

**PRELIMINARY RISK
ASSESSMENT BONC WEN**

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1 INTRODUCTION

GroundSolve Ltd (GSL) were commissioned by North Wales Housing Association (NWA) to undertake a Land Contamination Risk Management (LCRM) Preliminary Risk Assessment for an area of land at Bonc Wen, see Figure 1.

A previous desk study and limited site investigation was prepared for NWA by Datrys Consulting Engineers Ltd (DCEL). However, this report is not in line with current guidelines, and therefore GSL were appointed to prepare an updated report, to meet current planning requirements.

1.1 PROPOSED DEVELOPMENT

Current plans are to construct three 2-story blocks of apartments, with associated parking and gardens, see Figure 2.

Foundation loads are not known at this stage but based on experience are anticipated to be between 50 and 75kN per meter run for two to three storey structures. Floor slab loading are anticipated to be low, probably not exceeding 5kN/m². Development levels will be close to existing levels, with the site being largely flat.

The recommendations in this report are based on these assumptions, consequently, they should be reviewed, and if necessary revised during the detailed design.

As such, in accordance with the '*Updated technical background to the CLEA model*' (Environment Agency, 2009) and '*Suitable 4 Use Levels*' (LQM / CIEH 2015) the proposed generic land use for this development is RESIDENTIAL WITH HOMEGROWN PRODUCE.

1.2 PREVIOUS REPORTS

A previous investigation was found on the BGS website, which comprised five boreholes drilled to investigate the mine workings beneath the site.

A site investigation was carried out in April 2015 by SRL, for NWA. As part of this investigation the underlying ground was drilled to prove the depth to the underlying coal seams, trial pits were excavated, and shallow soil samples collected. DCEL subsequently produced a Geotechnical Design Report, including some limited contamination testing, although this testing does not meet current standards or requirements.

In May 2016 Nkc Geotech Ltd undertook a mineshaft investigation, and produced recommendations to treat the shaft and workings.

GSL subsequently carried out a review of all existing information, and carried out a detailed mining risk assessment. This assessment removed the requirement to grout mine workings at depth, and provided recommendations for capping the mine shafts.

Finally, GSL carried out a further mineshaft investigation in September 2021, in order to locate both shafts in order for the recommended remedial works to be designed.

These reports are summarised in Section 5.0.

1.3 OBJECTIVES

Considering the proposed development of the Site, the objectives of this appraisal were:

1. To determine the historical and current land use.
2. To establish the environmental setting of the Site.
3. To evaluate whether past mining or other extractive industries could have an influence on the Site.
4. To review previous pertinent third-party reports.
5. To determine likely ground and groundwater conditions.
6. To determine the potential risks to human health and the wider environment.
7. To determine potential risks posed to the Site from hazardous ground gases and / or vapours.
8. To derive a Preliminary Conceptual Site Model.

1.4 ASSUMPTIONS

The following assumptions are made in this report:

1. It is assumed that ground levels will not change significantly from those described in this report or as shown on proposed development drawings. If this is not the case, then amendments to the recommendations made in this report may be required.
2. Any references to observations of suspected asbestos-containing materials are for information only and should be verified by a suitably qualified asbestos specialist and/or confirmed by laboratory analysis.
3. The use of the term 'Topsoil' within this report is based on a visual identification only and that these materials have not necessarily been classified in accordance with BS3882:2015.
4. The comments and opinions presented in this report are based on the findings of the desk study performed by GroundSolve Ltd. There may be other conditions prevailing on the Site which have not been revealed by this investigation and which have not been considered by this report at this stage.
5. Responsibility cannot be accepted for any conditions not revealed by this investigation. Any diagram or opinion on the possible configuration of the findings is conjectural and given for guidance only. Confirmation of ground conditions should be undertaken if deemed necessary.
6. This report has been prepared for the sole use of the Client. No other third party may rely upon or reproduce the contents of this report without the written approval of GroundSolve Ltd. If any unauthorised third party comes into possession of this report, they rely on it entirely at their own risk.

2 SITE DETAILS AND DESCRIPTION

Table 2.1 – Current Site Overview

Site name	Bonc Wen, Rhosllanerchrugog
Site address	Bonc Wen Car Park, Rhosllanerchrugog, Wrexham LL14 2EE
National Grid Reference (NGR)	SJ289463
Approximate Site area	2,300m ²
Site shape	Roughly rectangular
Current land use on the Site	Open land both vegetated and concreted
Surrounding land uses	Car park, open land and housing
General topography and ground levels	172 – 174m

Relevant site photographs are presented in Appendix A.

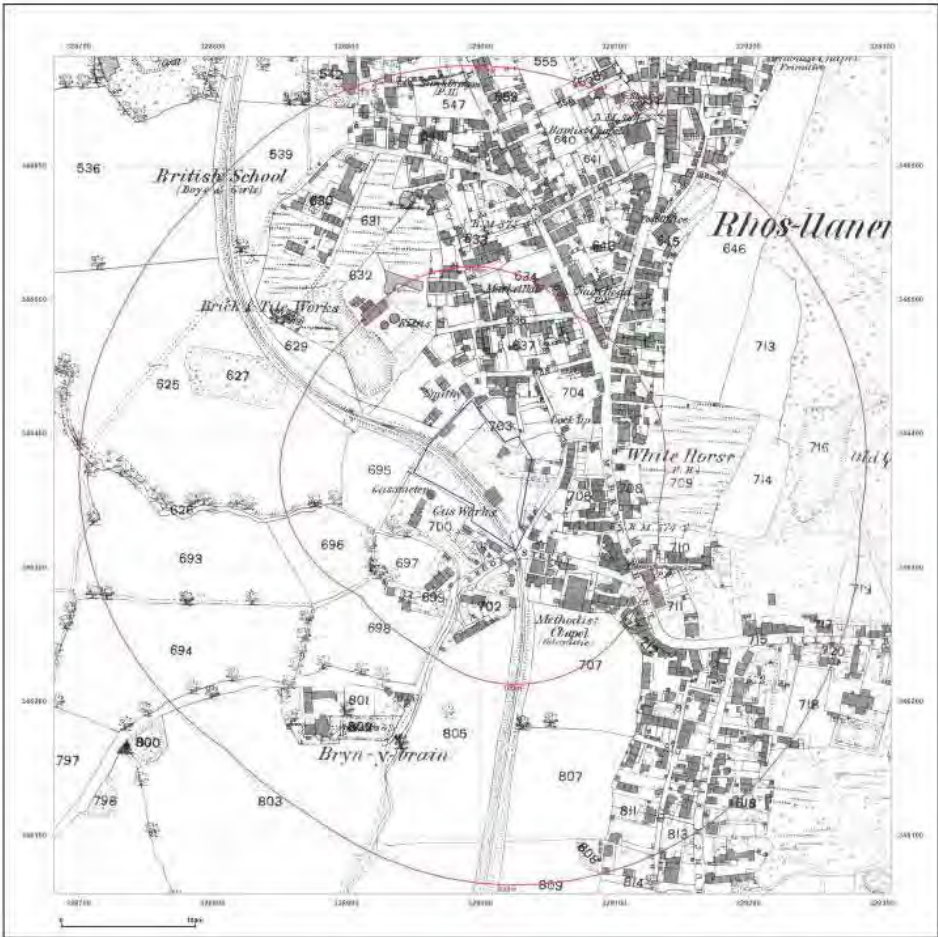
3 SITE HISTORY

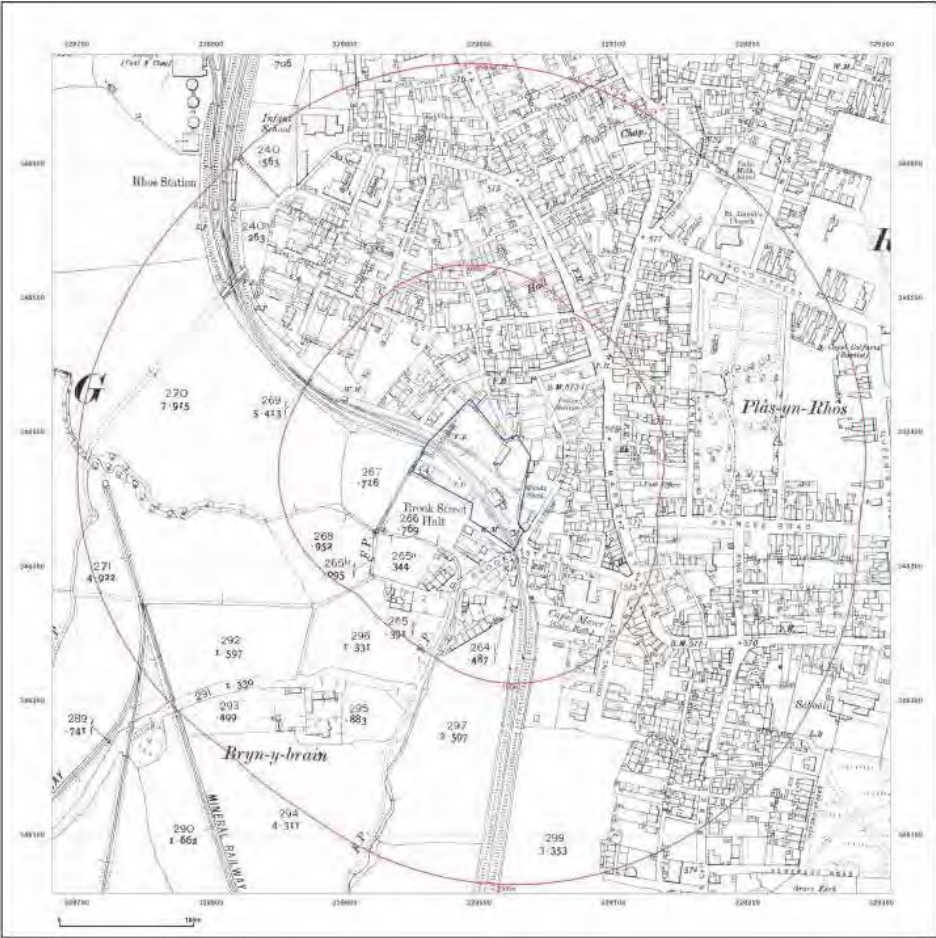
3.1 SITE HISTORY REVIEW

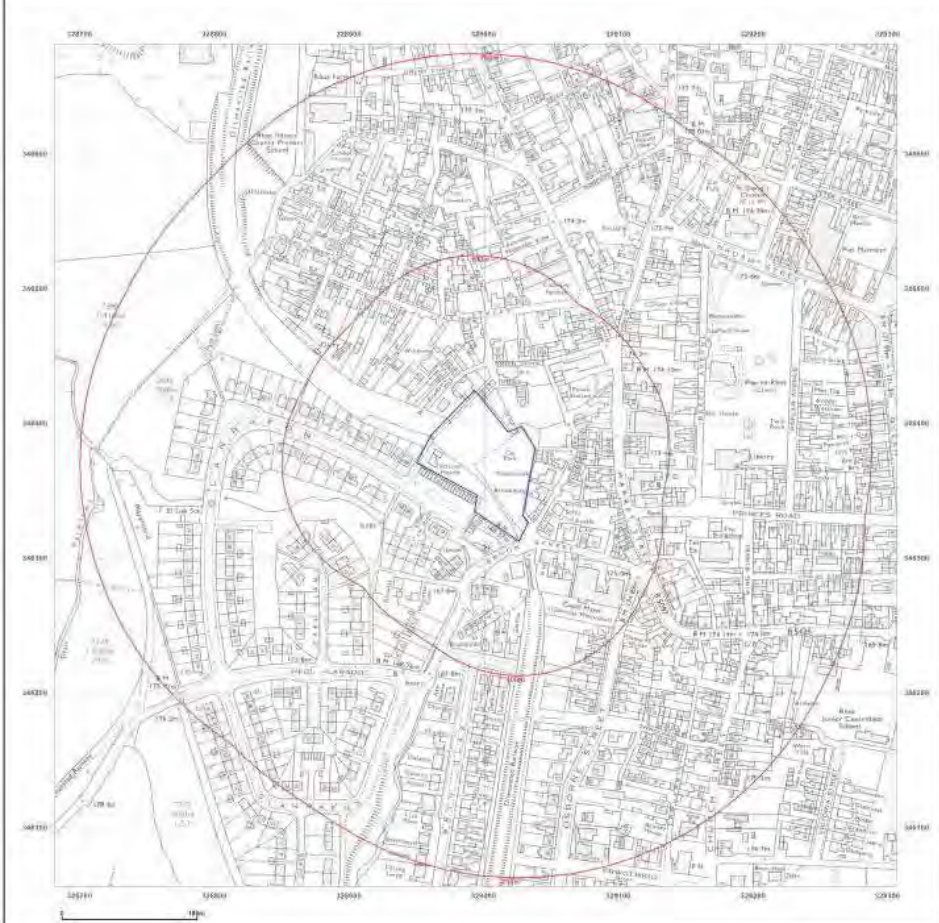
Extracts of Ordnance Survey (OS) plans dated from 1875 were reviewed. These were obtained as part of the Groundsure Report for the Site, which is presented in Appendix B.

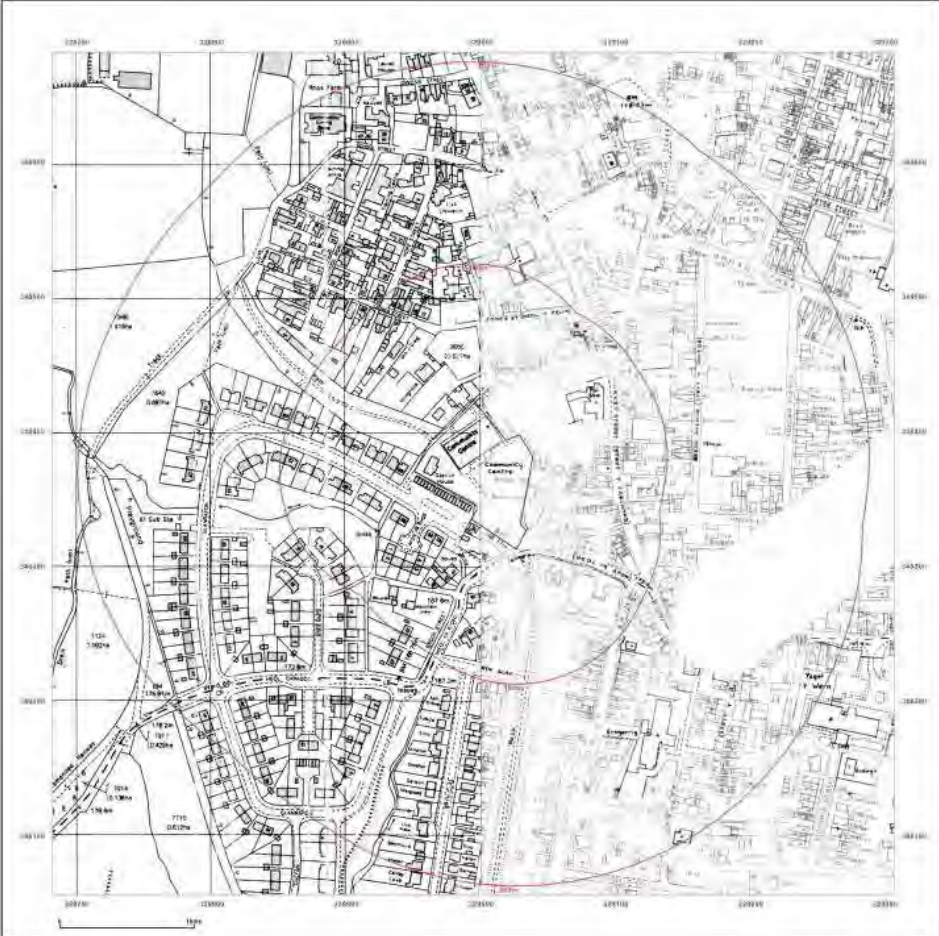
Table 3.1 below presents a summary of the main aspects of the Site relevant to the current and proposed future end uses. It is not the intention of this report to describe in detail all of the changes that have occurred on or adjacent to the Site, where these are not relevant to the land use.

Table 3.1 - Site History

Time Period	On-Site features	Off-Site features
Pre-1900	 • Rail line running northwest to southeast • Three buildings north of rail line with open fields/gardens	• Housing to the north and east • Gas works to the south west • Brick and tile works, smithy and kilns to the north west

Time Period	On-Site features	Off-Site features
Pre World War II period	 • Goods shed to south east of site • Overpass created • Station house created	• No gas works • Increase of houses surrounding site • No brick and tile works, smithy and kilns

Time Period	On-Site features	Off-Site features
1945-1980 (Post war period)	 • Overpass removed and replaced with underpass • Rail line removed • All onsite buildings apart from the station house have been removed • Eastern half of the site is now a car park	• Housing surrounding site

Time Period	On-Site features	Off-Site features
1980 – 2000 (Late 20th century period)	 Community centre on the north of the site	

Time Period	On-Site features	Off-Site features
2000 to 2020 (Modern day period)	 • Community centre demolished • Station house building recently demolished	

4 ENVIRONMENTAL SETTING

4.1 GEOLOGY

Table 4.1 - Geological Summary

Maps and publications referenced	1:50,000 scale BGS geology plan, Sheet 121 Wrexham Applied Mapping Study Sheet 121 Geological Memoirs																																							
Made ground / artificial ground	Made ground associated with previous railway line, community centre, and mine workings anticipated across site.																																							
Drift geology	Glacial till																																							
Solid geology	Pennine Lower & Middle Coal Measures.																																							
Faults	No faults in vicinity of site																																							
Coal seams	Sheet 121 and the Wrexham study show the Red coal seam outcropping on the western site boundary, with the Fireclay Group (Stone/New Coal) immediately west of the site. However, the 1940 edition geology plan shows the Stone coal seam (New) outcropping on the north western site boundary, exposed in a clay pit, the presence of which was confirmed in the memoirs. The Nant Coal seam is shown outcropping well to the west of the site. The memoirs gave the following sequence in the vicinity of the site in several pits: <table><tr><td colspan="3">Delph Pits</td></tr><tr><td>Coal Seam</td><td>Thickness (m)</td><td>Separation</td></tr><tr><td>Red Coal</td><td>0.39</td><td>13.1</td></tr><tr><td>Stone Coal</td><td>0.72</td><td>0.46</td></tr><tr><td>Half Yard</td><td>0.46</td><td>5.54</td></tr><tr><td>Coal</td><td></td><td>21.70</td></tr><tr><td>Nant</td><td>1.83</td><td></td></tr><tr><td colspan="3">Caeglo Colliery</td></tr><tr><td>Coal Seam</td><td>Thickness (m)</td><td>Separation</td></tr><tr><td>Red Coal</td><td></td><td>7.0</td></tr><tr><td>Stone Coal</td><td></td><td>5.8</td></tr><tr><td>Half yard</td><td>0.46</td><td>20.73</td></tr><tr><td>Nant</td><td></td><td></td></tr></table> In addition ironstones and fireclays associated with the coals were worked. The dip is recorded as being to the east and ESE at 8°. The source information for the shafts on site is recorded as Mine Plan 14897, which has been supplied. This plan shows workings in the following seams, in descending order:	Delph Pits			Coal Seam	Thickness (m)	Separation	Red Coal	0.39	13.1	Stone Coal	0.72	0.46	Half Yard	0.46	5.54	Coal		21.70	Nant	1.83		Caeglo Colliery			Coal Seam	Thickness (m)	Separation	Red Coal		7.0	Stone Coal		5.8	Half yard	0.46	20.73	Nant		
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Nant																																								

- New/Stone Coal,
- Nant,
- Lower Yard,
- Wall & Benches.

However, workings are not shown beneath the site on these plans only the shaft locations.

In addition, it presents the following section in descending order:

Coal Seam	Thickness (m)	Comments
Red Coal	0.70	Not workable
Rows of Ironstone		All worked
New Coal	0.74	All worked
Benches	0.31	Not workable
Nant Coal	0.92	
Bench		Not workable
Rows of ironstone		
Yard Coal	0.92	
Rows of Ironstone		
Wall & Bench	1.08	
Half Yard		

4.2 MINING AND QUARRYING

Table 4.2 - Coal Mining Activities

	Yes/No	Comments
Is the Site in an area of potential shallow coal workings?	Yes	Shallow coal workings are present at the site
Is the Site in a high risk development area?	Yes	
Are there any known shafts, adits, tips, lagoons, or opencast workings likely to affect the Site?	Yes	There are two shafts present on site
Is exploratory work required to investigate the potential risk from shallow mining or quarrying?	No	Exploratory works and risk assessments for the proposed development have previously been carried out and submitted to the Coal Authority and Wrexham Planning, both by GSL and others.

Table 4.3 - Other Extractive Industries

	Yes/No	Comments
Superficial drift deposits		
Evidence of extraction on or within 250 m of the Site?	No	
Action required?	No	
Solid Strata		
Any evidence of mineral extraction on or within 250 m of the Site?	Yes	Ironstone workings present within area
Action required?	Yes	

4.3 HYDROGEOLOGY

Table 4.4 - Groundwater Occurrence and Abstraction

	Presence/location	Comments
Environment Agency aquifer designation – Superficial Deposits	On site	Secondary undifferentiated
Environment Agency aquifer designation – Bedrock	On site	Secondary A
Anticipated groundwater depth(s)	On site	Anticipated perched water table above the glacial till within any made ground. Water table at depth within underlying bedrock.
Direction of flow	Assumed southerly, following topography	
Current licensed abstractions – potable	None recorded within 1000m	
Source Protection Zones	None recorded within 500m	

NR - none recorded.

4.4 HYDROLOGY

Table 4.5 - Surface Water Features

	Presence/location	Comments
Nearest surface water feature	68m southwest	Inland river not influenced by normal tidal action
Other surface water features	NR	
Canals, ponds, lakes, etc.	NR	
Water Framework Directive (WFD) Surface Water Bodies	2621m southeast	Black Brook (Clywedog) River
Licensed surface water abstractions	NR	

Environment Agency GQA assessments: A = very good to E = poor

4.5 ENVIRONMENTAL DESIGNATIONS

Table 4.6 - Summary of Environmental Designations

	Presence/location	Comments
Sites of Special Scientific Interest (SSSI)	751m east	Stryt Las A'r Hafod
Conserved wetland sites (Ramsar sites)	None recorded within 2000m	
Special Areas of Conservation (SAC)	2 recorded within 1000m	751m and 963m east
Special Protection Areas (SPA)	None recorded within 2000m	
National Nature Reserves (NNR)	None recorded within 2000m	
Local Nature Reserves (LNR)	None recorded within 2000m	
Designated Ancient Woodland	3 records within 1000m	Nearest is 521m northwest of the site
Biosphere Reserves	None recorded within 2000m	
Forest Parks	None recorded within 2000m	
Marine Conservation Zones	None recorded within 2000m	
Green Belt	None recorded within 2000m	
Proposed Ramsar sites	None recorded within 2000m	
Possible Special Areas of Conservation (pSAC)	None recorded within 2000m	
Nitrate Sensitive Areas	None recorded within 2000m	
Nitrate Vulnerable Zones	None recorded within 2000m	
SSSI Units	None recorded within 2000m	

4.6 LANDFILL AND WASTE MANAGEMENT ACTIVITY

Table 4.7 - Waste Management Activities

	Presence/location	Comments
Active or recent landfill	None recorded within 500m	
Historical landfill (BGS records)	None recorded within 500m	
Historical landfill (LA/mapping records)	None recorded within 500m	
Historical landfill (EA/NRW records)	None recorded within 500m	
Historical waste sites	None recorded within 500m	
Licensed waste sites	None recorded within 500m	
Waste exemptions	1 within 100m	Dental practice, 53m NE of site
Evidence of other landfilling or potential infilling on or within 250m of Site	No	
Walkover evidence of fly-tipping on Site?	General rubbish encountered across site but no significant tipping	
Is a landfill/ground gas risk assessment required?	Made ground & mine workings anticipated	Risk assessment required

4.7 LOCAL INDUSTRIAL LAND USES

Other potentially contaminative activities are shown in Table 4.8 below with those features considered pertinent to the conceptual site model highlighted in **bold**. The entries relate to activities within *circa* 250 m of the Site, with the exception of COMAH facilities where the assessment is extended to a distance of *circa* 500m from the Site.

Table 4.8 - Other Potentially Contaminative Processes in the Locality

	Location	Comments
Recent industrial land uses	No significant nearby industrial uses identified	
Current or recent petrol stations	None recorded within 500m	
Electricity cables	None recorded within 500m	
Gas pipelines	None recorded within 500m	
Sites determined as Contaminated Land	None recorded within 500m	
Control of Major Accident Hazards (COMAH)	None recorded within 500m	
Regulated explosive sites	None recorded within 500m	

	Location	Comments
Hazardous substance storage/usage	None recorded within 500m	
Historical licensed industrial activities (IPC)	None recorded within 500m	
Licensed industrial activities (Part A(1))	None recorded within 500m	
Licensed pollutant release (Part A(2)/B)	None recorded within 500m	
Radioactive Substance Authorisations	None recorded within 500m	
Licensed Discharges to controlled waters	4 within 500m	Nearest is 271m south, stormwater overflow discharge to the Afon Goch
Pollutant release to surface waters (Red List)	None recorded within 500m	
Pollutant release to public sewer	None recorded within 500m	
List 1 Dangerous Substances	None recorded within 500m	
List 2 Dangerous Substances	None recorded within 500m	
Pollution Incidents (EA/NRW)	4 within 500m	Nearest was 73m east due to smoke, with no impact recorded to land or air. Remaining three all relate to sewage discharges with no impact to land recorded.
Pollution inventory substances	None recorded within 500m	
Pollution inventory waste transfers	None recorded within 500m	
Pollution inventory radioactive waste	None recorded within 500m	

COMAH – Control of Major Accident Hazards (regulations); NIHHS – Notification of Installations Handling Hazardous Substances (regulations)

4.8 RADON RISK

Table 4.9 - Radon Risk Status

	Comments
Estimated properties affected	On site – between 3-5%
Radon Protection Measures required?	Basic radon protection measures required

4.9 WASTE CLASSIFICATION AND MATERIALS RE-USE

If the Site is to be redeveloped and materials are disposed off Site, the material exported from the Site to Landfill should be hauled by a register waste character in accordance with Duty of Care Regulations 1991 and the Hazardous Waste Regulations 2005.

Based on the history of the Site and the anticipated potential contaminants of concern, it is possible that any made ground may be considered hazardous waste soil material; however, this will be subject to confirmatory investigation, sampling, laboratory analysis and waste classification in accordance with the Guidance on the Classification and Assessment of Waste (WM3).

It will be necessary to register the Site in advance of the intended reclamation works with the Environment Agency before disposal to landfill can take place. There will be requirement for the waste producer to provide appropriate Waste Acceptance Criteria (WAC) testing of the Soils for disposal to ensure that the soils are appropriately classified and that the landfill is licensed to receive such soils. A consignment note shall be completed, signed and retained by all parties involved. The consignment note shall state the volume of waste, a physical description of the material and statement of its chemical composition. The waste consignment notes shall be kept by the contractor for a period of at least two years.

Subject to volumetric fill requirements and a future assessment of suitability of re-use (both chemically and geotechnically), some materials *may* be considered for potential re-use in line with an appropriate end-of-waste protocol such as WRAP Quality Protocol for Aggregates from Inert Waste, U1 Exemption or a Materials Management Plan in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP).

5 PREVIOUS INVESTIGATION FINDINGS

DCEL have previously produced a Geotechnical Design Report (2015), which included the findings of an intrusive investigation carried out by SRL.

The report found the ground conditions at the site to comprise:

- Made ground, comprising black ashy sand and gravel, to depths of between 1.5m and 4m
- Very stiff CLAY (Glacial Till), to depths of between 10.0m and 12.5m
- Coal measures bedrock, with two coal seams/possible workings encountered at depths of between 20m and 26m.

The report also contained limited chemical testing and analysis, which found the made ground to be contaminated with heavy metals and PAHs, particularly focused around the shaft locations/former railway sidings.

GSL and NKC Geotech (May 2016) have also carried out several phases of investigation and risk assessment relating to the mine workings.

GSL issued an updated Mining Risk Assessment in October 2021, which has been submitted to Wrexham Planning and the Coal Authority, and forms the most recent assessment of the coal mining risks. Full details of the report are not reproduced here, however the ground conditions encountered and reported in the report are in line with the DCEL report.

A permit to treat the mine shafts has subsequently been obtained from the Coal Authority, in line with the GSL recommendations presented in our Mining Risk Assessment Report.

6 PRELIMINARY CONCEPTUAL SITE MODEL

6.1 INTRODUCTION

Based on the information provided in the previous sections of this report a combined preliminary conceptual site model and conceptual exposure model has been developed for the proposed future land use. This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors. In assessing the likely contaminants of concern present at the Site, reference has also been made to Defra and Environment Agency supporting documentation. A preliminary qualitative risk assessment has also been made of the likelihood of the linkage operating and its potential significance in accordance with CIRIA C552.

The preliminary conceptual model is presented in schematic form in section 7.9. The potential pollutant linkages identified and the qualitative risk assessment for these are presented in Conceptual Site Model.

The following sections discuss all the identified potential on and off-site sources, pathways, and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study. At this stage, the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.

Three impact potentials exist for any given site, these are:

- The site impacting upon itself.
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

All three impacts need to be considered in a risk assessment.

- Sources: these are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g., Made Ground, infilled ground etc).
- Pathways: a pathway is defined as a mechanism or route by which a contaminant encounters, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.
- Receptors: receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures, and utilities that could be adversely affected by contaminant(s).

6.2 HAZARDS IDENTIFIED WITH THE PROPOSED DEVELOPMENT

The hazard identification is based on the assumptions presented below:

- the site will be a residential development.
- the previous residential properties and outbuildings are a source of contamination.
- drinking water will be from mains supply.

6.3 POTENTIAL SOURCES OF CONTAMINATION

For the purpose of this assessment the potential contaminants of concern have been considered according to whether they are likely to have originated from on-site or off-site sources.

Potential On-site Sources of Contamination

- Hydrocarbon spills from railway operations
- Hydrocarbon spills from heating oil/boiler rooms in previous buildings
- Hydrocarbon spills from existing car park use
- Asbestos from previous buildings
- Ash (PAHs) from previous railway operations
- Heavy metals & PAHs from historic mining uses
- Ground gases from any organic made ground, and from historic mining features

Potential Off-site Sources of Contamination

- Hydrocarbons, PAHs, heavy metals, cyanide from historic gas works

6.4 POTENTIAL RECEPTORS OF CONTAMINATION

Based on the data previously discussed, the following potential receptors to contamination have been identified:

Table 6.1 - Identified Potential Receptors

Sensitive Receptors	
A	Humans – Predevelopment completion, i.e., working on site during demolition and construction.
B	Humans living on the site post construction.
C	Controlled waters – Surface Waters (rivers and streams)
D	Groundwater in the secondary A aquifer.
E	Local flora and fauna during and post construction.
F	Building structure and services.

The possible contaminant linkages are discussed below. It should be noted not all may be formed between all sources and receptors.

The preliminary assessment of risks undertaken for the development considers potential risks to receptors A to F in Table 7.1 above. The receptors A to F incorporate each of the receptors normally required by the Local Authority to be considered in their planning conditions relating to land contamination:

- Human Health (A & B)
- Property (including buildings, crops, livestock, pets, woodland, service lines) (E & F)
- Adjoining land (D & F)
- Groundwater and surface water (C & D)

- Ecological systems (E)
- Buildings and structures (F)

It should be noted that there are no archaeological sites or ancient monuments considered to be within the zone of influence of the site. They are therefore not considered in the risk assessment.

The closest of each of the above receptor categories to the site are considered to be:

On-site

Human health, property, groundwater and surface water, buildings and structures

Off-site

Human health, groundwater and surface water, adjoining land

The possible contaminant linkages are discussed below. It should be noted not all may be formed between all sources and receptors.

6.5 IDENTIFICATION OF PATHWAYS

6.5.1 Pathways to Human Health

There are various routes by which a potential contaminant may reach a receptor. For example, in areas where contaminated material is exposed, dermal contact with the material, inhalation or ingestion of dust may occur.

Inhalation or ingestion of dust and water could occur during the construction and development phase at the site. Pathways from dermal contact with soil and groundwater may also arise. It is considered that the risk of short-term exposure for ground workers and other construction workers is low unless there are asbestos fibres are encountered.

Post construction, the surface of the development area will be occupied with buildings and hard standing, with smaller garden areas. This will effectively eliminate the persistence of potential pathways such as long-term direct contact and dust inhalation/ingestion as long as the soil in the garden areas has no significant concentrations of contaminants.

6.5.2 Ground Gas

There is no credible on-site ground gas source other than the historic mine workings, unless deep organic rich Made Ground is encountered. However, it is noted that during previous drilling works into the shafts (which directly access underground workings) and underlying coal seams, no significant quantities of ground gases have been recorded.

6.5.3 Pathways to Controlled Waters

Groundwater levels at the site are anticipated to be at a depth of more than 5 m within the bedrock. However, there is the likelihood that perched groundwater will be present within / at the base of any made ground. Lateral migration of potentially contaminated groundwater offsite (either via permeable made ground or the underlying aquifer) must be considered.

The vertical leaching of contaminants from any potential Made Ground into the groundwater is a potential pathway for contaminants to impact upon groundwater. Any made ground deposits are anticipated to be underlain by Glacial Till (Clay) and therefore it is very unlikely for contaminants to make their way into the groundwater within the bedrock. The site is not located within a groundwater source protection zone.

Surface run off from contaminated areas into surface watercourses must also be considered. Due to the predominant surface being hard standing across the proposed development with formal drainage measures, there will be highly limited potential for surface run-off to spread any potential contamination.

There are limited viable overland migration pathways for surface run off to any surface receptors, due to the urban nature of the surrounding land with roads and drainage measures present.

6.5.4 Other Pathways

Other potential pathways that are possibly less significant to the site but still require consideration are: potential phytotoxic effects on sensitive landscaping plants; chemical attack on foundations and services and permeation of contaminants through domestic water pipes. The risk to buildings from ground gases has been discussed under human health above.

6.6 CONTAMINANT LINKAGES

For each contamination source there are potential contaminant linkages with all receptors. However, in the context of this site, not all of the contaminant linkages are plausible, particularly those of potential groundwater contamination and lateral groundwater migration. The likelihood of the various pathways linking the contaminants to the receptors is presented in Table 7.2 below:

Table 6.2 - Matrix of Contaminant Linkages

Source/ Contaminated Medium	Pathway	Receptor					
		A – Humans using the site pre-development completion	B – Humans living on the site post construction assuming clean garden soils	C – Surface water	D - Groundwater	E – Flora & Fauna Post Construction	F – Building & Services
Soil	Ingestion	S	P	-	-	U	-
	Dermal Contact/Direct Contact	S	P	-	-	U	P
	Inhalation	S	P	-	-	U	-
	Infrastructure/Drainage	P	U	P	P	U	P
	Groundwater	P	U	U	U	U	P
	Surface Water	P	U	U	P	U	P
Groundwater	Ingestion	P	U	-	-	U	-
	Inhalation	S	U	-	-	U	-
	Dermal Contact	P	U	-	-	U	-
	Groundwater	P	U	P	-	U	P
	Surface Water	P	U	U	-	U	P
Radon	Migration	-	S	-	-	-	-
Gas (CH ₄ CO ₂)	Migration	P	P/U	-	-	U	U
Key to significance of contaminant linkages S = Significant Pathway P = Possible Pathway U = Unlikely Pathway - = Not Applicable Only Significant and Possible contaminant linkages are taken forwards to the next part of the risk assessment.							

6.7 UNCERTAINTIES

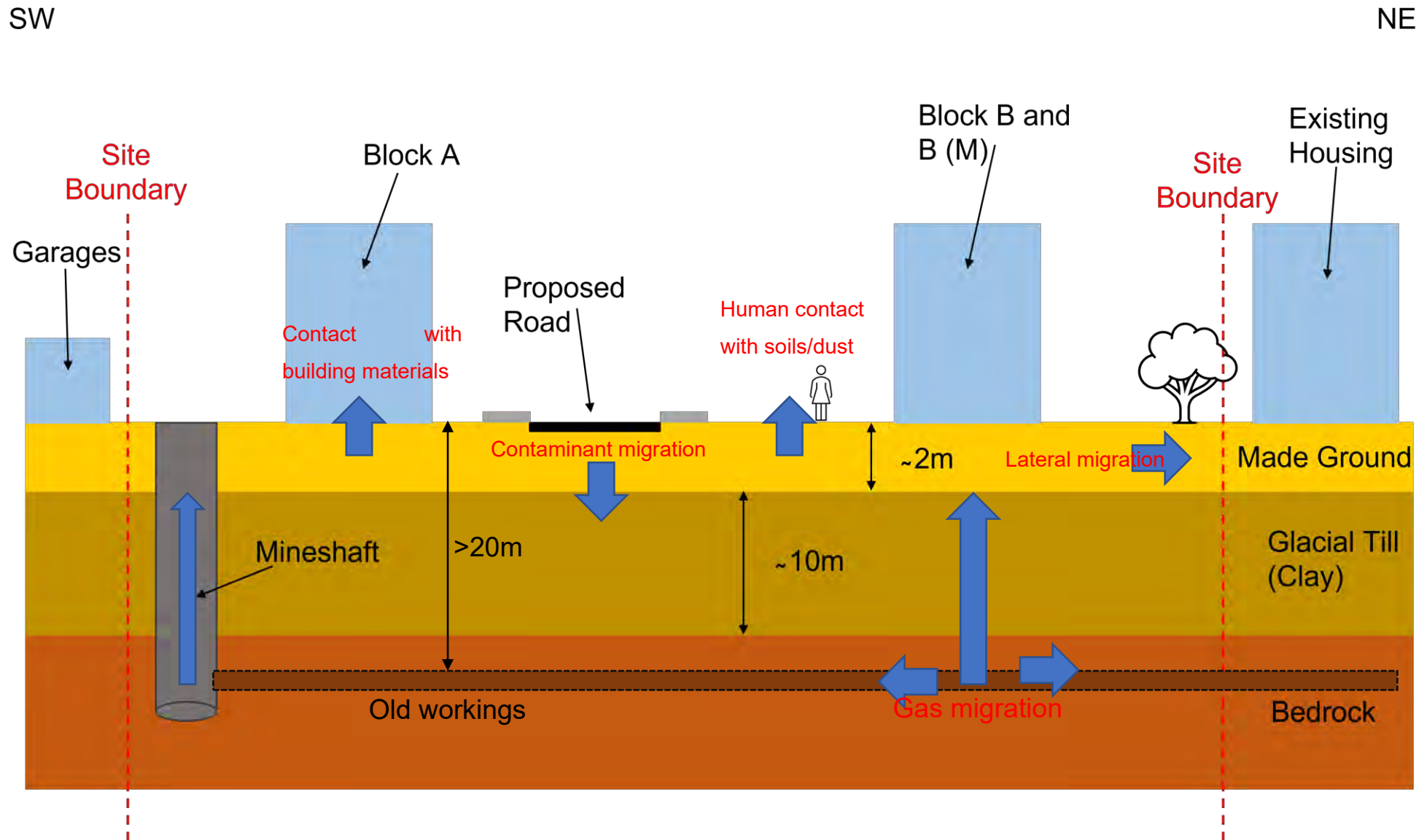
The following uncertainties exist in the preliminary conceptual model:

- The presence of any features unrecorded by the historic maps.
- Any unrecorded geological features.
- Any unrecorded pollution events during the Site's history.

6.8 CONCEPTUAL SITE MODEL

In accordance with BS 10175, a schematic section has been developed for the site based on the previously presented data and contaminant linkage assessment:

The model shows the predicted geology and topography, the major on-site potential contamination sources and vulnerable receptors.



The information presented above represents the preliminary conceptual ground model that may need to be revised based on information obtained as part of any future intrusive investigation. A number of sensitive receptors and potential pathways and sources (in association with a list of likely contaminants) have been identified.

The ground model and proposed end use described above should be considered broadly representative of the standard housing (with vegetable uptake) as defined in SR3 "Updated Technical Model to the CLEA Model" (SC050021/SR3, 2011) for the purpose of this report.

6.9 PRELIMINARY ASSESSMENT OF POTENTIAL POLLUTANT LINKAGES

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
On-site Made Ground deposits associated with railway, old mine workings, and demolished buildings, as well as uncontrolled waste storage. Contaminants may include toxic/phytotoxic elements, hydrocarbons, PAHs, ACMs, hydrocarbons, hazardous ground gasses.	Dermal contact, ingestion, and inhalation	Construction workers	Md	Lw	M/L	Due to the proposed development of the site (construction of a new housing), the risk of potential exposure to any possible in-ground contamination via soft landscaping areas is considered to be present.
		Future site users				GSL recommend that a ground investigation should be undertaken to assess the potential risks to future site users and other receptors, including construction materials.
	Migration of contaminated groundwater (vertical/lateral).	Off-site human receptors	Md	Lw	M/L	Construction workers should employ appropriate PPE and standard site safety measures during construction.
		Construction Materials				Ground conditions underlying the site are likely to comprise of thin Made Ground deposits associated with the historic mine workings and railway land uses, as well as the more recent demolished buildings. The underlying superficial geology is indicated to comprise relatively impermeable Glacial Till (clay). The underlying bedrock geology is indicated to comprise Mudstone, Siltstone and/or Sandstone from the Pennine Coal Measures Formation, including coal and ironstone seams. The distance to the nearest surface water features increases the likelihood of contaminated groundwater migration impacting controlled water receptors. However, the presence of till deposits beneath the site means the risk cannot be completely discounted. As such, the risk to controlled water and ecological receptors is considered to be low to moderate. GSL recommend that a ground investigation should be undertaken to assess the potential risks to controlled water receptors.
Off-site Potential Made Ground deposits associated with the historical gas works	Migration and accumulation of hazardous ground gasses and vapours (vertical/lateral) leading to asphyxiation (carbon dioxide) or explosion (methane, hydrocarbons).	Construction workers	Md	Lw	L	There is the potential for Made Ground deposits to be present on-site.
		Future site users				These materials are unlikely to be a potential source of ground gas due to the anticipated thickness and nature of the made ground.
Off-site Potential Made Ground deposits associated with the historical gas works	Migration of contaminated groundwater (vertical/lateral).	Off-site human receptors	Md	Lw	M/L	Site is underlain by impermeable glacial till. No gases detected in boreholes drilled into mine shafts or workings during previous investigations.
		Secondary Aquifer (Bedrock Geology)				Ground conditions surrounding the site will be typically similar to site conditions. Former gas works location has been redeveloped with houses/garages and significant remnant contamination is unlikely to be present. GSL recommend that a ground investigation should be undertaken to assess the potential risks to controlled water receptors.

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
Contaminants may include toxic/phytotoxic elements, ACMs, hazardous ground gasses, hydrocarbons	Migration and accumulation of hazardous ground gasses and vapours (vertical/lateral) leading to asphyxiation (carbon dioxide) or explosion (methane, hydrocarbons).	Future site users	Md	Lw	L	Ground conditions surrounding the site will be typically similar to site conditions with no commercial / industrial land uses close to the site. Radon risk low – moderate with 5% to 10% of estimated properties affected. Basic radon protective measures are required. GSL recommend that the proposed ground investigation should include an assessment of potential ground gas generation from any made ground encountered.
KEY: Consequence: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Probability: Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely Risk: VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low						
Pollutant Linkage Assessment Summary - The pollutant linkage assessment has indicated that the site represents a Moderate to Low risk to human health receptors, construction materials, controlled waters receptors, ecological receptors and archaeological remains in the context of the current site status.						

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 ENVIRONMENTAL RISK ASSESSMENT

A preliminary risk assessment has been carried out based on the contaminant-pathway-receptor model as defined in Statutory Guidance to Part IIA of the Environment Protection Act, 1990, and in accordance with BS 10175: 2011 +A1 2013 "Investigation of Potentially Contaminated Sites – Code of Practice". The characteristic ground conditions and elements of the surrounding environment and has been summarised and a risk assessment carried out.

The site has historically been occupied by minehafts, railway sidings, and several buildings, with a car park in the eastern area. There is Made Ground known to be present on site, which may include heavy metals, hydrocarbons, PAHs and asbestos.

Although the site is underlain by mine workings, none of the previous investigations encountered any mine gases while drilling into the workings and shafts. Mine gas is therefore not considered a credible ground gas source on site, especially when the low permeability glacial till deposits are considered, which would act as a barrier to upward migration. The mine shaft treatment works will sever any remaining pathways between underground workings and surface receptors via this route.

In addition, basic radon protection measures are required for all properties.

In order to make a quantitative assessment of the potential risks and so any required remedial measures can be designed; we recommend that a ground investigation is carried out in accordance with BS 10175: 2011+A1 2013 with a suitably qualified geologist or engineer supervising all works. This should be combined with a geotechnical investigation carried out in accordance with BS 5930:2015.

The objectives of the Ground Investigation will be:

- to determine shallow soil and groundwater (if encountered) conditions, including whether significant contamination has resulted from past or current land uses.
- to determine the risks posed by any ground contamination and provide recommendations on remedial measures to manage such risks.
- to determine the risks posed to the Site from hazardous ground gases.
- to determine the existence, and if applicable, the extent of contamination within local groundwater beneath the Site.
- to provide advice relating to geotechnical issues associated with the Site.

7.2 PROPOSED SCOPE OF WORKS

The following scope of works are proposed:

- 1 day of windowless sampling, for visual inspection of the ground and to allow collection of soil samples for testing.
- In situ geotechnical testing to assist with foundation design and recommendations (SPT testing).
- Geoenvironmental chemical testing on selected soil samples to include metals, pH, speciated PAH, speciated TPH, phenol, sulphate, TOC and asbestos screens in order to assess potential risks to human health based on historical land uses on and within close proximity to the Site and to assist with basic waste characterisation.

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FIGURES



OS LICENSE No. 100030802

SCALE 1:50,000 @ A4

Figure Title

SITE LOCATION

FIGURE 1



SCALE 1:500 @ A3

Figure Title
Proposed Development
and
Location of Shafts

FIGURE 2

APPENDIX A – SITE PHOTOGRAPHS



1 – Western part of site, with concrete slab from former community centre building visible



2 – Northwestern area of site, concrete slab visible and adjacent residential properties



3 – Car park in eastern half of site



4 – Site entrance in southeastern corner



5 – Footpath along western site boundary

APPENDIX B – GROUNDSURE REPORT

WMBC CAR PARK, BONC WEN, RHOSLLANERCHRUGOG, WREXHAM, LL14 2EE

Order Details

Date: 16/08/2022
Your ref: 2774_-_Bonc_Wen
Our Ref: GS-8982678

Site Details

Location: 328995 346384
Area: 0.5 ha
Authority: [Wrexham - Wrexham County Borough Council](#)



Summary of findings

p. 2 **Aerial image**

p. 8

OS MasterMap site plan

p.13 groundsure.com/insightuserguide

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>	11	4	16	108	-
20	1.2	<u>Historical tanks</u>	0	2	2	11	-
20	1.3	<u>Historical energy features</u>	0	2	5	19	-
22	1.4	Historical petrol stations	0	0	0	0	-
22	1.5	<u>Historical garages</u>	0	0	0	7	-
23	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
24	2.1	<u>Historical industrial land uses</u>	11	4	19	143	-
31	2.2	<u>Historical tanks</u>	0	2	3	11	-
32	2.3	<u>Historical energy features</u>	0	2	12	36	-
34	2.4	Historical petrol stations	0	0	0	0	-
34	2.5	<u>Historical garages</u>	0	0	0	22	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
36	3.1	Active or recent landfill	0	0	0	0	-
36	3.2	Historical landfill (BGS records)	0	0	0	0	-
37	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
37	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
37	3.5	Historical waste sites	0	0	0	0	-
37	3.6	Licensed waste sites	0	0	0	0	-
37	3.7	<u>Waste exemptions</u>	0	0	1	7	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
39	4.1	<u>Recent industrial land uses</u>	0	0	6	-	-
40	4.2	Current or recent petrol stations	0	0	0	0	-
40	4.3	Electricity cables	0	0	0	0	-
40	4.4	Gas pipelines	0	0	0	0	-
40	4.5	Sites determined as Contaminated Land	0	0	0	0	-



41	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
41	4.7	Regulated explosive sites	0	0	0	0	-
41	4.8	Hazardous substance storage/usage	0	0	0	0	-
41	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
41	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
42	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
42	4.12	Radioactive Substance Authorisations	0	0	0	0	-
42	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	0	4	-
43	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
43	4.15	Pollutant release to public sewer	0	0	0	0	-
43	4.16	List 1 Dangerous Substances	0	0	0	0	-
43	4.17	List 2 Dangerous Substances	0	0	0	0	-
44	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	3	1	-
44	4.19	Pollution inventory substances	0	0	0	0	-
45	4.20	Pollution inventory waste transfers	0	0	0	0	-
45	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
46	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
47	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
48	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
49	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
49	5.5	Groundwater vulnerability- local information	None (within 0m)				
50	5.6	<u>Groundwater abstractions</u>	0	0	0	0	3
51	5.7	<u>Surface water abstractions</u>	0	0	0	0	2
52	5.8	<u>Potable abstractions</u>	0	0	0	0	4
53	5.9	Source Protection Zones	0	0	0	0	-
53	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
54	6.1	<u>Water Network (OS MasterMap)</u>	0	0	5	-	-



55	6.2	<u>Surface water features</u>	0	0	2	-	-
55	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
56	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
56	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
57	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
57	7.2	Historical Flood Events	0	0	0	-	-
57	7.3	Flood Defences	0	0	0	-	-
58	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
58	7.5	Flood Storage Areas	0	0	0	-	-
59	7.6	Flood Zone 2	None (within 50m)				
59	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
60	8.1	<u>Surface water flooding</u>	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
62	9.1	<u>Groundwater flooding</u>	Low (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
63	10.1	<u>Sites of Special Scientific Interest (SSSI)</u>	0	0	0	0	4
64	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
64	10.3	<u>Special Areas of Conservation (SAC)</u>	0	0	0	0	4
65	10.4	Special Protection Areas (SPA)	0	0	0	0	0
65	10.5	National Nature Reserves (NNR)	0	0	0	0	0
65	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
66	10.7	<u>Designated Ancient Woodland</u>	0	0	0	0	30
67	10.8	Biosphere Reserves	0	0	0	0	0
67	10.9	Forest Parks	0	0	0	0	0
67	10.10	Marine Conservation Zones	0	0	0	0	0
68	10.11	Green Belt	0	0	0	0	0
68	10.12	Proposed Ramsar sites	0	0	0	0	0



68	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
68	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
68	10.15	Nitrate Sensitive Areas	0	0	0	0	0
69	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
70	<u>10.17</u>	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
71	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
72	11.1	World Heritage Sites	0	0	0	-	-
73	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
73	11.3	National Parks	0	0	0	-	-
73	<u>11.4</u>	<u>Listed Buildings</u>	0	0	2	-	-
74	11.5	Conservation Areas	0	0	0	-	-
74	11.6	Scheduled Ancient Monuments	0	0	0	-	-
74	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
75	<u>12.1</u>	<u>Agricultural Land Classification</u>	Grade 3b (within 250m)				
76	12.2	Open Access Land	0	0	0	-	-
76	12.3	Tree Felling Licences	0	0	0	-	-
76	12.4	Environmental Stewardship Schemes	0	0	0	-	-
76	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
77	13.1	Priority Habitat Inventory	0	0	0	-	-
77	13.2	Habitat Networks	0	0	0	-	-
77	13.3	Open Mosaic Habitat	0	0	0	-	-
77	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
78	<u>14.1</u>	<u>10k Availability</u>	Identified (within 500m)				
79	<u>14.2</u>	<u>Artificial and made ground (10k)</u>	0	0	4	7	-
81	<u>14.3</u>	<u>Superficial geology (10k)</u>	1	0	0	0	-

82	14.4	Landslip (10k)	0	0	0	0	-
83	14.5	<u>Bedrock geology (10k)</u>	1	0	1	3	-
84	14.6	<u>Bedrock faults and other linear features (10k)</u>	2	2	5	5	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
85	15.1	<u>50k Availability</u>	Identified (within 500m)				
86	15.2	<u>Artificial and made ground (50k)</u>	0	0	1	4	-
87	15.3	Artificial ground permeability (50k)	0	0	-	-	-
88	15.4	<u>Superficial geology (50k)</u>	1	0	0	0	-
89	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
89	15.6	Landslip (50k)	0	0	0	0	-
89	15.7	Landslip permeability (50k)	None (within 50m)				
90	15.8	<u>Bedrock geology (50k)</u>	1	0	1	2	-
91	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
91	15.10	<u>Bedrock faults and other linear features (50k)</u>	1	2	5	4	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
93	16.1	<u>BGS Boreholes</u>	9	2	59	-	-
Page	Section	Natural ground subsidence					
97	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
98	17.2	<u>Running sands</u>	Very low (within 50m)				
100	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
101	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
102	17.5	<u>Landslides</u>	Very low (within 50m)				
103	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
105	18.1	Natural cavities	0	0	0	0	-
106	18.2	<u>BritPits</u>	0	0	0	4	-
107	18.3	<u>Surface ground workings</u>	0	2	8	-	-
107	18.4	<u>Underground workings</u>	0	0	0	15	54
110	18.5	Historical Mineral Planning Areas	0	0	0	0	-



<u>110</u>	<u>18.6</u>	<u>Non-coal mining</u>	1	0	0	0	0
111	18.7	Mining cavities	0	0	0	0	0
111	18.8	JPB mining areas	None (within 0m)				
<u>111</u>	<u>18.9</u>	<u>Coal mining</u>	Identified (within 0m)				
111	18.10	Brine areas	None (within 0m)				
112	18.11	Gypsum areas	None (within 0m)				
112	18.12	Tin mining	None (within 0m)				
112	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
<u>113</u>	<u>19.1</u>	<u>Radon</u>	Between 3% and 5% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
<u>114</u>	<u>20.1</u>	<u>BGS Estimated Background Soil Chemistry</u>	3	1	-	-	-
114	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
114	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
115	21.1	Underground railways (London)	0	0	0	-	-
115	21.2	Underground railways (Non-London)	0	0	0	-	-
116	21.3	Railway tunnels	0	0	0	-	-
<u>116</u>	<u>21.4</u>	<u>Historical railway and tunnel features</u>	9	0	9	-	-
117	21.5	Royal Mail tunnels	0	0	0	-	-
<u>117</u>	<u>21.6</u>	<u>Historical railways</u>	2	0	3	-	-
117	21.7	Railways	0	0	0	-	-
118	21.8	Crossrail 1	0	0	0	0	-
118	21.9	Crossrail 2	0	0	0	0	-
118	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 10/04/2020

Site Area: 0.5ha



Recent site history - 2017 aerial photograph



Capture Date: 07/05/2017

Site Area: 0.5ha



Recent site history - 2013 aerial photograph



Capture Date: 09/06/2013

Site Area: 0.5ha



Recent site history - 2009 aerial photograph



Capture Date: 01/06/2009

Site Area: 0.5ha



Recent site history - 2001 aerial photograph

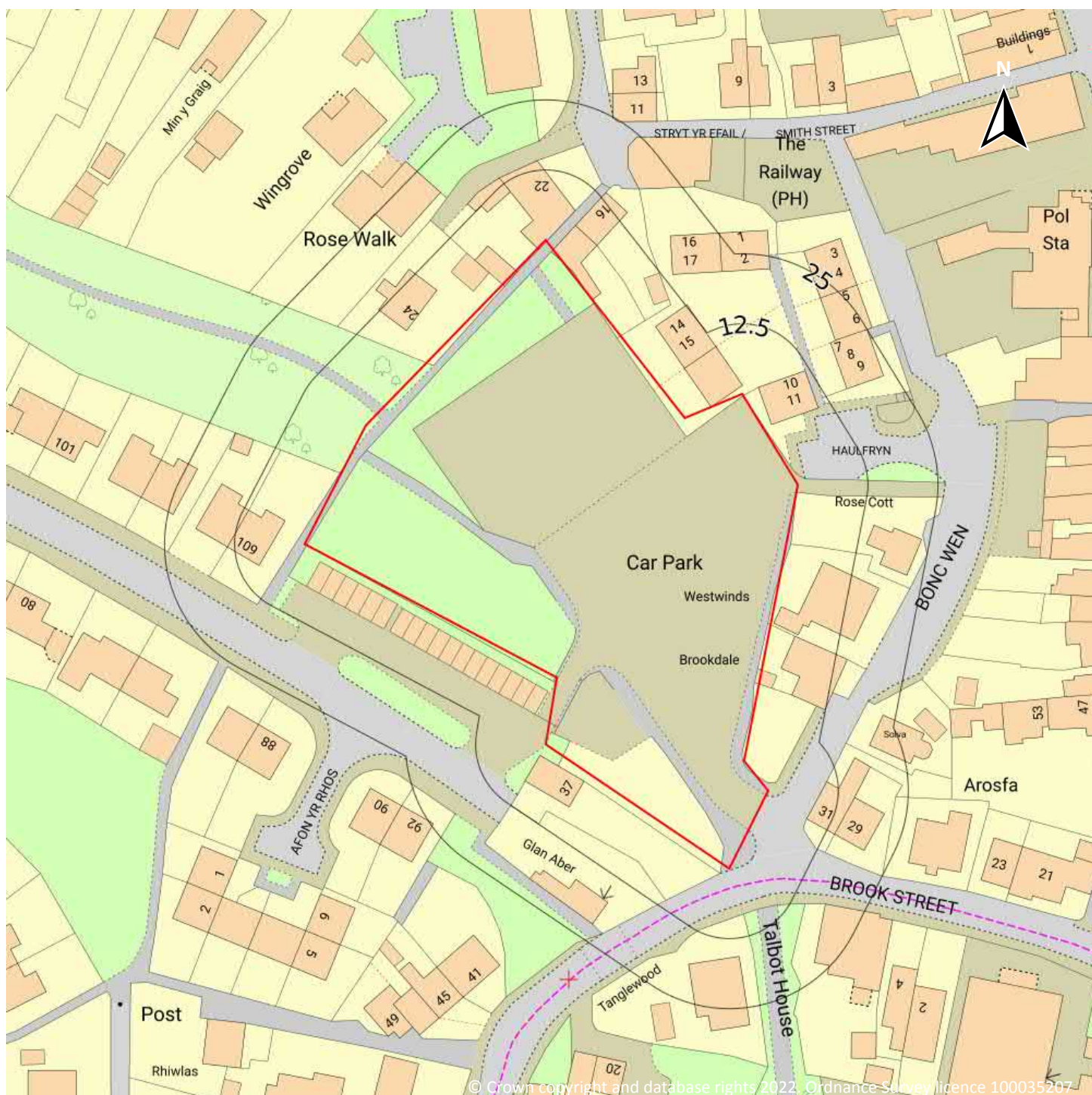


Capture Date: 28/07/2001

Site Area: 0.5ha



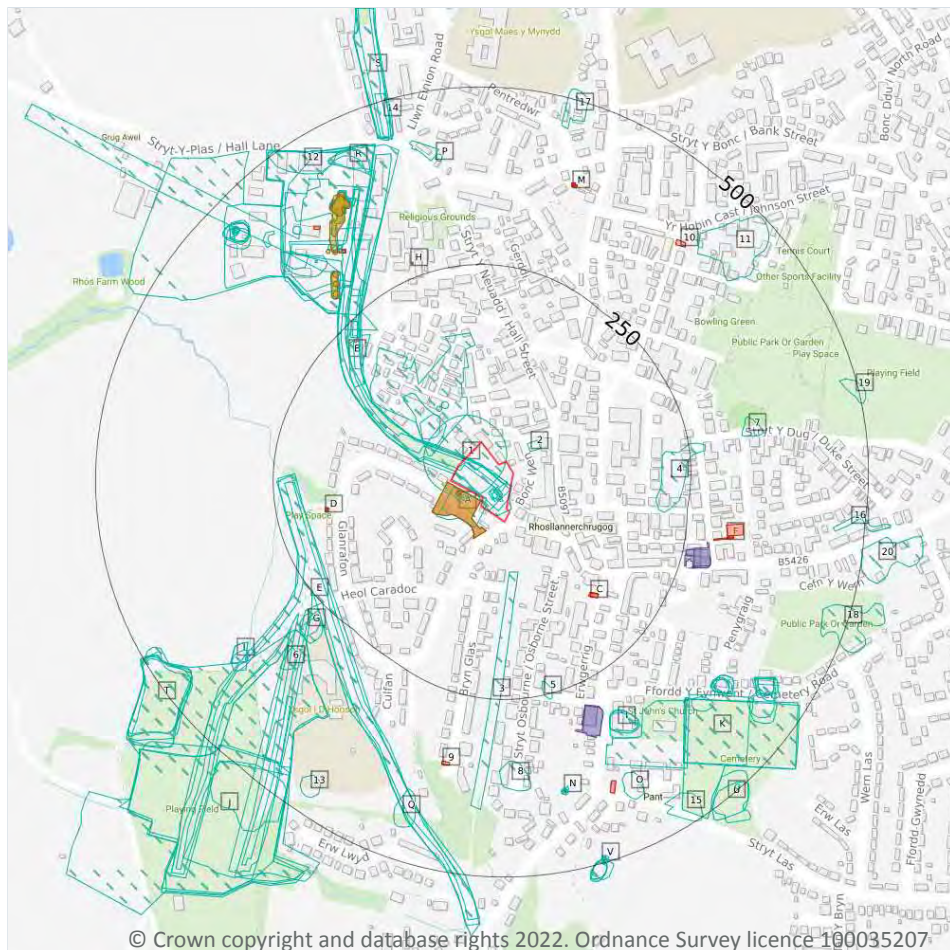
OS MasterMap site plan



Site Area: 0.5ha



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

139

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
1	On site	Smithy	1873	843056



ID	Location	Land use	Dates present	Group ID
A	On site	Gas Works	1873	802191
A	On site	Railway Station	1909	822830
A	On site	Railway Building	1898	873346
A	On site	Railway Building	1949	895994
A	On site	Railway Sidings	1898	973097
A	On site	Railway Building	1960	977477
B	On site	Disused Railway Sidings	1960	837197
B	On site	Railway Sidings	1938	889928
B	On site	Railway Sidings	1898 - 1909	905457
B	On site	Tramway Sidings	1949 - 1960	931149
A	8m SW	Gasometer	1873	809644
2	36m NE	Police Station	1974	832466
B	39m NW	Brick and Tile Works	1873	833237
B	42m NW	Unspecified Pit	1873	911056
B	51m NW	Unspecified Pit	1898	991137
B	68m NW	Unspecified Kilns	1873	822210
3	71m S	Cuttings	1873	795142
B	72m NW	Unspecified Kilns	1873	822215
B	176m NW	Cuttings	1873	892627
B	193m NW	Unspecified Heap	1974	802704
4	204m E	Unspecified Heap	1873	802709
E	209m W	Mineral Railway Sidings	1938 - 1949	946232
E	209m W	Mineral Railway Sidings	1960	855666
E	215m W	Mineral Railway Sidings	1898 - 1909	904665
B	215m NW	Cuttings	1974	955185
B	226m NW	Disused Railway Station	1960	810844
B	228m NW	Railway Station	1938 - 1949	946442
B	230m NW	Railway Station	1909	918251

ID	Location	Land use	Dates present	Group ID
5	231m S	Unspecified Ground Workings	1873	799163
B	247m NW	Brick Works	1949	940235
G	266m SW	Unspecified Heap	1938	886270
G	269m SW	Unspecified Heap	1873	989119
B	271m NW	Unspecified Works	1960	829741
B	271m NW	Unspecified Disused Works	1974	813334
B	271m NW	Brick Works	1909 - 1938	897454
B	285m NW	Unspecified Tanks	1949 - 1960	861987
B	288m NW	Unspecified Tanks	1909 - 1938	880672
B	290m NW	Brick Works	1898	846570
B	293m NW	Brick Works	1873	864871
J	301m SW	Unspecified Works	1960	829740
J	301m SW	Brick Works	1938	882557
I	307m SE	Unspecified Heap	1909	901368
I	309m SE	Unspecified Heap	1938 - 1960	961600
I	310m SE	Unspecified Heap	1873	889300
6	323m SW	Unspecified Heap	1873	802739
7	326m E	Unspecified Heap	1873	802606
B	328m NW	Unspecified Heap	1873 - 1898	899816
I	329m SE	Grave Yard	1873	929745
B	334m NW	Unspecified Tanks	1898	937841
B	335m NW	Unspecified Tank	1960	904122
B	336m NW	Unspecified Tanks	1949 - 1960	977720
8	337m S	Unspecified Heap	1873 - 1898	869897
B	338m NW	Unspecified Tanks	1909	849379
B	339m NW	Unspecified Tank	1938	856320
B	343m NW	Coal Shaft	1873	830826
B	349m NW	Unspecified Pit	1974	838868



ID	Location	Land use	Dates present	Group ID
K	355m SE	Cemetery	1898 - 1938	940416
K	356m SE	Cemetery	1949 - 1960	926980
K	358m SE	Cemetery	1974	896853
K	364m SE	Unspecified Heap	1873	802710
L	365m SW	Unspecified Heap	1949	946078
L	365m SW	Unspecified Heap	1898	991010
K	369m SE	Unspecified Heap	1909	903699
K	370m SE	Unspecified Heap	1938	984859
K	371m SE	Unspecified Heap	1898	891090
K	371m SE	Unspecified Heap	1949	946281
L	372m SW	Unspecified Heap	1873	861106
K	374m SE	Unspecified Heap	1960	903360
B	374m NW	Unspecified Tanks	1898	870930
B	374m NW	Unspecified Tanks	1949	940186
B	375m NW	Unspecified Tanks	1960	923776
B	376m NW	Unspecified Tanks	1938	979398
E	378m SW	Unspecified Heap	1974	802738
N	382m S	Unspecified Old Shaft	1898	923148
N	384m S	Old Coal Shaft	1909 - 1938	938537
N	385m S	Old Coal Shaft	1949	990984
N	386m S	Unspecified Old Shaft	1960	878619
B	389m NW	Unspecified Disused Shaft	1974	813044
O	393m SE	Unspecified Heap	1873 - 1898	902259
11	398m NE	Unspecified Heap	1873	802712
P	399m N	Smithy	1873	843058
Q	399m S	Unspecified Heap	1873	802706
P	402m N	Smithy	1898 - 1909	908395
B	405m NW	Unspecified Ground Workings	1974	799153



ID	Location	Land use	Dates present	Group ID
R	408m NW	Unspecified Heap	1949 - 1960	923202
R	412m N	Unspecified Ground Workings	1909	799162
K	413m SE	Unspecified Heap	1949	950674
K	414m SE	Unspecified Heaps	1909	831182
K	415m SE	Unspecified Heap	1938	870116
K	419m SE	Unspecified Heap	1960	873751
K	424m SE	Unspecified Heap	1873	875660
Q	424m S	Coal Shaft	1873	830832
B	427m NW	Unspecified Heap	1873	956514
K	428m SE	Unspecified Heap	1873 - 1898	874360
B	434m NW	Unspecified Heap	1949	942214
B	434m NW	Unspecified Heap	1960 - 1974	955951
B	436m NW	Unspecified Heap	1938	856942
B	437m NW	Unspecified Heap	1909	935647
12	440m NW	Unspecified Heap	1974	964546
S	444m N	Cuttings	1873	946034
S	444m N	Cuttings	1909	893765
13	446m SW	Unspecified Heap	1873	802705
14	446m N	Railway Sidings	1898	794413
S	448m N	Cuttings	1949 - 1974	956902
S	449m N	Cuttings	1938	870828
B	449m NW	Coal Shaft	1873	830825
B	450m NW	Unspecified Old Shaft	1960	955805
B	450m NW	Unspecified Disused Shaft	1974	813046
B	452m NW	Old Coal Shaft	1938	930084
B	452m NW	Unspecified Old Shaft	1898	868269
B	452m NW	Old Coal Shaft	1949	911582
T	452m SW	Unspecified Heap	1938	901052

ID	Location	Land use	Dates present	Group ID
B	453m NW	Old Coal Shaft	1909	848132
T	454m SW	Unspecified Heap	1898 - 1909	911579
15	455m SE	Unspecified Heap	1873 - 1898	935144
T	455m SW	Unspecified Heap	1960 - 1974	966497
J	455m SW	Brick Works	1898 - 1909	895656
16	456m E	Unspecified Ground Workings	1909	799165
17	457m N	Unspecified Heap	1873	802703
T	459m SW	Unspecified Heap	1949	918706
T	460m SW	Unspecified Heap	1873	944122
J	462m SW	Brick Works	1949	947803
18	462m E	Unspecified Heap	1873	802608
J	465m SW	Brick Works	1873	865161
U	472m SE	Unspecified Heaps	1898	831183
19	477m E	Unspecified Heap	1873	802607
J	478m SW	Unspecified Heap	1873 - 1898	967951
U	484m SE	Unspecified Ground Workings	1873	799160
V	490m S	Old Coal Shaft	1909 - 1938	847124
V	491m S	Unspecified Old Shaft	1898	852333
V	492m S	Old Coal Shaft	1949	946081
V	493m S	Unspecified Heap	1898	869207
U	493m SE	Unspecified Old Shaft	1898	805658
V	495m S	Unspecified Old Shaft	1960	932077
V	495m S	Unspecified Quarry	1938	816860
V	495m S	Unspecified Heap	1949	879444
20	497m E	Unspecified Heap	1873 - 1898	864052
V	498m S	Old Coal Shaft	1909	967695

This data is sourced from Ordnance Survey / Groundsure.



1.2 Historical tanks

Records within 500m

15

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
A	2m W	Gas Works	1875	122161
A	7m SW	Gasometer	1875	108352
B	223m NW	Unspecified Tank	1962 - 1973	127974
B	225m NW	Unspecified Tank	1912	109702
H	268m N	Unspecified Tank	1973	124998
H	269m N	Unspecified Tank	1990	133643
B	287m NW	Tanks	1912	104481
B	287m NW	Unspecified Tank	1962	109701
B	298m NW	Unspecified Tank	1962	109700
B	308m NW	Unspecified Tank	1962	109483
B	334m NW	Unspecified Tank	1900	109484
B	336m NW	Tanks	1912	127678
B	341m NW	Unspecified Tank	1900	109486
B	356m NW	Tanks	1962	128390
B	374m NW	Tanks	1900	141615

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

26

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
A	2m W	Gas Works	1875	63836
A	7m SW	Gasometer	1875	59545
C	156m SE	Electricity Substation	1959 - 1999	80916
C	158m SE	Electricity Substation	1992	75841
D	176m W	Electricity Substation	-	59485
D	177m W	Electricity Substation	1973 - 1990	78055
D	178m W	Electricity Substation	1959	67067
F	290m E	Electricity Substation	1993 - 1999	74467
F	306m E	Electricity Substation	1959 - 1992	79180
F	313m E	Electricity Substation	1973	67101
B	328m NW	Electricity Substation	1959 - 1990	67892
B	329m NW	Electricity Substation	-	59449
9	347m S	Electricity Substation	1990 - 1994	84123
B	376m NW	Electricity Substation	1973	59962
M	382m N	Electricity Substation	1994	75503
M	382m N	Electricity Substation	1999	79609
M	382m N	Electricity Substation	1996	80475
M	382m N	Electricity Substation	1993	85298
M	383m N	Electricity Substation	1973	65076
M	384m N	Electricity Substation	1989	64673
M	384m N	Electricity Substation	1992	65541
M	384m N	Electricity Substation	1959	66913
M	384m N	Electricity Substation	1988	70515
M	384m N	Electricity Substation	1989	76108
10	388m NE	Electricity Substation	1959 - 1999	77776
O	394m SE	Electricity Substation	1990	60103

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

7

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
F	254m E	Garage	1973	23133
F	254m E	Garage	1959 - 1989	27110
F	255m E	Garage	1992	21853
F	265m E	Garage	1993 - 1999	26943
I	281m SE	Garage	1959 - 1992	25035
I	282m SE	Garage	1962 - 1973	26128
I	283m SE	Garage	1993 - 1999	24590

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

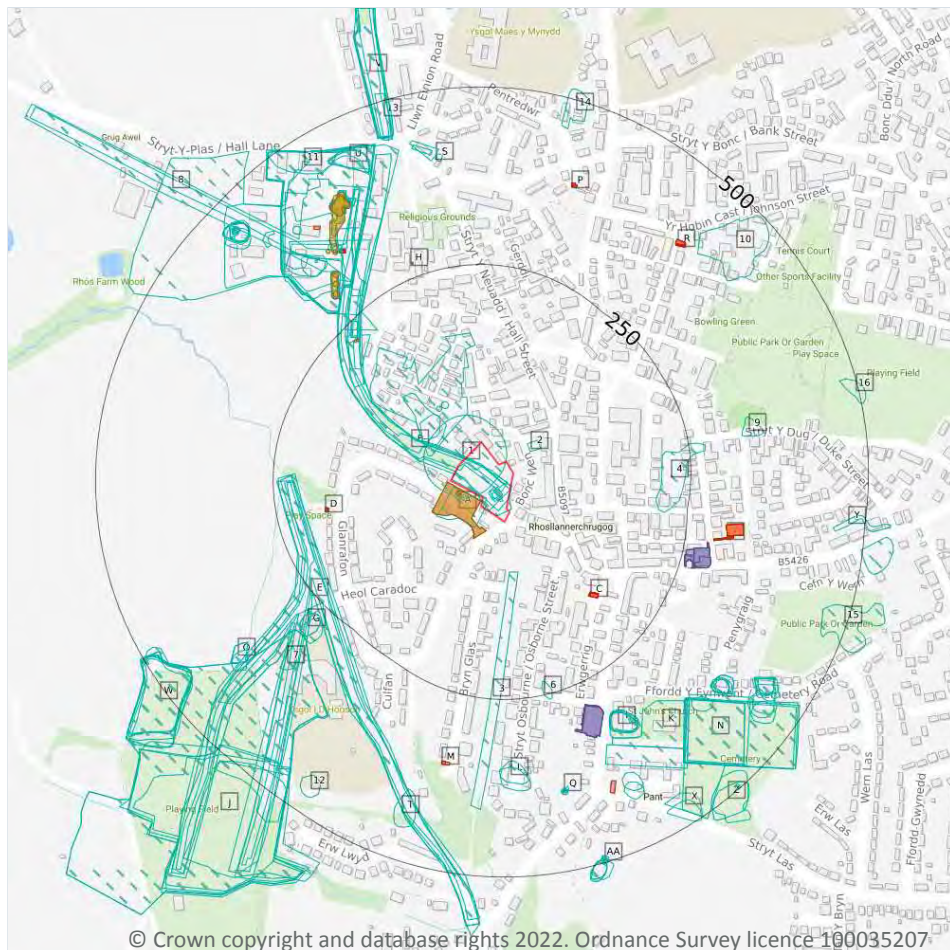
0

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



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

2.1 Historical industrial land uses

Records within 500m

177

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 24**

ID	Location	Land Use	Date	Group ID
1	On site	Smithy	1873	843056
A	On site	Gas Works	1873	802191
A	On site	Railway Station	1909	822830

ID	Location	Land Use	Date	Group ID
A	On site	Railway Building	1949	895994
A	On site	Railway Sidings	1898	973097
A	On site	Railway Building	1898	873346
A	On site	Railway Building	1960	977477
B	On site	Railway Sidings	1909	905457
B	On site	Tramway Sidings	1949	931149
B	On site	Disused Railway Sidings	1960	837197
B	On site	Railway Sidings	1938	889928
A	8m SW	Gasometer	1873	809644
2	36m NE	Police Station	1974	832466
B	39m NW	Brick and Tile Works	1873	833237
B	42m NW	Unspecified Pit	1873	911056
B	51m NW	Unspecified Pit	1898	991137
B	68m NW	Unspecified Kilns	1873	822210
3	71m S	Cuttings	1873	795142
B	72m NW	Unspecified Kilns	1873	822215
B	176m NW	Cuttings	1873	892627
B	193m NW	Unspecified Heap	1974	802704
4	204m E	Unspecified Heap	1873	802709
E	209m W	Mineral Railway Sidings	1949	946232
E	209m W	Mineral Railway Sidings	1960	855666
E	213m W	Mineral Railway Sidings	1938	946232
5	215m W	Mineral Railway Sidings	1898	904665
B	215m NW	Cuttings	1974	955185
E	216m W	Mineral Railway Sidings	1909	904665
B	226m NW	Disused Railway Station	1960	810844
B	228m NW	Railway Station	1949	946442
B	228m NW	Railway Station	1938	946442

ID	Location	Land Use	Date	Group ID
B	230m NW	Railway Station	1909	918251
6	231m S	Unspecified Ground Workings	1873	799163
B	247m NW	Brick Works	1949	940235
G	266m SW	Unspecified Heap	1938	886270
G	266m SW	Unspecified Heap	1938	886270
B	266m NW	Railway Sidings	1898	905457
G	269m SW	Unspecified Heap	1873	989119
B	271m NW	Unspecified Works	1960	829741
B	271m NW	Unspecified Disused Works	1974	813334
B	271m NW	Brick Works	1938	897454
B	271m NW	Brick Works	1938	897454
B	272m NW	Brick Works	1909	897454
B	285m NW	Unspecified Tanks	1960	861987
B	287m NW	Unspecified Tanks	1949	861987
B	288m NW	Unspecified Tanks	1938	880672
B	289m NW	Unspecified Tanks	1909	880672
B	290m NW	Brick Works	1898	846570
B	293m NW	Brick Works	1873	864871
J	301m SW	Unspecified Works	1960	829740
J	301m SW	Brick Works	1938	882557
J	301m SW	Brick Works	1938	882557
I	307m SE	Unspecified Heap	1909	901368
I	309m SE	Unspecified Heap	1960	961600
I	309m SE	Unspecified Heap	1938	961600
I	309m SE	Unspecified Heap	1938	961600
I	310m SE	Unspecified Heap	1949	961600
I	310m SE	Unspecified Heap	1873	889300
7	323m SW	Unspecified Heap	1873	802739



ID	Location	Land Use	Date	Group ID
8	323m NW	Tramway Sidings	1960	931149
9	326m E	Unspecified Heap	1873	802606
B	328m NW	Unspecified Heap	1898	899816
B	329m NW	Unspecified Heap	1873	899816
K	329m SE	Grave Yard	1873	929745
B	334m NW	Unspecified Tanks	1898	937841
B	335m NW	Unspecified Tank	1960	904122
B	336m NW	Unspecified Tanks	1949	977720
L	337m S	Unspecified Heap	1898	869897
B	338m NW	Unspecified Tanks	1909	849379
B	339m NW	Unspecified Tank	1938	856320
B	343m NW	Coal Shaft	1873	830826
B	345m NW	Unspecified Tanks	1960	977720
K	345m SE	Grave Yard	1873	929745
L	345m S	Unspecified Heap	1873	869897
B	349m NW	Unspecified Pit	1974	838868
N	355m SE	Cemetery	1909	940416
N	356m SE	Cemetery	1949	926980
N	356m SE	Cemetery	1938	940416
N	356m SE	Cemetery	1898	940416
N	358m SE	Cemetery	1974	896853
N	358m SE	Cemetery	1960	926980
N	364m SE	Unspecified Heap	1873	802710
O	365m SW	Unspecified Heap	1949	946078
O	365m SW	Unspecified Heap	1898	991010
N	369m SE	Unspecified Heap	1909	903699
N	370m SE	Unspecified Heap	1938	984859
N	370m SE	Unspecified Heap	1938	984859



ID	Location	Land Use	Date	Group ID
N	371m SE	Unspecified Heap	1949	946281
N	371m SE	Unspecified Heap	1898	891090
O	372m SW	Unspecified Heap	1873	861106
N	374m SE	Unspecified Heap	1960	903360
B	374m NW	Unspecified Tanks	1949	940186
B	374m NW	Unspecified Tanks	1898	870930
B	375m NW	Unspecified Tanks	1960	923776
B	376m NW	Unspecified Tanks	1938	979398
E	378m SW	Unspecified Heap	1974	802738
Q	382m S	Unspecified Old Shaft	1898	923148
Q	384m S	Old Coal Shaft	1909	938537
Q	385m S	Old Coal Shaft	1938	938537
Q	385m S	Old Coal Shaft	1949	990984
Q	386m S	Unspecified Old Shaft	1960	878619
B	389m NW	Unspecified Disused Shaft	1974	813044
K	393m SE	Unspecified Heap	1898	902259
10	398m NE	Unspecified Heap	1873	802712
S	399m N	Smithy	1873	843058
T	399m S	Unspecified Heap	1873	802706
S	402m N	Smithy	1898	908395
B	405m NW	Unspecified Ground Workings	1974	799153
K	406m SE	Unspecified Heap	1873	902259
U	408m NW	Unspecified Heap	1949	923202
S	410m N	Smithy	1909	908395
U	411m NW	Unspecified Heap	1960	923202
U	412m N	Unspecified Ground Workings	1909	799162
N	413m SE	Unspecified Heap	1949	950674
N	414m SE	Unspecified Heaps	1909	831182

ID	Location	Land Use	Date	Group ID
N	415m SE	Unspecified Heap	1938	870116
N	415m SE	Unspecified Heap	1938	870116
N	419m SE	Unspecified Heap	1960	873751
N	424m SE	Unspecified Heap	1873	875660
T	424m S	Coal Shaft	1873	830832
B	427m NW	Unspecified Heap	1873	956514
N	428m SE	Unspecified Heap	1898	874360
B	434m NW	Unspecified Heap	1949	942214
B	434m NW	Unspecified Heap	1974	955951
B	434m NW	Unspecified Heap	1960	955951
N	436m SE	Unspecified Heap	1873	874360
B	436m NW	Unspecified Heap	1938	856942
B	436m NW	Unspecified Heap	1938	856942
B	437m NW	Unspecified Heap	1909	935647
11	440m NW	Unspecified Heap	1974	964546
V	444m N	Cuttings	1873	946034
V	444m N	Cuttings	1909	893765
12	446m SW	Unspecified Heap	1873	802705
13	446m N	Railway Sidings	1898	794413
V	448m N	Cuttings	1974	956902
V	448m N	Cuttings	1960	956902
V	449m N	Cuttings	1938	870828
B	449m NW	Coal Shaft	1873	830825
B	450m NW	Unspecified Old Shaft	1960	955805
V	450m N	Cuttings	1949	956902
B	450m NW	Unspecified Disused Shaft	1974	813046
B	452m NW	Old Coal Shaft	1938	930084
B	452m NW	Old Coal Shaft	1949	911582

ID	Location	Land Use	Date	Group ID
B	452m NW	Unspecified Old Shaft	1898	868269
W	452m SW	Unspecified Heap	1938	901052
W	452m SW	Unspecified Heap	1938	901052
B	453m NW	Old Coal Shaft	1909	848132
W	454m SW	Unspecified Heap	1909	911579
W	455m SW	Unspecified Heap	1898	911579
W	455m SW	Unspecified Heap	1974	966497
W	455m SW	Unspecified Heap	1960	966497
X	455m SE	Unspecified Heap	1898	935144
J	455m SW	Brick Works	1898	895656
Y	456m E	Unspecified Ground Workings	1909	799165
14	457m N	Unspecified Heap	1873	802703
J	458m SW	Brick Works	1909	895656
W	459m SW	Unspecified Heap	1949	918706
W	460m SW	Unspecified Heap	1873	944122
J	462m SW	Brick Works	1949	947803
15	462m E	Unspecified Heap	1873	802608
J	465m SW	Brick Works	1873	865161
X	466m SE	Unspecified Heap	1873	935144
Z	472m SE	Unspecified Heaps	1898	831183
16	477m E	Unspecified Heap	1873	802607
J	478m SW	Unspecified Heap	1898	967951
Z	484m SE	Unspecified Ground Workings	1873	799160
AA	490m S	Old Coal Shaft	1909	847124
AA	491m S	Unspecified Old Shaft	1898	852333
AA	491m S	Old Coal Shaft	1938	847124
AA	492m S	Old Coal Shaft	1949	946081
AA	493m S	Unspecified Heap	1898	869207



ID	Location	Land Use	Date	Group ID
Z	493m SE	Unspecified Old Shaft	1898	805658
AA	495m S	Unspecified Old Shaft	1960	932077
AA	495m S	Unspecified Heap	1949	879444
AA	495m S	Unspecified Quarry	1938	816860
Y	497m E	Unspecified Heap	1898	864052
AA	498m S	Old Coal Shaft	1909	967695

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

16

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 24**

ID	Location	Land Use	Date	Group ID
A	2m W	Gas Works	1875	122161
A	7m SW	Gasometer	1875	108352
B	223m NW	Unspecified Tank	1962	127974
B	223m NW	Unspecified Tank	1973	127974
B	225m NW	Unspecified Tank	1912	109702
H	268m N	Unspecified Tank	1973	124998
H	269m N	Unspecified Tank	1990	133643
B	287m NW	Tanks	1912	104481
B	287m NW	Unspecified Tank	1962	109701
B	298m NW	Unspecified Tank	1962	109700
B	308m NW	Unspecified Tank	1962	109483
B	334m NW	Unspecified Tank	1900	109484
B	336m NW	Tanks	1912	127678
B	341m NW	Unspecified Tank	1900	109486



ID	Location	Land Use	Date	Group ID
B	356m NW	Tanks	1962	128390
B	374m NW	Tanks	1900	141615

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

50

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 24**

ID	Location	Land Use	Date	Group ID
A	2m W	Gas Works	1875	63836
A	7m SW	Gasometer	1875	59545
C	156m SE	Electricity Substation	1959	80916
C	156m SE	Electricity Substation	1988	80916
C	156m SE	Electricity Substation	1994	80916
C	156m SE	Electricity Substation	1999	80916
C	156m SE	Electricity Substation	1996	80916
C	156m SE	Electricity Substation	1993	80916
C	156m SE	Electricity Substation	1973	80916
C	158m SE	Electricity Substation	1992	75841
D	176m W	Electricity Substation	-	59485
D	177m W	Electricity Substation	1990	78055
D	177m W	Electricity Substation	1973	78055
D	178m W	Electricity Substation	1959	67067
F	290m E	Electricity Substation	1994	74467
F	290m E	Electricity Substation	1999	74467
F	290m E	Electricity Substation	1996	74467
F	290m E	Electricity Substation	1993	74467



ID	Location	Land Use	Date	Group ID
F	306m E	Electricity Substation	1959	79180
F	306m E	Electricity Substation	1988	79180
F	306m E	Electricity Substation	1989	79180
F	306m E	Electricity Substation	1989	79180
F	306m E	Electricity Substation	1992	79180
F	313m E	Electricity Substation	1973	67101
B	328m NW	Electricity Substation	1990	67892
B	329m NW	Electricity Substation	-	59449
B	330m NW	Electricity Substation	1959	67892
M	347m S	Electricity Substation	1994	84123
M	347m S	Electricity Substation	1990	84123
B	376m NW	Electricity Substation	1973	59962
P	382m N	Electricity Substation	1994	75503
P	382m N	Electricity Substation	1999	79609
P	382m N	Electricity Substation	1996	80475
P	382m N	Electricity Substation	1993	85298
P	383m N	Electricity Substation	1973	65076
P	384m N	Electricity Substation	1959	66913
P	384m N	Electricity Substation	1988	70515
P	384m N	Electricity Substation	1989	76108
P	384m N	Electricity Substation	1989	64673
P	384m N	Electricity Substation	1992	65541
R	388m NE	Electricity Substation	1994	77776
R	388m NE	Electricity Substation	1999	77776
R	388m NE	Electricity Substation	1996	77776
R	388m NE	Electricity Substation	1993	77776
R	388m NE	Electricity Substation	1973	77776
R	389m NE	Electricity Substation	1959	77776

ID	Location	Land Use	Date	Group ID
R	389m NE	Electricity Substation	1988	77776
R	389m NE	Electricity Substation	1989	77776
R	389m NE	Electricity Substation	1992	77776
K	394m SE	Electricity Substation	1990	60103

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0
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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	22
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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 24**

ID	Location	Land Use	Date	Group ID
F	254m E	Garage	1973	23133
F	254m E	Garage	1959	27110
F	254m E	Garage	1988	27110
F	254m E	Garage	1989	27110
F	254m E	Garage	1989	27110
F	255m E	Garage	1992	21853
F	265m E	Garage	1999	26943
F	265m E	Garage	1996	26943
F	265m E	Garage	1993	26943

ID	Location	Land Use	Date	Group ID
F	265m E	Garage	1994	26943
F	270m E	Garage	1962	27110
I	281m SE	Garage	1959	25035
I	281m SE	Garage	1988	25035
I	281m SE	Garage	1989	25035
I	281m SE	Garage	1989	25035
I	281m SE	Garage	1992	25035
I	282m SE	Garage	1962	26128
I	282m SE	Garage	1973	26128
I	283m SE	Garage	1999	24590
I	283m SE	Garage	1996	24590
I	283m SE	Garage	1993	24590
I	283m SE	Garage	1994	24590

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Waste exemptions

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**

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**0**

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.

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

3.5 Historical waste sites

Records within 500m**0**

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**8**

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.

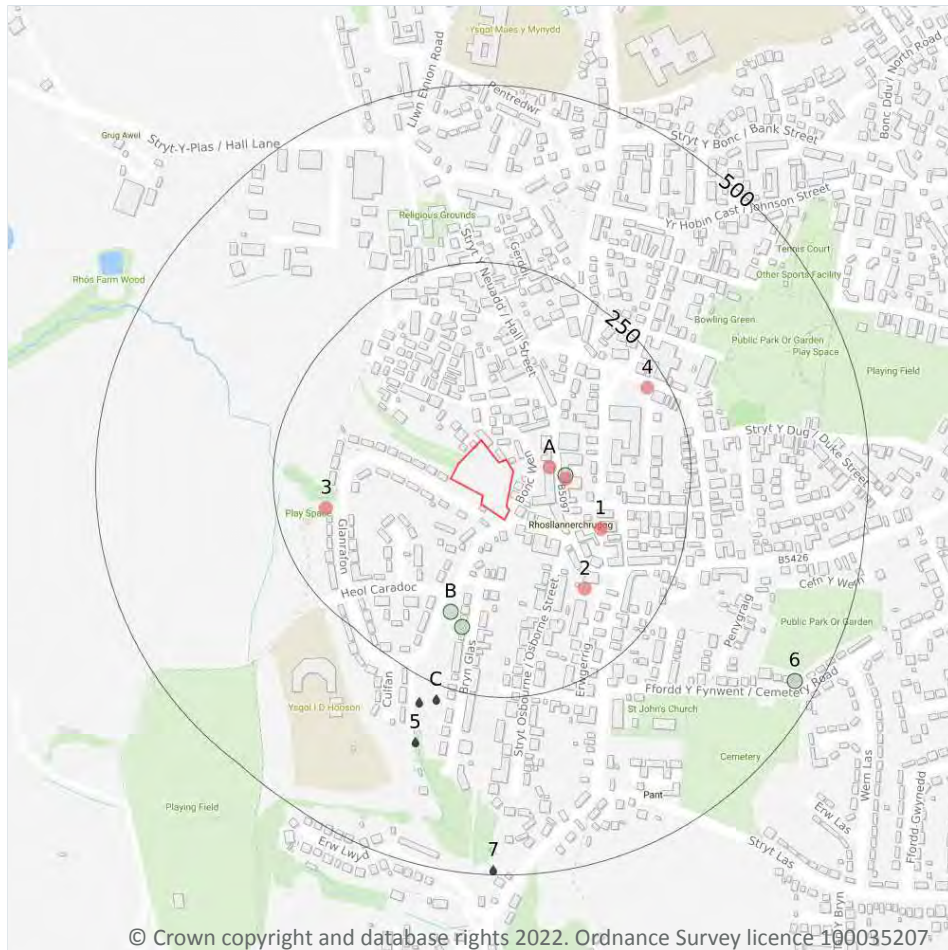
Features are displayed on the Waste and landfill map on **page 36**

ID	Location	Site	Reference	Category	Sub-Category	Description
1	53m NE	CROWN DENTAL CARE LTD, Rhos Dental Practice, 25- 27 Market Street, Rhosllanerchrugog, Wrexham, Wreccsam, LL14 1AH	NRW- WME067719	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
A	333m N	Rhos Farm, Owens Street, Rhosllanerchrugog, Wrexham, Wreccsam, LL14 1BL	NRW- WME044645	Disposing of waste exemption	On a farm	Burning waste in the open
A	333m N	Rhos Farm, Owens Street, Rhosllanerchrugog, Wrexham, Wreccsam, LL14 1BL	NRW- WME044645	Using waste exemption	On a farm	Use of waste for a specified purpose
A	333m N	Rhos Farm, Owens Street, Rhosllanerchrugog, Wrexham, Wreccsam, LL14 1BL	NRW- WME044645	Using waste exemption	On a farm	Use of waste in construction
A	333m N	Rhos Farm, Owens Street, Rhosllanerchrugog, Wrexham, Wreccsam, LL14 1BL	NRW- WME044645	Treating waste exemption	On a farm	Cleaning, washing, spraying or coating relevant waste
A	333m N	Rhos Farm, Owens Street, Rhosllanerchrugog, Wrexham, Wreccsam, LL14 1BL	NRW- WME044645	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
A	333m N	Rhos Farm, Owens Street, Rhosllanerchrugog, Wrexham, Wreccsam, LL14 1BL	NRW- WME044645	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
A	333m N	Rhos Farm, Owens Street, Rhosllanerchrugog, Wrexham, Wreccsam, LL14 1BL	NRW- WME044645	Storing waste exemption	On a farm	Storage of waste in secure containers

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
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

6

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 39**

ID	Location	Company	Address	Activity	Category
A	51m E	Rhos Radio	23, Market Street, Rhosllanerchrugog, Wrexham, Clwyd, LL14 1AH	Electrical Equipment Repair and Servicing	Repair and Servicing
A	75m E	T & C Williams	36-38, Market Street, Rhosllanerchrugog, Wrexham, Clwyd, LL14 1AF	General Construction Supplies	Industrial Products
1	131m E	Telephone Exchange	Clwyd, LL14	Telecommunications Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
2	149m SE	Electricity Sub Station	Clwyd, LL14	Electrical Features	Infrastructure and Facilities
3	180m W	Electricity Sub Station	Clwyd, LL14	Electrical Features	Infrastructure and Facilities
4	222m NE	Electricity Sub Station	Clwyd, LL14	Electrical Features	Infrastructure and Facilities

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

4

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 39**

ID	Location	Address	Details	
C	271m S	Bersham Colliery CSO, Nr 24 Bryn Glas, RHOSLLANERCHGRUGOG, Wrexham, LL14 2EB	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: CM0176001 Permit Version: 3 Receiving Water: AFON GOCH	Status: Effective Issue date: 07/10/2019 Effective Date: 07/10/2019 Revocation Date: -
C	283m SW	BRYN Y BRAIN CSO, BRYN GLAS, RHOSLLANERCHGRUGOG, WREXHAM, WALES, LL14 2EB	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: CM0176001 Permit Version: 2 Receiving Water: PANT BROOK AVON SOCH	Status: Effective Issue date: 19/03/2004 Effective Date: 31/03/2004 Revocation Date: -
5	337m S	RHOSSLANERCHGRUGOG BRYN Y BRAI	Effluent Type: UNSPECIFIED Permit Number: CM0176001 Permit Version: 1 Receiving Water: PANT BROOK AVON SOCH	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 20/10/1989 Effective Date: 20/10/1989 Revocation Date: 30/03/2004



ID	Location	Address	Details	
7	493m S	RHOS OSBORNE STREET, OSBORNE STREET	Effluent Type: UNSPECIFIED Permit Number: CM0057901 Permit Version: 1 Receiving Water: TRIB.OF GOCH	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 27/06/1969 Effective Date: 27/06/1969 Revocation Date: 05/04/1995

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
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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
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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
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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
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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

4

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

Features are displayed on the Current industrial land use map on **page 39**

ID	Location	Details	
A	73m E	Incident Date: 06/08/2014 Incident Identification: 1265372 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	149m SW	Incident Date: 01/09/2003 Incident Identification: 186385 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
B	162m S	Incident Date: 11/08/2003 Incident Identification: 180955 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
6	466m SE	Incident Date: 06/08/2014 Incident Identification: 1265526 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)

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.

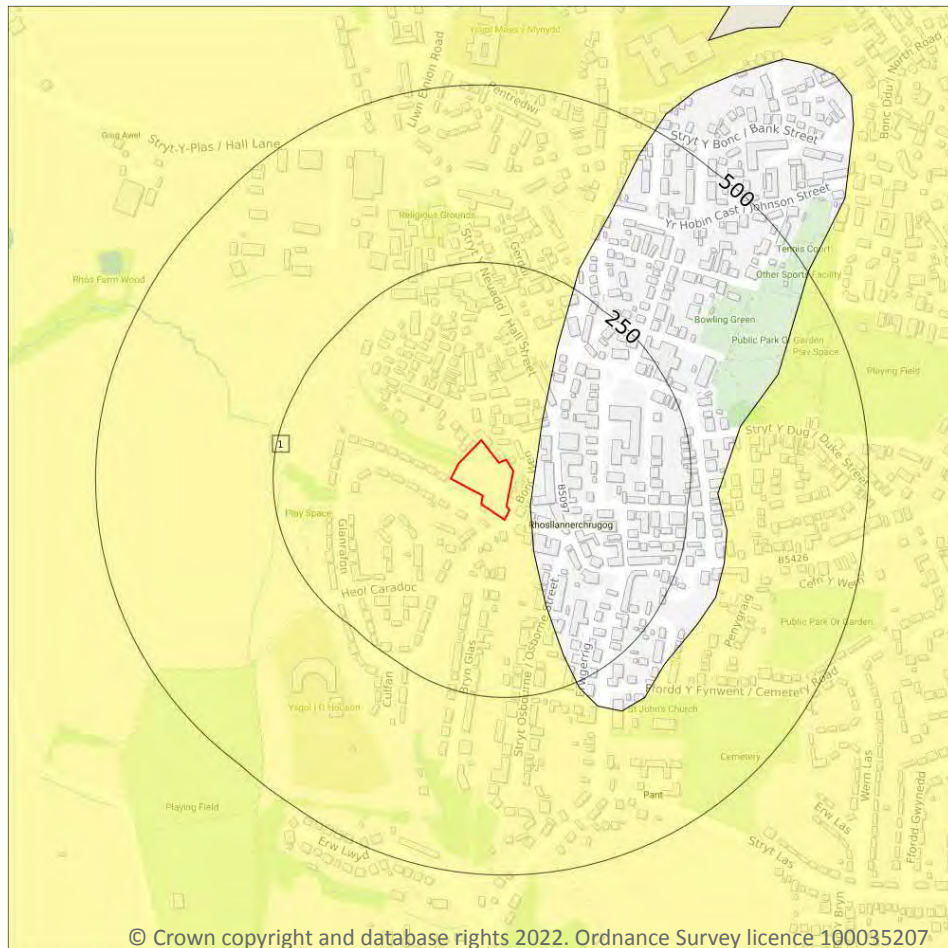
4.21 Pollution inventory radioactive waste

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



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

5.1 Superficial aquifer

Records within 500m

1

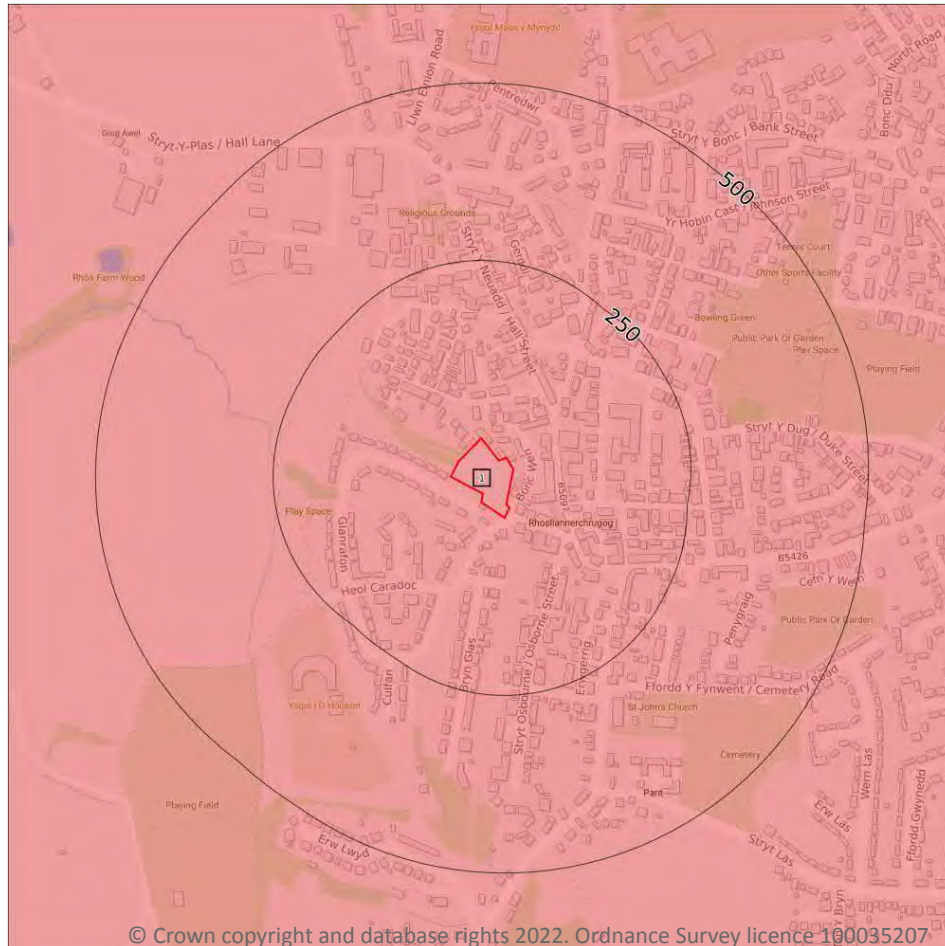
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 46**

ID	Location	Designation	Description
1	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

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

1

Aquifer status of groundwater held within bedrock geology.

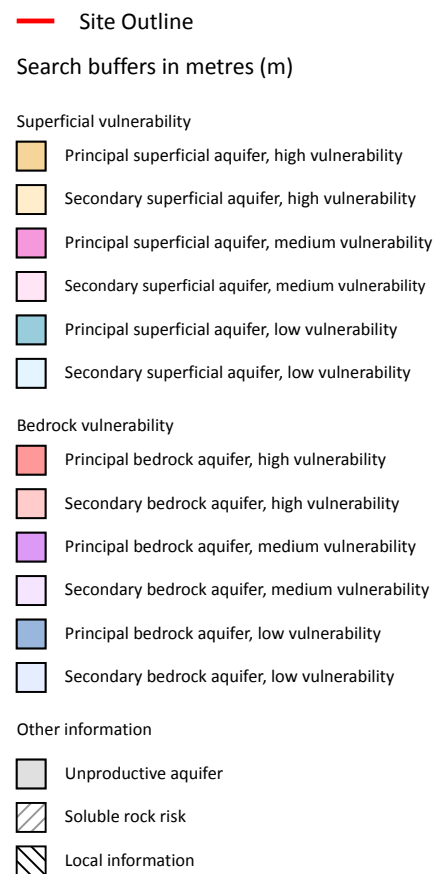
Features are displayed on the Bedrock aquifer map on **page 47**

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

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

3

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 48**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	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
2	On site	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: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
3	29m E	Summary Classification: Secondary bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300- 550mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m 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



- Site Outline
- Search buffers in metres (m)
- Source Protection Zone 1
Inner catchment
- Source Protection Zone 2
Outer catchment
- Source Protection Zone 3
Total catchment
- Source Protection Zone 4
Zone of Special Interest
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
Point features
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

3

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 50**

ID	Location	Details	
-	1275m N	Status: Historical Licence No: 24/67/7/0037 Details: Potable Water Supply - Direct Direct Source: EAW Groundwater Point: TALWRN BOREHOLE Data Type: Point Name: Dee Valley Water Plc Easting: 328960 Northing: 347700	Annual Volume (m ³): 272760 Max Daily Volume (m ³): 1431.99 Original Application No: - Original Start Date: 05/07/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2007 Version End Date: -
-	1275m N	Status: Active Licence No: 24/67/7/0037 Details: Potable Water Supply - Direct - Medium Direct Source: Underground Strata - Carboniferous Coal Measures Point: - Data Type: Point Name: - Easting: 328960 Northing: 347700	Annual Volume (m ³): 272,760 Max Daily Volume (m ³): 1,418.40 Original Application No: - Original Start Date: Dec 5 2018 12:00AM Expiry Date: - Issue No: - Version Start Date: - Version End Date: -
-	1773m SW	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: -

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

5.7 Surface water abstractions

Records within 2000m

2

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 50**

ID	Location	Details	
-	1837m SW	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: -
-	1837m SW	Status: Active Licence No: 24/67/5/0003 Details: Potable 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: -

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 50**

ID	Location	Details	
-	1275m N	Status: Historical Licence No: 24/67/7/0037 Details: Potable Water Supply - Direct Direct Source: EAW Groundwater Point: TALWRN BOREHOLE Data Type: Point Name: Dee Valley Water Plc Easting: 328960 Northing: 347700	Annual Volume (m ³): 272760 Max Daily Volume (m ³): 1431.99 Original Application No: - Original Start Date: 05/07/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2007 Version End Date: -



ID	Location	Details	
-	1275m N	Status: Active Licence No: 24/67/7/0037 Details: Potable Water Supply - Direct - Medium Direct Source: Underground Strata - Carboniferous Coal Measures Point: - Data Type: Point Name: - Easting: 328960 Northing: 347700	Annual Volume (m ³): 272,760 Max Daily Volume (m ³): 1,418.40 Original Application No: - Original Start Date: Dec 5 2018 12:00AM Expiry Date: - Issue No: - Version Start Date: - Version End Date: -
-	1837m SW	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: -
-	1837m SW	Status: Active Licence No: 24/67/5/0003 Details: Potable 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: -

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

5.9 Source Protection Zones

Records within 500m	0
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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 54**

ID	Location	Type of water feature	Ground level	Permanence	Name
1	68m SW	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-

ID	Location	Type of water feature	Ground level	Permanence	Name
B	163m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	236m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	236m W	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
C	242m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

2

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 54**

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 54**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River WB catchment	Black Brook (Clywedog)	GB111067051700	Clywedog - Dee	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 54**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	2621m SE	River	Black Brook (Clywedog)	GB111067051700	Good	Good	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 54**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Dee Carboniferous Coal Measures	GB41102G204800	Poor	Poor	Good	2017

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 the sea

Records within 50m**0**

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; 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). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 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

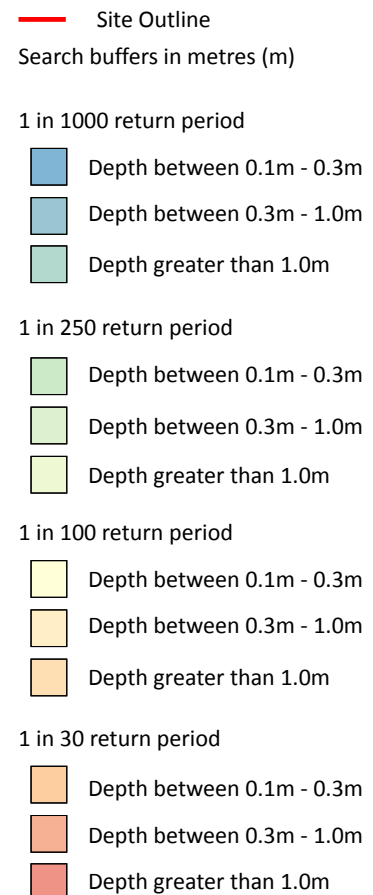
Records within 50m

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 250 year, 0.3m - 1.0m

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 60**

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.

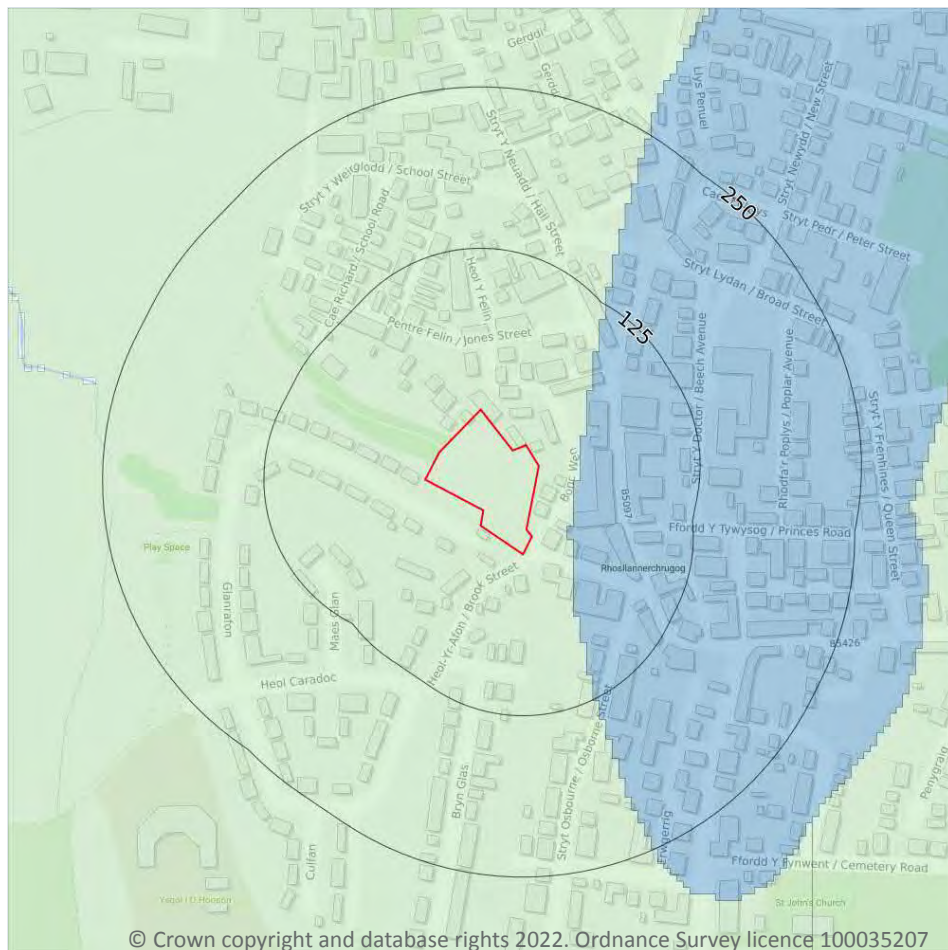
The table below shows the maximum flood depths for a range of return periods for the site.

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

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



— Site Outline
Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

Low

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 62**

This data is sourced from Ambienta Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- + Special Areas of Conservation (SAC)
- Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

4

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 63**

ID	Location	Name	Data source
A	751m E	STRYT LAS A'R HAFOD	Natural Resources Wales



ID	Location	Name	Data source
B	963m SE	STRYT LAS A'R HAFOD	Natural Resources Wales
-	1661m E	STRYT LAS A'R HAFOD	Natural Resources Wales
-	1748m SE	STRYT LAS A'R HAFOD	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	4
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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 63**

ID	Location	Name	Features of interest	Habitat description	Data source
A	751m 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
B	963m SE	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
-	1661m 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
-	1748m SE	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

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

30

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 63**

ID	Location	Name	Woodland Type
1	521m NW	Unknown	Ancient Semi Natural Woodland
2	755m N	Unknown	Restored Ancient Woodland Site
3	843m SE	Unknown	Ancient Semi Natural Woodland
4	1026m SE	Unknown	Ancient Semi Natural Woodland
5	1075m NE	Unknown	Restored Ancient Woodland Site
6	1125m W	Unknown	Ancient Semi Natural Woodland
7	1141m SW	Unknown	Ancient Semi Natural Woodland
8	1147m SW	Unknown	Ancient Semi Natural Woodland
9	1173m SW	Unknown	Ancient Semi Natural Woodland
10	1177m SW	Unknown	Ancient Semi Natural Woodland
11	1184m S	Unknown	Ancient Semi Natural Woodland
-	1309m N	Unknown	Restored Ancient Woodland Site
13	1332m NW	Unknown	Ancient Semi Natural Woodland
-	1392m NE	Unknown	Ancient Semi Natural Woodland
14	1402m SE	Unknown	Ancient Semi Natural Woodland
-	1412m NE	Unknown	Ancient Semi Natural Woodland
-	1505m S	Unknown	Ancient Semi Natural Woodland
-	1560m SE	Unknown	Ancient Semi Natural Woodland
-	1621m NE	Unknown	Ancient Semi Natural Woodland
18	1628m SE	Unknown	Restored Ancient Woodland Site
-	1688m NW	Unknown	Ancient Semi Natural Woodland
-	1711m W	Unknown	Ancient Semi Natural Woodland



ID	Location	Name	Woodland Type
-	1731m NE	Unknown	Ancient Semi Natural Woodland
-	1743m SW	Unknown	Ancient Semi Natural Woodland
-	1865m N	Unknown	Ancient Semi Natural Woodland
-	1878m SW	Unknown	Ancient Semi Natural Woodland
-	1912m N	Unknown	Ancient Semi Natural Woodland
-	1942m NW	Unknown	Ancient Semi Natural Woodland
-	1944m NW	Unknown	Ancient Semi Natural Woodland
-	1957m W	Unknown	Ancient Semi Natural Woodland

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

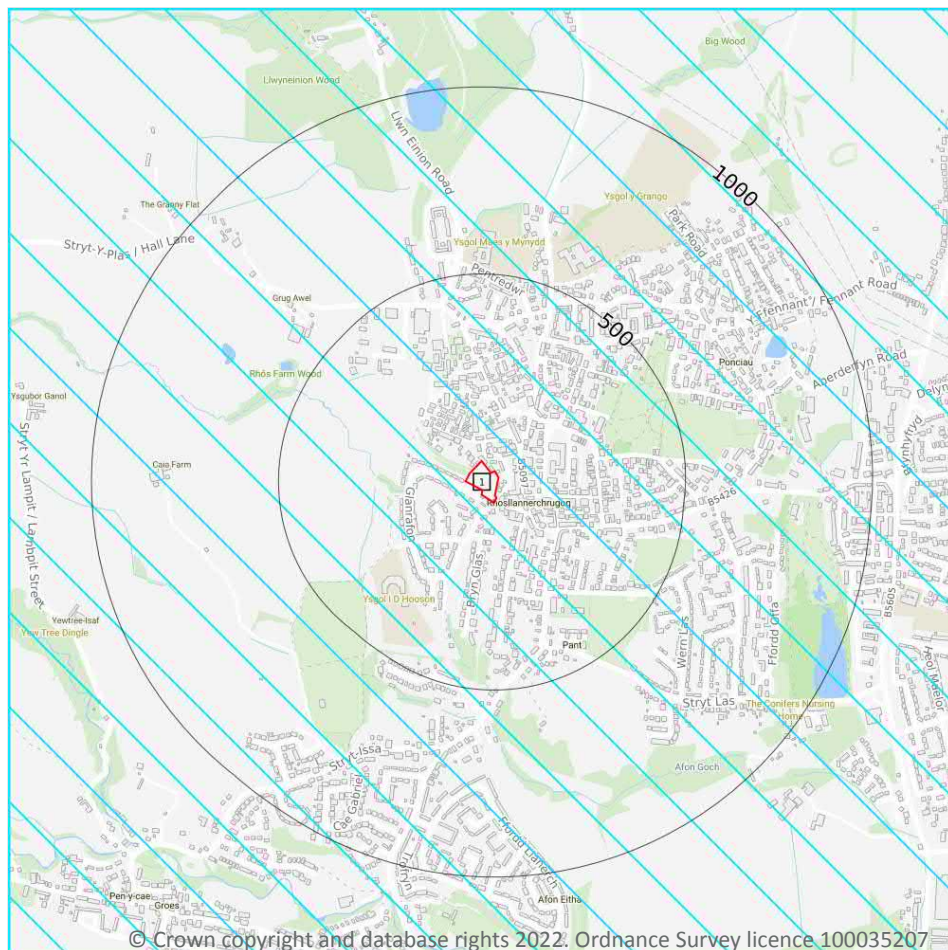
0

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 70**

ID	Location	Type of developments requiring consultation
1	On site	Air pollution - Livestock & poultry units with floorspace > 500m ² , slurry lagoons & digestate stores > 4000m ² . 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.



11.2 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 72**

ID	Location	Name	Grade	Reference Number	Listed date
1	59m SE	Capel Mawr (Jerusalem Welsh Presbyterian Chapel) with attached school room, Close to the junction of Brook Street and Market Street, in the centre of the village.	II	16845	15/01/1996
2	235m NE	Penuel Baptist Chapel, Prominently sited in the angle of High Street and Campbell Street.	II	17091	15/01/1996

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



11.5 Conservation Areas

Records within 250m**0**

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.

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



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Timber felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

1

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 75**

ID	Location	Classification	Description
2	170m NW	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

14.1 10k Availability

Records within 500m

1

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.

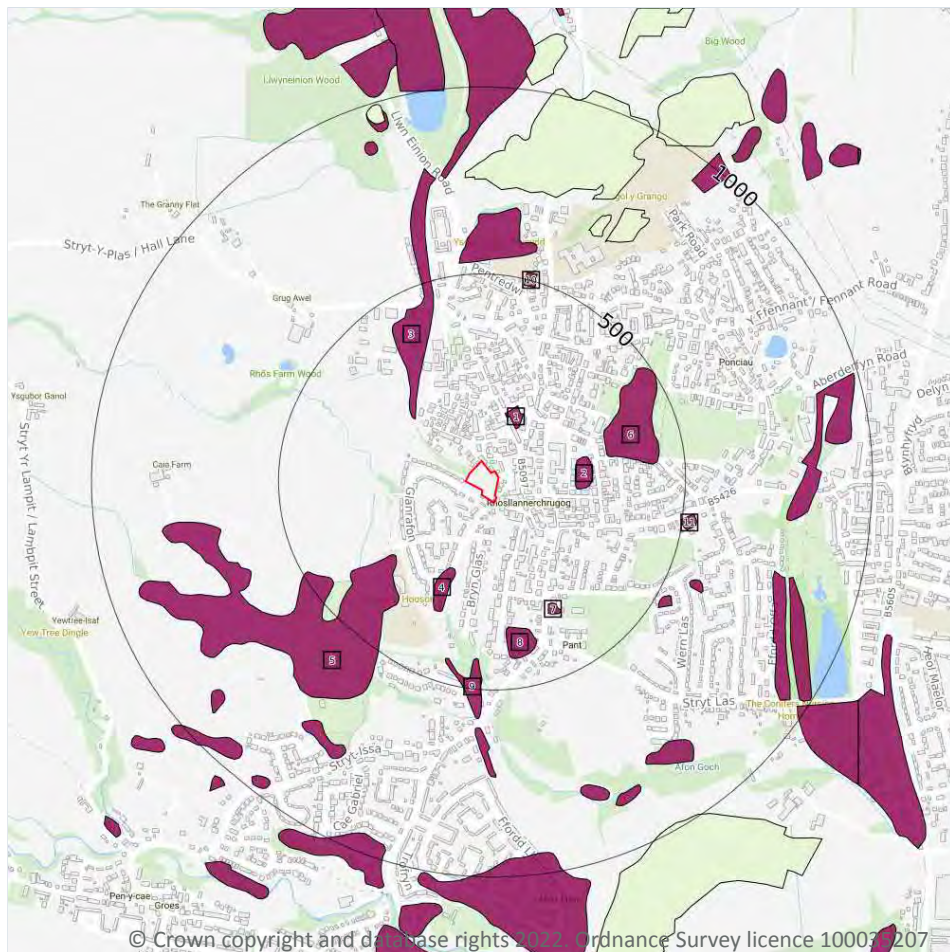
Features are displayed on the Geology 1:10,000 scale - Availability map on **page 78**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	SJ24NE

This data is sourced from the British Geological Survey.



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



— Site Outline
Search buffers in metres (m)

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

14.2 Artificial and made ground (10k)

Records within 500m

11

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 79**

ID	Location	LEX Code	Description	Rock description
1	126m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	205m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	206m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	206m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

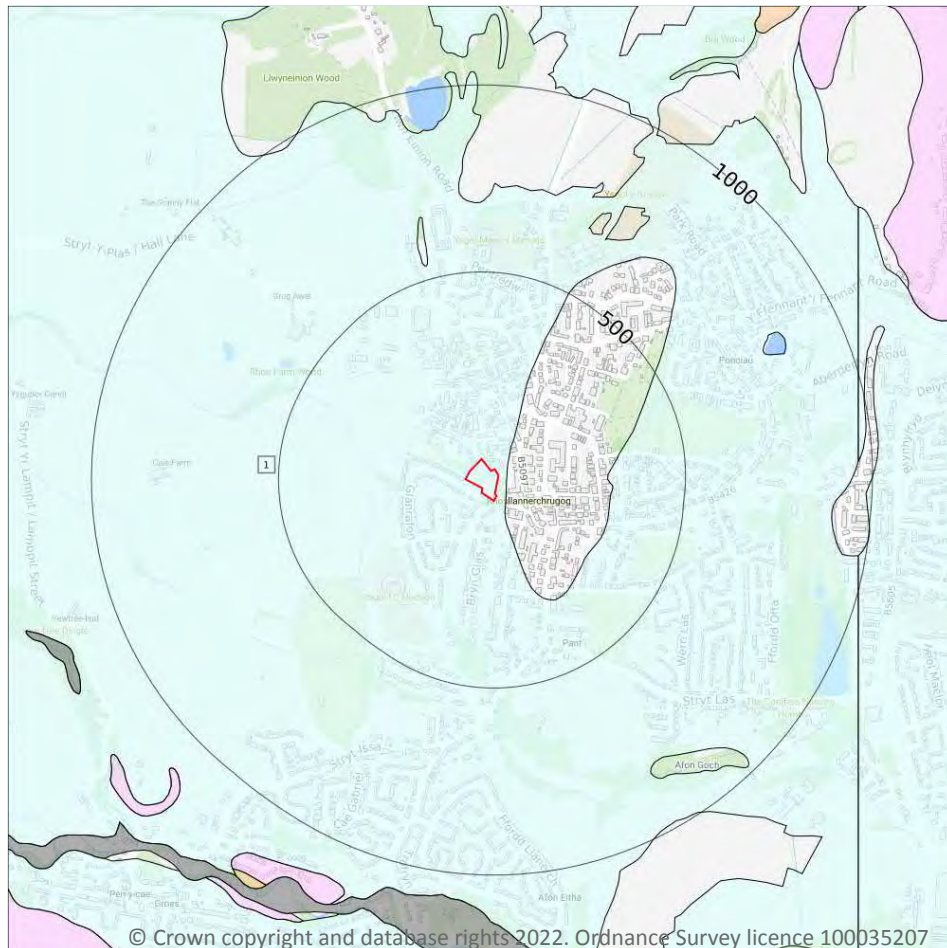


ID	Location	LEX Code	Description	Rock description
5	273m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6	296m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
7	307m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
8	335m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
9	418m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
10	484m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
11	497m E	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

1

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 81**

ID	Location	LEX Code	Description	Rock description
1	On site	TILL-DMTN	Till - Diamicton	Diamicton

This data is sourced from the British Geological Survey.



14.4 Landslip (10k)

Records within 500m

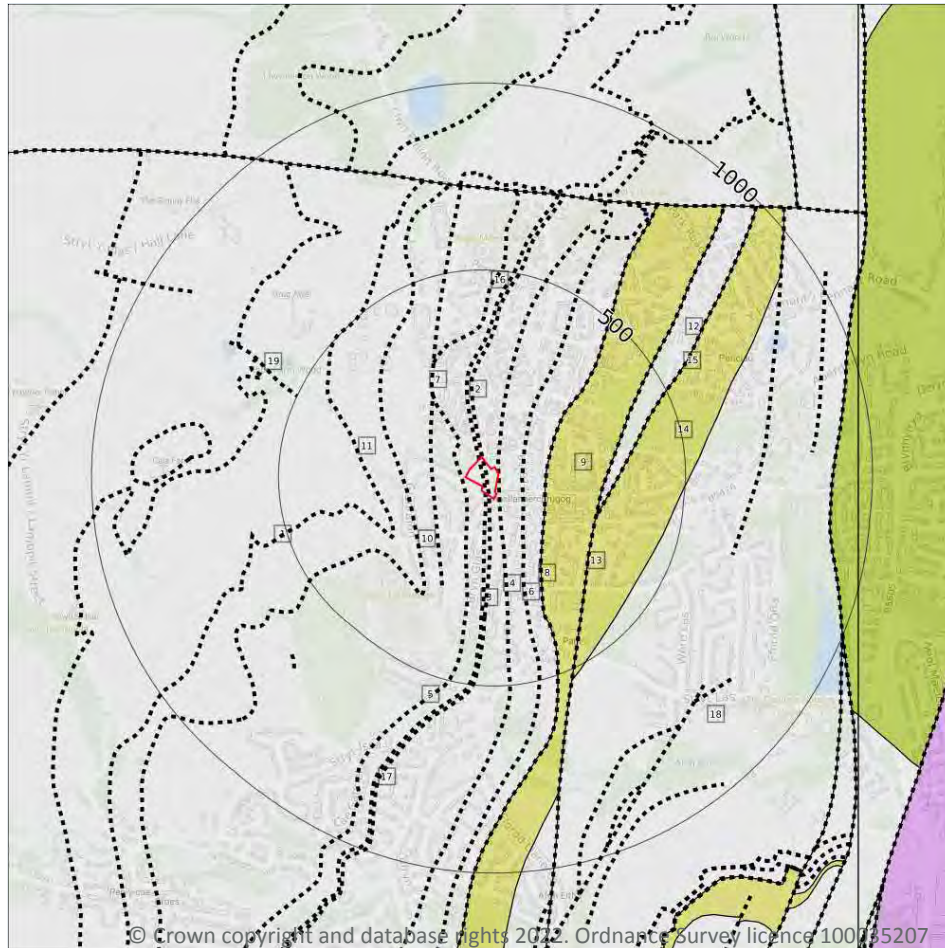
0

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

5

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 83**

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	127m E	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
12	273m E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age



ID	Location	LEX Code	Description	Rock age
14	273m E	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
18	440m SE	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

14

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 83**

ID	Location	Category	Description
2	On site	FOSSIL_HORIZON	Fossil horizon, marine band
3	On site	ROCK	Coal seam, inferred
4	0m E	ROCK	Coal seam, inferred
5	11m W	ROCK	Coal seam, inferred
6	64m E	ROCK	Coal seam, inferred
7	89m W	FAULT	Normal fault, inferred; crossmarks on downthrow side
8	127m E	ROCK	Coal seam, inferred
10	160m W	ROCK	Coal seam, inferred
11	227m SW	ROCK	Coal seam, inferred
13	273m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
15	273m E	ROCK	Coal seam, inferred
16	283m NW	ROCK	Coal seam, inferred
17	316m S	FOSSIL_HORIZON	Fossil horizon, marine band
19	500m NW	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.

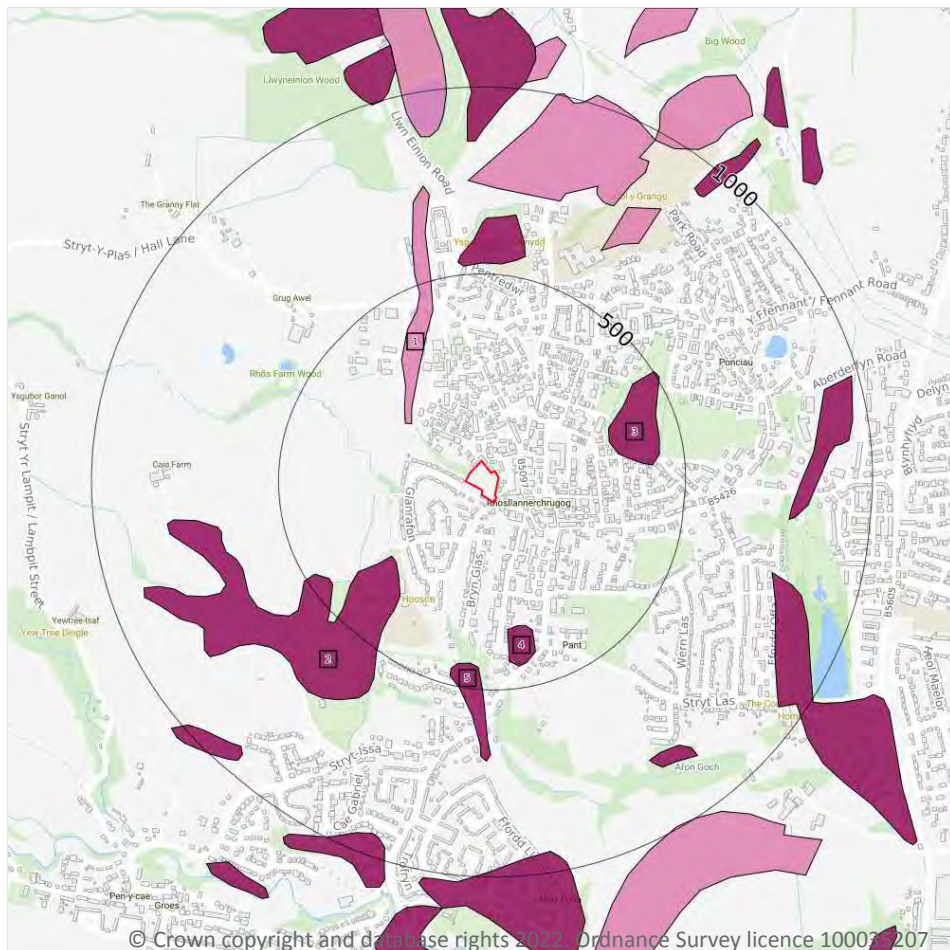
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 85**

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

5

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 86**

ID	Location	LEX Code	Description	Rock description
1	204m NW	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
2	281m SW	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
3	311m E	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
4	334m S	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT



ID	Location	LEX Code	Description	Rock description
5	433m S	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

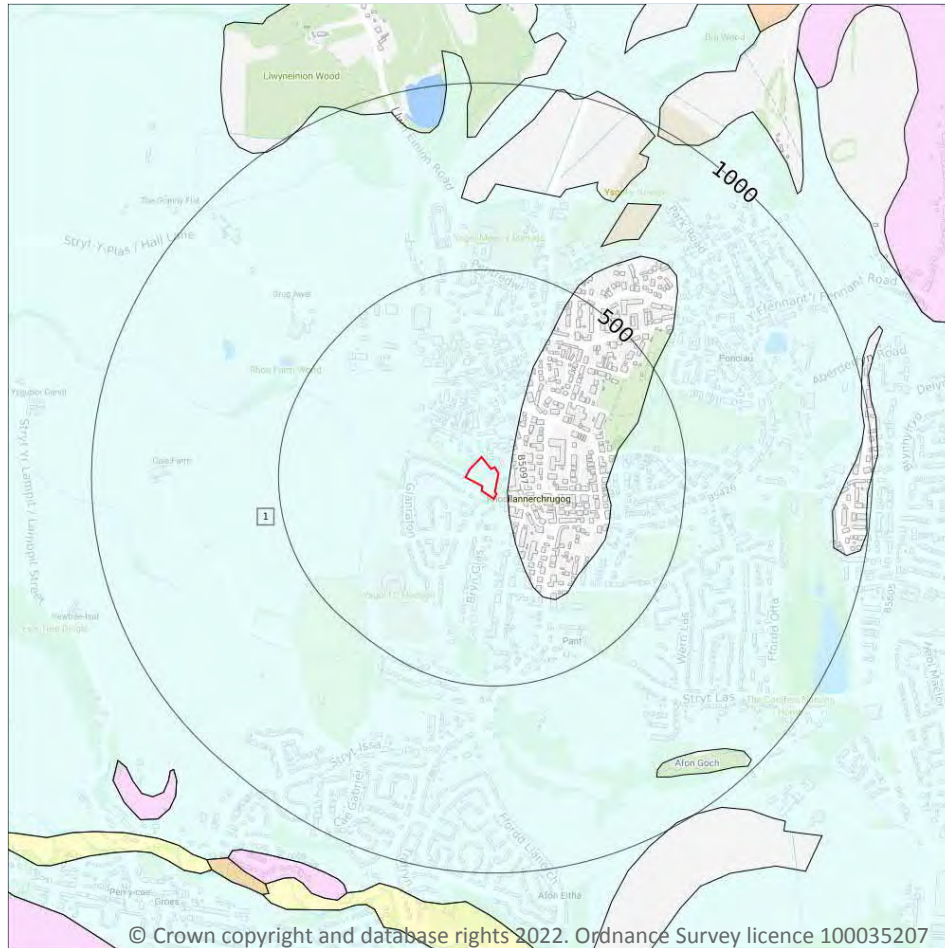
0

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

1

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 88**

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	TILL, DEVANSIAN	DIAMICTON

This data is sourced from the British Geological Survey.



15.5 Superficial permeability (50k)

Records within 50m**1**

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

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)

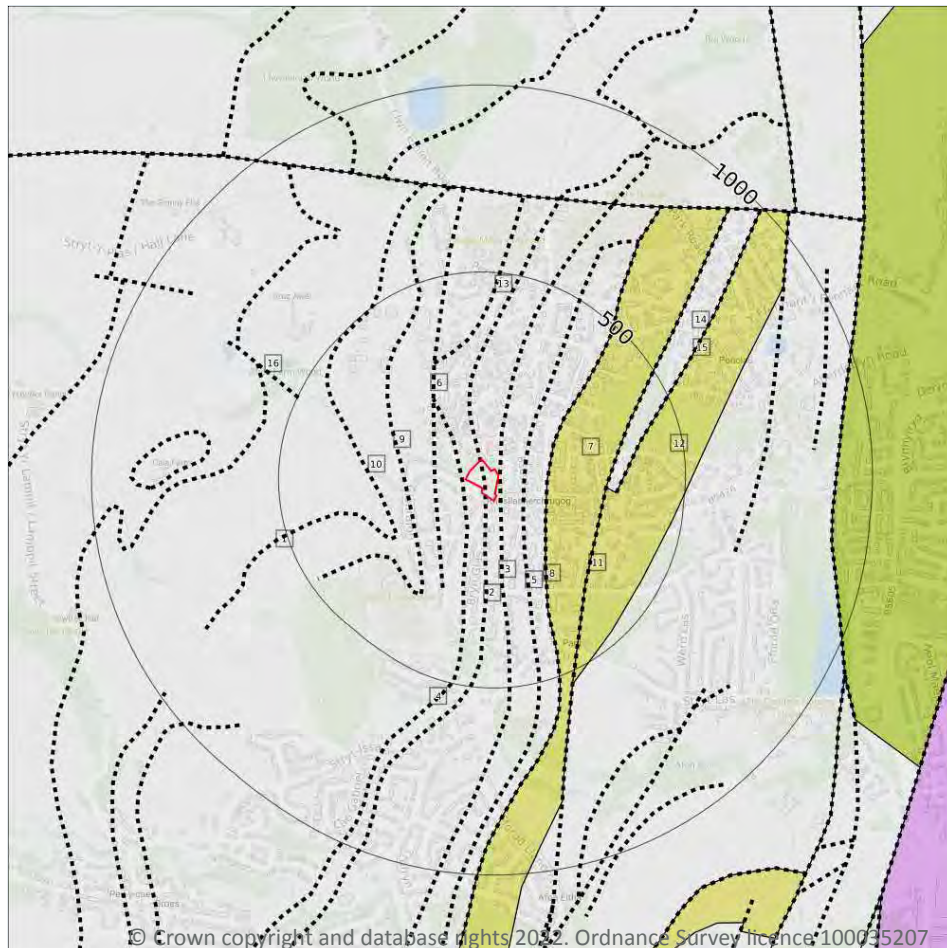
Records within 50m**0**

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

4

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 90**

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



ID	Location	LEX Code	Description	Rock age
7	131m E	PLMC-SDST	PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - SANDSTONE	WESTPHALIAN
12	282m E	PLMC-SDST	PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - SANDSTONE	WESTPHALIAN
14	290m E	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

1

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

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

12

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 90**

ID	Location	Category	Description
2	On site	ROCK	Coal seam, inferred
3	4m E	ROCK	Coal seam, inferred
4	9m W	ROCK	Coal seam, inferred
5	70m E	ROCK	Coal seam, inferred
6	82m W	FAULT	Fault, inferred, displacement unknown

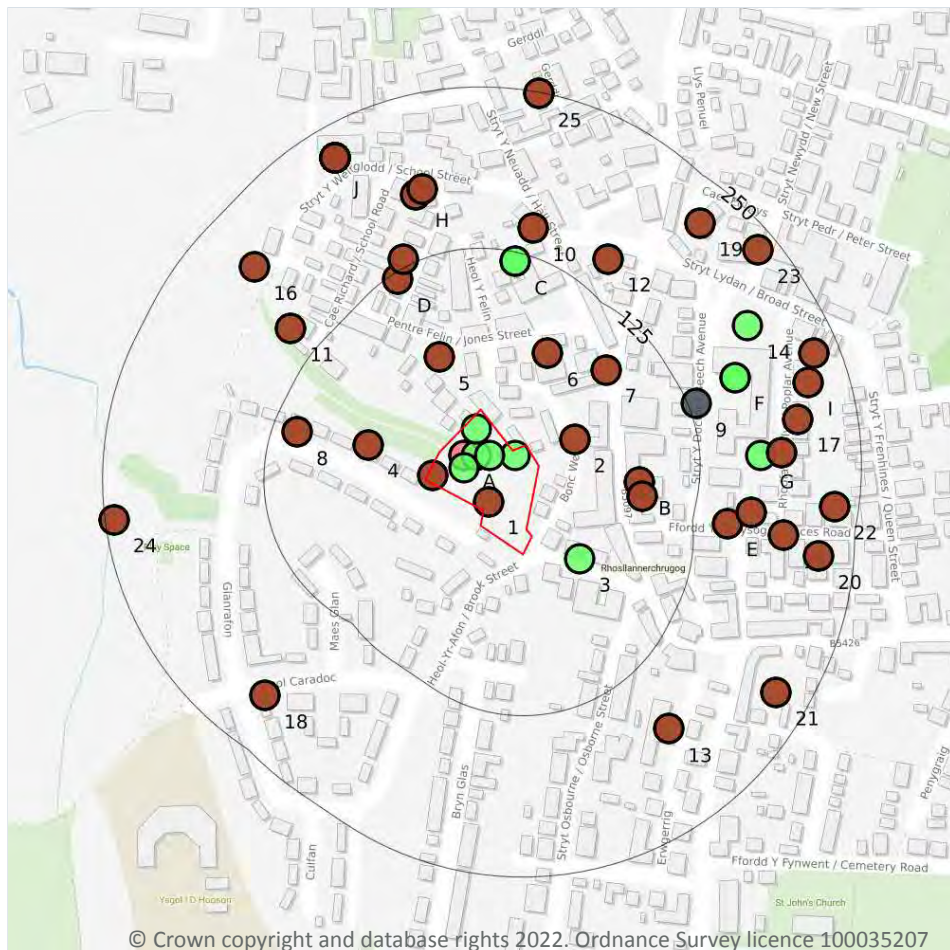


ID	Location	Category	Description
8	131m E	ROCK	Coal seam, inferred
9	160m W	ROCK	Coal seam, inferred
10	225m SW	ROCK	Coal seam, inferred
11	282m E	FAULT	Fault, inferred, displacement unknown
13	286m NW	ROCK	Coal seam, inferred
15	318m E	ROCK	Coal seam, inferred
16	494m NW	FAULT	Fault, inferred, displacement unknown

This data is sourced from the British Geological Survey.



16 Boreholes



— Site Outline
Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

16.1 BGS Boreholes

Records within 250m

70

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 93**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	328999 346354	RHOS COLL. SHAFT	-1.0	N	143365
A	On site	328980 346390	N WALES COKING COAL SURV. BH64	50.2	N	142544
A	On site	328980 346390	N WALES COKING COAL SURV. BH63	100.0	N	142543



ID	Location	Grid reference	Name	Length	Confidential	Web link
A	On site	329020 346390	RHOS,BONC WEN 4	20.0	N	143027
A	On site	328990 346390	RHOS,BONC WEN 2	30.0	N	143025
A	On site	328956 346374	RHOS COLL. SHAFT	-1.0	N	143364
A	On site	328980 346380	RHOS,BONC WEN 1	30.0	N	143024
A	On site	328990 346410	RHOS,BONC WEN 5	30.0	N	143028
A	On site	329000 346390	RHOS,BONC WEN 3	23.0	N	143026
2	34m NE	329066 346402	RHOSLLANERCH.COLL. NO.3 SHAFT	-1.0	N	143097
3	41m SE	329070 346310	BROOK ST RHOS IGS13	21.7	N	142439
4	52m NW	328906 346398	UNNAMED SHAFT	-1.0	N	143385
5	52m NW	328961 346466	UNNAMED SHAFT	-1.0	N	143541
6	68m NE	329045 346469	UNNAMED SHAFT	-1.0	N	143542
B	79m E	329116 346369	RHOSLLANERCH.COLL. NO.2 SHAFT	-1.0	N	143098
B	83m E	329118 346358	RHOSLLANERCH.COLL. NO.1 SHAFT	-1.0	N	143099
7	85m NE	329090 346456	UNNAMED SHAFT	-1.0	N	143387
8	106m W	328851 346408	UNNAMED SHAFT	-1.0	N	143384
C	118m N	329020 346540	HALL ST RHOS IGS12A	20.0	N	142437
C	118m N	329020 346540	HALL ST RHOS IGS12B	20.0	N	142438
D	119m NW	328929 346526	UNNAMED SHAFT	-1.0	N	143540
9	131m E	329160 346430	6 BEECH AVENUE RHOSLLANERCHRUGOG 1	-	Y	N/A
D	131m NW	328933 346542	UNNAMED SHAFT	-1.0	N	143573
10	147m N	329034 346566	RHOS COLL. NO.10 SHAFT	-1.0	N	143182
11	150m NW	328846 346488	UNNAMED SHAFT	-1.0	N	143216
E	152m E	329184 346337	PONKEY COLL, SHAFT	-1.0	N	143435
12	153m NE	329092 346542	RHOSLLANERCH.COLL. NO.4 SHAFT	-1.0	N	143095
F	167m NE	329190 346450	PEN YN RHOS CLINIC BH2	12.0	N	142535
F	167m NE	329190 346450	PEN YN RHOS CLINIC BH1	12.15	N	142534
E	169m E	329203 346346	PONKEY COLL, SHAFT	-1.0	N	143436
G	172m E	329210 346390	RHOS CLINIC 1	26.2	N	142930



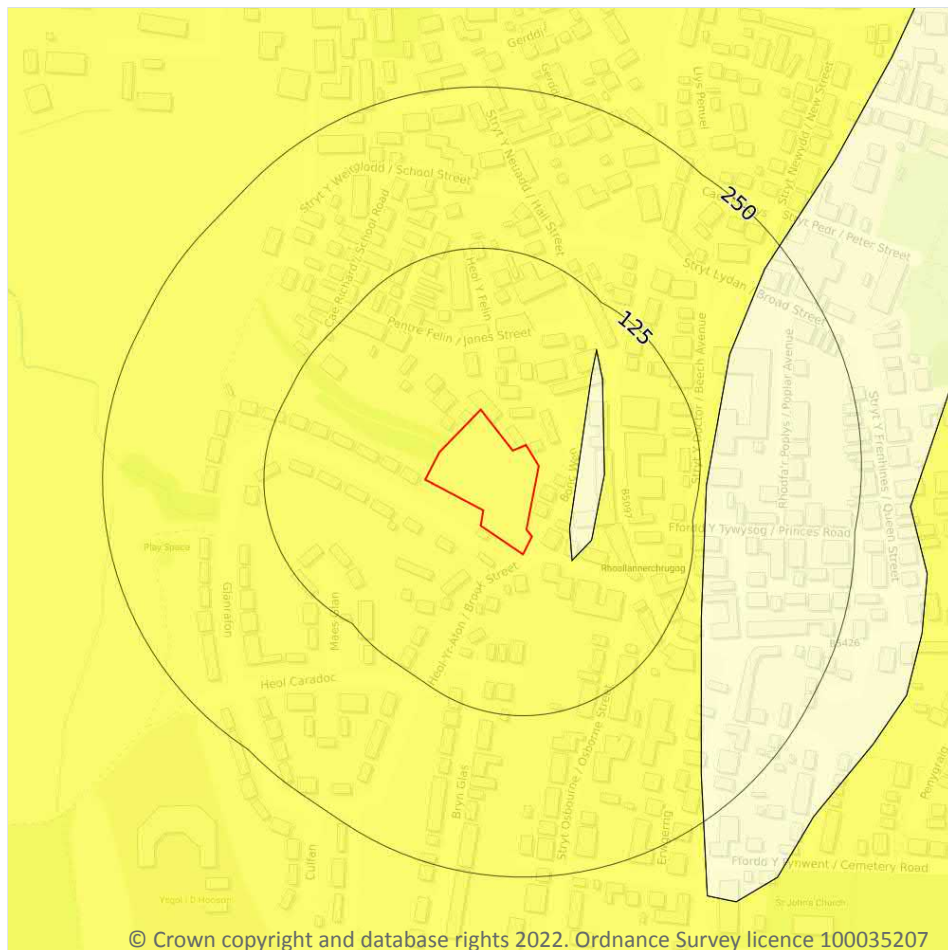
ID	Location	Grid reference	Name	Length	Confidential	Web link
H	174m N	328943 346592	UNNAMED SHAFT	-1.0	N	143539
13	176m SE	329139 346178	UNNAMED SHAFT	-1.0	N	143575
H	177m N	328948 346596	UNNAMED SHAFT	-1.0	N	143538
G	188m E	329226 346392	PONKEY COLL, SHAFT	-1.0	N	143424
14	195m NE	329200 346490	RHOS CLINIC 2	25.3	N	142931
15	195m E	329228 346328	PONKEY COLL, SHAFT	-1.0	N	143437
16	203m NW	328818 346536	UNNAMED SHAFT	-1.0	N	143376
17	204m E	329239 346418	PONKEY COLL, SHAFT	-1.0	N	143423
18	208m SW	328826 346204	RHOS FARM COLL. SHAFT	-1.0	N	143087
I	219m E	329247 346446	PONKEY COLL, SHAFT	-1.0	N	143422
19	219m NE	329163 346570	RHOSLLANERCH.COLL. NO.5 SHAFT	-1.0	N	143096
20	223m E	329255 346312	PONKEY COLL, SHAFT	-1.0	N	143439
21	224m SE	329222 346206	UNNAMED SHAFT	-1.0	N	143296
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH10	-1.0	N	142424
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH12	-1.0	N	142426
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH14	5.45	N	142428
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH20	7.3	N	142434
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH1	11.3	N	142415
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH18	11.2	N	142432
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH21	11.3	N	142435
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH6	-1.0	N	142420
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH2	-1.0	N	142416
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH3	-1.0	N	142417
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH19	10.4	N	142433
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH17	11.55	N	142431
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH5	-1.0	N	142419
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH9	-1.0	N	142423
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH4	-1.0	N	142418



ID	Location	Grid reference	Name	Length	Confidential	Web link
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH8	-1.0	N	142422
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH13	5.8	N	142427
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH15	14.65	N	142429
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH16	12.1	N	142430
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH7	-1.0	N	142421
J	225m NW	328880 346620	RHOS JUNIOR SCHOOL BH11	-1.0	N	142425
I	230m E	329251 346469	PONKEY COLL, SHAFT	-1.0	N	143250
22	231m E	329267 346350	PONKEY COLL, SHAFT	-1.0	N	143438
23	235m NE	329208 346549	PONKEY COLL, SHAFT	-1.0	N	143248
24	243m W	328709 346340	UNNAMED SHAFT	-1.0	N	143379
25	249m N	329038 346670	RHOSLLANERCH.COLL. NO.11 SHAFT	-1.0	N	143092

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

2

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).

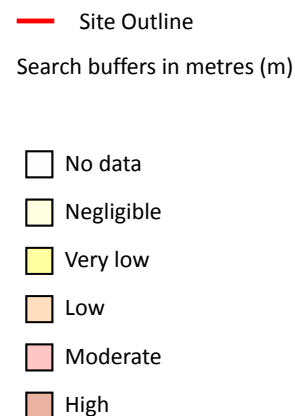
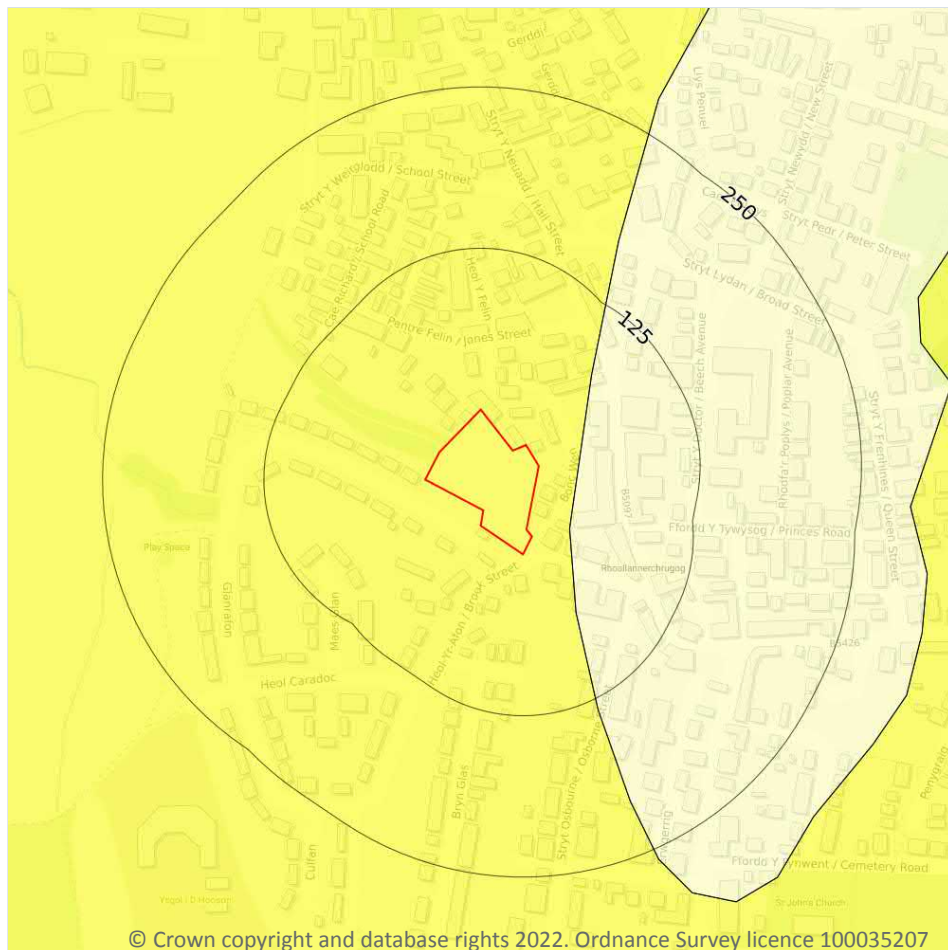
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 97**

Location	Hazard rating	Details
On site	Very low	Ground conditions predominantly low plasticity.
30m E	Negligible	Ground conditions predominantly non-plastic.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



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 98**

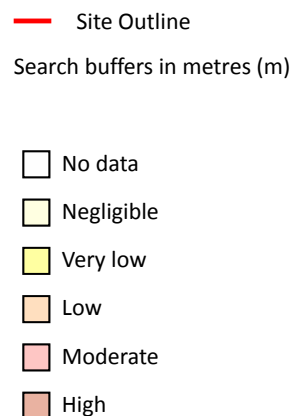
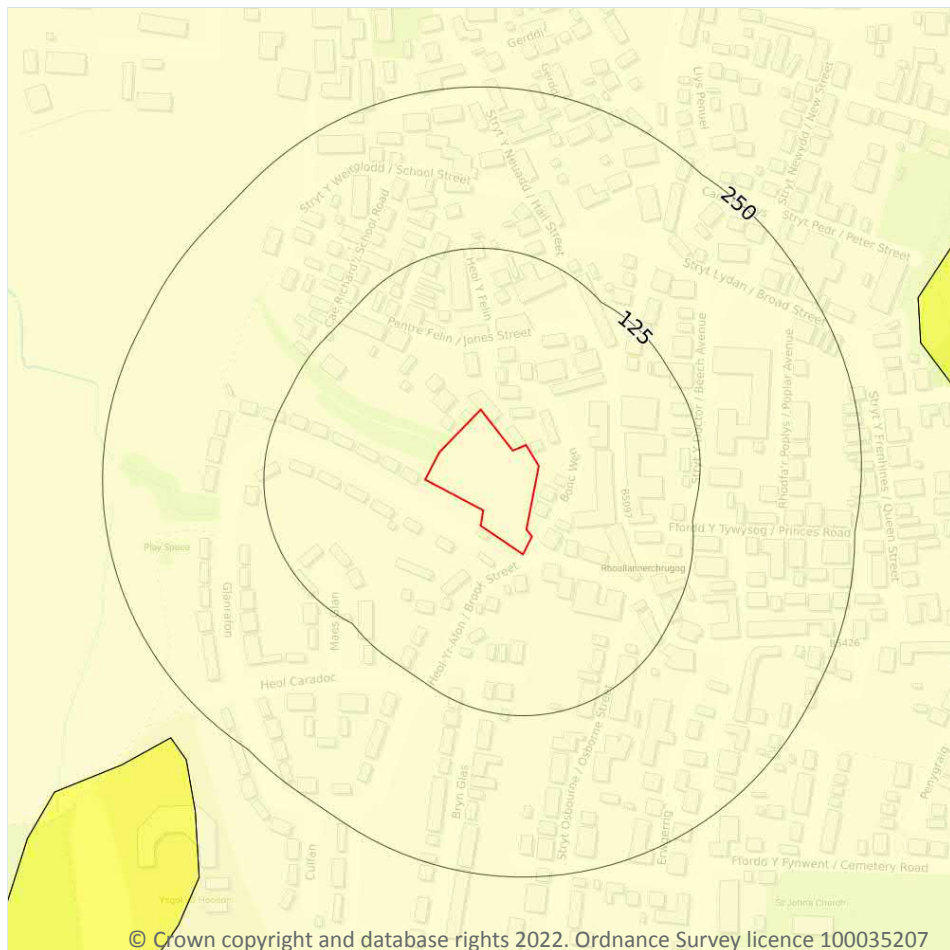
Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

Location	Hazard rating	Details
30m E	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

1

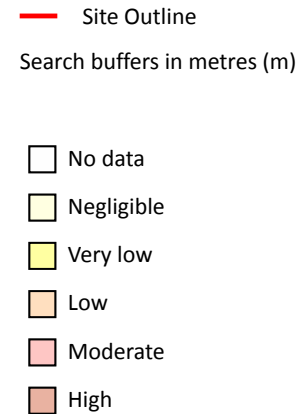
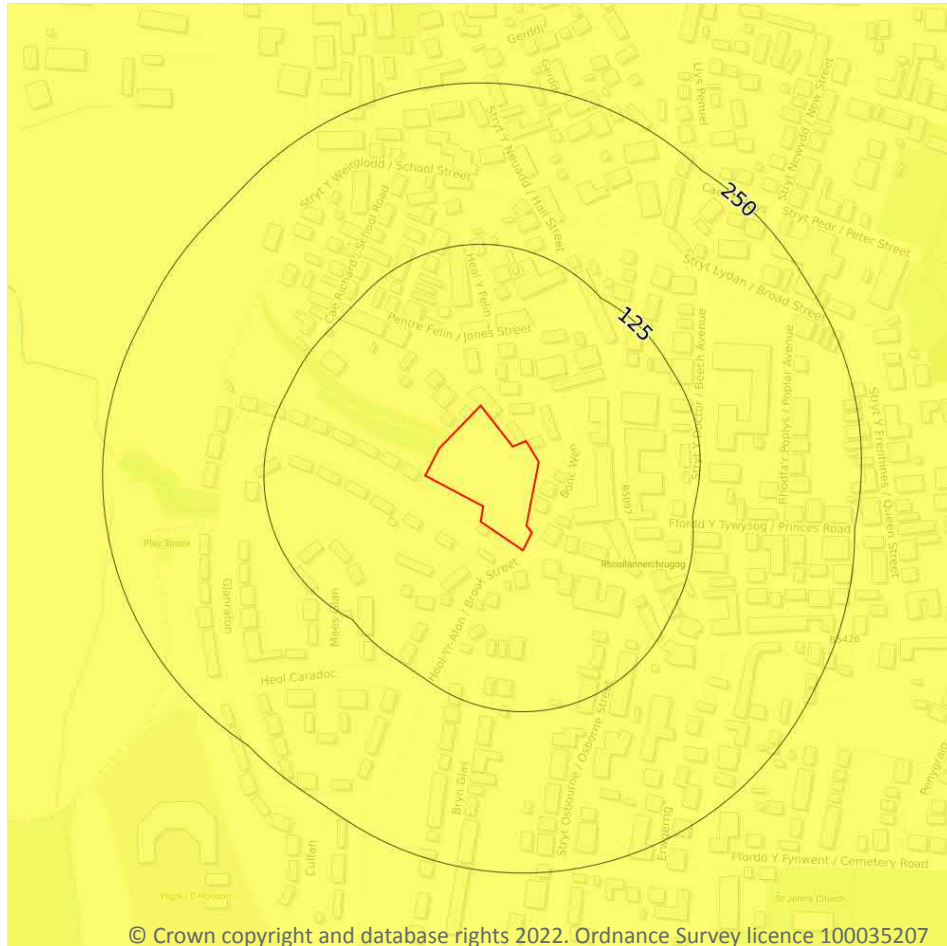
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 100**

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m

1

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.

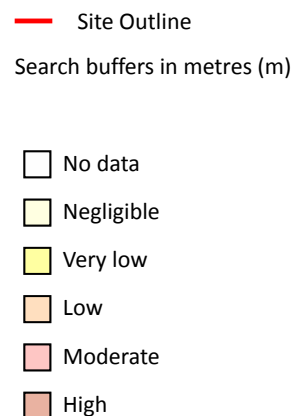
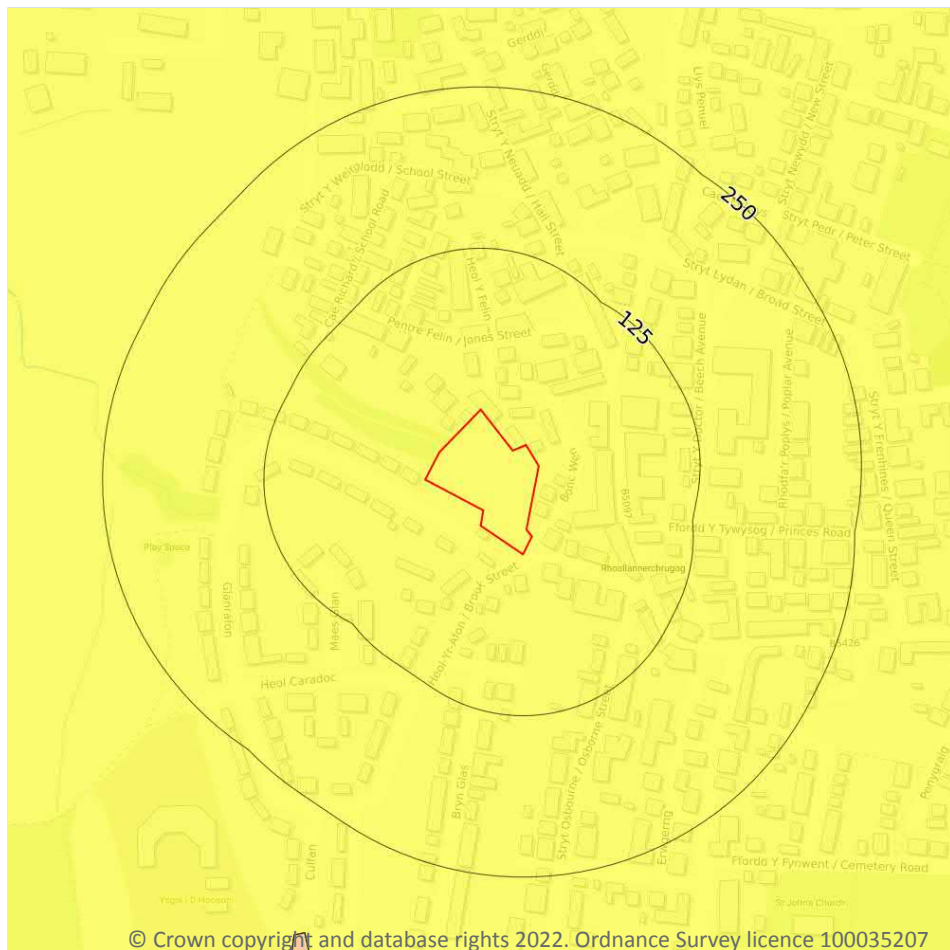
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 101**

Location	Hazard rating	Details
On site	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



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17.5 Landslides

Records within 50m

1

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.

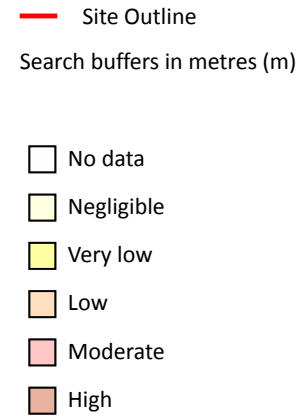
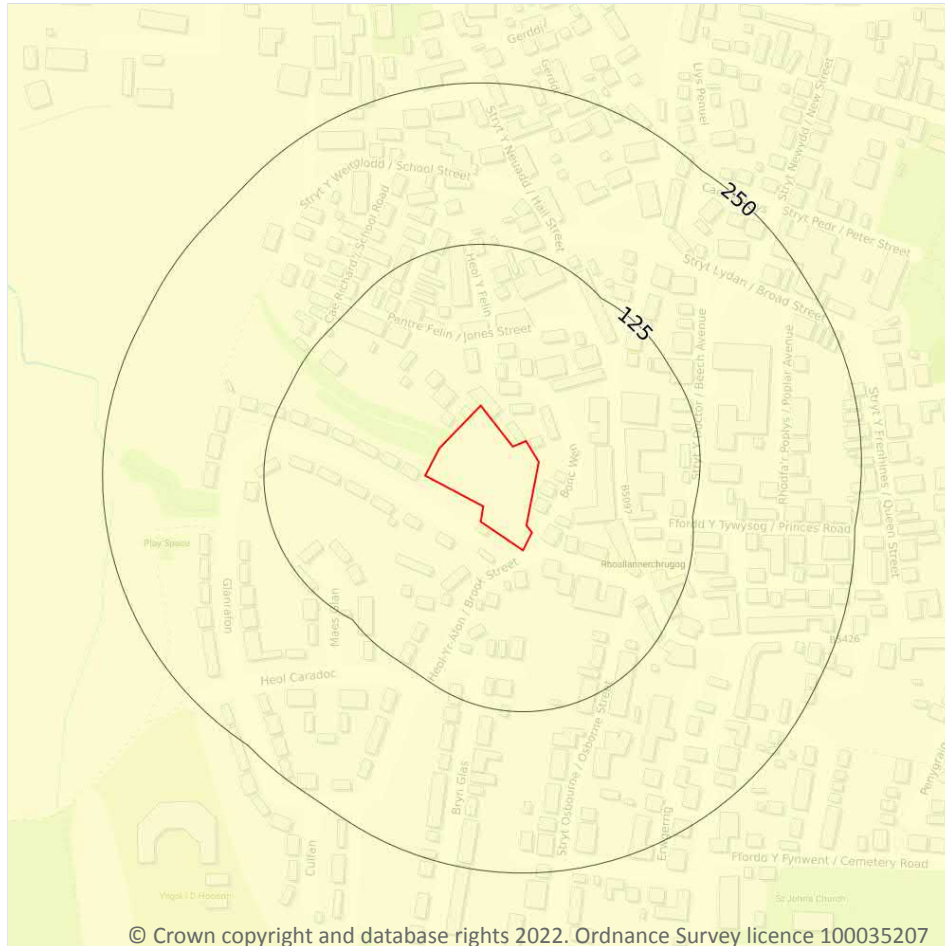
Features are displayed on the Natural ground subsidence - Landslides map on **page 102**

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.

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

1

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.

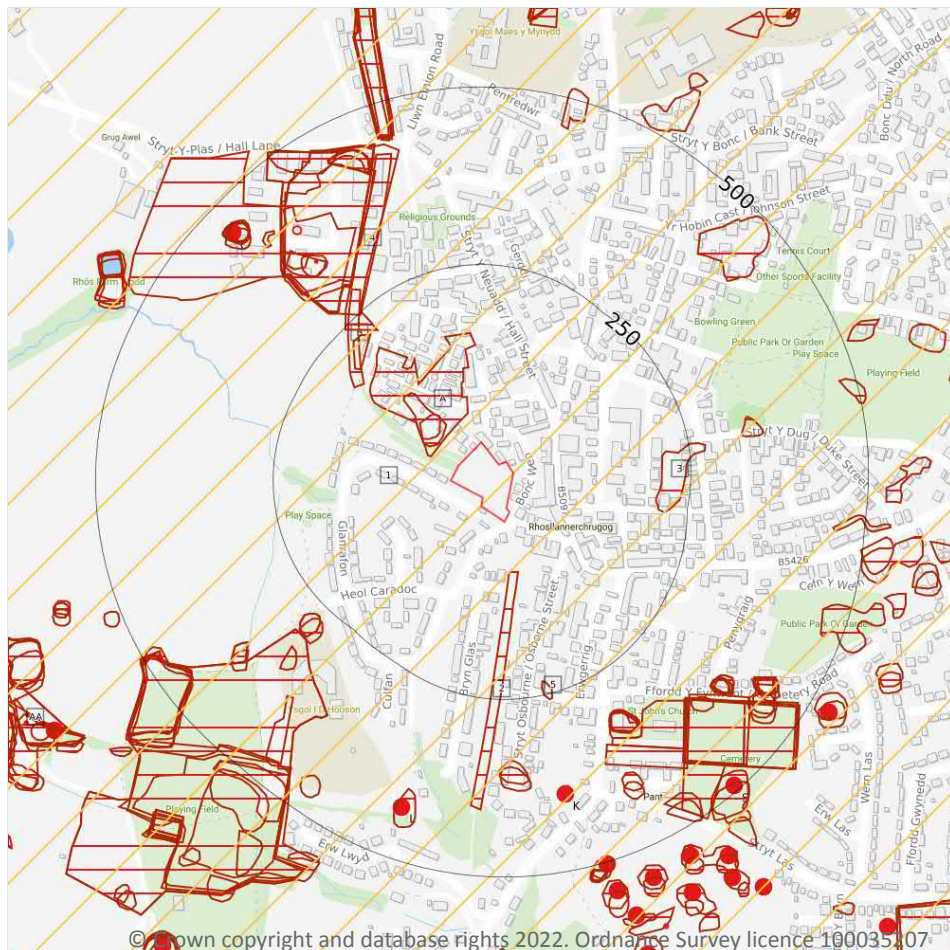
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 103**

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.

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

4

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 105**

ID	Location	Details	Description
K	392m S	Name: Pant Address: Rhosllanerchrugog, 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
L	426m S	Name: Pant Brick Works Address: Rhosllanerchrugog, 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
C	456m NW	Name: Rhosllanerchrugog Address: Rhosllanerchrugog, 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
S	492m SE	Name: Pant Address: Rhosllanerchrugog, 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

10

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 105**

ID	Location	Land Use	Year of mapping	Mapping scale
A	39m NW	Brick and Tile Works	1873	1:10560
A	42m NW	Unspecified Pit	1873	1:10560
A	51m NW	Unspecified Pit	1898	1:10560
2	71m S	Cuttings	1873	1:10560
B	176m NW	Cuttings	1873	1:10560
B	193m NW	Unspecified Heap	1974	1:10000
3	204m E	Unspecified Heap	1873	1:10560
4	215m NW	Cuttings	1974	1:10000
5	231m S	Unspecified Ground Workings	1873	1:10560
C	247m NW	Brick Works	1949	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

69

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 105**

ID	Location	Land Use	Year of mapping	Mapping scale
C	343m NW	Coal Shaft	1873	1:10560
K	382m S	Unspecified Old Shaft	1898	1:10560
K	385m S	Old Coal Shaft	1949	1:10560
K	386m S	Unspecified Old Shaft	1960	1:10560
C	389m NW	Unspecified Disused Shaft	1974	1:10000



ID	Location	Land Use	Year of mapping	Mapping scale
L	424m S	Coal Shaft	1873	1:10560
C	449m NW	Coal Shaft	1873	1:10560
C	450m NW	Unspecified Old Shaft	1960	1:10560
C	450m NW	Unspecified Disused Shaft	1974	1:10000
C	452m NW	Old Coal Shaft	1949	1:10560
C	452m NW	Unspecified Old Shaft	1898	1:10560
S	491m S	Unspecified Old Shaft	1898	1:10560
S	492m S	Old Coal Shaft	1949	1:10560
S	493m SE	Unspecified Old Shaft	1898	1:10560
S	495m S	Unspecified Old Shaft	1960	1:10560
T	526m SE	Unspecified Disused Shaft	1974	1:10000
T	528m SE	Unspecified Old Shaft	1898	1:10560
S	579m SE	Unspecified Old Shafts	1898	1:10560
S	584m SE	Old Coal Shafts	1949	1:10560
S	584m S	Old Coal Shaft	1949	1:10560
S	586m SE	Unspecified Old Shafts	1960	1:10560
S	587m S	Unspecified Old Shaft	1960	1:10560
S	590m SE	Old Coal Shafts	1949	1:10560
S	590m SE	Unspecified Old Shafts	1898	1:10560
S	594m SE	Unspecified Old Shafts	1960	1:10560
S	610m S	Unspecified Old Shaft	1898	1:10560
-	670m W	Unspecified Shaft	1960	1:10560
AA	686m SW	Coal Shaft	1873	1:10560
-	693m W	Unspecified Shaft	1898	1:10560
-	697m W	Coal Shaft	1873	1:10560
-	712m W	Clay Shaft	1949	1:10560
-	715m W	Unspecified Shaft	1960	1:10560
-	727m W	Coal Shaft	1873	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
-	728m W	Unspecified Shaft	1949	1:10560
-	730m W	Unspecified Shaft	1960	1:10560
AD	755m SW	Old Coal Shaft	1949	1:10560
AD	755m SW	Unspecified Old Shaft	1898	1:10560
AD	765m SW	Unspecified Old Shaft	1960	1:10560
AF	780m SE	Old Coal Shaft	1949	1:10560
AF	780m SE	Unspecified Old Shaft	1898	1:10560
-	785m W	Old Coal Shaft	1949	1:10560
-	785m W	Unspecified Old Shaft	1898	1:10560
-	785m S	Old Coal Shaft	1949	1:10560
-	785m S	Unspecified Old Shafts	1898	1:10560
-	785m S	Unspecified Disused Shaft	1974	1:10000
AF	787m SE	Unspecified Old Shaft	1960	1:10560
-	790m W	Unspecified Old Shaft	1960	1:10560
-	791m S	Unspecified Old Shaft	1960	1:10560
-	794m SE	Unspecified Old Shafts	1898	1:10560
-	810m SE	Coal Shaft	1873	1:10560
-	875m W	Old Coal Shaft	1949	1:10560
-	875m W	Unspecified Old Shaft	1898	1:10560
-	883m W	Unspecified Old Shaft	1960	1:10560
-	912m S	Unspecified Disused Shaft	1974	1:10000
-	915m S	Old Coal Shaft	1949	1:10560
-	915m S	Unspecified Old Shaft	1898	1:10560
-	919m S	Unspecified Old Shaft	1960	1:10560
-	922m SE	Unspecified Old Shaft	1949	1:10560
-	926m SE	Unspecified Old Shaft	1960	1:10560
-	928m SE	Unspecified Old Shaft	1960	1:10560
-	960m SW	Old Coal Shaft	1949	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
-	960m SW	Unspecified Old Shaft	1898	1:10560
-	963m SW	Coal Shaft	1873	1:10560
-	967m SW	Unspecified Old Shaft	1960	1:10560
-	969m E	Unspecified Disused Shaft	1974	1:10000
-	971m E	Old Coal Shaft	1949	1:10560
-	974m E	Unspecified Old Shafts	1898	1:10560
-	976m E	Unspecified Old Shaft	1960	1:10560
-	982m E	Unspecified Old Shafts	1898	1:10560

This is 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

1

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 105**

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

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
-----------------	---

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

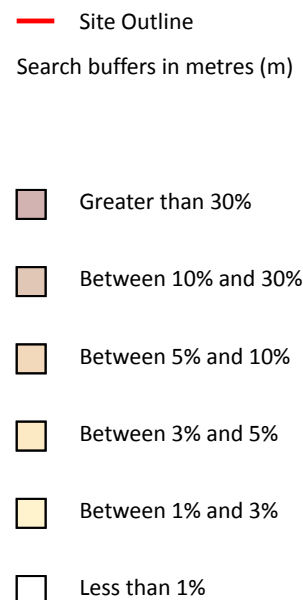
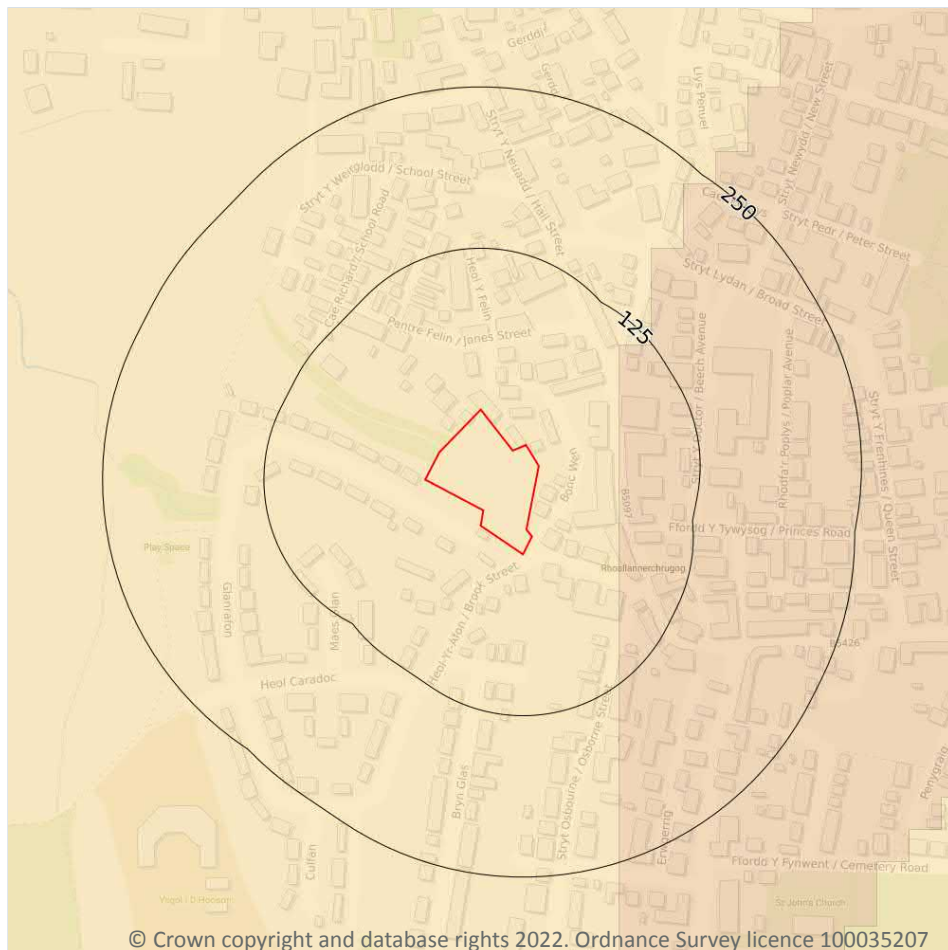
18.13 Clay mining

Records on site	0
-----------------	---

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



19.1 Radon

Records on site

1

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 113**

Location	Estimated properties affected	Radon Protection Measures required
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

4

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 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
30m SE	15 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

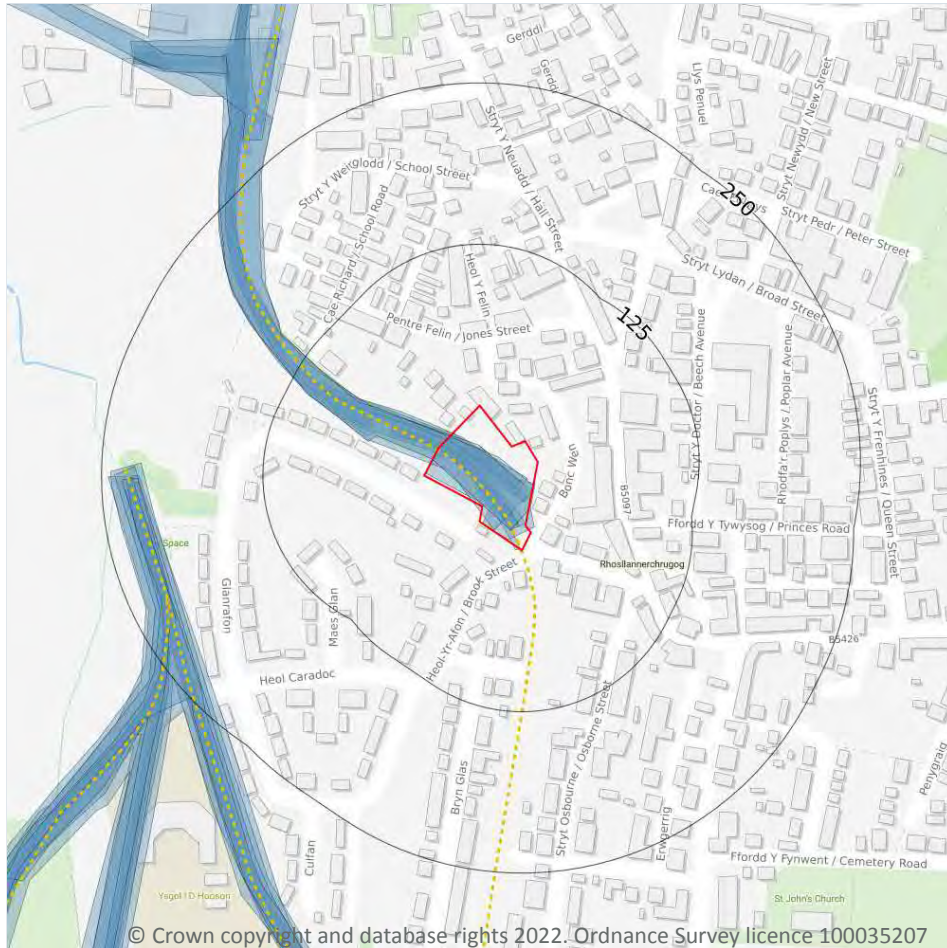
0

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



- Site Outline
- Search buffers in metres (m)
- C1 Crossrail 1 Stations
- Crossrail 1 Route
- C2 Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

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

18

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 115**

Location	Land Use	Year of mapping	Mapping scale
On site	Mineral Railway Sidings	1962	2500
On site	Railway Sidings	1875	2500
On site	Railway Sidings	1900	2500
On site	Railway Sidings	1912	2500
On site	Railway Sidings	1898	10560
On site	Railway Sidings	1938	10560
On site	Railway Sidings	1909	10560
On site	Tramway Sidings	1949	10560
On site	Disused Railway Sidings	1960	10560
146m NW	Mineral Railway Sidings	1962	2500
209m W	Mineral Railway Sidings	1949	10560
209m W	Mineral Railway Sidings	1960	10560
213m W	Mineral Railway Sidings	1938	10560
215m W	Mineral Railway Sidings	1898	10560
216m W	Mineral Railway Sidings	1962	2500
216m W	Mineral Railway Sidings	1909	10560
220m W	Mineral Railway Sidings	1900	2500



Location	Land Use	Year of mapping	Mapping scale
220m W	Mineral Railway Sidings	1912	2500

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0
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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	5
----------------------------	----------

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

Features are displayed on the Railway infrastructure and projects map on **page 115**

Location	Description
On site	Abandoned
On site	Abandoned
189m NW	Razed
218m W	Abandoned
220m SW	Abandoned

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	0
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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/>.



Site Details:

WMBC CAR PARK, BONC WEN,
RHOSLLANERCHRUGOG,
WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: County Series

Map date: 1875

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A

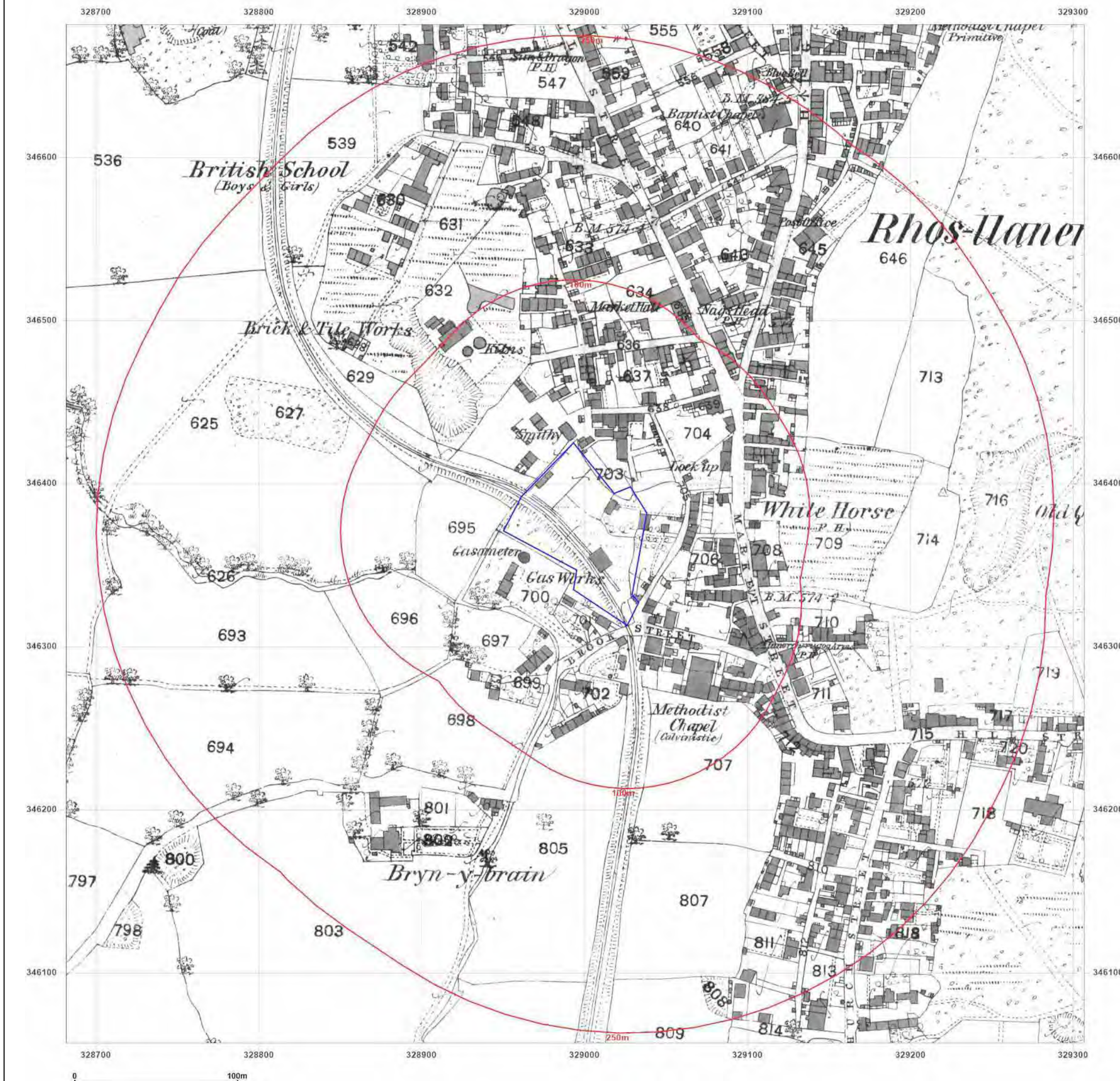


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Site Details:

WMBC CAR PARK, BONC WEN,
RHOSLLANERCHUGOG,
WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: County Series

Map date: 1900

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1900
Revised 1900
Edition N/A
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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: County Series

Map date: 1912

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1912
Revised 1912
Edition N/A
Copyright N/A
Levelled N/A

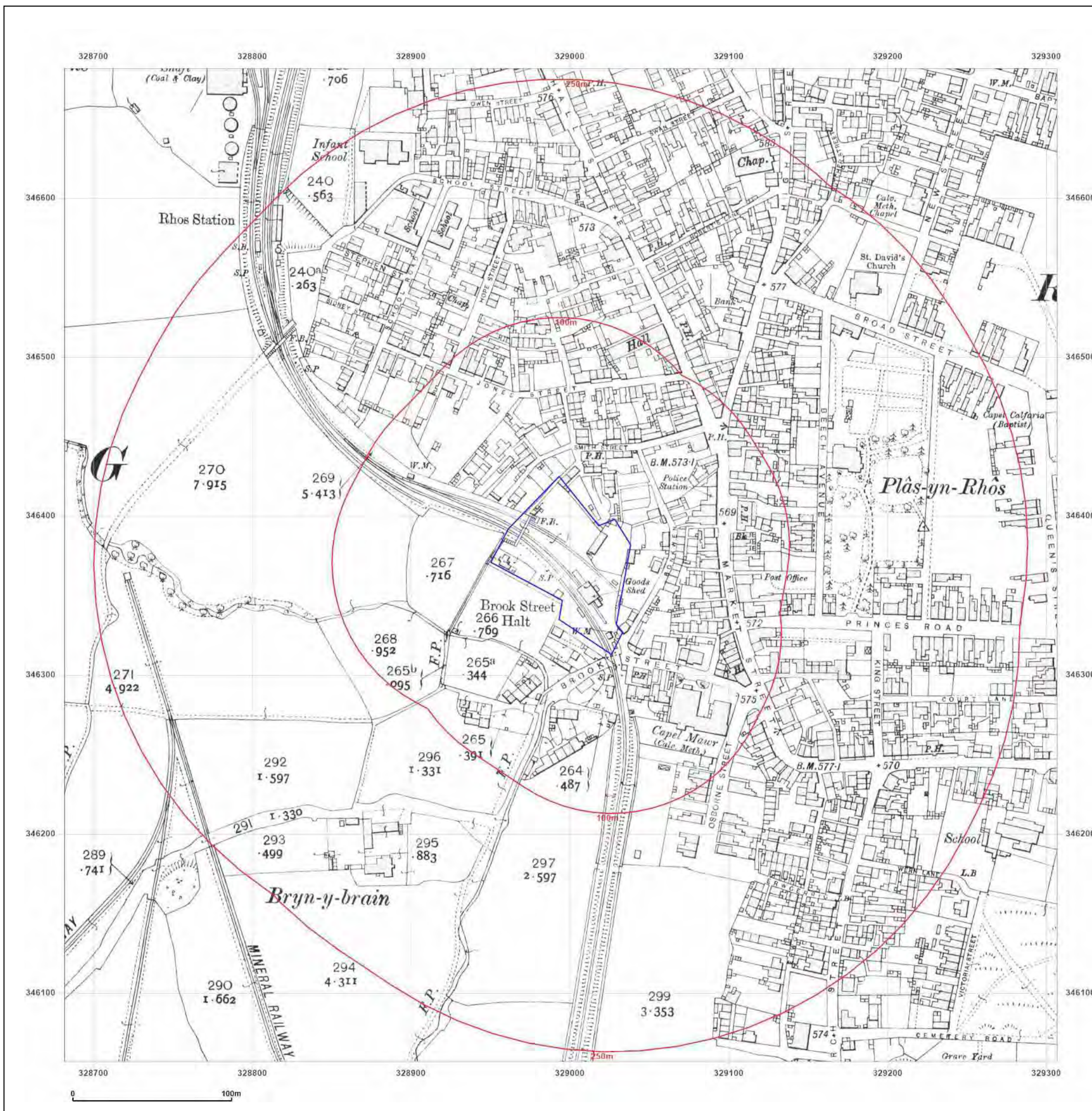


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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1963

Scale: 1:2,500

Printed at: 1:2,500



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

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

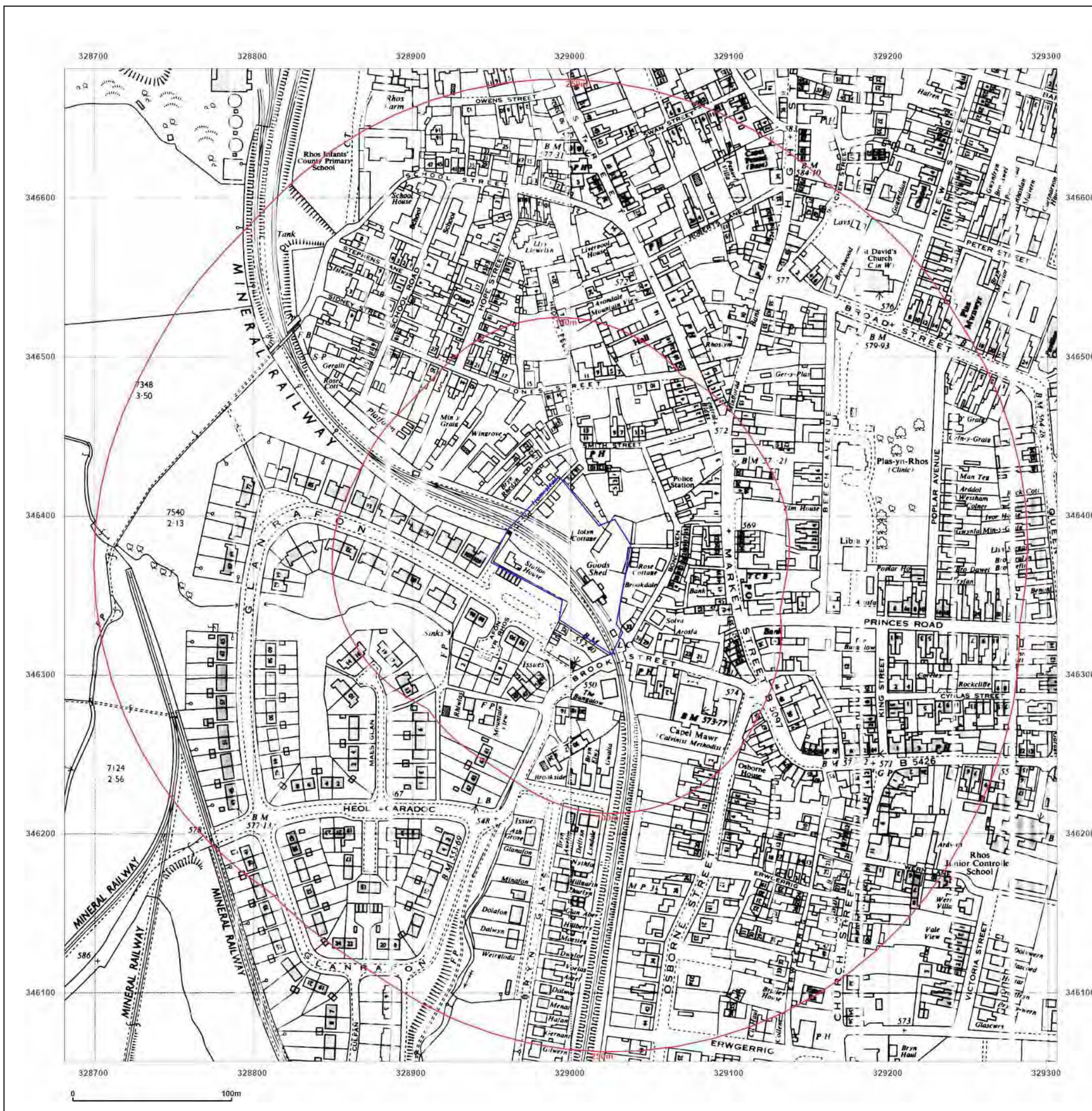


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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1963

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1962
Revised 1962
Edition N/A
Copyright 1963
Levelled 1959

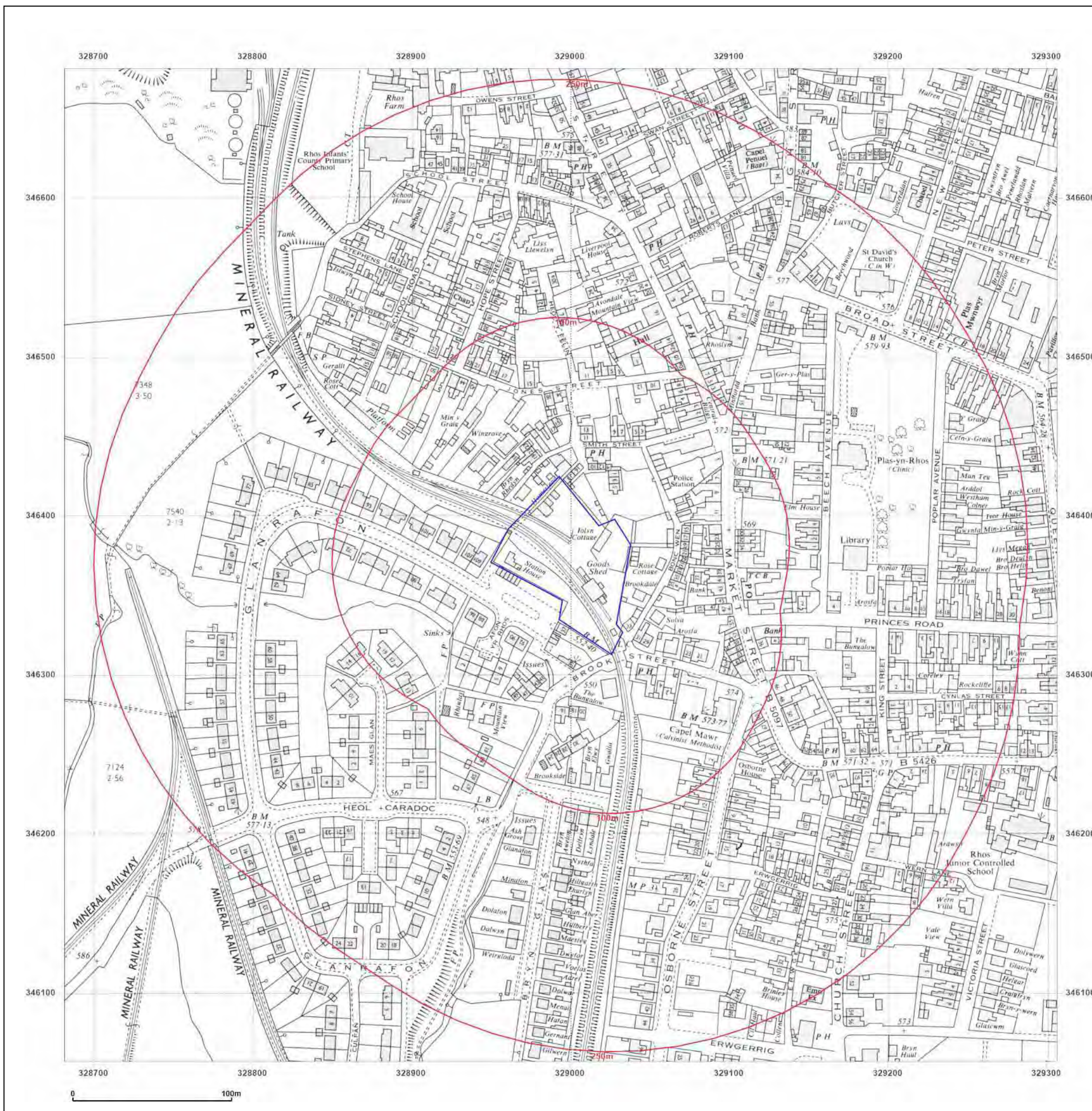


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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1973
Revised 1973
Edition N/A
Copyright 1974
Levelled 1959

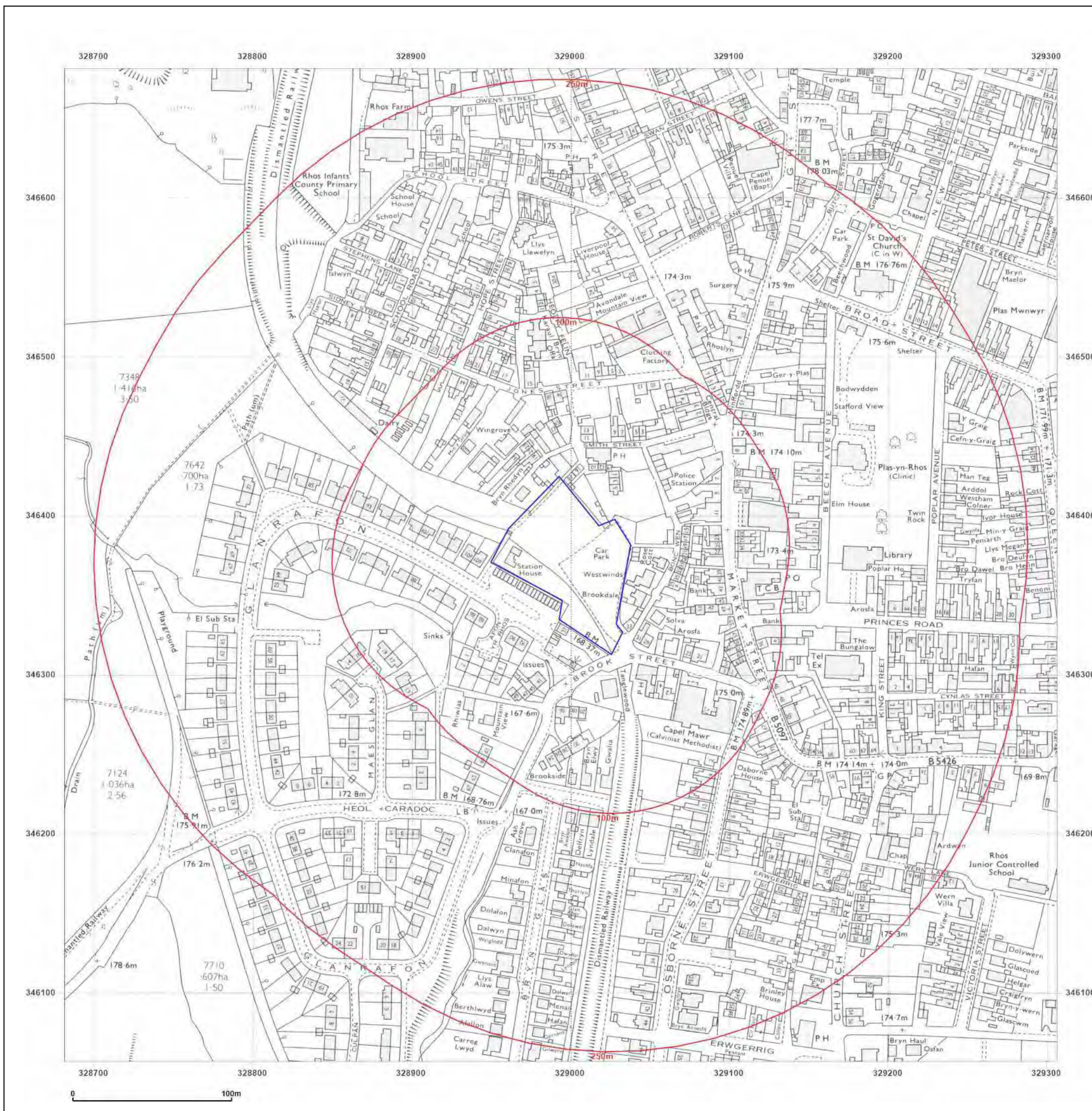


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Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



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

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

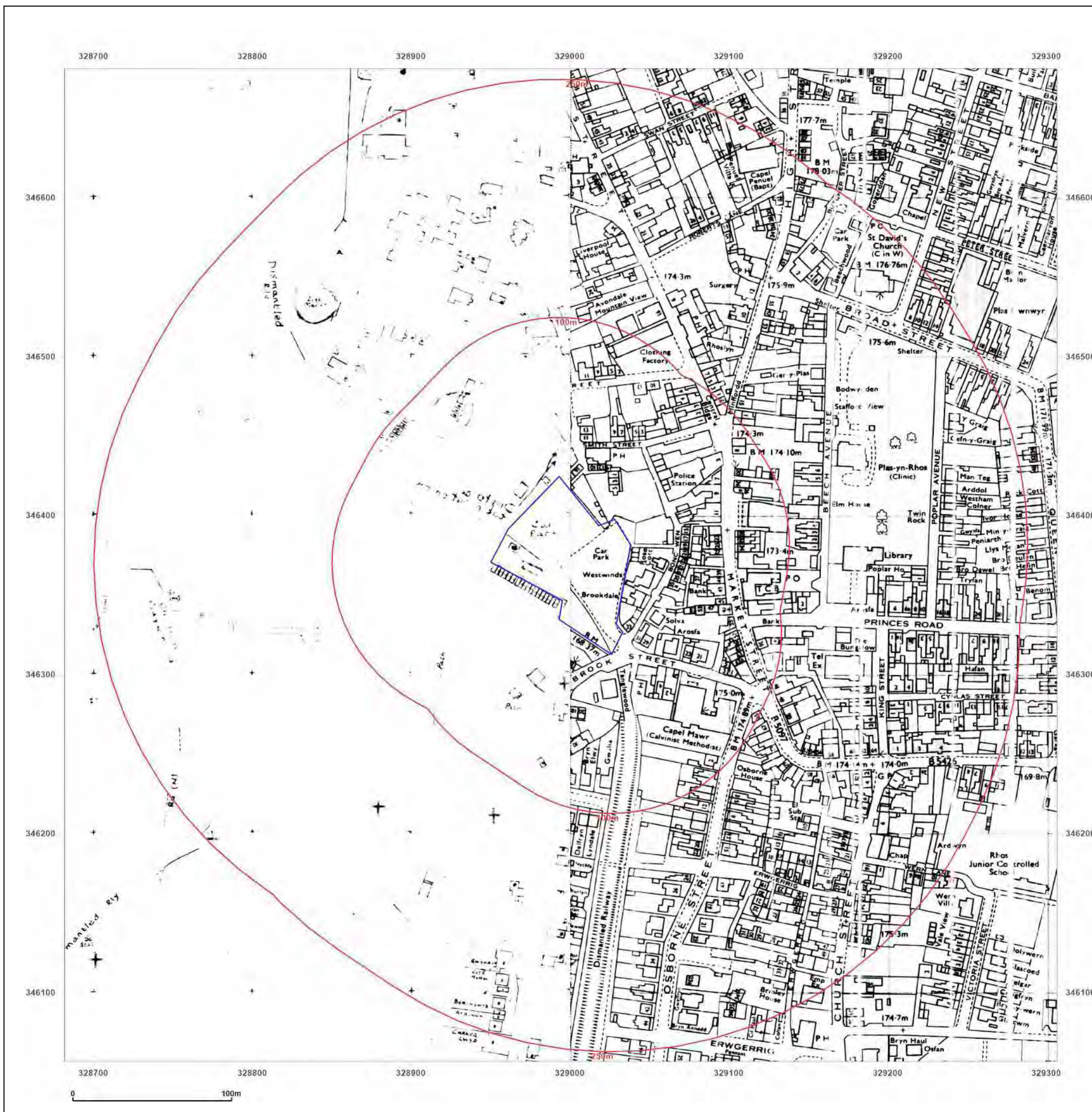


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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



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

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

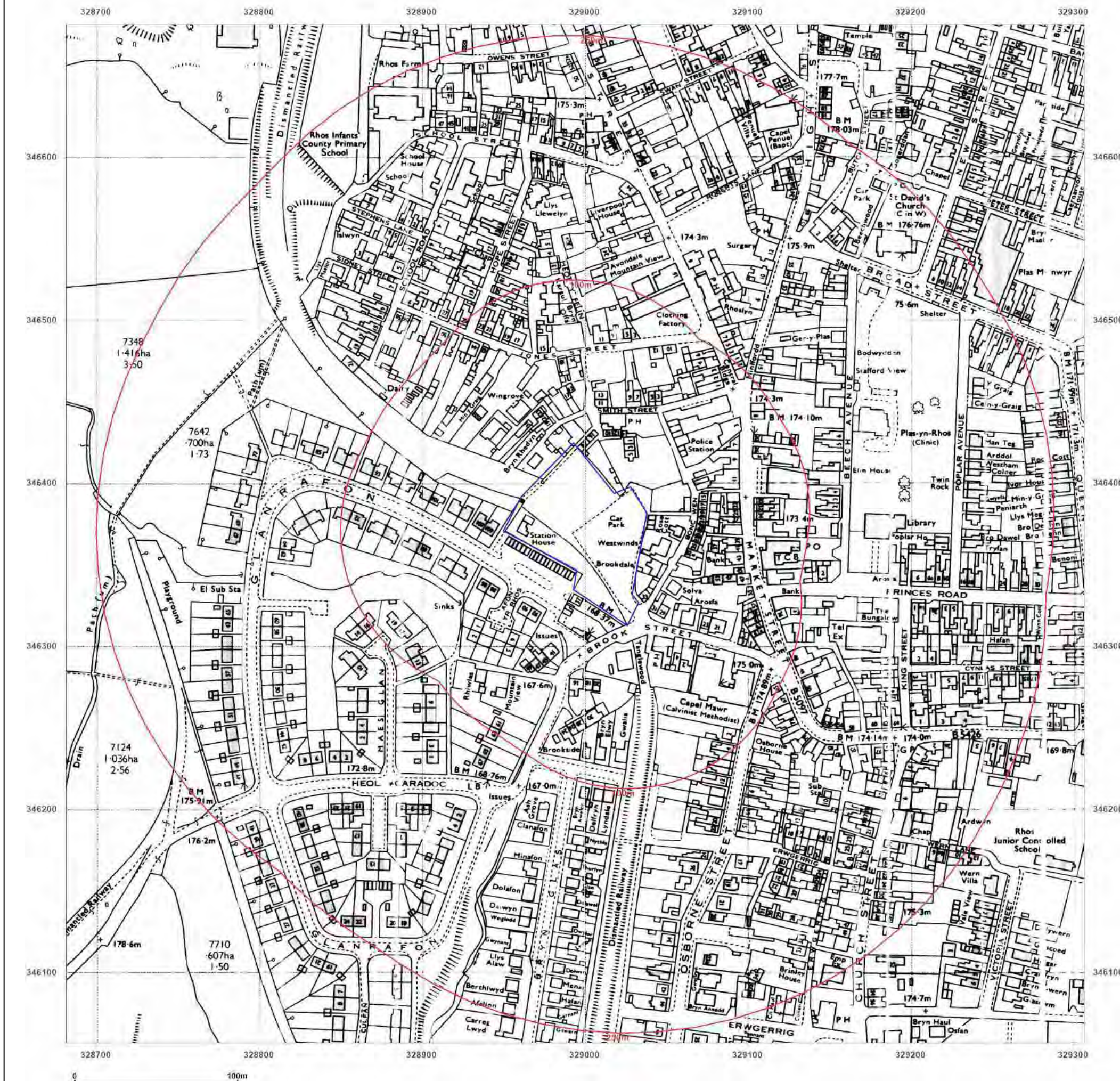


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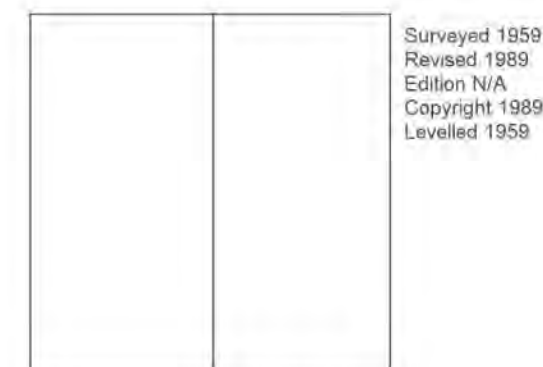
Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1989

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1959
Revised 1989
Edition N/A
Copyright 1989
Levelled 1959

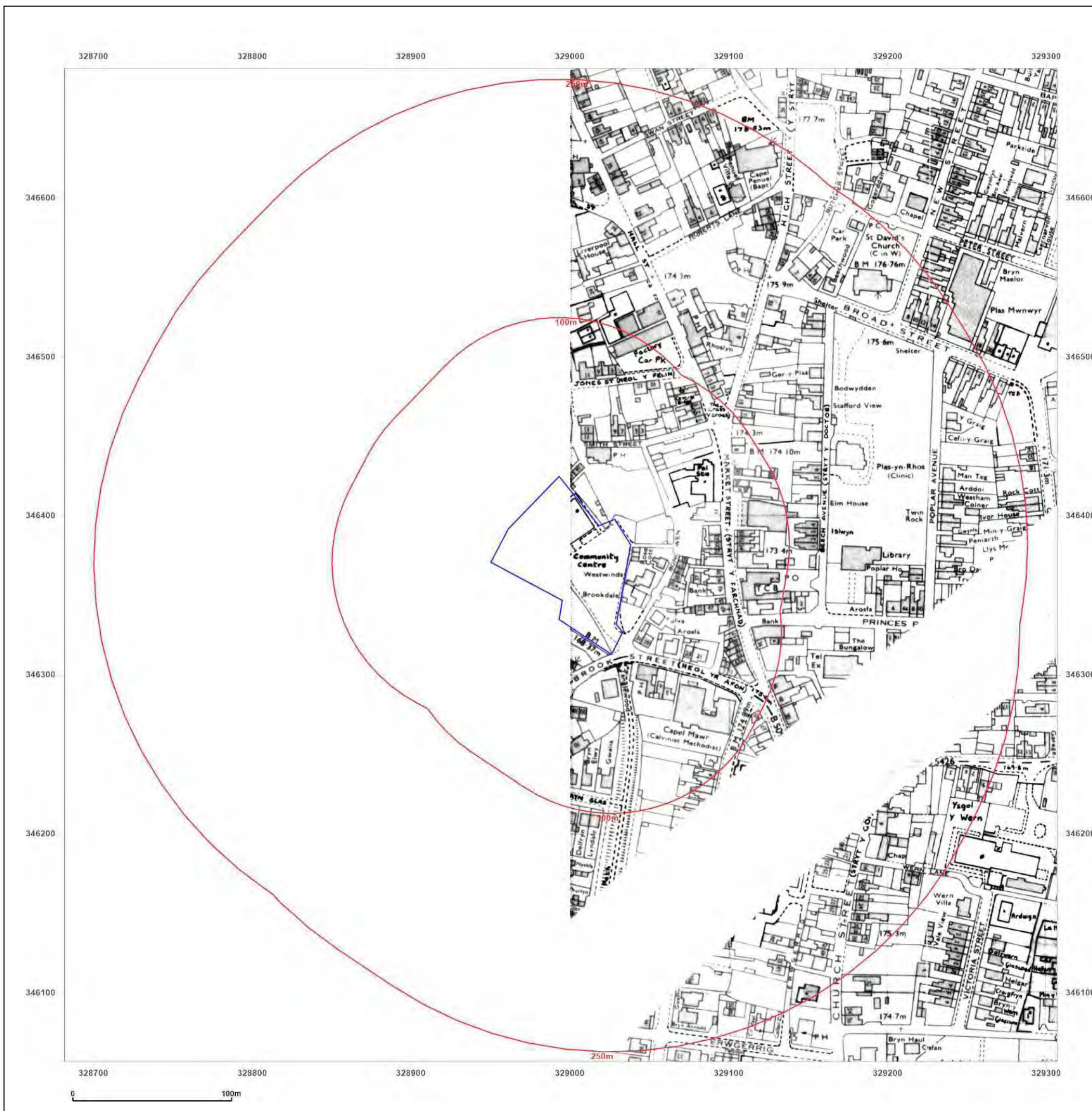


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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1988-1991

Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed 1959
Revised 1988
Edition N/A
Copyright 1988
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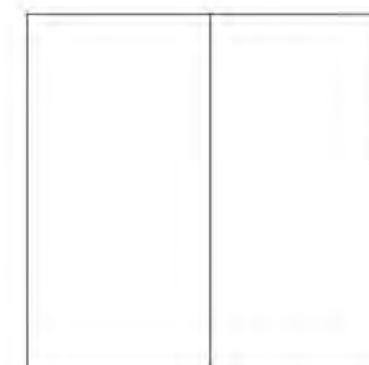
Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1992

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1962
Revised 1990
Edition N/A
Copyright 1992
Levelled N/A

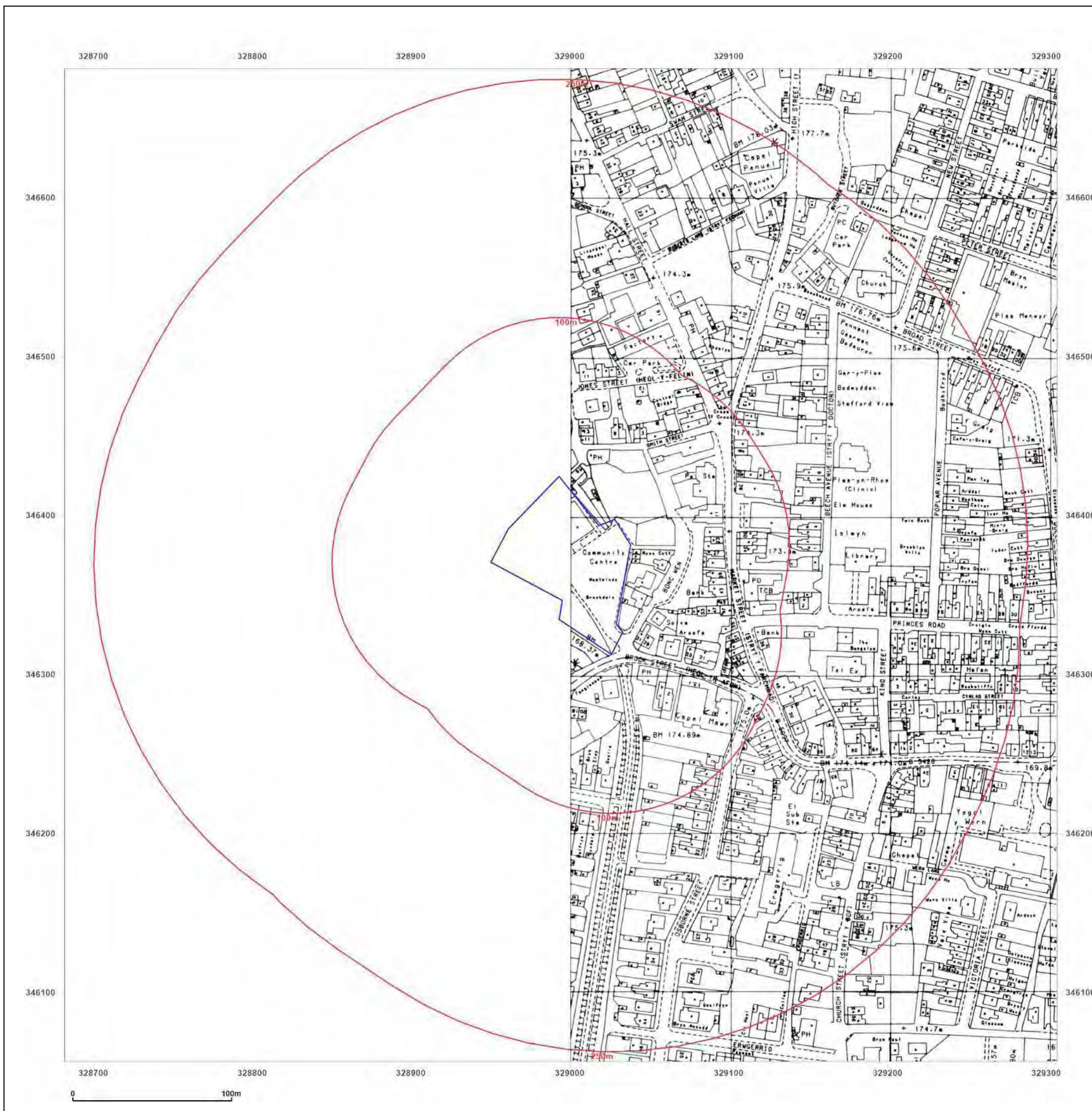


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Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1989-1993

Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed 1959
Revised 1989
Edition N/A
Copyright 1989
Levelled 1959

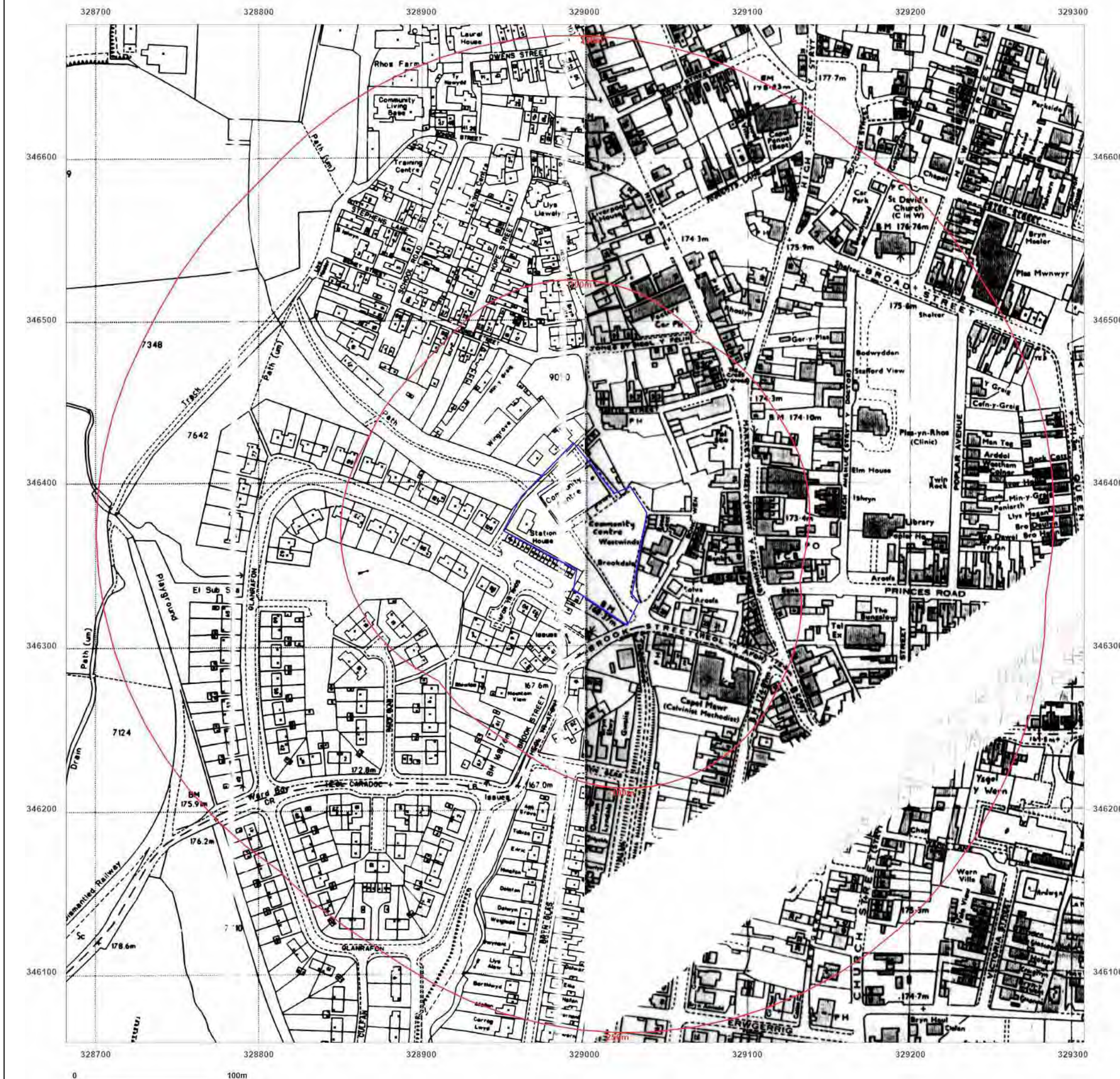


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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



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

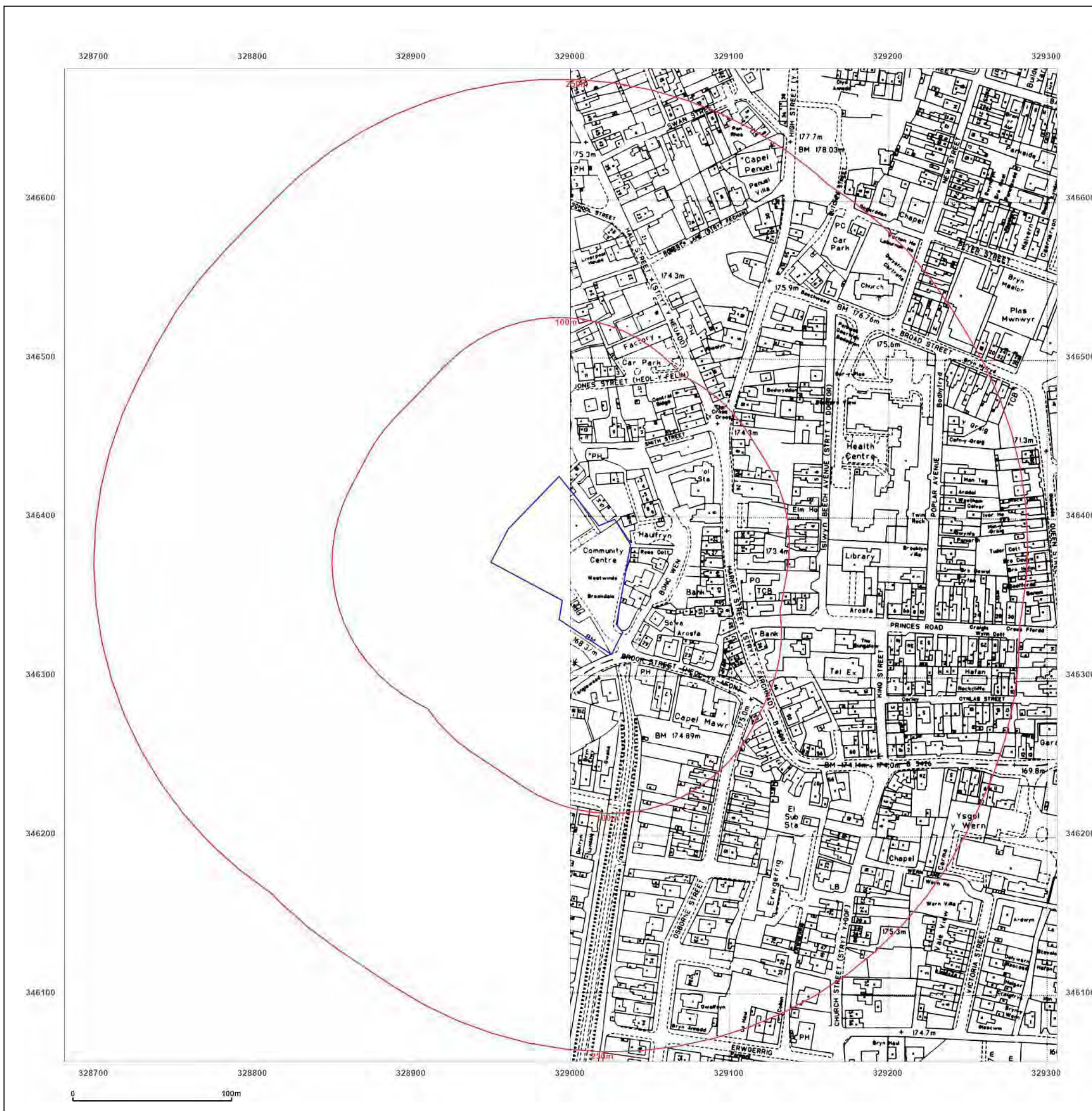


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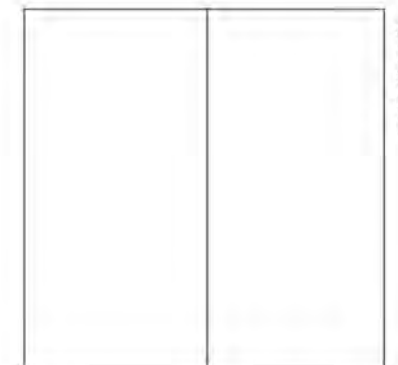
Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1994

Scale: 1:2,500

Printed at: 1:2,500



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

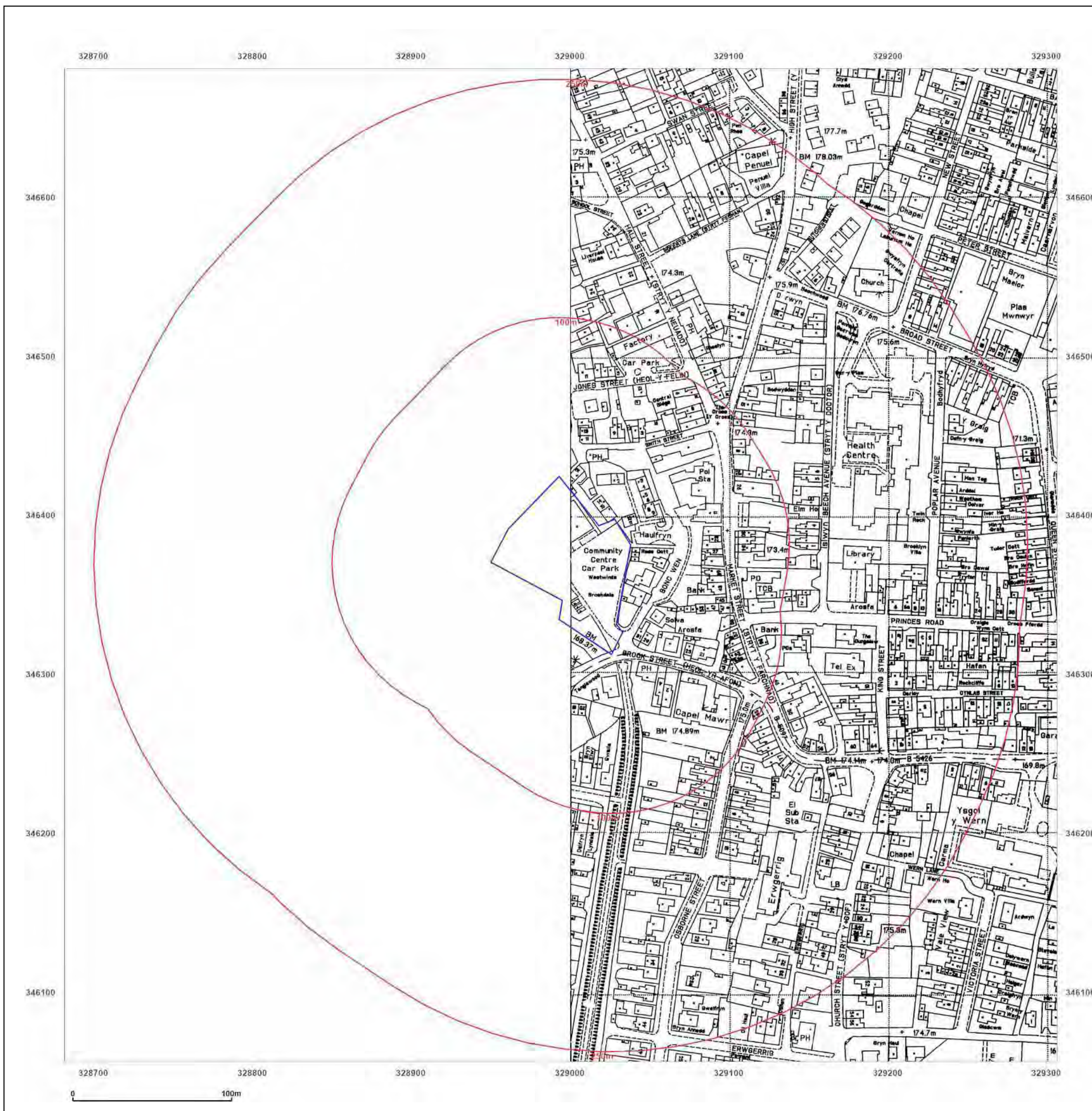


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WREXHAM, LL14 2EE

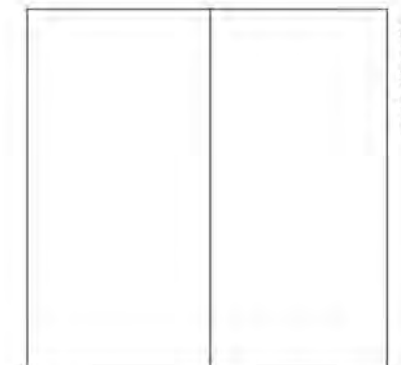
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Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1994

Scale: 1:2,500

Printed at: 1:2,500



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

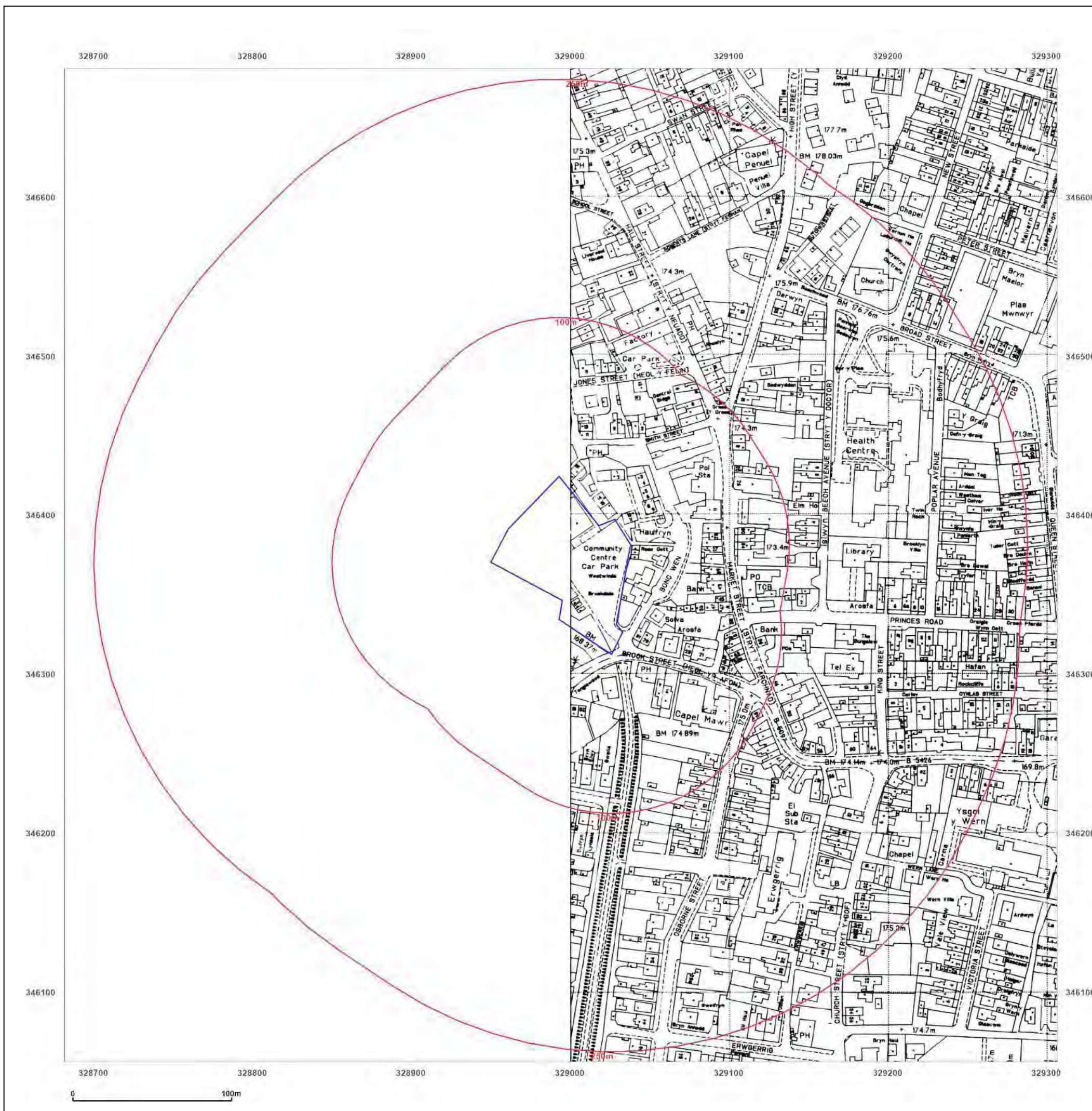


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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250

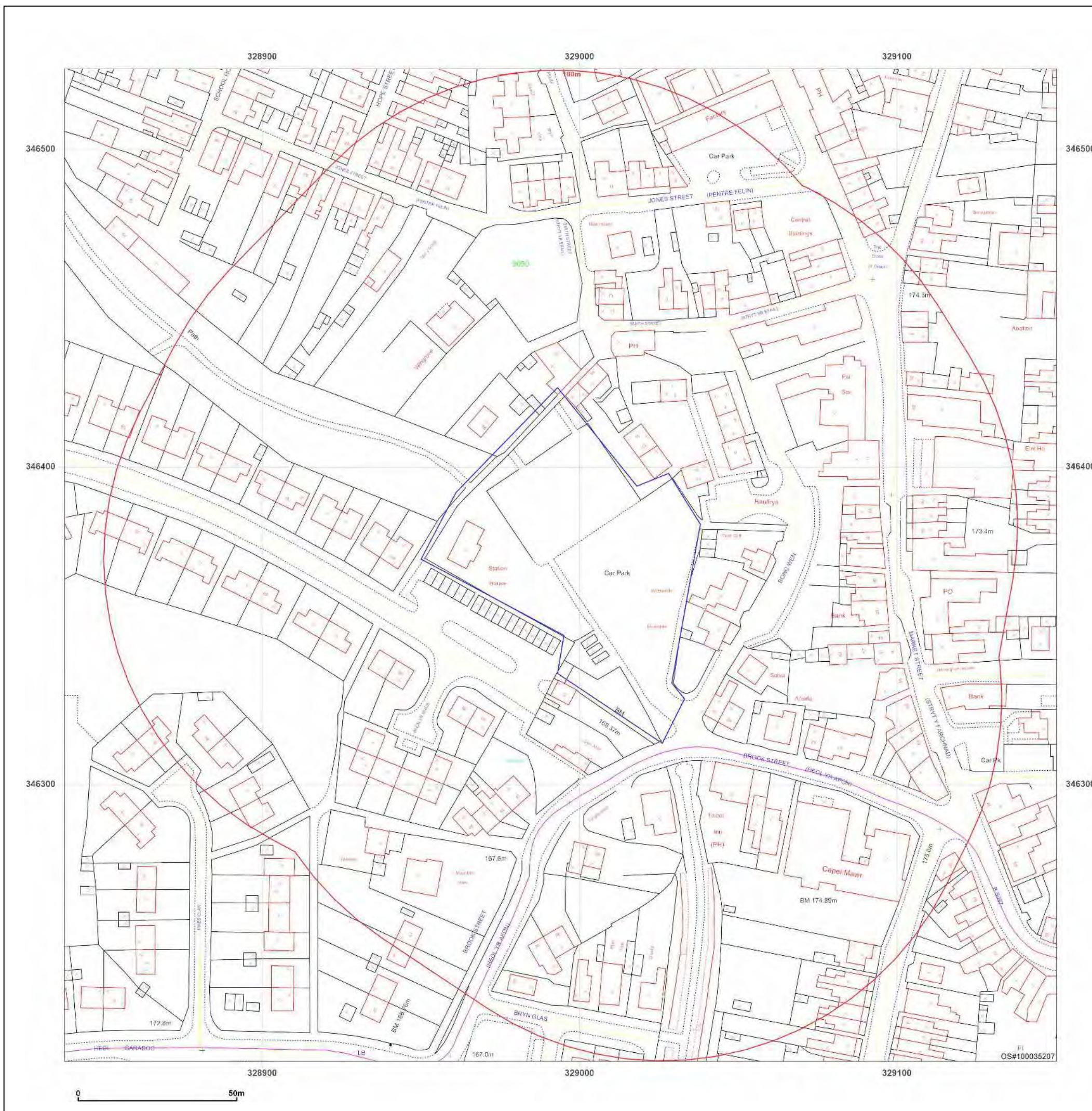


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Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: County Series

Map date: 1872-1873

Scale: 1:10,560

Printed at: 1:10,560



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

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

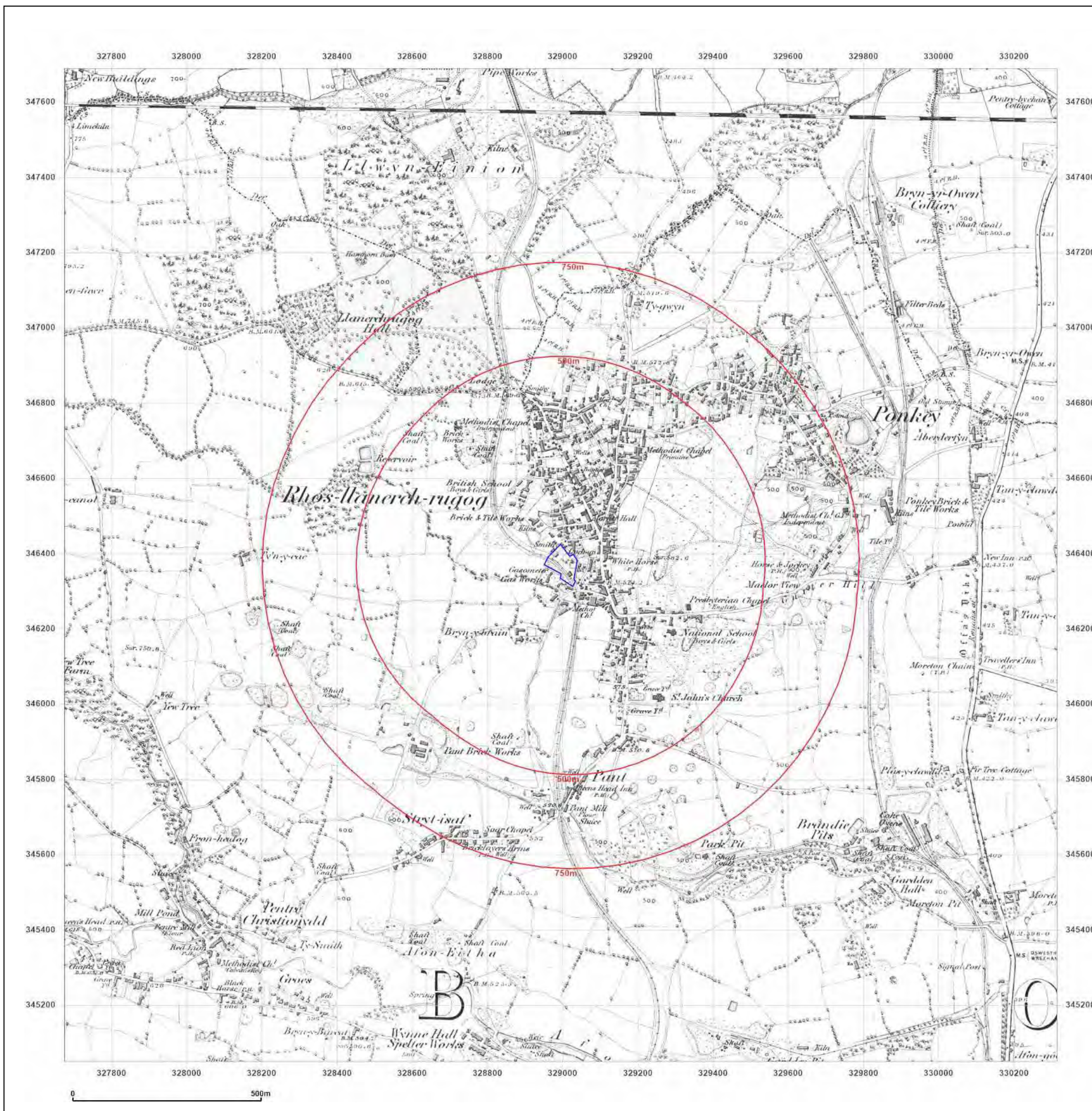


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Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

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 1871
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

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

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

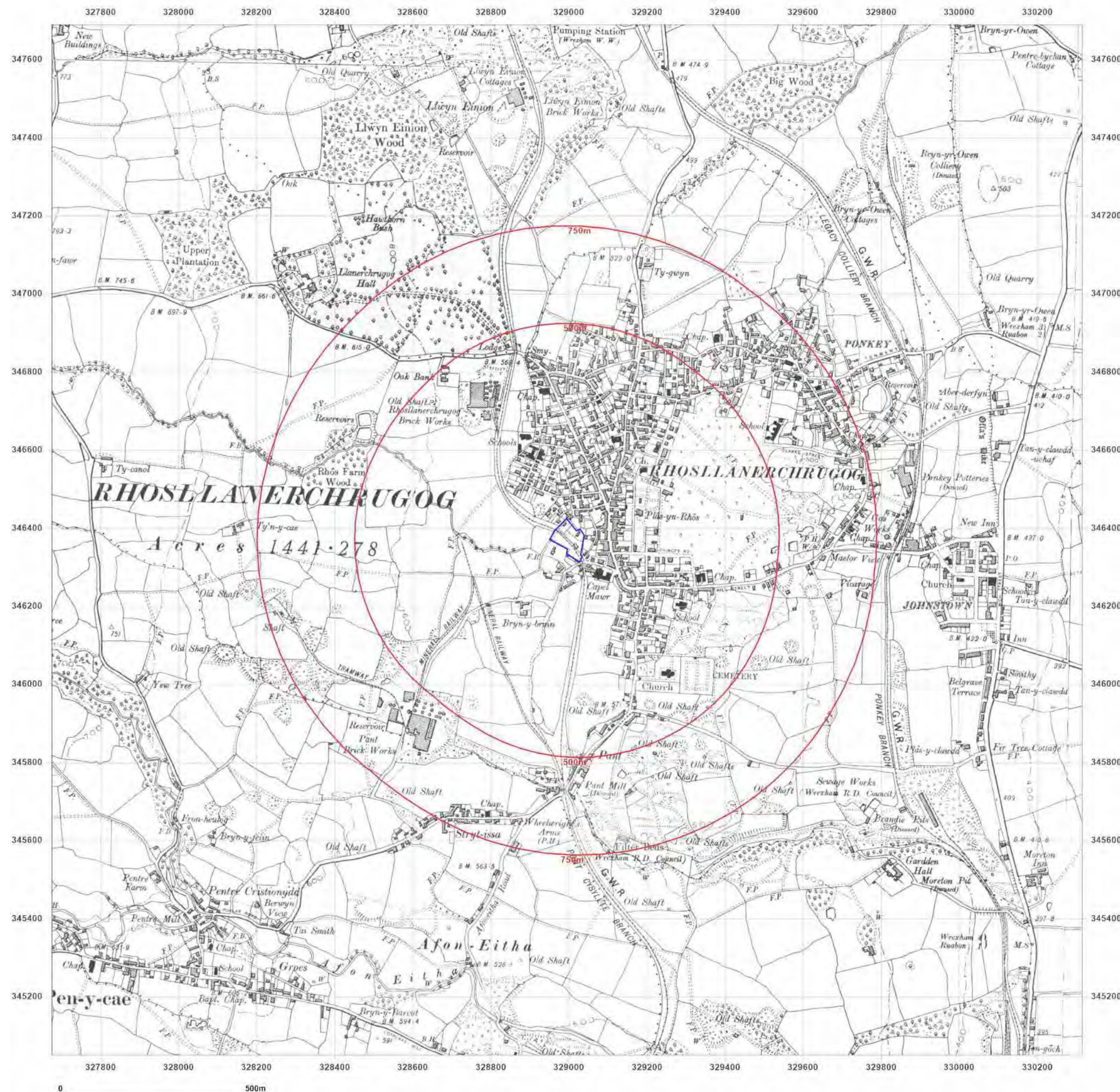


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RHOSLLANERCHRUGOG,
WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: County Series

Map date: 1909-1910

Scale: 1:10,560

Printed at: 1:10,560



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

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

Surveyed 1871
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

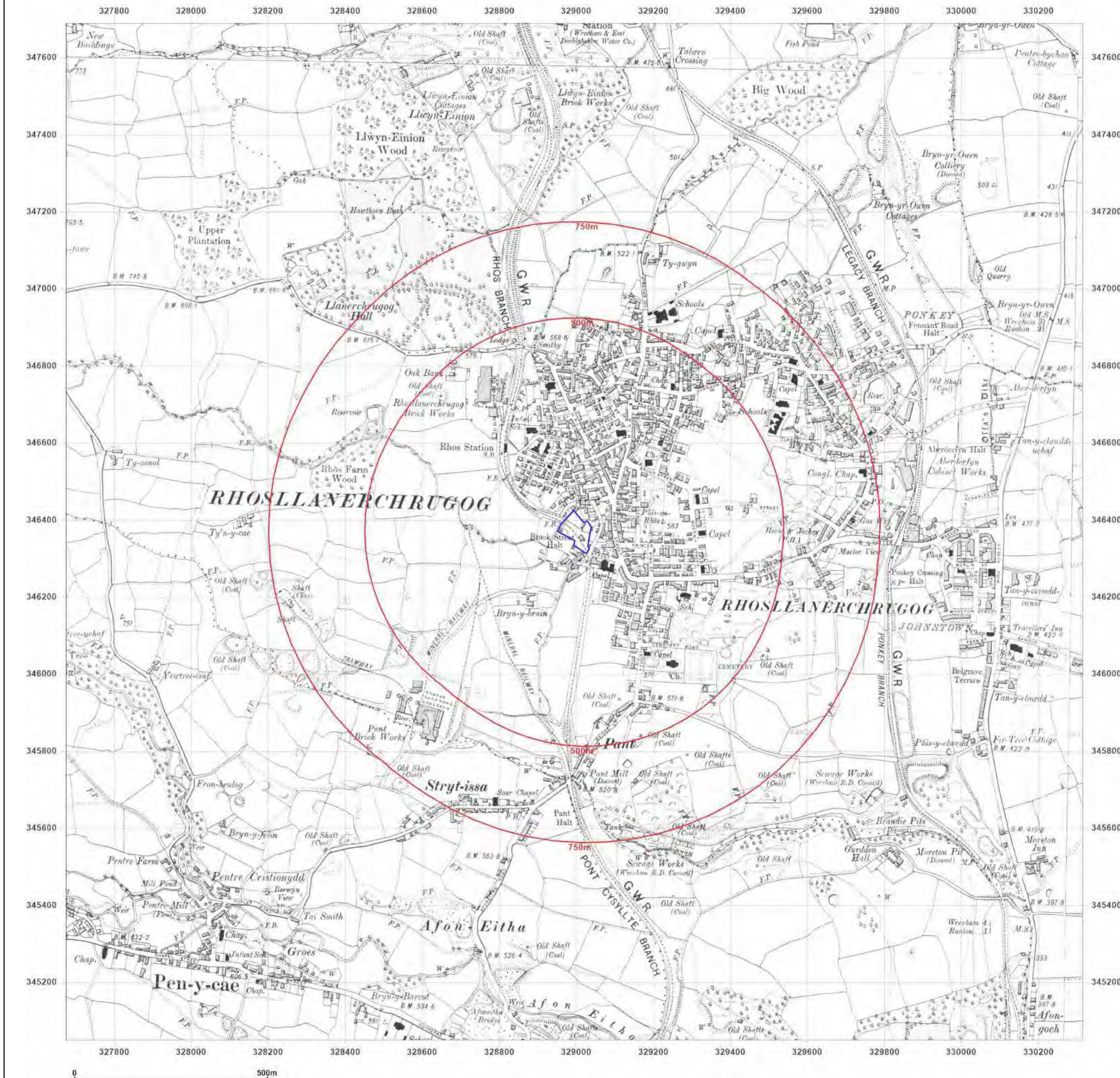


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RHOSLLANERCHRUGOG,
WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



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

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

Surveyed 1871
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

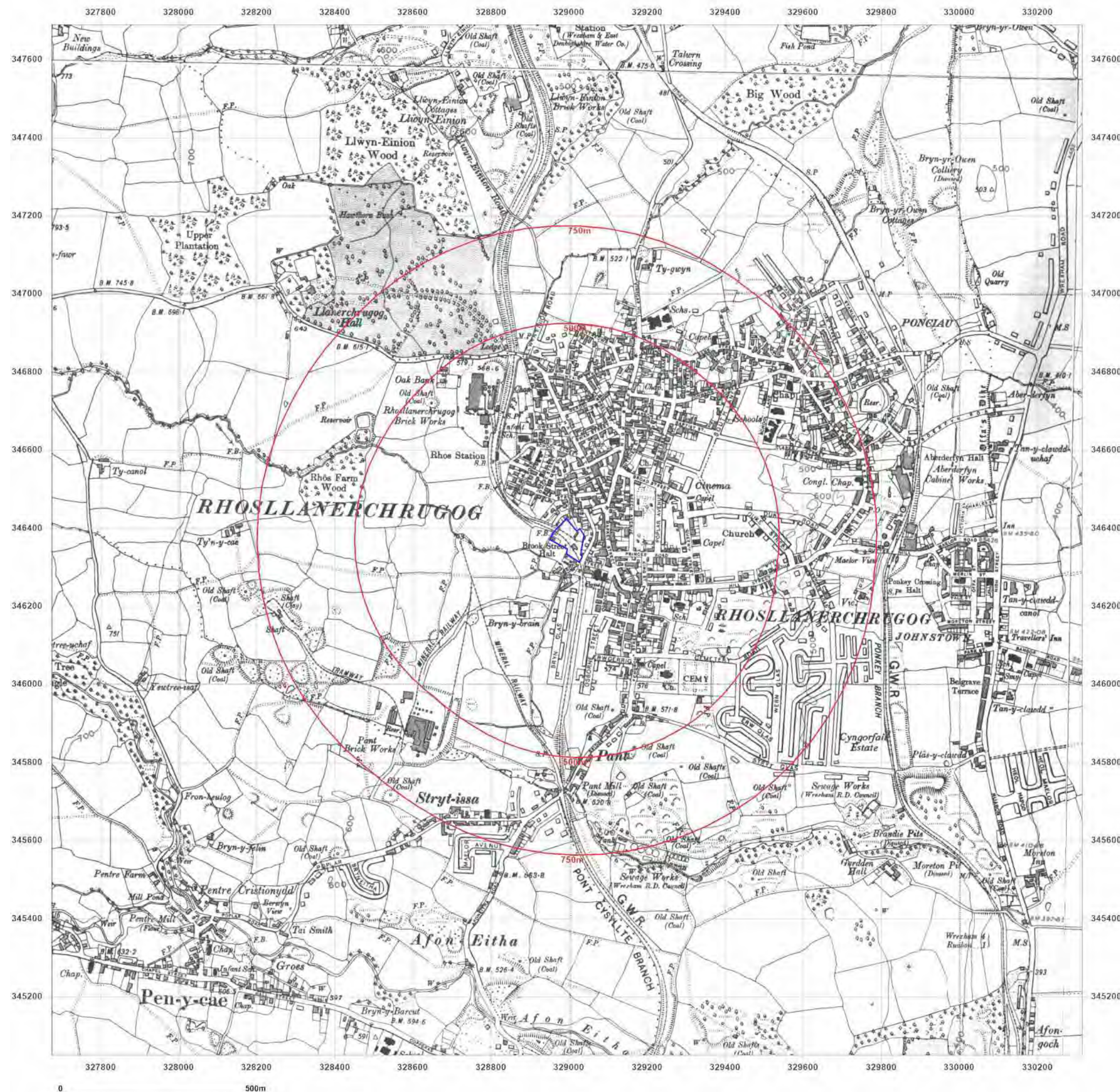


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RHOSLLANERCHRUGOG,
WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: County Series

Map date: 1949

Scale: 1:10,560

Printed at: 1:10,560



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

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

Surveyed 1871
Revised 1949
Edition N/A
Copyright N/A
Levelled N/A

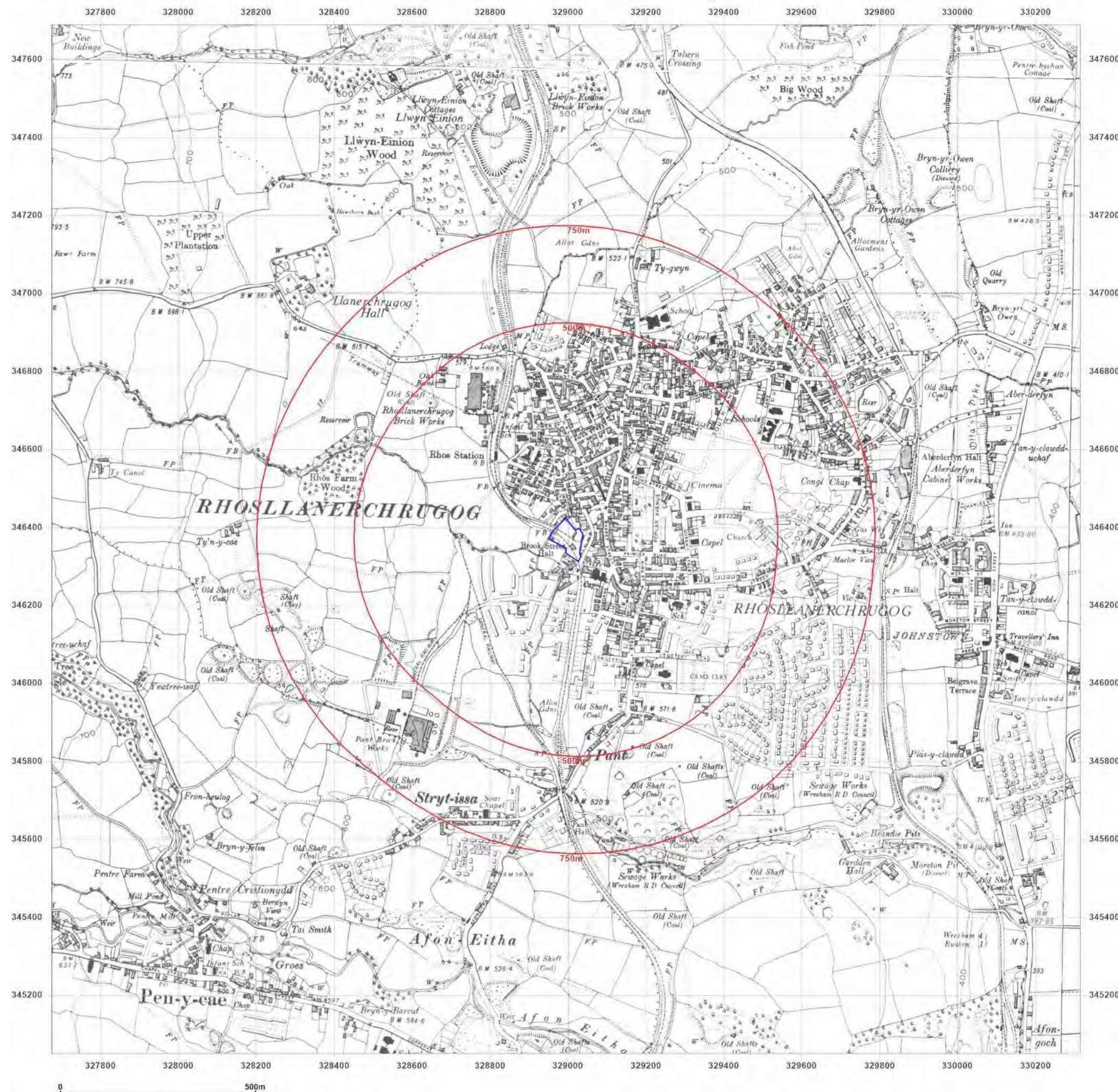


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Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 1976-1979

Scale: 1:10,000

Printed at: 1:10,000



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

Surveyed 1975
Revised 1979
Edition N/A
Copyright 1979
Levelled 1977

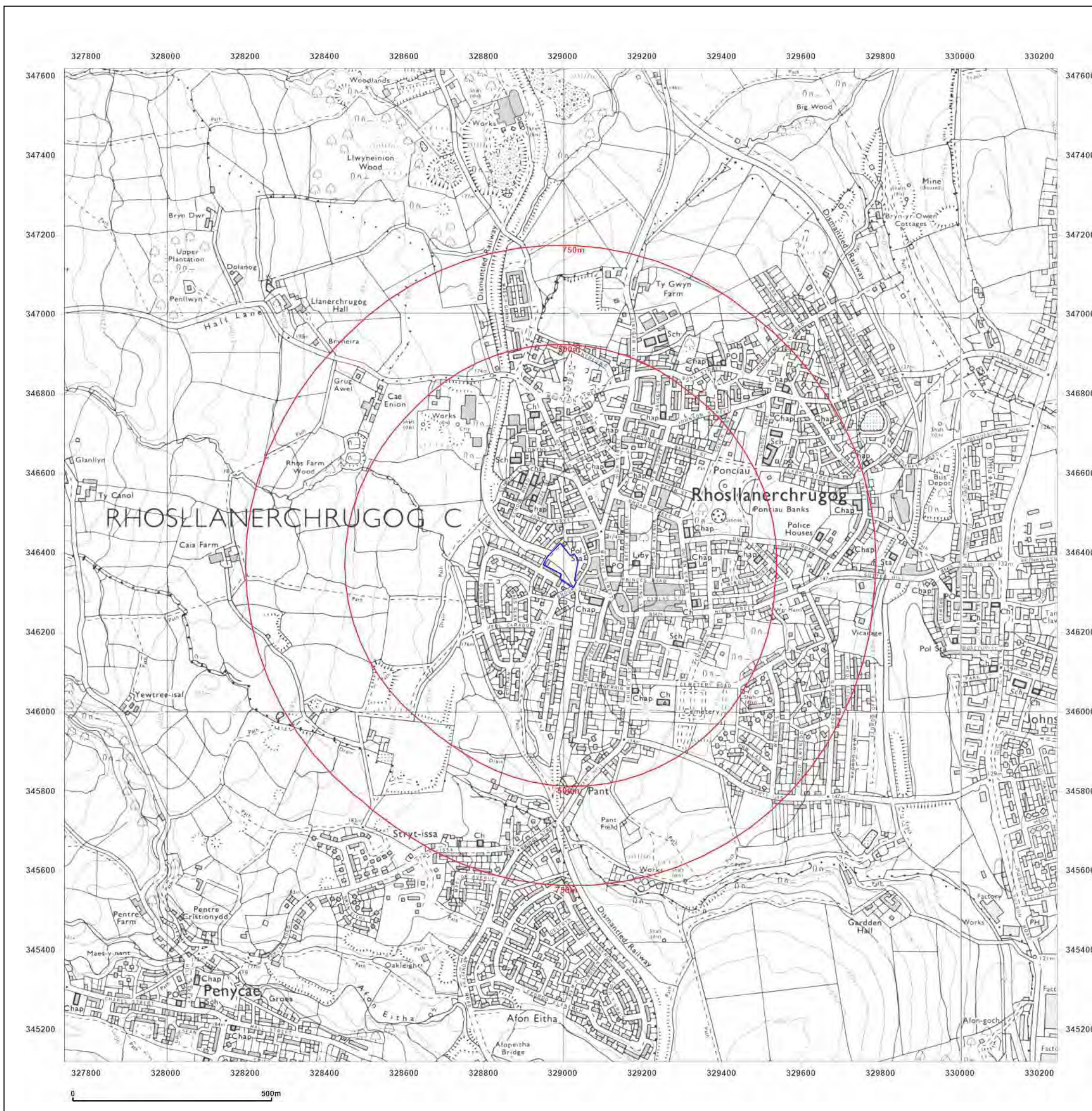


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WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

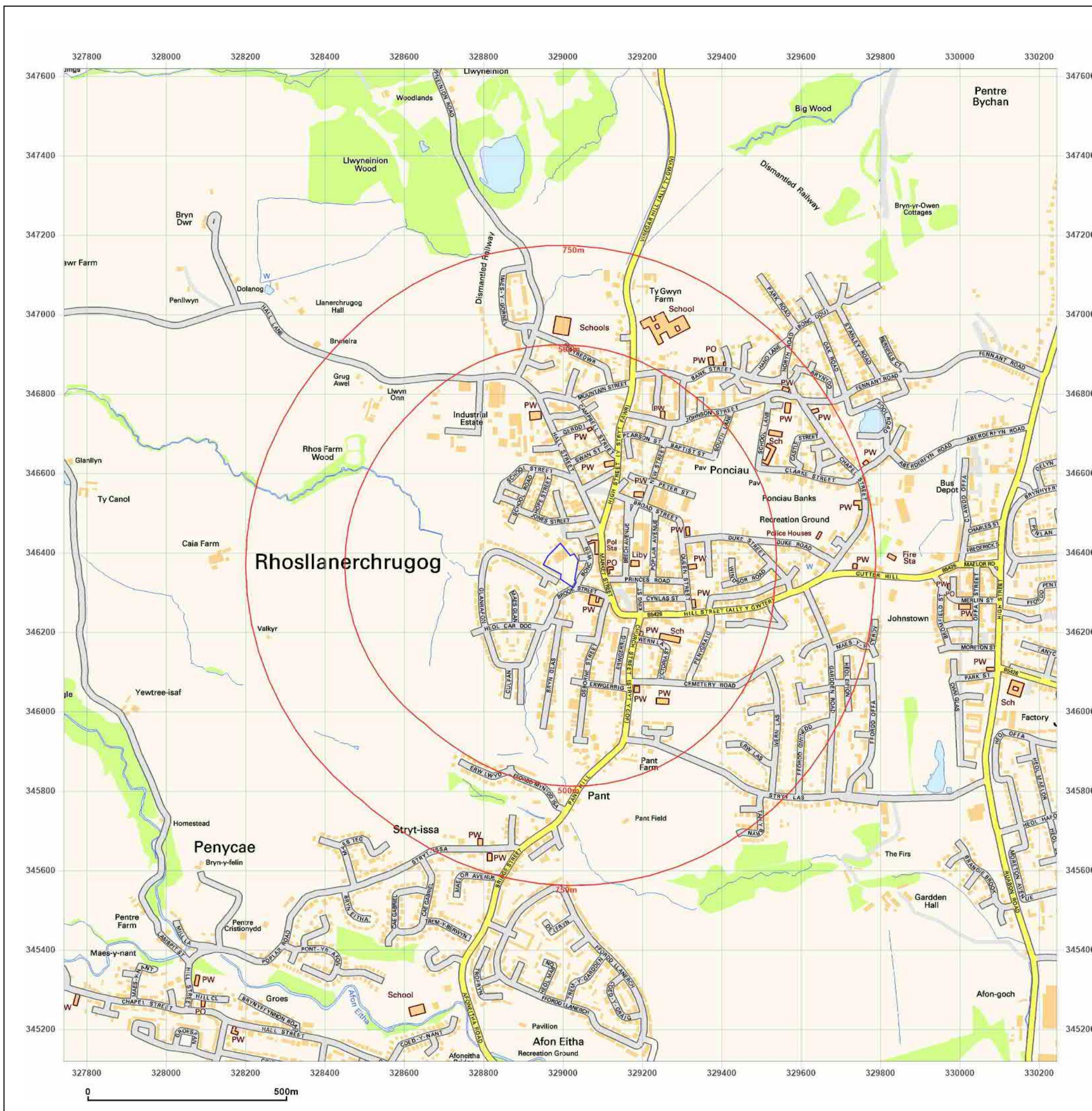


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RHOSLLANERCHRUGOG,
WREXHAM, LL14 2EE

Client Ref: 2774_-_Bonc_Wen
Report Ref: GS-8982677
Grid Ref: 328994, 346369

Map Name: National Grid

Map date: 2022

Scale: 1:10,000

Printed at: 1:10,000



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