ground (10k)

Records within 500m

9

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 75**

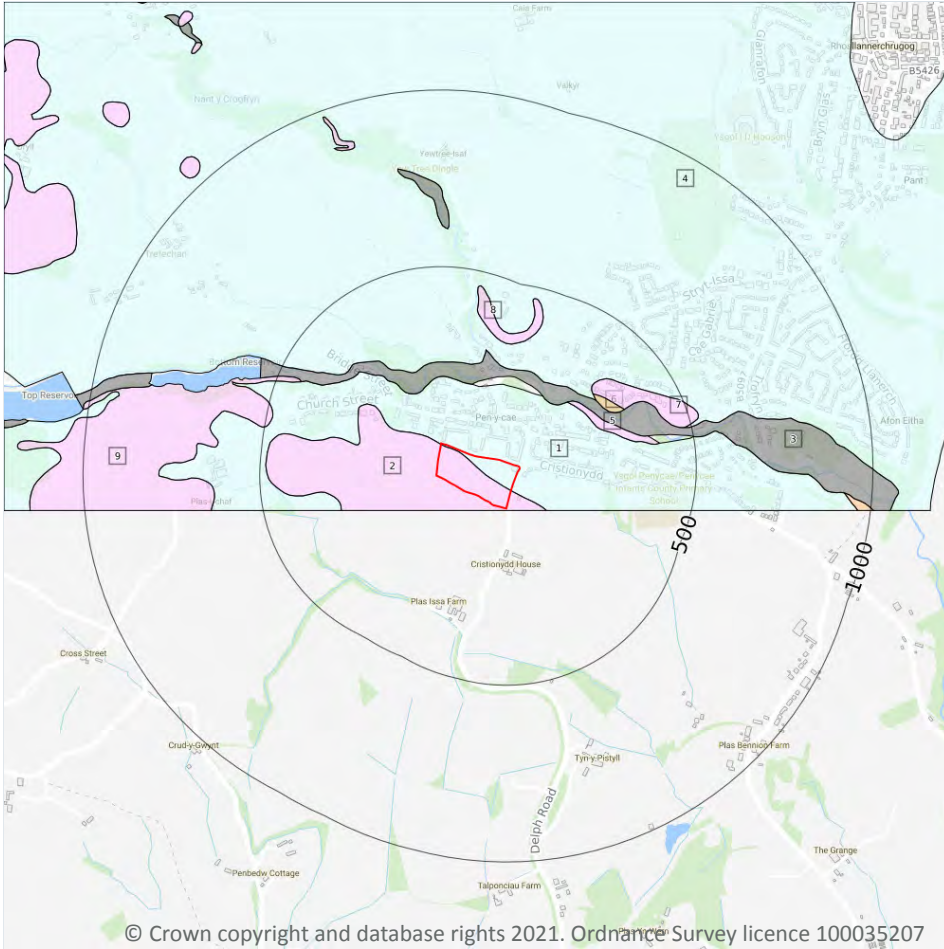
ID	Location	LEX Code	Description	Rock description
A	On site	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	12m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
1	248m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	255m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit


ID	Location	LEX Code	Description	Rock description
3	283m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	442m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	444m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6	478m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
7	496m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
-  Landslip (10k)
- Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

9

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 77**

ID	Location	LEX Code	Description	Rock description
1	On site	TILL-DMTN	Till - Diamicton	Diamicton
2	On site	GFDU-XSV	Glaciofluvial Deposits - Sand And Gravel	Sand And Gravel
3	157m NW	ALV-C	Alluvium - Clay (unlithified Deposits Coding Scheme)	Clay
4	214m N	TILL-DMTN	Till - Diamicton	Diamicton



ID	Location	LEX Code	Description	Rock description
5	228m NE	GFDU-XSV	Glaciofluvial Deposits - Sand And Gravel	Sand And Gravel
6	288m NE	RTDU-XSV	River Terrace Deposits (undifferentiated) - Sand And Gravel	Sand And Gravel
7	294m NE	GFDU-XSV	Glaciofluvial Deposits - Sand And Gravel	Sand And Gravel
8	329m N	GFDU-XSV	Glaciofluvial Deposits - Sand And Gravel	Sand And Gravel
9	432m NW	GFDU-XSV	Glaciofluvial Deposits - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

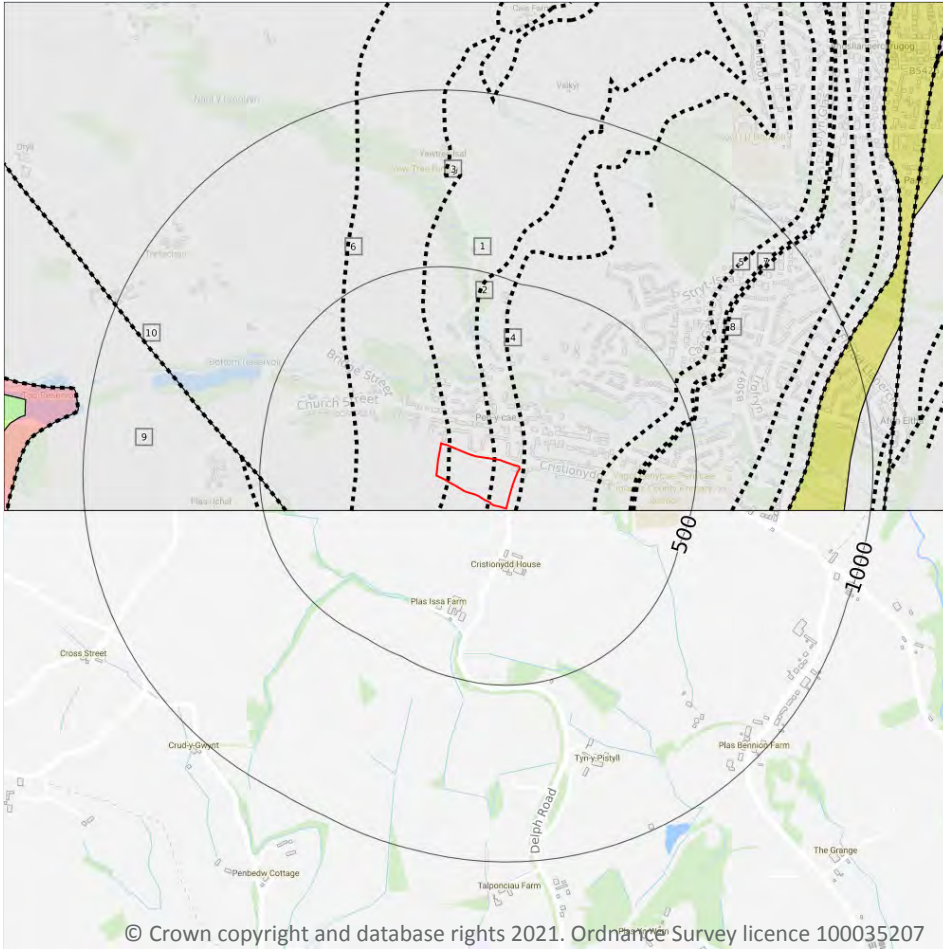
0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

2

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 79**

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
9	438m W	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age

This data is sourced from the British Geological Survey.



14.6 Bedrock faults and other linear features (10k)

Records within 500m

8

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 79**

ID	Location	Category	Description
2	On site	ROCK	Coal seam, inferred
3	On site	ROCK	Coal seam, inferred
4	11m E	ROCK	Coal seam, inferred
5	226m E	ROCK	Coal seam, inferred
6	228m W	ROCK	Coal seam, inferred
7	328m E	ROCK	Coal seam, inferred
8	335m E	FOSSIL_HORIZON	Fossil horizon, marine band
10	438m W	FAULT	Normal fault, inferred; crossmarks on downthrow side

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline
 Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme. Where 50k data is not available, this area has been filled in with 625k scale data.

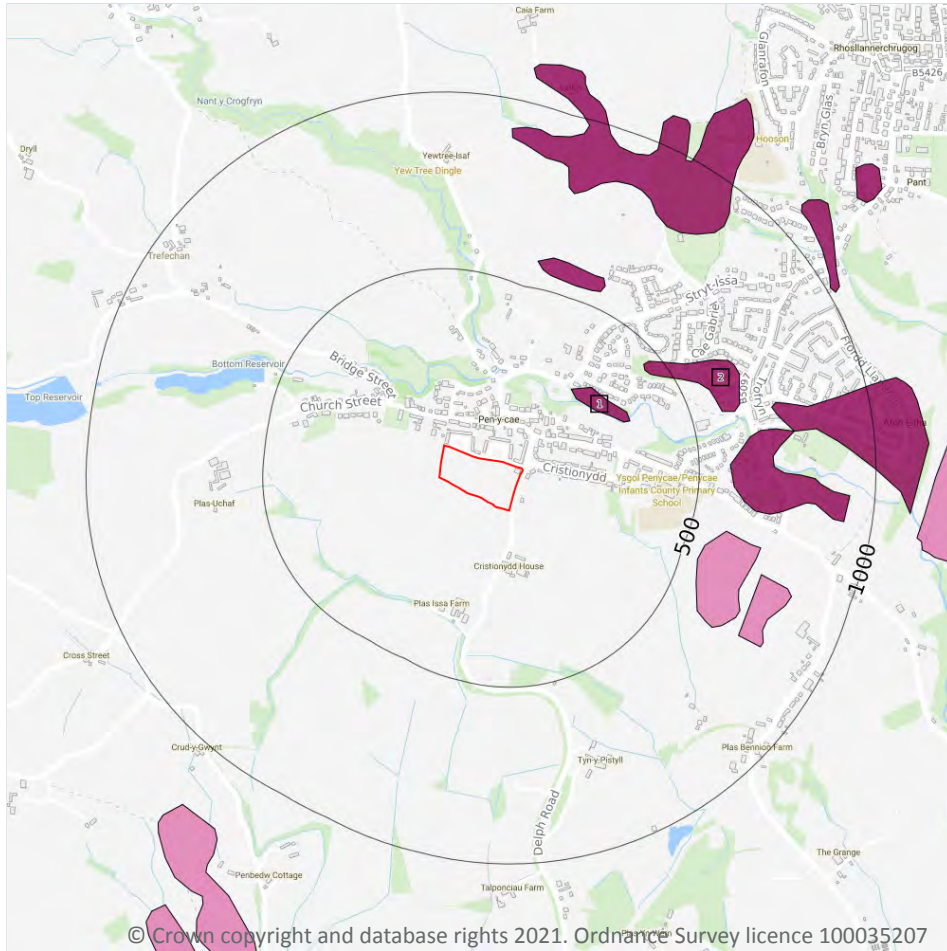
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 81**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW121_wrexham_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground



— Site Outline
 Search buffers in metres (m)

- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m

2

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 82**

ID	Location	LEX Code	Description	Rock description
1	250m NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	446m NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

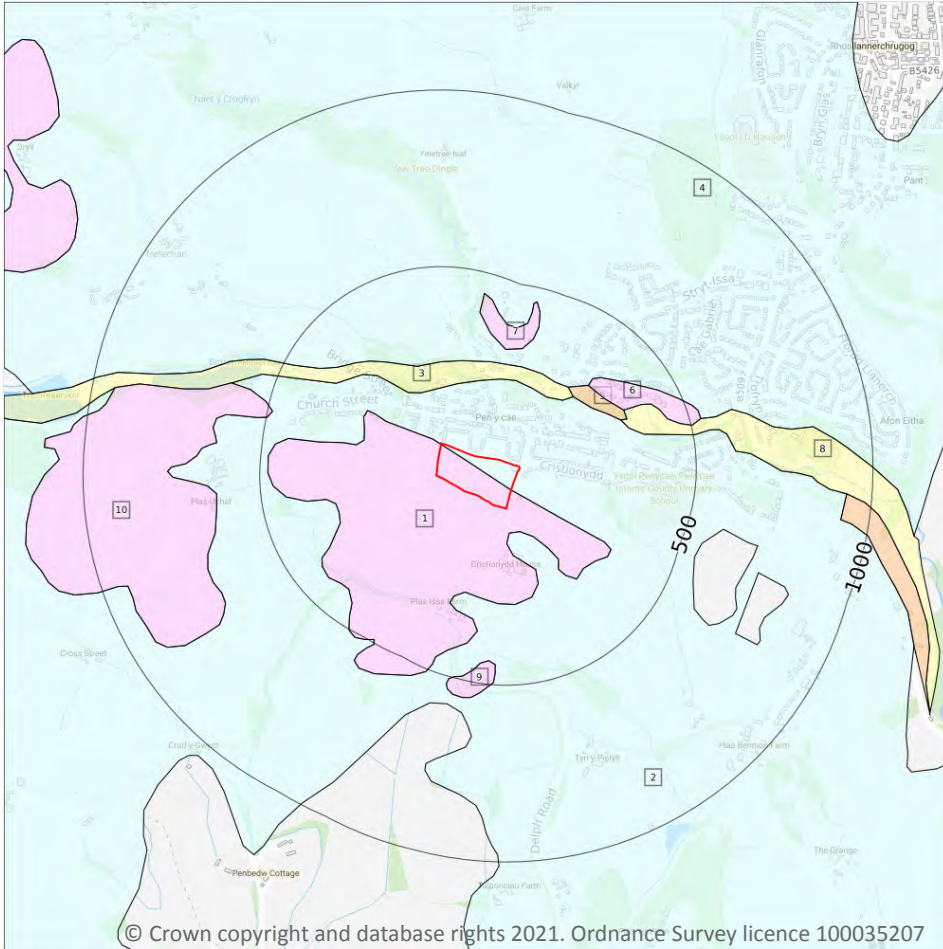
0


A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
-  Landslip (50k)
- Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

10

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 84**

ID	Location	LEX Code	Description	Rock description
1	On site	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
2	On site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
3	153m N	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

ID	Location	LEX Code	Description	Rock description
4	227m N	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
5	250m NE	RTDU-XSV	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND AND GRAVEL
6	302m NE	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
7	312m N	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
8	317m NE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
9	433m S	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
10	486m W	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	3
---------------------------	----------

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	High	Low
On site	Intergranular	Very High	High
5m S	Intergranular	Very High	High

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0
----------------------------	----------

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

Records within 50m

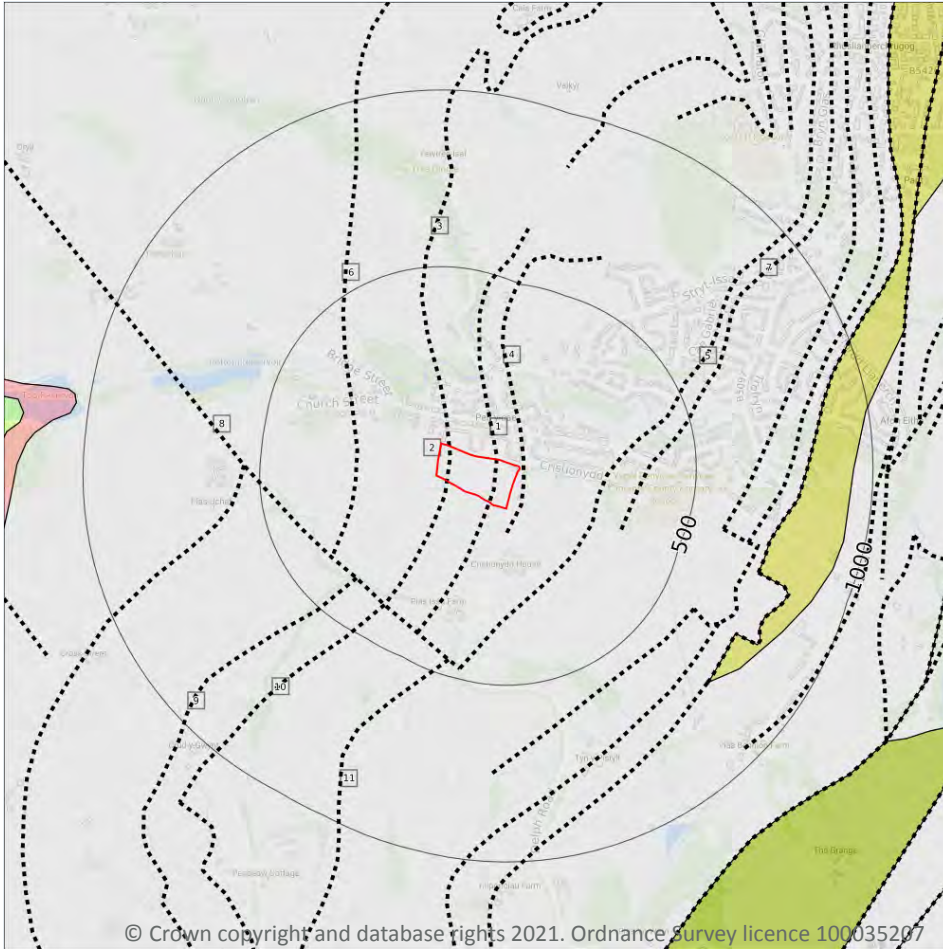
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (50k)
- Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

1

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 87**

ID	Location	LEX Code	Description	Rock age
2	On site	PLMC-MDSS	PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

2

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Moderate	Low
5m S	Fracture	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

10

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

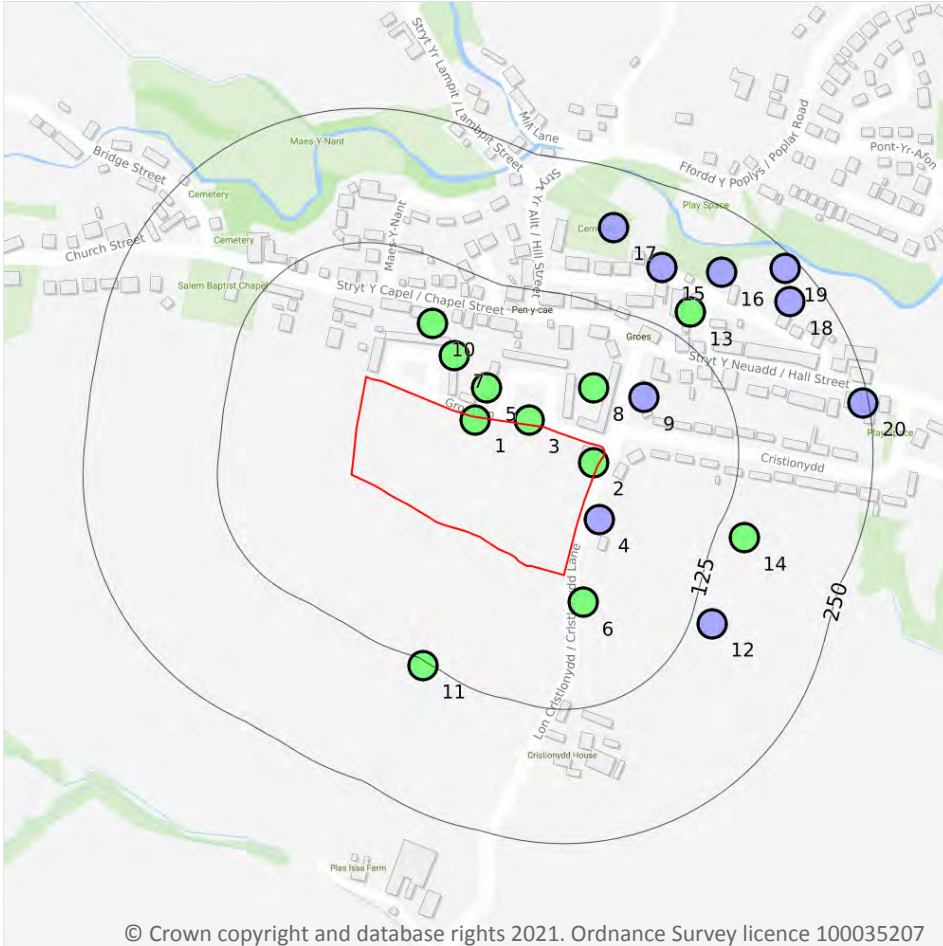
Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 87**

ID	Location	Category	Description
1	On site	ROCK	Coal seam, inferred
3	On site	ROCK	Coal seam, inferred
4	11m E	ROCK	Coal seam, inferred
5	227m SE	ROCK	Coal seam, inferred
6	228m W	ROCK	Coal seam, inferred
7	330m E	ROCK	Coal seam, inferred
8	367m SW	FAULT	Fault, inferred, displacement unknown
9	368m SW	ROCK	Coal seam, inferred
10	392m SW	ROCK	Coal seam, inferred
11	455m S	ROCK	Coal seam, inferred

This data is sourced from the British Geological Survey.



16 Boreholes



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16.1 BGS Boreholes

Records within 250m

20

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on **page 89**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	328000 345150	PEN Y CAE O/C SITE BH111	15.0	N	142762
2	On site	328110 345110	PEN Y CAE O/C SITE BH114	15.0	N	142765
3	5m N	328050 345150	PEN Y CAE O/C SITE BH112	15.0	N	142763

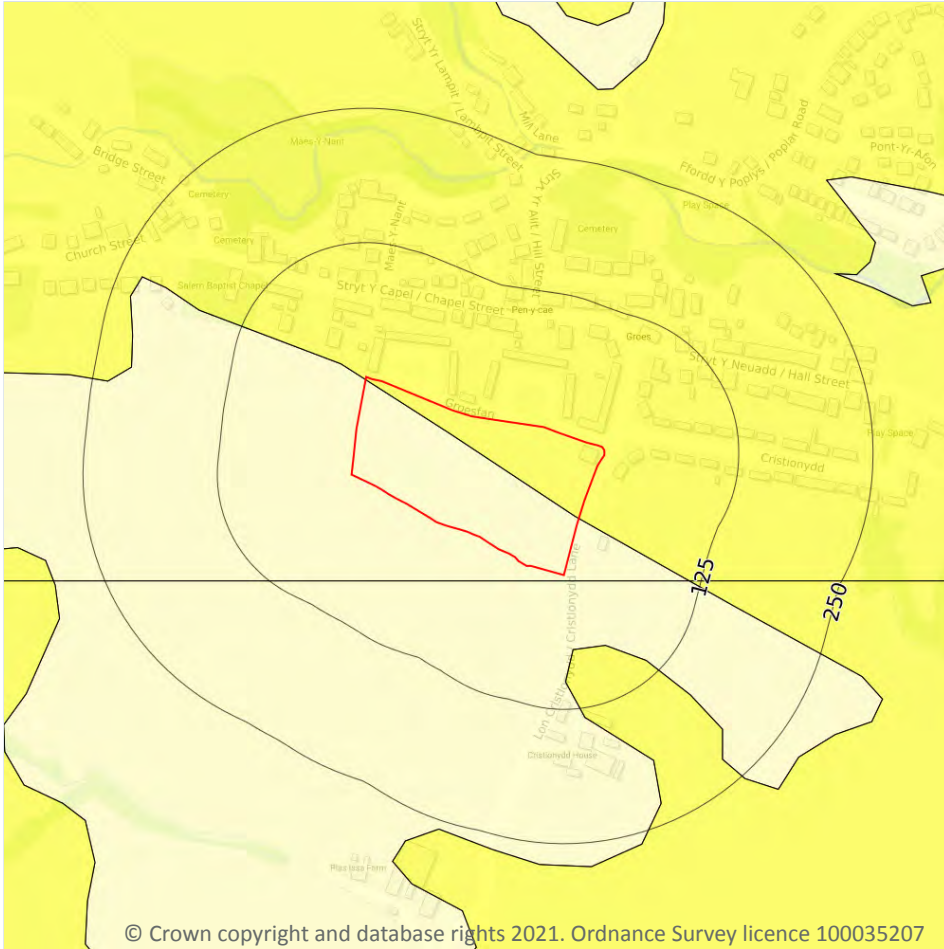


ID	Location	Grid reference	Name	Length	Confidential	Web link
4	18m E	328115 345057	UNNAMED SHAFT	-2.0	N	143140
5	29m N	328010 345180	PEN Y CAE O/C SITE BH110	12.0	N	142761
6	31m SE	328100 344980	GROES, O/C SITE. 6	21.64	N	143784
7	48m N	327980 345210	PEN Y CAE O/C SITE BH109	15.0	N	142760
8	51m N	328110 345180	PEN Y CAE O/C SITE BH113	12.19	N	142764
9	61m NE	328157 345171	UNNAMED SHAFT	-2.0	N	143465
10	68m N	327960 345240	PEN Y CAE O/C SITE BH108	15.0	N	142759
11	130m SW	327951 344921	PLAS-ISAF PENYCAE DENBIGH	19.39	N	143689
12	145m E	328220 344960	GROES, O/C SITE. 4	-2.0	N	143783
13	150m NE	328200 345250	ERW LLWYD O/C SITE BH1	12.19	N	142729
14	151m SE	328250 345040	GROES O/C SITE BH5	18.29	N	142552
15	176m N	328174 345292	GROES COLL. SHAFT	-2.0	N	143133
16	197m NE	328229 345287	UNNAMED SHAFT	-2.0	N	143466
17	197m N	328129 345329	GROES COLL. SHAFT	-2.0	N	143132
18	221m NE	328293 345260	GROES COLL. SHAFT	-2.0	N	143135
19	238m NE	328288 345291	GROES COLL. SHAFT	-2.0	N	143134
20	245m E	328361 345166	GROES COLL., ENGINE PIT	-2.0	N	143389

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



— Site Outline
Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.1 Shrink swell clays

Records within 50m

3

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 91**

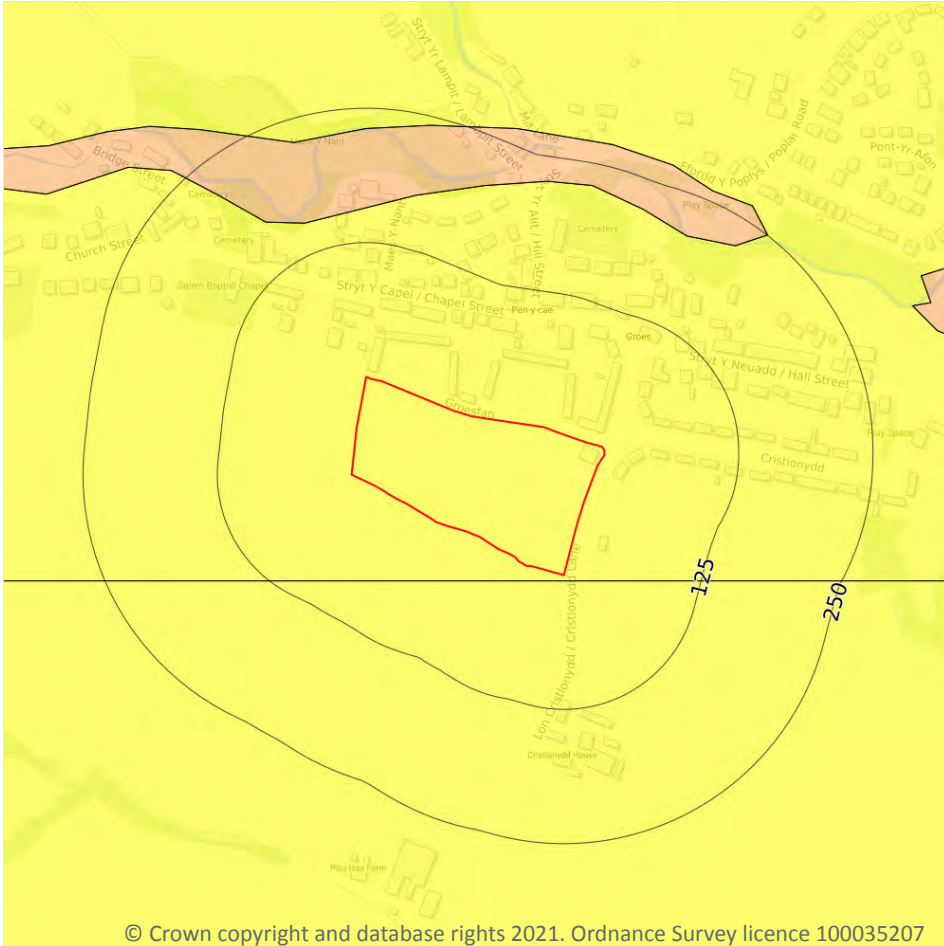
Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.
5m S	Negligible	Ground conditions predominantly non-plastic.



This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



- Site Outline
- Search buffers in metres (m)
- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.2 Running sands

Records within 50m

2

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 93**

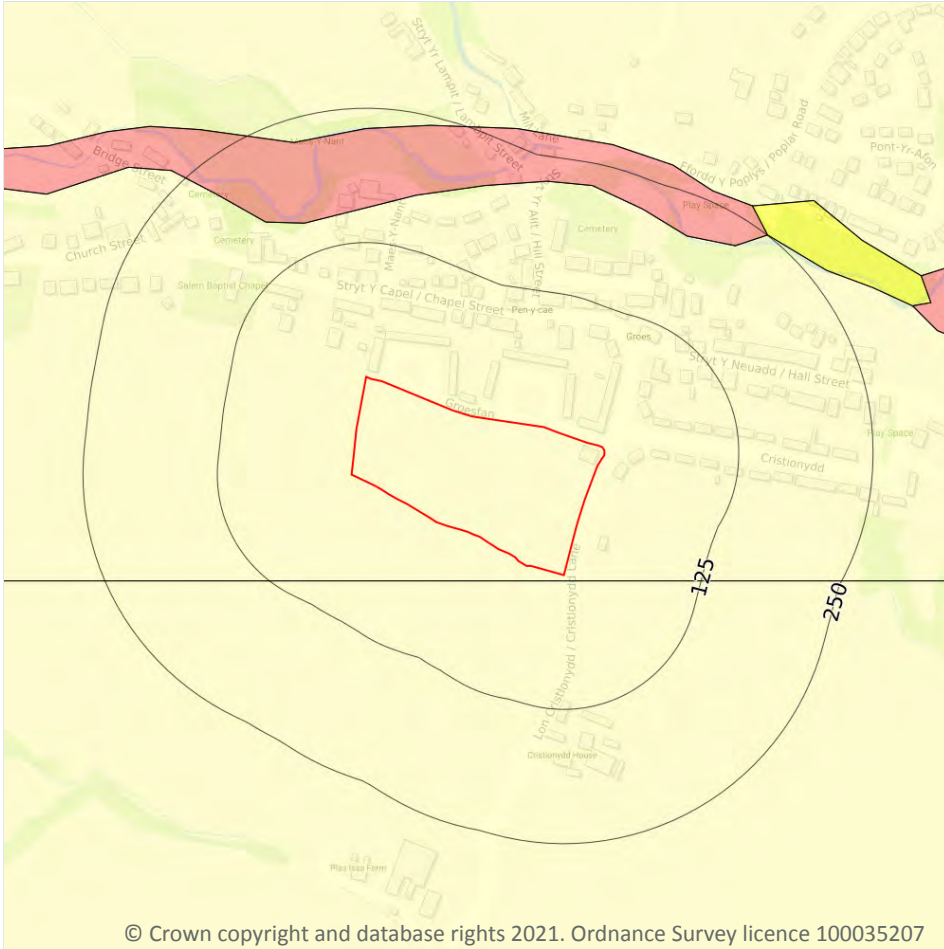
Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

Location	Hazard rating	Details
5m S	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



— Site Outline
Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m

2

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

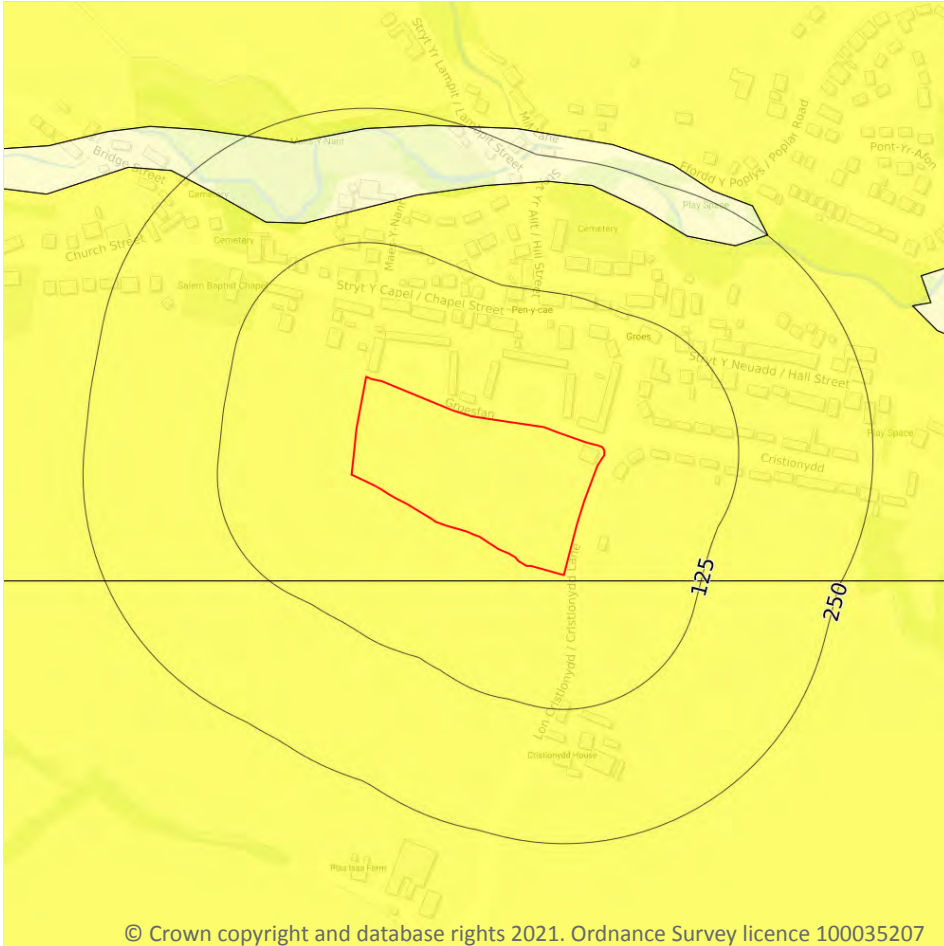
Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 95**

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.
5m S	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



— Site Outline
 Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m

2

The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

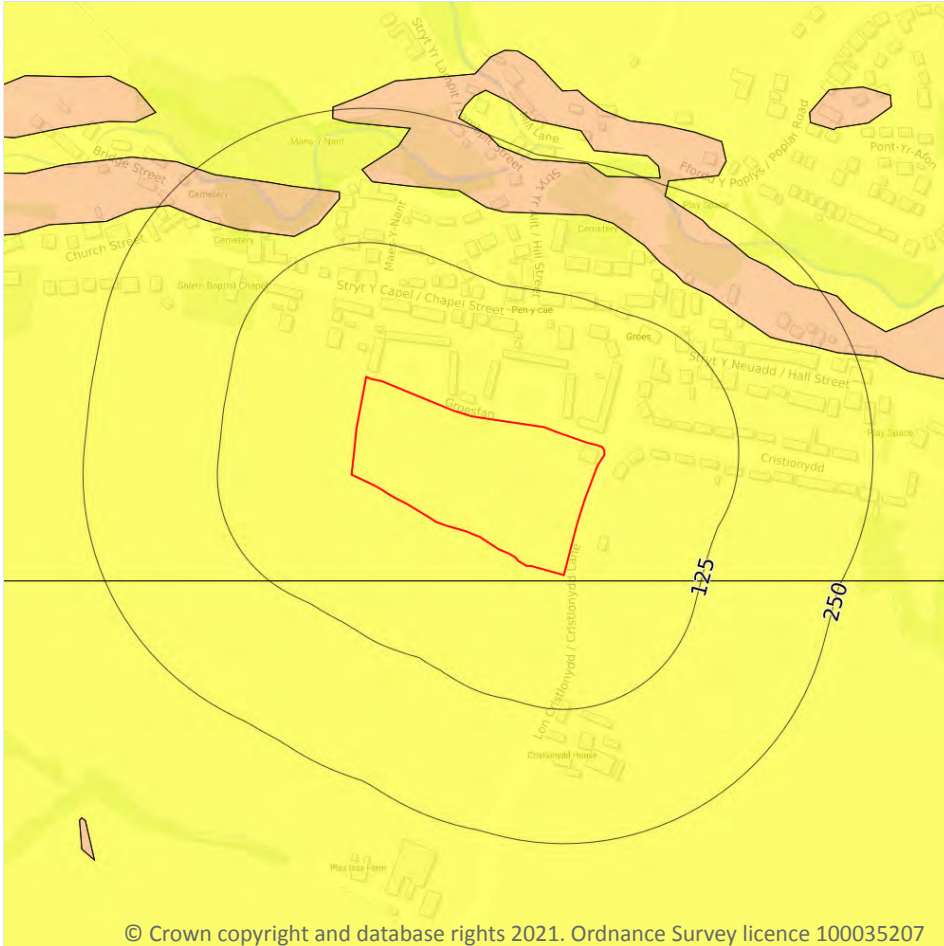
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 96**

Location	Hazard rating	Details
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
5m S	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



- Site Outline
- Search buffers in metres (m)
- No data
 - Negligible
 - Very low
 - Low
 - Moderate
 - High

17.5 Landslides

Records within 50m

2

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 97**

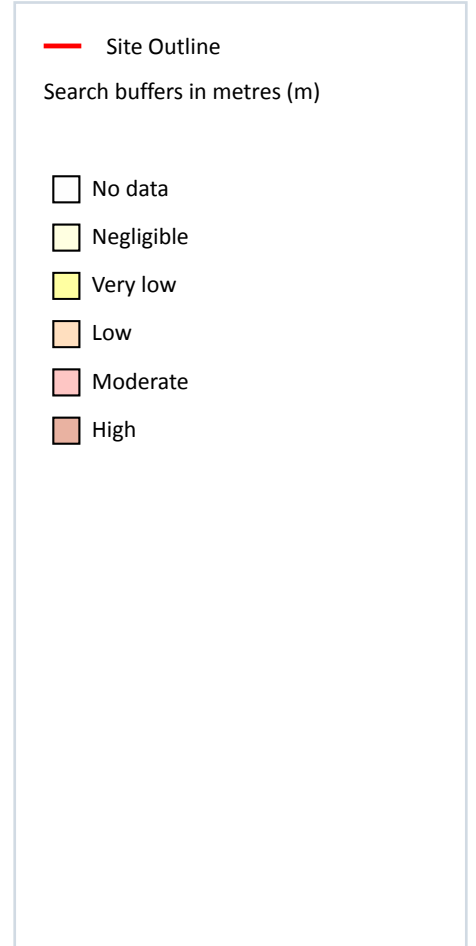
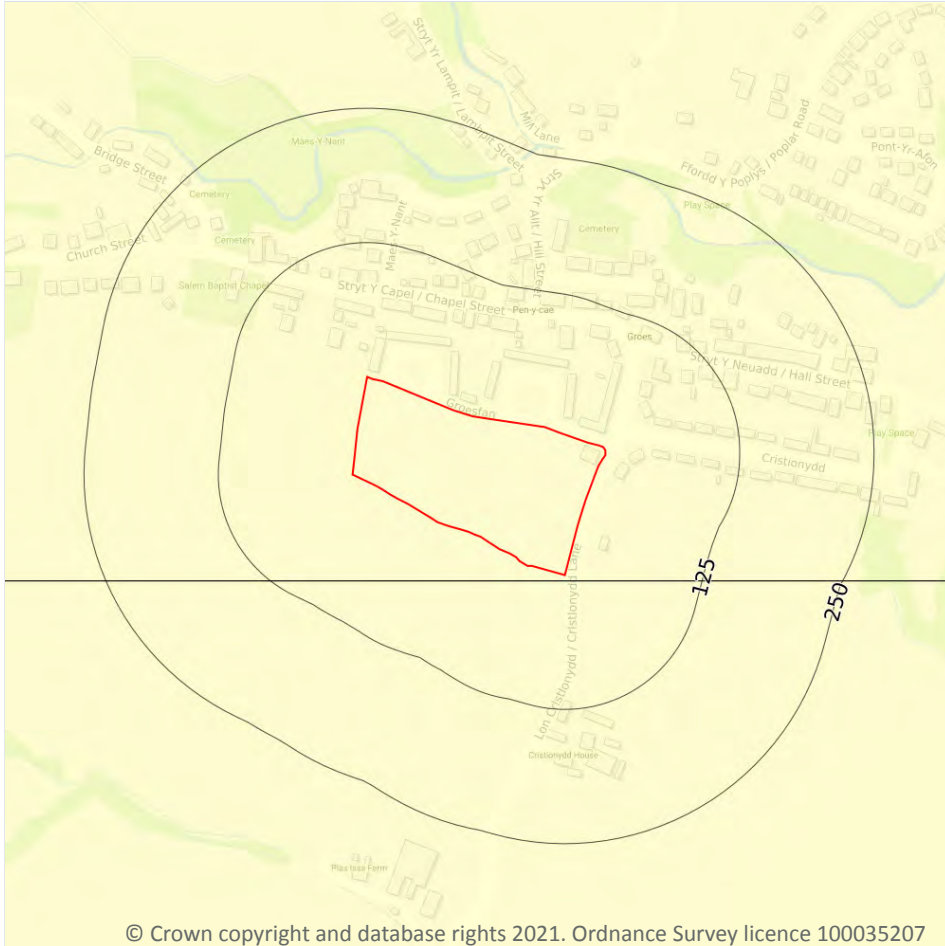
Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

Location	Hazard rating	Details
5m S	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

2

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 99**

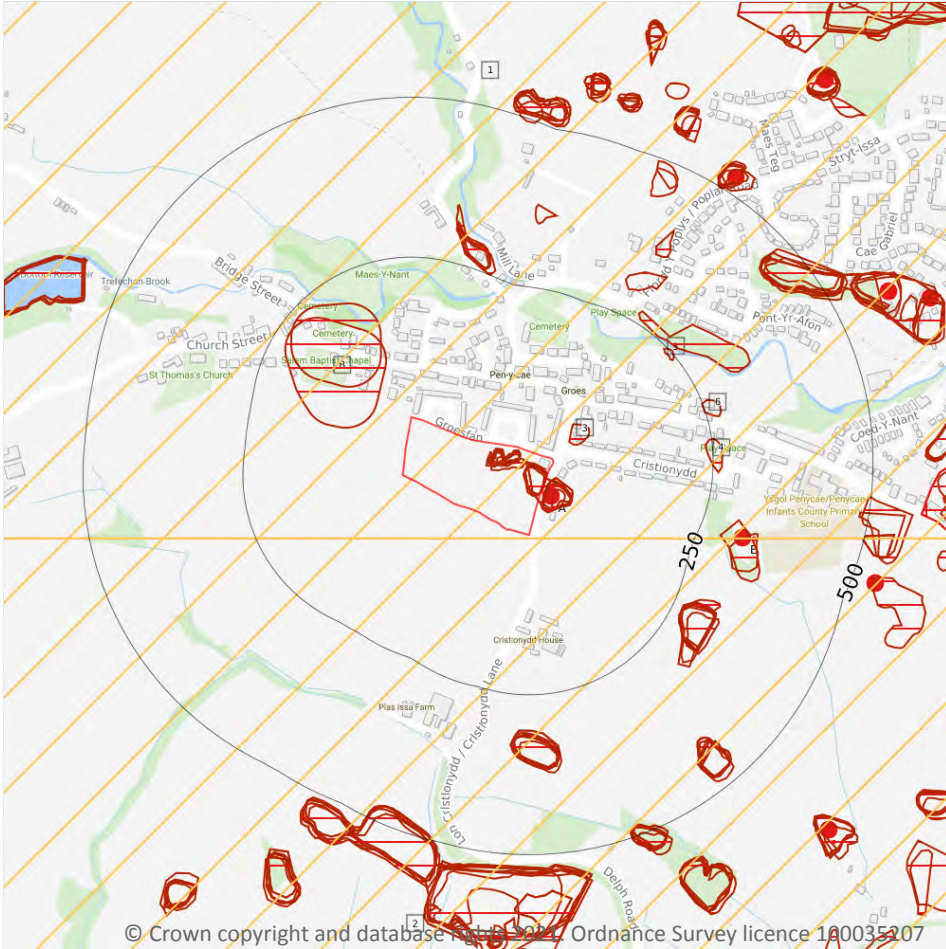
Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

Location	Hazard rating	Details
5m S	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities



- Site Outline
- Search buffers in metres (m)
- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities
- Non Coal Mining
- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m

2

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining, ground workings and natural cavities map on **page 101**

ID	Location	Details	Description
A	16m E	Name: Plas-isaf Address: Penycae, WREXHAM, Denbighshire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
E	317m E	Name: Plas-Bernion Colliery Address: Penycae, WREXHAM, Denbighshire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

25

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 101**

ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Pond	1960	1:10560
A	On site	Unspecified Heaps	1938	1:10560
A	On site	Pond	1873	1:10560
A	On site	Unspecified Heap	1949	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Unspecified Heap	1898	1:10560
A	On site	Unspecified Heaps	1938	1:10560
A	On site	Pond	1938	1:10560
A	On site	Pond	1949	1:10560
A	On site	Pond	1898	1:10560
A	On site	Unspecified Heap	1974	1:10000
A	On site	Unspecified Heap	1960	1:10560
A	On site	Pond	1909	1:10560
A	On site	Unspecified Heap	1909	1:10560
A	6m E	Unspecified Heap	1909	1:10560
A	6m E	Unspecified Heap	1974	1:10000
A	6m E	Unspecified Heap	1960	1:10560
A	8m E	Unspecified Heap	1949	1:10560
A	8m E	Unspecified Heap	1898	1:10560
A	20m E	Unspecified Heap	1873	1:10560
3	38m NE	Unspecified Heap	1873	1:10560
B	58m W	Grave Yard	1873	1:10560
B	88m NW	Grave Yard	1873	1:10560
4	240m E	Unspecified Heap	1873	1:10560
5	242m NE	Unspecified Ground Workings	1873	1:10560
6	249m E	Unspecified Heap	1873	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

58

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 101**



ID	Location	Land Use	Year of mapping	Mapping scale
A	25m E	Coal Shaft	1873	1:10560
E	332m E	Coal Shaft	1873	1:10560
P	520m NE	Unspecified Old Shaft	1960	1:10560
P	526m NE	Old Coal Shaft	1949	1:10560
P	526m NE	Unspecified Old Shaft	1898	1:10560
P	526m NE	Coal Shaft	1873	1:10560
R	541m E	Coal Shaft	1873	1:10560
12	582m E	Colliery	1873	1:10560
J	587m NE	Coal Shaft	1873	1:10560
-	667m S	Unspecified Disused Shaft	1974	1:10000
-	670m S	Unspecified Old Shaft	1960	1:10560
AA	674m SE	Coal Shaft	1873	1:10560
-	678m S	Old Coal Shaft	1949	1:10560
-	678m S	Unspecified Old Shaft	1898	1:10560
-	709m E	Colliery	1873	1:10560
AC	721m NE	Unspecified Old Shaft	1960	1:10560
AC	731m NE	Old Coal Shaft	1949	1:10560
AC	731m NE	Unspecified Old Shaft	1898	1:10560
-	768m E	Old Coal Shaft	1949	1:10560
-	768m E	Unspecified Old Shaft	1898	1:10560
-	792m E	Unspecified Old Shafts	1898	1:10560
-	797m E	Unspecified Old Shafts	1960	1:10560
-	798m E	Old Coal Shafts	1949	1:10560
-	800m E	Unspecified Shaft	1873	1:10560
-	815m S	Unspecified Old Shaft	1898	1:10560
-	848m S	Unspecified Old Shaft	1960	1:10560
-	849m S	Unspecified Old Shaft	1898	1:10560
-	849m S	Old Coal Shaft	1949	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
-	850m E	Coal Shaft	1873	1:10560
-	866m SE	Unspecified Disused Shaft	1994	1:10000
-	866m SE	Unspecified Disused Shaft	1974	1:10000
-	866m SE	Unspecified Disused Shaft	1985	1:10000
-	868m SE	Old Coal Shaft	1949	1:10560
-	868m SE	Unspecified Old Shafts	1898	1:10560
-	874m SE	Unspecified Old Shaft	1960	1:10560
-	885m S	Unspecified Disused Shaft	1994	1:10000
-	885m S	Unspecified Disused Shaft	1974	1:10000
-	885m S	Unspecified Disused Shaft	1985	1:10000
-	888m E	Old Coal Shafts	1949	1:10560
-	888m E	Unspecified Old Shafts	1898	1:10560
-	890m E	Unspecified Old Shafts	1960	1:10560
-	894m S	Unspecified Old Shaft	1960	1:10560
-	894m S	Old Coal Shaft	1949	1:10560
-	894m S	Unspecified Old Shaft	1898	1:10560
-	895m E	Unspecified Shaft	1873	1:10560
-	905m N	Unspecified Old Shaft	1960	1:10560
-	911m N	Old Coal Shaft	1949	1:10560
-	911m N	Unspecified Old Shaft	1898	1:10560
-	931m N	Coal Shaft	1873	1:10560
-	937m SE	Unspecified Disused Shaft	1994	1:10000
-	937m SE	Unspecified Disused Shaft	1974	1:10000
-	937m SE	Unspecified Disused Shaft	1985	1:10000
-	937m SE	Old Coal Shaft	1949	1:10560
-	937m SE	Unspecified Old Shafts	1898	1:10560
-	943m SE	Unspecified Old Shaft	1960	1:10560
-	981m S	Unspecified Old Shafts	1960	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
-	983m S	Old Coal Shafts	1949	1:10560
-	988m S	Unspecified Shafts	1898	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m

0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

2

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining, ground workings and natural cavities map on **page 101**

ID	Location	Name	Commodity	Class	Likelihood
1	On site	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
2	5m S	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

This data is sourced from the British Geological Survey.



18.7 Mining cavities

Records within 1000m **0**

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site **0**

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site **1**

Areas which could be affected by past, current or future coal mining.

Location	Details
On site	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site **0**

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0
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Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0
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Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

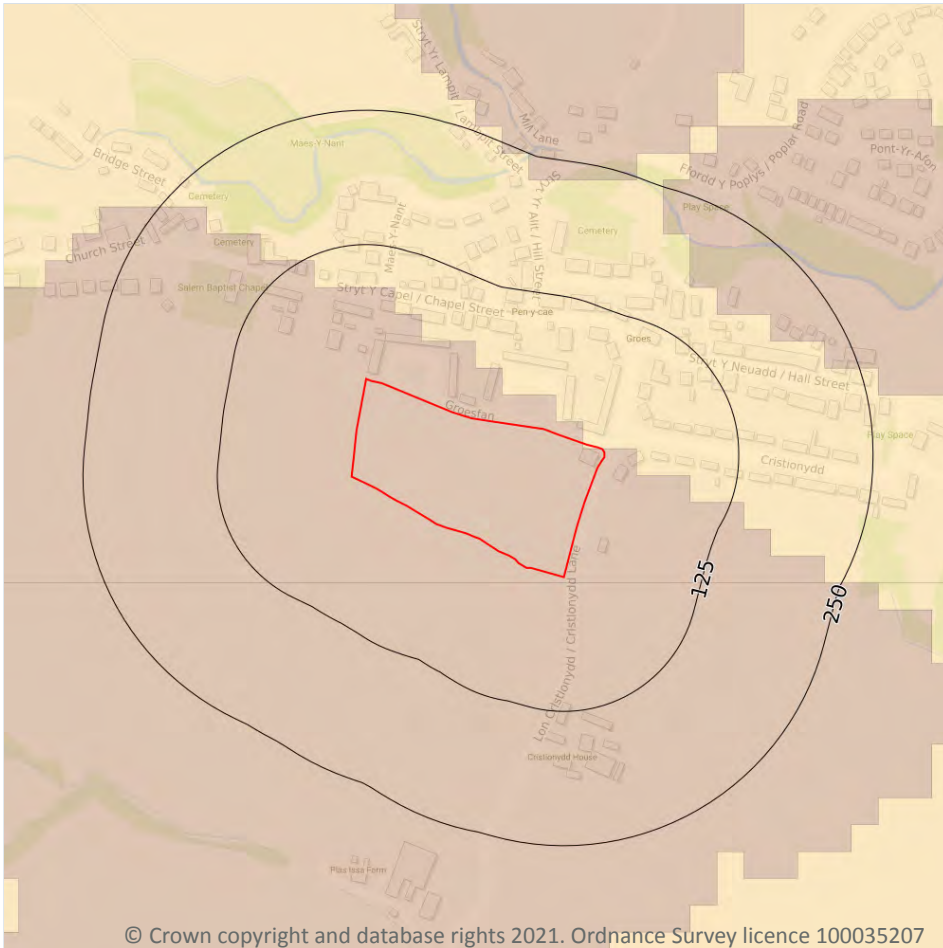
18.13 Clay mining

Records on site	0
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Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon



— Site Outline
 Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

19.1 Radon

Records on site

2

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on [page 109](#)

Location	Estimated properties affected	Radon Protection Measures required
On site	Between 10% and 30%	Full
On site	Between 3% and 5%	Basic

This data is sourced from the British Geological Survey and Public Health England.



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

12

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
5m SE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
5m SE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
37m S	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
37m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
37m S	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
37m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg



This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m

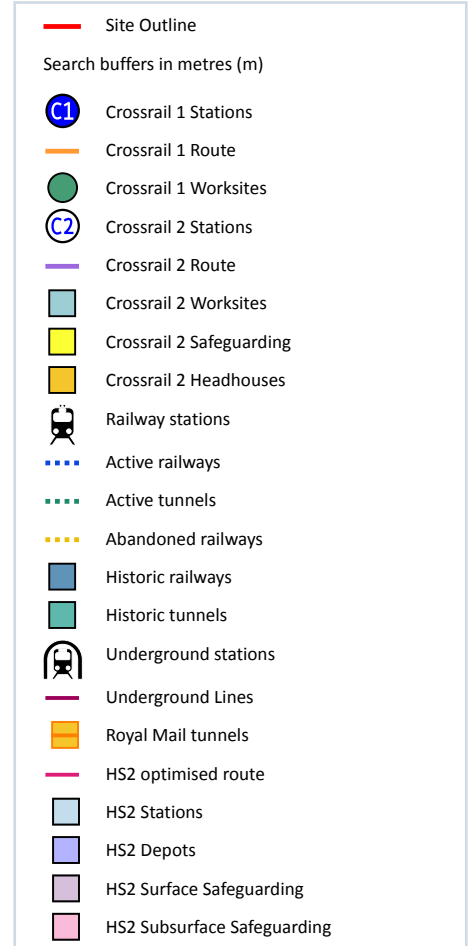
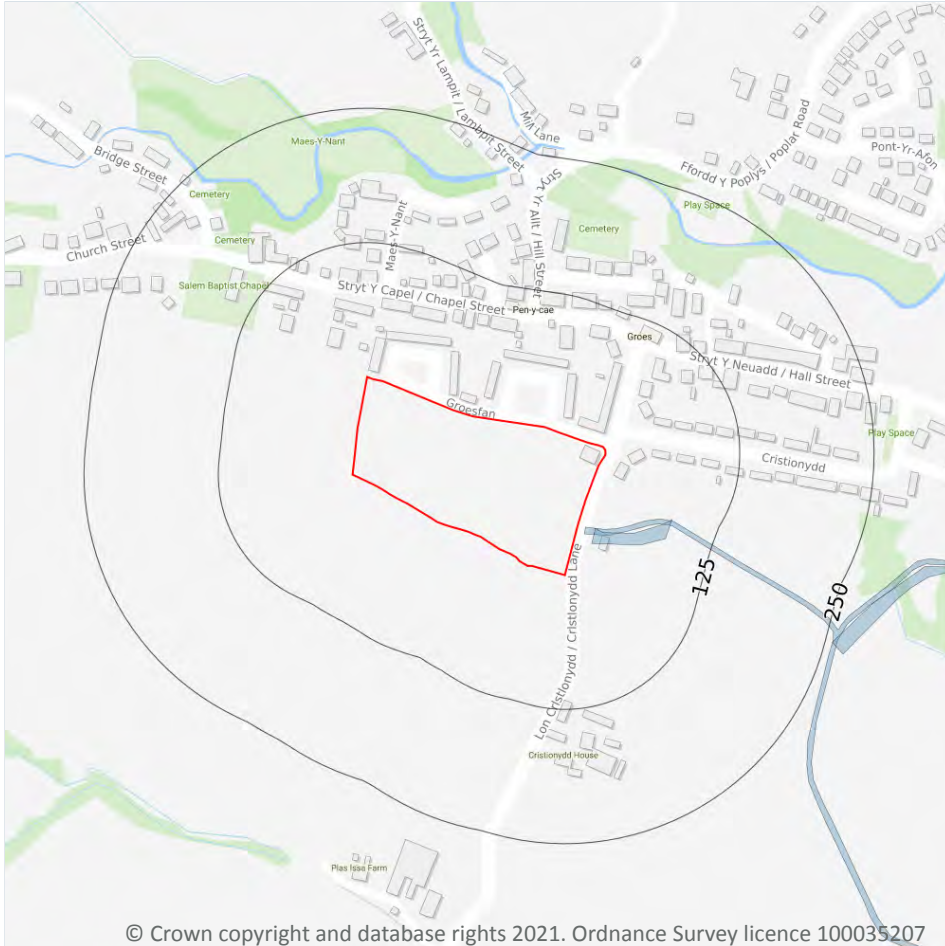
0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



21 Railway infrastructure and projects



21.1 Underground railways (London)

Records within 250m

0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m

0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m

2

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 113**

Location	Land Use	Year of mapping	Mapping scale
8m E	Railway Sidings	1873	2500
17m E	Railway Sidings	1873	10560

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m

0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m

0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.



21.7 Railways

Records within 250m

0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m

0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m

0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m

0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference>.

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: <https://www.groundsure.com/terms-and-conditions-jan-2020/>.





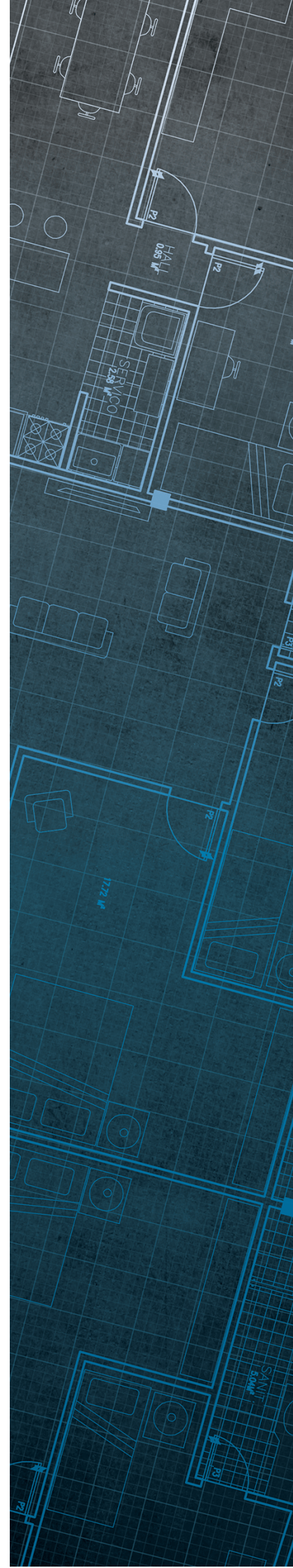
The Coal
Authority

Consultants Coal Mining Report

Land At Groesfan, Penycae,
Wrexham
Denbighshire
LL14 2RP

Date of enquiry: 10 May 2021
Date enquiry received: 10 May 2021
Issue date: 10 May 2021

Our reference: 51002533943001
Your reference: GS-7838406



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

GROUNDSURE LIMITED

Enquiry address

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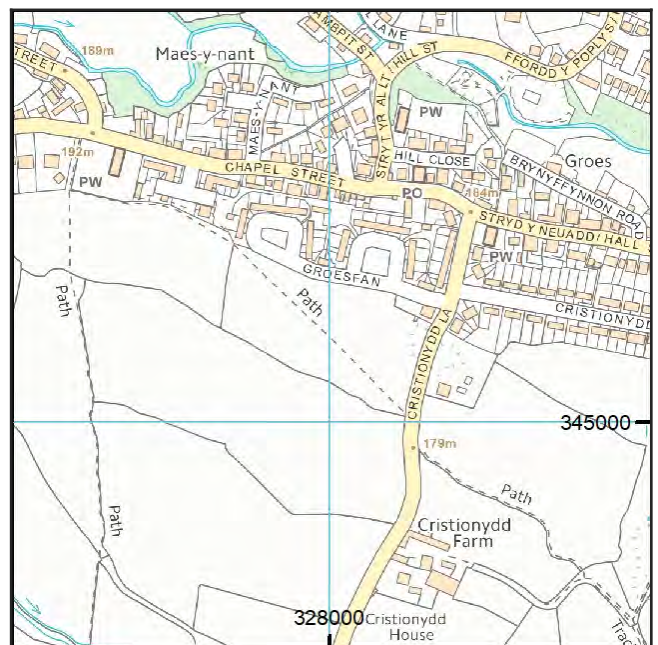
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Approximate position of property



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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	WALL AND BENCH	Coal	380X	52	Beneath Property	6.0	South-East	110	1860
unnamed	WALL AND BENCH	Coal	3810	56	North-East	6.0	South-East	110	1850

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
Shaft	328345-115	328115 345055		Coal	
Shaft	328345-450	328157 345179		Coal	

Abandoned mine plan catalogue numbers

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

13859	14882	14896
16713	14885	14880
PO0	14891	NW1418

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
RUABON YARD (SOFT 5 QTRS)	Coal	Yes	Within	N/A	17
WALL AND BENCH	Coal	Yes	Within	N/A	15

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas 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.

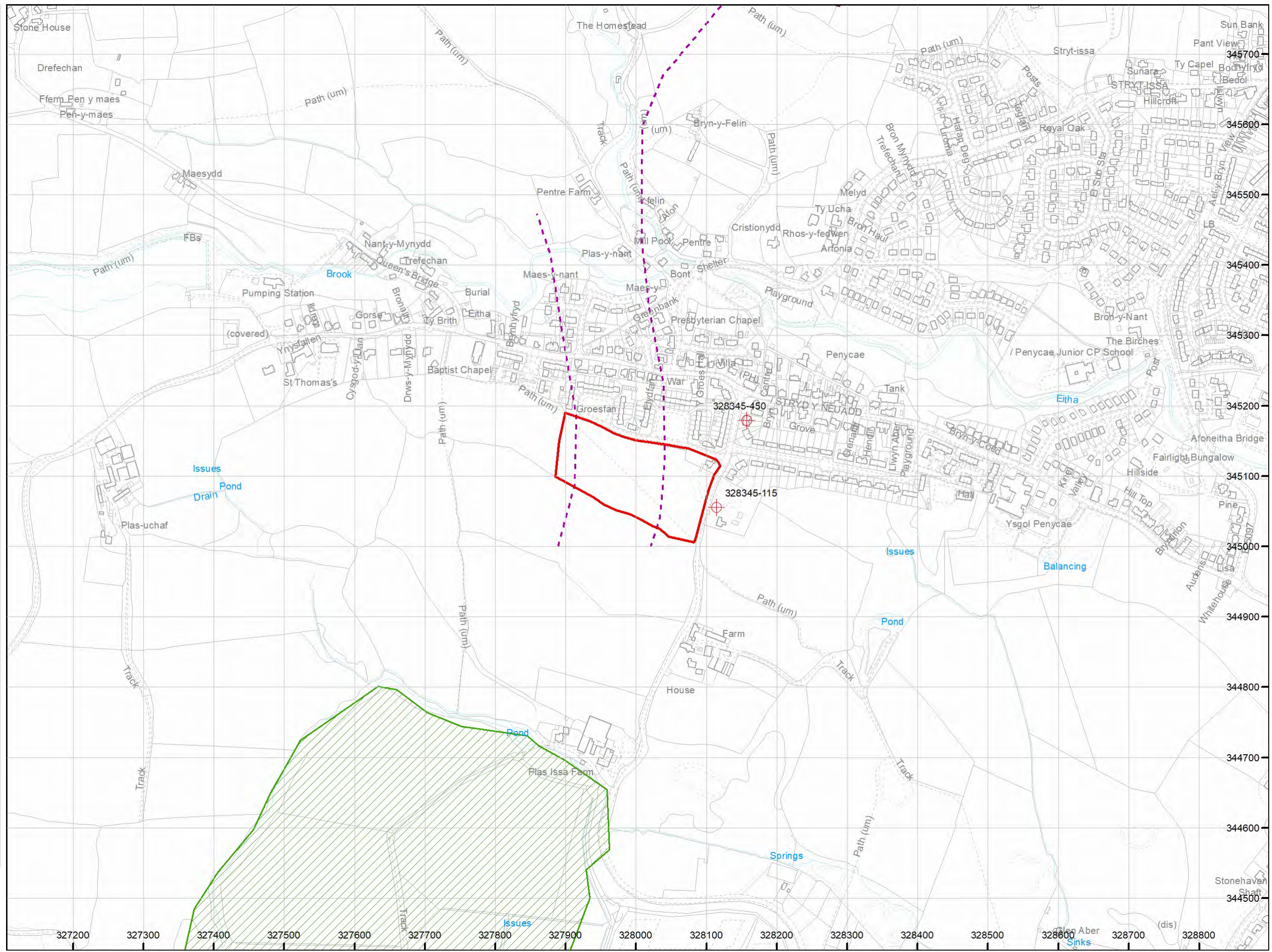
Payment to owners of former copyhold land

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.

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 
- Disused mine shaft 
- Outcrop (Conjectured) 
- Unlicensed opencast site 



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APPENDIX D

(i) Conceptual Model

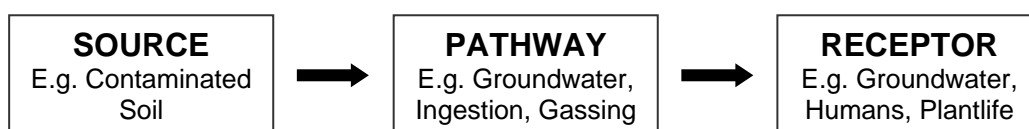
The report aims to identify land which could potentially be affected by contamination, such that it could affect the value or re-use of the land, or such that mitigation would be required for certain proposed end uses of the land.

The assessment also aims to identify land which would be regarded as ‘contaminated land’ under the terms of the Environmental Protection Act 1990, Part IIa. This act includes a stricter test for contaminated land than that outlined above. Land is considered to be contaminated if either: the land is causing significant harm to people, ecosystems or infrastructure; or there is a significant possibility that such harm could be caused; or pollution of controlled waters is being, or is likely to be, caused.

The following situations are defined as being where harm is to be regarded as significant: chronic or quite toxic effect, serious injury or death to humans; irreversible or other adverse harm to the ecological system; substantial damage to or failure of buildings; death of, or disease or other physical damage affecting, livestock or crops; pollution of controlled waters.

The risk assessment uses a ‘Source-Pathway-Receptor’ methodology for assessing whether a source of contamination could potentially lead to harmful consequences. This means that there needs to be a pollutant linkage from source to receptor for harm to be caused, this linkage consisting of: a source of pollution; a pathway for the pollutant to move along; a receptor that is affected by the pollutant.

As an example, the pollutant source could be an identified leak of oil or an area of dumped waste.



The pathways could include transport of the contaminant by groundwater, surface water, windblown dust, or vapours, and for human receptors will include the means by which contaminants enter the body, for example skin contact, ingestion and inhalation.

Receptors include people, other living organisms, the built environment and groundwater and surface waters (these latter two also being contaminant pathways).

The source-pathway-receptor methodology relationship allows an assessment of the environmental risk to be determined, based on the nature of the source, the degree of exposure of the receptor to the source and the sensitivity of the receptor.

This section of the report is based on the information set out in the previous sections of the report and should not be read independently of such sections.

Initial Conceptual Model

From the available information the preliminary conceptual model is visualised as follows:

Target (Receptor)	POTENTIAL SOURCE-PATHWAY LINKAGE
Site Users / Residents	Inhalation of soil gas, odours or dust.
	Ingestion of, and skin contact with, contaminated soil.
	Ingestion of contaminants in vegetables etc. or in soils adhering to vegetables, etc.
Construction/ Maintenance Workers.	Inhalation of soil gas, odours or dust.
	Ingestion of, and skin contact with, contaminated soil
Plants	Adverse effects on growth caused by presence of contaminants in soil
Buildings and Structures	Flow of ground gas into buildings. Asphyxiation, toxicity, explosion and fire hazards
	Sulphate attack of foundations
	Hydrocarbons penetrating plastic water supply pipes
Groundwater	Migration of soluble contaminants into groundwater on or off site. Migration of oils into groundwater on or off site.
Surface water	Migration of soluble contaminants and/or direct run-off of contaminants. Migration of oils into groundwater on or off site.

Initial Environmental Risk Assessment - General

It is accepted that an environmental risk assessment can be based on a source-pathway-target model. An examination is carried out as to whether a target will be at risk from a contamination source, that a source exists, and whether there are any pathways (routes of exposure) which might actually link the source to the target.

Environmental risk assessments rely heavily on numerical trigger concentrations or guidelines because exposure of targets to contamination is difficult to quantify directly. Quantification of risk is therefore mainly undertaken for general scenarios in order to derive trigger levels. These are derived for various contaminants for particular targets and routes of exposure. An example of a sensitive target would be users of a domestic back garden, where routes of exposure might be skin contact, dust inhalation, direct ingestion and indirect ingestion via cultivation and consumption of fruit and vegetables. In March 2002, the first parts of the new CLEA risk assessment guidance were released by DEFRA/Environment Agency.

The risk assessment approach is an extension of the 'fit for use' concept whereby land is cleaned up to a standard fit for the proposed use, that is, so all remaining risks are acceptable. However, as well as being 'fit for use', the environmental risk assessment approach also addresses the soil and water environment so that these are also safeguarded where necessary. For example if a site was contaminated with heavy metals and the development comprised the proposed construction of hard standings and buildings only, the fit-for-use approach might require no remediation for the site. However, consideration of the wider environment needs to address whether groundwater is being contaminated, and if so whether remediation is required for this reason.

The following classification presented by CIRIA has been used in the assessment of risk:

Estimation of risk from consideration of magnitude, consequences and probabilities				
Probability	Consequences			
	Severe	Moderate	Mild	Minor
High	Very high	High	Moderate	Moderate / Low
Medium	High	Moderate	Moderate / Low	Low
Low	Moderate	Moderate / Low	Low	Very Low
Unlikely	Moderate / Low	Low	Very Low	Very Low

Reference: Contaminated Land Risk Management; A Guide to Good Practice, CIRIA C552:2001

APPENDIX E

(i) Notes on Limitations

The desk study report includes examination and provision of historical maps and an environmental database search covering geology, hydrogeology, historical, land use, water abstractions, groundwater source protection zones, landfill sites, radon, trade directory entries, petrol filling stations and nature reserves for the site and surrounding area. A Coal Authority Report has been obtained as part of the investigation.

This report does not consider ecological impacts (e.g. bats) or botanical risks (e.g. Japanese knotweed). It is recommended that these are considered as part of the assessment of development constraints for the site.

The assessment and judgements given in this report are directed by both the finite data on which they are based and the proposed works to which they are addressed. The data essentially comprised a study of available documented information from various sources together with discussions with relevant authorities and other interested parties. There may also be circumstances at the site that are not documented. The information reviewed is not exhaustive and has been accepted in good faith as providing representative and true data pertaining to site conditions. If additional information becomes available which might impact our environmental conclusions, we request the opportunity to review the information, reassess the potential concerns and modify our opinion if warranted.

It should be noted that any risks identified in this report are perceived risks based on the available information. Actual risks can only be assessed following a physical investigation of the site.

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