

Report No	Date
22181/R2	September 2024
Project	BLAENDULAIS – SUPPLEMENTARY GROUND INVESTIGATION
Client	TRJ

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Report No:	Date:
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Project:
BLAENDULAIS – SUPPLEMENTARY GROUND INVESTIGATION

Issue Number	Status	Description of Amendments
1	Draft	
2	Final	Lab testing incorporated
3	Final	Remaining lab
4	Final	CMGRA Added
5	Final	Phase 1 redrafted on new data

Report prepared by:	
Signed 	September 2024

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1.0 INTRODUCTION

1.1 Introduction

Spectrum Geo Services (SGS) were commissioned by TRJ Ltd. to complete a review of existing GI data at a site at Blaendulais, Seven Sisters, SA10 9DN. This review recommended further ground investigation operations, due to the fact that the building plans had required a change in footprint and Planning Red Line.

The site is approximately 0.228ha in area and is centred on National Grid Reference (NGR) 81942, 08914. The approximate postcode of the site being SA10 9DN.

SGS had completed a review of previous data (22181_R1) dated August 2023, which noted the requirement to undertake further window sampling, trial pitting and probe holes at the site to confirm the ground conditions and the potential presence of shallow coal seams/workings.

1.2 Scope of Works

The objectives of this assessment are to investigate the near surface deposits by window sampling and pitting, and to drill 2 No rotary probe holes with water flush, to determine/confirm the present of coals and the potential presence of broken ground or open workings which may influence the development. This assessment is augmented by the Socotec Desk Study and the Tetra Tech Ground Investigation report, each of which are appended for clarity. SGS also purchased additional Phase 1 data for the redline boundary of the target site, which is employed in the Risk Assessments.

1.3 Limitations

Subsoils are inherently variable and by their very nature are hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that were not apparent from the data available for review.

Unless specifically noted to the contrary, it should be assumed that this report has not been submitted to any regulatory authorities for approval. Redevelopment sites in particular may have planning conditions attached in respect of contaminated land assessment. Where we are made aware of such conditions in advance of scoping the works, we can tailor the report to

the regulatory authority requirements. Where we are not made aware of any such requirements there can be no certainty that our investigation will meet any or all of the regulatory authority requirements.

2.0 EXISTING SITE INFORMATION

2.1 Site Location

The site is located at Blaendulais, Seven Sisters, SA10 9DN.

At the time of the investigation, the site comprised an open area of rough grass, as shown in Figure 01.



Figure 01.

The planning red line is shown in Figure 2.

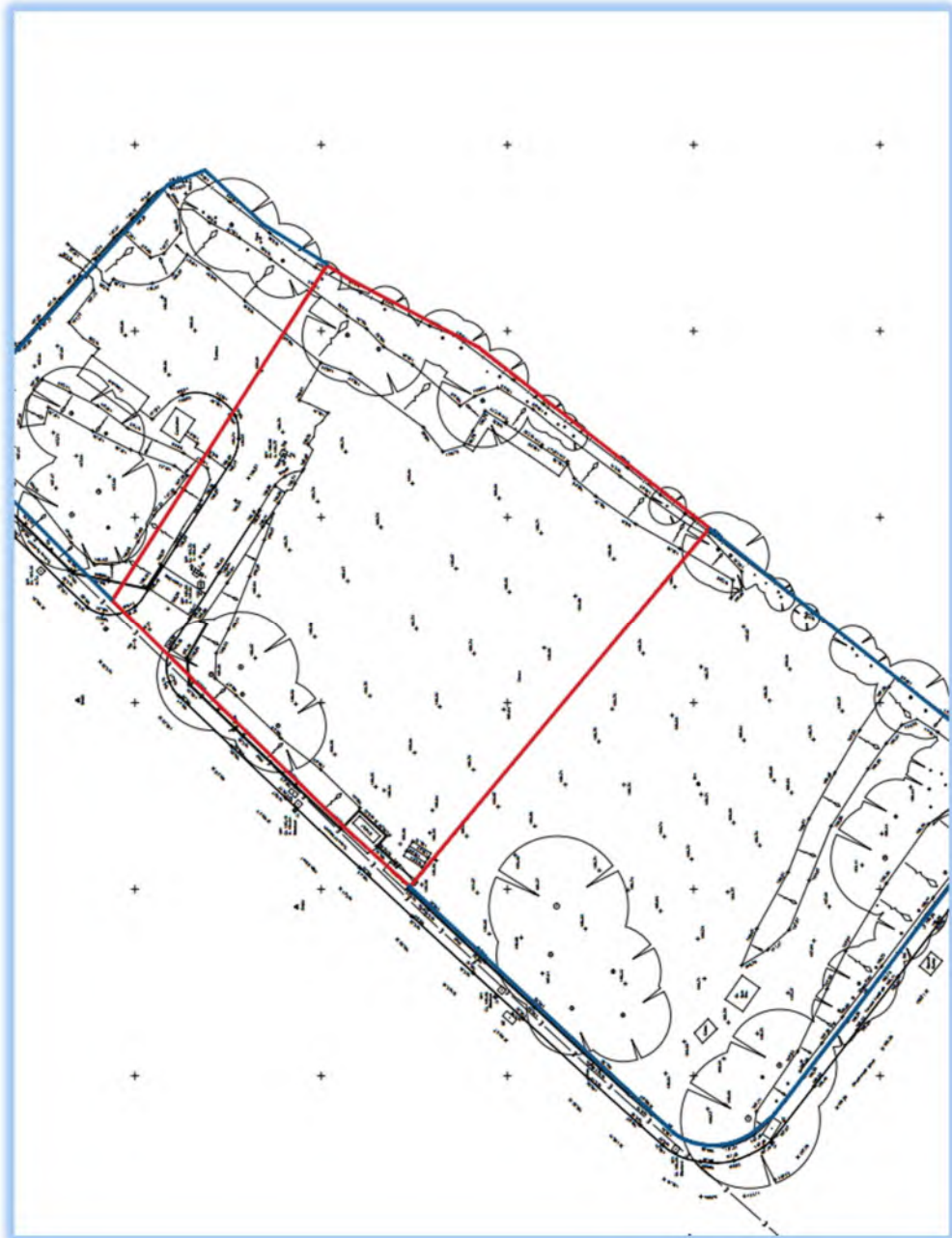


Figure 2

2.2 Published Geology

Information published by the British Geological Survey (BGS) suggests the site to be underlain by a sequence comprising;

Bedrock Geology

South Wales Middle Coal Measures Formation - Mudstone, siltstone and sandstone. Sedimentary bedrock formed between 318 and 309.5 million years ago during the Carboniferous period.



Figure 03: Geological Setting

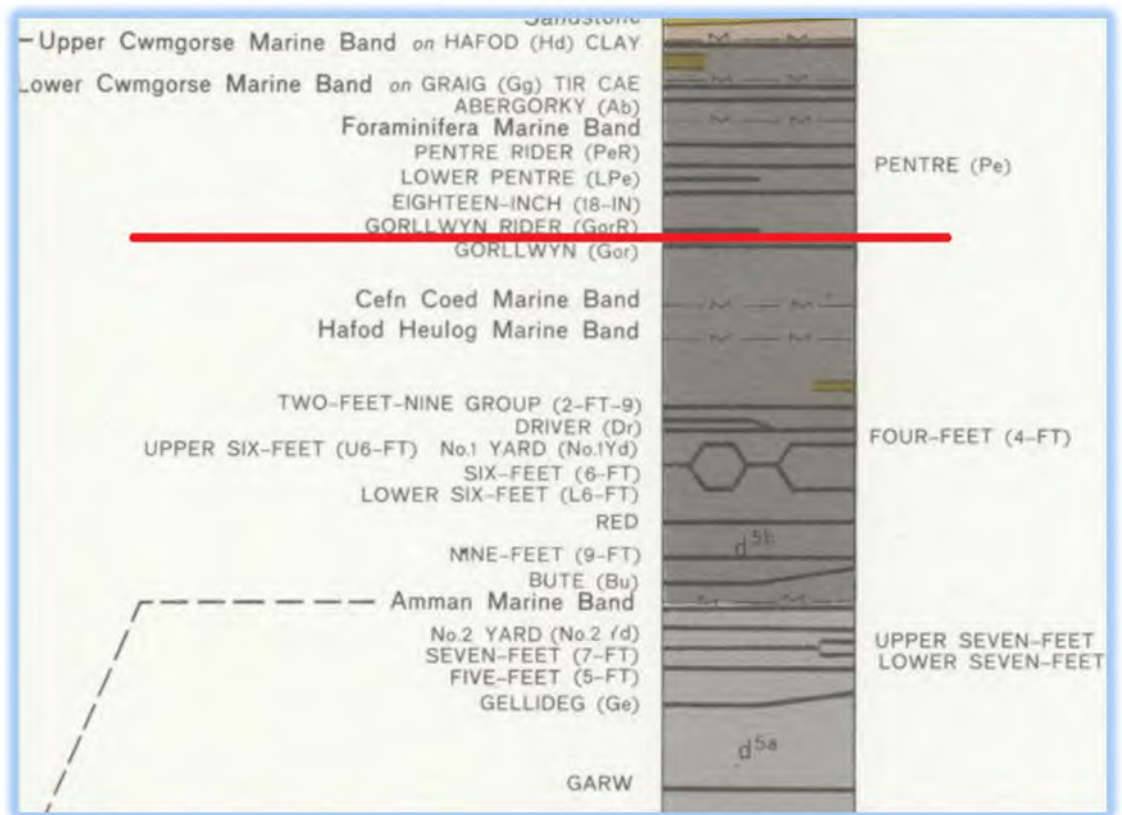


Figure 4: Geological Column

2.3 Hydrology

The site lies to the east of the River Avan, with elevated ground to the west.

Thus, it is anticipated that the predominant groundwater flow is in a westerly direction.

2.4 Hydrogeology

The superficial hydrogeology is as a secondary aquifer, the solid geology being secondary (a).

No abstraction point are local to the site.

3.0 DESK STUDY

3.1 Socotec Desk Study

A desk study adjacent to the site was previously undertaken by Socotec, as noted in 22181_R1.

The SOCOTEC desk top study (DTS) and field reconnaissance report (Report No. H1060- 21) supplied by Neath Port Talbot County Borough Council outlined the following summary of the sites and its key risks.

- *Geoenvironmental and geotechnical hazards may both be encountered on this site – geotechnical hazards are likely to be low but potentially high if the coals seam outcropping beneath the site has been worked, while geoenvironmental hazards may pose moderate risk. A ground investigation should be carried out to confirm the ground conditions, groundwater levels and ground gas at the proposed development locations to provide information to allow for the assessment of geotechnical parameters to be used for preliminary design of foundations along with an assessment of potential contamination on and beneath the site.*
- *The information available at this stage indicates there are potential current and historical sources of contamination on or beneath the site. The sources of these are the hard standing, past mining, former railway sidings and mill pond(s). There are likely to be contaminated soils beneath the site and as the use of soft verges has not been ruled out (neither has the production of edible plants) there is a clear pathway linkage for these to pose a risk to the end users and maintenance workers post development and construction workers during development. The potential for a thicknesses of Made Ground, to be present also means that there is potential for ground gases to also pose a risk.*
- *Further risks are also posed by the surrounding rail sidings further from the site, though the reduced likely pathways mean these pose a lower risk than those present on the site.*
- *A ground investigation should be carried out to confirm the ground conditions and allow assessment of the contamination potentially present at the site. Based on these finding a full*

geoenvironmental assessment will be required to assess the risks posed to the development and its receptors

- *The information at desk study stage indicates the site is underlain by coal bearing strata that has been subject to mining both in the area surrounding and directly beneath the site. There is a coal seam recorded as outcropping directly beneath the site and though this is not recorded as having been worked its shallow nature means it may have been worked but not recorded. Therefore, it may pose a potentially significant risk to the development. In addition the deeper worked and shallow seam are also potentially sources for the generation of ground gases.*

3.2 SGS Desk Study

A desk study was commissioned for the updated red line boundary shown in Figure 2.

The data is Appended. Timeline based upon available historic maps:

- 1877 to 1879: Railway Station is in the north eastern corner of the site. Rail line running along the eastern boundary, north/south. A terrace of houses is noted along the western boundary. Seven Sisters pit is noted 250m north.
- 1898: Standert Tce and Railway Tce. have been built to the east of the site.
- 1918: Railway sidings run through the site, in the eastern half, northwest to south east.
- 1962: Ditto. Lavs shown in the south western corner.
- 1989: Canolfan building at site.

3.3 Radon Report

The appended radon report indicates that the site is not within a radon affected area.

3.4 Enviro Insight Report

The Enviro Insight report assesses the recorded likelihood of occurrence of various environmental risks at the site.

- a) Historic Landfill – none at site. Closest at 139m N.
- b) Environmental Permits – not identified,
- c) Landfill – not identified
- d) Current land use – not identified
- e) Former land use – on site sidings, station, coal pit, colliery, **though the CA report says no entries and colliery 100m to north.**
- f) Abstraction Licences – not identified on site,
- g) Surface Water abstraction Licences – not identified on site,
- h) Flooding Groundwater – negligible to low,
- i) Flooding Surface Water – 1 in 1000 year. 0.1m to 0.30m
- j) Environmental Sensitivity – not identified
- k) Natural Hazards – low (see Coal Mining Report)
- l) Industrial Landuse – none
- m) Hydrogeology – superficial aquifer, secondary undifferentiated, bedrock Secondary A.

Historic mapping shows that there were railway sidings running north south through the mid east of the site, during the period 1918 to 1962.

3.5 Site Walkover

A walkover was undertaken as part of the Phase 1, and is appended to this report. No sources or evidence of contamination were observed.

3.6 Previous Ground Investigation

Tetra Tech undertook a Phase2 Ground Investigation.

The site investigation was undertaken between 16th and 19th May 2022. The scope of the investigation specified by Neath Port Talbot Council is based on the desk top study undertaken by SOCOTEC Report No. H1060-21 and included the following:

- *Two combined dynamic sample and rotary open hole boreholes (BH01 and BH02) to a depth of 30metres, with sampling and SPTs in the upper 10metres.*

- *Twelve windowless sample boreholes (WS01-WS12) to refusal at depths ranging between 0.4 and 2.9m bgl, with regular SPTs and samples taken.*
- *One day of soakaway testing in two trial pits (TP03 and TP04) at depths of 1.4m bgl and 1.1m bgl.*
- *Five TRL DCP locations to obtain indicative CBR values around the site.*
- *Installation of gas/groundwater monitoring standpipes within both boreholes and one windowless sample borehole (WS08).*
- *On-site inspection and logging of recovered samples.*
- *Representative soil samples taken and submitted for geotechnical classification testing. Representative soil samples submitted and tested for a suite of potential contaminants.*

3.7 Coal Mining Risk Assessment (CMRA)

The Tetra Tech risk assessment indicates that there is a Low Risk of ground instability as a result of deep or shallow recorded/unrecorded mining and mining geology beneath the site. Following the drilling of two rotary openhole boreholes no workings were encountered in the Gorwyllyn seam.

3.8 Ground Contamination

Laboratory testing to the south of the site has recorded a limited number of exceedances on beryllium and arsenic, however within the context of the proposed development and the predominant hard standing the recorded concentrations are not considered to pose a significant risk to site users. Elevated concentrations of PAH have also been recorded in the soil derived leachate samples, with a single PAH compound identified within groundwater. However, given the limited nature of the exceedances and the low permeability of the subsurface strata the recorded concentrations are not considered to pose a risk to controlled waters.

3.5 Ground Gas

Ground gas monitoring undertaken on the site has recorded limited concentrations of carbon dioxide and methane within the subsurface. The site has been defined as a Characteristic Situation 1 (Very Low risk) whereby no ground gas protection measures are considered necessary within the context of the proposed development.

4.0 SGS SITE OPERATIONS

4.1 Site Works

Site works comprised window sampling, machine dug trial pits and 2 rotary drilled probe holes, employing water flush and Klemm drill rig. These were drilled on 29 and 30 September 2023. The positions are shown on Drawing 22177/Locs.

100% water flush returns were noted by the driller during the rotary probing. On completion the holes were filled with bentonite grout, with no excessive take.

Borehole logs are shown in Appendix B. The results of previous ground investigations are appended.

5.0 SITE CONDITIONS ENCOUNTERED

5.1 Ground Conditions

During both ground investigations, a generalised succession as was noted, indicated in Table 5.1.

Stratum	Depth to base (m)	Remarks
MADE GROUND	0.30 to 0.70	
Stiff CLAY	0.70 to 2.90	Glacial Till
GRAVEL	(1.20)	SA01 only
MUDSTONE	(30.00)	
BH03 Coal	24.80 – 25.00	
BH04 Coal	22.20 – 22.50	

Table 5.1. Generalised Strata

5.2 Groundwater Conditions

Water strikes were noted at 1.50m as a seepage at SA01 and between 11.20m and 15.00m at BH03 and 04. Post site monitoring has noted groundwater levels in the standpipes within the upper 1.50m.

It should be noted that groundwater levels vary due to changes in climatic and other conditions and may therefore vary from those recorded during these operations.

5.3 Soakaway Testing

None of the soakaway testing produced an appropriate infiltration rate (If), as the ground was impermeable. The results are appended.

Thus, the values are not considered to be suitable for soakaway drainage solutions.

6.0 LABORATORY TESTING

Chemical laboratory testing was conducted to determine the concentrations of the following. As the Aquifers were undifferentiated and Secondary, and soakaway values were not suitable, leachate testing was not undertaken, though some data was developed within the Tetra Tech study immediately to the south;

- Metals
- Asbestos
- pH and SO₄
- PAH MS
- TPH CWG
- WAC E 1 stage

Chemical soil analysis was undertaken at 4 locations across the accessible part of the site in broad accordance with the DOE Industrial Profile for “Railway Land”. Samples were taken, both at the area of railway sidings and to the west of those. Further testing is considered to be necessary in the wooded area once landscaping plans are developed. The results are appended.

7.0 PRELIMINARY CONCEPTUAL MODEL AND QUALITATIVE RISK ASSESSMENT

Source Characterisation

All potential **on-site** and **off-site** sources of contamination identified are detailed in Table 7.1.1 below. The table also details any which have been discounted.

Table 7.1. 1: Identified Potential Sources of Contamination

Source		Distance (m)	Compass Direction	Identified by:	Comments
Probable Made Ground and Railway Sidings	On-Site	0		Possible	Suite of contamination testing required to negate source.
Mine Ground Gas	On-Site	0		Possible	MGRG and Gas Monitoring

It is not possible to discount all of the potential sources of contamination. Potential sources of contamination which cannot be discounted are carried forward to a preliminary qualitative risk assessment. The Contaminants of Concern (CoC) for the remaining potential sources of contamination are listed in Table 7.1.2.

Table 7.1. 2: Contaminants of Concern

CONTAMINANTS OF CONCERN									
Source	Metals	Cadmium	PAH	Soil Organic Matter	SO ₄ , SO ₃	pH	Asbestos	Chromium IV	Mine Gas
ON-SITE									
Made Ground	X	X	X	X	X	X	X	X	
Mine Gas									x

Testing in broad accordance with DOE Industrial Profile for Railway Land

Pathway Characterisation

The potential pathways by which receptors might be exposed to contaminants (sources) at the site can vary depending on the proposed or current land use (e.g. residential properties, public open space, retail).

For humans, the three possible routes of exposure to contaminants are:

- Inhalation of dusts or vapours
- Ingestion of dusts or soil either by hand-to-mouth activity or by eating plants grown in contaminated soils
- Dermal (skin) contact with contaminated soils and waters and transfer of contaminants through the skin into the body

Buildings and service conduits can also be affected by contaminants in the following ways:

- Soil gas or vapour pooling in voids within or beneath structures
- By direct contact of building fabric with contaminated soils
- Service trenches acting as preferential migration pathways
- Ingress of contaminants into conduits, contaminating drinking water supplies

Finally, for the local water environment the following pathways may be present:

- Run-off from the site surface entering surface water courses near the site
- Leaching of contaminants from the soil to on-site groundwater
- Migration of contaminated on-site groundwater to off-site groundwater and/or surface water bodies

Receptor Characterisation

The receptors are the elements in the pollutant linkage that can potentially be harmed by the contaminants. These are as follows:

- Humans: site workers and residential users
- Buildings: building fabric and services; and
- The local water environment (surface water and groundwater)

Pollutant Linkages

The significance of potential pollutant linkages at the site is now qualitatively assessed by considering the magnitude of the hazard and the possibility of the linkages occurring based on the observations made, in Table 7.1.3 below.

Preliminary Qualitative Risk Assessment

The preliminary conceptual model outlined above has been used to undertake an initial qualitative risk assessment for the site to determine the possibility of significant risks that may exist following development of the site. The qualitative risk assessment will also investigate the risks to the wider environment as a result of contamination from on site sources.

Risk categories are presented in accordance with R&D66:2008 Volume 1.

Table 7.1.3: Preliminary Qualitative Environmental Risk Assessment for Identified sources of Contamination

Source	Potential contaminants	Potential Pathway(s)	Potential receptor(s)	Assessment	Consequence	Potential Probability	Risk Class	Investigation Required
Site soils/ Made Ground	Metals, PAHs, asbestos, SO ₄ , pH, TPH	Ingestion, inhalation, dermal contact	Humans (residents & end users)	Dermal contact, inhalation and ingestion pathways will be broken in areas covered by hardstanding. However the risk of humans coming into contact with potential contaminants at the site will remain in areas of soft landscaping. Contaminants could compromise the integrity of any water supply pipe and subsequently lead to consumption of contaminated water supply.	Severe	Low	Moderate	Yes
			Humans (site workers)	Construction and maintenance workers could come into contact with contaminated made ground. Excessive exposure may occur during some manual activities including working in service trenches.	Severe	Low	Moderate	Yes
		Direct contact, aggressive ground conditions,	Building fabric and services	The presence of contamination in shallow soils may pose a risk to buried concrete structures. Direct contact with this contamination in both soil and superficial groundwater (if present) can result in damage to concrete fabric and services in a similar fashion to that described above for water supply pipe.	Medium	Low	Moderate/Low	Yes
		Leaching, migration.	Surface water environment	There is no surface water at the site. The majority of proposed development is to consist of tarmac and drained surfaces which will prevent surface water run-	Medium	Unlikely	Low	No

Source	Potential contaminants	Potential Pathway(s)	Potential receptor(s)	Assessment	Consequence	Potential Probability	Risk Class	Investigation Required
			Groundwater environment – Superficial Groundwater	off from coming into contact with any potentially contaminated made ground. Mobile contaminants that may be present on site, could migrate to surface water bodies by transportation via the bedrock aquifer, however the presence of hardcover to the site will reduce the infiltration of water through potentially contaminated soils therefore reducing the leaching potential. Soakaway values are too low to allow soakaways to be included. The superficial aquifer is secondary undifferentiated.				

			Groundwater environment – Bedrock Aquifer	The underlying bedrock is a Secondary (A) Aquifer – Low Permeability Layer	Medium	Unlikely	Low	No
Coal Mining Ground Gas	CH ₄ /CO ₂	Migration to surface	Building structure, users	Groundgas testing required from a spread of 50mm gas installations across the probable line of coal subcrop, although proximal GI data suggests no risk	Severe	Low	Moderate	Yes

Table 7.1.3 contd: Preliminary Qualitative Environmental Risk Assessment for Identified sources of Contamination

8.0 GEOTECHNICAL PARAMETERS

8.1 Introduction

This section presents geotechnical parameters, which will be taken forward into the foundation options appraisals, and assigns parameters to the strata encountered. We have chosen not to assess geotechnical parameters of the Made Ground, as it is variable both laterally and vertically.

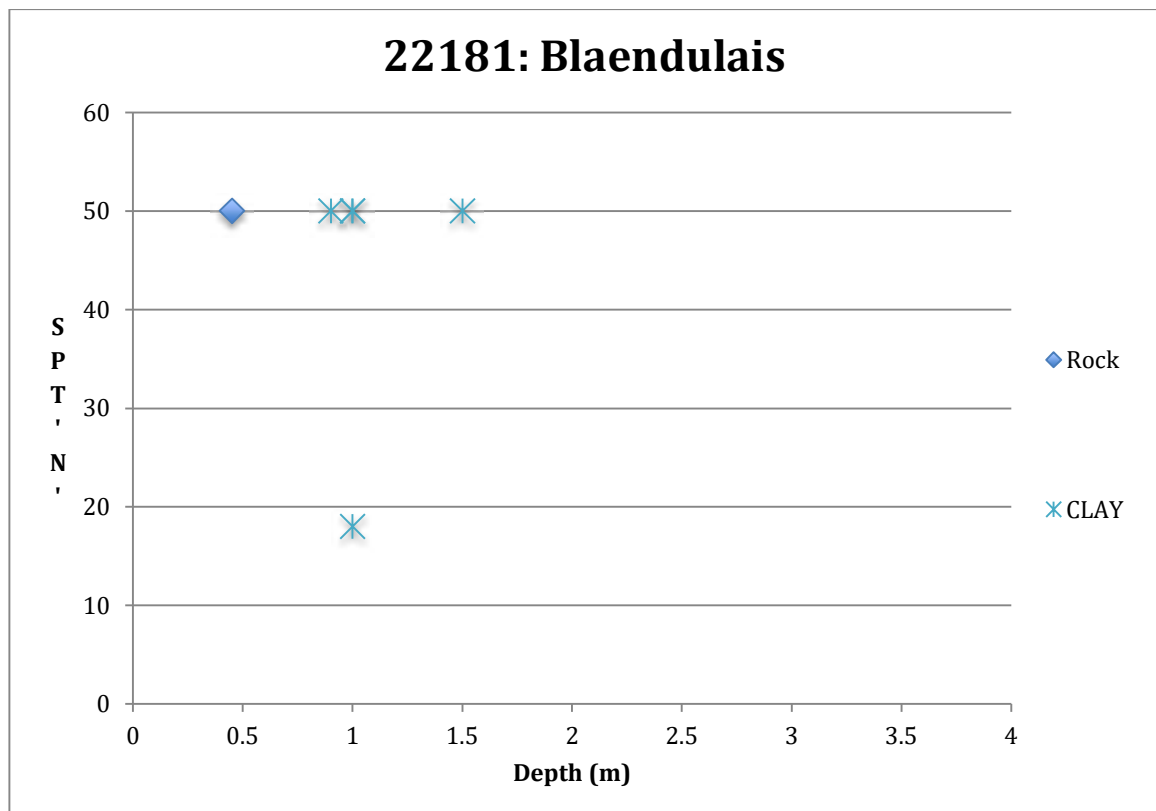


Figure 8.1. SPT N vs Depth

8.1.1 Stiff CLAY

What has been described as stiff gravelly CLAY, was noted beneath the Made Ground.

The upper surface was noted at depths of between 0.30m and 0.70m, below the Made Ground.

Uncorrected SPT N values of between 18 and refusal were recorded. Allowing for the effects of overburden and correcting accordingly suggests the strata to be stiff.

Employing correlations developed by Stroud et al, the following is recommended.

- *Undrained Shear Strength (c_u) – 100kN/m²*
- *Coefficient of Volume Compressibility (m_v) – 0.09m²/MN*

9.0 GEOTECHNICAL ASSESSMENT

9.1 Introduction

The following sections provide an assessment of the options relating to foundation options at site, making suggestions relating to potential options/assessment for bearing capacity and foundations and attack to buried concrete.

9.2 Foundation Options

At a depth of 1.00m to 1.50m the CLAY would provide an allowable bearing capacity (q_a) in the order of 100kN/m², however care must be taken to inspect the stratum for loose or waterlogged zones.

It should be noted that the upper surface of the weathered rock was noted at shallow depth in several exploratory holes, as shallow as 0.70m in TP05. Thus, there may be need to employ breakers to accomplish excavations for foundations and services.

Excavations in the Made Ground will degrade in wet conditions, and thus close support should be considered. Water was monitored as shallow as 1.50m depth, thus this may affect excavation depths. It is recommended that pumping from open sump is allowed for.

All formations must be inspected by a professional Geotechnical Engineer to confirm that the materials will accommodate the allowable bearing capacity calculated, and so that soft spots are identified, and removed.

9.3 Attack to Buried Concrete

Laboratory testing during, noted slightly acid to alkaline pH values, and a maximum water soluble sulphate value of 0.19g/l, indicating Sulphate Class DS-1, in accordance with BRE Special Digest 1.

9.4 Groundwater

Groundwater was monitored at around 1.50m at it's shallowest.

It is prudent to assume that there may be perched tables or standing water during periods of rainfall. Thus, pumping from open sumps should be accommodated for.

It should be noted that groundwater levels vary due to changes in climatic and other conditions and may therefore at times vary from those recorded during these operations.

10.0 CONTAMINATION TESTING

Contamination testing was undertaken on four soil samples, as shown in the Appendices.

Client Sample ID	Units	TP01	TP03	WS02	WS03			
Depth to Top		0.60	0.30	0.30	0.40			
Sample Type		Soil - ES	Soil - ES	Soil - ES	Soil - ES	S4UL/ C4SL Resi With	S4UL/ C4SL Resi Without	POS Resi
% Stones >10mm	% w/w	13.1	12.7	13.9	3.6			
pH	pH	6.24	9.63	9.02	8.26			
Sulphate (water sol 2:1)	g/l	0.04	0.19	0.07	<0.01			
Organic matter	% w/w	2.1	0.4	6.2	96.4			
Arsenic	mg/kg	3	26	15	5	37	40	79
Boron (water soluble)	mg/kg	<1.0	<1.0	<1.0	<1.0	290	11000	21000
Cadmium	mg/kg	<0.5	<0.5	1.3	<0.5	11	65	120
Copper	mg/kg	16	49	65	53	2400	7100	12000
Chromium	mg/kg	12	14	13	6	910	910	1500
Chromium Hex	mg/kg		<1	<1	<1	6	6	7.7
Lead	mg/kg	11	33	38	32	190	310	630
Mercury	mg/kg	<0.17	<0.17	<0.17	<0.17	40	56	120
Nickel	mg/kg	14	23	26	9	180	180	230
Selenium	mg/kg	<1	<1	<1	<1	250	430	1100
Zinc	mg/kg	31	126	2990	75	3700	40000	8100
TPH total (>C6-C40)	mg/kg	528	87	99	60	48000	64000	
Asbestos in Soil (inc. matrix)								
Asbestos in soil		NAD	NAD	NAD	NAD			
Asbestos ACM - Suitable for Water Absorption Test?		N/A	N/A	N/A	N/A	Non detected		
PAH-16MS								
Acenaphthene	mg/kg	0.01	<0.01	0.01	0.06	1100	6000	
Acenaphthylene	mg/kg	0.01	<0.01	<0.01	0.01	920	6000	
Anthracene	mg/kg	0.02	<0.02	<0.02	0.07	11000	37000	
Benzo(a)anthracene	mg/kg	<0.04	0.09	0.11	0.14	13	15	
Benzo(a)pyrene	mg/kg	<0.04	0.08	0.09	0.07	3	3.2	
Benzo(b)fluoranthene	mg/kg	<0.05	0.16	0.18	0.29	3.7	4	
Benzo(ghi)perylene	mg/kg	<0.05	0.07	0.08	<0.05	350	360	
Benzo(k)fluoranthene	mg/kg	<0.07	<0.07	<0.07	0.09	100	110	
Chrysene	mg/kg	<0.06	0.14	0.16	0.29	27	32	
Dibenzo(ah)anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	0.3	0.32	
Fluoranthene	mg/kg	<0.08	0.19	0.2	0.57	890	1600	
Fluorene	mg/kg	0.04	<0.01	<0.01	0.02	860	4500	
Indeno(123-cd)pyrene	mg/kg	<0.03	0.08	0.09	0.06	41	46	
Naphthalene	mg/kg	<0.03	<0.03	0.03	0.12	13	13	
Phenanthrene	mg/kg	<0.03	0.15	0.15	0.71	440	1500	
Pyrene	mg/kg	<0.07	0.13	0.16	0.27	2000	3800	
Total PAH-16MS	mg/kg	0.08	1.09	1.26	2.77	17761	60984	

Table 10.1: Soil Contamination Results

The results have been compared with current Environment Agency limits for Residential with and without homegrown produce and POS Resi Uses. Table 10.1 shows the recorded values, related to current Soil Guideline Values (SGVs)/S4UL, or other published values.

Thus, it is evident that all positions were within guidelines for Residential with and without plant uptake. Thus, no remediation strategy is required.

Waste Acceptance Criteria (WAC) Testing was undertaken on a single sample from WS04. No values exceeded inert landfill levels. It is likely that under the contractors Material Management Plans, further testing will be required for materials being removed from site.

11.0 COAL INVESTIGATION ASSESSMENT

The drilling operations noted in the original phase of investigations, noted no coal. The two boreholes during this phase noted a thin coal (200mm to 300mm thick) at 22m to 25m depths. No workings were noted and no loss of flush recorded in any of the holes.



Fig 11: Geoindex Extract

This, combined with the knowledge that there was no flush take during the drilling, indicates that there are no workings within these seams, which would by their dimensions, likely to be non-economic for deep mining.

Thus, it is considered that no further investigation is required, and that no ground stabilisation is required for the development.

12.0 MINE GROUND GAS RISK ASSESSMENT

12.1 GROUND GAS RISK ASSESSMENT

12.1.1 Conceptual Site Model

The following sections outline the anticipated Source-Pathway- Receptor model associated with the proposed development on site.

Sources

The following potential sources have been identified on and off site.

- Made Ground deposits
- The site is also located within the South Wales Coalfield, with historical mine workings within the vicinity of the site.

Pathways

The following potential pathways have been identified which may act as preferential pathways for ground gas migration:

- The underlying strata have been classified as largely low permeability. Therefore, there is limited potential for horizontal and vertical migration of ground gas;
- Buried service runs and foundations, including sub-floor voids.

Receptors

Within the context of ground gases, the following enclosed structures are considered to represent potential receptors.

- Structures and enclosed areas within proposed development.

This preliminary assessment has been completed in accordance with guidance published in CL:AIRE, 2021, Good practice for risk assessment for coal mine gas emissions. In the first instance, the risk assessment process requires the screening out of 'potentially at-risk sites' utilising the decision support tool for mine gas risk assessment, provided in Figure 13.1 - CLAIRE 2021. A summary of the decision tool and site outcome is presented in Table 12.1.

STEP	QUALIFIER	OUTCOME	COMMENT
1	Site within a coal authority defined coal mining reporting area?	Yes	Go to step 2
2	Are all these statements true? Mine entries >50m from site boundary. Workings >150m depth. No faults or other potential pathways connecting surface to deeper unflooded workings. Outside area of past or probable shallow workings on coal authority viewer	No	Go to step 3
3	Are all these statements true? Workings between 30m and 150m but permanently flooded or covered by 10m+ of low permeable superficial deposits. Mine entries > 50m from site boundary. Low permeability superficial deposits of sufficient thickness – <1x10 ⁻⁴ m/s hydraulic conductivity	YES	Medium Risk Zone
4	Are any of these statements true? Mine entries on site or <20m from site boundary. Workings below site <30m depth and unflooded or variable water level. Faults or other pathways connecting surface to deeper unflooded workings. Within area of past or probable shallow workings on Coal Authority Viewer.	No	

Table 12.1: Ground Gas Decision Tool

It is determined the site is a medium risk of mine gas requiring a detailed mine gas risk assessment to establish whether suitable mitigation measures can be incorporated into the development.

The faulted local area congruent with the confirmed coal seams pose a risk. The faulting may act as preferential pathways for hazardous gasses, such as methane and carbon dioxide, to migrate vertically and horizontally from their reservoirs, up to the surface. Due to the risk from mine gas, following completion of drilling works, ground gas wells should be installed in the holes with response zone positioned within the unsaturated zone. This should be followed up with gas monitoring. The ground gas monitoring results and groundwater level monitoring results should be used to inform a mine gas risk assessment in accordance with CL:AIRE, 2021, Good practice for risk assessment for coal mine gas emissions.

12.2 Ground Gas Monitoring

Six return ground gas monitoring visits were undertaken over 25 months, at 4 No monitoring points, between the 2nd June 2022 and 05 July 2024. Full factual site records of the gas monitoring results are appended.

Ground gases were monitored within boreholes on the site recording the following parameters.

Concentrations of ground gases;

- Methane (%v/v);
- Carbon dioxide (%v/v);
- Oxygen (%v/v);
- Carbon monoxide (ppm);
- Hydrogen sulphide (ppm);
- Borehole flow rate (l/hr);
- Depth to groundwater;
- Atmospheric pressure trends;

Where groundwater levels are noted to be above the screened sections of the boreholes the data is not considered to be representative of the ground gas regime and are therefore not used within the risk assessment process.

The key reference document which has been used to undertake the semi-quantitative land gas assessment presented in this report is CIRIA C665 (CIRIA, 2007). This provides a framework for assessment of land gas risk to buildings/structures with foundations (i.e. houses and/or commercial properties).

The risk assessment process is based on a Source-Pathway-Receptor Conceptual Site Model Methodology, with consideration given to the potential sources likely to be present on the site and the ground gas monitoring regime designed to reflect the scale of the source potential.

Monitoring was undertaken by TT and SGS over a 25 month period at varying atmospheric conditions and pressures – ranging from 995 to 1019 mb.

The collected data has been used for the purposes of undertaking a semi-quantitative assessment in accordance with the CIRIA 665 methodology. The calculation used to calculate the gas screening value (GSV) for the site, together with the relevant definition of units, is as follows:

$$\text{GSV (litres of gas/hr)} = \text{borehole flow rate (l/hr)} \times \text{gas concentration (volume/100)}$$

The calculated GSV values are used to determine the Characteristic Situation (CS) for the site in terms of methane and carbon dioxide, based on the conditions outlined in Table 12-1 below.

Thus, a GSV for the highest flow (0.1l/hr) and highest CH₄ (0.1%) is calculated as 0.0002l/hr, and for CO₂ (0.9%) is calculated as 0.0018l/hr.

CS classification is applicable to all buildings, with the exception of low-rise housing with a ventilated underfloor void, in these situations, the NHBC Traffic Light System is adopted. Based on the proposed development, a CS1, Very Low Risk classification is considered the most appropriate.

Characteristic Situation	Risk Classification	Gas Screening Value Threshold (l/hr)	Additional Considerations
1	Very Low Risk	<0.07	Methane concentration <1% Carbon dioxide <5%
2	Low Risk	<0.7	Borehole flow rate <70 l/hr
3	Moderate Risk	<3.5	-
4	Moderate to High Risk	<15	Quantitative risk assessment required to evaluate scope of protective measures
5	High Risk	<70	-
6	Very High Risk	>70	-

Table 12-1 –GSV Classification (Modified Wilson and Card Methodology)

12.2.1 Risk Assessment – Methane and Carbon Dioxide

In order to assess the significance of ground gases at the site, measured concentrations and flow rates have been used to derive Gas Screening Values (GSVs). GSVs are the product of gas concentration and gas flow measured in a borehole and provide an indication of the flow of the particular gas in question out of the ground.

The worst-case values have been used within the risk assessment. Based on a maximum flow recorded of 0.2l/hr and the maximum recorded concentration of carbon dioxide (CO₂) and methane (CH₄) during the monitoring visits, the GSVs have been calculated as presented in Table 12-2.

Gas	Maximum Concentration (%)	Maximum Flow Rate (l/hr)	GSV (l/hr)	Characteristic Situation (Wilson and Card)
Carbon Dioxide				1 Very Low Risk
Methane				1 Very Low Risk

Table 12-2 – GSV Calculations

Maximum concentrations of carbon monoxide and hydrogen sulphide were recorded at <1ppm throughout the monitoring period. The recorded concentrations are considered to be suitably low to negate the requirement for additional risk assessment.

The monitoring rounds was undertaken during rising, falling and steady pressures with no discernible variation in ground gas monitoring results recorded.

The site has been classified as Characteristic Situation 1 (Very Low Risk) based on the worst-case recorded concentrations of carbon dioxide and methane and maximum flow rates. Site classification of a Characteristic Situation 1 indicates gas protection measures are not required within new developments.

13.0 REVISED CONCEPTUAL SITE MODEL

Table 13.1 provides the Revised Conceptual Site Model, developed with the knowledge of the findings of the Phase 2 Ground Investigation. Risk categories are presented in accordance with R&D66:2008 Volume 1.

Table 13.1: Revised Quantitative Environmental Risk Assessment for Identified sources of Contamination

Source	Potential contaminants	Potential Pathway(s)	Potential receptor(s)	Assessment	Consequence	Potential Probability	Risk Class	Investigation Required
Site Soils/ Made Ground	Metals, PAHs, asbestos, SO ₄ , pH, TPH	Ingestion, inhalation, dermal contact	Humans (residents & end users)	No elevated concentrations were noted.	Medium	Very Low	Negligible	Undertaken
			Humans (site workers)	No elevated concentrations were noted.	Medium	Very Low	Negligible	Undertaken
		Direct contact, aggressive ground conditions,	Building fabric and services	Testing noted no elevations which would affect building fabric.	High	Very Low	Negligible	Undertaken
		Leaching, migration.	Surface water environment	There is no surface water at the site. The majority of proposed development is to consist of drained surfaces which will prevent surface water run-off from coming into contact with potentially contaminated made ground. Superficial aquifer is undifferentiated. Soakaway rates extremely low. No leachable contamination was noted by TT	Mild	Very Low	Negligible	No
			Groundwater environment – Superficial Groundwater					
			Groundwater environment – Bedrock Aquifer	The underlying bedrock is a Secondary (B) Aquifer – Low Permeability Layer	Medium	Very Low	Negligible	No
Coal Mining Ground Gas	CH ₄ /CO ₂	Migration to surface	Building structure, users	Gas testing showed no deleterious concentrations. A CS1 situation has been calculated	Severe	Low	Very Low	Undertaken

14.0 ADDITIONAL COMMENTS

Reference should also be made to the Socotec Desk Top Study and Tetra Tech Geotechnical Interpretive reports. The recommendations given in these reports regarding foundation type, gas protection, made ground and potential hazardous materials should be considered, as ground conditions were consistent across the whole area.

Foundations are to be coordinated with any new or existing services and underground obstructions.

Any excavated material is to be WAC tested and WM3 assessed. Material that cannot be re-used for landscaping is to be removed off site for disposal at a suitable licenced facility.

15.0 CONCLUSIONS

Allowable bearing capacities have been provided for the natural strata encountered. The clays at site will need care during construction to ensure the formation is suitable for foundations. Formations, will need to be inspected for soft/loose spots and where those are found, treated accordingly. The granular strata will require care regarding trench stability.

Groundwater was noted as being within typical foundation depths, thus pumping from sumps and stabilization of excavations should be allowed for.

Soakaway values were extremely low. It would be worth undertaking further testing at depth within boreholes closer to the design stage.

Based upon the monitoring data indicating a zero flow and CO₂ below 5%, a BS8485 classification of CS1 (Very Low Risk) is considered appropriate. Radon protection measures are not considered necessary.

Contamination testing has shown there to be no elevated concentrations. Thus, no source has been identified, with no Remediation Strategy Required. As it was not possible to access the wooded eastern zone, it is recommended that further testing is undertaken in that area, once felling has occurred, to check test within that proposed landscaped area.

Slightly acidic soil results were noted, and Sulphate Class DS-1, in accordance with BRE Special Digest 1 is recommended for buried concrete.

It is evident that no subsidence claims have been drawn to the Coal Authority's attention.

APPENDIX A

Drawings

Borehole Location Plan

Drawing 22181_Locs

Planning Application Red Line.



EXISTING SITE PLAN - TOPO SURVEY

**BLAENDULAIS, HIGH STREET, SEVEN SISTERS, NEATH,
PORT TALBOT SA10 9DL**

Notes

This drawing is copyrighted and must not be reproduced or disclosed to third parties without the prior written permission of Prime Architecture Limited.

Do not scale from this drawing. Responsibility will not be accepted by Prime Architecture Limited for errors made by others scaling from the drawing. Use written dimensions only. Contractor to verify all dimensions before commencing work on site.

Prime Architecture Limited are to be notified immediately in writing of any discrepancies. All survey information incorporated within the drawings cannot be guaranteed as accurate unless confirmed by a fixed dimension.

All dimensions are in millimeters unless otherwise noted.

This drawing is to be read in conjunction with all relevant project drawings and specification prepared by Prime Architecture Limited and other relevant consultants, specialists, etc.

CDM notes are provided to assist the contractor in managing residual hazards identified during the design stage. Any such notes do not relieve the contractor of their duties and they must provide a safe system of work based on method statements, risk assessments, etc.

Revision:	Description:	Date:



Drawing Status:

BUILDING REGULATIONS



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Client:

T Richard Jones (Betws) Ltd

Project Title:

The Proposal of Childcare Units at
Blaendulais, High Street, Seven
Sisters, Neath, Port Talbot SA10 9DL

Drawing Title:

Existing Site Plan - Topo Survey

Scale: 1:200 @ A1	Drawn: MZ	Date: June 2024
Job No: 1145	Drawing No: 02	Rev: -

Existing Site Plan 1:200

APPENDIX B

Borehole Logs



Rotary Core Log

Project Name: Blaendulais				Client: TRJ				Date: 09/10/2023			
Location: Blaendulais				Contractor: Apex Drilling Services							
Project No. : 22181				Crew Name: TD/JB				Drilling Equipment: Fraste PLG			
Borehole Number BH03		Hole Type RO		Level		Logged By PL		Scale 1:50		Page Number Sheet 1 of 3	

Well	Water	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.40			BACKFILL **	
										CLAY **	1
							1.30			CLAY and BOULDERS **	2
							2.90			WEATHERED MUDSTONE **	3
											4
							4.30			SANDSTONE **	5
							5.30			MUDSTONE **	
							5.90			SANDSTONE **	6
											7
											8
											9
											10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)
Remarks																	



Rotary Core Log

Project Name: Blaendulais				Client: TRJ				Date: 09/10/2023			
Location: Blaendulais				Contractor: Apex Drilling Services							
Project No. : 22181				Crew Name: TD/JB				Drilling Equipment: Fraste PLG			
Borehole Number BH03		Hole Type RO		Level		Logged By PL		Scale 1:50		Page Number Sheet 2 of 3	

Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description			
				TCR	SCR	RQD								
	▼							17.20			SANDSTONE **	11		
												12		
												13		
												14		
												15		
												16		
												17		
													MUDSTONE **	18
														19
														20

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)
Remarks																	





Rotary Core Log

Project Name: Blaendulais				Client: TRJ				Date: 09/10/2023			
Location: Blaendulais				Contractor: Apex Drilling Services							
Project No. : 22181				Crew Name: TD/JB				Drilling Equipment: Fraste PLG			
Borehole Number BH04		Hole Type RO		Level		Logged By PL		Scale 1:50		Page Number Sheet 1 of 3	

Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD						
								0.40			BACKFILL **	1
											WEATHERED MUDSTONE **	
								1.10			SANDSTONE **	2
								8.70				3
												4
												5
												6
												7
												8
												9
												10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)
Remarks																	

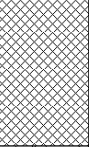
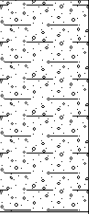


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Trial Pit Log

Project Name: Blaendulais			Client: TRJ			Date: 10/10/2023		
Location: Blaendulais			Contractor: Apex Drilling Services					
Project No. : 22181			Crew Name: LJ			Equipment: 2.5 ton excavator		
Location Number SA01		Location Type TP		Level		Logged By PL		Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.50	ES		0.50			MADE GROUND: Multicoloured clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with low cobble content of angular brick, sandstone and concrete. Fill.	1
					1.20			Brown, orange and grey slightly sandy clayey subrounded fine to coarse GRAVEL of sandstone with low cobble content of subrounded sandstone. GLACIAL TILL.	
								End of Borehole at 1.200m	5

Dimensions			Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks		Date	Rate	Remarks

Remarks								
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Trial Pit Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Equipment: 2.5 ton excavator	
Location Number SA02	Location Type TP	Level	Logged By PL	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50 - 1.00	ES		0.10			Soft dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of brick and sandstone. TOPSOIL.	
					0.50			MADE GROUND: Multicoloured clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with low cobble content of angular brick, sandstone and concrete. Fill.	
					1.00			Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL.	
								End of Borehole at 1.000m	1
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks							
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[illegible]

Remarks	
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Trial Pit Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Equipment: 2.5 ton excavator	
Location Number TP01	Location Type TP	Level	Logged By PL	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.60 - 0.90	ES		0.50			MADE GROUND: Multicoloured clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with low cobble content of angular brick, sandstone and concrete. Fill.	
								Stiff to very stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL.	1
	▼				1.50			End of Borehole at 1.500m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks							
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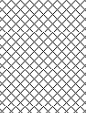






Trial Pit Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Equipment: 2.5 ton excavator	
Location Number TP04	Location Type TP	Level	Logged By PL	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40			MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill.	
					0.70			Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION	
								End of Borehole at 0.700m	
									1
									2
									3
									4
									5

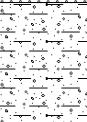
Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks



Trial Pit Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Equipment: 2.5 ton excavator	
Location Number TP05	Location Type TP	Level	Logged By PL	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill.	
					0.70			Stiff to very stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subrounded sandstone. Gravel is subrounded fine to coarse of sandstone. GLACIAL TILL.	
					0.71			Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION	
								End of Borehole at 0.700m	1
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks							
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Percussion Drilling Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Drilling Equipment: DART	
Borehole Number WS01	Hole Type WS	Level	Logged By PL	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.50			GL - 0.50: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill.	
		1.00	SPT	N=18 (4,2/2,4,7,5)	1.00			0.50 - 1.00: Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL.	1
		1.50	SPT	N=50 (3,4/50 for 20mm)	1.50 1.51			No Recovery Probable Bedrock End of Borehole at 1.500m	2
									3
									4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks



Percussion Drilling Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Drilling Equipment: DART	
Borehole Number WS02	Hole Type WS	Level	Logged By PL	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.50	ES		0.50			GL - 0.50: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill.	
		0.70 - 1.00	ES					0.50 - 1.30: Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL.	1
		1.00	SPT	N=50 (3,3/50 for 160mm)	1.30 1.31			Probable Bedrock End of Borehole at 1.300m	2
									3
									4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks



Percussion Drilling Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Drilling Equipment: DART	
Borehole Number WS03	Hole Type WS	Level	Logged By PL	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40 - 0.70	ES					GL - 0.70: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill.	
		0.70 - 1.00	ES		0.70			0.70 - 0.90: Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL.	1
		0.90	SPT	N=30 (1,1/30 for 5mm)	0.90 0.91			Probable Bedrock End of Borehole at 0.900m	2
									3
									4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks



Percussion Drilling Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Drilling Equipment: DART	
Borehole Number WS04	Hole Type WS	Level	Logged By PL	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.50	ES					GL - 0.50: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. 0.50 - 1.00: Stiff to very stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. Probable Bedrock End of Borehole at 1.000m	
		0.50 - 1.00	ES		0.50				
		1.00	SPT	N=50 (3,5/50 for 10mm)	1.00 1.10				1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks



Percussion Drilling Log

Project Name: Blaendulais		Client: TRJ		Date: 10/10/2023	
Location: Blaendulais		Contractor: Apex Drilling Services			
Project No. : 22181		Crew Name: LJ		Drilling Equipment: DART	
Borehole Number WS05	Hole Type WS	Level	Logged By PL	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.45	SPT	N=50 (25 for 15mm/50 for 10mm)	0.45 0.46			GL - 0.45: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. 0.45: Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION End of Borehole at 0.450m	1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks										
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Appendix C

Laboratory Testing

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/10186
Issue Number: 1

Date: 07 November, 2023

Client: Spectrum Geo Services
Foxglove Cottage
Cwm Risca Lane
Tondu
Wales
CF32 0EH

Project Manager: Rob Griffiths
Project Name: Blaendulais
Project Ref: 22181
Order No: 22181/01
Date Samples Received: 16/10/23
Date Instructions Received: 16/10/23
Date Analysis Completed: 07/11/23

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 23/10186

Client Project Name: Blaendulais

Client Project Ref: 22181

Lab Sample ID	23/10186/1	23/10186/2	23/10186/3	23/10186/4	23/10186/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP01	TP03	WS02	WS03	WS04					
Depth to Top	0.60	0.30	0.30	0.40	0.20					
Depth To Bottom	0.90	0.60	1.00	0.70	0.50					
Date Sampled	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	3A	4AE	4AE	4AE	4AB					
% Stones >10mm _A	13.1	12.7	13.9	3.6	35.3			% w/w	0.1	A-T-044
pH _D ^{M#}	6.24	9.63	9.02	8.26	9.01			pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.04	0.19	0.07	<0.01	-			g/l	0.01	A-T-026s
Organic Matter _D ^{M#}	2.1	0.4	6.2	96.4	-			% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	3	26	15	5	-			mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	<1.0	<1.0	<1.0	<1.0	-			mg/kg	1	A-T-027s
Cadmium _D ^{M#}	<0.5	<0.5	1.3	<0.5	-			mg/kg	0.5	A-T-024s
Copper _D ^{M#}	16	49	65	53	-			mg/kg	1	A-T-024s
Chromium _D ^{M#}	12	14	13	6	-			mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	-			mg/kg	1	A-T-040s
Lead _D ^{M#}	11	33	38	32	-			mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	-			mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	14	23	26	9	-			mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	-			mg/kg	1	A-T-024s
Zinc _D ^{M#}	31	126	2990	75	-			mg/kg	5	A-T-024s
TPH total (>C6-C40) _A ^{M#}	528	87	99	60	-			mg/kg	10	A-T-007s

Envirolab Job Number: 23/10186

Client Project Name: Blaendulais

Client Project Ref: 22181

Lab Sample ID	23/10186/1	23/10186/2	23/10186/3	23/10186/4	23/10186/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP01	TP03	WS02	WS03	WS04					
Depth to Top	0.60	0.30	0.30	0.40	0.20					
Depth To Bottom	0.90	0.60	1.00	0.70	0.50					
Date Sampled	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	3A	4AE	4AE	4AE	4AB					
Asbestos in Soil (inc. matrix)										
Asbestos in soil _D [#]	NAD	NAD	NAD	NAD	-					A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-					A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	-					A-T-045

Envirolab Job Number: 23/10186

Client Project Name: Blaendulais

Client Project Ref: 22181

Lab Sample ID	23/10186/1	23/10186/2	23/10186/3	23/10186/4	23/10186/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP01	TP03	WS02	WS03	WS04					
Depth to Top	0.60	0.30	0.30	0.40	0.20					
Depth To Bottom	0.90	0.60	1.00	0.70	0.50					
Date Sampled	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	3A	4AE	4AE	4AE	4AB					
PAH-16MS										
Acenaphthene _A ^{M#}	0.01	<0.01	0.01	0.06	-			mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.01	<0.01	<0.01	0.01	-			mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.02	<0.02	<0.02	0.07	-			mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	0.09	0.11	0.14	-			mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	0.08	0.09	0.07	-			mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	0.16	0.18	0.29	-			mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	0.07	0.08	<0.05	-			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	0.09	-			mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	0.14	0.16	0.29	-			mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A	<0.04	<0.04	<0.04	<0.04	-			mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	0.19	0.20	0.57	-			mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.04	<0.01	<0.01	0.02	-			mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	0.08	0.09	0.06	-			mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	0.03	0.12	-			mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	0.15	0.15	0.71	-			mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	0.13	0.16	0.27	-			mg/kg	0.07	A-T-019s
Total PAH-16MS _A	0.08	1.09	1.26	2.77	-			mg/kg	0.01	A-T-019s

Report Notes

General

This report shall not be reproduced, except in full, without written approval from Envirolab.
 The results reported herein relate only to the material supplied to the laboratory.
 The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **six weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
 Analytical results reflect the quality of the sample at the time of analysis only.
 Opinions and Interpretations expressed are outside our scope of accreditation.
 The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
 A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Key

Superscript "#"	Accredited to ISO 17025
Superscript "M"	Accredited to MCertS
Superscript "U"	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript "A"	Analysis performed on as-received Sample
Subscript "D"	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript "A"	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
N/A	Not applicable

Asbestos

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
 Stones etc. are not removed from the sample prior to analysis
 Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing, and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).
 For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
 For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
 All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
 Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.
 Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the accreditation range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Spectrum Geo Services, Foxglove Cottage, Cwm Risca Lane, Tondy, Wales,
CF32 0EH

Project: Blaendulais

Clients Project No: 22181

Project No: 23/10186

Date Received: 16/10/2023 (am)

Cool Box Temperatures (°C): 12.1

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/10186/1	23/10186/2	23/10186/3	23/10186/4	23/10186/5
Client Sample No					
Client Sample ID/Depth	TP01 0.60-0.90m	TP03 0.30-0.60m	WS02 0.30-1.00m	WS03 0.40-0.70m	WS04 0.20-0.50m
Date Sampled	11/10/23	11/10/23	11/10/23	11/10/23	11/10/23
A-T-004s					23/10/2023
A-T-007s	23/10/2023	23/10/2023	23/10/2023	23/10/2023	23/10/2023
A-T-019s	25/10/2023	25/10/2023	25/10/2023	25/10/2023	25/10/2023
A-T-022s					23/10/2023
A-T-024s	26/10/2023	26/10/2023	28/10/2023	26/10/2023	
A-T-025w					30/10/2023
A-T-026s	26/10/2023	26/10/2023	26/10/2023	26/10/2023	
A-T-026w					30/10/2023
A-T-026w (F)					30/10/2023
A-T-027s	27/10/2023	27/10/2023	27/10/2023	27/10/2023	
A-T-030s					26/10/2023
A-T-031s	26/10/2023	26/10/2023	26/10/2023	26/10/2023	26/10/2023
A-T-031w					30/10/2023
A-T-032s	02/11/2023	01/11/2023	01/11/2023	07/11/2023	02/11/2023
A-T-032w					30/10/2023
A-T-037w					30/10/2023
A-T-040s	02/11/2023	26/10/2023	26/10/2023	26/10/2023	
A-T-044	27/10/2023	27/10/2023	27/10/2023	27/10/2023	27/10/2023
A-T-045	20/10/2023	20/10/2023	20/10/2023	20/10/2023	
A-T-050w					30/10/2023
A-T-ANCs					26/10/2023
Calc-no stones					30/10/2023
Probe (w)					30/10/2023

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Final Test Report

Envirolab Job Number: 23/10186
Issue Number: 1
Date: 7-Nov-23

Client: Spectrum Geo Services
Foxglove Cottage
Cwm Risca Lane
Tondu
Wales
CF32 0EH

Project Manager: Rob Griffiths
Project Name: Blaendulais
Project Ref: 22181
Order No: 22181/01

Date Samples Received: 16-Oct-23
Date Instructions Received: 16-Oct-23
Date Analysis Completed: 7-Nov-23

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Approved by:



Richard Wong
Client Manager

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	23/10186/5				
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				WS04				
Depth to Top				0.2				
Depth to Bottom				0.50				
Date Sampled				11/10/2023				
Sample Type				Soil - ES				
Sample Matrix Code				4AB				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	9.01		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.46		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.1		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	2.7		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	0.89		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	0.52		100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	64		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
				mg/l	mg/kg			
Arsenic	A-T-025	N	N	0.007	0.070	0.5	2	25
Barium	A-T-025	N	N	0.015	0.150	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.003	0.030	0.5	10	70
Copper	A-T-025	N	N	0.006	0.060	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.001	0.010	0.5	10	30
Nickel	A-T-025	N	N	<0.002	<0.02	0.4	10	40
Lead	A-T-025	N	N	<0.001	<0.01	0.5	10	50
Antimony	A-T-025	N	N	0.012	0.120	0.06	0.7	5
Selenium	A-T-025	N	N	0.001	0.010	0.1	0.5	7
Zinc	A-T-025	N	N	0.012	0.120	4	50	200
Chloride	A-T-026	N	N	1	11	800	15000	25000
Fluoride	A-T-026	N	N	0.2	2.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	51	512	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	96	960	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	9.4				
Conductivity (µS/cm)	A-T-037	N	N	192				
Mass Sample (kg)				0.205				
Dry Matter (%)	A-T-044	N	N	85.2				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								



Results Summary

Apex Testing Solutions Limited

Sturmi Way
Village Farm Industrial Estate
Pyle
Bridgend
CF33 6BZ

Telephone: 01656 746762

E-mail: andrew.grogan@apex-drilling.com

laura.davis@apex-drilling.com

<u>Reporting Details</u>		<u>Key Information</u>	
Company Name:	Spectrum Geo	Site Name:	Blaendulais
Address:	Foxglove Cottage Cwm Risca Lane Bridgend CF32 0EH	Job Number:	D23449
Contact Name:	Rob	Date Received:	16/10/2023
Contact Number:		Job Coordinator:	A. Grogan

Item No.	Tests Undertaken	Number of Tests
1	Atterburg Limits (4 point) - BS1377-2: 1990	3
2	# pH & sulphate (pH/SO ₄)	3
3	Courier Charge	3

Results Issued: 25/10/2023

Comments

Results herein relate only to samples received in the laboratory and where not sampled by Apex Testing Solutions personnel relate to the samples as received.

Where tests are UKAS accredited any Opinion and/or Interpretation expressed herein are outside the scope of the UKAS Accreditation. The reports shall not be reproduced in full without the written approval of the laboratory.

Please contact the job coordinator should any further information be required.

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014+A1:2022

Project No: D23449

Project Name: 22181 - Blaendulais

Client: Spectrum Geo

Address: Foxglove Cottage

Cwm Risca Lane

Bridgend

ATS Sample No: 34755

CF32 0EH

Site Ref / Hole ID: WS02

Sample No:

Depth (m): 0.70 - 1.00

Sample Type: Disturbed

**Sampling Certificate
Received:** No

Material Description: Brown sandy gravelly
CLAY

Location in Works: N/a

Material Source: Ex-Site

Date Sampled: Unknown

Material Supplier: Ex-Site

Sampled By: Client

Specification: ISO 17892-1

Date Received: 16 October 2023

Date Tested: 21 October 2023

Test Results

Moisture Content (%)

20.9

Remarks:

QA Ref.

EN ISO 17892-
1:2014 A1:2022



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est,
Pyle, Bridgend, CF33 6BZ

Tel: 01656 746762 Fax: 01656 749096



7771

Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/10/2023

Fig

MC

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

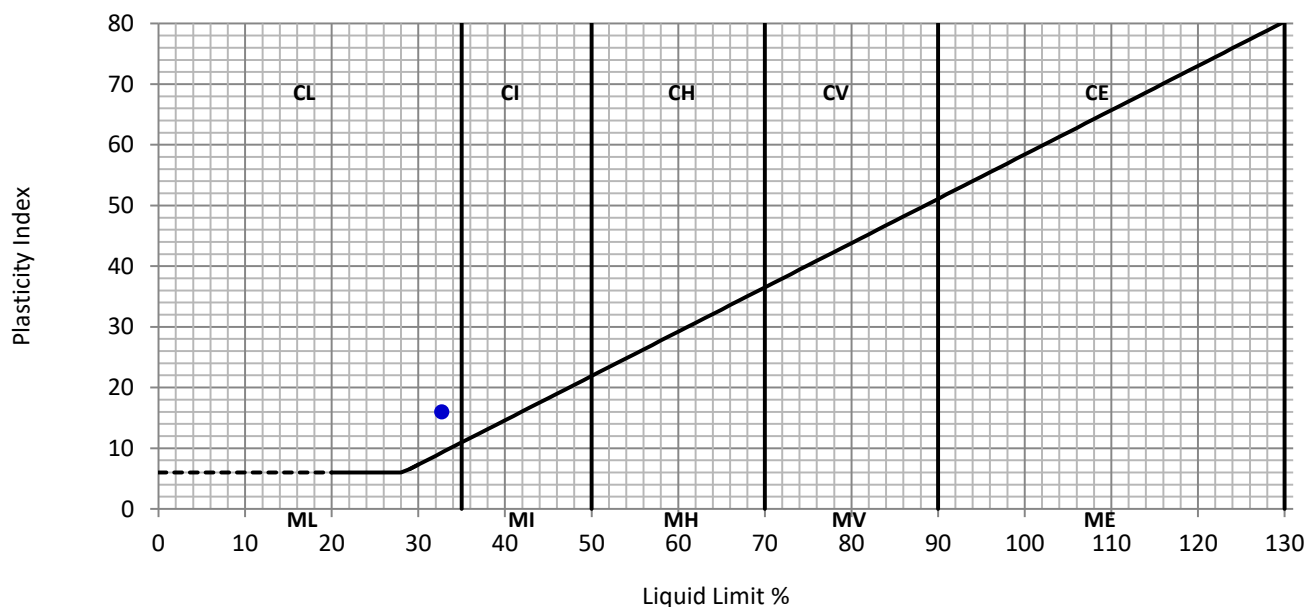
Project No:	D23449	Client:	Spectrum Geo
Project Name:	22181 - Blaendulais	Address:	Foxglove Cottage Cwm Risca Lane Bridgend CF32 0EH
ATS Sample No:	34755		

Site Ref / Hole ID:	WS02	Depth (m):	0.70 - 1.00
Sample No:		Sample Type:	Disturbed
Sampling Certificate Received:	No	Material Description:	Brown sandy gravelly CLAY
Location in Works:	N/a	Material Source:	Ex-Site
Date Sampled:	Unknown	Material Supplier:	Ex-Site
Sampled By:	Client	Specification:	BS1377
Date Received:	16 October 2023	Date Tested:	19 October 2023

Test Results

Liquid Limit	33	%
Plastic Limit	17	%
Plasticity Index	16	%

Preparation:	4.2.4 Sieved Specimen
Proportion retained on 425µm sieve:	35 %



Remarks:

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014+A1:2022

Project No: D23449

Project Name: 22181 - Blaendulais

Client: Spectrum Geo

Address: Foxglove Cottage

Cwm Risca Lane

Bridgend

ATS Sample No: 34756

CF32 0EH

Site Ref / Hole ID: WS03

Sample No:

Depth (m): 0.70 - 1.00

Sample Type: Disturbed

Sampling Certificate
Received: No

Material Description: Dark grey very gravelly
CLAY

Location in Works: N/a

Material Source: Ex-Site

Date Sampled: Unknown

Material Supplier: Ex-Site

Sampled By: Client

Specification: ISO 17892-1

Date Received: 16 October 2023

Date Tested: 18 October 2023

Test Results

Moisture Content (%)

17.6

Remarks:

QA Ref.

EN ISO 17892-
1:2014 A1:2022



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est,
Pyle, Bridgend, CF33 6BZ

Tel: 01656 746762 Fax: 01656 749096



7771

Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/10/2023

Fig

MC

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

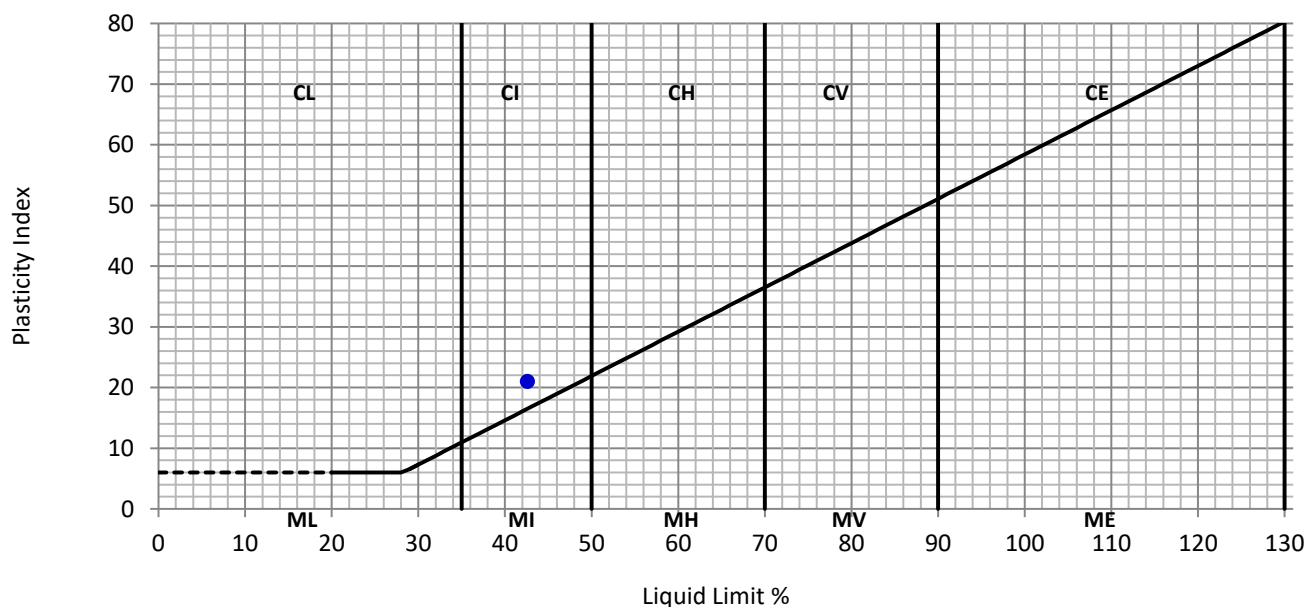
Project No:	D23449	Client:	Spectrum Geo
Project Name:	22181 - Blaendulais	Address:	Foxglove Cottage Cwm Risca Lane Bridgend CF32 0EH
ATS Sample No:	34756		

Site Ref / Hole ID:	WS03	Depth (m):	0.70 - 1.00
Sample No:		Sample Type:	Disturbed
Sampling Certificate Received:	No	Material Description:	Dark grey very gravelly CLAY
Location in Works:	N/a	Material Source:	Ex-Site
Date Sampled:	Unknown	Material Supplier:	Ex-Site
Sampled By:	Client	Specification:	BS1377
Date Received:	16 October 2023	Date Tested:	19 October 2023

Test Results

Liquid Limit	43	%
Plastic Limit	22	%
Plasticity Index	21	%

Preparation:	4.2.4 Sieved Specimen
Proportion retained on 425µm sieve:	76 %



Remarks:

QA Ref.

BS1377 - 2
Rev. 3.0



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est, Pyle,
Bridgend, CF33 6BZ
Tel: 01656 746762 Fax: 01656 749096



7771

Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/10/2023

Fig.

ATT

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014+A1:2022

Project No: D23449

Project Name: 22181 - Blaendulais

Client: Spectrum Geo

Address: Foxglove Cottage

Cwm Risca Lane

Bridgend

ATS Sample No: 34757

CF32 0EH

Site Ref / Hole ID: WS04

Sample No:

Depth (m): 0.50 - 1.00

Sample Type: Disturbed

**Sampling Certificate
Received:** No

Material Description: Brown sandy gravelly
CLAY

Location in Works: N/a

Material Source: Ex-Site

Date Sampled: Unknown

Material Supplier: Ex-Site

Sampled By: Client

Specification: ISO 17892-1

Date Received: 16 October 2023

Date Tested: 21 October 2023

Test Results

Moisture Content (%)

9.9

Remarks:

QA Ref.

EN ISO 17892-
1:2014 A1:2022



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est,
Pyle, Bridgend, CF33 6BZ

Tel: 01656 746762 Fax: 01656 749096



7771

Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/10/2023

Fig

MC

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

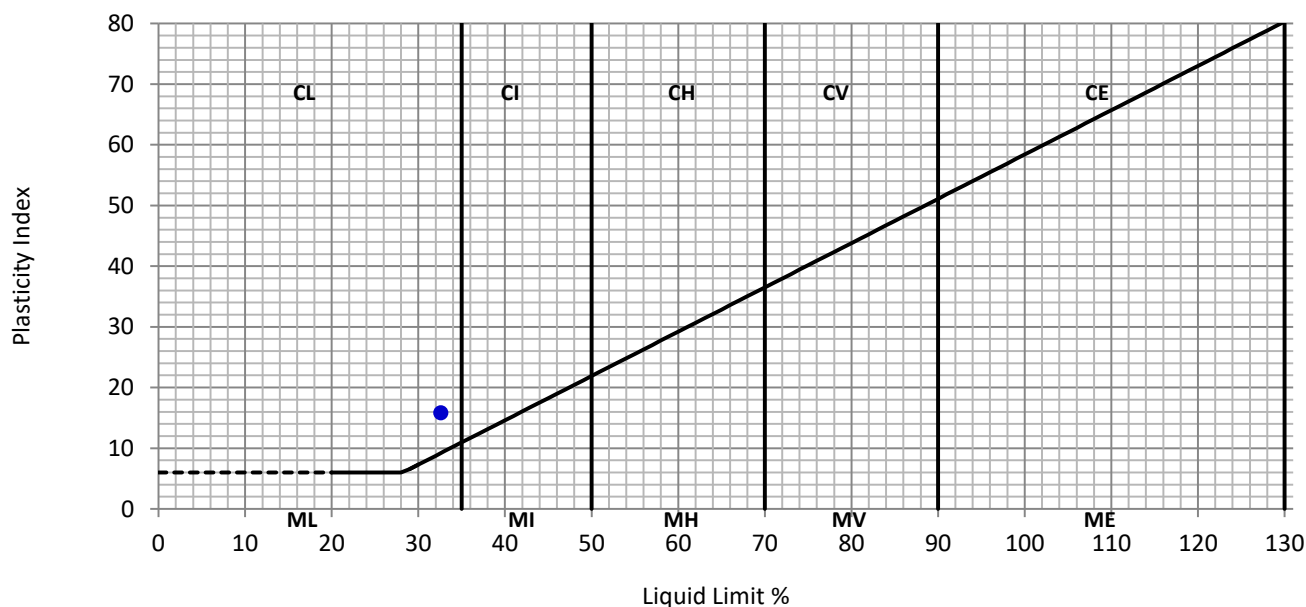
Project No:	D23449	Client:	Spectrum Geo
Project Name:	22181 - Blaendulais	Address:	Foxglove Cottage Cwm Risca Lane Bridgend CF32 0EH
ATS Sample No:	34757		

Site Ref / Hole ID:	WS04	Depth (m):	0.50 - 1.00
Sample No:		Sample Type:	Disturbed
Sampling Certificate Received:	No	Material Description:	Brown sandy gravelly CLAY
Location in Works:	N/a	Material Source:	Ex-Site
Date Sampled:	Unknown	Material Supplier:	Ex-Site
Sampled By:	Client	Specification:	BS1377
Date Received:	16 October 2023	Date Tested:	19 October 2023

Test Results

Liquid Limit	33	%
Plastic Limit	17	%
Plasticity Index	16	%

Preparation:	4.2.4 Sieved Specimen
Proportion retained on 425µm sieve:	32 %



Remarks:



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Apex Testing Solutions Limited
Sturmi Way
Village Farm Industrial Estate
Pyle
Bridgend
CF33 6BZ

Attention: Laura Davies

CERTIFICATE OF ANALYSIS

Date of report Generation:	25 October 2023
Customer:	Apex Testing Solutions Limited
Sample Delivery Group (SDG):	231019-54
Your Reference:	D23449
Location:	Blaendulais
Report No:	708685
Order Number:	ATS 1866

We received 3 samples on Thursday October 19, 2023 and 3 of these samples were scheduled for analysis which was completed on Wednesday October 25, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 231019-54
Client Ref.: D23449

Report Number: 708685
Location: Blaendulais

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
28808066	WS2		0.70 - 1.00	17/10/2023
28808069	WS3		0.70 - 1.00	17/10/2023
28808072	WS4		0.50 - 1.00	17/10/2023

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 231019-54

Report Number: 708685

Superseded Report:

Client Ref.: D23449

Location: Blaendulais

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

28808072
28808069
28808066

Customer
Sample Reference

WS4
WS3
WS2

AGS Reference

Depth (m)

0.50 - 1.00
0.70 - 1.00
0.70 - 1.00

Container

250g Amber Jar
(ALE210)
250g Amber Jar
(ALE210)
250g Amber Jar
(ALE210)

Sample Type

S
S
S

Anions by Kone (soil)

All

NDPs: 0
Tests: 3

X X X

Sample description

All

NDPs: 0
Tests: 3

X X X



CERTIFICATE OF ANALYSIS

Validated

SDG: 231019-54
Client Ref.: D23449

Report Number: 708685
Location: Blaendulais

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
------------------	----------	-------------	-----------------	---------------	-------------	---------------	------------	--------------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
28808066	WS2	0.70 - 1.00	Dark Brown	Sandy Clay Loam	Stones	Vegetation
28808069	WS3	0.70 - 1.00	Dark Brown	Silt Loam	None	Stones
28808072	WS4	0.50 - 1.00	Dark Brown	Sandy Clay Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 231019-54

Report Number: 708685

Superseded Report:

Client Ref.: D23449

Location: Blaendulais

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 231019-54
Client Ref.: D23449

Report Number: 708685
Location: Blaendulais

Superseded Report:

Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM243	Mixed Anions In Soils By Kone

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 231019-54

Report Number: 708685

Superseded Report:

Client Ref.: D23449

Location: Blaendulais

Test Completion Dates

Lab Sample No(s)	28808066	28808069	28808072
Customer Sample Ref.	WS2	WS3	WS4
AGS Ref.			
Depth	0.70 - 1.00	0.70 - 1.00	0.50 - 1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	25-Oct-2023	25-Oct-2023	25-Oct-2023
Sample description	19-Oct-2023	19-Oct-2023	19-Oct-2023



CERTIFICATE OF ANALYSIS

SDG: 231019-54
Client Ref: D23449

Report Number: 708685
Location: Blaendulais

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX D

Gas and Groundwater Monitoring

[illegible]

Date :			Meteorological and Site Conditions								
09/06/2022											
Operator:			State of ground								
JTC			Wind Overcast Warm								
			Wind Direction								
			Cloud Cover								
			Precipitation None								
			Temperature(deg.C) 16								
			Barometric Pressure (mb) 1017								
Equipment Used:			Dipmeter Multigas Analyser 30m								
Survey Information:			BH01: Gas bung was on ground near to borehole. Repaced and sampled.								
BH	Depth (m)	O ₂ (%w/v)	H ₂ S ppm	CO ppm	CH ₄ (%w/v)	CO ₂ (%w/v)	LEL (%)	AP mb	Flow (l/h)	DP (Pa)	Dip (m)
BH01	1.45	20.80	0.00	0.00	0.10	0.20	0.00	1017	0.10		3.30
BH02	8.20	20.60	0.00	0.00	0.10	0.20	0.00	1017	0.10		3.40
WS08	2.50	20.40			0.10	0.50	0.00	1017	0.10		DRY
Remarks:											
The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.											
Gas Monitoring			Blaendulus						Project No: 22181		

[illegible]

Date :		Meteorological and Site Conditions										
24/06/2024		State of ground		Dry								
Operator:		Wind		Light								
PL		Wind Direction		SW								
		Cloud Cover		80%								
		Precipitation		None								
		Temperature(deg.C)		18								
		Barometric Presure (mb)		1019								
Equipment Used:		Dipmeter 30m Multigas Analyser										
Survey Information:		BH01: Gas bung was on ground near to borehole. Repaced and sampled.										
BH	Depth (m)	O ₂ (%w/v)	H ₂ S ppm	CO ppm	CH ₄ (%w/v)	CO ₂ (%w/v)	LEL (%)	AP mb	Flow (l/h)	DP (Pa)	Dip (m)	
BH01	1.45	21.00			0.00	0.00	0.00	1019	0.00	0.00	1.36	
BH03	1.30	20.90			0.00	0.00	0.00	1019	0.00	0.00	1.19	
BH02	8.20	20.70			0.00	0.00	0.00	1019	0.00	0.00	2.61	
WS08	2.50	20.90			0.00	0.20	0.00	1019	0.00	0.00	DRY	
Remarks:												
The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.												
Gas Monitoring				Blaendulus				Project No: 22181				

[illegible]

spectrum
geo services

Date :	Meteorological and Site Conditions										
05/07/2024	State of groundDry										
Operator: PL	WindLight										
	Wind DirectionSW										
	Cloud Cover80%										
	PrecipitationNone										
	Temperature(deg.C)14										
	Barometric Presure (mb)1011										
Equipment Used:	DipmeterMultigas Analyser 30m										
Survey Information:	BH01: Gas bung was on ground near to borehole. Repaced and sampled.										
BH	Depth(m)	O ₂ (%w/v)	H ₂ Sppm	COppm	CH ₄ (%w/v)	CO ₂ (%w/v)	LEL(%)	APmb	Flow(l/h)	DP(Pa)	Dip(m)
BH01	1.45	20.90			0.00	0.00	0.00	1011	0.00	0.00	1.32
BH03	1.30	20.80			0.00	>>>>	0.00	1011	0.00	0.00	1.10
BH02	8.20	20.70			0.00	0.10	0.00	1011	0.00	0.00	2.51
WS08	2.50	20.80			0.00	0.30	0.00	1011	0.00	0.00	DRY
Remarks:											
The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.											
Gas Monitoring				Blaendulus				Project No: 22181			

APPENDIX E

Photographic Plates







10/10/23

PROJECT

BLAENDUL AIS

PROJECT NO

22181

TP

SA03

DEPTH (M)

GL 0.90

FACE











10/10/23

PROJECT BLAENDUL AIS
PROJECT NO 22181
TP TP 05
DEPTH (M) GL 0.70
FACE



10/10/23

PROJECT
PROJECT NO
TP
DEPTH (M)
FACE

BLAENDUL AIS

22181

WS 01

GL 1.50

NK 1.00-1.50



100 200 300 400



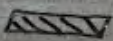
10/10/23

PROJECT
PROJECT NO
TP
DEPTH (M)
FACE

BLAENDUL AIS

22181

WS 02

GL  1.30



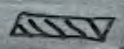
10/10/23

PROJECT
PROJECT NO
TP
DEPTH (M)
FACE

BLAENDUL AIS

22181

WS 03

GL  0.90



10/10/23

PROJECT
PROJECT NO
TP
DEPTH (M)
FACE

BLAENDUL AIS

22181

WS 04

GL  1.00



10/10/23

PROJECT

BLAENDULAIS

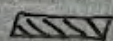
PROJECT NO

22181

TP

WS 05

DEPTH (M)

GL  0.45

FACE



100 200 300 400 500 600



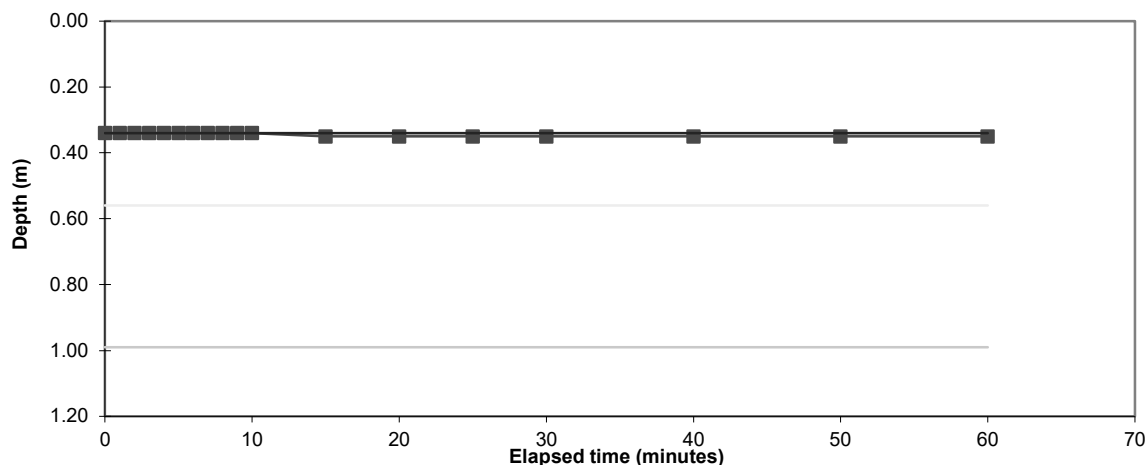
APPENDIX F

Soakaway Testing

Soakaway Test Results

Trial Pit No: SA01 Test No: 1 Date: 10.10.2023
 Length (m): 1.00
 Width (m): 0.30 Granular infill: NA
 Depth (m): 1.20 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.34	30	0.35
1	0.34	40	0.35
2	0.34	50	0.35
3	0.34	60	0.35
4	0.34		
5	0.34		
6	0.34		
7	0.34		
8	0.34		
9	0.34		
10	0.34		
15	0.35		
20	0.35		
25	0.35		



Water depth at start of test (m): 0.34
 75% effective depth (m): 0.56 Elapsed time (mins): #N/A
 50% effective depth (m): 0.77
 25% effective depth (m): 0.99 Elapsed time (mins): #N/A
 Empty depth (m): 1.20

Volume outflow between 75% and 25% effective depth (m³):
 Mean surface area of outflow (m²): 1.42
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
 Results processed following BRE 365 (1991)
 Water depths measured below ground level

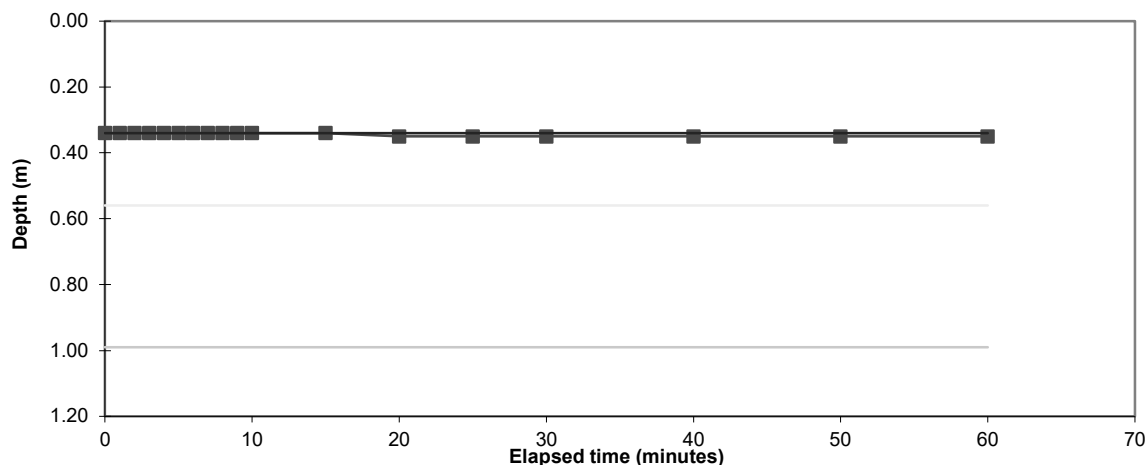
Project: Blaendulais
 Project No.: 22181
 Carried out for: TRJ

Figure
SA1_01

Soakaway Test Results

Trial Pit No: SA01 Test No: 2 Date: 10.10.2023
 Length (m): 1.00
 Width (m): 0.30 Granular infill: NA
 Depth (m): 1.20 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.34	30	0.35
1	0.34	40	0.35
2	0.34	50	0.35
3	0.34	60	0.35
4	0.34		
5	0.34		
6	0.34		
7	0.34		
8	0.34		
9	0.34		
10	0.34		
15	0.34		
20	0.35		
25	0.35		



Water depth at start of test (m): 0.34
 75% effective depth (m): 0.56 Elapsed time (mins): #N/A
 50% effective depth (m): 0.77
 25% effective depth (m): 0.99 Elapsed time (mins): #N/A
 Empty depth (m): 1.20

Volume outflow between 75% and 25% effective depth (m³):
 Mean surface area of outflow (m²): 1.42
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
 Results processed following BRE 365 (1991)
 Water depths measured below ground level

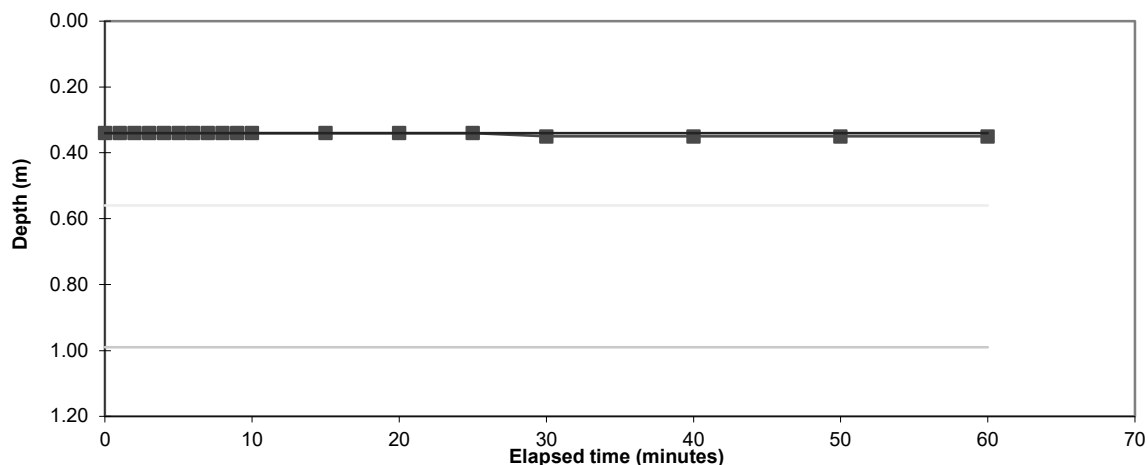
Project: Blaendulais
 Project No.: 22181
 Carried out for: TRJ

Figure
SA1_02

Soakaway Test Results

Trial Pit No: SA01 Test No: 3 Date: 10.10.2023
 Length (m): 1.00
 Width (m): 0.30 Granular infill: NA
 Depth (m): 1.20 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.34	30	0.35
1	0.34	40	0.35
2	0.34	50	0.35
3	0.34	60	0.35
4	0.34		
5	0.34		
6	0.34		
7	0.34		
8	0.34		
9	0.34		
10	0.34		
15	0.34		
20	0.34		
25	0.34		



Water depth at start of test (m): 0.34
 75% effective depth (m): 0.56 Elapsed time (mins): #N/A
 50% effective depth (m): 0.77
 25% effective depth (m): 0.99 Elapsed time (mins): #N/A
 Empty depth (m): 1.20

Volume outflow between 75% and 25% effective depth (m³):
 Mean surface area of outflow (m²): 1.42
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
 Results processed following BRE 365 (1991)
 Water depths measured below ground level

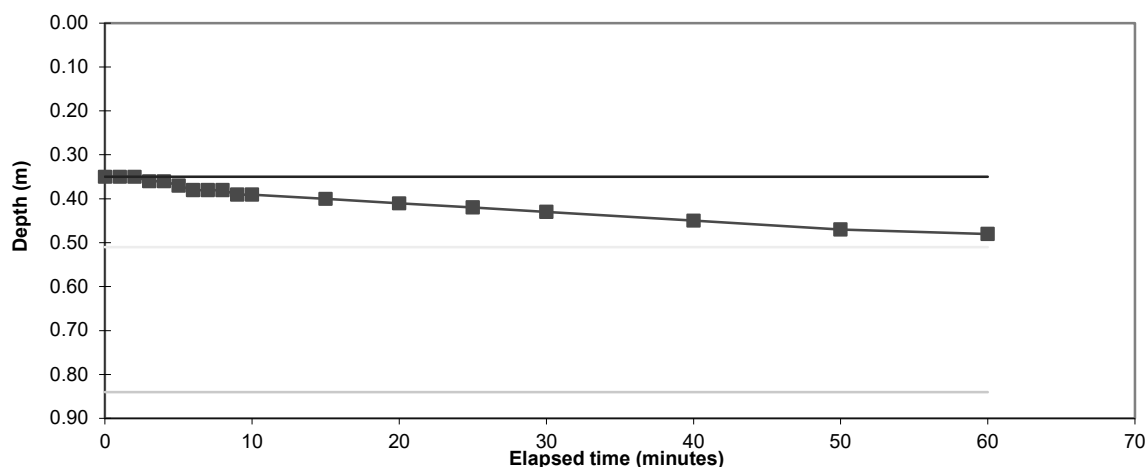
Project: Blaendulais
 Project No.: 22181
 Carried out for: TRJ

Figure
SA1_03

Soakaway Test Results

Trial Pit No: SA02 Test No: 1 Date: 10.10.2023
 Length (m): 1.00
 Width (m): 0.30 Granular infill: NA
 Depth (m): 1.00 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.35	30	0.43
1	0.35	40	0.45
2	0.35	50	0.47
3	0.36	60	0.48
4	0.36		
5	0.37		
6	0.38		
7	0.38		
8	0.38		
9	0.39		
10	0.39		
15	0.40		
20	0.41		
25	0.42		



Water depth at start of test (m): 0.35
 75% effective depth (m): 0.51 Elapsed time (mins): #N/A
 50% effective depth (m): 0.68
 25% effective depth (m): 0.84 Elapsed time (mins): #N/A
 Empty depth (m): 1.00

Volume outflow between 75% and 25% effective depth (m³):
 Mean surface area of outflow (m²): 1.13
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
 Results processed following BRE 365 (1991)
 Water depths measured below ground level

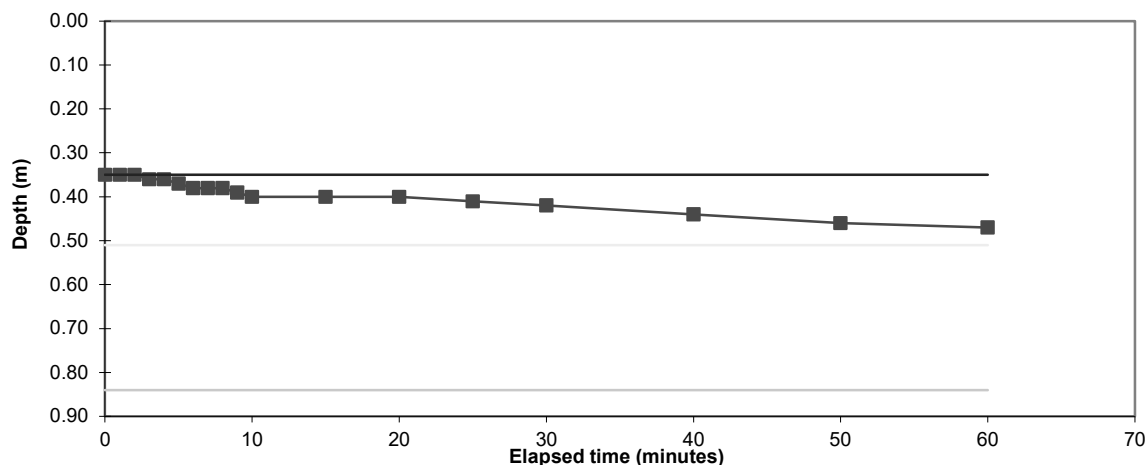
Project: Blaendulais
 Project No.: 22181
 Carried out for: TRJ

Figure
SA02_1

Soakaway Test Results

Trial Pit No: SA02 Test No: 2 Date: 10.10.2023
 Length (m): 1.00
 Width (m): 0.30 Granular infill: NA
 Depth (m): 1.00 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.35	30	0.42
1	0.35	40	0.44
2	0.35	50	0.46
3	0.36	60	0.47
4	0.36		
5	0.37		
6	0.38		
7	0.38		
8	0.38		
9	0.39		
10	0.40		
15	0.40		
20	0.40		
25	0.41		



Water depth at start of test (m): 0.35
 75% effective depth (m): 0.51 Elapsed time (mins): #N/A
 50% effective depth (m): 0.68
 25% effective depth (m): 0.84 Elapsed time (mins): #N/A
 Empty depth (m): 1.00

Volume outflow between 75% and 25% effective depth (m³):
 Mean surface area of outflow (m²): 1.13
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
 Results processed following BRE 365 (1991)
 Water depths measured below ground level

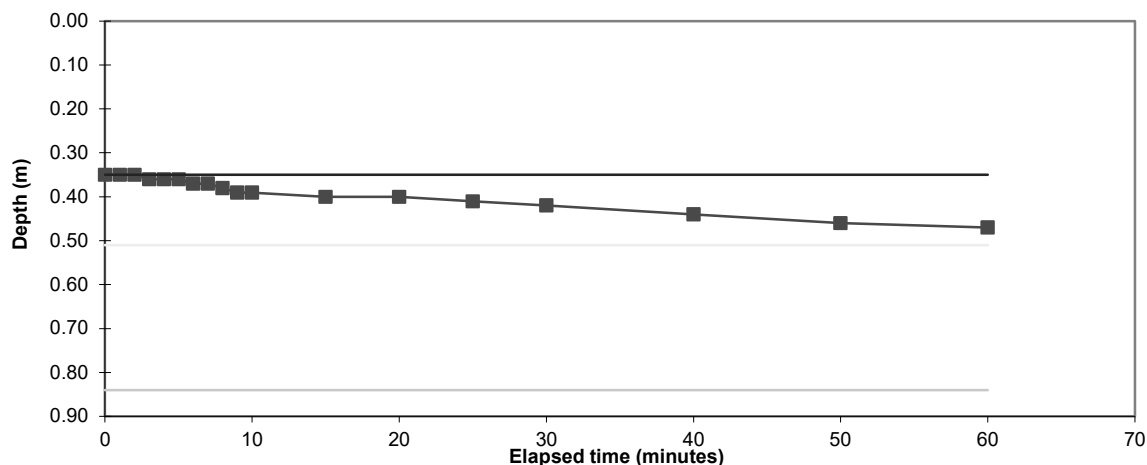
Project: Blaendulais
 Project No.: 22181
 Carried out for: TRJ

Figure
SA02_2

Soakaway Test Results

Trial Pit No: SA02 Test No: 3 Date: 10.10.2023
 Length (m): 1.00
 Width (m): 0.30 Granular infill: NA
 Depth (m): 1.00 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.35	30	0.42
1	0.35	40	0.44
2	0.35	50	0.46
3	0.36	60	0.47
4	0.36		
5	0.36		
6	0.37		
7	0.37		
8	0.38		
9	0.39		
10	0.39		
15	0.40		
20	0.40		
25	0.41		



Water depth at start of test (m): 0.35
 75% effective depth (m): 0.51 Elapsed time (mins): #N/A
 50% effective depth (m): 0.68
 25% effective depth (m): 0.84 Elapsed time (mins): #N/A
 Empty depth (m): 1.00

Volume outflow between 75% and 25% effective depth (m³):
 Mean surface area of outflow (m²): 1.13
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
 Results processed following BRE 365 (1991)
 Water depths measured below ground level

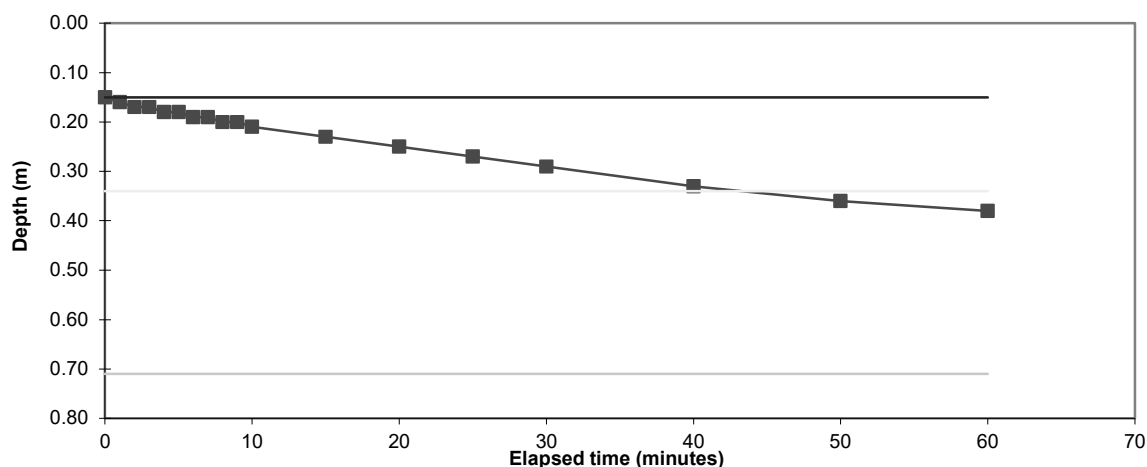
Project: Blaendulais
 Project No.: 22181
 Carried out for: TRJ

Figure
SA02_3

Soakaway Test Results

Trial Pit No: SA03 Test No: 1 Date: 10.10.2023
Length (m): 1.00
Width (m): 0.30 Granular infill: NA
Depth (m): 0.90 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.15	30	0.29
1	0.16	40	0.33
2	0.17	50	0.36
3	0.17	60	0.38
4	0.18		
5	0.18		
6	0.19		
7	0.19		
8	0.20		
9	0.20		
10	0.21		
15	0.23		
20	0.25		
25	0.27		



Water depth at start of test (m): 0.15
75% effective depth (m): 0.34 Elapsed time (mins): 43.3
50% effective depth (m): 0.53
25% effective depth (m): 0.71 Elapsed time (mins): #N/A
Empty depth (m): 0.90

Volume outflow between 75% and 25% effective depth (m^3):
Mean surface area of outflow (m^2): 1.26
(side area at 50% effective depth + base area)
Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate

Remarks

Notes:
Results processed following BRE 365 (1991)
Water depths measured below ground level

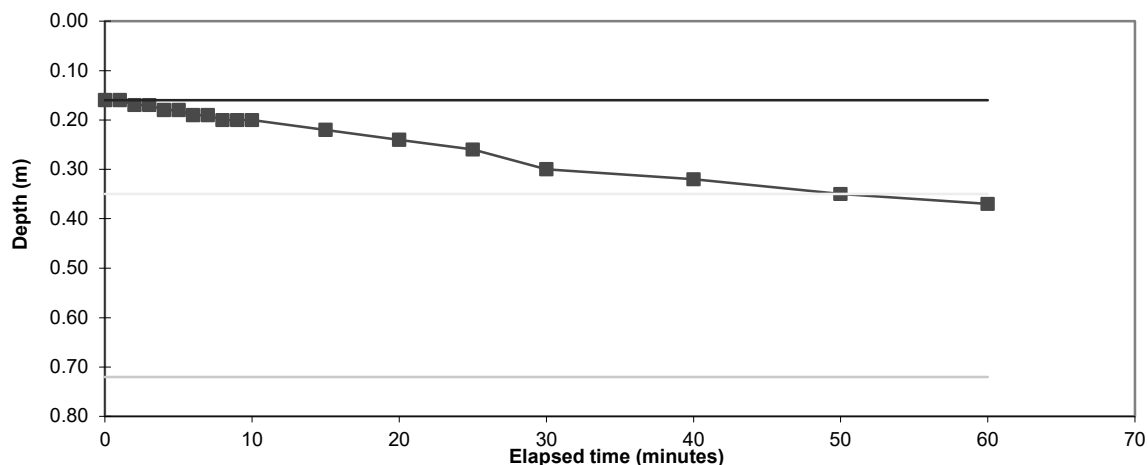
Project Blaendulais
Project No. 22181
Carried out for TRJ

Figure
SA03_1

Soakaway Test Results

Trial Pit No: SA03 Test No: 2 Date: 10.10.2023
 Length (m): 1.00
 Width (m): 0.30 Granular infill: NA
 Depth (m): 0.90 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.16	30	0.30
1	0.16	40	0.32
2	0.17	50	0.35
3	0.17	60	0.37
4	0.18		
5	0.18		
6	0.19		
7	0.19		
8	0.20		
9	0.20		
10	0.20		
15	0.22		
20	0.24		
25	0.26		



Water depth at start of test (m): 0.16
 75% effective depth (m): 0.35 Elapsed time (mins): 50.0
 50% effective depth (m): 0.53 Elapsed time (mins): #N/A
 25% effective depth (m): 0.72
 Empty depth (m): 0.90

Volume outflow between 75% and 25% effective depth (m³):
 Mean surface area of outflow (m²): 1.26
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate

Remarks

Notes:
 Results processed following BRE 365 (1991)
 Water depths measured below ground level

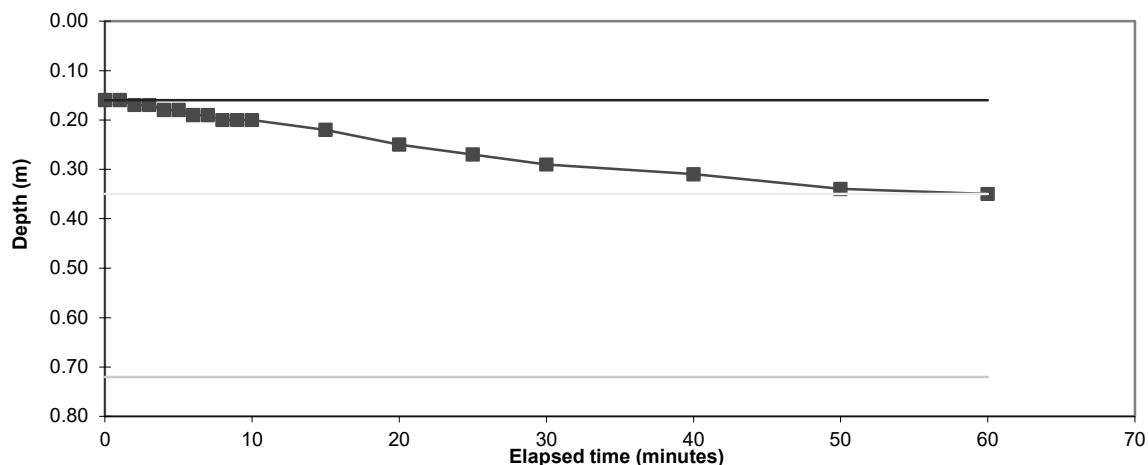
Project Blaendulais
 Project No. 22181
 Carried out for TRJ

Figure
SA03_2

Soakaway Test Results

Trial Pit No: SA03 Test No: 3 Date: 10.10.2023
 Length (m): 1.00
 Width (m): 0.30 Granular infill: NA
 Depth (m): 0.90 Porosity of infill: 1 (assumed)

Elapsed time (minutes)	Water Depth (metres)	Elapsed time (minutes)	Water Depth (metres)
0	0.16	30	0.29
1	0.16	40	0.31
2	0.17	50	0.34
3	0.17	60	0.35
4	0.18		
5	0.18		
6	0.19		
7	0.19		
8	0.20		
9	0.20		
10	0.20		
15	0.22		
20	0.25		
25	0.27		



Water depth at start of test (m): 0.16
 75% effective depth (m): 0.35 Elapsed time (mins): #N/A
 50% effective depth (m): 0.53 Elapsed time (mins): #N/A
 25% effective depth (m): 0.72
 Empty depth (m): 0.90

Volume outflow between 75% and 25% effective depth (m^3):
 Mean surface area of outflow (m^2): 1.26
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s): Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate

Remarks

Notes:
 Results processed following BRE 365 (1991)
 Water depths measured below ground level

Project Blaendulais
 Project No. 22181
 Carried out for TRJ

Figure
SA03_3

APPENDIX G

Permit Closure Summary Form



Permit Ref.	27301	Project / Site Location	NPT Childcare Unit, High Street, Blaendulais, SA10 9DN
-------------	--------------	-------------------------	--

Please supply all relevant documents, including this completed form within 3 months of the permitted works being completed.

Where relevant the report should include; borehole logs and details of mine or mine entry treatment works carried out (incl. engineering drawings, grout takes etc.) and a scaled site layout plan (correlated to O.S N' Grid) showing all relevant mine entry positions, coal seams, voids and broken ground proved by the works.

Summary of works

Start date

Finish date

Have any variations occurred? ☐ No ☐ Yes If so was the Authority notified? ☐ No ☐ Yes

Please describe;

Did if any of the following incidents occur?

- ☐ Spontaneous combustion ☐ Water emission ☐ Gas emission (elevated or above action levels)
☐ Geotechnical instability ☐ Legal issues incl. damage or potential claims ☐ **None**

If yes, please detail each item;

Were any of the following encountered? Please give a brief summary of the works undertaken.

- ☐ Intact coal only ☐ Broken ground ☐ Backfilled ground ☐ Voids

Description;

Will further works be necessary that require a Permit? ☐ No ☐ Yes

If yes, please describe, including any recommendations;

Name:	Email:
Company:	Tel:

APPENDIX H

Phase 1 Data

Walkover Report

Previous Desk Study and Ground Investigation

Historic Maps

Environmental Report

Blaendulais Childcare Centre

Order Details

Date: 24/09/2024
Your ref: 22181 Blaendulais
Our Ref: GS-4XQ-XX4-V4Y-SOE

Site Details

Location: 281974 208954
Area: 0.22 ha
Authority: [Castell-nedd Port Talbot - Neath Port Talbot County Borough](#) ↗



[Summary of findings](#)

[p.2 > Aerial image](#)

[p.6 >](#)

[OS MasterMap site plan](#)

[p.11 > Insight User Guide](#) ↗

Contact us with any questions at:

info@groundsure.com ↗

01273 257 755

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
12 >	1.1 >	Historical industrial land uses >	17	12	28	12	-
15 >	1.2 >	Historical tanks >	0	0	0	1	-
16	1.3	Historical energy features	0	0	0	0	-
16	1.4	Historical petrol stations	0	0	0	0	-
16 >	1.5 >	Historical garages >	0	0	0	3	-
17	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
18 >	2.1 >	Historical industrial land uses >	19	16	43	18	-
22 >	2.2 >	Historical tanks >	0	0	0	1	-
22	2.3	Historical energy features	0	0	0	0	-
23	2.4	Historical petrol stations	0	0	0	0	-
23 >	2.5 >	Historical garages >	0	0	0	3	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
24	3.1	Active or recent landfill	0	0	0	0	-
24	3.2	Historical landfill (BGS records)	0	0	0	0	-
25 >	3.3 >	Historical landfill (LA/mapping records) >	0	0	2	0	-
25	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
25	3.5	Historical waste sites	0	0	0	0	-
25	3.6	Licensed waste sites	0	0	0	0	-
26 >	3.7 >	Waste exemptions >	0	0	0	1	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
27 >	4.1 >	Recent industrial land uses >	0	0	3	-	-
28 >	4.2 >	Current or recent petrol stations >	0	0	1	0	-
28	4.3	Electricity cables	0	0	0	0	-
28	4.4	Gas pipelines	0	0	0	0	-
28	4.5	Sites determined as Contaminated Land	0	0	0	0	-



29	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
29	4.7	Regulated explosive sites	0	0	0	0	-
29	4.8	Hazardous substance storage/usage	0	0	0	0	-
29	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
29	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
30	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
30	4.12	Radioactive Substance Authorisations	0	0	0	0	-
30	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
30	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
30	4.15	Pollutant release to public sewer	0	0	0	0	-
31	4.16	List 1 Dangerous Substances	0	0	0	0	-
31	4.17	List 2 Dangerous Substances	0	0	0	0	-
31 >	4.18 >	<u>Pollution Incidents (EA/NRW) ></u>	0	0	3	14	-
33	4.19	Pollution inventory substances	0	0	0	0	-
33	4.20	Pollution inventory waste transfers	0	0	0	0	-
34	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	<u>Geology (basic) ></u>					
35 >	5.1 >	<u>Superficial geology (625k) ></u>	Identified (within 500m)				
35 >	5.2 >	<u>Bedrock geology (625k) ></u>	Identified (within 500m)				
Page	Section	<u>Hydrogeology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
36 >	6.1 >	<u>Superficial aquifer ></u>	Identified (within 500m)				
38 >	6.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
39 >	6.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
41	6.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
41	6.5	Groundwater vulnerability- local information	None (within 0m)				
42	6.6	Groundwater abstractions	0	0	0	0	0
43 >	6.7 >	<u>Surface water abstractions ></u>	0	0	0	0	2
43	6.8	Potable abstractions	0	0	0	0	0
44	6.9	Source Protection Zones	0	0	0	0	-



44	6.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
45 >	7.1 >	Water Network (OS MasterMap) >	0	0	10	-	-
46 >	7.2 >	Surface water features >	0	0	5	-	-
47 >	7.3 >	WFD Surface water body catchments >	1	-	-	-	-
47 >	7.4 >	WFD Surface water bodies >	0	0	1	-	-
47 >	7.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
49	8.1	Risk of flooding from rivers and the sea	None (within 50m)				
49	8.2	Historical Flood Events	0	0	0	-	-
49	8.3	Flood Defences	0	0	0	-	-
50	8.4	Areas Benefiting from Flood Defences	0	0	0	-	-
50	8.5	Flood Storage Areas	0	0	0	-	-
51	8.6	Flood Zone 2	None (within 50m)				
51	8.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
52 >	9.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
54 >	10.1 >	Groundwater flooding >	Low (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
55	11.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
56	11.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
56	11.3	Special Areas of Conservation (SAC)	0	0	0	0	0
56	11.4	Special Protection Areas (SPA)	0	0	0	0	0
56	11.5	National Nature Reserves (NNR)	0	0	0	0	0
57	11.6	Local Nature Reserves (LNR)	0	0	0	0	0
57 >	11.7 >	Designated Ancient Woodland >	0	0	1	3	9
58	11.8	Biosphere Reserves	0	0	0	0	0
58	11.9	Forest Parks	0	0	0	0	0



58	11.10	Marine Conservation Zones	0	0	0	0	0
58	11.11	Green Belt	0	0	0	0	0
58	11.12	Proposed Ramsar sites	0	0	0	0	0
59	11.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
59	11.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
59	11.15	Nitrate Sensitive Areas	0	0	0	0	0
59	11.16	Nitrate Vulnerable Zones	0	0	0	0	0
60	11.17	SSSI Impact Risk Zones	0	-	-	-	-
60	11.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
61	12.1	World Heritage Sites	0	0	0	-	-
62	12.2	Area of Outstanding Natural Beauty	0	0	0	-	-
62	12.3	National Parks	0	0	0	-	-
62 >	12.4 >	Listed Buildings >	0	0	1	-	-
63	12.5	Conservation Areas	0	0	0	-	-
63	12.6	Scheduled Ancient Monuments	0	0	0	-	-
63	12.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
64 >	13.1 >	Agricultural Land Classification >	Grade 4 (within 250m)				
65	13.2	Open Access Land	0	0	0	-	-
65	13.3	Tree Felling Licences	0	0	0	-	-
65	13.4	Environmental Stewardship Schemes	0	0	0	-	-
65	13.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
67	14.1	Priority Habitat Inventory	0	0	0	-	-
67	14.2	Habitat Networks	0	0	0	-	-
67	14.3	Open Mosaic Habitat	0	0	0	-	-
67	14.4	Limestone Pavement Orders	0	0	0	-	-



Recent aerial photograph



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Capture Date: 14/04/2020

Site Area: 0.22ha



Recent site history - 2017 aerial photograph



Capture Date: 17/06/2017

Site Area: 0.22ha



Recent site history - 2013 aerial photograph



Capture Date: 14/07/2013

Site Area: 0.22ha



Recent site history - 2001 aerial photograph



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Capture Date: 27/08/2001

Site Area: 0.22ha



Recent site history - 2000 aerial photograph



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Capture Date: 18/06/2000

Site Area: 0.22ha



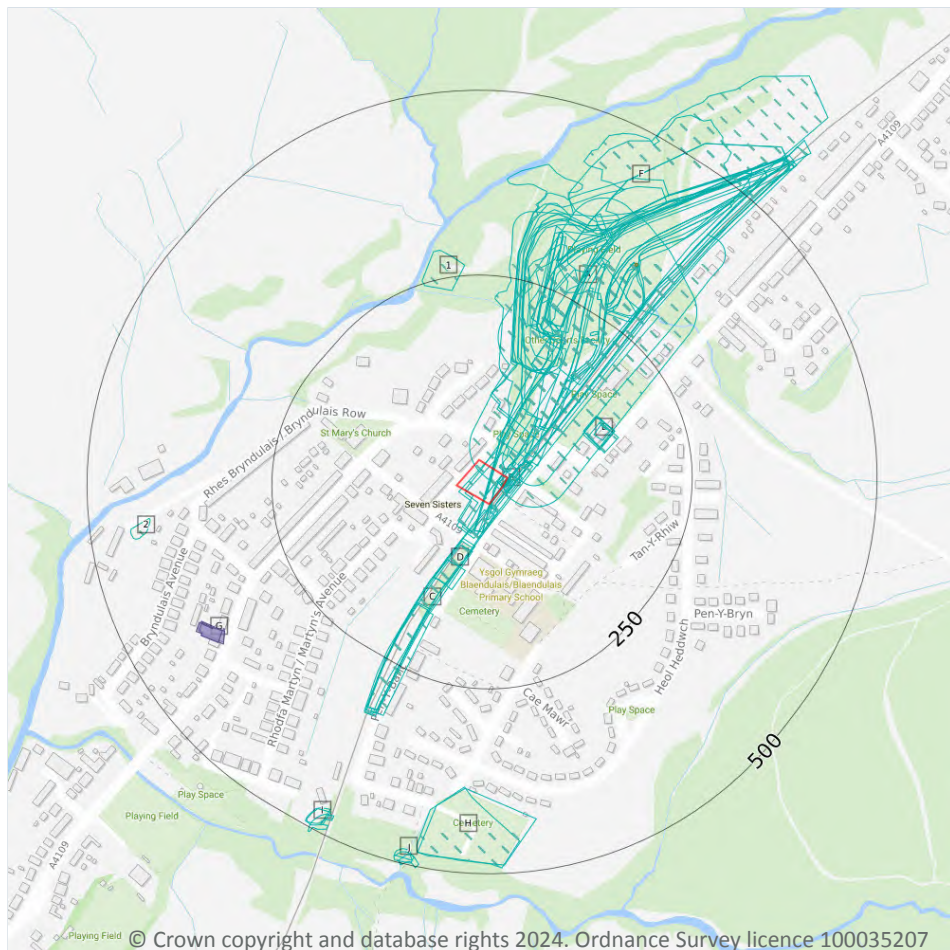
OS MasterMap site plan



Site Area: 0.22ha



1 Past land use



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

1.1 Historical industrial land uses

Records within 500m

69

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 12 >](#)

ID	Location	Land use	Dates present	Group ID
A	On site	Mill Ponds	1921	265152



ID	Location	Land use	Dates present	Group ID
A	On site	Railway Sidings	1948	285557
A	On site	Coal Pit	1876	286211
A	On site	Colliery	1921	294127
A	On site	Railway Sidings	1914	297297
A	On site	Railway Sidings	1921	297936
A	On site	Railway Sidings	1964	300923
A	On site	Railway Sidings	1988	306752
A	On site	Railway Sidings	1914	314793
A	On site	Railway Sidings	1921	317427
B	On site	Railway Station	1903	286577
B	On site	Railway Station	1921 - 1948	291144
B	On site	Railway Station	1901	295489
B	On site	Railway Station	1914	299899
B	On site	Railway Station	1914	301821
B	On site	Railway Station	1877	319600
B	On site	Railway Station	1964 - 1988	326058
B	1m E	Railway Station	1876	308972
B	1m SE	Railway Station	1921	324359
C	3m S	Cuttings	1876	317006
A	6m E	Colliery	1901 - 1903	318713
B	9m E	Railway Station	1921	313168
B	9m E	Railway Building	1921 - 1948	317069
C	10m S	Cuttings	1877	285515
A	23m NE	Railway Sidings	1876 - 1877	323242
A	23m NE	Unspecified Mine	1964 - 1988	303971
A	33m NE	Railway Sidings	1903	325891
A	36m NE	Colliery	1921	295147
A	42m NE	Tramway Sidings	1901 - 1903	322226



ID	Location	Land use	Dates present	Group ID
C	58m S	Cuttings	1914 - 1921	291419
D	62m S	Cuttings	1921	314360
A	66m NE	Colliery	1948	306471
C	67m S	Cuttings	1921	286386
A	81m NE	Railway Sidings	1921	314165
A	82m NE	Colliery	1914	323741
D	93m S	Cuttings	1921 - 1948	284742
E	118m NE	Police Station	1914 - 1921	311947
E	121m NE	Police Station	1948	289816
E	121m NE	Police Station	1921	290095
E	122m NE	Police Station	1921	290411
E	131m NE	Police Station	1964 - 1988	287000
A	132m NE	Railway Building	1948	280275
F	139m NE	Refuse Heap	1964 - 1988	290582
A	139m N	Refuse Heap	1921	300754
A	141m NE	Refuse Heap	1921	286926
A	142m NE	Refuse Heap	1921	305842
A	145m NE	Unspecified Heap	1901	274539
A	159m NE	Coal Pit	1877	292524
C	163m SW	Cuttings	1948	316506
C	166m SW	Cuttings	1921	294371
F	190m N	Refuse Heaps	1948	277098
A	190m NE	Railway Sidings	1921	310537
A	194m N	Refuse Heap	1914	328048
A	208m NE	Unspecified Shafts	1877	270756
A	211m NE	Unspecified Shaft	1876	266414
A	223m NE	Unspecified Shaft	1876 - 1877	308521
1	232m N	Refuse Heap	1964 - 1988	300539



ID	Location	Land use	Dates present	Group ID
A	259m NE	Refuse Heap	1921	291321
A	267m NE	Refuse Heap	1914	291293
A	310m NE	Cuttings	1876	266057
H	384m S	Cemetery	1964 - 1988	317879
H	386m S	Burial Ground	1948	281442
2	417m W	Unspecified Old Quarry	1901 - 1903	308480
I	465m SW	Unspecified Pit	1914	329076
I	469m SW	Unspecified Ground Workings	1921	310111
I	471m SW	Unspecified Ground Workings	1921	322039
J	480m S	Unspecified Pit	1948	316763
J	484m S	Unspecified Pit	1921	323336
J	486m S	Unspecified Ground Workings	1921	261593

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

1

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 12 >](#)

ID	Location	Land use	Dates present	Group ID
A	335m NE	Unspecified Tank	1962	34736

This data is sourced from Ordnance Survey / Groundsure.



1.3 Historical energy features

Records within 500m	0
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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'.

This data is sourced from Ordnance Survey / Groundsure.

1.4 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, 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	3
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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 12 >](#)

ID	Location	Land use	Dates present	Group ID
G	370m SW	Garage	1993	6974
G	371m SW	Garage	1962	6852
G	373m SW	Garage	1987	7028

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

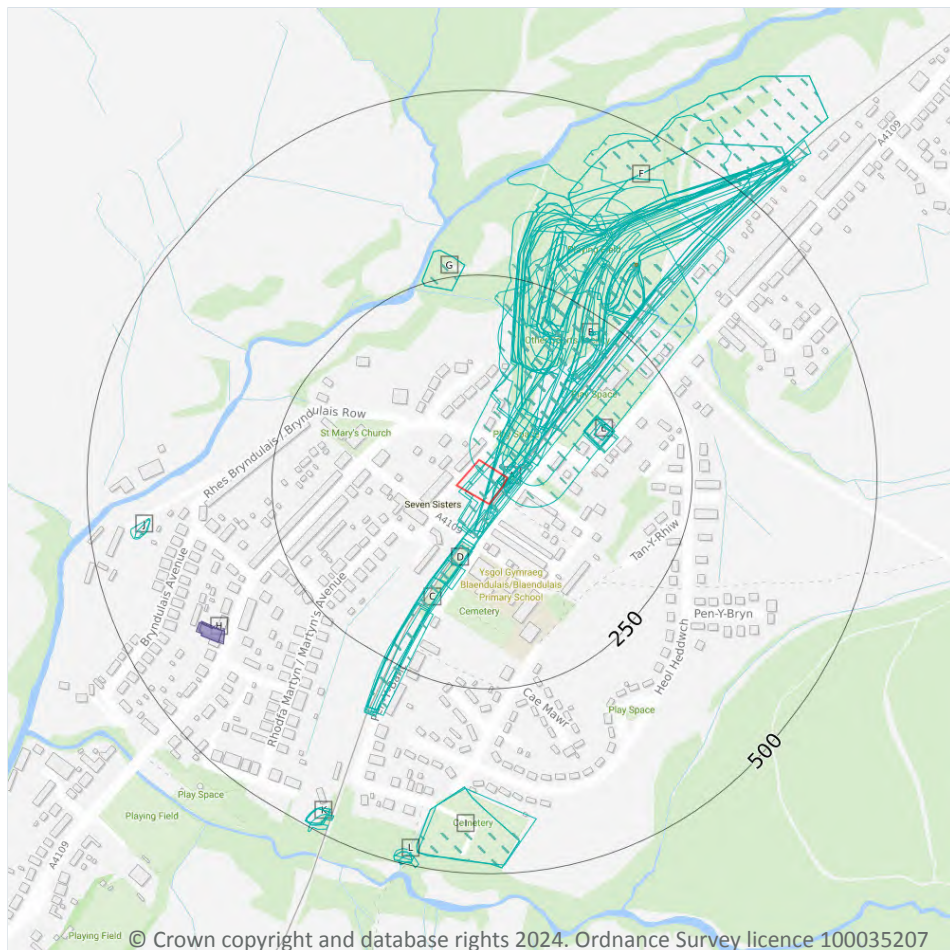
0

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 garages

2.1 Historical industrial land uses

Records within 500m

96

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 18](#) >

ID	Location	Land Use	Date	Group ID
A	On site	Railway Station	1901	295489
A	On site	Railway Station	1914	301821
A	On site	Railway Station	1914	299899



ID	Location	Land Use	Date	Group ID
A	On site	Railway Station	1948	291144
A	On site	Railway Station	1903	286577
A	On site	Railway Station	1877	319600
A	On site	Railway Station	1988	326058
A	On site	Railway Station	1964	326058
A	On site	Railway Station	1921	291144
B	On site	Coal Pit	1876	286211
B	On site	Railway Sidings	1921	317427
B	On site	Mill Ponds	1921	265152
B	On site	Colliery	1921	294127
B	On site	Railway Sidings	1914	314793
B	On site	Railway Sidings	1914	297297
B	On site	Railway Sidings	1948	285557
B	On site	Railway Sidings	1988	306752
B	On site	Railway Sidings	1964	300923
B	On site	Railway Sidings	1921	297936
A	1m E	Railway Station	1876	308972
A	1m SE	Railway Station	1921	324359
C	3m S	Cuttings	1876	317006
B	6m E	Colliery	1903	318713
A	9m E	Railway Station	1921	313168
A	9m E	Railway Building	1948	317069
C	10m S	Cuttings	1877	285515
A	10m NE	Railway Building	1921	317069
B	23m NE	Railway Sidings	1877	323242
B	23m NE	Unspecified Mine	1988	303971
B	23m NE	Unspecified Mine	1964	303971
B	33m NE	Railway Sidings	1903	325891



ID	Location	Land Use	Date	Group ID
B	36m NE	Colliery	1921	295147
B	36m NE	Colliery	1921	295147
B	38m NE	Railway Sidings	1876	323242
B	42m NE	Tramway Sidings	1901	322226
C	58m S	Cuttings	1914	291419
C	58m S	Cuttings	1914	291419
D	62m S	Cuttings	1921	314360
B	66m NE	Colliery	1948	306471
C	67m S	Cuttings	1921	286386
B	76m NE	Colliery	1901	318713
B	81m NE	Railway Sidings	1921	314165
B	82m NE	Colliery	1914	323741
B	82m NE	Colliery	1914	323741
D	93m S	Cuttings	1921	284742
D	93m SW	Cuttings	1948	284742
E	118m NE	Police Station	1921	311947
E	121m NE	Police Station	1948	289816
E	121m NE	Police Station	1921	290095
E	122m NE	Police Station	1914	311947
E	122m NE	Police Station	1914	311947
E	122m NE	Police Station	1921	290411
E	131m NE	Police Station	1988	287000
E	131m NE	Police Station	1964	287000
B	132m NE	Railway Building	1948	280275
F	139m NE	Refuse Heap	1988	290582
F	139m NE	Refuse Heap	1964	290582
B	139m N	Refuse Heap	1921	300754
B	141m NE	Refuse Heap	1921	286926



ID	Location	Land Use	Date	Group ID
B	142m NE	Refuse Heap	1921	305842
B	142m NE	Refuse Heap	1921	305842
B	145m NE	Unspecified Heap	1901	274539
B	159m NE	Railway Sidings	1921	297936
B	159m NE	Coal Pit	1877	292524
C	163m SW	Cuttings	1948	316506
B	163m NE	Tramway Sidings	1903	322226
C	166m SW	Cuttings	1921	294371
C	168m S	Cuttings	1921	291419
F	190m N	Refuse Heaps	1948	277098
B	190m NE	Railway Sidings	1921	310537
B	194m N	Refuse Heap	1914	328048
B	194m N	Refuse Heap	1914	328048
B	208m NE	Unspecified Shafts	1877	270756
B	211m NE	Unspecified Shaft	1876	266414
B	223m NE	Unspecified Shaft	1877	308521
B	226m NE	Unspecified Shaft	1876	308521
G	232m N	Refuse Heap	1988	300539
G	232m N	Refuse Heap	1964	300539
B	259m NE	Refuse Heap	1921	291321
B	267m NE	Refuse Heap	1914	291293
B	267m NE	Refuse Heap	1914	291293
B	310m NE	Cuttings	1876	266057
I	384m S	Cemetery	1988	317879
I	384m S	Cemetery	1964	317879
I	386m S	Burial Ground	1948	281442
J	417m W	Unspecified Old Quarry	1901	308480
J	418m W	Unspecified Old Quarry	1903	308480



ID	Location	Land Use	Date	Group ID
K	465m SW	Unspecified Pit	1914	329076
K	465m SW	Unspecified Pit	1914	329076
K	469m SW	Unspecified Ground Workings	1921	310111
K	469m SW	Unspecified Ground Workings	1921	310111
K	471m SW	Unspecified Ground Workings	1921	322039
L	480m S	Unspecified Pit	1948	316763
L	484m S	Unspecified Pit	1921	323336
L	484m S	Unspecified Pit	1921	323336
L	486m S	Unspecified Ground Workings	1921	261593

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

1

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 18 >](#)

ID	Location	Land Use	Date	Group ID
B	335m NE	Unspecified Tank	1962	34736

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

0

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'.

This data is sourced from Ordnance Survey / Groundsure.



2.4 Historical petrol stations

Records within 500m**0**

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

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m**3**

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 18 >](#)

ID	Location	Land Use	Date	Group ID
H	370m SW	Garage	1993	6974
H	371m SW	Garage	1962	6852
H	373m SW	Garage	1987	7028

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical landfill (LA/OS)
- 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**2**

Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on [page 24 >](#)

ID	Location	Site address	Source	Data type
1	139m N	Refuse Tip	1962 mapping	Polygon
2	236m N	Refuse Tip	1961 mapping	Polygon

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

1

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.

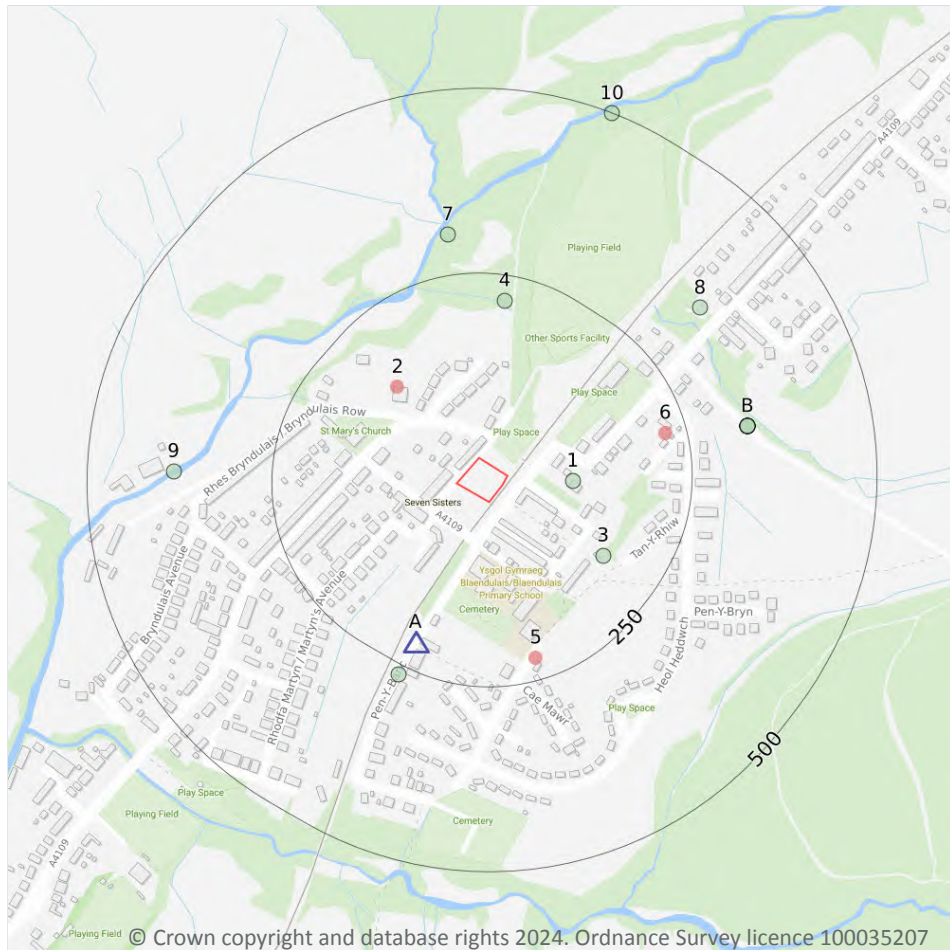
Features are displayed on the Waste and landfill map on [page 24 >](#)

ID	Location	Site	Reference	Category	Sub-Category	Description
3	275m W	Land Opposite Bryndulias Row, Sa109eb	NRW-WME062807	Using waste exemption	On a farm	Use of waste in construction

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
- △ Current or recent petrol stations
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

3

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 27 >](#)

ID	Location	Company	Address	Activity	Category
2	146m NW	Seven Sisters Fire Station	Seven Sisters Fire Station, Bryndulais Row, Seven Sisters, West Glamorgan, SA10 9EA	Fire Brigade Stations	Central and Local Government
5	220m S	Electricity Sub Station	West Glamorgan, SA10	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
6	221m E	Electricity Sub Station	West Glamorgan, SA10	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	1
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Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on [page 27 >](#)

ID	Location	Company	Address	LPG	Status
A	214m SW	OBSOLETE	Church Road, Seven Sisters, Neath, Neath Port Talbot, SA10 9DT	Not Applicable	Obsolete

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0
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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**0**

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

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

4.14 Pollutant release to surface waters (Red List)

Records within 500m**0**

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

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

4.15 Pollutant release to public sewer

Records within 500m**0**

Discharges of Special Category Effluents to the public sewer.

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



4.16 List 1 Dangerous Substances

Records within 500m

0

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

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

4.17 List 2 Dangerous Substances

Records within 500m

0

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

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m

17

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 27 >](#)

ID	Location	Details	
1	89m E	Incident Date: 03/01/2014 Incident Identification: 1189750 Pollutant: Contaminated Water Pollutant Description: Firefighting Run-Off	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
3	166m SE	Incident Date: 13/02/2003 Incident Identification: 136726 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
4	216m N	Incident Date: 12/06/2007 Incident Identification: 502566 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
A	264m SW	Incident Date: 18/10/2002 Incident Identification: 115533 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)



ID	Location	Details	
7	305m N	Incident Date: 18/05/2001 Incident Identification: 5961 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	331m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	331m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Vehicles and Vehicle Parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	331m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Tyres	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	331m E	Incident Date: 06/04/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Specific Waste Materials Specific Waste Materials Specific Waste Materials Specific Waste Materials Pollutant Description: Construction and Demolition Materials and Wastes Asbestos Commercial Waste Household Waste Tyres Vehicles and Vehicle Parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	331m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Asbestos	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	331m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Household Waste	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	331m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Inert Materials and Wastes:Specific Waste Materials:Specific Waste Materials:Specific Waste Materials:Specific Waste Materials:Specific Waste Materials Pollutant Description: Construction and Demolition Materials and Wastes:Asbestos:Commercial Waste:Household Waste:Tyres:Vehicles and Vehicle Parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)



ID	Location	Details	
B	331m E	Incident Date: 06/04/2001 Incident Identification: 7402 Pollutant: Inert Materials and Wastes : Specific Waste Materials Pollutant Description: Construction and Demolition Materials and Wastes :Asbestos :Commercial Waste :Household Waste :Tyres :Vehicles and Vehicle Parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	331m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
8	346m NE	Incident Date: 06/05/2015 Incident Identification: 1334992 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
9	383m W	Incident Date: 11/06/2007 Incident Identification: 502089 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
10	499m N	Incident Date: 29/04/2002 Incident Identification: 75457 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

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

4.19 Pollution inventory substances

Records within 500m	0
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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
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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 Geology (basic)

5.1 Superficial geology (625k)

Records within 500m

1

Generalised geology data based on BGS's published poster maps of the UK (North and South). Superficial related themes digitised from 1977 first edition Quaternary map (North and South).

Location	Lex code	Description	Rock type
On site	TILL-DMTN	TILL	DIAMICTON

This data is sourced from the British Geological Survey.

5.2 Bedrock geology (625k)

Records within 500m

1

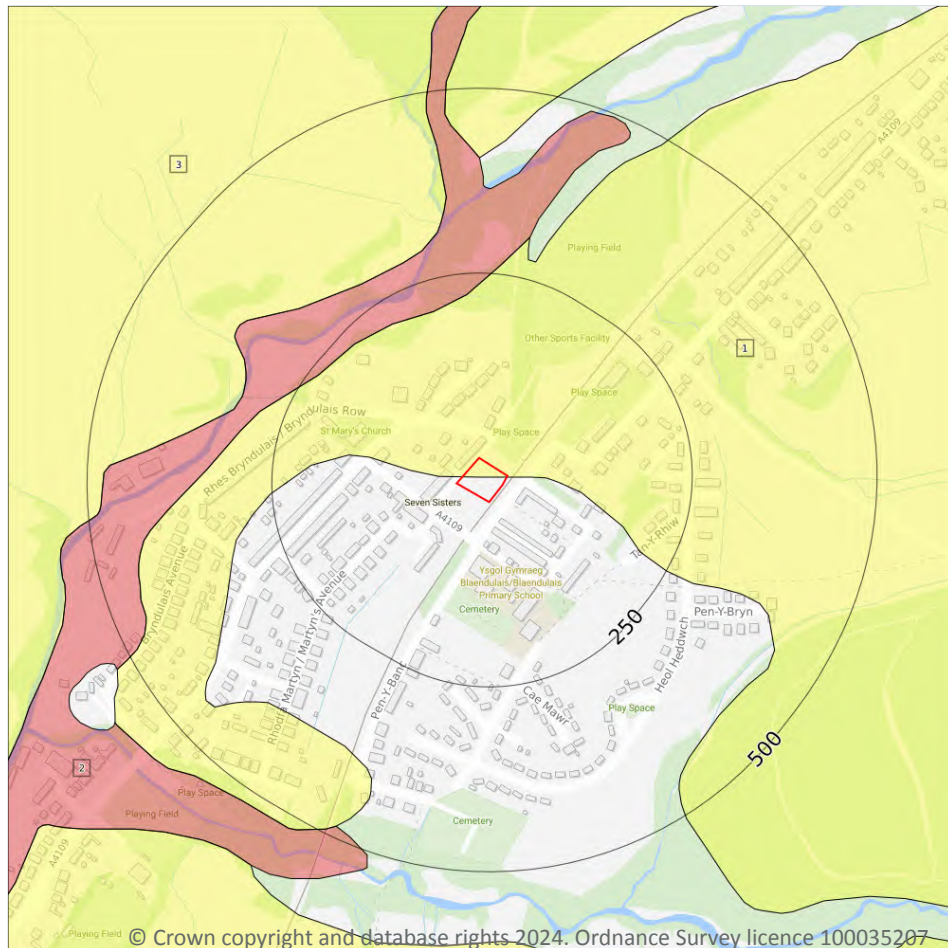
Generalised geology data based on BGS's published poster maps of the UK (North and South). Bedrock related themes created through generalisation of 1:50,000 data.

Location	Lex code	Description	Rock type
On site	PSMCM-MSCI	PENNINE MIDDLE COAL MEASURES FORMATION AND SOUTH WALES MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED)	MUDSTONE, SILTSTONE, SANDSTONE, COAL, IRONSTONE AND FERRICRETE

This data is sourced from the British Geological Survey.



6 Hydrogeology - Superficial aquifer



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

6.1 Superficial aquifer

Records within 500m

3

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 36](#) >

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
2	207m N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

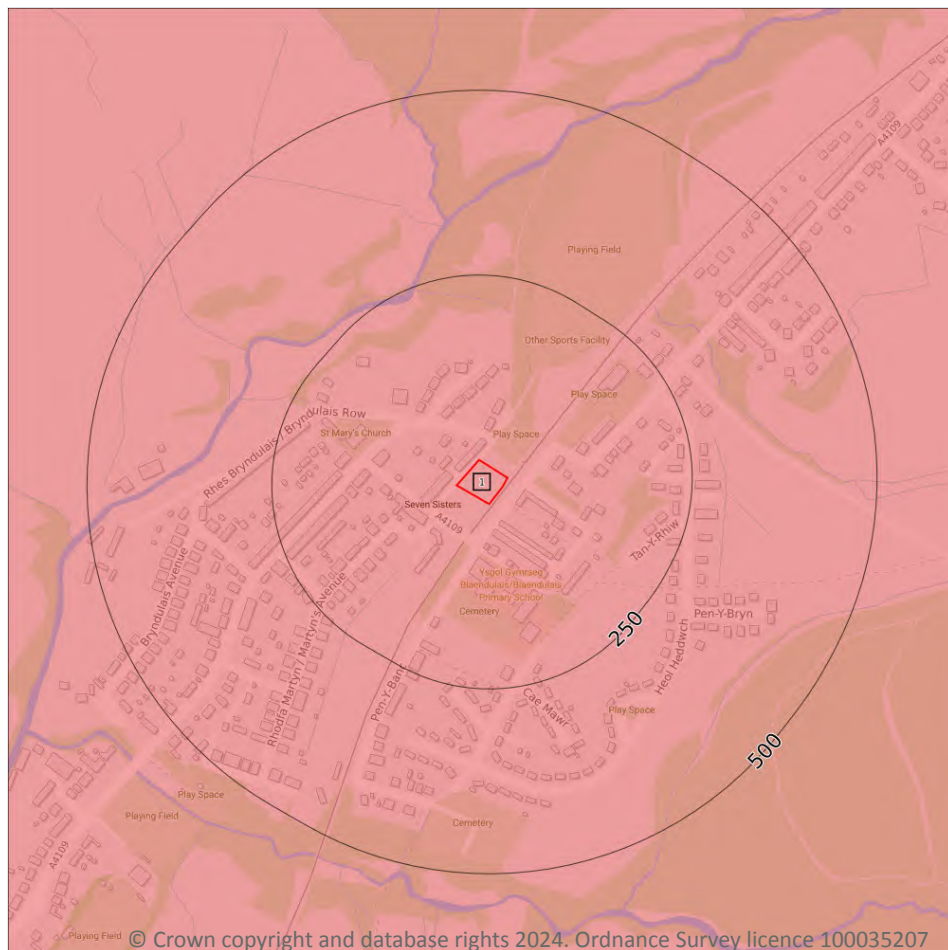


ID	Location	Designation	Description
3	282m NW	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics 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

6.2 Bedrock aquifer

Records within 500m

1

Aquifer status of groundwater held within bedrock geology.

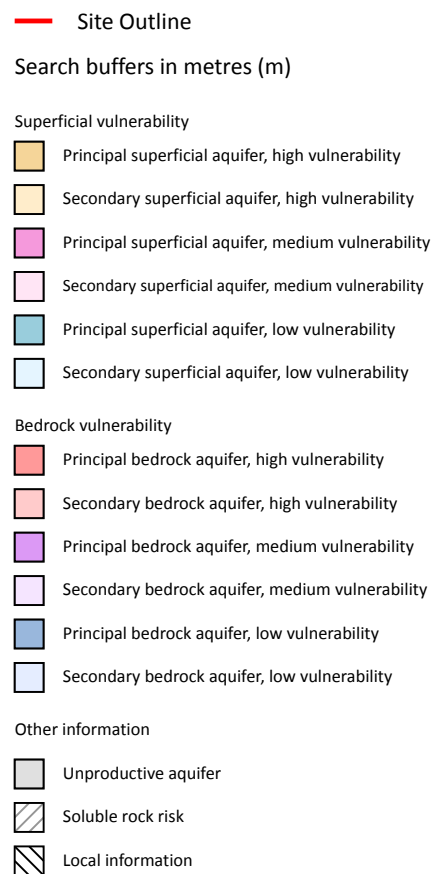
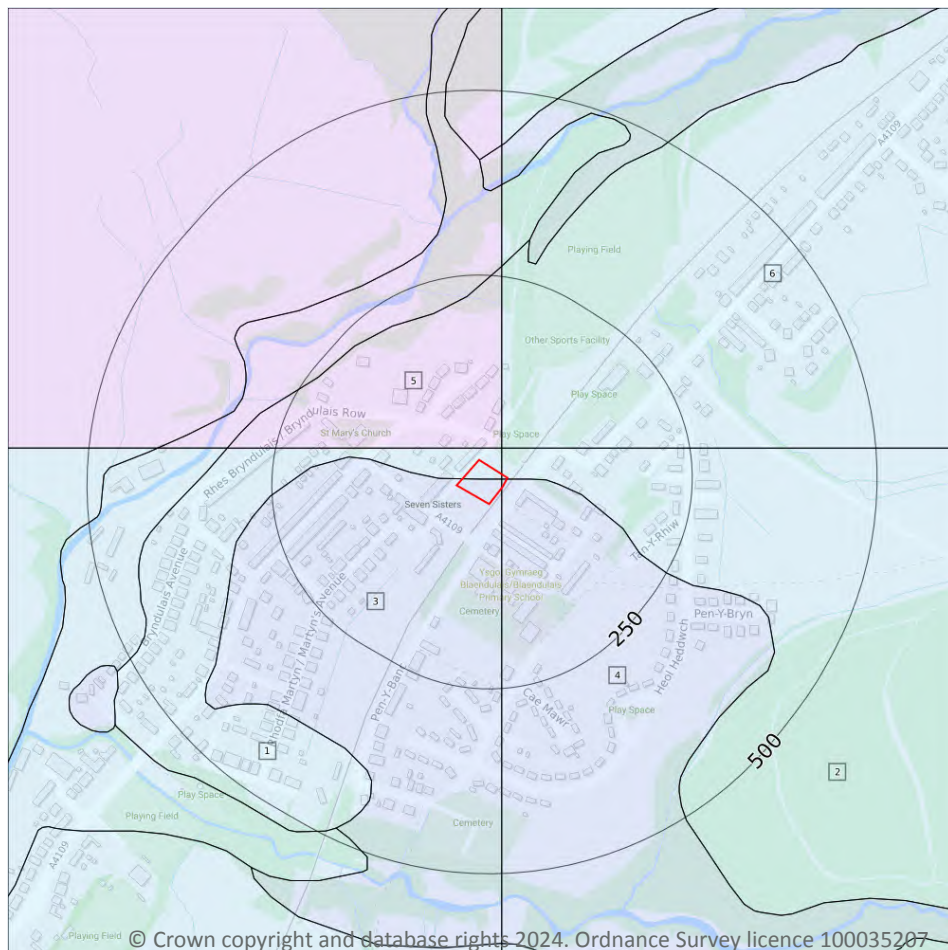
Features are displayed on the Bedrock aquifer map on [page 38](#) >

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



6.3 Groundwater vulnerability

Records within 50m

6

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

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

Features are displayed on the Groundwater vulnerability map on [page 39](#) >



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: >550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: <3m Patchiness value: >90% Recharge potential: Medium	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: >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	On site	Summary Classification: Secondary bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: >90% Recharge potential: Medium	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
4	On site	Summary Classification: Secondary bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
5	16m N	Summary Classification: Secondary bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
6	30m NE	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >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

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



6.4 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.

6.5 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
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)

6.6 Groundwater abstractions

Records within 2000m

0

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.

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



6.7 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 42 >](#)

ID	Location	Details	
-	1445m S	Status: Historical Licence No: 21/58/73/0019 Details: Make-Up or Top Up Water Direct Source: EAW Surface Water Point: TRIBUTARY OF NANT-Y-CAFN Data Type: Point Name: 3J's Coal Trading Company Ltd Easting: 281950 Northing: 207480	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 16/05/1994 Expiry Date: 30/11/2007 Issue No: 100 Version Start Date: 01/04/2000 Version End Date: -
-	1766m S	Status: Historical Licence No: 21/58/73/0019 Details: Make-Up or Top Up Water Direct Source: EAW Surface Water Point: TRIBUTARY OF NANT-Y-CAFN Data Type: Point Name: 3J's Coal Trading Company Ltd Easting: 282060 Northing: 207160	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 16/05/1994 Expiry Date: 30/11/2007 Issue No: 100 Version Start Date: 01/04/2000 Version End Date: -

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

6.8 Potable abstractions

Records within 2000m

0

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.

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



6.9 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.

6.10 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.



7 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

7.1 Water Network (OS MasterMap)

Records within 250m

10

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 45 >](#)

ID	Location	Type of water feature	Ground level	Permanence	Name
B	135m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
C	203m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
1	204m N	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
D	233m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
3	240m SW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
E	241m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Dulais
F	243m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	244m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Dulais
E	244m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Dulais
E	248m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Dulais

This data is sourced from the Ordnance Survey.

7.2 Surface water features

Records within 250m

5

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 45 >](#)

This data is sourced from the Ordnance Survey.



7.3 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 45 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River WB catchment	Dulais - headwaters to confluence with River Neath	GB110058032360	Neath	Tawe to Cadoxton

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

7.4 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 45 >](#)

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
4	241m NW	River	Dulais - headwaters to confluence with River Neath	GB110058032360	Good	Good	Good	2016

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

7.5 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 45 >](#)



ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Swansea Carboniferous Coal Measures	GB41002G201000	Poor	Poor	Good	2017

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



8 River and coastal flooding

8.1 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.

8.2 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.

8.3 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.



8.4 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.

8.5 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

8.6 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.

8.7 Flood Zone 3

Records within 50m

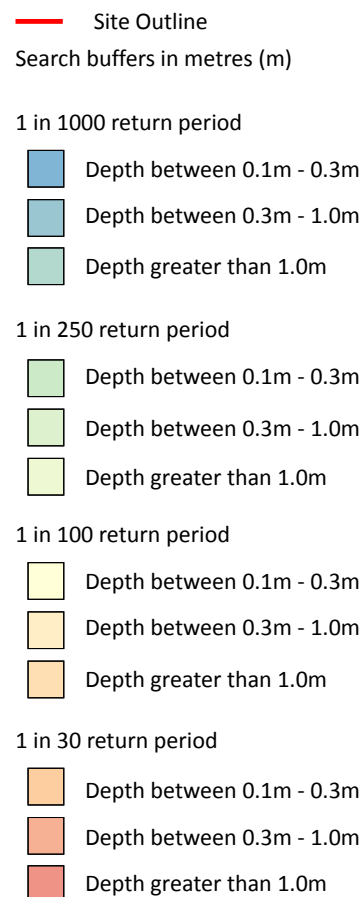
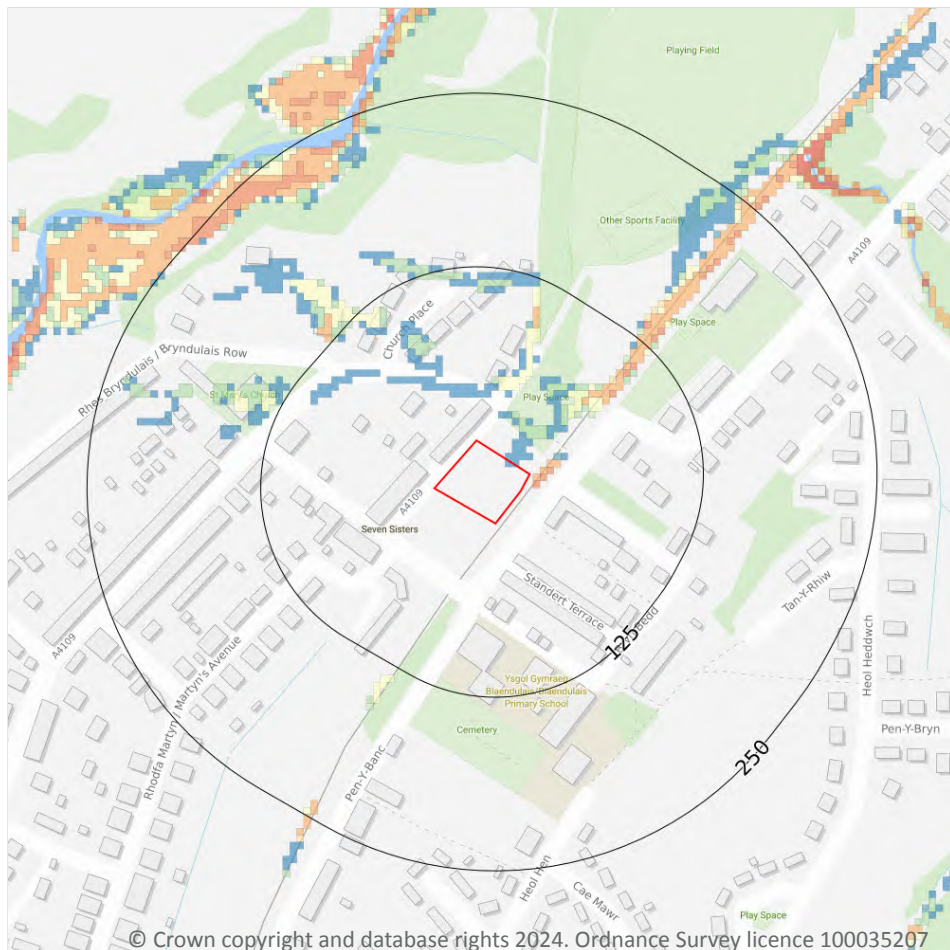
0

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.



9 Surface water flooding



9.1 Surface water flooding

Highest risk on site

1 in 1000 year, 0.1m - 0.3m

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

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

Features are displayed on the Surface water flooding map on [page 52 >](#)

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.

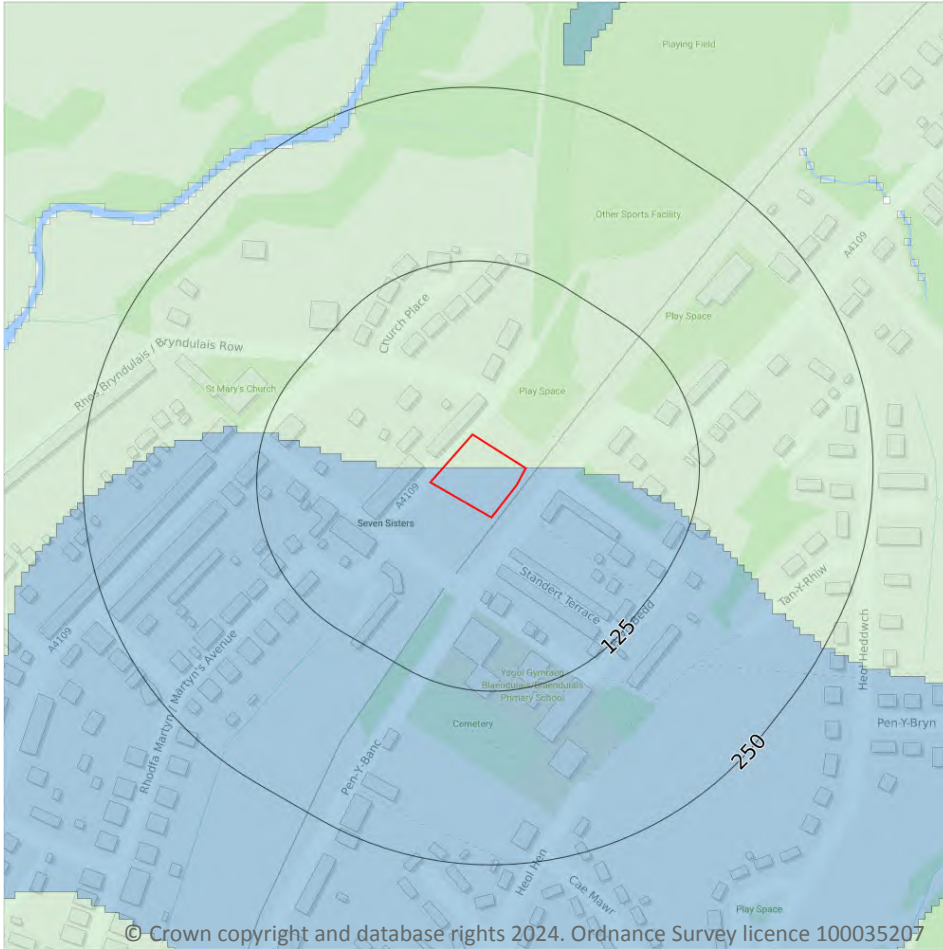
The table below shows the maximum flood depths for a range of return periods for the site.

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

This data is sourced from Ambiantal Risk Analytics.



10 Groundwater flooding



— Site Outline
Search buffers in metres (m)

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

10.1 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 54 >](#)

This data is sourced from Ambiantal Risk Analytics.

11 Environmental designations



- Site Outline
- Search buffers in metres (m)
- ▨ Designated Ancient Woodland

11.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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.

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

11.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

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.

11.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

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.

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

11.4 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.

11.5 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.

11.6 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.

11.7 Designated Ancient Woodland

Records within 2000m

13

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 55 >](#)

ID	Location	Name	Woodland Type
1	178m NW	Unknown	Ancient Semi Natural Woodland
2	317m N	Unknown	Ancient Semi Natural Woodland
3	446m N	Unknown	Ancient Semi Natural Woodland
4	468m N	Unknown	Ancient Semi Natural Woodland
5	590m S	Unknown	Ancient Semi Natural Woodland
6	703m SE	Unknown	Plantation on Ancient Woodland Site
7	969m SE	Unknown	Ancient Semi Natural Woodland
8	973m SE	Unknown	Ancient Semi Natural Woodland
9	1051m SE	Unknown	Plantation on Ancient Woodland Site
10	1374m SW	Unknown	Ancient Semi Natural Woodland
-	1507m S	Unknown	Plantation on Ancient Woodland Site
-	1547m S	Unknown	Ancient Semi Natural Woodland
-	1707m S	Unknown	Plantation on Ancient Woodland Site

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



11.8 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.

11.9 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.

11.10 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.

11.11 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.

11.12 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.



11.13 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.

11.14 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.

11.15 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.

11.16 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

11.17 SSSI Impact Risk Zones

Records on site

0

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.

This data is sourced from Natural England.

11.18 SSSI Units

Records within 2000m

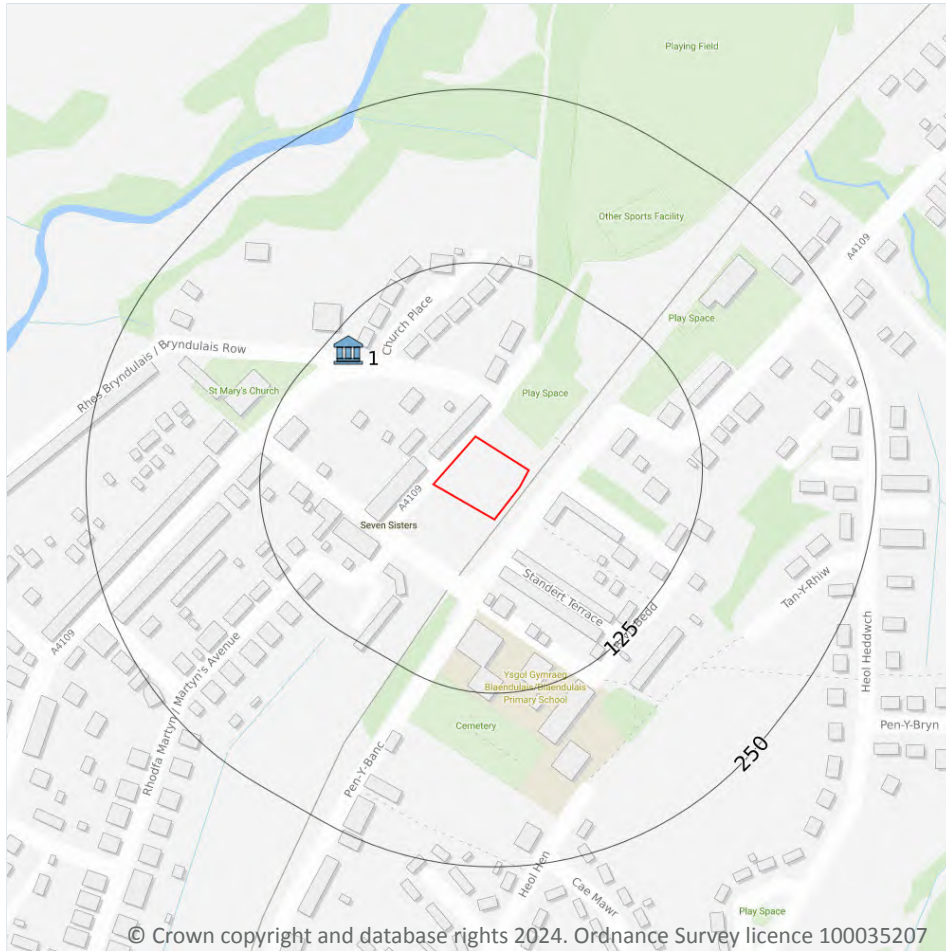
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation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

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



12 Visual and cultural designations



- Site Outline
- Search buffers in metres (m)
- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

12.1 World Heritage Sites

Records within 250m

0

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

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

12.2 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.

12.3 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.

12.4 Listed Buildings

Records within 250m

1

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 61 >](#)

ID	Location	Name	Grade	Reference Number	Listed date
1	110m NW	The War Memorial, In A Prominent Position On The N Side Of A Bend In The A4109 Near The Centre Of Seven Sisters.	II	82050	06/11/2003

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



12.5 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.

12.6 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.

12.7 Registered Parks and Gardens

Records within 250m

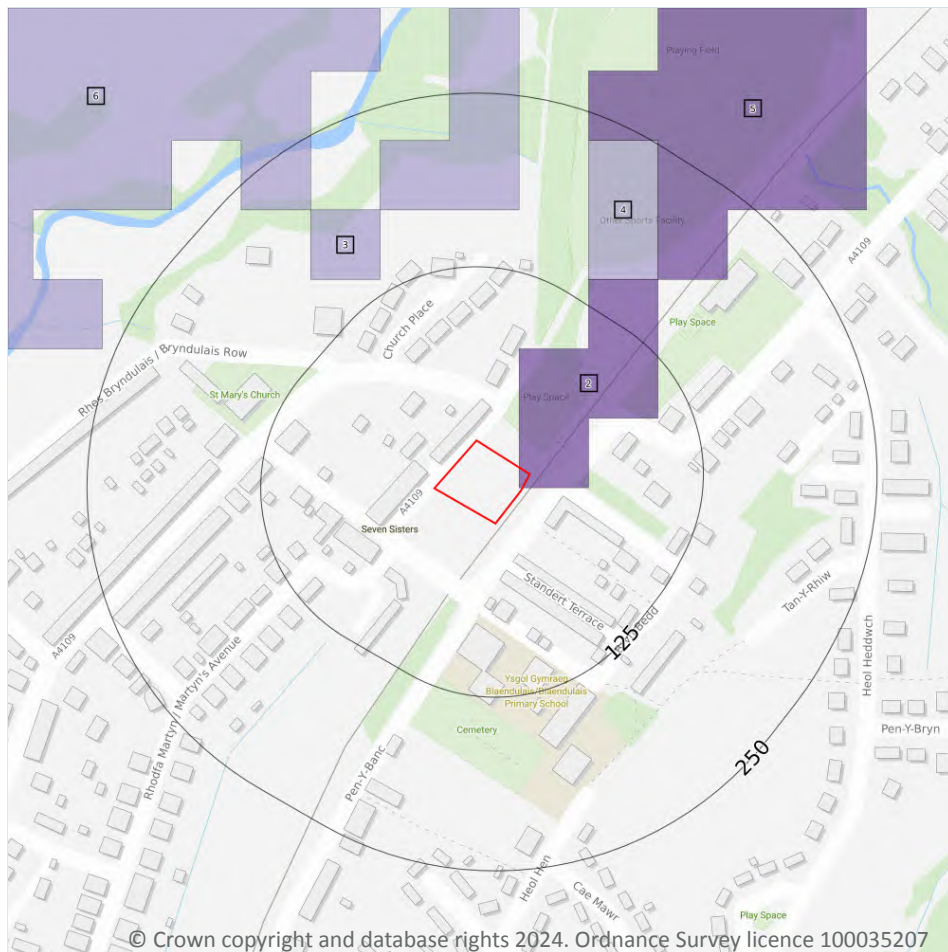
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Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, 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.



13 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

13.1 Agricultural Land Classification

Records within 250m

6

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 64](#) >

ID	Location	Classification	Description
2	On site	Grade 5	Very poor quality agricultural land
3	135m NW	Grade 4	Poor quality agricultural land
4	141m NE	Grade 4	Poor quality agricultural land

ID	Location	Classification	Description
A	166m N	Grade 4	Poor quality agricultural land
5	168m NE	Grade 5	Very poor quality agricultural land
6	205m NW	Grade 4	Poor quality agricultural land

This data is sourced from Natural Resources Wales.

13.2 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.

13.3 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.

13.4 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.

13.5 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.



14 Habitat designations

14.1 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.

14.2 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.

14.3 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.

14.4 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.



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> ↗.

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Blaendulais Childcare Centre

Client Ref: 22181 Blaendulais
Report Ref: GS-RMJ-8A4-KAY-BSG
Grid Ref: 281973, 208954

Map Name: County Series

Map date: 1877

Scale: 1:2,500

Printed at: 1:2,500



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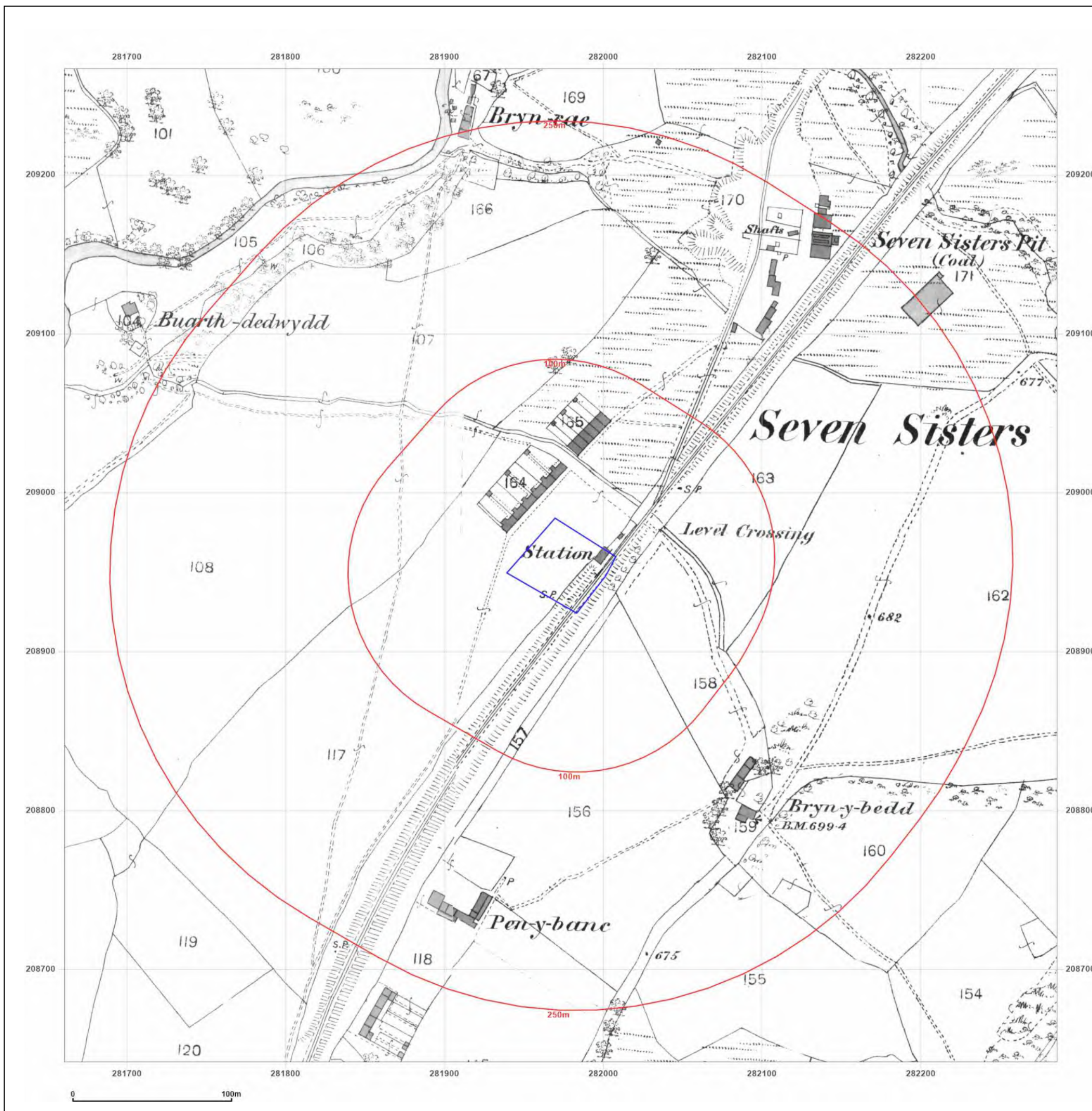


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Grid Ref: 281973, 208954

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Map date: 1879

Scale: 1:2,500

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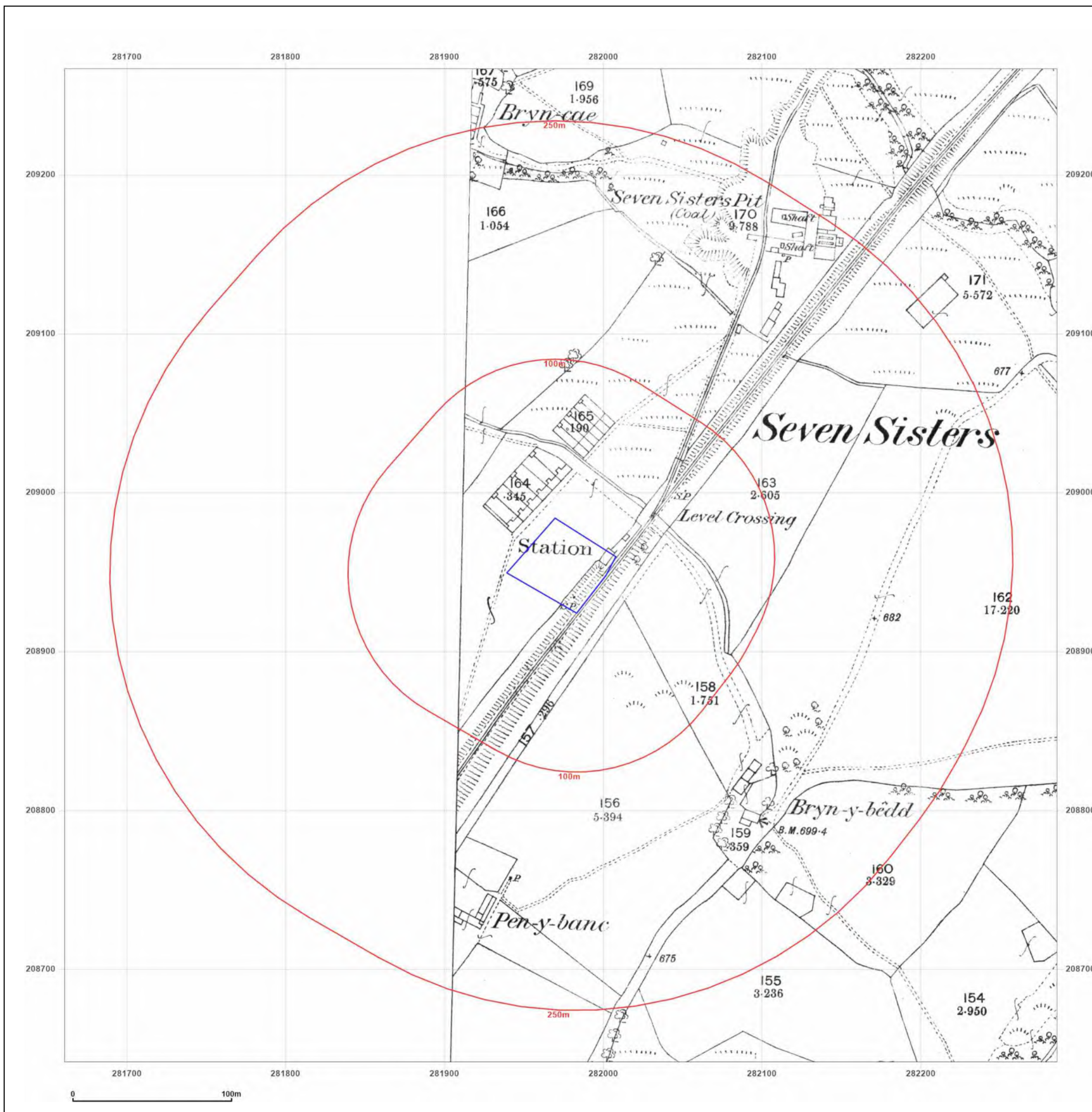


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Grid Ref: 281973, 208954

Map Name: County Series

Map date: 1898-1899

Scale: 1:2,500

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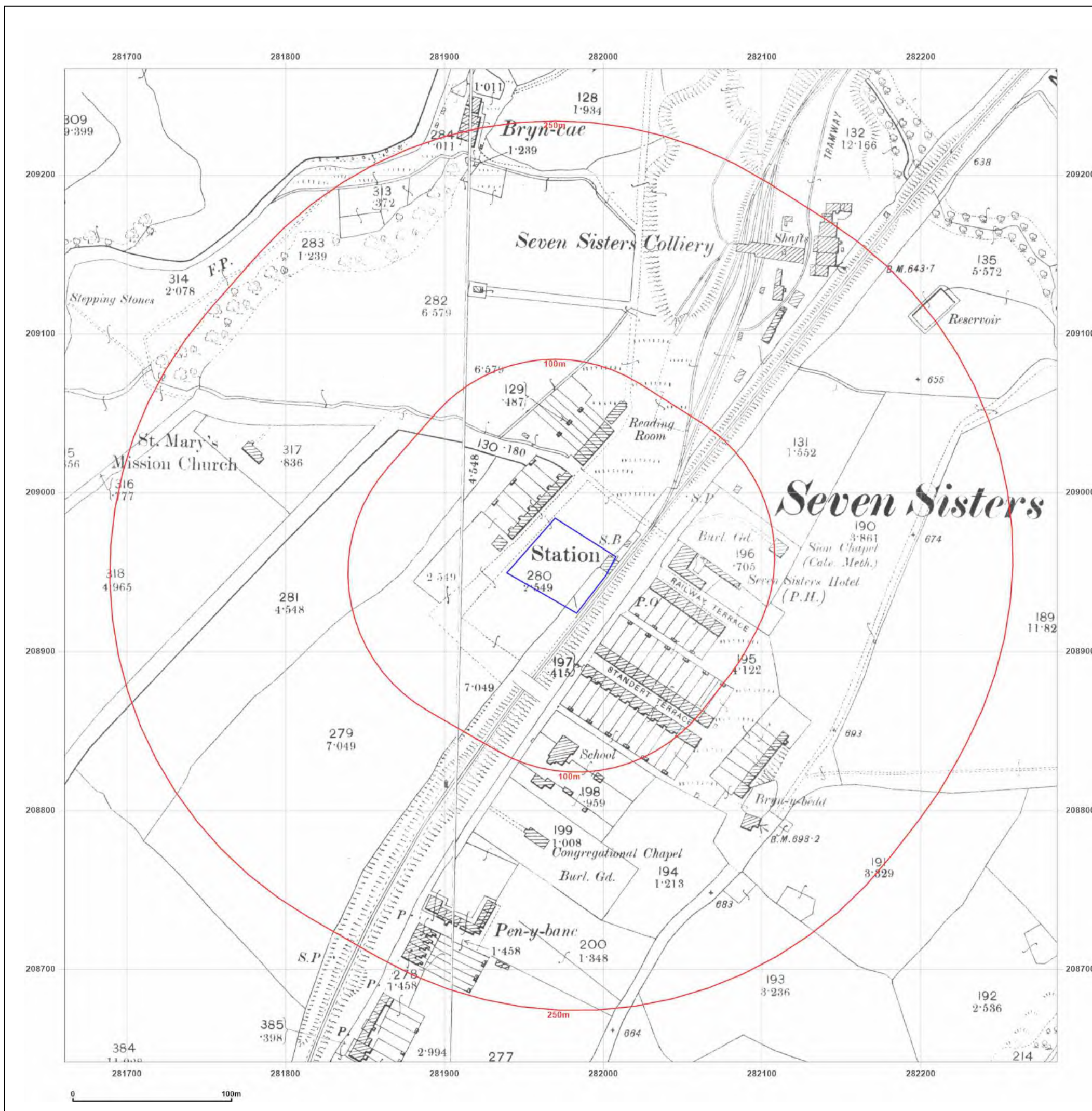


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Map Name: County Series

Map date: 1904

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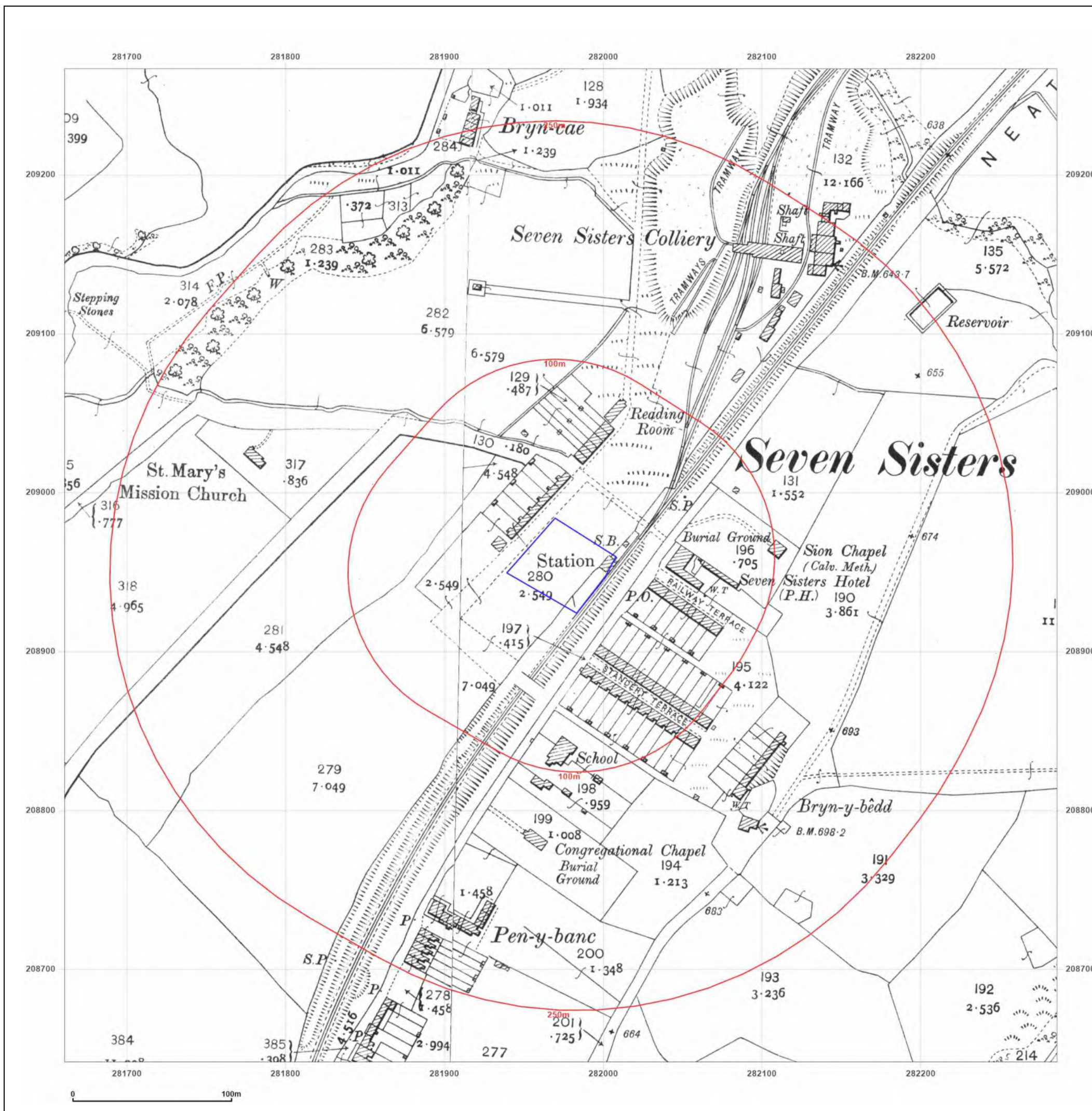


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Map Name: National Grid

Map date: 1962

Scale: 1:2,500

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 Revised 1962
 Edition N/A
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Surveyed 1962
 Revised 1962
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 Copyright 1962
 Levelled 1956

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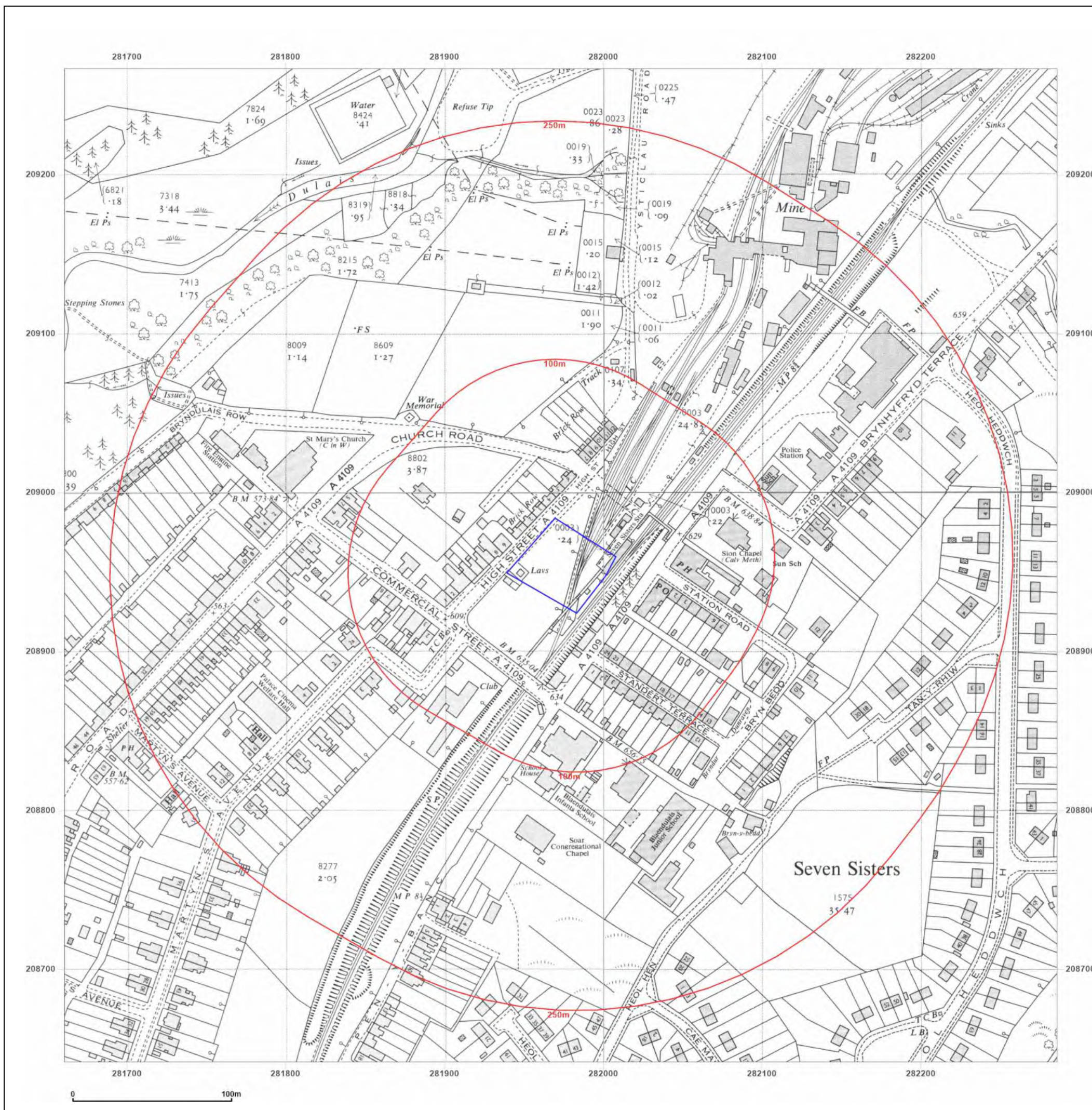


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Grid Ref: 281973, 208954

Map Name: National Grid

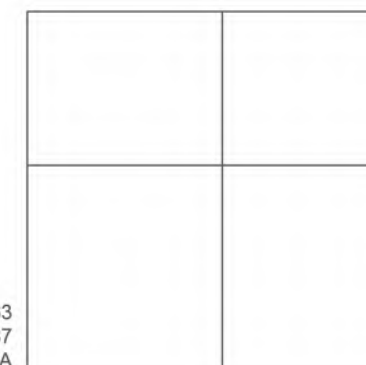
Map date: 1987-1988

Scale: 1:2,500

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Surveyed 1963
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 Copyright 1987
 Levelled 1963

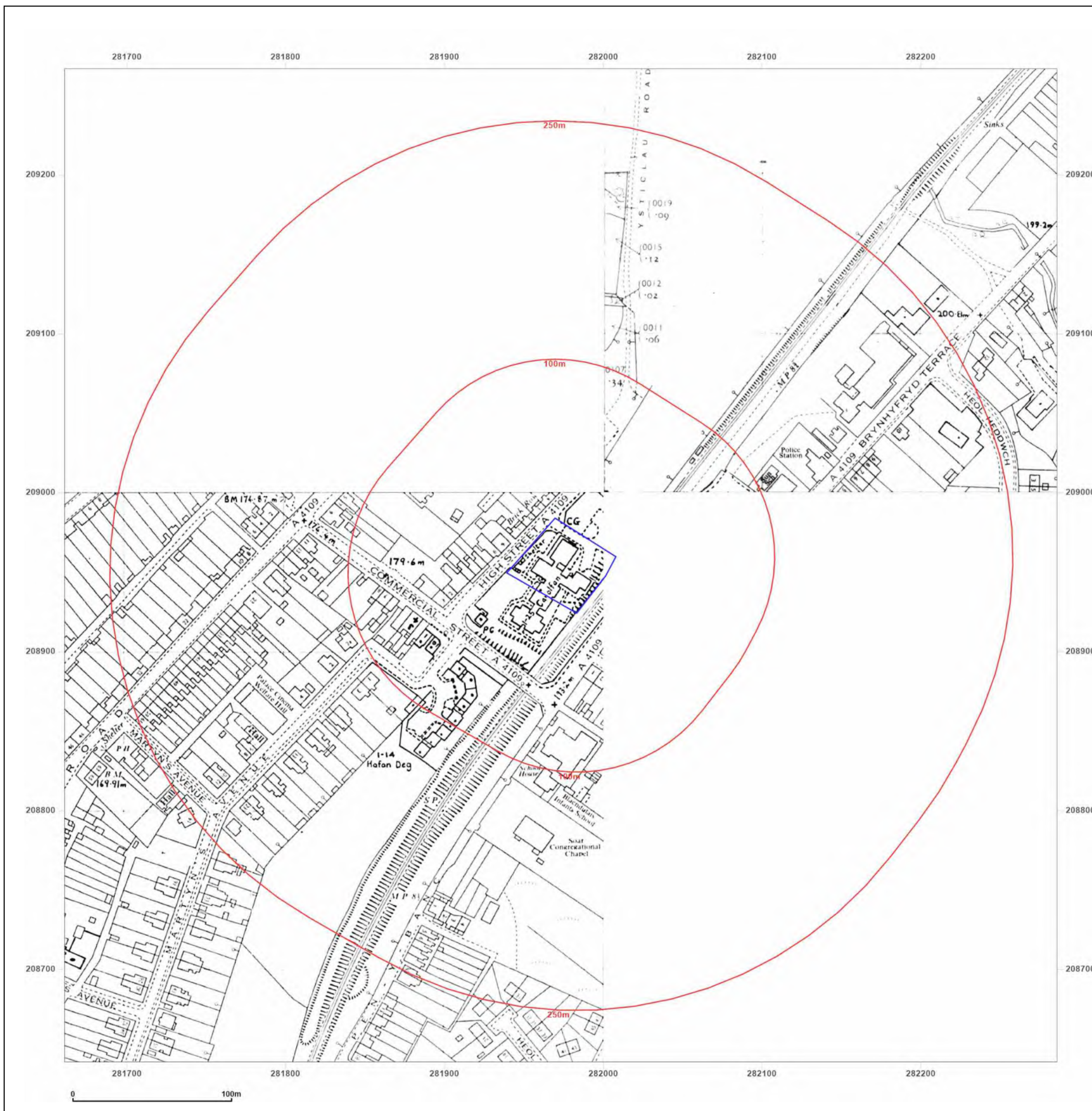


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Grid Ref: 281973, 208954

Map Name: National Grid

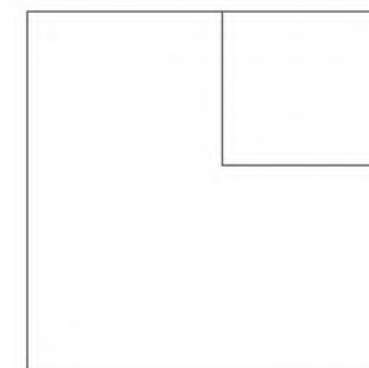
Map date: 1993

Scale: 1:2,500

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 Edition N/A
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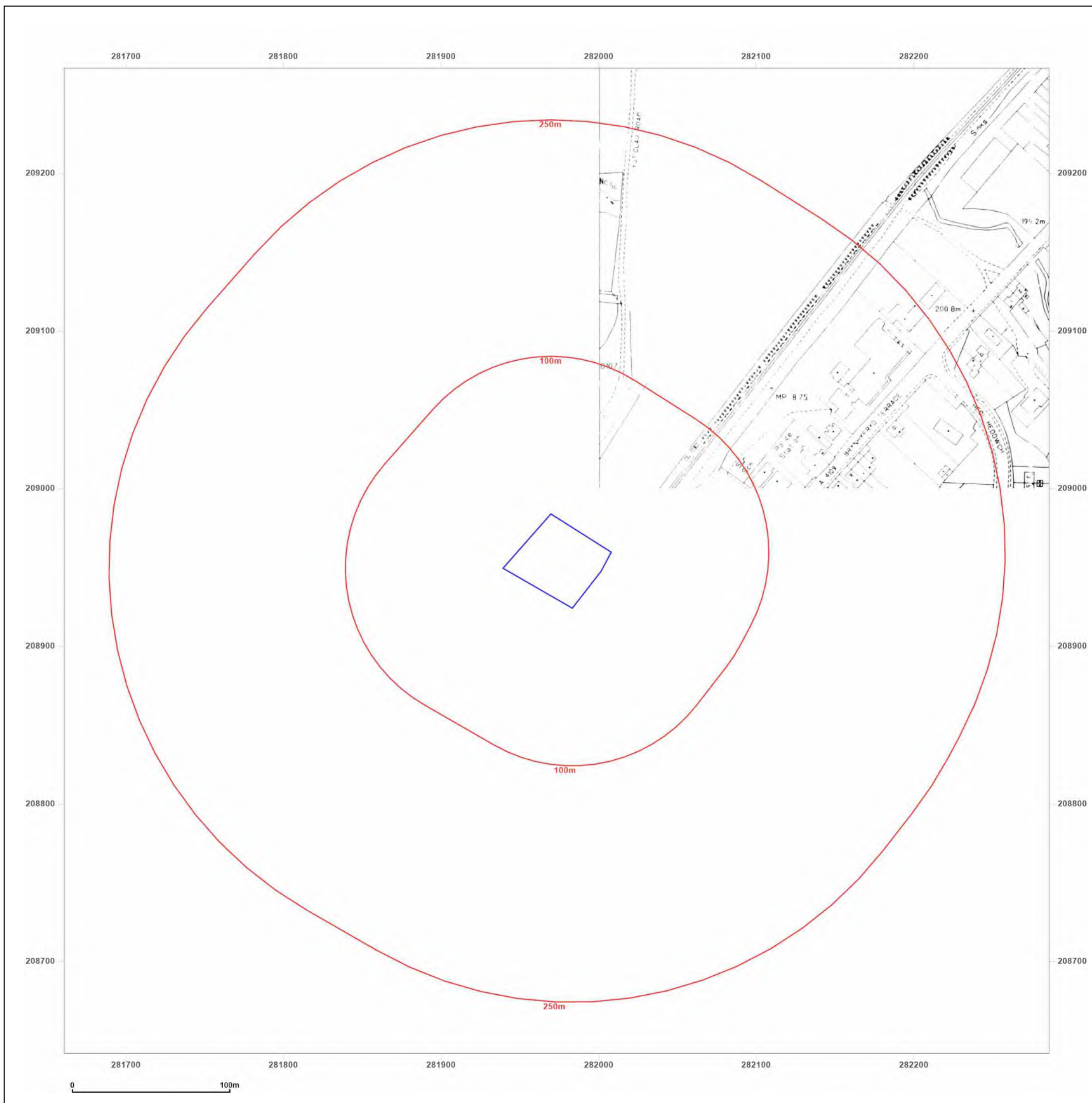


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Grid Ref: 281973, 208954

Map Name: National Grid

Map date: 1989-1993

Scale: 1:2,500

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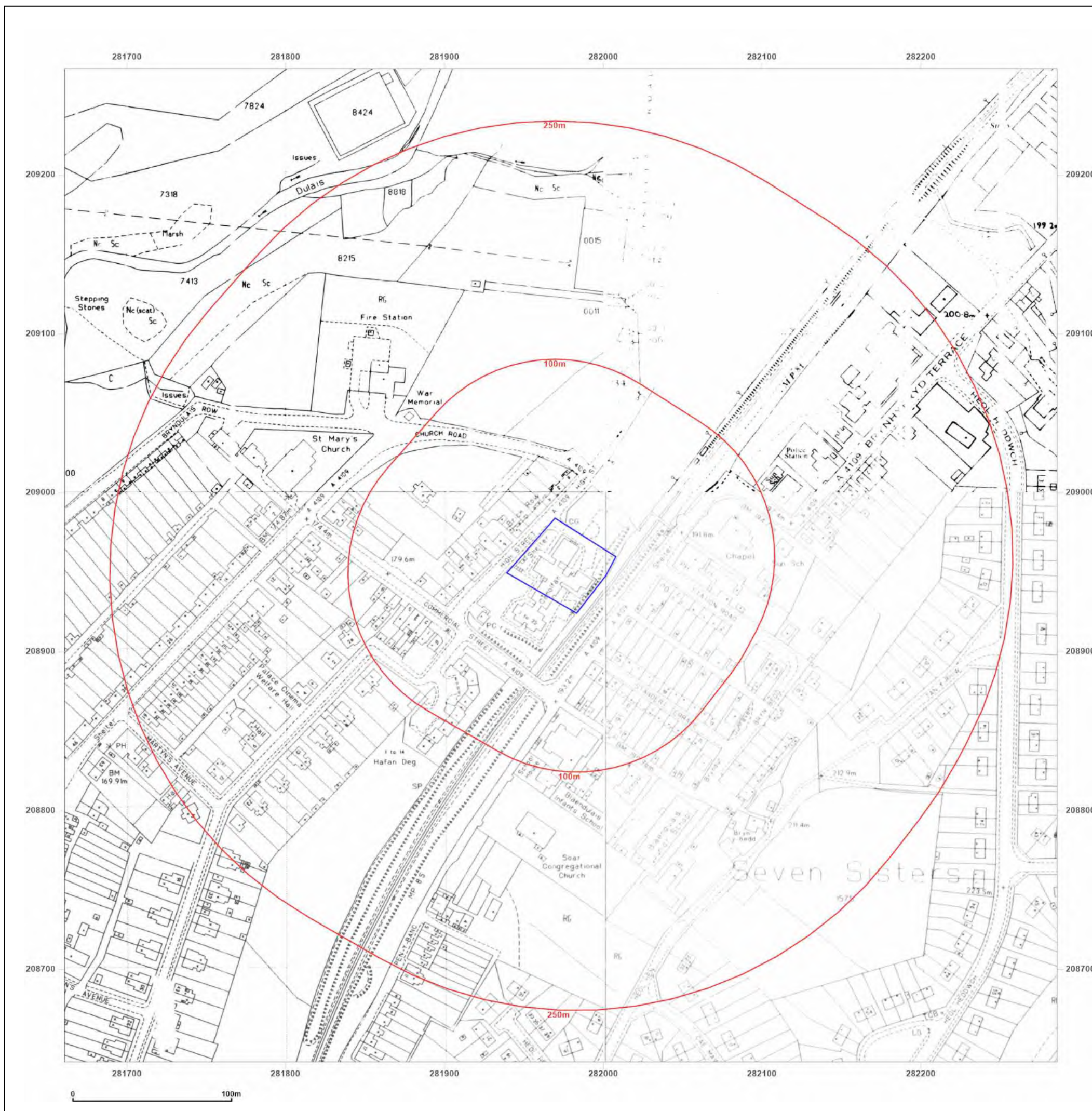


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Map Name: LandLine

Map date: 2003

Scale: 1:1,250

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Map Name: County Series

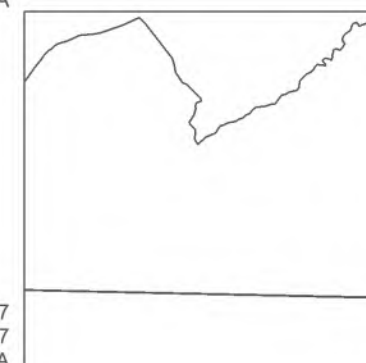
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Scale: 1:10,560

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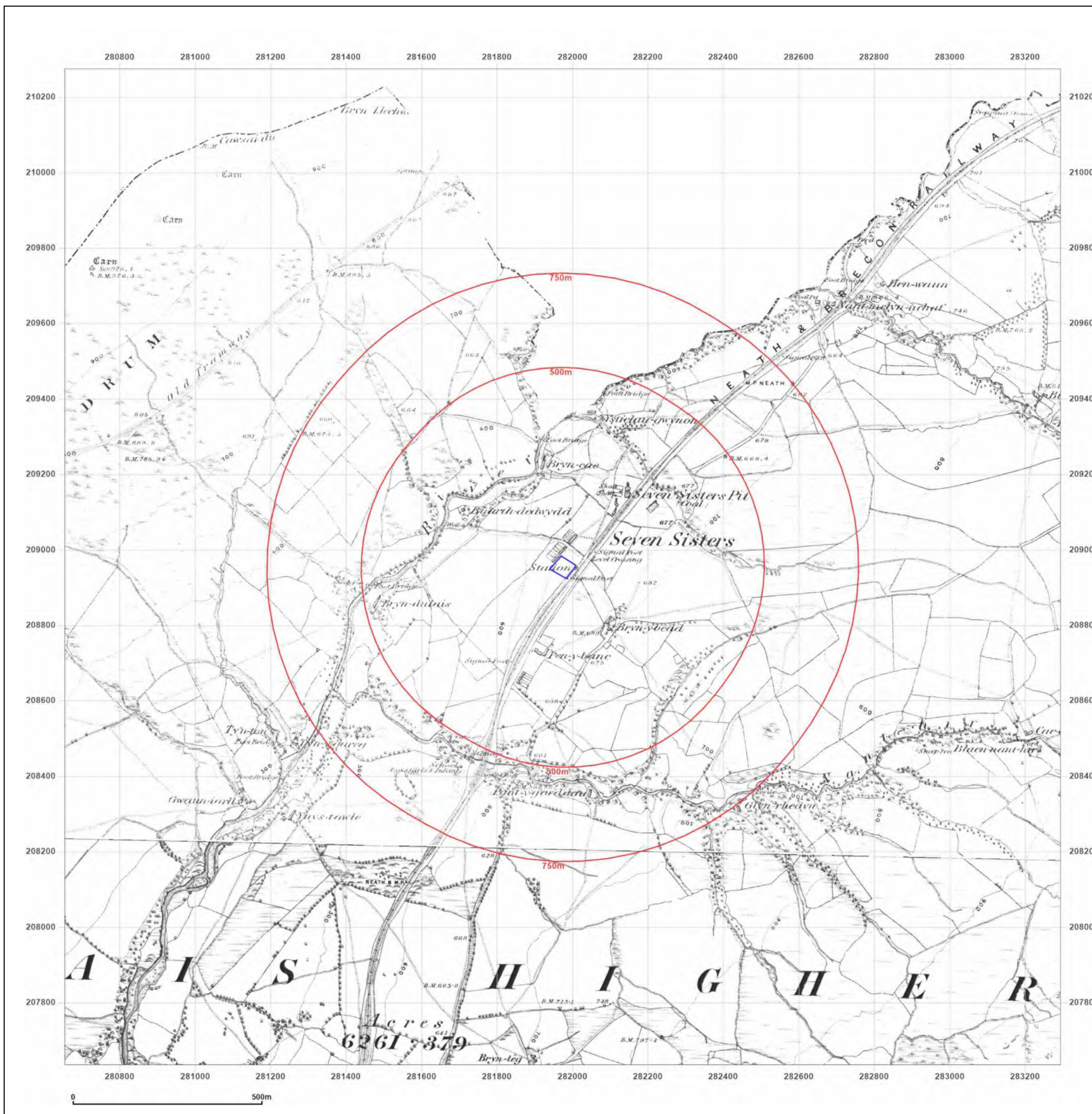


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Map date: 1877

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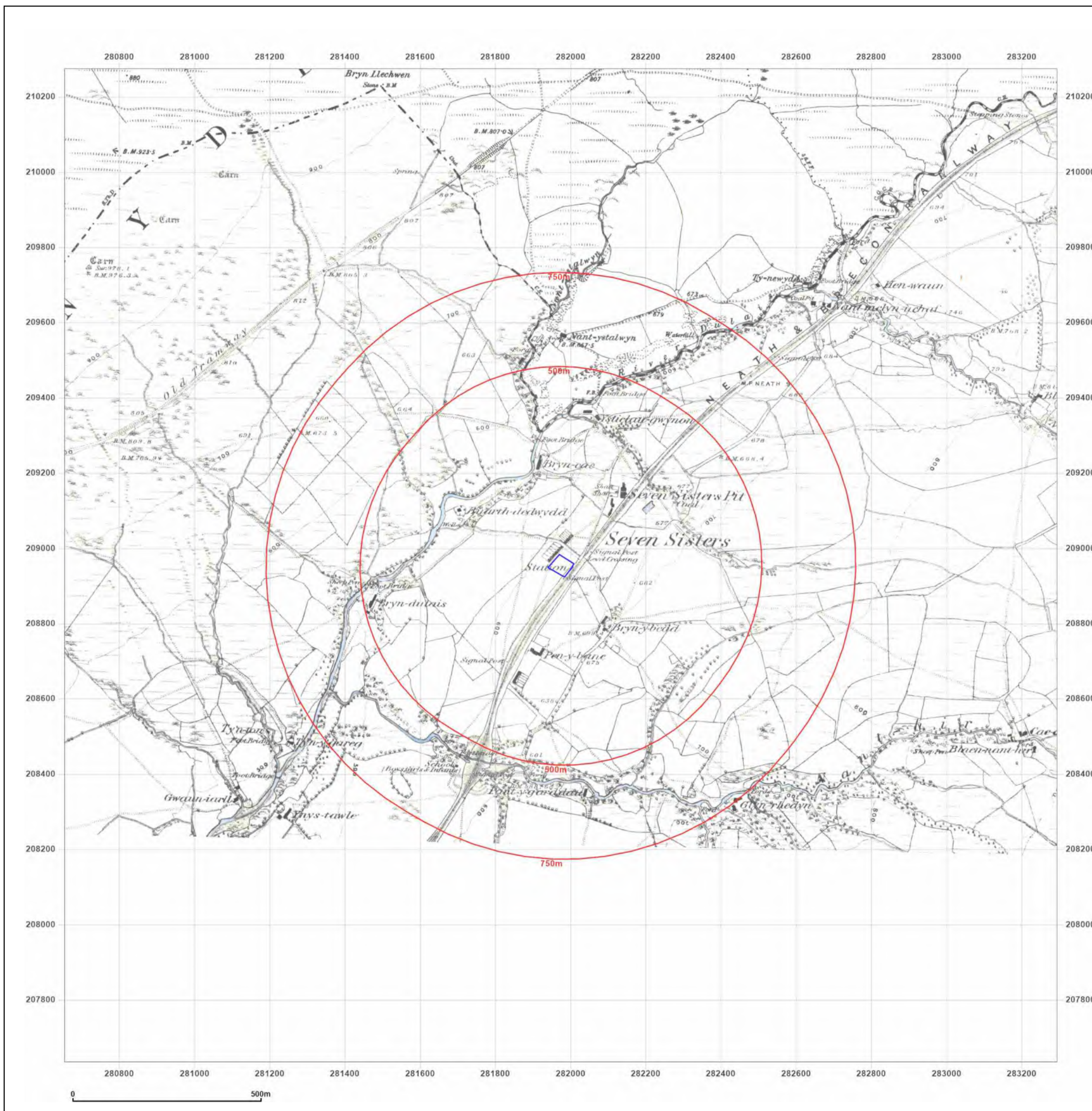


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Map Name: County Series

Map date: 1901

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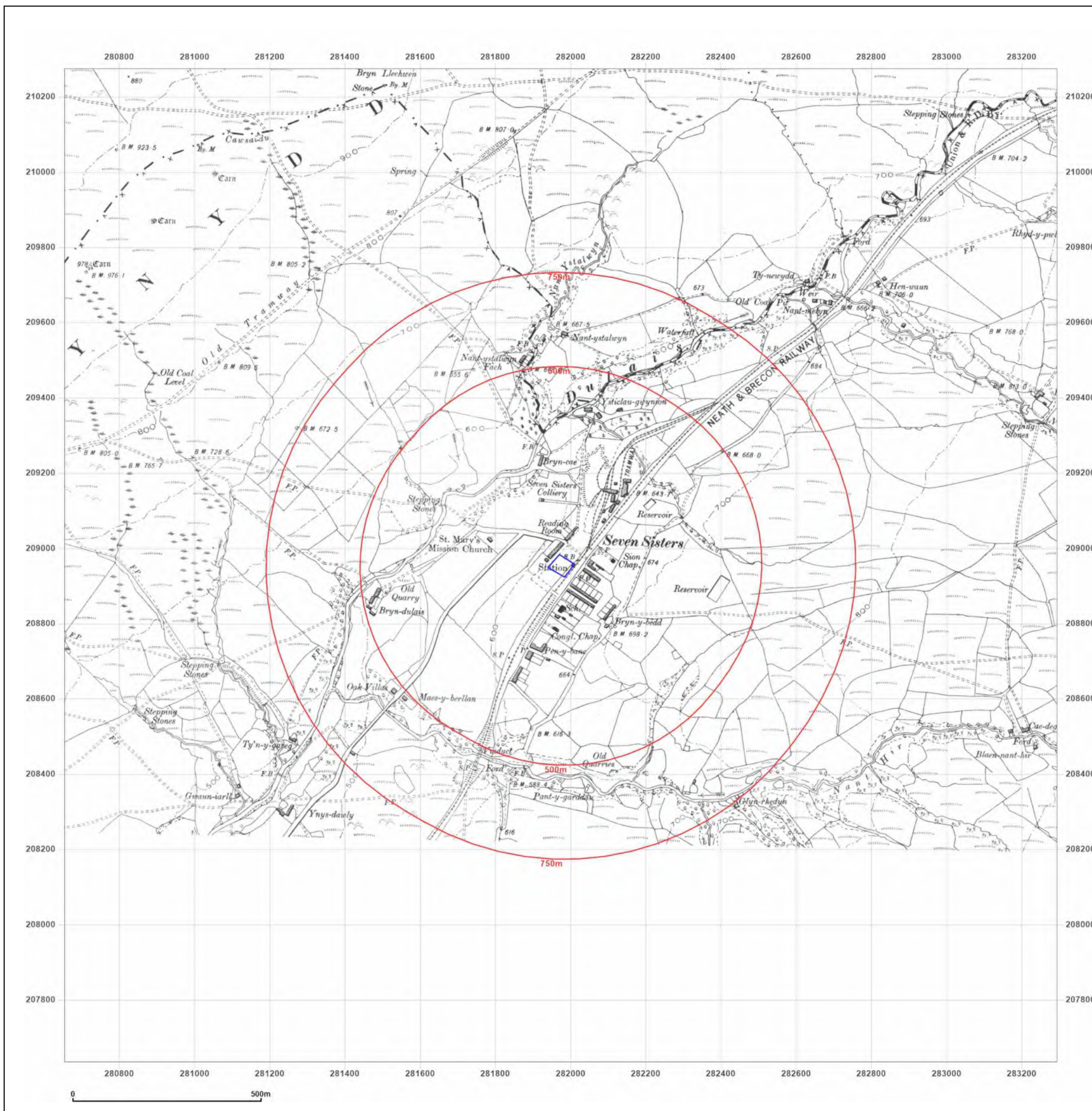


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Map Name: County Series

Map date: 1903

Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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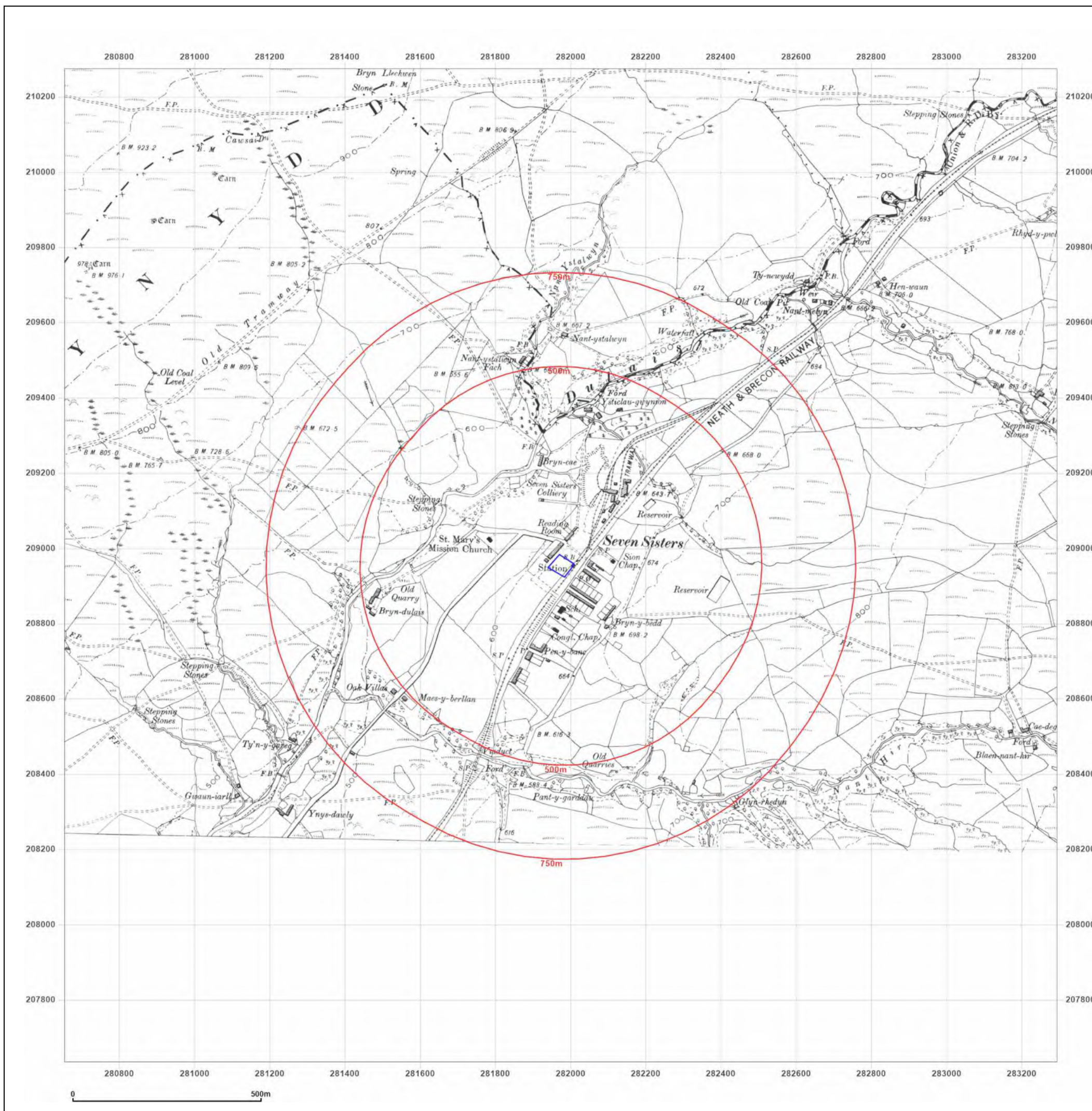


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Map Name: County Series

Map date: 1913-1914

Scale: 1:10,560

Printed at: 1:10,560



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Surveyed 1876
Revised 1913
Edition N/A
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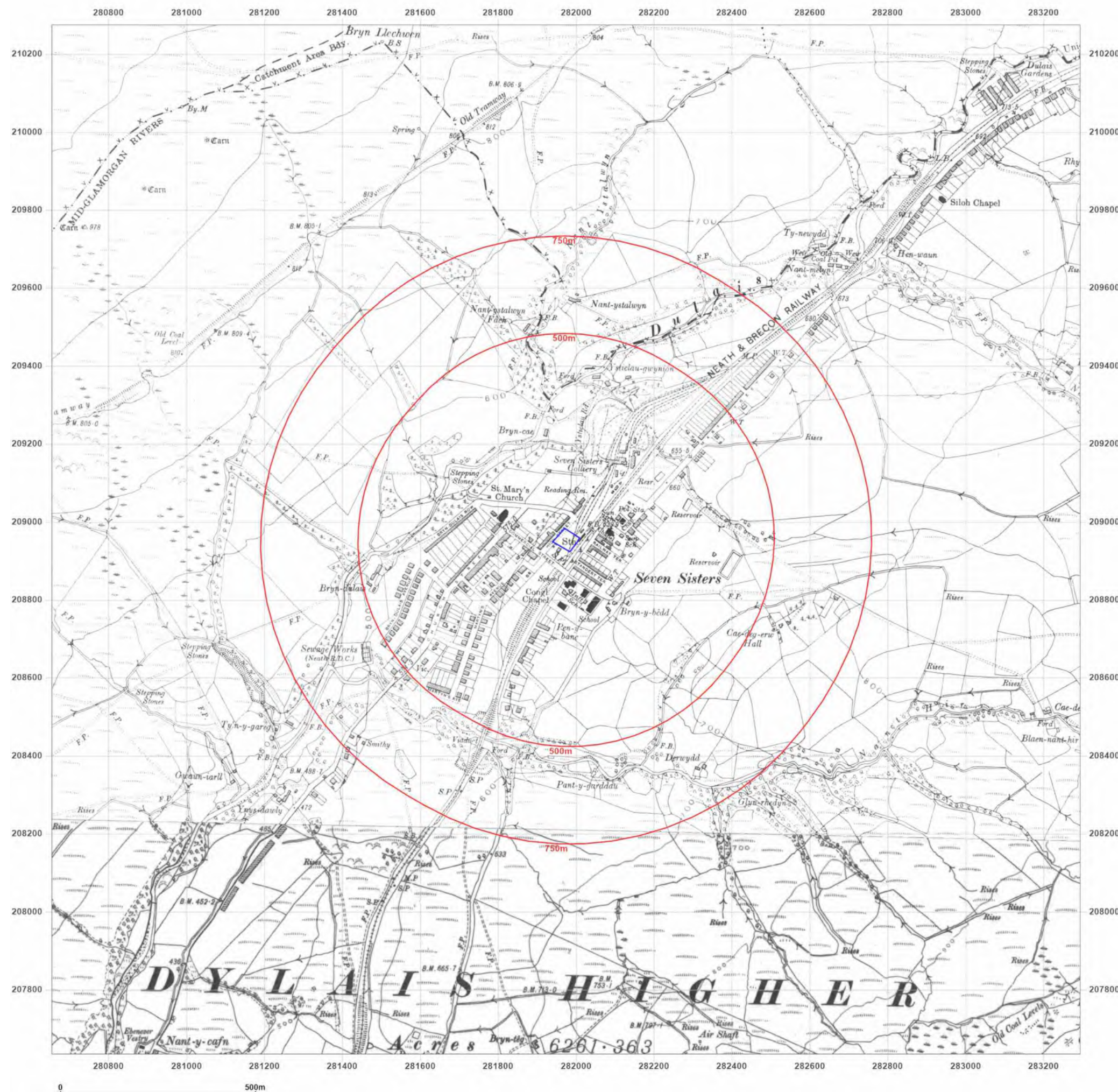


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Grid Ref: 281973, 208954

Map Name: County Series

Map date: 1921

Scale: 1:10,560

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

Surveyed 1877
Revised 1921
Edition N/A
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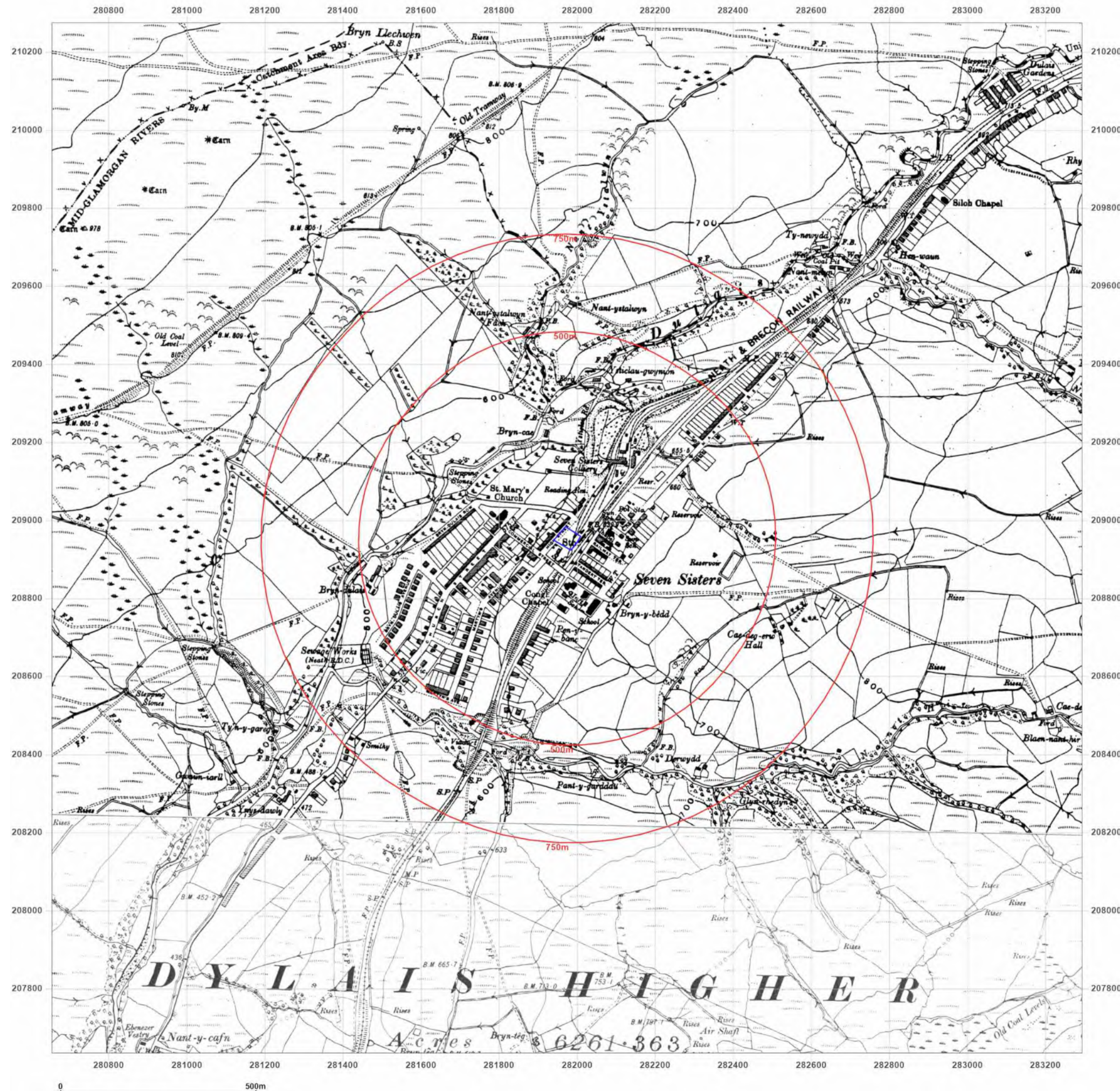


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Map Name: County Series

Map date: 1921

Scale: 1:10,560

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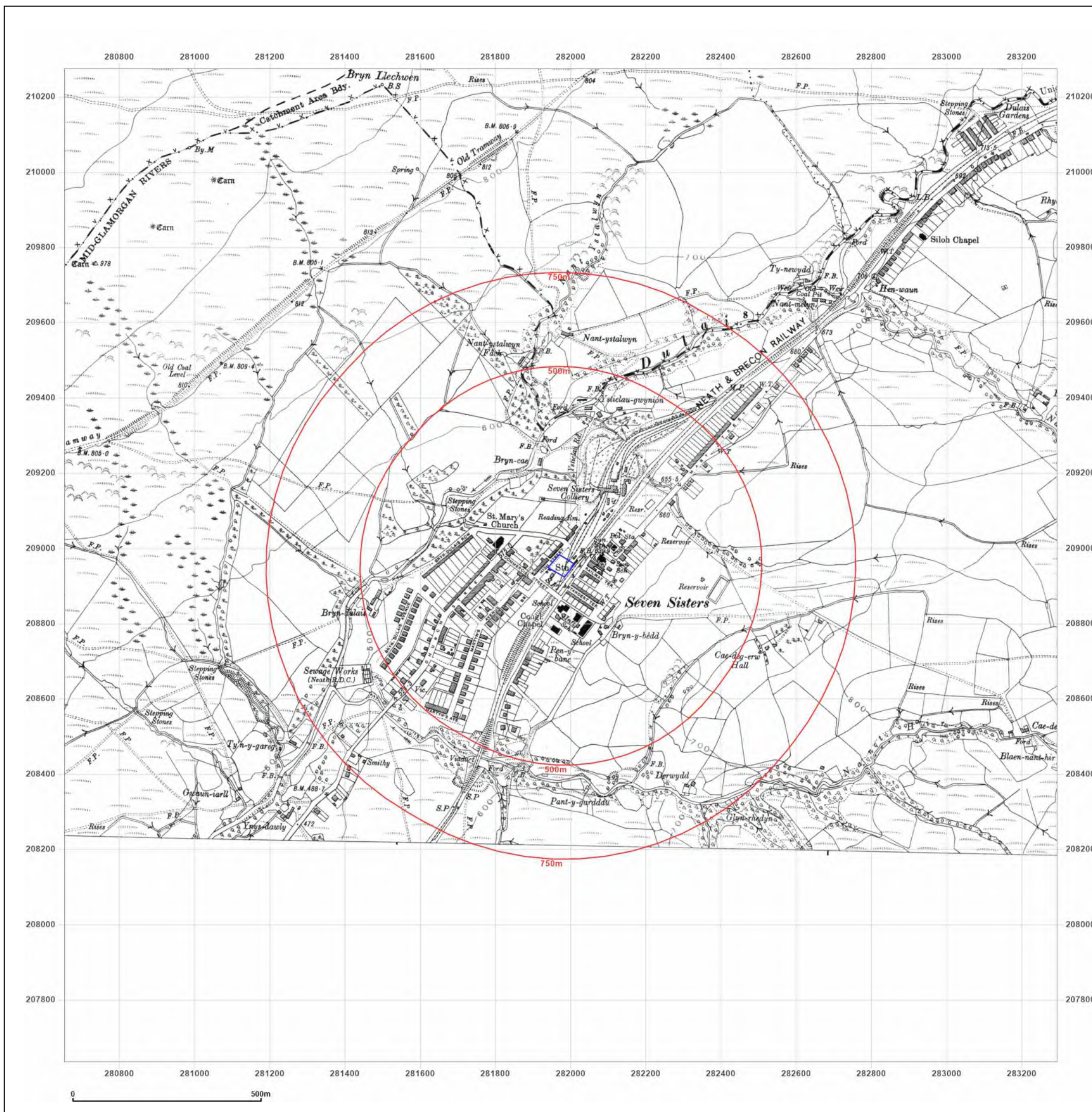


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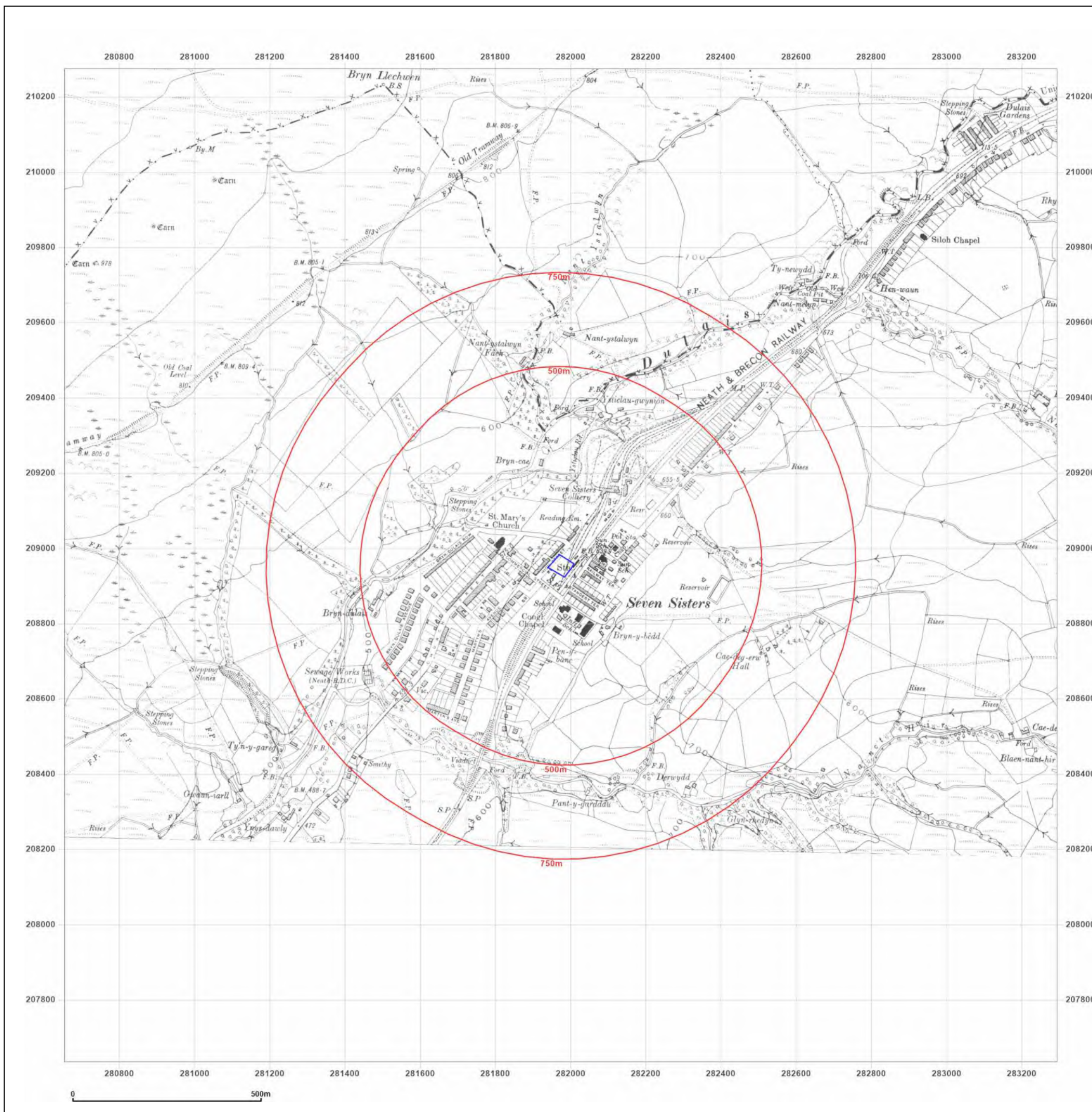


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Map Name: County Series

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Scale: 1:10,560

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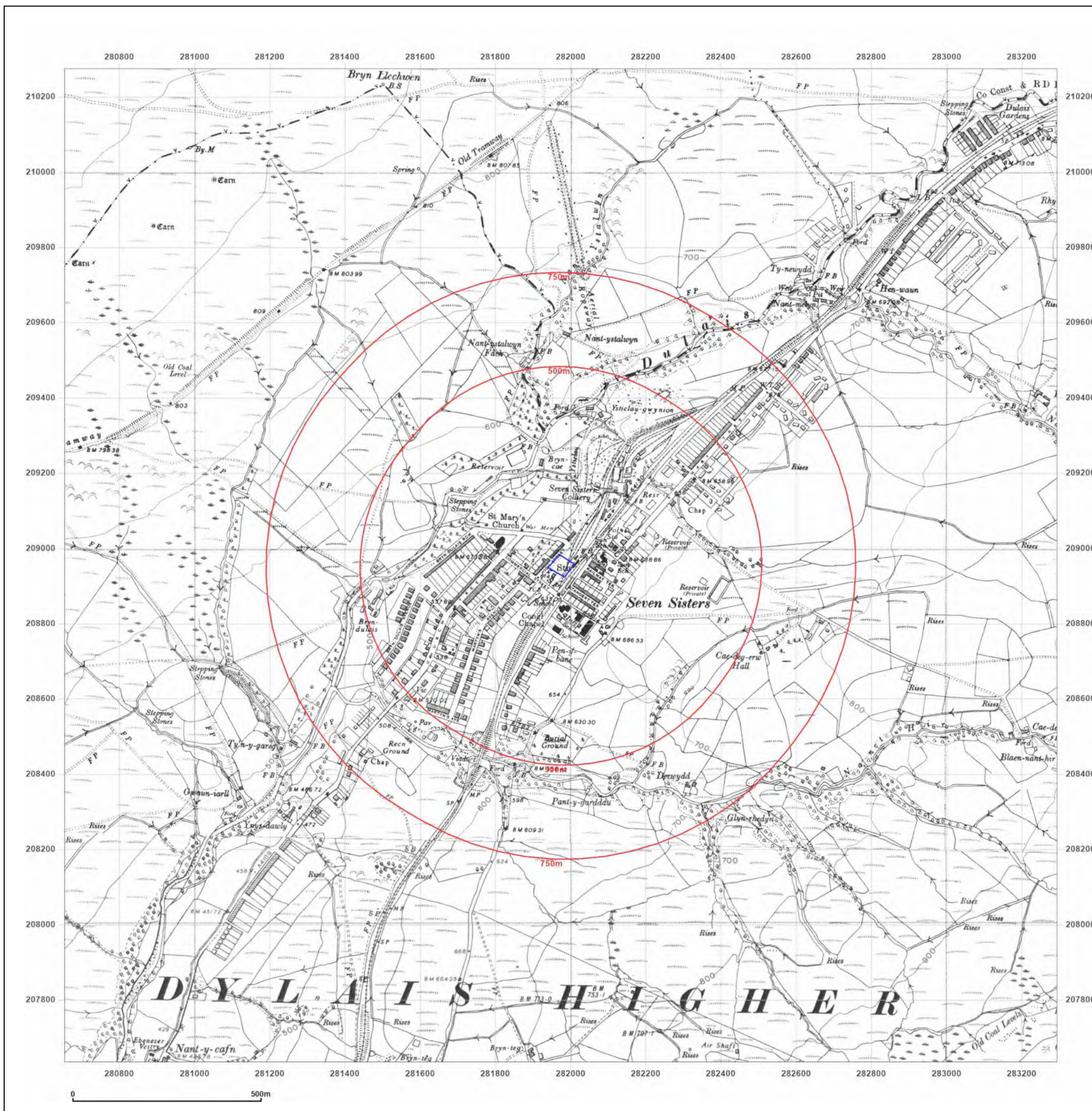


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Site Details:

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Report Ref: GS-RMJ-8A4-KAY-BSG
Grid Ref: 281973, 208954

Map Name: Provisional

Map date: 1964-1965

Scale: 1:10,560

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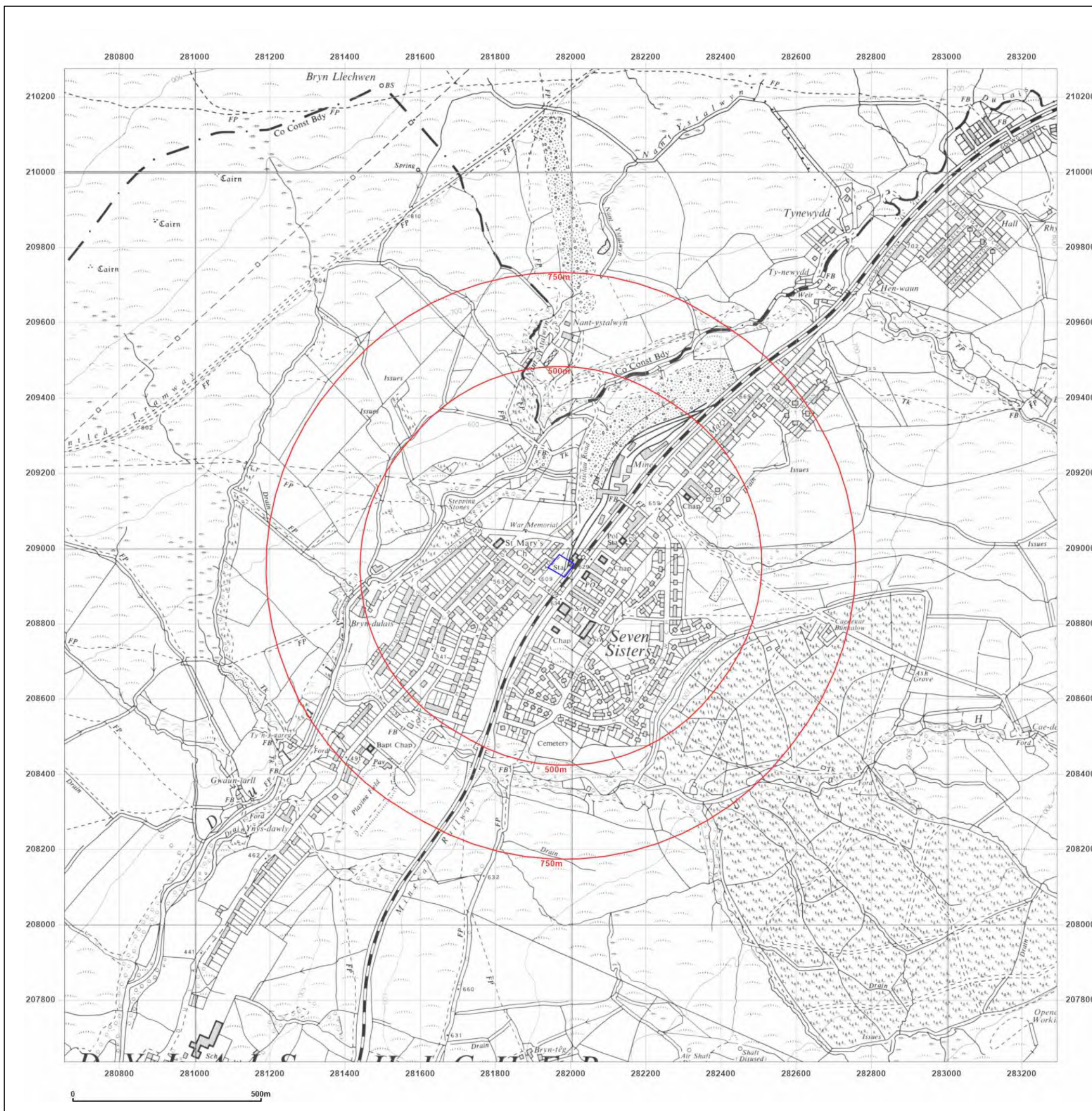


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Report Ref: GS-RMJ-8A4-KAY-BSG
Grid Ref: 281973, 208954

Map Name: National Grid

Map date: 1987-1988

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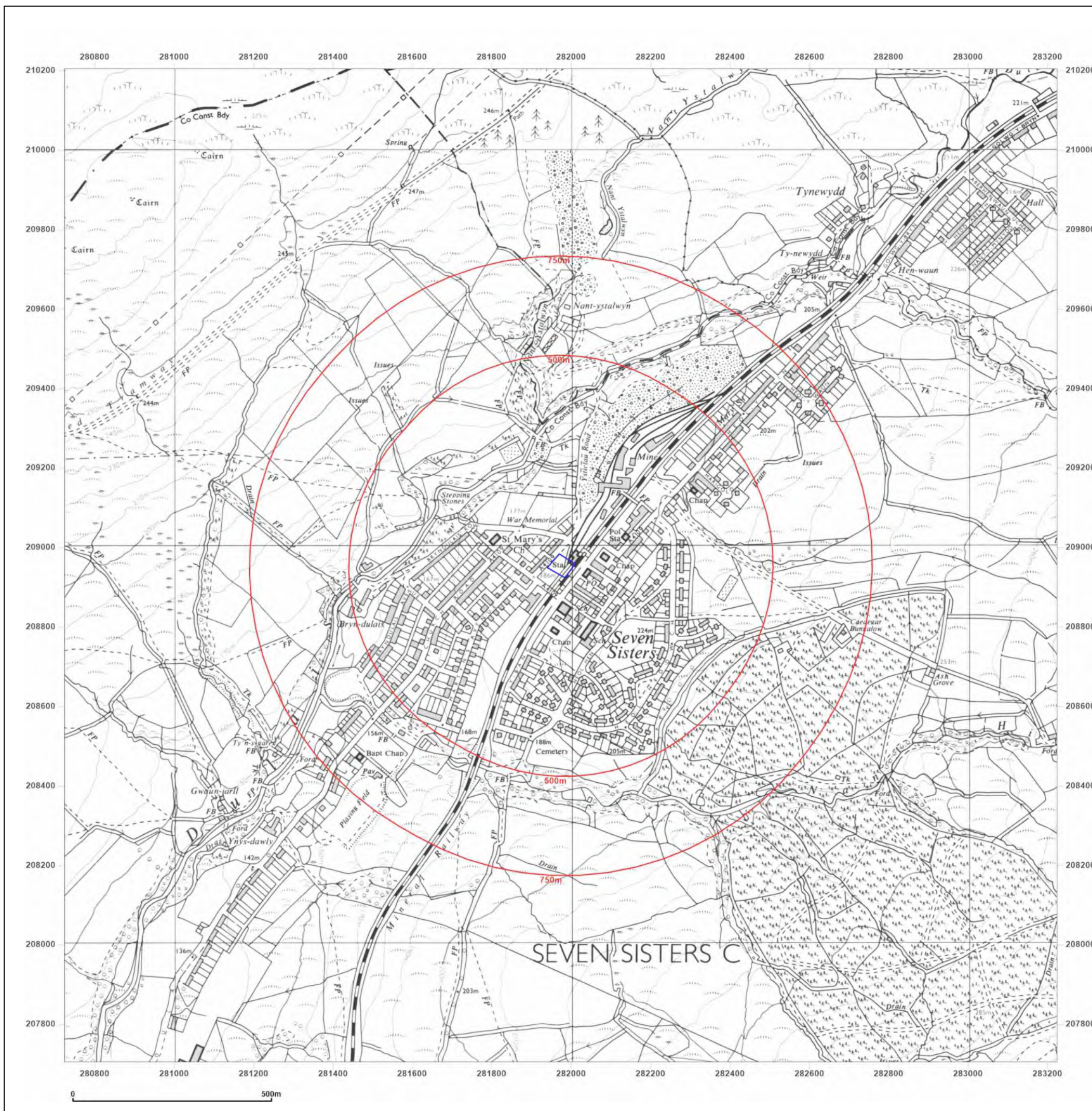


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Site Details:

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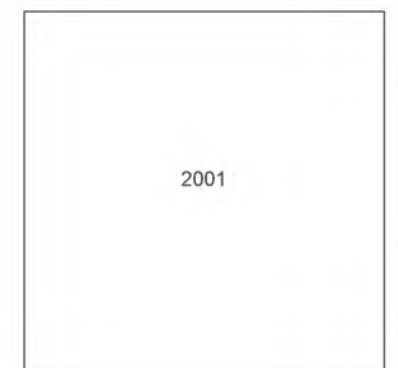
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Grid Ref: 281973, 208954

Map Name: National Grid

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Site Details:

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Grid Ref: 281973, 208954

Map Name: National Grid

Map date: 2010

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Client Ref: 22181 Blaendulais
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Grid Ref: 281973, 208954

Map Name: National Grid

Map date: 2024

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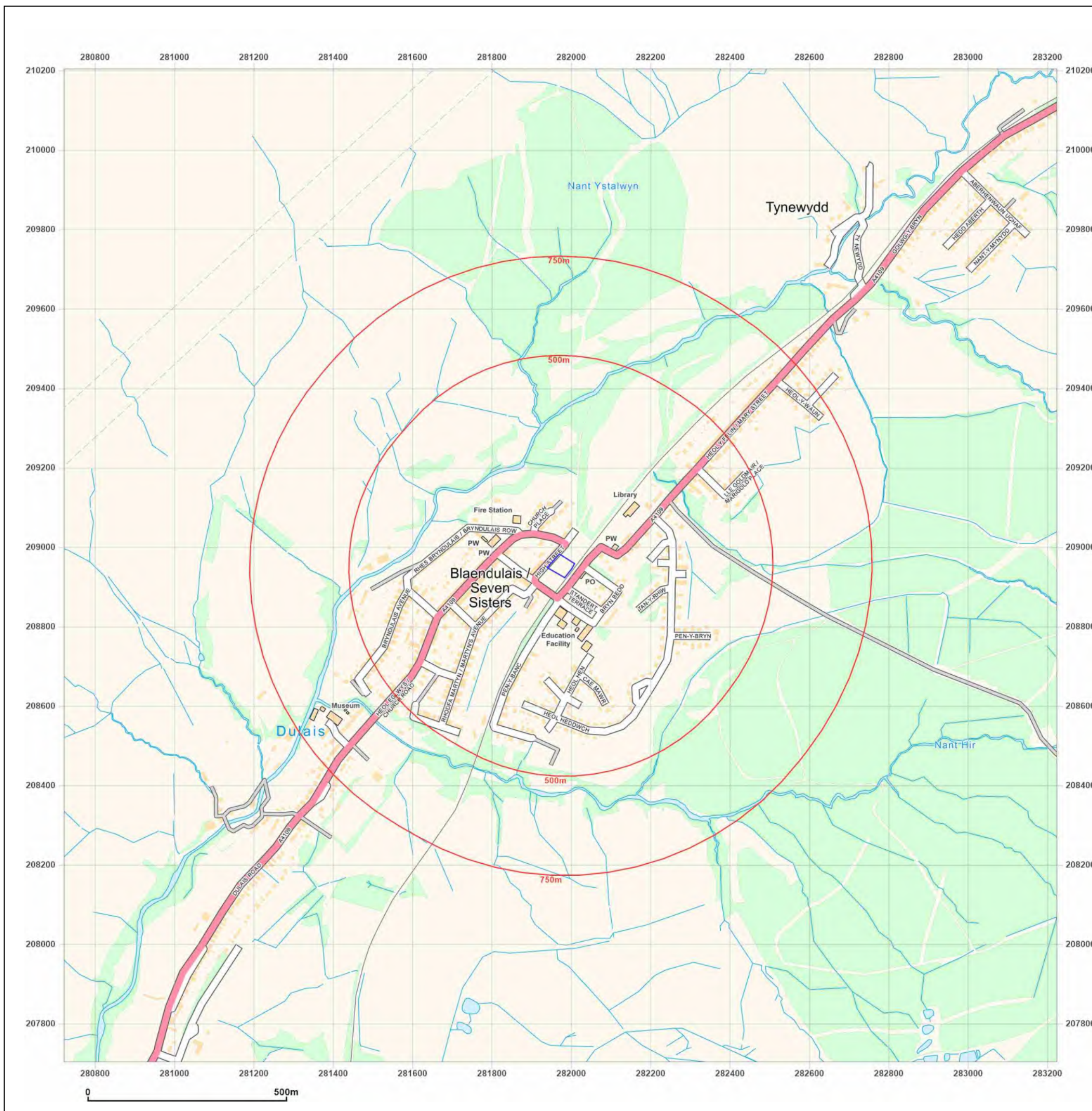


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Blaendulais

Ground Investigation Report



July 2022

DRAFT

Ground Investigation Report

B035256
July, 2022

PRESENTED TO

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EXECUTIVE SUMMARY

The Site	The site is located within the town of Seven Sisters, which is approximately 12 miles northeast of Port Talbot. The site is approximately 0.228ha in area and is centered on National Grid reference (NGR) SN 81942 08914. The approximate postcode for the site is SA10 9DN. The site address is Land opposite, 4 High St, Seven Sisters, Neath SA10 9DN. The site remained undeveloped until circa 1918 when several buildings (unknown uses) appeared on the northern and north-western parts of the site. These remained until a block of residential flats were built sometime between 1962 and 1987. It is anticipated that these flats, following construction, remained relatively unchanged. A small building is shown the south west corner of the site, labelled as PC (Public Convenience), on maps from 1987 to 2003. The PC is not visible on Google Street view (captured May 2011), however, what appears to be an electrical sub-station is present in its location. The surrounding area is dominated by further residential and commercial properties which occupy the south eastern and north eastern site boundaries. The site is bounded to the east by a railway line which had already been constructed at the time of the first OS map publication in 1877 and the A4109 beyond.
Geology	The published geological map for the area, BGS Sheet 231 (1979), and the BGS GeoIndex Onshore online viewer (2021) show the north of the site to be located on recent Glaciofluvial deposits (Diamicton Till). The south of the site is not shown to contain superficial deposits. The underlying bedrock is indicated to comprise South Wales Middle Coal Measures Formation of Carboniferous age characterised by Mudstone, Siltstone and Sandstone. The Coal Authority report for the site indicates that the Gorllwyn Seam outcrops beneath the site and could have been subject to unrecorded shallow mining activities.
Site Investigation	The site investigation was undertaken between 16th and 19th May 2022 and comprised: • Two combined dynamic sample and rotary open hole boreholes (BH01 and BH02) to a depth of 30metres, with sampling and SPTs in the upper 10metres. • Twelve windowless sample boreholes (WS01-WS12) to refusal at depths ranging between 0.4 and 2.9m bgl, with regular SPTs and samples taken. • One day of soakaway testing in two trial pits (TP03 and TP04) at depths of 1.4m bgl and 1.1m bgl. • Five TRL DCP locations to obtain indicative CBR values around the site. • Installation of gas/groundwater monitoring standpipes within both boreholes and one windowless sample borehole (WS08). • On-site inspection and logging of recovered samples. • Representative soil samples taken and submitted for geotechnical classification testing. Representative soil samples submitted and tested for a suite of potential contaminants.

Ground Conditions	The sequence of strata encountered beneath the site comprised; • Topsoil • Made Ground – comprising general building demolition material or colliery spoil • Glaciofluvial deposits (Diamicton Till). • South Wales Middle Coal Measures Formation (Mudstone, Siltstone and Sandstone)
Geotechnical Assessment	Traditional shallow foundations (pad or strip) placed with Glacial Deposits may be designed to an allowable net bearing capacity of 120kPa which will result in settlement of no more than 25mm for foundations of no more than 0.50m wide. Given the presence of a significant thickness of variable made ground across the site, the use of suspended floor slabs is recommended. For buried concrete the Design Sulphate Class for the site can be taken as DS-2 and the Aggressive Chemical Environment for Concrete (ACEC) site classification can be taken as AC-2. Dewatering of temporary excavations may not be required but should be anticipated during winter months. A conservative CBR value of 5% is recommended for preliminary pavement design. A number of concrete obstructions were observed across the site including within the proposed building footprint. It will likely be necessary to grub out the existing foundations to allow for construction of any new foundations.
Coal Mining Risk Assessment	The risk assessment indicates that there is a Low Risk of ground instability as a result of deep or shallow recorded/unrecorded mining and mining geology beneath the site. Following the drilling of two rotary openhole boreholes no workings were encountered in the Gorwllyn seam.
Ground Contamination Assessment	Laboratory testing has recorded a limited number of exceedances on beryllium and arsenic, however within the context of the proposed development and the predominant hard standing the recorded concentrations are not considered to pose a significant risk to site users. Elevated concentrations of PAH have also been recorded in the soil derived leachate samples, with a single PAH compound identified within groundwater. However, given the limited nature of the exceedances and the low permeability of the subsurface strata the recorded concentrations are not considered to pose a risk to controlled waters.
Ground Gas Assessment	Ground gas monitoring undertaken on the site has recorded limited concentrations of carbon dioxide and methane within the subsurface. The site has been defined as a Characteristic Situation 1 (Very Low risk) whereby no ground gas protection measures are considered necessary within the context of the proposed development.
Conclusions and Recommendations	Based on the findings of the ground investigation, the following recommendations are outlined: • A Reactive Strategy should be developed for the site to outline the requirements for identification, assessment and management of any areas of

previously unidentified contamination encountered during the development phase;

- Movement of materials on the site should be undertaken in conjunction with a Materials Management Plan in line with the recommendations in the CL:AIRE Code of Practice to confirm any materials utilised on site are geotechnically and chemically suitable for re-use and to ensure all materials leaving site are disposed of at a suitable waste disposal facility;
- It remains the responsibility of the contractor as waste producer to classify any waste materials and identify a suitable off site disposal facility.
- A number of subsurface obstructions were encountered during the ground investigation thought to related to the previous land use as residential flats or the raised embankment on the southern site boundary to provide road access of the railway line. Considerable breaking out of these obstructions cannot be discounted during the construction phase to allow for the construction of new foundations or grubbing out for new areas of hardstanding and associated access.

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AOD	above Ordnance Datum
bgl	below ground level
BGS	British Geological Survey
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C4SL	Category 4 Screening Levels
CIEH	Chartered Institute of Environmental Health
CLEA	Contaminated Land Exposure Assessment
CoC	Constituent of Concern
CSM	Conceptual Site Model
DEFRA	Department of Environment, food and Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
DTS	Desktop Study
DRO	Diesel Range Organics
DWS	Drinking Water Standard
EA	Environment Agency (England)
EPH	Extractable Petroleum Hydrocarbons
EQS	Environmental Quality Standards
FOC	Fraction Organic Carbon
GPR	Ground Penetrating Radar
LOD	Limit of detection
LQM	Land Quality Management
NRW	Natural Resources Wales
OS	Ordnance Survey
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PPE	Personal Protection Equipment
ppm	parts per million
PRO	Petroleum Range Organics
SGV	Soil Guideline Values
SOM	Soil Organic Matter
SVOC	Semi-volatile organic compounds
TPH	Total Petroleum Hydrocarbon
TSV	Tier 1 Screening Values
VOC	Volatile Organic Carbon
VPH	Volatile Petroleum Hydrocarbons
AOD	above Ordnance Datum

1.0 INTRODUCTION

1.1 INSTRUCTION

Tetra Tech Environment Planning Transport Ltd (Tt) was commissioned by Neath Port Talbot County Borough Council to undertake a ground investigation for a site known as Blaendulais (known hereafter as “the site”).

The location of the site is shown on Figure 1.

1.2 BRIEF

The brief was to provide an intrusive ground investigation to provide information on the ground conditions and enable a geotechnical assessment and contaminated land risk assessment to support the proposed development of the site.

The work was designed to comprise the following elements:

- Twelve window sample boreholes to a maximum depth of 5.00m bgl with Standard Penetration Tests (SPTs) conducted at 1m intervals throughout the full depth of the holes;
- Two mechanically excavated trial pits to facilitate infiltration tests undertaken to BRE 365;
- Two combined dynamic sample, rotary core and rotary open hole boreholes to a depth of 30metres, with sampling and SPTs in the upper 10 metres;
- Five TRL DCP locations to obtain indicative CBR values around the site;
- Installation of three ground gas and groundwater monitoring wells;
- On-site inspection and logging of recovered samples;
- Representative soil samples taken and submitted for geotechnical classification testing;
- Representative soil samples submitted and tested for a suite of potential contaminants;
- Three return visits to monitor ground gas and groundwater levels;
- Preparation of a Ground Investigation report.

1.3 PROPOSED DEVELOPMENT

It is understood that the proposed development will involve construction of a childcare unit with areas of hardstanding for parking.

1.4 REPORT SCOPE

This report includes the following key elements:

- Full factual records of the site works carried out;
- Summary of the ground conditions encountered;
- In-Situ testing results;
- Environmental laboratory testing results;
- Geotechnical laboratory testing results;
- Interpretation of Geotechnical and Environmental laboratory data, including a qualitative ground contamination risk assessment (compliant with CIRIA 552 (CIRIA, 2001) methodology);
- An executive summary of the report to allow a rapid, layman's overview.

1.5 LIMITATIONS

The recommendations and opinions expressed in this report are based on information obtained as part of the desk study or provided by others. Information provided from other sources is taken in good faith and Tetra Tech cannot guarantee its accuracy.

This report is subject to the report conditions presented in Appendix A.

The information contained in this report is intended for the use of the Neath Port Talbot County Borough Council and Tetra Tech can take no responsibility for the use of this information by any third party or for uses other than that described in this report or detailed within the terms of our engagement.

2.0 SUMMARY OF SITE INFORMATION

2.1 LOCATION

The site is located within the town of Seven Sisters, which is approximately 12 miles northeast of Port Talbot. The site is approximately 0.228ha in area and is centered on National Grid reference (NGR) SN 81942 08914.

The approximate postcode for the site is SA10 9DN.

The site address is Land opposite 4 High St, Seven Sisters, Neath SA10 9DN.

A site location plan is presented in Figure 1.

2.2 GENERAL AREA CONTEXT

Table 2-1 - Surrounding land uses

	Description
North	Series of residential and commercial properties
East	Railway line is situated along the eastern boundary with the A4109 beyond.
South	High Street and residential and commercial properties beyond.
West	High Street and residential and commercial properties beyond.

2.3 SITE DESCRIPTION

The site is currently unused however an existing electrical substation is situated in the southwest of the site. The whole site is generally overgrown by bramble, immature trees, long grass and other shrubs and is classified as a Brownfield site. There are also numerous mature trees around the boundaries of the site. The overall topography of the site is generally flat with localised terracing. The highest point being situated on the southern boundary of the site. The site slopes down to the northeast and flattens off for approximately 5m, then is stepped again parallel with the southern boundary of the site. The remainder of the site is relatively flat. It is a reasonable assumption that the stepped nature of the site is due to the construction the adjacent road (Commercial Street) to the south, which rises to provide access over the railway line.

2.4 GEOLOGY, HYDROGEOLOGY, HYDROLOGY AND RADON

2.4.1 Geology

Details of the geology underlying the site have been obtained from the following sources:

- British Geological Survey (BGS) Sheet No.231 Merthyr Tydfil Solid and Drift Edition / Solid Edition etc, 1:50 000 or 1:63,000 scale;
- BGS website (British Geological Survey, 2022); accessed 07/06/2022;
- Coal Authority Interactive Mapper (The Coal Authority, 2021), accessed 07/06/2022.

Made Ground

The BGS interactive mapping does not show the presence of any Made Ground on site. However, due to the known site history and the site being classified as a Brownfield site, Made Ground is anticipated to present beneath the surface across the site. The Made Ground is likely to be comprised of building demolition rubble.

Superficial Geology

The BGS Geoindex indicates that the superficial deposits are present in the northern part of the site. The superficial deposits on site are anticipated to comprise of Glaciofluvial deposits (Diamicton Till). These deposits are sedimentary deposits and glacial in origin. They are detrital, created by the action of ice and meltwater, they can form a wide range of deposits.

Solid Geology

The BGS Geoindex indicates that the solid geology underlying the site is comprised of the South Wales Middle Coal Measures Formation (Mudstone, Siltstone and Sandstone) of Carboniferous Age. The BGS Geoindex describes the formation as *“grey, (productive) coal-bearing mudstones/siltstones, with seatearths and minor sandstones”*.

The hard copy Geological Survey of Great Britain Merthyr Tydfil map (Sheet 231 1:50,000 Series Drift or Solid) shows a mine entry to the north of the site (circa 100m) with some artificial ground beyond. No coal outcrops are shown to be present beneath the site and the regional geological dip is indicated to be 10 degrees to the south southwest.

The online Coal Authority Interactive map differs to the Geological map and indicates a proved coal seam outcropping beneath the site, trending south-southwest to north northeast close to the western boundary of the site and dipping to the right (east). This is also confirmed in the Coal Authority Report Consultant report, although the seam is indicated to stop circa 50m north of the site. The seam is identified as the Gorllwyn, workable with a bearing of 36 degrees.

2.4.2 Hydrogeology

The South Wales Middle Coal Measures Formation is designated as a Secondary A Aquifer. These are 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.

The Superficial Deposits of Diamicton Till are classified as a Secondary Undifferentiated Aquifer. This has been assigned in cases where it has not been possible to attribute either a Secondary A or B aquifer to the soil type due to the variable characteristics.

2.4.3 Radon

The BRE document 211 (Scivyer, 2015) mapping coverage for the site area was consulted and indicates that the site is located within an area where no radon protection measures are required for new developments. The entirety of the site is situated within an area where less than 1% of homes are above the action level.

2.5 SUMMARY OF SITE HISTORY

A Desktop study has been previously undertaken by SOCOTEC (Phase 1) and was supplied to Tetra Tech as part of the tender documentation. The site history was outlined in Section 5 of the Socotec report which is summarised below.

The site remained undeveloped until circa 1918 when several buildings (unknown uses) appeared on the northern and north-western parts of the site. These remained until a block of residential flats were built sometime between 1962 and 1987. It is anticipated that these flats, following construction, remained relatively unchanged. A small building is shown the south west corner of the site, labelled as PC (Public Convenience), on maps from 1987 to 2003. The PC is not visible on Google Street view (captured May 2011), however, what appears to be an electrical sub-station is present in its location.

The surrounding area is dominated by further residential and commercial properties which occupy the south eastern and north eastern site boundaries. The site is bounded to the east by a railway line which had already been constructed at the time of the first OS map publication in 1877 and the A4109 beyond.

3.0 SITE INVESTIGATION

The site investigation was undertaken between the 16th and 19th May 2022 and return monitoring visits were undertaken on 2nd, 9th and 15th June 2022 following the completion of the ground investigation.

Details of the fieldwork methods are given in the notes section at the end of this report.

3.1 SCOPE

The scope of the site investigation included the following:

- Two combined dynamic sample and rotary open hole boreholes (BH01 and BH02) to a depth of 30metres with SPTs.
- Twelve windowless sample boreholes (WS01-WS12) to refusal at depths ranging between 0.4 and 2.9m bgl, with regular SPTs and samples taken.
- One day of soakaway testing in two trial pits (TP03 and TP04) at depths of 1.4m bgl and 1.1m bgl.
- Five TRL DCP locations to obtain indicative CBR values around the site.
- Installation of gas/groundwater monitoring standpipes within both boreholes and one windowless sample borehole (WS08).
- On-site inspection and logging of recovered samples;
- Representative soil samples taken and submitted for geotechnical classification testing;
- Representative soil samples taken, submitted and tested for a suite of potential contaminants;
- Three return visits to monitor ground gas and groundwater levels.

Figure 2 shows the layout of the exploratory holes advanced during the site investigation. Exploratory hole logs including photographic plates are presented in Appendix B.

3.2 CHANGES IN SCOPE

Trial pits TP01 and TP02 both encountered probable concrete at depths of 0.6 and 0.7m bgl. Both were re-located and excavated as TP03 and TP04.

4.0 GROUND CONDITIONS ENCOUNTERED

4.1 STRATA ENCOUNTERED

The sequence of strata encountered beneath the site was;

- Topsoil
- Made Ground
- Superficial Glacial Till Deposits
- South Wales Middle Coal Formation

A summary of each stratum depth is provided in the table below, with descriptions of each stratum detailed in the subsequent sections. Exploratory hole logs including photographic plates can also be seen in Appendix B.

Table 4-1 – Summary of Ground Conditions Encountered

Location	Depth to base of strata (m bgl)			
	Topsoil	Made Ground	Glacial Till Deposits	South Wales Middle Coal Measures
BH01	Ne	0.00 – 1.50	1.50 – 3.50	3.50 – 30.00
BH02	Ne	0.00 – 1.70	1.70 – 3.00	3.00 – 30.00
TP01	Ne	0.00 -0.60	Ne	Ne
TP02	Ne	0.00 -0.70	Ne	Ne
TP03	Ne	0.00 – 0.80	0.80 – 1.40	Ne
TP04	0.00 – 0.30	0.30 – 1.10	Ne	Ne
WS01	Ne	0.00 – 1.10	1.10 – 1.60	Ne
WS02	Ne	0.00 – 2.90	Ne	Ne
WS03	Ne	0.00 – 1.80	Ne	Ne
WS04	Ne	0.00 – 1.60	1.60 – 2.60	Ne
WS05	Ne	0.00 – 1.00	Ne	Ne
WS06	Ne	0.00 - 0.55	Ne	Ne
WS07	Ne	0.00 – 1.00	Ne	Ne
WS08	Ne	0.00 – 1.85	1.85 – 2.80	Ne
WS09	Ne	0.00 – 0.40	Ne	Ne
WS09A	Ne	0.00 – 1.00	Ne	Ne
WS10	Ne	0.00 -0.50	Ne	Ne
WS11	Ne	0.00 – 1.00	Ne	Ne
WS12	Ne	0.00 -0.90	Ne	Ne

4.1.1 Topsoil

Topsoil was encountered in one exploratory hole (TP04) position to a depth of 0.30mbgl and was described as “Dark brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular of sandstone and limestone.”

4.1.2 Made Ground

Made Ground was encountered in all the exploratory positions to a maximum depth of 2.90mbgl (WS02, base not proven. These soils were found to be variable in composition and comprised:

- Soft to firm, dark greyish brown, sandy gravelly clay with gravel of brick, concrete, sandstone, mudstone and old building material. 9plastic and metal)
- Light brown sandy cobbly gravel of concrete, brick and old building materials.
- Loose to dense dark brownish black silty sandy gravel of concrete, sandstone, mudstone, rare brick and occasional colliery spoil with low cobble content of the same.

4.1.3 Glacial Deposits

Glacial fluvial deposits were encountered in six exploratory hole positions that penetrated the full thickness of made ground at depths ranging between 0.8 to 1.85m bgl. The thickness of the Glacial fluvial deposits was only proved in the deep boreholes at depths of 3.0m and 3.50m bgl. These soils were found to be variable in composition comprising both fine grained (cohesive) and coarse grained (granular) soils.

The fine grained soils were typically recorded as firm and stiff mottled orangish grey brown sandy gravelly clay.

The coarse grained soils were recorded as medium dense and dense orangish brown clayey sandy gravel or orangish grey brown clayey gravelly sand.

4.1.4 Bedrock – South Wales Middle Coal Formation

Bedrock of South Wales Middle Coal Formation deposits was encountered in the two deep borehole positions at depths of 3.0m and 3.5m bgl. These rocks, were recorded as dark brown medium hard to hard inter bedded mudstone, sandstone and siltstone

Small traces of thin coal seams (>10cm thick) were recorded in BH01 at 5m and 10.2m bgl and in BH02 at 5 mbgl. No other coals seams, backfilled workings or voids were recorded Broken sandstone was recorded in BH02 between 12.0 and 12.3m bgl. .

4.2 GROUNDWATER

Groundwater was encountered in BH01, BH02, TP01 and BH12. Summarised below.

Hole ID	Water Strike Depth (mbgl)	Depth of water after 20 minutes (mbgl)
BH01	3.30	3.30
BH02	5.00	4.95

	8.50	8.50
TP01	0.60	0.55
WS12	0.90	0.88

4.3 IN SITU TESTING

4.3.1 Standard Penetration Testing

Standard Penetration Tests, using a solid cone, were undertaken in two of the boreholes every 1.50m to a maximum depth of 6.50m, and every 1.00m in the dynamic window sample locations, in accordance with BS EN ISO 22476-3 (2005) and BS5930 (2015) to assess the relative density of the superficial deposits encountered within the boreholes.

As stipulated by BS5930:2015, the SPT N-values represented on the borehole logs are the uncorrected results which were obtained in the field, and these are presented on the boreholes logs in Appendix D.

4.3.2 TRL probes

DCP probing to provide California Bearing Ratio values for pavement design was undertaken in five exploratory positions up to 1.0m bgl adjacent to WS01, WS04, WS06, WS07 and WS11 where areas of hardstanding have been proposed.

Results are presented in Appendix E.

4.3.3 Soil Infiltration Testing

Two soil infiltration tests were carried out, designated as TP03 and TP04. The tests were undertaken within the Glacial-alluvial deposits and Made Ground. The results of these tests can be found in Appendix D and are summarised in the table below.

Table 4-2 – Summary of Soil Infiltration Testing

Location	Depth	Strata	Hydraulic Conductivity (m/sec)
			Test 1
TP03	0.80 – 1.40	GLACIAL ALLUVIAL	FAILED water level did not fall below the 75% volume line after 6 hours of testing. To record a result the water level is required to fall to 25% of the pits volume.
TP04	0.50 – 1.10	MADE GROUND	FAILED water level did not fall below the 75% volume line after 6 hours of testing. To record a result the water level is required to fall to 25% of the pits volume.

4.4 VISUAL OR OLFACTORY EVIDENCE OF CONTAMINATION

No evidence of contamination.

4.5 OBSTRUCTIONS

A number of the exploratory holes refused shallow on hard strata. Although not visible in many of the boreholes it is suspected that some of these refusals are due to historic concrete slabs or slabs related to the previous buildings on the site. Concrete was encountered in BH02 at 0.40m bgl which stopped the hand pitting requiring the rotary rig to progress through the concrete layer to 0.60m bgl.

TP01 also encountered concrete and a small orange 60mm pipe (drainage) at 0.60mbgl. The hole was terminated on this concrete obstruction.

WS08 and WS04 located on the raised site area on the southern boundary of the site that allows the road to climb over the railway line had refusals in the hand pits due to concrete slab at a depth of 0.20m. These were relocated away from the edge of the embankment closer to the roadside to get allow progress to a reasonable depth before further refusal.

5.0 LABORATORY TESTING

5.1 GEOTECHNICAL TESTING

A programme of laboratory testing was carried out on samples taken from the various strata encountered during the site investigation. Geotechnical testing was scheduled by Tetra Tech and carried out by GSTL Ltd, an approved supplier in accordance with the requirements of Tetra Tech quality system and UKAS accredited for a range of geotechnical tests. The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of the specific tests used in each case are given in Table 5-1. Laboratory geotechnical test results are given in Appendix E.

Table 5-1 - Summary of Geotechnical Testing

Test	No.	Test Method
Moisture Content	5	BS1377:1990 Part 2:3.2
4 Point Liquid & Plastic Limit	5	BS1377:1990 Part 2:4.3&5.3
PSD: Wet Sieve method	5	BS1377:1990 Part 2:9.2
PSD: Sedimentation by Pipette	3	BS1377:1990 Part 2:9.4
BRE Digest SD1 Suite D (Brownfield site – pyrite present Total Sulphate, Water Soluble Sulphate, Total Sulphur, Water Soluble Nitrate, Water Soluble Chloride, Water Soluble Magnesium and pH determination)	5	BRE SD1:2005

5.2 ENVIRONMENTAL TESTING

Environmental chemistry was investigated by specialist chemical analysis of selected soil samples carried out by ALS Environmental Laboratories, an approved supplier in accordance with the requirements of Tetra Tech quality system and UKAS and MCERTS accredited for a range of chemical analyses. The testing was scheduled by Tetra Tech and is summarised in Table 5-2 for soil samples. The test results are included in Appendix F.

Table 5-2 - Summary of Environmental Testing

Test suite	No.
<u>Soil Samples:</u> - Tetra Tech Suite C - Heavy metals including Chromium (Hexavalent), Boron (water soluble), Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium and Zinc; - Inorganics – including pH, Water soluble Sulphate as SO₄ (2:1 Extract), Cyanide (Easily liberatable- low level); - Speciated Petroleum Hydrocarbons (TPH CWG); - Speciated Polyaromatic Hydrocarbons (USEPA 16); - BTEX and MTBE;	5

○ Asbestos Screen; and, ○ Phenol.	
<u>Soil Derived Leachate Samples and Groundwater Suites</u> • Tetra Tech Leachate Suite C ○ Heavy metals including Antimony, Boron, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium and Zinc; ○ Inorganics – including pH, Sulphate, Chloride, Nitrite, Nitrate, Total Cyanide, Ammoniacal Nitrogen and NH₃ and NH₄ and Total Alkalinity ○ Speciated Petroleum Hydrocarbons (TPH CWG); ○ Speciated Polyaromatic Hydrocarbons (USEPA 16); ○ BTEX and MTBE; ○ Phenol.	2

6.0 GROUNDWATER AND GAS MONITORING

6.1 GROUNDWATER MONITORING

Groundwater levels were monitored on three occasions following the completion of the ground investigation, on 2nd, 9th, and 15th June. The monitoring data is presented in Appendix G and summarised in **Error! Not a valid bookmark self-reference.** below.

Table 6-1- Summary of groundwater levels

Location	Base of borehole (m bgl)	Depth to water (m bgl)		
		01/06/2022	09/06/2022	15/06/2022
BH01	6.00	3.40	3.40	4.12
BH02	3.40	3.30	3.30	Dry
WS08	1.00	Dry	Dry	Dry

6.2 GROUND GAS MONITORING

Ground gas levels were monitored on three occasions following the completion of the ground investigation, on 2nd, 9th, and 15th June. The monitoring data is presented in Appendix G and in **Error! Not a valid bookmark self-reference.** below.

Table 6-2 – Summary of phase 1 Ground Gas monitoring

Location	Max. Methane (peak) (% vol)	Max. Carbon Dioxide (peak) (% vol)	Min. Oxygen (steady) (% vol)	Max. Carbon Monoxide (steady) (ppm)	Max. Hydrogen Sulphide (steady) (ppm)	Max. Borehole flow (peak) (l/h)
BH01	<0.10	0.80	14.30	<1	<1	0.20
BH02	<0.10	0.90	14.10	<1	<1	0.10
WS08	<0.10	0.60	14.30	<1	<1	0.20

The results indicate measurable concentrations of carbon dioxide (maximum of 0.90%/vol in BH02l) and methane (maximum 0.10%/vol in all exploratory locations).

The maximum gas flow recorded across the monitoring round was a flow of 0.20l/hr, recorded at BH01 and WS08.

The monitoring rounds were undertaken during atmospheric pressure conditions ranging from 994mb to 998mb. A review of atmospheric pressure graphs on weatheronline.co.uk indicates that monitoring was undertaken during periods of steady pressure.

In addition, the ground gas monitoring results indicate hydrogen sulphide concentrations of <1 ppm across all monitoring rounds. Maximum concentrations of carbon monoxide of <1 ppm were recorded.

7.0 SOIL INFILTRATION TESTING

7.1 BACKGROUND

On 7th January 2019, the Welsh Government introduced Schedule 3 of the Flood and Water Management Act 2010 which requires new developments to consider the feasibility of Sustainable Drainage Systems (SuDS) at the design stage. New developments over 100m² or including more than one property must obtain approval of the drainage system from the SuDS Approval Body (SAB) prior to the commencement of construction.

To support the assessment study, preliminary soil infiltration testing has been undertaken as part of the site investigation to provide information on the potential infiltration rates within the sub-strata on the site.

Soil infiltration tests have been undertaken in line with BRE 365 (2016) methodology and any deviations from this approach are documented within the following section. Where possible, locations and depths of test pits were determined based on the proposed drainage design.

7.2 TEST LOCATIONS

Two soil infiltration tests were undertaken over a single day of testing. Initially the test locations were identified as TP01 and TP02 with a target depth of 1.50m bgl. Upon excavation of both locations, hard strata was encountered at 0.60m and 0.70m bgl. As a result, the trial pits were terminated with new locations excavated in order to find favorable ground conditions.

Test locations TP03 and TP04 were excavated to 1.40m and 1.10m bgl respectively and did not reach target depth due to encountering hard strata. Infiltration tests were undertaken at these locations with details summarised in table 7-1.

Test locations were securely fenced and covered until the testing period was completed and excavations backfilled in as dug order upon completion

7.3 SOIL INFILTRATION TESTS

Two soil infiltration tests were undertaken within a machine excavated trial pit as summarised in the following table.

Table 7-1 Summary of Soil Infiltration Test Locations

Test Location	Depth to Base (m bgl)	Top of Target Strata (m bgl)	Target strata
TP03	0.80	1.40	GLACIAL TILL
TP04	1.10	0.50	MADE GROUND

No repeat fills were undertaken within either test locations over one day of testing locations due to poor infiltration.

The results of the soil infiltration tests are presented in the following table. Full test results are included in Appendix D of this report.

Table 7-2 Summary of Soil Infiltration Test Results

Test Location	Soil Infiltration Rate (m/s)		
	Test 1	Test 2	Test 3
TP03	Failed	No test conducted	
TP04	Failed	No test conducted	

7.4 GROUND CONDITIONS

7.4.1 Depth to groundwater

Due to the shallow nature of the soil infiltration testing, a trial pit was not excavated adjacent to the test location to identify the groundwater level.

No water strikes were encountered in any of the inspection pits or the exploratory window sample locations. A water strike was encountered in both exploratory borehole locations (BH01 and BH02) at 3.40m bgl and 5.00m respectively with a second water strike being encountered in BH02 at 8.50m bgl.

TP01 also encountered groundwater seepage at a shallow depth of 0.60m bgl rising to 0.58m bgl over 20 minutes. Based on other exploratory hole locations and the strata encountered within TP01, it is likely that this was perched water.

Based on the findings of the fieldworks and post completion monitoring, it is anticipated that groundwater is at least 3.40m bgl or deeper. It should be noted that groundwater levels can vary seasonal and year on year and at the time of investigation the site was dry.

7.4.2 Strata Type

The Alluvial Deposits encountered in TP03 could generally be described as '*Mottled orangish grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded of sandstone, limestone and rare mudstone.*'

The Made Ground encountered in TP04 could generally be described as '*light brown laminated weathered colliery shale.*'

Full draft logs of the exploratory pits are included in Appendix B.

7.4.3 Ground Contamination

Significant ground contamination was not identified as part of the ground investigation, a contamination assessment is presented in Sections 11.0 and 12.0.

7.5 CONSTRAINTS AND LIMITATIONS

The information presented above is intended to assess the feasibility of soakaway drainage in order to support the development of the drainage strategy. Further testing, groundwater monitoring and ground investigation may be required to support a full SAB application or to inform the development of the final design process.

Ground conditions can vary throughout the year, including the location of the groundwater table. Consideration should be given to the potential effects of seasonal variation when reviewing the data above. It should be noted that the entirety of the site was dry at the time of investigation.

8.0 COAL MINING RISK ASSESSMENT

At the time of writing the report, Tetra Tech is aware that the proposed development will include the development of a childcare unit (single storey) which will include hard standing areas for car parking and a bin store. It is current understood that the existing substation on site will remain.

All information collated on ground conditions is based on extrapolation from data available on adjacent sites and from literature sources. In summary, the following data sources have been consulted.

- Coal Authority Interactive Map Viewer 2022
- British Geological Survey (BGS) Sheet No. 247 (Swansea) Solid and Drift Edition, 1:50 000 and 1:10,560 scale;
- SOCOTEC Phase 1 Desk Study (report number H1061-21)
- Consultants Coal Mining Report (GS-8293535)
- British Geological Survey Geindex Online Mapping
- British Geological Survey Borehole Database, comprising borehole logs of shafts and borehole records adjacent to the site.
- Tetra Tech records of borehole drilled on site.

8.1 BGS AND COAL AUTHORITY REPORT SUMMARY

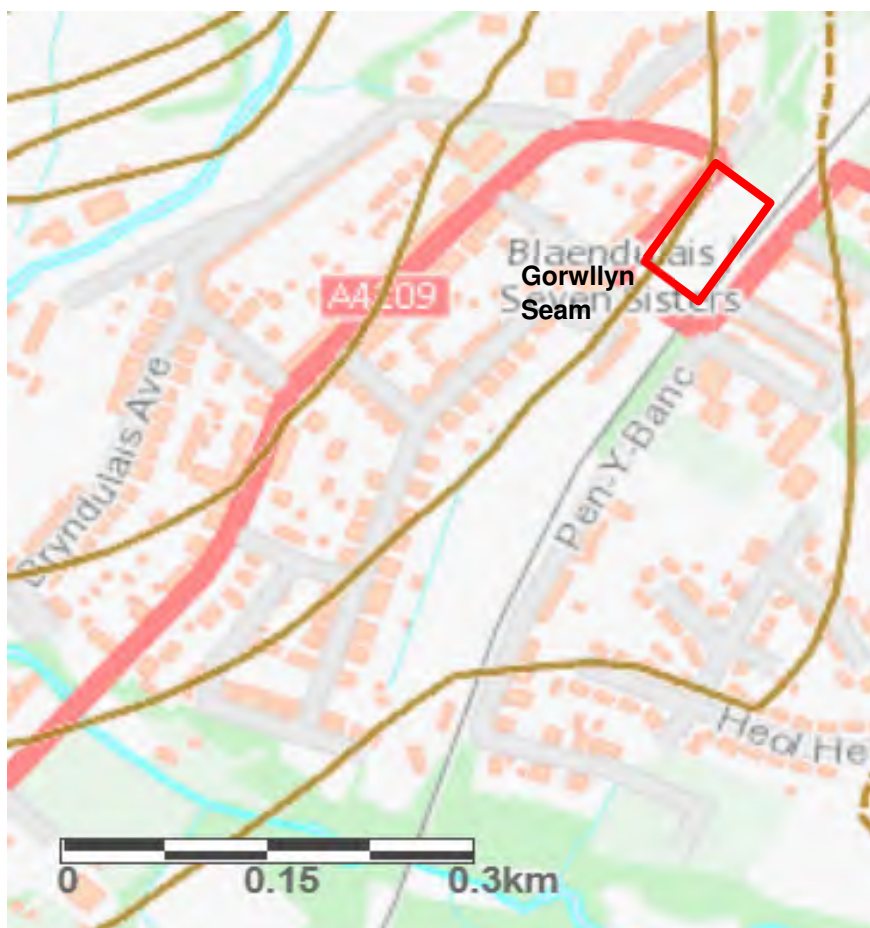
The Coal Authority Consultants Report (provided in Appendix I) states the following:

- Four coal seams lie beneath the property at a shallow depth to 150m depth and were last worked in 1944. Any movement in the ground due to coal mining activity associated with these workings should have stopped by now. In addition, the property is in an area where the Coal Authority believe there is coal at or close to the surface.
- The property also lies within in a surface area that could be affected by underground mining an outcrop seam of coal (Gorllywn).
- The Coal Authority believe that there are not probable unrecorded shallow workings on the site.
- Spine roadways have not been recorded at shallow depth.
- The site is not within influencing distance of current mining activity and the Coal Authority has no plans to grant licenses in the area relating to underground mining. However, reserves of coal exist in the local area which could be worked at some time in the future.
- There are no mine entries recorded within 100metres of the site boundary.
- The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that may have been affected by coal mining.
- The site is not within a boundary of an opencast site from which coal has been removed by opencast methods.
- The property does not lie within 500 metres of the boundary of an opencast site from which coal is being removed by opencast methods and there are no licenses to remove coal by opencast method within.
- The Coal Authority has not received a damage notice or claim for the subject property or any property within 50m of the site since 31st October 1994.
- The Coal Authority has no record of a mine gas emission requiring action within 500m of the enquiry boundary.
- The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.
- The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.
- No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.
- The property is not in an area where a notice to withdraw support. The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

The Coal Authority interactive maps were consulted prior to the investigation and show the site to lie within a development high risk area.. The Coal Authority Report identified the following Coal Seams:

- Gorwilyn Coal Seam being present below the site, outcropping 36°. The direction of the outcrop and the thickness is not detailed within the report.

Extract 1: From Coal Authority Interactive Mapping



Given the probable presence of a shallow outcropping coal seam beneath the site, deep boreholes were undertaken as part of the investigation to locate the seam and identify if it had been previously worked.

8.2 RISK ASSESSMENT AND MITIGATION STRATEGY

Table 9-1 summarises the key hazards identified by review of the available data sources, the factors affecting risk posed by each hazard and an assessment of the estimated risk proposed to any redevelopment of the site.

Assessing risks from coal mining is based upon guidance provided by the Coal Authority following a 'risk based' approach implemented through PPG 14 – Development on Unstable Land.

The risk posed has been assessed as one of three categories.

High risk	Based upon the data available there is a significant risk of shallow ground instability associated with coal mining. Investigation will be required as part of the site re-development. Mitigation measures likely to be required.
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Moderate risk	Based upon the data available there is a potentially significant risk of shallow ground instability associated with coal mining. Investigation will be required as part of the site re-development. Mitigation measures may be required.
Low risk	Based upon the data available there is a low risk of shallow ground instability associated with coal mining. No further assessment or investigation is recommended.

The table below summarises the potential risks associated with coal mining legacy at the site.

Table 8-1 – Coal Mining Risk Categories

Coal Mining Legacy	Yes	No	Risk Assessment
Underground coal and ironstone mining (recorded)	✓		Required
Shallow (<30m) underground coal and ironstone mining (recorded)	✓		Required
Underground coal and ironstone mining (unrecorded)	✓		Required
Shallow (<30m) underground coal and ironstone mining (unrecorded)	✓		Required
Recorded Mine entries (Shafts and adits)		x	Required
Coal and ironstone mining geology	✓		Required
Record of previous mine gas emissions		x	Not Required
Record of coal mining surface hazard		x	Not Required
Surface mining (recorded/unrecorded)		x	Not Required

Based on the information obtained from this assessment, the following risk assessment has been compiled (Table 8-2), which identifies plausible risks at the site that require mitigation in the context of the proposed end use.

Table 8-2 – Coal Mining Risk Assessment

Hazard	Area of site affected	Factors affecting risk	Risk estimate	Mitigation Recommendation	Risk estimate (post recommendation)
Collapse of workings (recorded and unrecorded) shallow coal seams <30m Coal Mining Seams	Entire Site	The Coal Authority believes that there is potential for coal at or close to the surface which may have been worked in the past from shallow depths (<30m). The Coal Authority recommends that the potential for such should be considered prior to development. The site is located on an outcrop of the Gorllwyn Coal Seam. The Coal Authority Interactive Mapping of the area shows a large part of the site to be in a high-risk development area. This is directly related to the outcropping coal seam that could have been subject to unrecorded mining activity.	Moderate	Drilling of two rotary openhole boreholes to a depth of 30m bgl to confirm whether the depth to the Gorllwyn Seam and whether it has been worked beneath the site at shallow depth. Thin coal seams (>10cm) were recorded in both boreholes at a depth of circa 5mbgl and in BH01 at 10.2m bgl. It is not conclusive whether these represent the Gorllwyn seam. No evidence of working or voiding was detected and given the recorded thickness is unlikely to have been worked. Broken ground was encountered in BH02 at 12.00 to 12.30m bgl. Due to the discreet thickness it is unlikely that this is a working and rather a zone of fractured sandstone. No further mitigation necessary.	Low

Collapse of workings (recorded and unrecorded) deep coal and ironstone seams.	Entire Site	The property is in a surface area that could be affected by underground mining of four seams from shallow (<30m) to 150m depth.	High	Coal seams are present beneath the site. Boreholes drilled to 30m bgl identified thin (>10) coal seams at shallow depth but did not identify any workings or voids. Deeper coal seams, even if worked, are unlikely to impact the surface. No further mitigation necessary.	Low
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8.3 RISK ASSESSMENT AND MITIGATION STRATEGY

The risk assessment indicates that there is a **Low Risk** of ground instability as a result of deep or shallow recorded/unrecorded mining and mining geology beneath the site.

There are no recorded mine entries within 100m of the site boundary.

The Consultants Coal Mining Report indicates that the site is within an area of historical coal mining activity. If ground conditions encountered during development appear different to what is present herein, then a specialist should be contacted.

The Gorllwyn Seam was potentially identified in both boreholes (BH01 and BH02) at 5.00m bgl respectively and were found not to be worked.

No further mitigation is deemed necessary.

9.0 GEOTECHNICAL ASSESSMENT

9.1 SOIL PROPERTIES

The ranges of the various soil properties measured are discussed below, to aid in the selection of design values. However, the appropriate choice of characteristic and design values will depend on the particular analysis and design philosophy used and should be selected by the designer.

Where characteristic values are given, these are reasonably conservative estimates of a measured or assessed property that may be used to represent the overall behaviour of the material. Design values are similar but also take into account the ground-structure interaction for a given structure so need to be selected by the designer. It is recommended, however, that design values used do not exceed the characteristic values given in this report.

9.1.1 Made Ground

Made ground deposits were identified in all exploratory hole locations. The SPT-N vs Depth plot for the site is presented in Figure 4. A summary of the in-situ testing is presented below.

Table 9-1 - Summary of test results within the Made Ground

	No. of results	Range (min-max)	Average	Lower quartile	Upper quartile	Characteristic value ⁺
SPT N Values	16	0 - 50	35	14	50	14
Undrained shear strength (kPa):						
- from SPT N values ¹	16	0 - 220	154	62	220	62
Notes: + suggested characteristic values are appropriate for most normal applications but designers should satisfy themselves that they are suitable for the specific application and design method they are using; 1 Estimated from a correlation by Stroud and Butler (1975) ⁽⁴⁾						

- The made ground soils are considered too variable to assign characteristic geotechnical values.

9.1.2 Glacial Till (Fine Grained)

Shallow fine grained Glacial Till deposits were identified within four exploratory hole locations immediately below the Made Ground/topsoil deposits and varied in thickness between 0.5m and 2.0m. A summary is presented in the table below.

Table 9-2 - Summary of test results within the fine grained Glacial Till deposits

	No. of results	Range (min-max)	Average	Lower quartile	Upper quartile	Characteristic value ⁺
Natural moisture content (m - %)	5	7.6 - 21	14	7.7	18	18
Liquid limit (LL)	5	19 - 39	29	19	34	19

Plastic limit (PL)	5	11 – 16	14	11	16	14
Plasticity index (PI)	5	8 – 23	15	9	18	18
Modified Plasticity Index ¹	5	6 - 18	11	7	14	14
SPT N Values	5	9 – 50	36	19	50	19
Undrained shear strength (kPa):						
- from SPT N values ²	5	40 - 220	176	154	220	40
Notes: + suggested characteristic values are appropriate for most normal applications but designers should satisfy themselves that they are suitable for the specific application and design method they are using; * Estimated from a correlation from Peck, Hansen and Thornburn, Foundation Engineering, Wiley, 2nd ed., (1974) ⁽⁶⁾ 1 Modified Plasticity Index (I _P) is defined as: I _P = (PI x %passing 425um)/100%; 2 Estimated from a correlation by Stroud and Butler (1975) ⁽⁴⁾						

Due to the presence of obstructions within the made ground only limited SPT's were undertaken in the fine grained Glacial Deposits, of which 3 refused at 50 blows. SPT N values of 9 and 19 were recorded in WS01 and WS08, both undertaken at the top of the unit. However, the undrained shear strength of the soils increases rapidly with depth. Therefore, it is recommended that the following values are taken as design/characteristic values for this material.

- Undrained shear strength 65kPa
- SPT N Value 14
- Angle of shearing resistance, ϕ 31.3°

9.1.3 Glacial Till (Coarse Grained)

Shallow coarse grained Glacial Till deposits were identified within two exploratory hole locations immediately below the Made Ground/topsoil deposits and varied in thickness between 0.6m and 1.0m. Only three SPT-N values were obtained in the coarse grained Glacial Till deposits, one of 24 and two of 50. For the purposes of design/characteristic values the more conservative 24 value has been used which equates to an angle of shearing resistance of 34.3°.

9.1.4 South Wales Middle Coal Measures Formation

The South Wales Middle Coal Measure were confirmed in 2 exploratory hole locations BH01 and BH02 however it is suspected that many of the windowless sampler SPT refusals may have also been on either dense/very stiff Glacial Till or on the South Wales Middle Coal Measures Formation. All SPT-N tests undertaken in the confirmed South Wales Middle Coal Measures resulted in 50 SPT-N value.

10.0 GEOTECHNICAL DESIGN CONSIDERATIONS

10.1 PROPOSED DEVELOPMENT

The proposed development plan is presented at the end of this report in Figure 3 and comprises a new childcare unit with associated areas of hardstanding for car parking.

10.2 EARTHWORKS

Given the current levels of the site and the terraced nature of some of the area, minor earthworks (cut and fill) are anticipated. The majority of any cut materials are likely to be made ground and thus unsuitable for re-use as engineered fill. Given the small scale of the development it would likely be more cost effective to import clean granular fill.

10.3 FOUNDATIONS

Within the area of the proposed building Made Ground was encountered overlying shallow coarse-grained Glacial Till deposits however many of the windowless sample holes refused at shallow depth and concrete was encountered in BH02 at 0.40m bgl. Prior to development existing foundations will need to be grubbed out to allow excavation to the deeper natural deposits. The Made Ground deposits are thick in places, such as WS02 (2.9m bgl) and may be associated with former structures on site such as the toilet block previously located in the vicinity of WS01. Underlying the Glacial Till are the South Wales Middles Coal Measures Formation which was encountered in BH02 at 3.00m bgl.

Based on the above ground conditions and given the relatively low groundwater table it is considered that shallow spread foundations, strip or pads, placed within the shallow fine grained or coarse grained Glacial Till. Foundations should be placed at a minimum of 1.0m bgl but will likely need to be extended deeper where the made ground is of greater thickness and should penetrate the Glacial Deposits by at least 0.3m. Shallow footings may be designed to an allowable net bearing pressure of 120kPa, giving a factor of safety greater than 3 against ultimate bearing capacity failure, and should result in settlement less than 25mm for a strip footing of no greater than 0.7m wide or a pad of no more than 1m².

If foundations cross from a fine to a coarse-grained soil, reinforcement of the foundation may be required to prevent differential settlement.

Foundation excavations should be inspected by a suitably experienced engineer or inspector to ensure the founding material is suitable natural deposits. Any Made Ground, soft, loose or otherwise unsuitable material should be excavated and replaced by compacted granular backfill or lean concrete.

10.4 FLOOR SLABS

Due to variable composition, strength/density and thickness of Made Ground (up to 2.90m), ground bearing floor slabs are not considered suitable without treatment. Given the small nature of the development, the use of suspended floor is considered the best option.

10.5 CHEMICAL ATTACK ON BURIED CONCRETE

Chemical tests undertaken on representative samples from the Made Ground and Glacial Till show moderate levels of water-soluble sulphates and generally neutral conditions. Based on these conditions, it is recommended that for foundations the Design Sulphate Class for the site, as defined in BRE Special Digest 1, be taken as DS-2, and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as AC-2.

10.6 TEMPORARY WORKS

The four trials pits excavated for the infiltration tests were found to have poor to moderate side wall stability particularly through the made ground deposits. It is considered that shoring or battering of even shallow excavations in the short term will be required. Groundwater is likely to be encountered at deeper depths (3.30m bgl) and dewatering of excavations is unlikely to be required. However, works were carried out in the spring and there may be seasonal variations that result in the need for dewatering.

10.7 PAVEMENTS

Based on the twelve results gathered within the Made Ground, CBR values were in the range of 1% to 45% (average 23%). Given the very variable nature of the results obtained it is recommended a conservative value of 5% is adopted for pavement design within this stratum.

The results within the shallow fine grained and coarse-grained alluvium ranged from 3% to 249%. A CBR value of 5% is recommended for pavement design.

Proof rolling of the formation level will be required and any loose or soft spots should be removed and replaced with an engineer fill, in accordance with a suitable specification. Due to potential obstructions there may also be a requirement to grub out existing foundations and any hard spots identified in the Made Ground deposits. The formation level will also need to be protected during inclement weather from deterioration.

Prior to placement of the founding material and the construction of the road pavement, the sub-formation and formation will need to be inspected and checked in accordance with a suitable specification to ensure the ground conditions are as expected. All testing should be carried out in accordance with DMRB IAN 73/06 to confirm that the ground conditions at the time of construction are consistent with the previous design parameters.

10.8 DRAINAGE

Soakaway testing within the shallow fine grained Glacial Till Made Ground deposits at TP03 and TP04 both failed after a day of testing suggesting the underlying geology is not suitable for soakaway drainage.

11.0 GROUND CONTAMINATION ASSESSMENT – HUMAN HEALTH

11.1 INTRODUCTION

The UK Contaminated Land Regime (CLR) allows for a tiered approach to the assessment of ground contamination which is designed to allow increasingly site-specific assessment. In order to assess the potential risk posed by contaminants contained within the soils at the study area a generic quantitative risk assessment (gQRA) has been undertaken by comparing recorded concentrations of chemical constituents in soil with Generic Assessment Criteria (GAC) to identify whether, at the concentrations recorded, the presence of the constituent has the potential to adversely affect the health of site users (a Tier 1 assessment). GAC are set at levels where potential exposure is deemed to be within acceptable limits.

If the recorded concentrations of a particular constituent are below the GAC then the risk is generally considered to be acceptable and further assessment / or mitigation measures are not required. Where a substance is recorded at concentrations higher than GAC this does not necessarily indicate that a particular risk is present, however, it does typically signify the requirement to undertake further assessment in line with the UK tiered risk assessment framework.

11.2 ASSESSMENT CRITERIA

11.2.1 Generic Assessment Criteria

The following GAC for soils have been utilised for the screening process, in order of preference:

- CL:AIRE published C4SL (DEFRA, 2014);
- CIEH/LQM published S4UL (LQM/CIEH, 2015);
- Tetra Tech internal Tier 1 Screening Criteria (issue 15) derived using the derivation tool CLEA version 1.06, in line with the current UK Contaminated Land Regime.

C4SL are currently available for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead¹. The C4SL were originally developed to support the categorisation of sites in accordance with Part 2A are also, based on DEFRA guidance, considered suitable for use during the assessment of sites as part of the planning process.

Where C4SLs are not available, 'Suitable for Use Levels' (S4UL) developed by CIEH/LQM have been used. The S4UL provide GAC based on minimal or tolerable risk intended to be protective of human health for individual or mixtures of substances. It is considered conservative and appropriate to use these values for contaminants for which C4SL are unavailable. GAC for volatile and semi-volatile organic compounds (VOC and SVOC) not presented in the S4UL document are sourced from CL:AIRE (CL:AIRE, January 2010).

Where no published screening values are available Tetra Tech have derived their own values (easily liberatable cyanide).

The CLEA model states that "For most exposure pathways, the contamination is assumed to be at or within one metre of the surface" (Environment Agency, 2009). It is considered that at depths greater than 1.0m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. Typically, volatile compounds only significantly affect the indoor inhalation pathway. The same screening concentrations have been used for all depths at this stage, though it is noted that these are highly conservative for depths below 1.00m bgl.

¹ Arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI, lead assuming 6% SOM (1% SOM C4SL also published for benzene).

11.2.2 Proposed End Use

Screening criteria have been developed for the following land use scenarios:

- Residential with plant uptake;
- Residential without plant uptake;
- Allotments;
- Public open space (park and residential);
- Commercial / Industrial.

The proposed development on site will consist of a childcare unit with associated outside play areas. As such the following screening assessment has been undertaken against a residential end use without plant uptake.

11.2.3 Soil Organic Matter

For organic contaminants, the generic soil screening values have been derived for a range of concentrations of soil organic matter (1%, 2.5%, 6%). In order to provide a conservative assessment the GAC derived for a 1% SOM have been adopted.

11.3 TIER 1 – SOIL SCREENING

Five soil samples collected from across the site were submitted for chemical laboratory analysis. Full copies of laboratory certificates for all soil analysis are included in Appendix F.

Comparison of the chemical analysis results with the generic assessment criteria for a residential without plant uptake end use has identified the following exceedances, as detailed in Table 11-1.

Table 11-1 - Summary of Constituents of Concern

Constituent of Concern	No. of Samples	Min	Max	SSV	Exceedances	
					No. of exceedances	Location
Arsenic	5	4.2	43.4	40	1	TP02 0.50m
Beryllium	5	0.8	2.4	1.7	3	TP01 0.30m WS08 1.90m WS04 1.60m

As summarised in the table above arsenic and beryllium have been identified at concentrations which exceed the screening value for a residential without plant uptake end use. Consideration has also been given to the screening values applicable to a public open space (residential) setting to provide additional context to the assessment.

In this scenario the screening value for arsenic is increased to 79mg/kg and beryllium is increased to 2.2mg/kg, whereby only a single exceedance of beryllium it is recorded within WS08 (2.4mg/kg). These elevated concentrations are considered further in Section 15.0.

11.4 ASBESTOS

Asbestos was not identified in any of the samples sent for laboratory analysis. Suspected asbestos containing materials were not identified during the ground investigation.

12.0 GROUND CONTAMINATION ASSESSMENT – WIDER ENVIRONMENT

12.1 INTRODUCTION

The potential for contaminated groundwater on site to adversely affect controlled water receptors (groundwater and surface water bodies) has been assessed at this stage by direct comparison of analytical data from the Tetra Tech ground investigation with relevant Water Quality Standards (WQS).

Similarly, the potential for soil contamination to impact controlled waters has been assessed by comparing analytical data from soil derived leachate tests directly against WQS.

12.2 ASSESSMENT CRITERIA

In light of the environmental setting of the site under consideration. The following water quality standards have been adopted, in order of preference.

- Water Framework Directive (WFD),
- Environmental Quality Standards (EQS);²
- WHO 2008 - Petroleum Products in Drinking Water (WHO 2008)
- UK Drinking Water Standards³.

12.2.1 Bioavailability

For certain heavy metals (copper, zinc, manganese, nickel and lead) the bioavailability of the metal within the water can be calculated to generate a bespoke screening criteria based on other groundwater parameters. This assessment is undertaken utilising the Metal Bioavailability Assessment Tool (M-BAT) which was developed using the EQS_(bioavailable) developed in line with the Water Framework Directive.

In the case of copper, zinc, manganese and nickel the assessment takes into account the concentration of calcium, Dissolved Organic Carbon (DOC) and pH of the water sample. The assessment for lead only takes the DOC of the sample into account. A spreadsheet has been developed for the assessment by the UK Technical Advisory Group on the Water Framework Directive.

12.3 SOIL DERIVED LEACHATE METHODOLOGY

Soil derived leachate samples can be used to identify potentially mobile contamination within soil samples collected from the site. It should be noted that the laboratory test methodology indicates a potential mobility of contaminants and is usually considered to reflect a worst-case situation and unlikely to represent on-site conditions.

The laboratory preparation of leachate samples is likely to produce higher concentrations of leachable components than conditions encountered on site and as such the following assessment is considered to be inherently conservative in nature. Furthermore, the resulting data are screened against criteria intended to be protective of water bodies and drinking water supplies and are not intended to assess the potential significance of contaminant mobility.

² Where WFD 2015 are not presented revoked WFD 2010 standards are used

³ WHO 2005; WHO 2008; UK Water Supply Regulations 2010 and 1989 Regulations. Priority given to UK drinking water standards

12.4 TIER 1 SCREENING ASSESSMENT – SOIL DERIVED LEACHATE

Two soil derived leachate samples were screened against a suite of determinants outlined in Section 12.2.

The following table summarises the determinants which have been identified at concentrations in excess of the adopted screening value.

Table 12-1 – Summary of Exceedances within Soil Derived Leachate Samples

Determinant	Units	Maximum	Minimum	Screening Value #	Exceedances	
					No.	Location
Benzo(a)pyrene	µg/l	0.076	<0.005	0.00017	1	WS03 0.7m
Benzo(ghi)perylene	µg/l	0.06	<0.005	0.0082	1	WS03 0.7m
Benzo(b)fluoranthene	µg/l	0.12	0.014	0.017	1	WS03 0.7m
Benzo(k)fluoranthene	µg/l	0.046	<0.008	0.017	1	WS03 0.7m
Fluoranthene	µg/l	0.008	0.09	0.0063	1	TP02 0.5m

Inland water EQS 2015

Five PAH compounds were identified within soil derived leachate samples at concentrations in excess of the adopted screening criteria. The recorded concentrations are considered to be limited within the context of the site setting and the aggressive nature of the leachate testing process. The recorded concentrations are however considered further in Section 15.0.

12.5 TIER 1 SCREENING ASSESSMENT – GROUNDWATER

One groundwater sample was obtained from the monitoring installations on the site and analysed for the suite of determinants outlined in Section 5.2. The results were screened against a suite of determinants outlined in Section 12.2.

The following table summarises the determinants which have been identified at concentrations in excess of the relevant WQS screening criteria.

Table 12-2 – Summary of Exceedances within Groundwater Samples

Determinant	Units	BH01	Screening Value #
Fluoranthene	µg/l	0.007	0.0063 [#]
Copper	µg/l	10	1 [*]
Nickel	µg/l	7	4 [#]

Inland water EQS 2015

* Freshwater EQS 2015

As can be seen in the table above fluoranthene, copper and nickel have been identified at concentrations in excess of the relevant EQS screening criteria.

As outlined in Section 12.2.1, the bioavailability of certain heavy metals can be taken into account within water samples. The M-BAT assessment tool has been used to determine a screening value taking into account the bioavailability of copper and nickel within the groundwater sample and the results are presented in the following table.

Table 12-3 – M-BAT adjusted Screening Values for Heavy Metals – Groundwater

Determinant	Sample	Concentration (µg/l)	Screening Value (µg/l)	M-BAT Screening Value (µg/l)	Exceedances
Copper	BH01	10	1	7.60	Yes
Nickel	BH01	7	4	16.93	No

The recorded concentrations of copper are therefore considered further within the risk assessment presented in Section 15.0.

13.0 PRELIMINARY GROUND GAS ASSESSMENT

13.1 INTRODUCTION

Three return ground gas monitoring visits were undertaken between the 2nd June and 15th June 2022. Full factual site records of the gas monitoring results are presented in Appendix G and summarised in Section 6.2.

13.1.1 Ground Gas Monitoring

Ground gases are monitored within boreholes on the site recording the following parameters.

- Concentrations of ground gases;
 - Methane (%v/v);
 - Carbon dioxide (%v/v);
 - Oxygen (%v/v);
 - Carbon monoxide (ppm);
 - Hydrogen sulphide (ppm);
- Borehole flow rate (l/hr);
- Depth to groundwater;
- Atmospheric pressure trends;

Where groundwater levels are noted to be above the screened sections of the boreholes the data is not considered to be representative of the ground gas regime and are therefore not used within the risk assessment process.

Atmospheric pressure trends are recorded on site during the monitoring process, but are also noted in the preceding three days, and one day after each monitoring visit. Falls in atmospheric pressure are generally considered to indicate a higher potential for ground gas migration from the sub surface and as such monitoring during periods of falling pressure are considered to represent worst case scenarios as outlined in the CL:AIRE Technical Bulletin TB17 (CL:AIRE, August 2018).

13.1.2 Land Gas Risk Assessment Methodology

The key reference document which has been used to undertake the semi-quantitative land gas assessment presented in this report is CIRIA C665 (CIRIA, 2007). This provides a framework for assessment of land gas risk to buildings/structures with foundations (i.e. houses and/or commercial properties).

The risk assessment process is based on a Source-Pathway-Receptor Conceptual Site Model Methodology, with consideration given to the potential sources likely to be present on the site and the ground gas monitoring regime designed to reflect the scale of the source potential.

The collected data has been used for the purposes of undertaking a semi-quantitative assessment in accordance with the CIRIA 665 methodology. The calculation used to calculate the gas screening value (GSV) for the site, together with the relevant definition of units, is as follows:

$$\text{GSV (litres of gas/hr)} = \text{borehole flow rate (l/hr)} \times \text{gas concentration (volume/100)}$$

The calculated GSV values are used to determine the Characteristic Situation (CS) for the site in terms of methane and carbon dioxide, based on the conditions outlined in Table 13-1 below.

CS classification is applicable to all buildings, with the exception of low-rise housing with a ventilated underfloor void, in these situations, the NHBC Traffic Light System is adopted. Based on the proposed development, the CS classification is considered the most appropriate.

Table 13-1 –GSV Classification (Modified Wilson and Card Methodology)

Characteristic Situation	Risk Classification	Gas Screening Value Threshold (l/hr)	Additional Considerations
1	Very Low Risk	<0.07	Methane concentration <1% Carbon dioxide <5%
2	Low Risk	<0.7	Borehole flow rate <70 l/hr
3	Moderate Risk	<3.5	-
4	Moderate to High Risk	<15	Quantitative risk assessment required to evaluate scope of protective measures
5	High Risk	<70	-
6	Very High Risk	>70	-

13.2 PRELIMINARY GROUND GAS RISK ASSESSMENT

13.2.1 Conceptual Site Model

The following sections outline the anticipated Source-Pathway- Receptor model associated with the proposed development on site.

Sources

The following potential sources have been identified on and off site.

- Made Ground deposits
- The site is also located within the South Wales Coalfield, with historical mine workings within the vicinity of the site.

Pathways

The following potential pathways have been identified which may act as preferential pathways for ground gas migration:

- The underlying strata have been classified as largely low permeability. Therefore, there is limited potential for horizontal and vertical migration of ground gas;
- Buried service runs and foundations, including sub-floor voids.

Receptors

Within the context of ground gases, the following enclosed structures are considered to represent potential receptors.

- Structures and enclosed areas within proposed development.

13.2.2 Risk Assessment – Methane and Carbon Dioxide

In order to assess the significance of ground gases at the site, measured concentrations and flow rates have been used to derive Gas Screening Values (GSVs). GSVs are the product of gas concentration and gas flow measured in a borehole and provide an indication of the flow of the particular gas in question out of the ground.

Due to the limited data obtained from the site the worst-case values have been used within the risk assessment. Based on a maximum flow recorded of 0.2l/hr and the maximum recorded concentration of carbon dioxide (CO₂) and methane (CH₄) during the three monitoring visits, the GSVs have been calculated as presented in Table 13-2.

Table 13-2 – Initial GSV Calculations

	Maximum Concentration (%)	Maximum Flow Rate (l/hr)	GSV (l/hr)	Characteristic Situation (Wilson and Card)
Carbon Dioxide	0.9	0.2	1.8x10 ⁻³	1 (Low Risk)
Methane	0.1	0.2	2x10 ⁻⁴	1 (Low Risk)

These values have been compared with the Revised Wilson and Card Classification presented in Table 13-1.

The risk assessment process indicates the site is representative of Characteristic Situation 1 (Very Low Risk) based on the recorded concentrations of carbon dioxide and methane and maximum flow rates within the sub surface.

13.2.3 Carbon Monoxide and Hydrogen Sulphide

Maximum concentrations of carbon monoxide and hydrogen sulphide were recorded at <1ppm throughout the monitoring period. The recorded concentrations are considered to be suitably low to negate the requirement for additional risk assessment.

13.2.4 Atmospheric Pressure Trends

The monitoring rounds was undertaken during rising, falling and steady pressures with no discernable variation in ground gas monitoring results recorded. The second monitoring round was undertaken following a period of falling pressure.

13.3 SUMMARY AND DISCUSSION

The site has been classified as Characteristic Situation 1 (Very Low Risk) based on the worst-case recorded concentrations of carbon dioxide and methane and maximum flow rates. Site classification of a Characteristic Situation 1 indicates gas protection measures are not required within new developments.

14.0 WASTE CLASSIFICATION ASSESSMENT

Waste classification is a two stage process, with the first step comprising a hazard assessment of the soil quality data in line with the guidance set out in the Environment Agency waste classification technical guidance WM3⁴ document. Once the hazardous properties of the materials are known, the second step is to assess the potential performance of the materials in a landfill, undertaken by considering the results of waste acceptance criteria (WAC) testing.

14.1.1 Waste Classification

The chemical analysis data obtained from the ground investigation has been used to make a preliminary assessment of whether soils from the study area would be classified as hazardous waste. The assessment provides an initial indication of the classification of the soils in the event that they are disposed to landfill. Note the decision as to whether soils are deemed to be hazardous waste ultimately rests with the receiving landfill.

The waste classification report is presented as Appendix H. The assessment was undertaken using HazWasteOnline, web-based software for waste classification. The software follows Environment Agency guidance and European regulations. Assessment sheets are presented in Appendix H.

In making the assessment the following assumptions have been made:

- TPH are not derived from petrol or diesel. There was no visual or olfactory evidence of hydrocarbons observed during the ground investigation and the long term presence of the mound on the study area means that storage of such fuels is unlikely to have taken place at the site.

The five samples analysed as part of the ground investigation were of made ground. The initial assessment identified 2no. samples (TP01 at 0.30m and TP03 at 0.55m) that were classified as potentially hazardous as a result of the presence of flammable liquids. After a review of the exploratory hole logs this hazardous property has been removed from all the samples where it was identified by the software as there was no visual or olfactory evidence of flammable liquids such as hydrocarbons observed during the ground investigation. The assessment sheets in Appendix H detail which samples this edit has been applied to.

After this amendment all samples have been classified as **non-hazardous**.

As mentioned above, the second stage of the assessment relates to the identification of a suitable receiving landfill facility based in Waste Acceptance Criteria (WAC) testing data. As present, no such data is available and as such a suitable receiving facility cannot be identified. Should materials be designated for off-site disposal as part of the proposed redevelopment of the site, it is recommended that additional testing is undertaken prior to disposal to include WAC testing to allow for a final classification in consultation with the landfill sites and waste disposal contractors.

14.1.2 Materials Management

Any material excavated on site may be classified as waste and it is the responsibility of the holder of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way can cease to be classed as waste for a particular purpose.

If site-won material is to be reused on site, or soils other than primary aggregate or aggregates produced under the WRAP Protocol, imported to site, a Materials Management Plan will be required, signed off by a Qualified Person as defined in the 'Development Industry Code of Practice' (CL:AIRE, 2011).

⁴ Environment Agency 2018. Technical Guidance WM3: Guidance on the classification and assessment of waste (Version 1.1).

15.0 CONCEPTUAL SITE MODEL AND PRELIMINARY GROUND CONTAMINATION RISK ASSESSMENT

15.1 OVERVIEW

The information presented in the previous sections of this report have been collated and evaluated to establish an initial qualitative risk assessment for the site. A conceptual model of the site has been generated based on information derived from this Phase 1 Geo-environmental Assessment, supplemented by information attained during the Tetra Tech site walkover.

The site has been considered with regard to current UK legislation and guidance, namely Part 2A of the Environmental Protection Act 1990 and the Contaminated Land (England) Regulations 2006, as amended, and in accordance with current UK good practice guidelines (for example BS10175:2011).

In general, ground contamination can occur through several causes, particularly from historical operations and activities. Contamination can result from either on-site sources or from on-site migration from off-site sources, leading to long term liabilities under recent legislation for any site owner.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- Source, i.e. a substance that is capable of causing pollution or harm;
- Pathway, i.e. a route by which the contaminant can reach a target; and
- Receptor (target), i.e. something which could be adversely affected by the contaminant.

If one of these elements is absent there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

15.2 CURRENT SITE USAGE AND PROPOSED DEVELOPMENT

The proposed development includes the development of a childcare facility with associated external play areas and parking.

15.3 CONCEPTUAL SITE MODEL

The key source, pathways and receptor model is outlined below within the context of potential development of the site.

15.3.1 Potential Sources of Contamination

The main potential sources of contamination on the site are associated with existing features as well as historical land uses on the site as summarised below.

On site Sources

- Made Ground associated with former development on the site;
- Historical colliery workings.
- Existing Electrical Substation

15.3.2 Potential Contaminant Pathways

The following contaminant pathways are considered to potentially be active based on the current site use and proposed development:

Human Exposure Pathways

- Direct dermal contact or ingestion of soils, or inhalation of dust and/or vapours (i.e. human interaction with surface and sub-surface materials).

Environmental Pathways

- Leaching and horizontal or vertical migration through the unsaturated ground, either through permeable sub-surface materials and/or preferential pathways;
- Lateral and vertical migration of groundwater through permeable sub-surface materials and/ or preferential pathways;
- Leaching to surface water run-off/drainage;
- The migration and accumulation of gases or vapours through permeable sub-surface materials and/ or preferential pathways.

15.3.3 Potential Receptors at Risk

The following potential receptors have been identified:

Human Health

- Current site users (currently undeveloped)
- Future site users (childcare unit);
- Site workers during the redevelopment of the site;
- Adjacent site users (residential)

Wider Environment

- Secondary A Aquifer within superficial deposits;
- Surface waters (Dulais River);
- Plant uptake; and
- Building Infrastructure and supply pipes.
- Adjacent Properties

15.4 GROUND CONDITIONS RISK ASSESSMENT

The source, pathway, receptor linkages identified in the previous section are outlined and a qualitative risk assessment shown in the following tables.

The risk assessment considers the site within an area context and assesses potential risks to identified receptors in relation to the existing site setting and the proposed development. CIRIA C552 has been used to define the risk rating presented in the Qualitative Risk Assessment matrix, the methodology for which is presented in Appendix I.

Table 15-1 – CIRIA C552 Qualitative Risk Assessment

This matrix is based on CIRIA C552 risk evaluation methodology, definitions for risk ratings is presented in Appendix I						
Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
Made Ground associated with previous development	Direct dermal contact or ingestion of soils, or inhalation of dust and/or vapours	Current site users	Medium	Unlikely	Low Risk	Whilst elevated concentrations of arsenic and beryllium have been recorded in the made ground on site, the concentrations are considered to be relatively marginal and when the site is considered against a Public Open Space (residential) end use only one exceedance of beryllium is identified. It is also understood that the proposed development will consist of a building with play areas consisting of predominant hardstanding / surfacing whereby interaction with the underlying made ground will be limited. Risks to construction workers can be managed with the use of PPE, good hygiene practices and ongoing risk assessments.
		Future site users		Low Risk	Moderate / Low Risk	
		Construction workers		Low Risk	Moderate / Low Risk	
	Leaching and lateral/vertical migration of mobile contaminants	Surface water	Mild	Low Risk	Low Risk	Elevated concentrations of PAH compounds have been recorded in the soil derived leachate samples and whilst these pose a potential risk to groundwater the low permeability

		Groundwater		Low Risk	Low Risk	of the subsurface and aggressive nature of the leachate testing procedure these risks are considered to be limited. A single exceedance of PAH has been recorded in groundwater from the site
Asbestos	Inhalation	Current site users	Medium	Unlikely	Low Risk	Asbestos containing materials have not been identified during the ground investigation.
		Future site users		Unlikely	Low Risk	
		Construction workers		Unlikely	Low Risk	
Ground Gas associated with made ground and colliery workings.	Accumulation of gases and inhalation	Future site users	Severe	Unlikely	Moderate / Low Risk	The results of the ground gas monitoring undertaken across the site indicates that the site is categorised as Characteristic Situation 1 (Very Low Risk). As such, ground gas protection measures are not considered necessary as part of the proposed development.
		Construction workers		Unlikely	Moderate / Low Risk	

16.0 CONCLUSIONS AND RECOMMENDATIONS

16.1 GROUND CONTAMINATION

16.1.1 Summary

Only limited ground contamination has been identified in the made ground on the site however given the conservative nature of the assessment and the understanding that the site will be largely hardstanding / formal surfacing the recorded concentrations are not considered to pose a significant risk to future site users. Risks to construction workers can be managed through the adoption of good hygiene practices and use of PPE during the development.

With regards to the potential for mobile contamination, elevated concentrations of PAH compounds have been recorded in soil derived leachate samples, with a further exceedance recorded in groundwater on the site. However, given the limited nature of the exceedances, the aggressive nature of the testing procedures and low permeability identified during the soil infiltration testing the recorded concentrations are not considered to pose a significant risk to controlled waters.

16.1.2 Asbestos

Asbestos containing materials have not been identified on the site or during subsequent laboratory testing.

16.1.3 Ground Gas

Ground gas monitoring has identified low concentrations of ground gases in the sub surface such that the site has been classified as Characteristic Situation 1 (Very Low Risk), therefore no ground gas protection measures are deemed necessary within the proposed development.

16.1.4 Waste

An initial waste assessment has been undertaken on the five samples obtained during the ground investigation. The results indicated that the majority of samples have been classified as non-hazardous. However, two samples obtained from TP01 and TP05 were initially classified as hazardous due the presence of flammable liquids. After a review of the exploratory hole logs this hazardous property has been removed from all the samples where it was identified by the software as there was no visual or olfactory evidence of flammable liquids such as hydrocarbons observed during the ground investigation therefore all samples have been classified as non-hazardous. This assessment is intended to provide an indicative assessment only. If materials are designated for off-site disposal during the development phase it is recommended that additional testing of the materials/area requiring disposal is undertaken to include WAC testing to identify a suitable receiving landfill facility.

16.2 GEOTECHNICAL

Traditional shallow foundations (pad or strip) placed within the natural fine or coarse grained Glacial Till deposits may be designed to an allowable net bearing capacity of 120kPa which will result in settlement of no more than 25mm for foundations of no more than 0.70m wide. Foundations excavations through the made ground are likely to be unstable and require shoring.

Given the presence of a significant thickness of variable made ground across the site, the use of suspended floor slabs is recommended.

For buried concrete the Design Sulphate Class for the site can be taken as DS-2 and the Aggressive Chemical Environment for Concrete (ACEC) site classification can be taken as AC-2.

Dewatering of temporary excavations may not be required but should be anticipated during winter months.

A conservative CBR value of 5% is recommended for preliminary pavement design.

16.3 SOIL INFILTRATION TESTING

Soil infiltration testing was undertaken in 2no. locations on site, within the Glacial Till deposits. Neither of the tests results in a fall to the 25% effective depth over the testing period (one day). It is therefore not considered suitable for the site to be serviced by soakaway type drainage.

16.4 RECOMMENDATIONS

Based on the findings of the ground investigation, the following recommendations are outlined:

- A Reactive Strategy should be developed for the site to outline the requirements for identification, assessment and management of any areas of previously unidentified contamination encountered during the development phase;
- Movement of materials on the site should be undertaken in conjunction with a Materials Management Plan in line with the recommendations in the CL:AIRE Code of Practice to confirm any materials utilised on site are geotechnically and chemically suitable for re-use and to ensure all materials leaving site are disposed of at a suitable waste disposal facility;
- It remains the responsibility of the contractor as waste producer to classify any waste materials and identify a suitable off site disposal facility.

16.4.1 Potential Constraints

A number of subsurface obstructions were encountered during the ground investigation thought to related to the previous land use as residential flats or the raised embankment on the southern site boundary to provide road access of the railway line. Considerable breaking out of these obstructions cannot be discounted during the construction phase to allow for the construction of new foundations or grubbing out for new areas of hardstanding and associated access.

17.0 NOTES

1. Standards

All boring operations, sampling of soils, *in situ* testing and geotechnical laboratory testing have been carried out in accordance with the recommendations of the British Standards BS 5930(2015)⁽¹⁾, BS 1377 (1990)⁽²⁾ and BS10175 (2001)⁽³⁾.

Soil and rock descriptions follow the recommendations of BS 593. Where descriptions or classifications are based on other documents (e.g. BS 8004 (1986) or CIRIA Project Report 11 (1993)), this is stated in the report text.

2. Site methods

Unless specifically stated otherwise, the following methods are used for exploratory holes.

- Holes described as cable percussive are bored using a light cable percussive rig. Standard penetration tests are carried out where appropriate, as shown in the logs. Disturbed and undisturbed samples are taken from the exploratory holes at the depths on the records.
- Window sampling generally uses the windowless sampling method, using a tracked Geotool.
- Dynamic probes are usually heavy dynamic probes, using the same tracked Geotool used for window sampling.

3. Definitions and abbreviations

The following terms are used in the exploratory hole logs

Samples

U	Undisturbed 102mm dia. sample
TW	Thin Walled undisturbed 102mm dia. sample
B	Bulk sample
D	Small disturbed sample
W	Water sample
CBR	California Bearing Ratio test or CBR value obtained from Mexiprobe test

In situ tests

S	Standard penetration test (SPT)
N	SPT N value (blows/300mm)
HP	Hand penetrometer – shear strength
SV	Hand shear vane – shear strength
VOC	Volatile organic compounds (ppm)
PID	Photo-ionisation detector – used to detect the presence of VOCs.

Core recovery and rock quality

TCR	Total core recovery (%)
SCR	Solid core recovery (%)
RQD	Rock quality designation (%)
FI	Fracture index
NR	No recovery
NI	Not intact

Rotary drilling sizes

Index letter	Nominal diameter (mm)	
	Borehole	Core
N	75	54
H	99	76
P	120	92
S	146	113

Water strikes

▽	Level of water strike
▼	Water level rose to this level (see Remarks at foot of log for details)

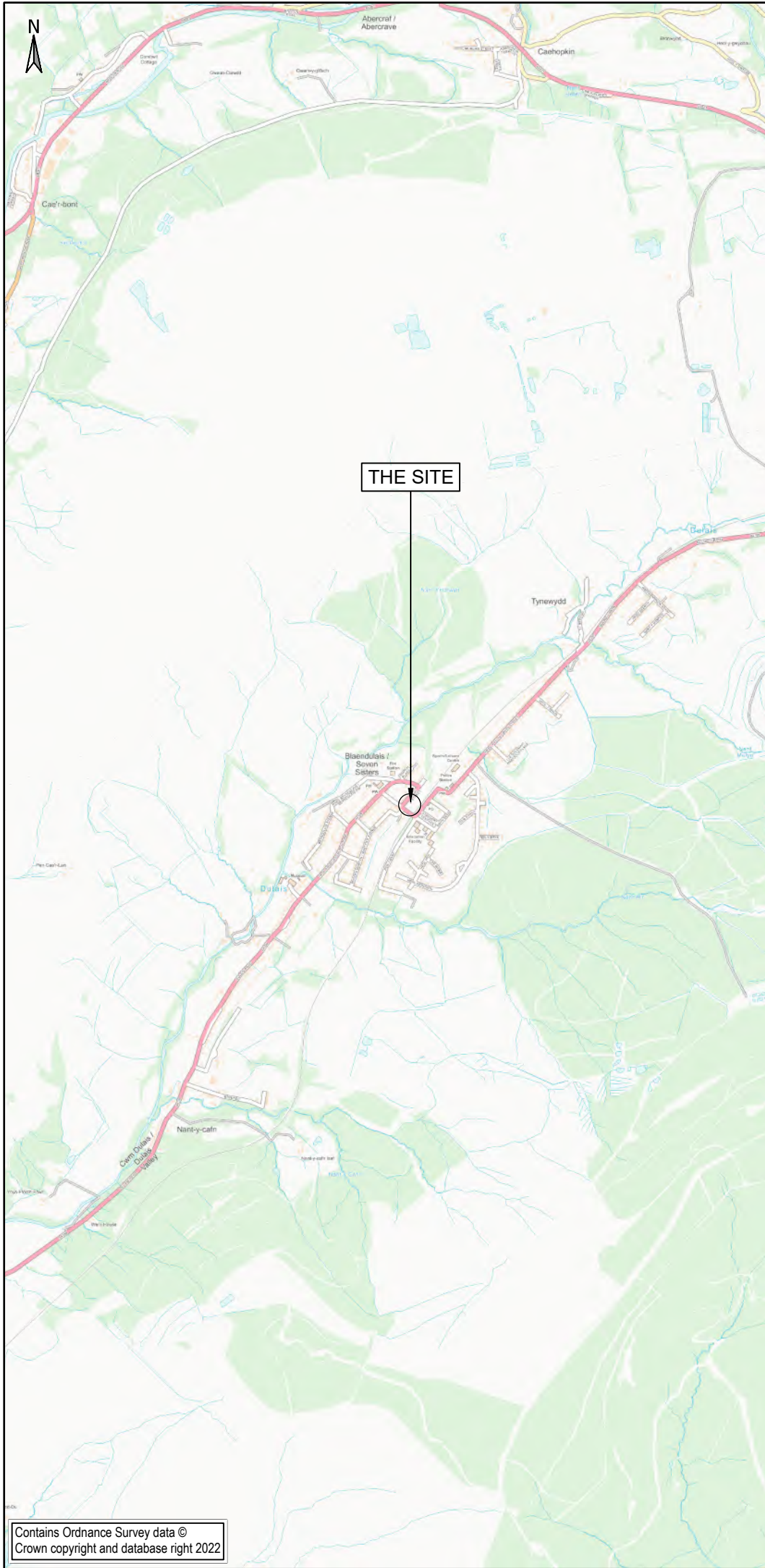
Depth means depth below existing ground level unless otherwise specified. Values specified in soil descriptions given in the exploratory hole logs are depths unless otherwise specified.

18.0 REFERENCES

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FIGURES

Figure 1- Site Location Plan



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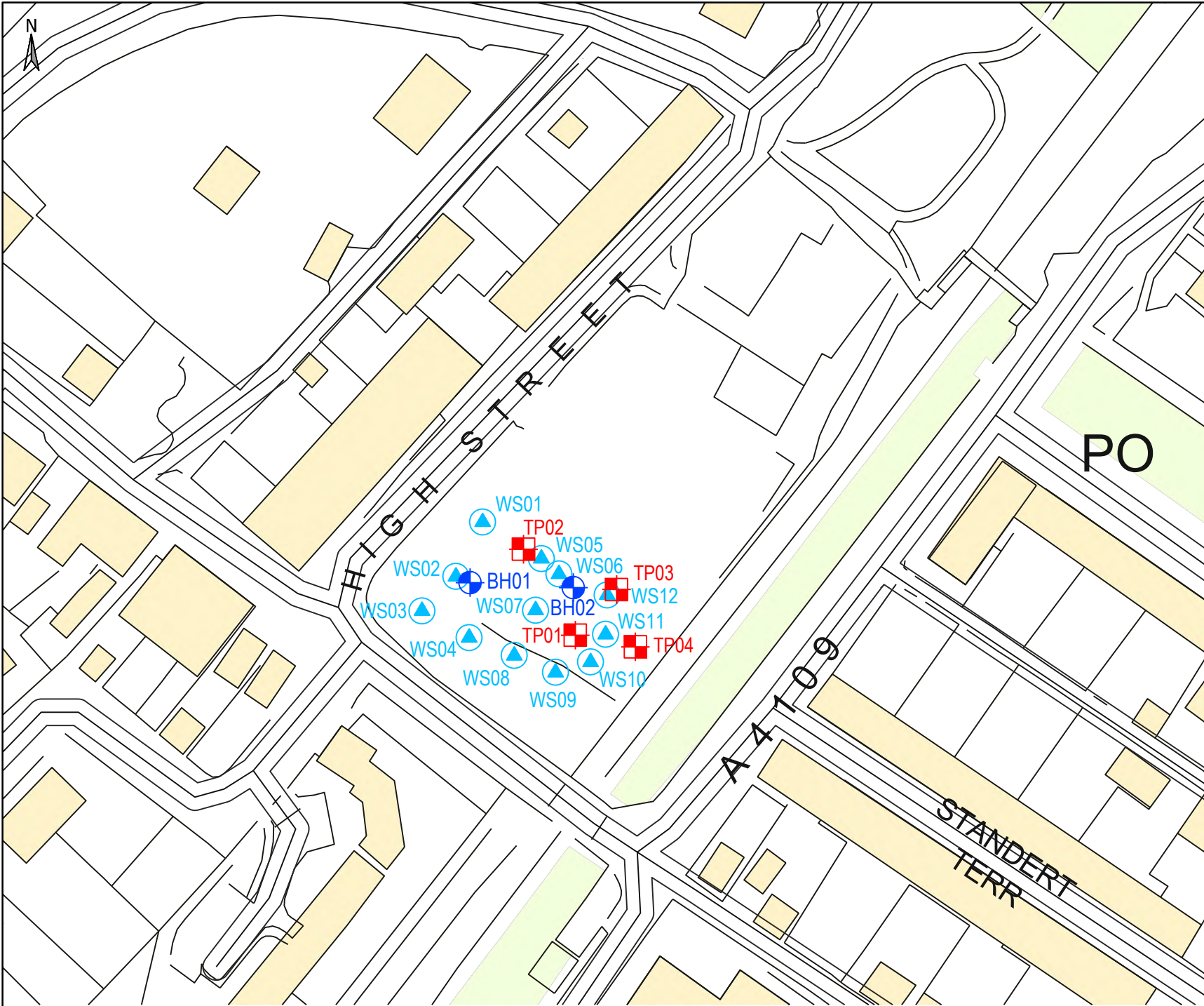
Client
NEATH PORT TALBOT COUNCIL

Project Name
BLAENDULAIS

Sheet Title
SITE LOCATION PLAN

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A4	Suitability
784-B035256	PP	08.06.22	GL	08.06.22	NEB	08.06.22	1:25,000	S0
Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision	
B035256	- TTE	- 00	- XX	- DR	- U	- 0001	P01	

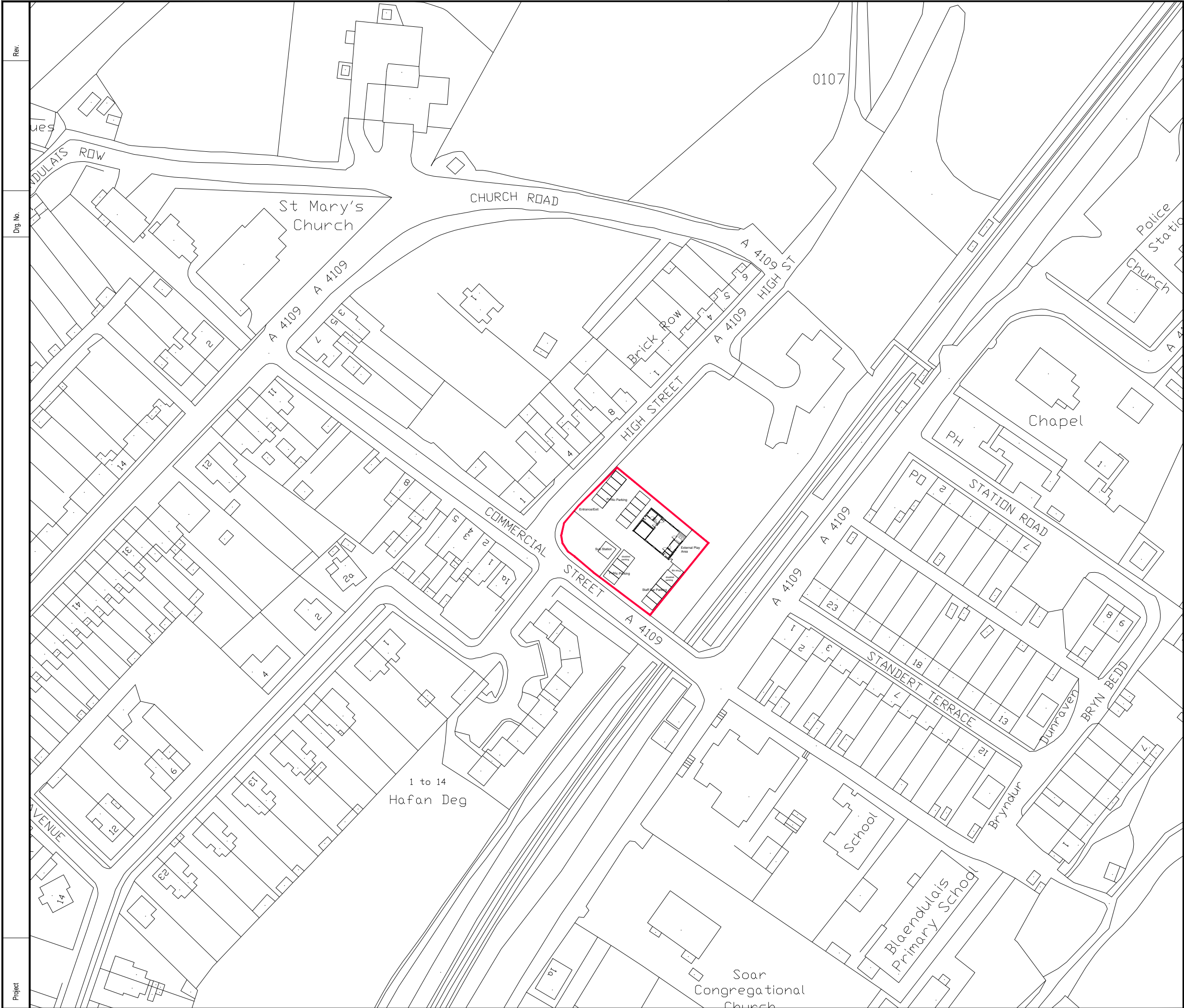
Figure 2 – Site Investigation Layout Plan



- LEGEND:
- TRIAL PIT
 - BOREHOLE
 - WINDOW SAMPLE

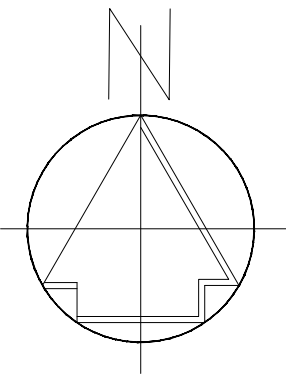
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SITE INVESTIGATION LAYOUT PLAN									
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Client Project Number	Originator	Volume/System		Level/Location	Type/Code	Role	Number	Revision	
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Figure 3 – Proposed Development Plan



NOTES

1. All dimensions in millimetres unless otherwise stated.



Rev	Details	Dr	Ch	Apr	Date



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County Borough Council Cyngor Bwrdeistref Sirol
Making a difference Gwahaniaeth er gwell

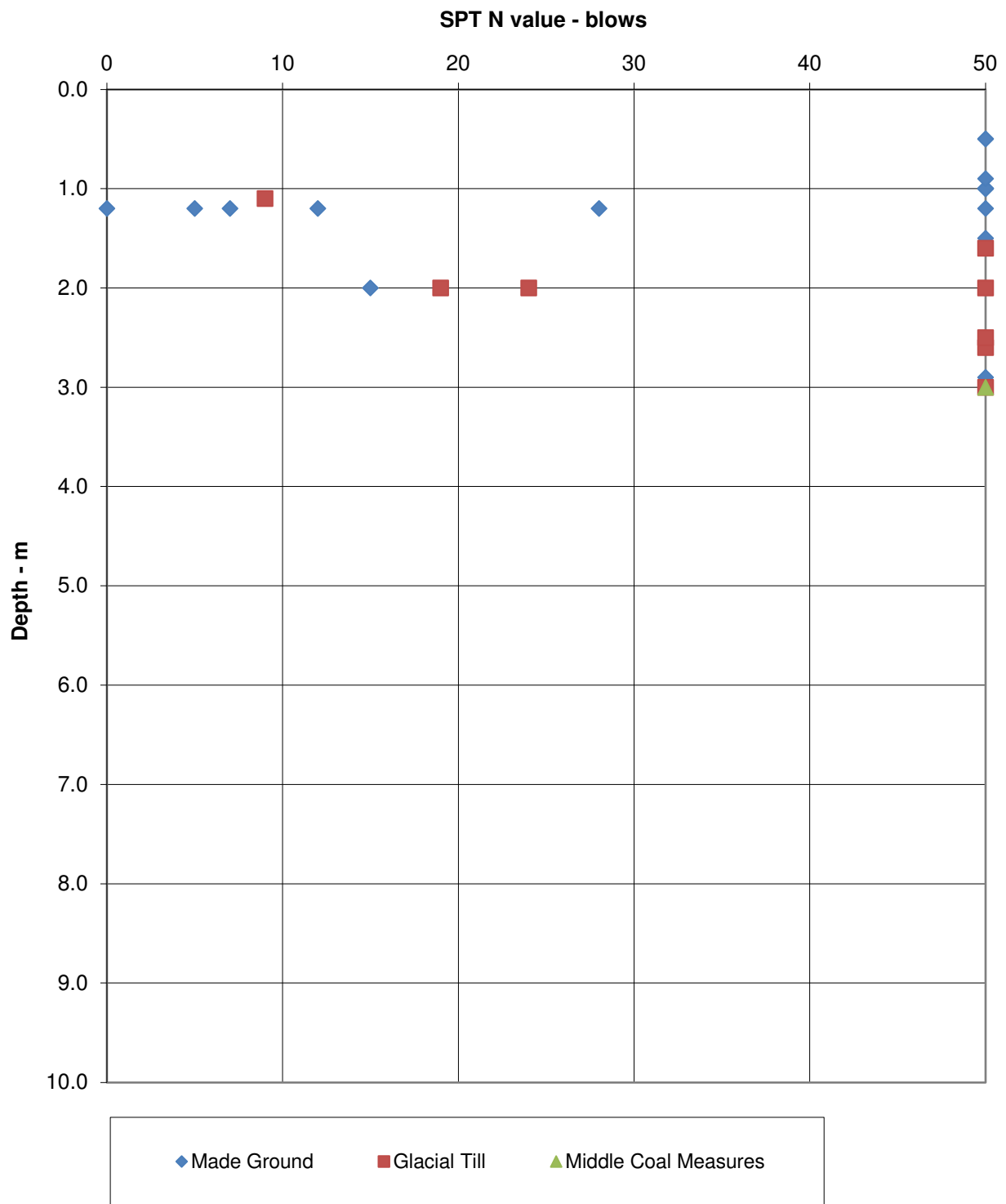
PROPERTY & REGENERATION
Nicola Pearce BSc(Hons) DipTP MRTPI
DIRECTOR OF ENVIRONMENT AND REGENERATION
THE QUAYS, BRUNEL WAY
BAGLAN ENERGY PARK SA11 2GG
www.npt.gov.uk

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Childcare Grants
Blaendulais

Drawing Title
Location Plan

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<u>Drawn</u>		<u>Checked</u>		<u>Approved</u>	
<u>Date</u>		<u>Date</u>		<u>Date</u>	
<u>Scales</u>	1:1250				
<u>Drawing No.</u>					<u>Rev.</u>

Figure 4 – SPT-N vs Depth Plot



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NPTCBC

Drawing Title

SPT vs Depth Plot

Drawing No.

FIGURE 4

PLATES



Plate 1

BH01 - 0.00mbgl - 0.40mbgl



Plate 2

BH01 - 0.00mbgl - 0.40mbgl

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Plate 3

BH01 - 1.20mbgl - 2.50mbgl

Plate 4

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Plate 1

BH02 - 0.00mbgl - 0.30mbgl (concrete slab obstruction)



Plate 2

BH02 - 0.00mbgl - 0.30mbgl (concrete slab obstruction)

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Plate 3

BH02 - 0.00mbgl - 0.30mbgl (concrete slab obstruction)

Plate 4

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Plate 1

TP01 - 0.00mbgl - 1.50mbgl



Plate 2

TP01 - 0.00mbgl - 1.50mbgl

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Plate 3

TP01 - 0.00mbgl - 1.50mbgl



Plate 4

TP01 - 0.00mbgl - 1.50mbgl

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Plate 5

TP01 - 0.00mbgl - 1.50mbgl



Plate 6

TP01 - 0.00mbgl - 1.50mbgl

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Plate 1

TP02 - 0.00mbgl - 0.70mbgl



Plate 2

TP02 - 0.00mbgl - 0.70mbgl

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Plate 3

TP02 - 0.00mbgl - 0.70mbgl



Plate 4

TP02 - 0.00mbgl - 0.70mbgl

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Plate 1

TP03 - 0.00mbgl - 1.40mbgl



Plate 2

TP03 - 0.00mbgl - 1.40mbgl

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Plate 3

TP03 - 0.00mbgl - 1.40mbgl



Plate 4

TP03 - 0.00mbgl - 1.40mbgl

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Plate 1

TP04 - 0.00mbgl - 1.40mbgl



Plate 2

TP04 - 0.00mbgl - 1.40mbgl

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Plate 3

TP04 - 0.00mbgl - 1.40mbgl



Plate 4

TP04 - 0.00mbgl - 1.40mbgl

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Plate 1

WS01 - 0.00mbgl - 0.40mbgl



Plate 2

WS01 - 0.00 - 0.40mbgl

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Plate 3

WS01 - 0.00mbgl - 0.40mbgl



Plate 4

WS01 - 1.10mbgl - 1.60mbgl

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Plate 1

WS02 - 0.00 -1.20mbgl



Plate 2

WS02 - 0.00 -1.20mbgl

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Plate 3

WS02 - 0.00 - 1.20mbgl



Plate 4

WS02 - 1.20 - 1.70mbgl

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Plate 5

WS02 - 1.70 - 2.20mbgl



Plate 6

WS02 - 2.20 - 2.90mbgl

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Plate 1

WS03 - 0.00mbgl - 1.00mbgl



Plate 2

WS03 - 0.00mbgl - 1.00mbgl

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Plate 1

WS04 - 1.20mbgl - 2.00mbgl



Plate 2

WS04 - 2.00mbgl - 2.60mbgl

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Plate 1

WS05 - 0.00mbgl - 1.00mbgl



Plate 2

WS05 - 0.00mbgl - 1.00mbgl

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Plate 3

WS05 - 0.00mbgl - 1.00mbgl

Plate 4

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Plate 1

WS06 - 0.00mbgl - 0.55mbgl



Plate 2

WS06 - 0.00mbgl - 0.55mbgl

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Plate 3

WS06 - 0.00mbgl - 0.55mbgl



Plate 4

WS06 - 0.00mbgl - 0.55mbgl

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Plate 1

WS07 - 0.00mbgl - 1.00mbgl



Plate 2

WS07 - 0.00mbgl - 1.00mbgl

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Plate 1

WS08 - 0.00mbgl - 1.00mbgl



Plate 2

WS08 - 0.00mbgl - 1.00mbgl

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Plate 3

WS08 - 1.20mbgl - 2.00mbgl



Plate 4

WS08 - 2.00mbgl - 2.90mbgl

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Plate 1

WS09 - 0.00mbgl - 1.00mbgl



Plate 2

WS09 - 0.00mbgl - 1.00mbgl

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Plate 3

WS09 - 0.00mbgl - 1.00mbgl

Plate 4

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Plate 1

WS10 - 0.00mbgl - 0.50mbgl



Plate 2

WS10 - 0.00mbgl - 0.50mbgl

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Plate 3

WS10 - 0.00mbgl - 0.50mbgl

Plate 4

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Plate 1

WS11 - 0.00mbgl - 1.10mbgl



Plate 2

WS11 - 0.00mbgl - 1.10mbgl

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Plate 1

WS12 - 0.00mbgl - 0.90mbgl



Plate 2

WS12- 0.00mbgl - 0.90mbgl

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Plate 3

WS12 - 0.00mbgl - 0.90mbgl

Plate 4

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Project No.:

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APPENDICES

APPENDIX A – REPORT CONDITIONS

APPENDIX A - REPORT CONDITIONS

GROUND INVESTIGATION

This report is produced solely for the benefit of Neath Port Talbot Council and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

This report is based on a visual site inspection, reference to accessible referenced historical records, information supplied by those parties referenced in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research. Where ground contamination is suspected but no physical site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to activities related to the site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, perhaps in higher concentrations, elsewhere on the site cannot be discounted.

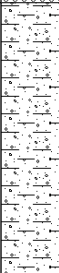
Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question as such bodies often have unpublished, more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Tetra Tech. In time improved practices or amended legislation may necessitate a re-assessment.

The assessment of ground conditions within this report is based upon the findings of the study undertaken. We have interpreted the ground conditions in between locations on the assumption that conditions do not vary significantly. However, no investigation can inspect each and every part of the site and therefore changes or variances in the physical and chemical site conditions as described in this report cannot be discounted.

The report is limited to those aspects of land contamination specifically reported on and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contamination (past or present) exists further extensive research will be required before the effects can be better determined.

APPENDIX B – EXPLORATORY HOLE LOGS

 Project: Blaendulais Location: Seven Sisters Client: Neath Port Talbot County Borough Council						Location Details Easting: 281931.88 Northing: 208920.45 Level: 186.72mAOD Depth: 30.00m Logger: Gabriel Lloyd Type: WS+RO Inclination: °					Status FINAL		Borehole Number BH01									
											Sheet 3 of 3											
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50								
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: NEB								
0.00 3.50	3.50 30.00	Window Sampler Rotary Open Hole	Klemm Klemm	Apex Drilling Services Apex Drilling Services	1.20 30.00	300 96	4.00	100						Approved By: CBP								
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring										
Dark brown medium hard to hard sandstone, mudstone and siltstone. (SOUTH WALES MIDDLE COAL MEASURES FORMATION)												Depth (m)	Ref	Tests / Results								
							EOH at 30.00m - Reached Required Depth.								30.00	156.72						
							Observations / Remarks 1. Dynamic sampling to 3.50mbgl, with limited recovery due to the large cobbles and boulders. 2. Rotary open holed from 3.50mbgl to 30.00mbgl. 3. Ground water encountered at 3.40mbgl. 4. Standpipe installed. 5. *Based on drillers description and limited returns.										Flushing					Hammer Information
From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %																
					T44																	
Groundwater										Project Number												
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks																	
						784-B035256																

Tt TETRA TECH Project: Blaendulais Location: Seven Sisters Client: Neath Port Talbot County Borough Council		Location Details				Status		Borehole Number									
		Easting: 281951.37 Northing: 298919.51 Level: 186.72mAOD Depth: 30.00m Logger: Gabriel Lloyd Type: WS+RO Inclination: °				FINAL		BH02									
								Sheet 1 of 3									
Method, Plant and Crew						Diameter		Casing				Groundwater				Scale: 1:50	
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)	Remarks	Checked By:	NEB	
0.00 3.50	3.50 30.00	Window Sampler Rotary Open Hole	Klemm Klemm	Apex Drilling Services Apex Drilling Services	1.20 3.00	300 96	3.00	100	5.00 8.50	- -	- -	0.00 0.00	0 0		Approved By:	CBP	
Strata Description						Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing				Finish Date:	18/05/2022	
											Depth (m)	Ref	Tests / Results				
Grass over, grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular of sandstone, mudstone, brick, metal and concrete. (MADE GROUND) MGR <i>Hard concrete at 0.40 to 0.60m bgl.</i>							1.70	185.02				1.30 1.30 - 2.50	ES1 B1	SPT(C) 1.20m, N=50 (25 for 55mm/50 for 20mm)		1	
Orangish grey brown clayey gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse of subangular to subrounded of sandstone, siltstone and mudstone. TILL							3.50	183.22						SPT(C) 2.00m, N=50 (25 for 30mm/50 for 20mm)		2	
Dark brown medium hard to hard inter bedded mudstone, sandstone and siltstone. (SOUTH WALES MIDDLE COAL MEASURES FORMATION) <																	

[illegible]

[illegible]

	Project: Blaendulais		Location Details				Status		Pit Number		
	Location: Seven Sisters		Easting: 281941.96 Northing: 208926.75				FINAL		TP02		
	Client: Neath Port Talbot County Borough Council		Level: 186.77mAOD Depth: 0.70m Logger: Gabriel Lloyd Type: TP								
			Groundwater				Scale: 1:25				
Hole Information							Checked By: NEB				
Pit Dimensions		Orientation: °	Strike (m)	Rose To (m)	After (mins)	Remarks	Approved By: CBP				
0.50m 1.40m		Shoring: None Stability: Stable Plant: JCB 3CX					Start Date: 16/05/2022 Finish Date: 16/05/2022				
Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing			
Dark greyish brown, sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular of brick, concrete, sandstone, mudstone and building material. (MADE GROUND) MGR				0.70	186.07			Depth (m)	Ref	Tests / Results	
								0.30 - 0.70	B1		
EOH at 0.70m - Encountered Hard Strata.							0.50	ES1			
										1	
										2	
										3	
										4	
										5	
Observations / Remarks								Longcross Court, Cardiff, CF24 0AD 029 2082 9200			
1. Refusal at 0.70mbgl due to hard strata. 2. No water encountered. Backfilled with arisings.								Project Number 784-B035256			

[illegible]

[illegible]

 3 U R W H B laendulais / R A D R Q Seven Sisters & O M H Q Neath Port Talbot County Borough Council				/ R A D R Q W H L O V (D V W L Q J , " ~ 1 R U W K L Q J , " ~ / H Y H O , " ~ " P \$ 2 ' ' H S W K , " ~ P / R J J H U , " D E U L H O / D A S H G : 6 " , Q F O L Q D W L R Q , " ~				6 W A X V) , 1 \$ /		% R U H K R O H 1 X P E H WS01 6 K H W H R I	
0 H M R G W D Q Q & U H Z ' L D P M U				& D V L Q J ' U R X Q W Z D				6 F D O H , " ~ & K H F N H G % \ , 1 (% \$ S S U R Y H G % \ , & % 3 6 W D U W ' D W H , " ~) L Q L V K ' D W H , " ~			
J U R P P T R P		7 I S H , Q V S H F W L R Q ' \ Q D P L F : L Q G R Z O H		3 O D Q W 8 V M G & U H Z 3 L W D Q G G L J J L Q V V L V L Q P S D 6 Q P S		5 R R W 6 V D O H V * U O O R K W K J : D O H V * U		' H S K P ' L D P P P ' H S K P ' L D P P P 6 W L R P H E D V L Q J S H O H S R V H 7 R L P H P L Q V 5 H P D U N V			
6 W W D ' H V A U R L Q S * U D V R Y D H N E U R Z Q L V R G J U H O V \ & / \$ < 0 H G L X M Q F B E E Q L V F V R E B V H D Y H U O L V R I E Q V H Q J B U R V D E J B D R I E U L F M E U R W F U H S O W F W D D Q G J O D V V & R E E O H M D Q S J X O S 2 8 R I F R Q F U H 0 * 5				/ H J H O G H S W K S H G X F H G P H Y H O P S 2 ' ' H Y H O		S H G X F H G P H Y H O P S 2 ' ' H Y H O D W H U , Q V W P D F N I L Q R		6 D P S O H V D Q G 7 H V W L Q J H S W K P 5 H I 7 H V W V 5 H V X O W V			
) L U P W R H G D R W V K E U R Z Q L V R G J U H O V \ & / \$ < 0 H G L X M Q F B E E Q L V F * U D Y H O L V V R E V X E U X R D Q G H M Q R H I D Q Q A R X G V * / \$ & , \$ / 7 , / / 7 , / /				% (6 % (6		637 6 P 1 637 6 ~ P ~ ~ I R U P P					
EOH at 1.60m - Refused on hard strata.											
2 E V H W R Q V 5 H P D U N V 5 H I X W D O D E J O V E X H W W V 1 R M Z D H Q V R X I C % D F W I D W O M I G Q 2 M				6 D P S O L Q J 5 X Q V ' U R P P T R P ' L D P P H F R Y H U I 5 H P D U N V ' \$ 5 7 ~ ~				+ D P P H U , Q W R R O P D 6 H M L I R (Q H U J W S R 3 U R W H M P E H U 784-B035256			

[illegible]

[illegible]

 Project: Blaendulais Location: Seven Sisters Client: Neath Port Talbot County Borough Council					Location Details Easting: 281931.70 Northing: 208910.08 Level: 187.63mAOD Depth: 2.60m Logger: Gabriel Iloyd +Gabriel Iloud Type: WS Inclination: °					Status FINAL		Borehole Number WS04				
										Sheet 1 of 1						
Method, Plant and Crew					Diameter		Casing		Groundwater					Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)	Remarks	Checked By: NEB	
0.00	1.20	Inspection Pit	Window Samplr Rig	South Wales Ground Testing	1.20	300									Approved By: CBP	
1.20	2.60	Dynamic Windowless Sampling	Window Smaplr Rig	South Wales Ground Testing	2.00	90									Start Date: 19/05/2022	
					2.60	80									Finish Date: 19/05/2022	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing				
Stiff dark greyish brown, silty very sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub angular of brick, concrete, sandstone and mud stone. (MADE GROUND) MGR												Depth (m)	Ref	Tests / Results		
Medium dense becoming dense orangish brown, clayey sandy GRAVEL. Sand is fine to coarse. Gravel is angular to sub rounded of sandstone, siltstone and rare mudstone. (GLACIAL TILL) TILL								1.60	186.03			0.10 - 0.50	B1	SPT(S) 1.20m, N=12 (4,2/3,3,3,3)	1	
												0.30	ES1			
EOH at 2.60m - Refused on Hard Strata.								2.60	185.03			1.60	ES2	SPT(S) 2.00m, N=24 (6,7/6,5,6,7)	2	
												1.60 - 2.60	B2			
														SPT(S) 2.60m, 50 (18,19/50 for 170mm)	3	
															4	
															5	
															6	
															7	
															8	
															9	
															10	
Observations / Remarks 1. Concrete obstruction located in initial hand pit at 0.20m bgl. Hole relocated closer to highway on southern boundary. 2. Refusal at 2.60mbgl due to hard strata. 3. No water encountered. Backfilled with arisings.										Sampling Runs					Hammer Information	
					From (m)	To (m)	Diam (mm)	Recovery %	Remarks	Serial No.	Energy Ratio %					
					1.20	2.00	90	90		DART346	68					
					2.00	2.60	80	100		Project Number						
												784-B035256				

[illegible]

 Project: Blaendulais Location: Seven Sisters Client: Neath Port Talbot County Borough Council										Location Details Easting: 281944.24 Northing: 208915.24 Level: 186.74mAOD Depth: 1.00m Logger: Gabriel Lloyd Type: WS Inclination: °							Status FINAL		Borehole Number WS07	
										Sheet 1 of 1										
Method, Plant and Crew						Diameter		Casing		Groundwater						Scale: 1:50				
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)	Remarks	Checked By: NEB					
0.00	1.00	Inspection Pit	Window Sample Rig	South Wales Ground Testing	1.00	300									Approved By: CBP					
															Start Date: 18/05/2022					
															Finish Date: 18/05/2022					
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing								
												Depth (m)	Ref	Tests / Results						
Grass over dark grey sandy GRAVEL & COBBLES of subangular to angular sandstone, mudstone, concrete and brick. (MADE GROUND) MGR												0.00 - 0.70	B1	SPT(S) 1.00m, 50 (18,24/50 for 70mm)						
												0.50	ES1							
EOH at 1.00m - Refused on Hard strata.								1.00	185.74							1				
																2				
																3				
																4				
																5				
																6				
																7				
																8				
																9				
																10				
Observations / Remarks										Sampling Runs					Hammer Information					
1. Refusal at 0.60mbgl due to hard strata. 2. No water encountered. Backfilled with arisings.										From (m)	To (m)	Diam (mm)	Recovery %	Remarks	Serial No.	Energy Ratio %				
															DART346	68				
															Project Number					
					784-B035256															

[illegible]

Tt TETRA TECH Project: Blaendulais Location: Seven Sisters Client: Neath Port Talbot County Borough Council						Location Details Easting: 281957.48 Level: 186.72mAOD Logger: Gabriel Lloyd Northing: 208910.69 Depth: 1.10m Type: WS Inclination: °						Status FINAL		Borehole Number WS11		
										Sheet 1 of 1						
Method, Plant and Crew					Diameter		Casing		Groundwater					Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)	Remarks	Checked By: NEB	
0.00	1.10	Inspection Pit	Hand Digging Tools	South Wales Ground Testing	1.00 1.10	300 90									Approved By: CBP	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing				
Grass over, sandy gravelly CLAY. Sand is fine to coarse. Garvel is angular to subangular of sandstone, concrete, brick and colliery spoil. (MADE GROUND) MGR								1.10	185.62			Depth (m)	Ref	Tests / Results		
												0.10 - 0.30	B1	SPT(S) 1.00m, 50 (15,22/50 for 85mm)		
EOH at 1.10m - Refused on Hard Strata.								1.10	185.62			0.30	ES1			
															1	
															2	
															3	
															4	
															5	
															6	
															7	
															8	
															9	
															10	
Observations / Remarks										Sampling Runs				Hammer Information		
1. Refusal at 1.10mbgl due to hard strata. 2. No water encountered. Backfilled with arisings.										From (m)	To (m)	Diam (mm)	Recovery %	Remarks	Serial No.	Energy Ratio %
															DART346	68
															Project Number	
										784-B035256						

APPENDIX C – TRL PROBE TEST RESULTS

Tetra Tech Environment



5th Floor, Longcross Court, 47 Newport Road, Cardiff
Tel: 02920 829200
Fax: 02920 455321
Environmental Consultancy
Ground Engineering Services

PROJECT No.: B035256

PROJECT NAME: Blaendulais

CLIENT: Neath Port Talbot Council

FIGURE No.: TRL01 / WS06

DCP-CBR Corellation

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$$

DCP -Modulus E Corellation

$$E = 17.6 (\text{CBR})^{0.64} \text{ MPa}$$

In situ CBR by TRL Probe

Reference: TRL01

Position: 1

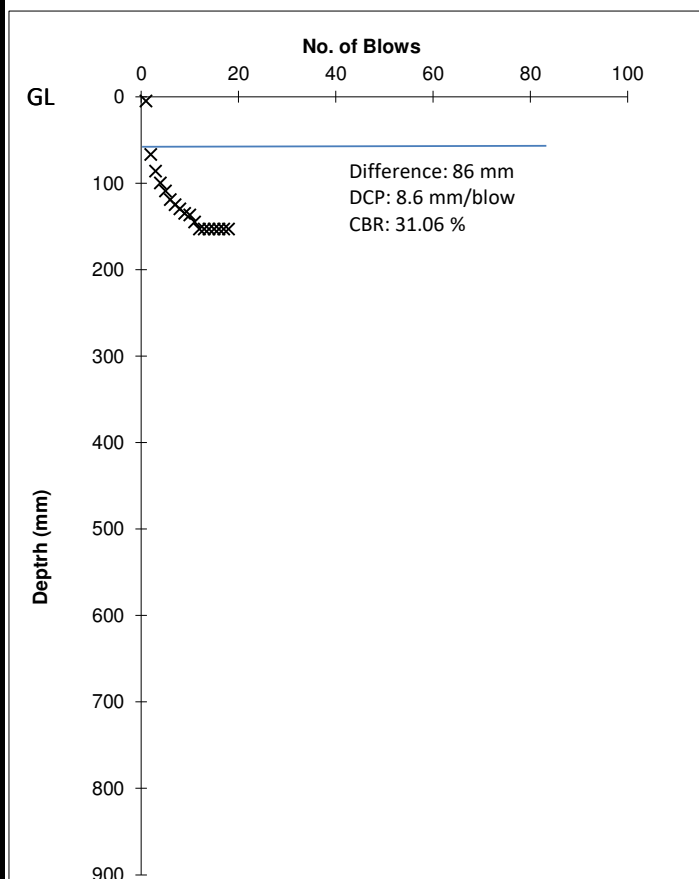
Date: 19th May 2022

mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
5	1	60	5				
62	2	122	67				
19	3	141	86				
14	4	155	100				
9	5	164	109				
10	6	174	119				
6	7	180	125				
5	8	185	130				
5	18	190	135				
2	19	192	137				
8	39	200	145				
8	59	208	153				
	60	208	153				
	70	208	153				
	71	208	153				
	81	208	153				
	82	208	153				
	83	208	153				
-208	93	0	-55				
	20		-55				
	21		-55				
	22		-55				
	23		-55				
	24		-55				
	25		-55				
	26		-55				
	27		-55				
	28		-55				

Test started at: 0 m below ground level

Zero Reading: 55 mm

Zero reading = start depth below ground surface



Data compiled by: CS
Data checked by: NEB

5th Floor, Longcross Court, 47 Newport Road, Cardiff

Tel: 02920 829200

Fax: 02920 455321

Environmental Consultancy

Ground Engineering Services

PROJECT No.: B035256

PROJECT NAME: Blaendulais

CLIENT: Neath Port Talbot Council

FIGURE No.: TRL02 / WS01

DCP-CBR Corellation

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10} (\text{mm/blow})$$

DCP -Modulus E Corellation

$$E = 17.6 (\text{CBR})^{0.64} \text{ MPa}$$

In situ CBR by TRL Probe

Reference: TRL02 / WS01

Position: 1

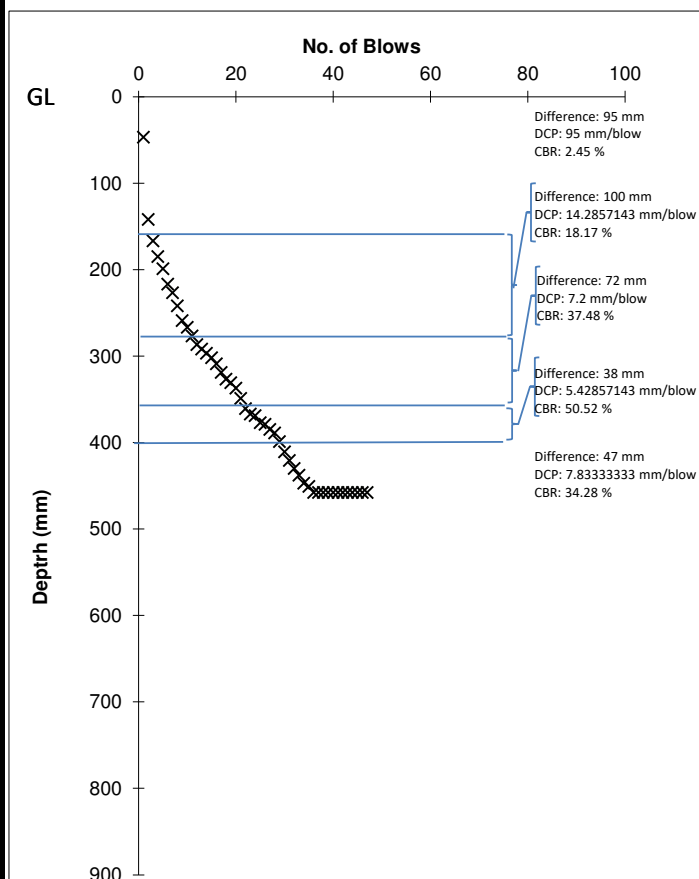
Date: 19th May 2022

mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
47	1	90	47				
95	2	185	142				
25	3	210	167				
18	4	228	185				
14	5	242	199				
18	6	260	217				
10	7	270	227				
15	8	285	242				
17	18	302	259				
8	19	310	267				
10	39	320	277				
10	59	330	287				
5	60	335	292				
5	70	340	297				
5	71	345	302				
7	81	352	309				
10	82	362	319				
8	83	370	327				
4	93	374	331				
6	20	380	337				
12	21	392	349				
12	22	404	361				
6	23	410	367				
2	24	412	369				
8	25	420	377				
2	26	422	379				
6	27	428	385				
4	28	432	389				
10		442					
12		454					
10		464					
9		473					
8		481					
9		490					
4		494					
7		501					
		501					
		501					
		501					
		501					
		501					
		501					
		501					
		501					
-501		501					

Test started at: 0 m below ground level

Zero Reading: 43 mm

Zero reading = start depth below ground surface



Data compiled by: CS
Data checked by: NEB

Tetra Tech Environment



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Ground Engineering Services

PROJECT No.: B035256
PROJECT NAME: Blaendulais
CLIENT: Neath Port Talbot Council
FIGURE No.: TRL03 / WS11

DCP-CBR Corellation

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10} (\text{mm/blow})$$

DCP -Modulus E Corellation

$$E = 17.6 (\text{CBR})^{0.64} \text{ MPa}$$

In situ CBR by TRL Probe

Reference: TRL03

Position: 1

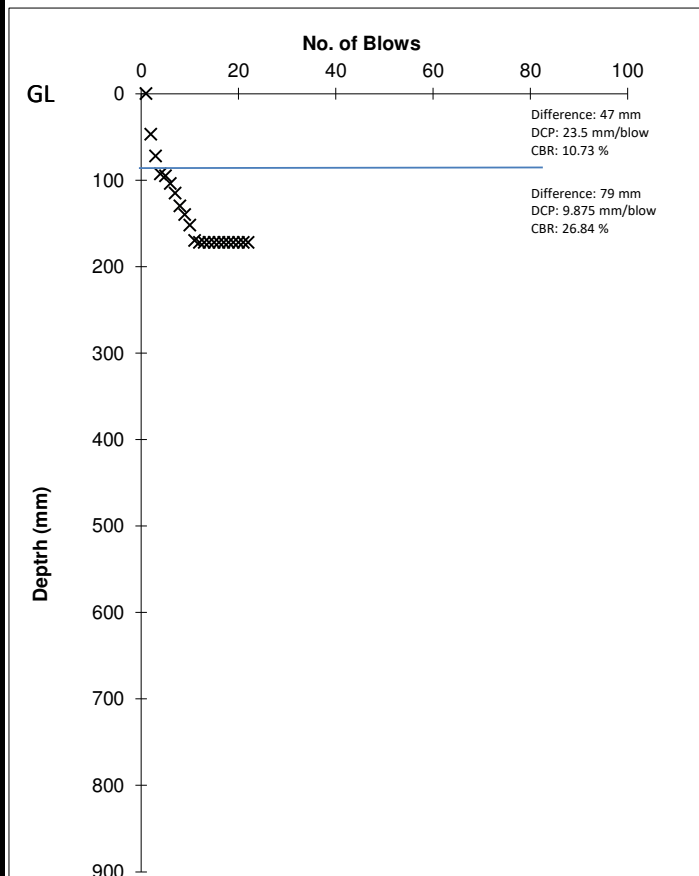
Date: 19th May 2022

mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
47	1	50					
25	2	97	47				
21	3	122	72				
2	4	143	93				
9	5	145	95				
11	6	154	104				
15	7	165	115				
10	8	180	130				
12	18	190	140				
18	19	202	152				
2	39	220	170				
	59	222	172				
	60	222	172				
	70	222	172				
	71	222	172				
	81	222	172				
	82	222	172				
	83	222	172				
	93	222	172				
	20	222	172				
	21	222	172				
	22	222	172				
-222	23		-50				
	24		-50				
	25		-50				
	26		-50				
	27		-50				
	28		-50				

Test started at: 0 m below ground level

Zero Reading: 50 mm

Zero reading = start depth below ground surface



Data compiled by: GL
Data checked by: NEB

Tetra Tech Environment



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Environmental Consultancy
Ground Engineering Services

PROJECT No.: B035256

PROJECT NAME: Blaendulais

CLIENT: Neath Port Talbot Council

FIGURE No.: TRL04 / WS07

DCP-CBR Corellation

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10} (\text{mm/blow})$$

DCP -Modulus E Corellation

$$E = 17.6 (\text{CBR})^{0.64} \text{ MPa}$$

In situ CBR by TRL Probe

Reference: TRL04

Position: 1

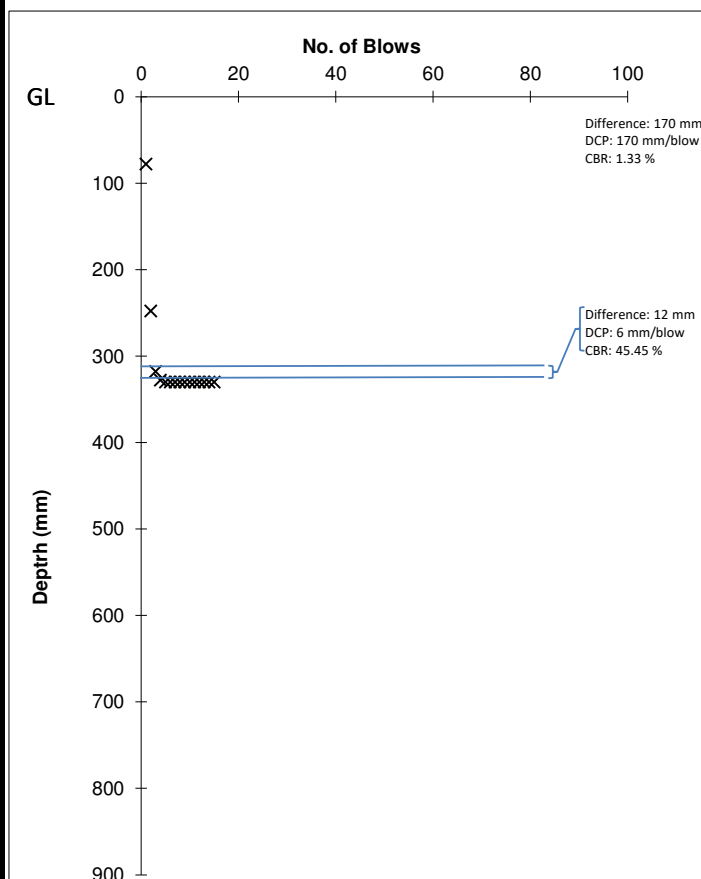
Date: 19th May 2022

mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
78	1	110	78				
170	2	280	248				
70	3	350	318				
10	4	360	328				
2	5	362	330				
	6	362	330				
	7	362	330				
	8	362	330				
	18	362	330				
	19	362	330				
	39	362	330				
	59	362	330				
	60	362	330				
	70	362	330				
	71	362	330				
-362	81		-32				
	82		-32				
	83		-32				
	93	0	-32				
	20		-32				
	21		-32				
	22		-32				
	23		-32				
	24		-32				
	25		-32				
	26		-32				
	27		-32				
	28		-32				

Test started at: 0 m below ground level

Zero Reading: 32 mm

Zero reading = start depth below ground surface



Data compiled by: GL
Data checked by: NEB

Tetra Tech Environment



5th Floor, Longcross Court, 47 Newport Road, Cardiff
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Environmental Consultancy
Ground Engineering Services

PROJECT No.: B035256

PROJECT NAME: Blaendulais

CLIENT: Neath Port Talbot Council

FIGURE No.: TRL05 / WS04

DCP-CBR Corellation

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10} (\text{mm/blow})$$

DCP -Modulus E Corellation

$$E = 17.6 (\text{CBR})^{0.64} \text{ MPa}$$

In situ CBR by TRL Probe

Reference: TRL05

Position: 1

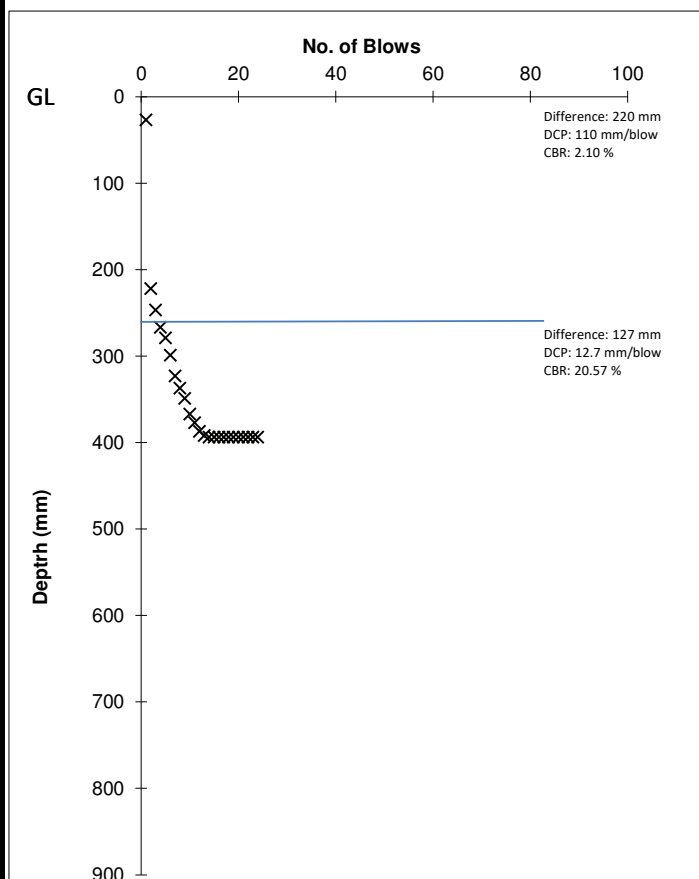
Date: 19th May 2022

mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
27	1	90	27				
195	2	285	222				
25	3	310	247				
20	4	330	267				
12	5	342	279				
20	6	362	299				
24	7	386	323				
14	8	400	337				
12	18	412	349				
18	19	430	367				
10	39	440	377				
10	59	450	387				
5	60	455	392				
2	70	457	394				
	71	457	394				
	81	457	394				
	82	457	394				
	83	457	394				
	93	457	394				
	20	457	394				
	21	457	394				
	22	457	394				
	23	457	394				
	24	457	394				
-457	25		-63				
	26		-63				
	27		-63				
	28		-63				

Test started at: 0 m below ground level

Zero Reading: 63 mm

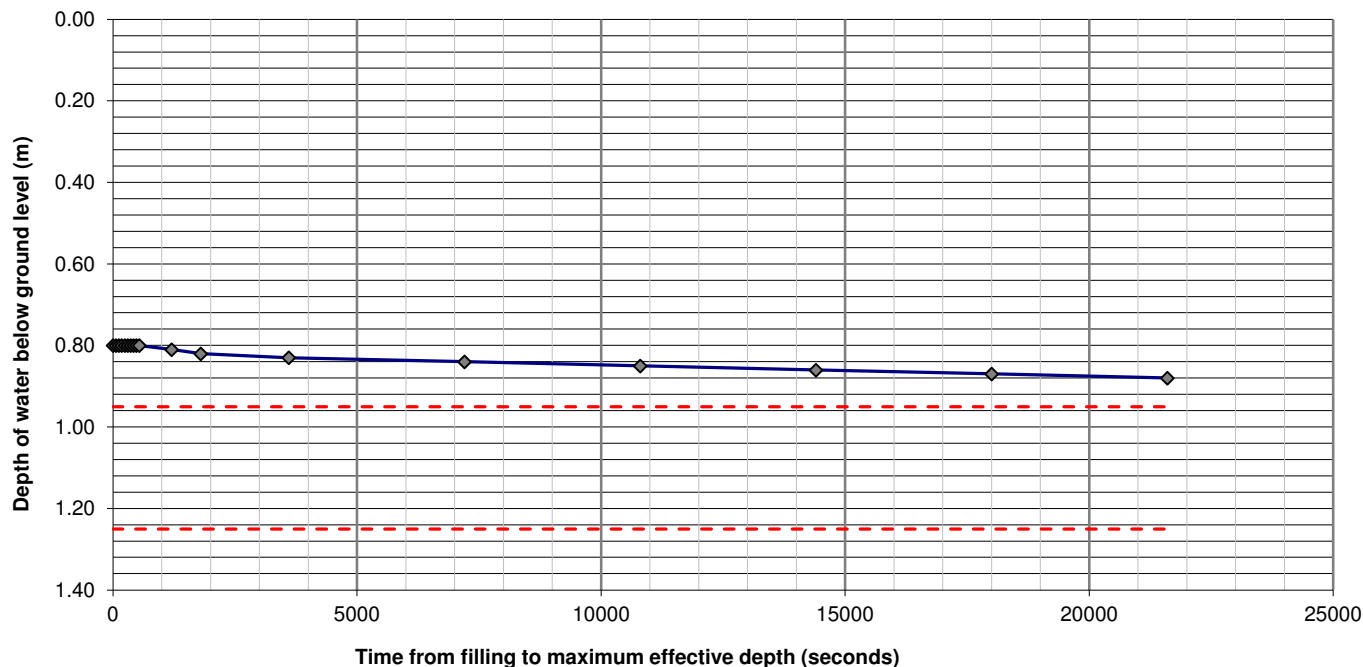
Zero reading = start depth below ground surface



Data compiled by: GL
Data checked by: NEB

APPENDIX D – SOIL INFILTRATION TEST RESULTS

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION

[illegible]

APPENDIX E – GEOTECHNICAL LABORATORY TEST RESULTS



Laboratory Report



Contract Number: 59665

Client Ref: **784-B035256**

Client PO:

Date Received: **24-05-2022**

Date Completed: **18-06-2022**

Report Date: **18-06-2022**

Client: **Tetra Tech**
5th Floor
Longcross Court
47 Newport Road
Cardiff
CF24 0AD

This report has been checked and approved by:

Brendan Evans
Office Administrator

Contract Title: **Blaendulais**

For the attention of: **Gabriel Lloyd**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	5
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	5
PSD Wet & Dry Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	5
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	3
BRE Full Suite includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate Sub-contracted Test	5
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Brendan Evans (Office Administrator) - Emma Sharp (Business Support Manager) - Paul Evans (Director)

Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)

Wayne Honey (Health and Safety Coordinator/ Quality Assistant)

GEO Site & Testing Services Ltd

Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN

Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk



Summary of Soil Descriptions

Contract Number	59665	
Site Name	Blaendulais	
Client Reference	784-B035256	

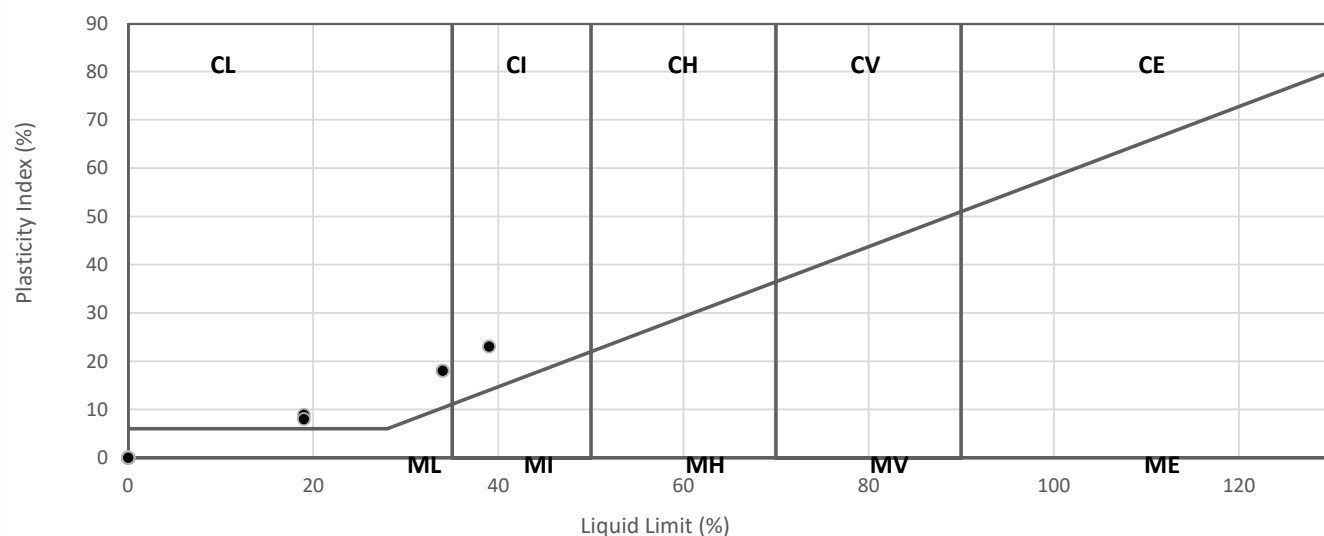
[illegible]

Contract Number	59665	
Project Location	Blaendulais	
Date Tested	13/06/2022	

[illegible]

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION

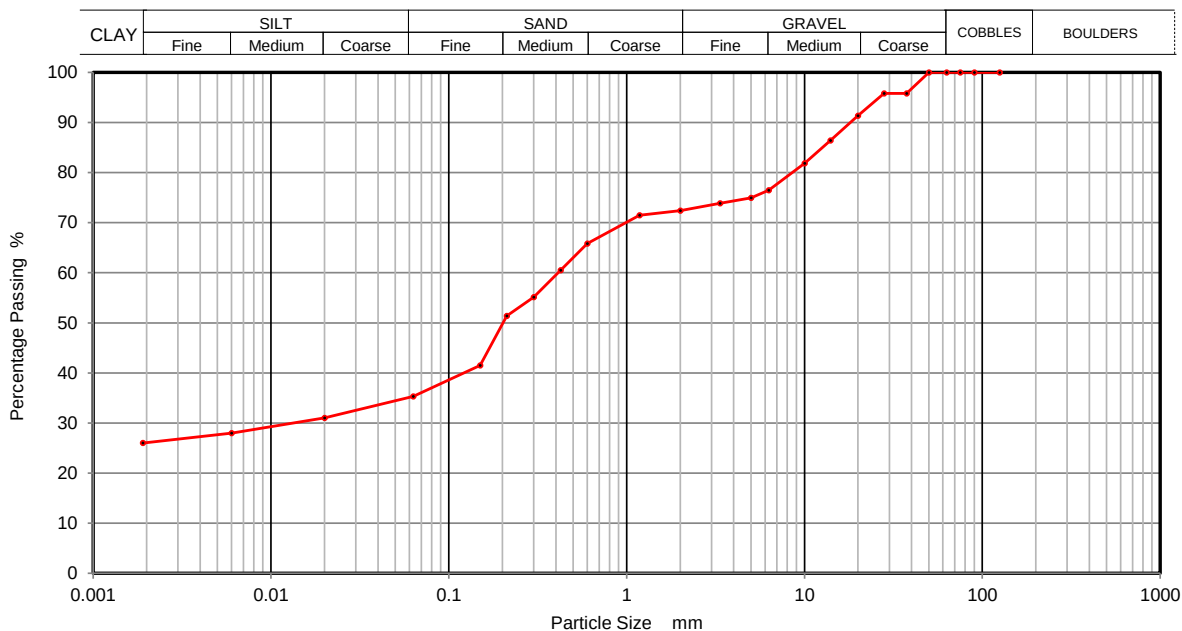


Operators			
Darcy Etheridge			

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	59665
Borehole/Pit No.	BH02
Sample No.	
Depth Top	1.30
Depth Base	2.50
Sample Type	B

Site Name	Blaendulais
Soil Description	*See description sheet
Date Tested	14/06/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	31
90	100	0.0060	28
75	100	0.0020	26
63	100		
50	100		
37.5	96		
28	96		
20	91		
14	86		
10	82		
6.3	76		
5	75		
3.35	74		
2	72		
1.18	71		
0.6	66		
0.425	61		
0.3	55		
0.212	51		
0.15	41		
0.063	35		

Sample Proportions	% dry mass
Cobbles	0
Gravel	28
Sand	37
Silt	9
Clay	26

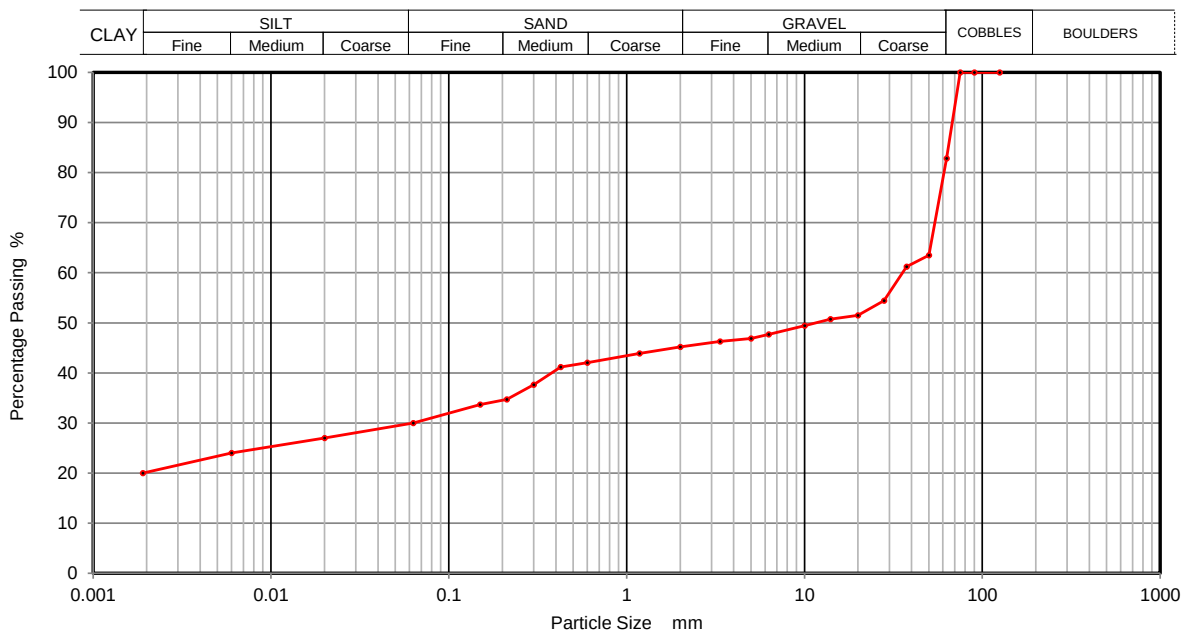
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator				
David Edwards				

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	59665
Borehole/Pit No.	TP03
Sample No.	
Depth Top	0.80
Depth Base	1.00
Sample Type	B

Site Name	Blaendulais
Soil Description	*See description sheet
Date Tested	14/06/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	27
90	100	0.0060	24
75	100	0.0020	20
63	83		
50	63		
37.5	61		
28	54		
20	51		
14	51		
10	49		
6.3	48		
5	47		
3.35	46		
2	45		
1.18	44		
0.6	42		
0.425	41		
0.3	38		
0.212	35		
0.15	34		
0.063	30		

Sample Proportions	% dry mass
Cobbles	17
Gravel	38
Sand	15
Silt	10
Clay	20

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator				
David Edwards				

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 59665

Borehole/Pit No. TP04

Site Name Blaendulais

Sample No.

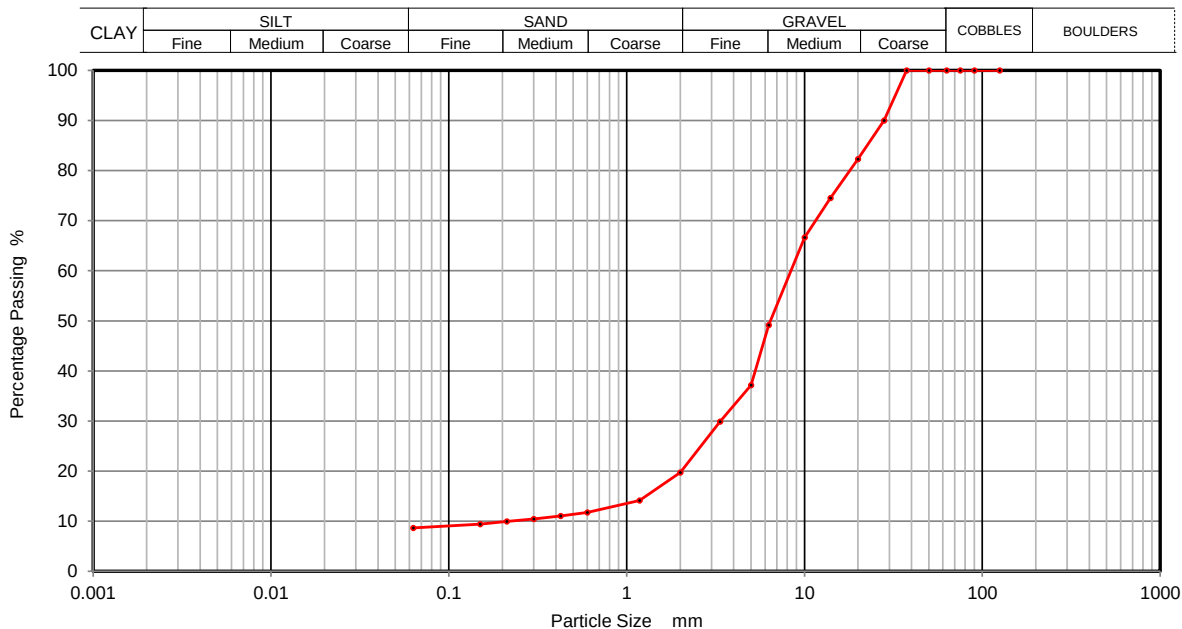
Soil Description *See description sheet

Depth Top 0.50

Depth Base 0.80

Date Tested 14/06/2022

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	90		
20	82		
14	75		
10	67		
6.3	49		
5	37		
3.35	30		
2	20		
1.18	14		
0.6	12		
0.425	11		
0.3	10		
0.212	10		
0.15	9		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	80
Sand	11
Silt and Clay	9

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator				
David Edwards				

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 59665

Borehole/Pit No. WS02

Site Name Blaendulais

Sample No.

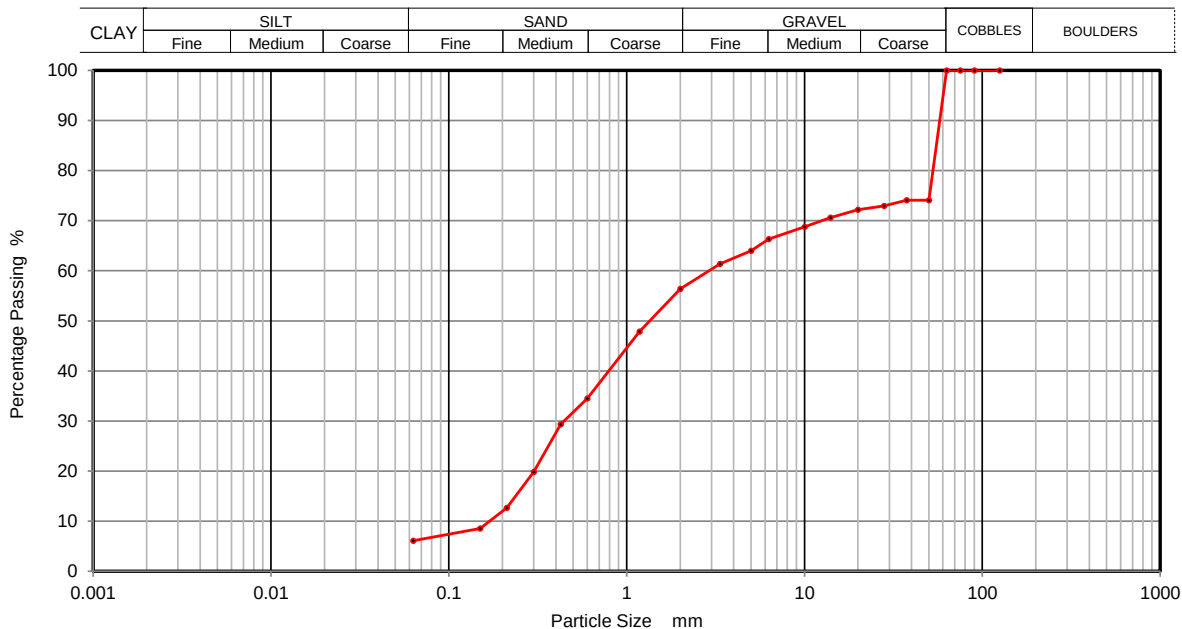
Soil Description *See description sheet

Depth Top 0.80

Depth Base

Date Tested 14/06/2022

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	74		
37.5	74		
28	73		
20	72		
14	71		
10	69		
6.3	66		
5	64		
3.35	61		
2	56		
1.18	48		
0.6	34		
0.425	29		
0.3	20		
0.212	13		
0.15	9		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	44
Sand	50
Silt and Clay	6

Remarks

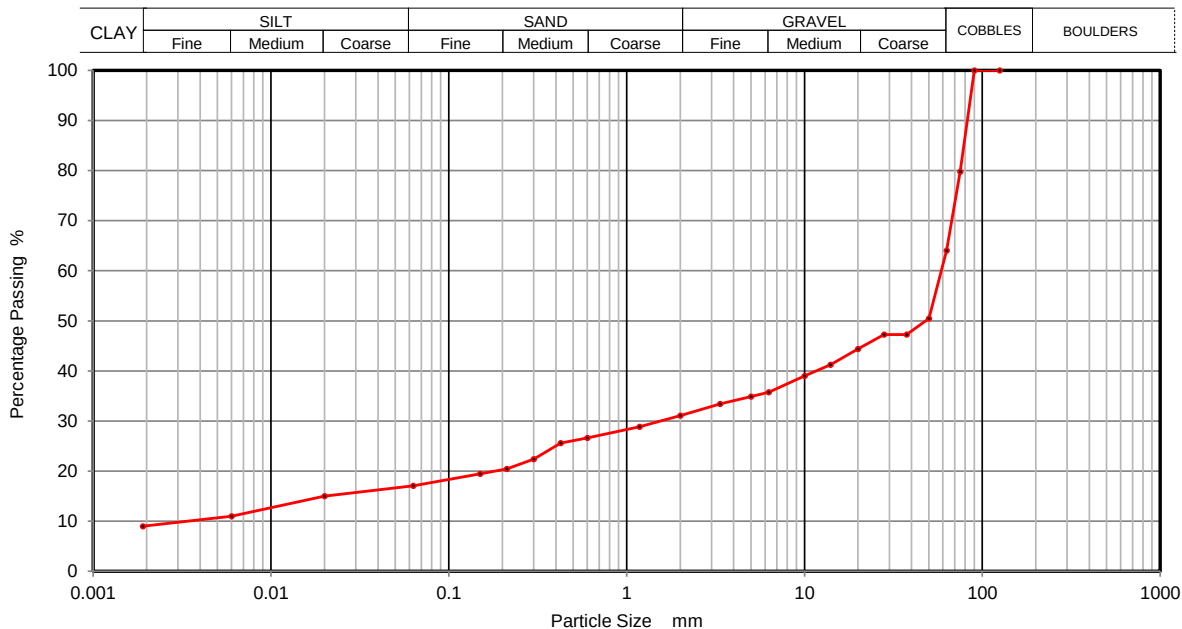
Preparation and testing in accordance with BS1377 unless noted below

Operator				
David Edwards				

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	59665
Borehole/Pit No.	WS07
Sample No.	
Depth Top	0.10
Depth Base	0.70
Sample Type	B

Site Name	Blaendulais
Soil Description	*See description sheet
Date Tested	14/06/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	15
90	100	0.0060	11
75	80	0.0020	9
63	64		
50	50		
37.5	47		
28	47		
20	44		
14	41		
10	39		
6.3	36		
5	35		
3.35	33		
2	31		
1.18	29		
0.6	27		
0.425	26		
0.3	22		
0.212	20		
0.15	19		
0.063	17		

Sample Proportions	% dry mass
Cobbles	36
Gravel	33
Sand	14
Silt	8
Clay	9

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator				
David Edwards				



ANALYTICAL TEST REPORT

Contract no: 110034

Contract name: Blaendulais

Client reference: -

Clients name: Geo Site & Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 06 June 2022

Analysis started: 06 June 2022

Analysis completed: 13 June 2022

Report issued: 13 June 2022

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
\$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

Megan Harris

Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			110034-1	110034-2	110034-3	110034-4	110034-5
Sample id			BH02	WS01A	WS06	WS07	WS12
Depth (m)			1.30-2.50	1.10-1.60	0.30-0.60	0.10-0.70	0.30-0.90
Date sampled			-	-	-	-	-
Test	Method	Units					
pH	CE004 ^U	units	6.9	7.4	8.6	7.3	7.3
Magnesium (2:1 water soluble)	CE061	mg/l Mg	1.7	<1	4.5	4.8	6.5
Chloride (2:1 water soluble)	CE049 ^U	mg/l Cl	2.5	2.4	12	1.7	1.4
Nitrate (2:1 water soluble)	CE049 ^U	mg/l NO ₃	<1	<1	<1	<1	1.2
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	18	<10	978	128	112
Sulphate (total)	CE062 ^U	mg/kg SO ₄	582	163	3999	530	369
Sulphate (total)	CE062 ^U	% w/w SO ₄	0.06	0.02	0.40	0.05	0.04
Sulphur (total)	CE119	mg/kg S	523	<100	2511	255	245
Sulphur (total)	CE119	% w/w S	0.05	<0.01	0.25	0.03	0.02

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Magnesium (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry		1	mg/l Mg
CE049	Chloride (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l Cl
CE049	Nitrate (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l NO ₃
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	U	100	mg/kg SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	U	0.01	% w/w SO ₄
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		100	mg/kg S
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		0.01	% w/w S

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
110034-1	BH02	1.30-2.50	Y	All (NSD)
110034-2	WS01A	1.10-1.60	Y	All (NSD)
110034-3	WS06	0.30-0.60	Y	All (NSD)
110034-4	WS07	0.10-0.70	Y	All (NSD)
110034-5	WS12	0.30-0.90	Y	All (NSD)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

APPENDIX F – CHEMICAL LABORATORY TEST RESULTS

Tetra Tech
5th Floor, Longcross Court
47 Newport Rd
Cardiff
Cardiff
UK
CF24 0AD

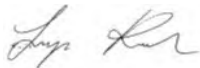


Attention :	Nicholas Bool
Date :	31st May, 2022
Your reference :	784-B035256
Our reference :	Test Report 22/8081 Batch 1
Location :	Blaeudulais
Date samples received :	18th May, 2022
Status :	Final Report
Issue :	1

Five samples were received for analysis on 18th May, 2022 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Liza Klebe

Project Co-ordinator

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudulais
Contact: Nicholas Bool
EMT Job No: 22/8081

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudulais
Contact: Nicholas Bool
EMT Job No: 22/8081

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9								Please see attached notes for all abbreviations and acronyms		
Sample ID	TP01	TP02	TP03										
Depth	0.30	0.50	0.55										
COC No / misc													
Containers	V J T	V J T	J T										
Sample Date	16/05/2022	16/05/2022	16/05/2022										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	18/05/2022	18/05/2022	18/05/2022								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1 ^{SV}	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1 ^{SV}	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1 ^{SV}	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C35-C44 (EH_1D_AL)	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44 (EH+HS_1D_AL)	<26	<26	<26								<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	25								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	145	<7	119								<7	mg/kg	TM5/PM8/PM16
>EC35-EC44 (EH_1D_AR)	29	<7	14								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44 (EH+HS_1D_AR)	174	<26	158								<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-44) (EH+HS_CU_1D_Total)	174	<52	158								<52	mg/kg	TM5/PM8/PM16
MTBE #	<5 ^{SV}	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Benzene #	<5 ^{SV}	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Toluene #	<5 ^{SV}	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 ^{SV}	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5 ^{SV}	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
o-Xylene #	<5 ^{SV}	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Total Phenols HPLC	0.37	0.15	<0.15								<0.15	mg/kg	TM26/PM21B
Hexavalent Chromium #	<0.3	<0.3	<0.3								<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0568	0.0048	0.0289								<0.0015	g/l	TM38/PM20
Chromium III	35.5	39.9	29.1								<0.5	mg/kg	NONE/NONE
Free Cyanide	<0.5	<0.5	<0.5								<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	0.019	0.017	0.242								<0.001	None	TM21/PM24
pH #	8.16	8.24	7.72								<0.01	pH units	TM73/PM11

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudulais
Contact: Nicholas Bool
EMT Job No: 22/8081

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudulais
Contact: Nicholas Bool
EMT Job No: 22/8081

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6										Please see attached notes for all abbreviations and acronyms	
Sample ID	TP02											
Depth	0.50											
COC No / misc												
Containers	V J T											
Sample Date	16/05/2022											
Sample Type	Soil											
Batch Number	1											
Date of Receipt	18/05/2022									LOD/LOR	Units	Method No.
TPH CWG												
Aliphatics												
>C5-C6	<10									<10	ug/l	TM36/PM6
>C6-C8	<10									<10	ug/l	TM36/PM6
>C8-C10	<10									<10	ug/l	TM36/PM6
>C10-C12	<5									<5	ug/l	TM5/PM16/PM3
>C12-C16	<10									<10	ug/l	TM5/PM16/PM3
>C16-C21	<10									<10	ug/l	TM5/PM16/PM3
>C21-C35	<10									<10	ug/l	TM5/PM16/PM3
Total aliphatics C5-35	<10									<10	ug/l	TM5/TM36/PM16/PM3/PM3
Aromatics												
>C5-EC7	<10									<10	ug/l	TM36/PM6
>EC7-EC8	<10									<10	ug/l	TM36/PM6
>EC8-EC10	<10									<10	ug/l	TM36/PM6
>EC10-EC12	<5									<5	ug/l	TM5/PM16/PM3
>EC12-EC16	<10									<10	ug/l	TM5/PM16/PM3
>EC16-EC21	<10									<10	ug/l	TM5/PM16/PM3
>EC21-EC35	<10									<10	ug/l	TM5/PM16/PM3
Total aromatics C5-35	<10									<10	ug/l	TM5/TM36/PM16/PM3/PM3
Total aliphatics and aromatics(C5-35)	<10									<10	ug/l	TM5/TM36/PM16/PM3/PM3
MTBE	<5									<5	ug/l	TM36/PM6
Benzene	<5									<5	ug/l	TM36/PM6
Toluene	<5									<5	ug/l	TM36/PM6
Ethylbenzene	<5									<5	ug/l	TM36/PM6
m/p-Xylene	<5									<5	ug/l	TM36/PM6
o-Xylene	<5									<5	ug/l	TM36/PM6
Total Phenols HPLC	<0.05									<0.05	mg/l	TM26/PM6
Sulphate as SO4 #	1.2									<0.5	mg/l	TM38/PM6
Chloride #	<0.3									<0.3	mg/l	TM38/PM6
Nitrate as NO3 #	0.5									<0.2	mg/l	TM38/PM6
Nitrite as NO2 #	<0.02									<0.02	mg/l	TM38/PM6
Ammoniacal Nitrogen as NH3 #	<0.03									<0.03	mg/l	TM38/PM6
Ammoniacal Nitrogen as NH4 #	<0.03									<0.03	mg/l	TM38/PM6
Total Cyanide #	<0.01									<0.01	mg/l	TM89/PM6
Dissolved Organic Carbon	<2									<2	mg/l	TM60/PM6
pH	7.15									<0.01	pH units	TM73/PM6
Total Alkalinity as CaCO3	62									<1	mg/l	TM75/PM6

Note:

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudulais
Contact: Nicholas Bool

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/8081

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

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It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

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Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

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STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/8081

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes

EMT Job No: 22/8081

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM69	One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes

EMT Job No: 22/8081

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.			AR	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes		AR	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 22/8081

[illegible]

Tetra Tech
5th Floor, Longcross Court
47 Newport Rd
Cardiff
Cardiff
UK
CF24 0AD



Attention : Nicholas Bool
Date : 10th June, 2022
Your reference : 784-B035256
Our reference : Test Report 22/8276 Batch 1
Location : Blaeadulais
Date samples received : 20th May, 2022
Status : Final Report
Issue : 1

Thirteen samples were received for analysis on 20th May, 2022 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudulais
Contact: Nicholas Bool
EMT Job No: 22/8276

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

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Location: Blaeudulais
Contact: Nicholas Bool
EMT Job No: 22/8276

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33										Please see attached notes for all abbreviations and acronyms		
Sample ID	WS03												
Depth	0.70												
COC No / misc													
Containers	V J T												
Sample Date	18/05/2022												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	20/05/2022										LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6	<10										<10	ug/l	TM36/PM6
>C6-C8	<10										<10	ug/l	TM36/PM6
>C8-C10	<10										<10	ug/l	TM36/PM6
>C10-C12	<5										<5	ug/l	TM5/PM16/PM3
>C12-C16	<10										<10	ug/l	TM5/PM16/PM3
>C16-C21	<10										<10	ug/l	TM5/PM16/PM3
>C21-C35	<10										<10	ug/l	TM5/PM16/PM3
Total aliphatics C5-35	<10										<10	ug/l	TM5/TM36/PM16/PM35/PM3
Aromatics													
>C5-EC7	<10										<10	ug/l	TM36/PM6
>EC7-EC8	<10										<10	ug/l	TM36/PM6
>EC8-EC10	<10										<10	ug/l	TM36/PM6
>EC10-EC12	<5										<5	ug/l	TM5/PM16/PM3
>EC12-EC16	<10										<10	ug/l	TM5/PM16/PM3
>EC16-EC21	<10										<10	ug/l	TM5/PM16/PM3
>EC21-EC35	<10										<10	ug/l	TM5/PM16/PM3
Total aromatics C5-35	<10										<10	ug/l	TM5/TM36/PM16/PM35/PM3
Total aliphatics and aromatics(C5-35)	<10										<10	ug/l	TM5/TM36/PM16/PM35/PM3
MTBE	<5										<5	ug/l	TM36/PM6
Benzene	<5										<5	ug/l	TM36/PM6
Toluene	<5										<5	ug/l	TM36/PM6
Ethylbenzene	<5										<5	ug/l	TM36/PM6
m/p-Xylene	<5										<5	ug/l	TM36/PM6
o-Xylene	<5										<5	ug/l	TM36/PM6
Total Phenols HPLC	<0.05										<0.05	mg/l	TM26/PM6
Sulphate as SO4 #	4.3										<0.5	mg/l	TM38/PM6
Chloride #	1.9										<0.3	mg/l	TM38/PM6
Nitrate as NO3 #	1.5										<0.2	mg/l	TM38/PM6
Nitrite as NO2 #	<0.02										<0.02	mg/l	TM38/PM6
Ammoniacal Nitrogen as NH3 #	<0.03										<0.03	mg/l	TM38/PM6
Ammoniacal Nitrogen as NH4 #	0.03										<0.03	mg/l	TM38/PM6
Total Cyanide #	<0.01										<0.01	mg/l	TM89/PM6
Dissolved Organic Carbon	4										<2	mg/l	TM60/PM6
pH	8.38										<0.01	pH units	TM73/PM6
Total Alkalinity as CaCO3	90										<1	mg/l	TM75/PM6

Please see attached notes for all abbreviations and acronyms

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudulais
Contact: Nicholas Bool

Matrix : CEN 10:1 1 Batch

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/8276

SOILS and ASH

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% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

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As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

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Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/8276

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM69	One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes

EMT Job No: 22/8276

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.			AR	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes		AR	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Tetra Tech
5th Floor, Longcross Court
47 Newport Rd
Cardiff
Cardiff
UK
CF24 0AD



Attention : Nicholas Bool
Date : 7th June, 2022
Your reference : 784-B035256
Our reference : Test Report 22/8651 Batch 1
Location : Blaeadlais
Date samples received : 26th May, 2022
Status : Final Report
Issue : 1

Six samples were received for analysis on 26th May, 2022 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

A handwritten signature in black ink, appearing to read 'B. Leslie'.

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudlais
Contact: Nicholas Bool
EMT Job No: 22/8651

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeadlais
Contact: Nicholas Bool
EMT Job No: 22/8651

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	10-12	16-18									Please see attached notes for all abbreviations and acronyms		
Sample ID	WS08	WS04											
Depth	1.90	1.60											
COC No / misc													
Containers	V J T	V J T											
Sample Date	19/05/2022	19/05/2022											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	26/05/2022	26/05/2022									LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C35-C44 (EH_1D_AL)	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44 (EH+HS_1D_AL)	<26	<26									<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC35-EC44 (EH_1D_AR)	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44 (EH+HS_1D_AR)	<26	<26									<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44) (EH+HS_CU_1D_Total)	<52	<52									<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5									<5	ug/kg	TM36/PM12
Benzene #	<5	<5									<5	ug/kg	TM36/PM12
Toluene #	<5	<5									<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5									<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5									<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	12.3	14.3									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0482	0.0626									<0.0015	g/l	TM38/PM20
Chromium III	33.4	42.7									<0.5	mg/kg	NONE/NONE
Free Cyanide	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	0.009	0.015									<0.001	None	TM21/PM24
pH #	6.27	5.59									<0.01	pH units	TM73/PM11

Client Name:	Tetra Tech
Reference:	784-B035256
Location:	Blaeudlais
Contact:	Nicholas Bool

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Client Name: Tetra Tech
Reference: 784-B035256
Location: Blaeudlais
Contact: Nicholas Bool

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/8651

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/8651

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 22/8651

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

APPENDIX G – GROUNDWATER AND GROUND GAS MONITORING DATA

Tetra Tech

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Blaendulais
Job No.: B035256
Client: Neath Port Talbot Council

Date Monitored:
Monitoring Engineer:
Weather:

02/06/22
 JTC
 dry, warm

EQUIPMENT USED			
Type	Make	Serial	Last Calibrated
Gas Analyser	Landtec GA5000	G502044	Nov-21
Interface Meter	Solinst	122-004988-1	n/a

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS												
Exploratory Hole No	Peak		Steady									
	CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)	BAL (%)	PID (ppm)	H ₂ S (ppm)	HCN (ppm)	CO (ppm)	Time	Remarks
BH02	0.0	0.9	0.0	0.9	14.1	84.9	nt	0	nt	0	10:00	
BH01	0.0	0.8	0.0	0.9	14.3	84.8	nt	0	nt	0	10:30	
WS08	0.0	0.6	0.0	0.6	14.3	85	nt	0	nt	0	10:45	

LANDGAS - PHYSICAL PARAMETERS							
Exploratory Hole No	Atmos Pressure (m bar)	Atmos Temp (°C)	BH Flow		BH Pressure		Remarks
			Peak (L/hr)	Steady (L/hr)	Peak (mbar)	Steady (mbar)	
BH02	995	14.0	0.1	0.1	0.14	0.14	
BH01	995	14.0	0.1	0.1	0.13	0.13	
WS08	995	14.0	0.1	0.1	0.10	0.10	

AMBIENT ATMOSPHERIC CONDITIONS			ATMOSPHERIC PRESSURE CONDITIONS	
Parameter	Before Monitoring	After Monitoring		
CH ₄ (% vol)	0.0	0.0	3 days prior (m bar)	1019
CO ₂ (% vol)	0.2	0.0	2 days prior (m bar)	1019
O ₂ (% vol)	21.1	21.1	1 day prior (m bar)	1018
PID (ppm)	nt	nt	during (m bar) am,midday,pm	1021, 1022, 1023
Atmos Press. (m bar)	1018	1018	1 day post (m bar)	1024

GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS													
Exploratory Hole No	Water Surface (mbgl)	Base Depth (mbgl)	LNAPL Surface (mbgl)	DNAPL Surface (mbgl)	Water Quality Indicators								Remarks
					ORP (mV)	SPC (µs/cm)	C (µs/cm)	Ph (value)	DO (mg/L)	Dissolved Solids (ppt)	Resistivity (Ω-cm)	Temp (°C)	
BH02	3.30	3.40	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
BH01	3.40	6.00	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
WS08	dry	1.00	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	

Notes nt = not tested
 nd = not detected

Data Compiled by: JTC
 Data Checked by: NEB

Tetra Tech

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Blaendulais
Job No.: B035256
Client: Neath Port Talbot Council

Date Monitored:
Monitoring Engineer:
Weather:

09/06/22
 JTC
 overcast, warm

EQUIPMENT USED			
Type	Make	Serial	Last Calibrated
Gas Analyser	Landtec GA5000	G502044	Nov-21
Interface Meter	Solinst	122-004988-1	n/a

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS												
Exploratory Hole No	Peak		Steady									
	CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)	BAL (%)	PID (ppm)	H ₂ S (ppm)	HCN (ppm)	CO (ppm)	Time	Remarks
BH02	0.1	0.2	0.1	0.2	20.8	78.9	nt	0	nt	0	11:30	
BH01	0.1	0.2	0.1	0.3	20.6	79.0	nt	0	nt	0	12:00	
WS08	0.1	0.5	0.1	0.5	20.4	79	nt	nt	nt	nt	13:00	

LANDGAS - PHYSICAL PARAMETERS							
Exploratory Hole No	Atmos Pressure (m bar)	Atmos Temp (°C)	BH Flow		BH Pressure		Remarks
			Peak (L/hr)	Steady (L/hr)	Peak (mbar)	Steady (mbar)	
BH02	994	16.0	0.1	0.1	0.07	0.07	
BH01	994	16.0	0.1	0.1	0.09	0.09	
WS08	994	16.0	0.1	0.1	0.09	0.09	

AMBIENT ATMOSPHERIC CONDITIONS				ATMOSPHERIC PRESSURE CONDITIONS			
Parameter	Before Monitoring	After Monitoring					
CH ₄ (% vol)	0.0	0.0	3 days prior (m bar)				1019
CO ₂ (% vol)	0.0	0.0	2 days prior (m bar)				1012
O ₂ (% vol)	21.4	21.5	1 day prior (m bar)				1008
PID (ppm)	nt	nt	during (m bar) am,midday,pm				1017, 1017, 1015
Atmos Press. (m bar)	1017	1015	1 day post (m bar)				1018

GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS													
Exploratory Hole No	Water Surface (mbgl)	Base Depth (mbgl)	LNAPL Surface (mbgl)	DNAPL Surface (mbgl)	Water Quality Indicators								Remarks
					ORP (mV)	SPC (µs/cm)	C (µs/cm)	Ph (value)	DO (mg/L)	Dissolved Solids (ppt)	Resistivity (Ω-cm)	Temp (°C)	
BH02	3.30	3.40	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
BH01	3.40	6.00	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
WS08	dry	1.00	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
			nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	

Notes nt = not tested
 nd = not detected

Data Compiled by: JTC
 Data Checked by: NEB

Tetra Tech

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Blaendulais
Job No.: B035256
Client: Neath Port Talbot Council

Date Monitored:
Monitoring Engineer:
Weather:

15/06/22
 JM
 clear, warm

EQUIPMENT USED			
Type	Make	Serial	Last Calibrated
Gas Analyser	Landtec GA5000	G502044	Nov-21
Interface Meter	Solinst	122-004988-1	n/a

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS												
Exploratory Hole No	Peak		Steady									
	CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)	BAL (%)	PID (ppm)	H ₂ S (ppm)	HCN (ppm)	CO (ppm)	Time	Remarks
BH02	0.1	0.2	0.1	0.2	20.8	78.9	nt	0	nt	0	09:00	
BH01	0.1	0.4	0.1	0.4	16.9	82.9	nt	0	nt	0	09:30	
WS08	0.1	0.5	0.1	0.5	20.4	79	nt	0	nt	0	10:00	

LANDGAS - PHYSICAL PARAMETERS							
Exploratory Hole No	Atmos Pressure (m bar)	Atmos Temp (°C)	BH Flow		BH Pressure		Remarks
			Peak (L/hr)	Steady (L/hr)	Peak (mbar)	Steady (mbar)	
BH02	998	16.0	0.1	0.1	-0.12	-0.05	
BH01	998	16.0	0.2	0.2	-0.17	-0.17	
WS08	998	16.0	0.2	0.2	0.12	0.12	

AMBIENT ATMOSPHERIC CONDITIONS				ATMOSPHERIC PRESSURE CONDITIONS			
Parameter	Before Monitoring	After Monitoring					
CH ₄ (% vol)	0.1	0.1	3 days prior (m bar)			1026	
CO ₂ (% vol)	0.1	0.1	2 days prior (m bar)			1028	
O ₂ (% vol)	21.1	21.1	1 day prior (m bar)			1023	
PID (ppm)	nt	nt	during (m bar) am,midday,pm			1019, 1020, 1019	
Atmos Press. (m bar)	998	998	1 day post (m bar)			1018	

GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS													
Exploratory Hole No	Water Surface (mbgl)	Base Depth (mbgl)	LNAPL Surface (mbgl)	DNAPL Surface (mbgl)	Water Quality Indicators								Remarks
					ORP (mV)	SPC (µs/cm)	C (µs/cm)	Ph (value)	DO (mg/L)	Dissolved Solids (ppt)	Resistivity (Ω-cm)	Temp (°C)	
BH02	DRY	3.40	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
BH01	4.12	6.00	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
WS08	DRY	1.00	nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
			nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	
			nd	nd	nt	nt	nt	nt	nt	nt	nt	nt	

Notes nt = not tested
 nd = not detected

Data Compiled by: JM
 Data Checked by: NEB

APPENDIX H – HAZWASTE ONLINE WASTE CLASSIFICATION REPORT

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



QAC9C-OHZNZ-AVD88

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in **pale yellow**.

Job name

EMT-22-8081-Batch-1-202205311319

Description/Comments

Classification of samples collected from a Ground Investigation at Blaendulais. Classification has been undertaken in line with EA Guidance WM3 Waste Classification: Guidance on the classification and assessment of Waste (1st Edition V1.1) 2018

Project

784-B035256

Site

Blaendulais

Classified by

Name:
Katy Woodhouse
Date:
12 Jul 2022 10:40 GMT
Telephone:

Company:
Tetra Tech (WYG (White Young Green))
5th Floor Longcross Court,
47 Newport Road
Cardiff
CF24 0AD

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course
Hazardous Waste Classification

Date
07 Nov 2019

Next 3 year Refresher due by Nov 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01-16/05/2022-0.30m		Non Hazardous		2
2	TP02-16/05/2022-0.50m		Non Hazardous		5
3	TP03-16/05/2022-0.55m		Non Hazardous		7

Related documents

#	Name	Description
1	EMT-22-8081-Batch-1-202205311319.HWOL	Element .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Katy Woodhouse

Created date: 12 Jul 2022 10:40 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	10
Appendix B: Rationale for selection of metal species	11
Appendix C: Version	12

Classification of sample: TP01-16/05/2022-0.30m

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
TP01-16/05/2022-0.30m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				35.7	mg/kg	1.32	47.136	mg/kg	0.00471 %		
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				2.1	mg/kg	2.775	5.828	mg/kg	0.000583 %		
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				0.8	mg/kg	3.22	2.576	mg/kg	0.000258 %		
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				35.5	mg/kg	1.462	51.885	mg/kg	0.00519 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				87	mg/kg	1.126	97.952	mg/kg	0.0098 %		
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	37	mg/kg	1.56	57.713	mg/kg	0.0037 %		
	082-004-00-2	231-846-0	7758-97-6									
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel chromate }				18.4	mg/kg	2.976	54.763	mg/kg	0.00548 %		
	028-035-00-7	238-766-5	14721-18-7									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc chromate }				143	mg/kg	2.774	396.703	mg/kg	0.0397 %		
	024-007-00-3	236-878-9	13530-65-9									
13	TPH (C6 to C40) petroleum group				174	mg/kg		174	mg/kg	0.0174 %		
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	• ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	• xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
19	• pH		PH		8.16 pH		8.16 pH	8.16 pH			
20	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
21	• acenaphthylene 205-917-1		208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
22	• acenaphthene 201-469-6		83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
23	• fluorene 201-695-5		86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
24	• phenanthrene 201-581-5		85-01-8		0.05 mg/kg		0.05 mg/kg	0.000005 %			
25	• anthracene 204-371-1		120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
26	• fluoranthene 205-912-4		206-44-0		0.13 mg/kg		0.13 mg/kg	0.000013 %			
27	• pyrene 204-927-3		129-00-0		0.1 mg/kg		0.1 mg/kg	0.00001 %			
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.15 mg/kg		0.15 mg/kg	0.000015 %			
29	chrysene 601-048-00-0	205-923-4	218-01-9		0.13 mg/kg		0.13 mg/kg	0.000013 %			
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.15 mg/kg		0.15 mg/kg	0.000015 %			
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.06 mg/kg		0.06 mg/kg	0.000006 %			
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.09 mg/kg		0.09 mg/kg	0.000009 %			
33	• indeno[123-cd]pyrene 205-893-2		193-39-5		0.07 mg/kg		0.07 mg/kg	0.000007 %			
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
35	• benzo[ghi]perylene 205-883-8		191-24-2		0.07 mg/kg		0.07 mg/kg	0.000007 %			
36	• vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		21 mg/kg	1.785	37.489 mg/kg	0.00375 %			
Total:									0.091 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
-  Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Not considered flammable per WFD HP3 definition 6 indents testing. Annex III of the Waste Framework Directive (WFD) Council Directive 2008/98/EC. No evidence of a free draining liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0174%)

Classification of sample: TP02-16/05/2022-0.50m

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
TP02-16/05/2022-0.50m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				43.4	mg/kg	1.32	57.302	mg/kg	0.00573 %		
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	2.22	mg/kg	0.000222 %		
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				0.3	mg/kg	3.22	0.966	mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				39.9	mg/kg	1.462	58.316	mg/kg	0.00583 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				62	mg/kg	1.126	69.805	mg/kg	0.00698 %		
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	38	mg/kg	1.56	59.273	mg/kg	0.0038 %		
	082-004-00-2	231-846-0	7758-97-6									
9	mercury { mercury dichloride }				0.3	mg/kg	1.353	0.406	mg/kg	0.0000406 %		
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel chromate }				26	mg/kg	2.976	77.383	mg/kg	0.00774 %		
	028-035-00-7	238-766-5	14721-18-7									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.554	mg/kg	0.000255 %		
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc chromate }				91	mg/kg	2.774	252.447	mg/kg	0.0252 %		
	024-007-00-3	236-878-9	13530-65-9									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	pH				8.24 pH		8.24 pH	8.24 pH			
			PH								
20	naphthalene				0.04 mg/kg		0.04 mg/kg	0.000004 %			
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				0.03 mg/kg		0.03 mg/kg	0.000003 %			
		205-917-1	208-96-8								
22	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				0.5 mg/kg		0.5 mg/kg	0.00005 %			
		201-581-5	85-01-8								
25	anthracene				0.14 mg/kg		0.14 mg/kg	0.000014 %			
		204-371-1	120-12-7								
26	fluoranthene				0.95 mg/kg		0.95 mg/kg	0.000095 %			
		205-912-4	206-44-0								
27	pyrene				0.68 mg/kg		0.68 mg/kg	0.000068 %			
		204-927-3	129-00-0								
28	benzo[a]anthracene				0.58 mg/kg		0.58 mg/kg	0.000058 %			
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				0.66 mg/kg		0.66 mg/kg	0.000066 %			
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				0.81 mg/kg		0.81 mg/kg	0.000081 %			
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				0.31 mg/kg		0.31 mg/kg	0.000031 %			
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				0.51 mg/kg		0.51 mg/kg	0.000051 %			
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				0.41 mg/kg		0.41 mg/kg	0.000041 %			
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				0.1 mg/kg		0.1 mg/kg	0.00001 %			
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				0.35 mg/kg		0.35 mg/kg	0.000035 %			
		205-883-8	191-24-2								
36	vanadium { divanadium pentaoxide; vanadium pentoxide }				17 mg/kg	1.785	30.348 mg/kg	0.00303 %			
	023-001-00-8	215-239-8	1314-62-1								
Total:									0.0649 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP03-16/05/2022-0.55m

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
TP03-16/05/2022-0.55m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				16.9	mg/kg	1.32	22.313	mg/kg	0.00223 %		
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.2	mg/kg	2.775	3.33	mg/kg	0.000333 %		
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				0.4	mg/kg	3.22	1.288	mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29.1	mg/kg	1.462	42.531	mg/kg	0.00425 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				292	mg/kg	1.126	328.759	mg/kg	0.0329 %		
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	87	mg/kg	1.56	135.704	mg/kg	0.0087 %		
	082-004-00-2	231-846-0	7758-97-6									
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel chromate }				24.3	mg/kg	2.976	72.323	mg/kg	0.00723 %		
	028-035-00-7	238-766-5	14721-18-7									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.554	mg/kg	0.000255 %		
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc chromate }				239	mg/kg	2.774	663.021	mg/kg	0.0663 %		
	024-007-00-3	236-878-9	13530-65-9									
13	TPH (C6 to C40) petroleum group				158	mg/kg		158	mg/kg	0.0158 %		
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
19	pH		PH		7.72 pH		7.72 pH	7.72 pH			
20	naphthalene 601-052-00-2	202-049-5	91-20-3		0.07 mg/kg		0.07 mg/kg	0.000007 %			
21	acenaphthylene 205-917-1	208-96-8			0.04 mg/kg		0.04 mg/kg	0.000004 %			
22	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
23	fluorene 201-695-5	86-73-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
24	phenanthrene 201-581-5	85-01-8			0.41 mg/kg		0.41 mg/kg	0.000041 %			
25	anthracene 204-371-1	120-12-7			0.09 mg/kg		0.09 mg/kg	0.000009 %			
26	fluoranthene 205-912-4	206-44-0			0.79 mg/kg		0.79 mg/kg	0.000079 %			
27	pyrene 204-927-3	129-00-0			0.58 mg/kg		0.58 mg/kg	0.000058 %			
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.49 mg/kg		0.49 mg/kg	0.000049 %			
29	chrysene 601-048-00-0	205-923-4	218-01-9		0.55 mg/kg		0.55 mg/kg	0.000055 %			
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.71 mg/kg		0.71 mg/kg	0.000071 %			
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.27 mg/kg		0.27 mg/kg	0.000027 %			
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.44 mg/kg		0.44 mg/kg	0.000044 %			
33	indeno[123-cd]pyrene 205-893-2	193-39-5			0.36 mg/kg		0.36 mg/kg	0.000036 %			
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		0.09 mg/kg		0.09 mg/kg	0.000009 %			
35	benzo[ghi]perylene 205-883-8	191-24-2			0.3 mg/kg		0.3 mg/kg	0.00003 %			
36	vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		24 mg/kg	1.785	42.844 mg/kg	0.00428 %			
Total:									0.143 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Not considered flammable per WFD HP3 definition 6 indents testing. Annex III of the Waste Framework Directive (WFD) Council Directive 2008/98/EC. No evidence of a free draining liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0158%)

Appendix A: Classifier defined and non GB MCL determinands

■ chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

■ ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2; H351

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

Selected as most appropriate

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
HazWasteOnline Classification Engine Version: 2022.192.5237.9831 (11 Jul 2022)
HazWasteOnline Database: 2022.192.5237.9831 (11 Jul 2022)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



KLKP9-HPFWO-THJ27

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in **pale yellow**.

Job name

EMT-22-8651-Batch-1-202206070928

Description/Comments

Classification of samples collected from a Ground Investigation at Blaendulais. Classification has been undertaken in line with EA Guidance WM3 Waste Classification: Guidance on the classification and assessment of Waste (1st Edition V1.1) 2018

Project

784-B035256

Site

Blaendulais

Classified by

Name:
Katy Woodhouse
Date:
12 Jul 2022 10:42 GMT
Telephone:

Company:
Tetra Tech (WYG (White Young Green))
5th Floor Longcross Court,
47 Newport Road
Cardiff
CF24 0AD

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course
Hazardous Waste Classification

Date
07 Nov 2019

Next 3 year Refresher due by Nov 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS08-19/05/2022-1.90m		Non Hazardous		2
2	WS04-19/05/2022-1.60m		Non Hazardous		4

Related documents

#	Name	Description
1	EMT-22-8651-Batch-1-202206070928.HWOL	Element .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Katy Woodhouse

Created date: 12 Jul 2022 10:42 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	6
Appendix B: Rationale for selection of metal species	7
Appendix C: Version	8

Classification of sample: WS08-19/05/2022-1.90m

Non Hazardous Waste
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
WS08-19/05/2022-1.90m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12.3% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 12.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				5.6	mg/kg	1.32	6.584	mg/kg	0.000658 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				2.4	mg/kg	2.775	5.931	mg/kg	0.000593 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				0.2	mg/kg	3.22	0.573	mg/kg	0.0000573 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				33.4	mg/kg	1.462	43.469	mg/kg	0.00435 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				49	mg/kg	1.126	49.126	mg/kg	0.00491 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	20	mg/kg	1.56	27.779	mg/kg	0.00178 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel chromate }				55.7	mg/kg	2.976	147.621	mg/kg	0.0148 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.548	mg/kg	0.000455 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc chromate }				116	mg/kg	2.774	286.555	mg/kg	0.0287 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	• ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	• xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
19	• pH		PH		6.27 pH		6.27 pH	6.27 pH			
20	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
21	• acenaphthylene 205-917-1		208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
22	• acenaphthene 201-469-6		83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
23	• fluorene 201-695-5		86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
24	• phenanthrene 201-581-5		85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
25	• anthracene 204-371-1		120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
26	• fluoranthene 205-912-4		206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
27	• pyrene 204-927-3		129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
29	chrysene 601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
33	• indeno[123-cd]pyrene 205-893-2		193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
35	• benzo[ghi]perylene 205-883-8		191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
36	• vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		31 mg/kg	1.785	49.279 mg/kg	0.00493 %	✓		
Total:									0.0665 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
-  Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS04-19/05/2022-1.60m

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
WS04-19/05/2022-1.60m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14.3% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				4.2	mg/kg	1.32	4.852	mg/kg	0.000485 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.7	mg/kg	2.775	4.128	mg/kg	0.000413 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				0.2	mg/kg	3.22	0.563	mg/kg	0.0000563 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				42.7	mg/kg	1.462	54.601	mg/kg	0.00546 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				26	mg/kg	1.126	25.611	mg/kg	0.00256 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	20	mg/kg	1.56	27.293	mg/kg	0.00175 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel chromate }				24.6	mg/kg	2.976	64.056	mg/kg	0.00641 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.469	mg/kg	0.000447 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc chromate }				72	mg/kg	2.774	174.749	mg/kg	0.0175 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	• ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	• xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
19	• pH PH				5.59 pH		5.59 pH	5.59 pH			
20	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
21	• acenaphthylene 205-917-1		208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
22	• acenaphthene 201-469-6		83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
23	• fluorene 201-695-5		86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
24	• phenanthrene 201-581-5		85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
25	• anthracene 204-371-1		120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
26	• fluoranthene 205-912-4		206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
27	• pyrene 204-927-3		129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
29	chrysene 601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
33	• indeno[123-cd]pyrene 205-893-2		193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
35	• benzo[ghi]perylene 205-883-8		191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
36	• vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		24 mg/kg	1.785	37.484 mg/kg	0.00375 %	✓		
Total:									0.0442 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
-  Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

■ chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

■ ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2; H351

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

Selected as most appropriate

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
HazWasteOnline Classification Engine Version: 2022.192.5237.9831 (11 Jul 2022)
HazWasteOnline Database: 2022.192.5237.9831 (11 Jul 2022)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

APPENDIX I – CIRIA C552 RISK METHODOLOGY

The following tables are derived from CIRIA C552 and have been used to define the risk rating presented in the Qualitative Risk Assessment matrix.

Classification of consequence

Classification	Definition
Severe	Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution (note; Water Resources Act contains no scope for considering significant pollution) of sensitive water resource. Catastrophic damage to building/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Medium	Chronic damage to human health ('significant harm', as defined In DETR, 2000). Pollution of sensitive water resources (note; Water Resources Act contains no scope for considering significant pollution). A significant change in a particular ecosystem, or an organism forming part of such an ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm', as defined In DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Classification of probability

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period that such an event would take place, and is even less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Matrix of consequence against probability to gain a risk classification

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

CHILDCARE UNIT BLAENDULAIS, NEATH PORT TALBOT

DESK STUDY AND FIELD RECONNAISSANCE

Report No H1061-21

January 2022

Issue No 1

Carried out for:
Neath Port Talbot Council
The Quays
Brunel Way
Baglan Energy Park
Neath
SA11 2GG



Report No H1061-21

ISSUE No DATE	STATUS	PREPARED BY	CHECKED BY	APPROVED BY
1 Dec 2021	Draft report	NAME and QUALIFICATIONS Ruth Blair BSc (Hons) FGS	NAME and QUALIFICATIONS Hugh Woodroffe BSc (Hons) FGS	NAME and QUALIFICATIONS Alex Wall BSc (Hons) FGS
		SIGNATURE 	SIGNATURE 	SIGNATURE 
1 Jan 2022	Final report	NAME and QUALIFICATIONS Andrew Figgis BSc (Hons)	NAME and QUALIFICATIONS Hugh Woodroffe BSc (Hons) FGS	NAME and QUALIFICATIONS Alex Wall BSc (Hons) FGS
		SIGNATURE 	SIGNATURE 	SIGNATURE 

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1 INTRODUCTION

SOCOTEC UK Limited (SOCOTEC) was commissioned in October 2021 by Neath Porth Talbot Council, to carry out a Desk Study and Field Reconnaissance for a proposed childcare unit (single story) in Blaendulais.

This desk study has been prepared in accordance with British Standards BS 5930:2015+A1 (2020) and BS 10175:2011+A2 (2017) and all normative references, including the Environment Agency (2020) online guidance *Land contamination: risk management (LCRM)*.

The Desk Study which incorporates the records of a Field Reconnaissance, see Appendix E presents and discusses the available data obtained for the site and surrounding area regarding its physical, historical and environmental setting. It identifies the potential issues at the site, develops an initial conceptual site model (CSM) for geoenvironmental considerations and provides an assessment of geotechnical aspects and other pertinent ground hazards that could affect the development.

The principal objective of this investigation and the context of the CSM developed within this report is to provide an assessment of potential significant risks in order to:

- Assess the potential requirements for further mitigation or investigation of land contamination risks to ensure that the proposed development will be 'suitable for use'.
- Give an account of the anticipated ground conditions at the site based upon published geological and hydrogeological information.
- Provide an account of any past/historic mining activities on or near the site which may pose a geotechnical risk to the proposed works.
- Provide information for detailed scoping of intrusive investigations.

2 SOURCES OF INFORMATION

The following sources of information have been used in preparation of this report:

- Extracts of available historical Ordnance Survey (OS) maps covering the period from 1876 to 2021 which are presented in Appendix B.

- A Groundsure Enviro + Geo Insight report (ref: GS-8293536 27/10/2021) for an area up to 1 km from the centre of the site which is reproduced in Appendix C. The Enviro Insight report is compiled from the database of information maintained by various statutory bodies listed within Appendix C. It included a series of maps showing the approximate position of the listed data together with details on geology, ground workings, mining and extraction, borehole records and estimated background soil chemistry.
- The British Geological Survey (BGS) website (as viewed during November 2021).
- Consultant Coal Mining Report (ref: GS-8293535 27/10/2021). This is reproduced in Appendix D.
- A Field Reconnaissance (Site Walkover Survey) undertaken on 01/11/2021, see site walkover checklist and photographs in Appendix E.
- Public utility service plans in Appendix F.

3 SITE SETTING

3.1 Location and Description

Blaendulais, Seven Sisters is a village which lies 13.5 km northeast of Neath, lying within Neath Port Talbot County Borough. The proposed site is located at National Grid reference SN 819 089, see Site Location Plan in Appendix A. The nearest postcode is: SA10 9DL.

The site is currently an unused, largely overgrown Brownfield site. The topography of the site is stepped, with the highest point being the southern boundary of the site. The site slopes down to the northeast and flattens off for approximately 5 m, then is stepped again parallel with the southern boundary of the site. The remainder of the site is relatively flat. It is a reasonable assumption that the stepped nature of the site is due to the construction/stabilisation of the adjacent road (Commercial Street) to the south.

The site comprises established trees along the south and eastern boundaries of the site and is generally largely overgrown. During the site walkover visit, ground underfoot was damp and in some places, marshy. An electricity substation (appeared to be functioning at the time of the site walkover) is located in the west of the site. A concrete slab (approximately 2.5 m²) is located to the east of the electricity substation. It is assumed to be associated with the previous use of the site.



The site is bounded by roads to the south (Commercial Street) and west (High Street). A railway line runs parallel with the eastern boundary of the site, this runs in a northeast southwest direction. The land to the north of the site is brownfield (overgrown). The vehicular entrance to the plot of land is approximately 50 m north of the northern site boundary.

Utility plans of the site have not been provided by NPTC. Overhead cables were observed parallel (outside of the site boundaries) with the southern and eastern boundaries.

4 FIELD RECONNAISSANCE

The notes made during the field reconnaissance undertaken on 1 November 2021 together with photographs taken are presented in Appendix E. The site was encountered as described in Section 3.1.

5 PHYSICAL AND HISTORICAL SETTING

The development of the site and surrounding area has been reviewed by reference to the historical maps and is summarised in Table 1 below.

TABLE 1 SUMMARY OF SITE HISTORY

DATE AND MAP SCALE	ON SITE DEVELOPMENT	NEARBY DEVELOPMENT
Ordnance Survey (1877-1879 and 1876-1877) Scales: 1:2,500 and 1:10,560	Undeveloped site. Potential path/bridleway running from north to south through centre of site.	The 'Neath and Brecon Railway' runs parallel with the south-eastern boundary of the site. The railway runs in a northeast southwest direction. A station is located approximately 80 m northeast of the site. A station is noted some 60m to the northeast of the site. Residential dwellings are located approximately 70 m north of the site. The River Dulais is located approximately 260 m to the northwest of the site. This runs in a northeast southwest direction and flows towards the southwest. The Nant-Hit river is located approximately 500 m south of the site. This runs in an east west direction and flows towards the west.



		The Seven Sisters Pit (coal) is located approximately 280 m north east of the site which includes 2 shafts. An 'Old Tramway' is located approximately 150m north of the site.
Ordnance Survey (1899-1904) Scale: 1:2,500	Undeveloped site. Path as previously noted no longer shown.	Residential development extending between 40 m and 180 m to the east of the site. A school is located approximately 80 m southeast of the site. Seven Sisters Pit (coal) is now named 'Seven Sisters Colliery'. A reservoir is located approximately 300 m northeast of the site. (This was noted on previous historic maps, however not noted as a reservoir)
Ordnance Survey (1918) Scale: 1:2,500	Buildings (unknown uses) constructed to north and northwest of the site. These extend slightly inside site boundary.	A road (Commercial Street) has been constructed along the southern boundary of the site. Significant residential development extending between 20 m and 300 m to the east and southeast of the site.
Ordnance Survey (1961-1962) Scale 1:2,500	Land use and features remains the same.	Significant residential development extending between 250 m and 500 m to the southeast of the site.
Ordnance Survey (1988-1933) Scale 1:2,500	Land use and features remains the same.	Seven Sisters Colliery Fire station is located approximately 170 m to the northwest of the site.
Ordnance Survey (2003) Scale 1:1,250	Building (unknown use, however presumed to be previous flats as known from anecdotal evidence) constructed to north of the site, extending into the site boundary. PC (understood to be public toilets as known from anecdotal evidence) located in the west of the site.	Further development of residential dwellings seen in the wider area.

6 PROPOSED DEVELOPMENT

From information provided by NPTC it is understood that the purpose of this desk study is to inform of site conditions for the proposed development of a childcare unit (single story) to include, but is not limited to the following:

- The construction of a single story child care unit (shown to include toilets, store rooms, kitchens and plant rooms).
- Staff and public parking area.
- Bin store
- Existing substation indicated to remain.

7 SITE GEOLOGY AND ENGINEERING GEOLOGICAL MODEL

7.1 Published Geological Information

The published geological map for the area, BGS Sheet 231 (1979), and the BGS GeoIndex Onshore online viewer (2021) show the north of the site to be located on recent Glaciofluvial deposits (Diamicton Till). The south of the site is not shown to contain superficial deposits.

The underlying bedrock is indicated to comprise South Wales Middle Coal Measures Formation of Carboniferous age characterised by Mudstone, Siltstone and Sandstone.

7.2 Surface Ground Workings

The GeolInsight report indicates 1 historical surface ground working feature on site which is reported to be a mill pond in 1921.

The GeolInsight report records 8 ground workings within 250 m of the site. These are summarised below. It should be noted that the GeolInsight report records 27 surface ground workings within 250 m of the site, however a number of these are duplicated.

- 3 m SE, Colliery (unknown, no details provided)
- 15 m SE, Cuttings (associated with adjacent railway)
- 47 m S, Cuttings
- 72 m NE, Colliery
- 115 m SW, Cuttings
- 150 m NE, Colliery
- 200 m NE, Refuse heap
- 246 m NE, Refuse heap

7.3 Underground Workings (including mining and extraction)

The Coal Authority report indicates that there has been historic coal mining undertaken on site. The Gorwilyn Seam (workable) is recorded to outcrop on site.

There are no mine entries within 100 m of the site. In addition to this there are no faults or fissures recorded.

The GeolInsight report holds 5 records of underground (coal and non-coal) mining within 1 km of the site. These are summarised below. It should be noted that the GeolInsight report indicates 14 records, however a number of these are duplicates.

- 88 m NE, unspecified mine
- 135 m NE, colliery
- 224 m NE, coal pit
- 271 m to 290 m NE, unspecified shafts
- 992 m NE, coal pit

7.4 Hydrogeology and Groundwater Abstraction

The hydrogeological characteristics of the site are summarised below:

TABLE 2 SUMMARY OF HYDROGEOLOGICAL CHARACTERISTICS

HAZARD	REMARKS
Aquifer Classification within Superficial Geology	The site is not located on a superficial aquifer. A Secondary Undifferentiated Aquifer is located approximately 20 m to the north of the site, and extends to the east and west of the site.
Aquifer Classification within Bedrock	The site is located entirely on a Secondary A bedrock aquifer.
Groundwater/ Potable Water Licence Abstraction	There are no active groundwater abstraction points within 2 km of the site.
Source Protection Zones	The site is not located within a Source Protection Zone.

7.5 Hydrology, Flooding and Surface Water Abstraction

Information on the hydrological characteristics of the site are summarised below:

TABLE 3 SUMMARY OF HYDROGEOLOGICAL CHARACTERISTICS

HAZARD	REMARKS
Surface Water Features / River Network	The River Dulais is located approximately 300 m northwest of the site. This runs in a northeast southwest direction and flows in a south-westerly direction. An unnamed watercourse is located approximately 90 m to the southwest of the site. This runs in a northeast southwest direction and flows in a south-westerly direction.
Surface Water Flood Risk	The site is not at risk of surface water flooding.
Fluvial Flood Risk	The site is not at risk of fluvial flooding.
Flood Defences / Groundwater Flooding / Susceptibility and Confidence Areas	The site is at negligible risk of groundwater flooding. The site is classed as “Secondary Bedrock Aquifer – Low Vulnerability”

8 GEO- HAZARDS

Information on various geological hazards is contained within the Groundsure GeolInsight report, and the risks categorised between *Negligible* and *High* as follows.

TABLE 4 SUMMARY OF POTENTIAL GEOLOGICAL HAZARDS

HAZARD	RISK CATEGORY	REMARKS
Shrink Swell Clay	Very Low	-
Landslides	Very Low	It should be noted that land directly to the east of the site is at ‘Low’ risk of landslides.
Ground Dissolution of Soluble Rocks	Negligible	-
Compressible Deposits	Negligible	-
Collapsible Deposits	Very Low	-
Running Sands	Negligible	-
Ground Workings – on-site and offsite	Yes	On-site: historical mill pond (1921) Offsite: 3 m SE, Colliery (unknown, no details provided)



		• 15 m SE, Cuttings (associated with adjacent railway) • 47 m S, Cuttings • 72 m NE, Colliery • 115 m SW, Cuttings • 150 m NE, Colliery • 200 m NE, Refuse heap • 246 m NE, Refuse heap • 88 m NE, unspecified mine • 135 m NE, colliery • 224 m NE, coal pit • 271 m to 290 m NE, unspecified shafts • 992 m NE, coal pit
Mining, Extraction and Natural Cavities – on-site and offsite	Yes	See section 7.3
Artificial Ground	No	Artificial is likely to be present given the previous use of the site and the close proximity to development.

8.1 Ground Gas

8.1.1 Radon

According to the Geo Insight report the estimated proportion of homes near the site that are above the radon action level is less than 1%.

8.1.2 Coal Measures

Coal measures are known to underlie the site, the principal ground gasses associated with the Coal Measures are methane (CH₄), hydrogen sulphide (H₂S) and carbon dioxide (CO₂). All of these gases are considered detrimental to human health. Methane is potentially explosive in particular concentrations while H₂S and CO₂ are considered to be asphyxiants.

8.1.3 Made Ground

According to the Geo and Enviro Insight report, the site and surrounding land does not contain made ground, however given the surrounding development, it is likely that some thickness of made ground may be present. It is also likely that the former mill ponds have been infilled and therefore some

thickness of Made Ground is likely associated with this feature. Given the perceived relatively shallow bedrock Made Ground is not anticipated to be particularly deep.

8.1.4 Landfill

The Geo and Enviro Insight report indicates that there are no current or historical landfills on site. There are 2 records of historical landfills located approximately 197 m NE and 275 m N of the site. The type of landfill is unknown, thus the materials are not well understood at the desk study stage and may have potential for the generation of ground gas.

A historical mill pond has been identified on site and it is assumed that this has been backfilled at some point especially prior to the previous development. There are no details available for the type of back fill used (or its source) and the use of the mill pond is unknown. Therefore, the material uses associated with the back fill and use of the mill pond(s) may be a potential source of ground gases. The mill pond(s) are not shown on the historical maps so their location cannot be confirmed.

9 OTHER CONSIDERATIONS

9.1 Archaeology and Ecology

No archaeological or ecological consultation has been undertaken as part of this study. As such, both will require specialist assessments, if required, at a later stage.

9.2 Unexploded Ordnance (UXO)

The Zetica Unexploded Ordnance (UXO) Risk Map indicates there is a low UXO risk on and in the vicinity of the site.

9.3 Utilities

Given the largely built up residential and commercial surroundings, the site and surrounding area are likely to contain underground services and as such available public utility plans were supplied by NPTC to SOCOTEC in January 2022. The details of which are summarised below:

- Openreach (BT Apparatus) – None shown on site area, however apparatus are shown bounding the site to the northwest and southwest, which are likely to be external to the site in the pavement.
- Western Power Distribution (Electricity) – An existing electricity sub station is located on the site and connecting underground cables, comprising two high voltage (HV) 11kV cables and three low voltage (LV) cables are shown from the sub station, trending to the north west towards High Street. Two underground LV cables are shown from the sub station, trending to the south west towards Commercial Street. In addition, a HV 11kV cable and two LV cables are shown entering the south eastern corner of the site area from the A4109. Further HV and LV cables are shown bounding the site to the northwest and southwest, which are likely to be external to the site in the pavement.
- ESP Utilities Group (Gas) – None shown on site area.
- Wales & West Utilities (Gas) – None indicated on site area.
- Virgin Media (Fibre Optic Cables) – None shown on site area.
- Dwr Cymru Welsh Water (Water and Drainage) – None shown on site area.

During the site reconnaissance, a gas pipe (above ground) was observed. This appears to protrude from the south and is then directed towards the east, over the railway and then under the A4109 to the east of the site.

No drainage was observed within the site boundary, however a drainage cover was observed approximately 45 m to the northeast on the hardstanding vehicular access to the plot. This cover was not lifted during the site reconnaissance.

Overhead services run parallel with the roads to the east (High Street) and south (Commercial Street) of the site. These lie outside the site boundaries.

10 ENVIRONMENTAL SETTING

10.1 Designated Environmentally Sensitive Sites

In the context of this report sensitive land usage covered by the Enviro Insight report includes the following:

- Sites of Special Scientific Interest (SSSI) and Ramsar.
- Local and National Nature Reserves (LNR, NNR,).
- Special Protection Areas (SPA) and Special Areas of Conservation (SAC).
- World Heritage Sites and Ancient Woodlands.
- Areas of Outstanding Natural Beauty (AONB) and Environmentally Sensitive Areas (ESA).
- Forest and National Parks.
- Nitrate Sensitive Areas and Nitrate Vulnerable Zones (NSA, NVZ).

The proposed development site does not lie within or close to any sensitive land uses as defined by the Enviro Insight report with the exception of Designated Ancient Woodland. The Geo and EnviroInsight report records of 12 Ancient Woodlands between approximately 200 m and 2 km from the site.

10.2 Environmental Permits, Incidents and Registers Map

10.2.1 Industrial Sites Holding Licences and/or Authorisations

According to the EnviroInsight report, there is a licensed discharge to controlled waters (the River Dulais) approximately 485 m W of the site. A historic licence (1963) and a current permit (2019 to present) is in place at this location. This is for the discharge of sewer storm overflow (water company).

10.2.2 Dangerous or Hazardous Sites

According to the information provided in the EnviroInsight report there are no Dangerous or Hazardous sites or substances within 2 km of the site.



10.2.3 Environment Agency Recorded Pollution Incidents

According to the EnviroInsight report, there are 9 records of substantiated pollution incidents within 500 m of the site. These are summarised in Table 5 below (listed by increasing distance from the site). It should be noted that the Geo and EnviroInsight report records 16 pollution events, however a number of these appear to be duplicated.

TABLE 5 SUMMARY OF POTENTIAL POLLUTION INCIDENTS

DATE AND LOCATION	POLLUTANTS AND REMARKS	WATER, LAND AND AIR IMPACTS
3 Jan 2014 143 m E	Contaminated Water (fire-fighting runoff)	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
13 Feb 2003 190 m E	Oils and Fuel (diesel)	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
18 October 2002 216 m S	Oils and Fuel (diesel)	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
12 June 2007 267 m N	Sewage Materials (crude sewage)	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
18 May 2001 346m N	Not identified	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
11 June 2007 359 m W	Inert Materials and Wastes	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
6 April 2001 and 4 June 2001 390 m E	Construction and Demolition materials and wastes, asbestos commercial waste, household waste, tyres and vehicle parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
6 May 2015 412 m NE	Sewage Materials (crude sewage)	Water Impact: Category - Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)

10.2.4 Sites Determined as Contaminated Land Under Part 2A EPA 1990

The Enviro Insight report does not list any Environmental Permits, Incidents or Registers within 500 m of the site.

10.3 Landfill and Other Waste Sites

10.3.1 Landfill Sites

According to the information provided in the Enviro Insight report there are 2 historic (circa 1962) landfills within 500 m of the site. These are located 197 m NE and 275 m N of the site.

10.3.2 Other Waste Sites

In addition to the historical landfills listed in Section 10.3.9, the Enviro Insight report states that there is 1 waste exemption site located 254 m W of the site. This is listed to be 'use of waste in construction, on a farm'.

10.4 Current Land Uses

The Enviro Insight report covers other potential contamination sources close to the site including:

- Current Industrial Data
- Petrol and Fuel Stations
- Underground High Pressure Oil and Gas Pipelines
- Hazardous substance storage/usage
- Licensed pollutant release (Part A(2)/B)
- Licenced discharges to controlled waters

According to the Enviro Insight report, the proposed development site does not lie within or close to any of the above types of site, however during the site reconnaissance, an electricity substation was observed (functioning) in the west of the site.

11 INITIAL GEOENVIRONMENTAL CONCEPTUAL SITE MODEL

11.1 General

In line with existing legislation and the current regime for the management of contaminated land, assessments are undertaken using a risk based approach. It is necessary to define a Conceptual Site Model (CSM) for the site which identifies the potential sources of contamination, the receptors and the pathways that can connect them. In order for there to be a risk from contamination, one or more relevant pollutant linkages must exist, connecting a contamination source, a receptor (an entity which might be affected by the contamination) and a pathway (or mechanism) by which the receptor can be exposed to the contaminant.

A discussion of potential sources, pathways and receptors and a tabulated summary of the CSM indicating potential pollutant linkages follows. The criteria used for assessing the relevance of identified potential pollutant linkages are based on the objectives stated above.

It is assumed that the “Childcare Unit” development will be for the use of children and staff. It is understood this will not involve the cultivation of plants for consumption so is may be considered a commercial property.

There are no known environmental receptors associated with this development.

11.2 Potential Sources of Contamination

Potential sources of contamination are usually associated with current and former industrial activities, where the processing, storage, use, transportation and disposal of raw materials, products and wastes often leads to the contamination of underlying ground and groundwater. In addition, natural processes can also give rise to contamination such as hazardous gases.

Based on the information presented above, potential sources of contamination from current and historical site uses and from potentially significant off site sources have been assessed. Potential sources of contamination and contaminants at and within the site boundary are summarised in the table below. These are based in the desk study data obtained and published guidance.

TABLE 6 POTENTIAL SOURCES OF CONTAMINATION

SITE USE / ACTIVITY AND AREA	SOURCES	CONTAMINANTS
Current on-site:		
Electrical Substation	Leaks of coolant from plant as they age.	Polychlorinated biphenyls (PCBs)
Coal seam outcropping beneath site	Ground gas generation	Harmful ground gasses H ₂ S, CH ₄ and CO ₂
Previous building remains	Degradation of macadam material leaching into the soils. Possible old services leaks, demolition rubble.	Unknown; possible hydrocarbons, metals, inorganic and organic contamination and asbestos
Historic on-site:		
Past building on site	Unknown.	Unknown possible hydrocarbons, heavy metals, inorganic and organic contamination.
Railway sidings	Spills and tipped material associated with the rails use and transport.	Unknown possible hydrocarbons, heavy metals, inorganic and organic contamination and asbestos
Mill pond(s)	Material that settled in mill pond and source of infill not known.	Unknown; possible hydrocarbons, metals, inorganic and organic contamination and asbestos
Coal Mining (Surface)	Unknown though machinery and infrastructure may have been present.	Unknown possible hydrocarbons, heavy metals, inorganic and organic contamination, potential asbestos.
Coal Mining (underground)	Ground gas generation	Harmful ground gasses H ₂ S, CH ₄ and CO ₂
Possible toilet block	Unknown	Unknown possible inorganic and organic contamination.
Current offsite:		
Gas pipe line	Leaks from pipe as it aged	Possible hydrocarbons
Historical offsite:		
Railway, tramway and station	Spills and tipped material associated with the rails use and transport.	Unknown possible hydrocarbons, heavy metals, inorganic and organic contamination and asbestos

11.3 Potential Migration Pathways

The following potential pathways have been identified as potential migration pathways:

- Direct soil, soil dust and/or water ingestion.
- Inhalation of soil dust, soil vapour and/or water vapour.
- Dermal contact with contaminated soil, soil dust and/or water.
- Consumption of home-grown produce and soil attached to home-grown produce.
- Lateral and vertical migration of gases and/or vapours through permeable strata.
- Permeable ground conditions/rainfall infiltration.
- Leaching of contaminants from soils into soil pore water and shallow groundwater.
- Downward migration of soil pore water and shallow groundwater.
- Lateral groundwater flow.
- Preferential pathways including existing and proposed services trenches and foundations.
- Surface water runoff into drains.

11.4 Potential Receptors

Potential receptors have been identified and categorised as follows:

11.4.1 Human Health

- Construction workers (during construction phase)
- Future site users
 - o Adult staff
 - o Male and female children of various ages
- Neighbouring site occupants (residential and light commercial properties within close proximity to site).
- Maintenance workers

11.4.2 Controlled Waters

- Bedrock is a Secondary A Aquifer.
- River Dulais is located approximately 300 m northwest

11.4.3 Environmental Receptors

There are no known environmental receptors. The nearest is a designated woodland 201 m north of the site but is considered sufficiently far from the site for there be no risk.

11.4.4 Property, Buildings, Structures and Services

Any on or near-site, property, buildings, structures or services, within a location which is unduly effected by pollution and suffers damage or increased deterioration as a consequence, these features are likely to include:

- On-site underground infrastructure associated with the proposed development.
- On-site above-ground infrastructure associated with the proposed development.
- On-site infrastructure associated with the existing development.
- On-site foundations for buildings, both for permanent structures and temporary buildings.
- On-site damage to services which form part of the larger local and national infrastructure.
- Offsite damage to the foundations of nearby properties and roads.
- Offsite damage to any neighbouring services.

11.5 Summary

The relevant pollutant linkages based on the potential sources, pathways and receptors outlined above are tabulated below:

TABLE 7 INITIAL CONCEPTUAL SITE MODEL

SOURCE	PATHWAY	RECEPTOR
Current onsite: - Electrical Substation - Previous Building remains and demolition rubble - Coal Seam Beneath Site Contaminants: - PCBs - Hydrocarbons	Ingestion, direct contact, inhalation of dust and vapours. Migration via permeable strata into groundwater. Direct contact with contaminated soils and waters. Lateral Groundwater Migration. Ground gas generation.	Workers at time of site development. Future maintenance workers for upkeep of site. Future site users. Aquifers underlying the site.



- Possible metals - Inorganic and organic contaminants - Asbestos - Ground gases		
Historic onsite: - Past building on site - Railway sidings - Mill Pond(s) - Coal mining (surface) - Coal mining (underground) - Possible toilet block Contaminants: - Hydrocarbons, - Metals, - Inorganic and organic contamination - Ground gases - Asbestos - Unknown in places	Ingestion, direct contact, inhalation of dust and vapours. Migration via permeable strata into groundwater. Direct contact with contaminated soils and waters. Lateral Groundwater Migration. Ground gas generation.	Workers at time of site development. Future maintenance workers for upkeep of site. Future site users. Aquifers underlying the site.
Current offsite: - Gas pipe line Contaminants: - Possible Hydrocarbons,	Lateral Groundwater Migration. Ground gas generation.	Workers at time of site development. Future maintenance workers for upkeep of site. Future site users. Aquifers underlying the site.
Historical offsite: - Mining processes, - Railway, tramway and station Contaminants: - Hydrocarbons - Metals - inorganic and organic contamination - Asbestos	Dust migration to site. Lateral Groundwater Migration. Given the proximity to the site of these sources there is also potential for contaminated material to have been moved during the previous site developments.	Workers at time of site development. Future maintenance workers for upkeep of site. Future site users. Aquifers underlying the site.

There are currently a series of uncertainties and assumptions in the CSM presented above as this is based on desk study information only:



- Ground conditions have been conceptualised based on BGS geological maps and other primarily desk based information.
- The presence and extent of any suspected contamination is unknown in the absence of site investigation data.
- The presence and depth of any groundwater bodies at the site is currently unknown.
- The ground gas regime within the site has not been characterised.
- The site has been developed previously (unknown use) and there was a former mill pond on the site though its location is not known.

12 PRELIMINARY RISK ASSESSMENT

12.1 Assessment of Environmental Risks Methodology

The identification of potential pollutant linkages is a key aspect of the evaluation of potentially contaminated land. An approach based on CIRIA report C552 has been adopted. For each of the pollutant linkages, an estimate is made of:

- The potential severity of the risk; and
- The likelihood of the risk occurring.

Table 8 below presents the classification of the severity of the risk:

TABLE 8 SEVERITY OF RISK

RISK FACTOR	TYPICAL EXAMPLES
Severe	Acute risks to human health; Major pollution of controlled waters (<<the water environment>>).
Medium	Chronic (long-term) risk to human health; Pollution of controlled waters (<<the water environment>>).
Minor	Damage to non-sensitive species or ecosystems, buildings or services.

The probability of the risk occurring is classified according to the criteria provided in Table 9 below:



TABLE 9 PROBABILITY OF RISK OCCURRING

PROBABILITY RATING	DESCRIPTION
High Likelihood	Pollutant linkage may be present, and risk is almost certain to occur in the long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low Likelihood	Pollutant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present but the circumstances under which harm would occur are improbable.

An overall qualitative evaluation of the level of risk is gained from a comparison of the severity and probability as presented in Table 10 below:

TABLE 10 RISK RATING EVALUATION

		SEVERITY		
		SEVERE	MEDIUM	MINOR
PROBABILITY	HIGH LIKELIHOOD	Very high risk	High Risk	Moderate / low risk
	LIKELY	High risk	Moderate risk	Low risk
	LOW LIKELIHOOD	Moderate risk	Moderate/ low risk	Very low risk
	UNLIKELY	Moderate / low risk	Low risk	Very low risk

12.2 Preliminary Risk Assessment

Table 11 below details the potential risks associated with the various potential pollutant linkages identified through the assessment of the data collated in this report. The risk category should be

reviewed if further information is made available or the environmental setting of the site changes, for example through a proposed change in the development layout or end use.

TABLE 11 PRELIMINARY RISK ASSESSMENT

SOURCE	PATHWAY	RECEPTOR	SEVERITY	PROBABILITY	RISK RATING	COMMENTS
Onsite: Soils and Waters beneath the development and hardstanding, electrical substation, coal seam beneath site and previous building remains Hydrocarbons, PCBs, Metals, Inorganic and organic contamination, Asbestos	Ingestion, direct contact, inhalation of dust	Construction site workers Future users Maintenance workers	Severe	Likely	High risk	The mill pond(s) and railway sidings are possible sources of unknown contamination formerly present on site. PCBs may also be present if the electrical substation has leaked.
	Consumption of home grown vegetables	Future users	Medium	Likely (depending on the end use may be unlikely)	Moderate risk	If home grown vegetables are to be consumed there is a moderate risk.
	Leaching and downward migration	Groundwater in the River Terrace Deposits	Medium	Low likelihood	Moderate/low risk	The soils beneath the site have been in place for a prolonged period so leaching is likely to have occurred though may increase if the new development affects the local groundwater regime.
	Lateral Groundwater Migration	River Dulais	Medium	Likely	Moderate risk	The soils beneath the site have been in place for a prolonged period so leaching is likely to have occurred though may increase if the new development affects the local groundwater regime.
Ground gases CO ₂ , H ₂ S, CO ₄	Build-up of dangerous gases within buildings or excavations	Construction site workers Future users	Severe	Likely	High risk	The presence of potential gas generating seams and workings beneath the site and the potential for thicknesses of Made Ground mean ground gases are likely to be generated beneath the site.
Offsite: Soils and waters	Leaching and downward migration	Construction site workers	Medium	Low Likelihood	Moderate/ low risk	The nearby railway sidings and gas main may pose a potential



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Hydrocarbons, PCBs, Metals, Inorganic and organic contamination,		Future users Maintenance workers				risk given the close proximity to the site they may pose a potential moderate to low risk.
	Lateral Groundwater Migration	Construction site workers Future users Maintenance workers	Medium	Low Likelihood	Moderate/ low risk	The nearby railway sidings and gas main may pose a potential risk given the close proximity to the site they may pose a potential moderate to low risk.
	Dust transportation of soil particles	Construction site workers Future users Maintenance workers	Medium	Low Likelihood	Moderate/ low risk	The nearby railway sidings and gas main may pose a potential risk given the close proximity to the site they may pose a potential moderate to low risk.

13 GEOTECHNICAL ASPECTS

13.1 Anticipated Ground Model and Potential Hazards

The anticipated ground conditions are expected to comprise potentially an unknown thickness of made ground over Glaciofluvial deposits in the north, though these superficial deposits are noted as being absent in the south of the site. Below the superficial deposits is bedrock of the South Wales Middle Coal Measures Formation. The groundwater table is unknown at this stage.

13.2 Possible Foundation Options

Although the general outline of the development is available, no details of the proposed foundation or the loads have been provided to SOCOTEC at this time. It should also be noted that the soils and bedrock beneath the site are not known at this stage and need to be verified by an intrusive investigation. There is potential for the some areas of the site to have made ground and superficial deposits to a significant depth. The presence of a former mill pond(s) means there may be locally thicker Made Ground that may not be suitable as a founding stratum.

Generally, shallow foundations will most likely be sufficient for most buildings depending on the final loadings and ground conditions encountered during the intrusive investigation. However should made ground or soft/low-density strata be found (such as the former mill pond) to substantial depths then shallow foundation methods such as strip foundations may not be suitable. Alternative to shallow foundations such as piled foundations or ground improvement techniques may be considered though the probable shallow bedrock may mean these are unlikely to be required subject to the intrusive investigation. More over there is a potential for boulders to be encountered in the superficial deposits such as the Glaciofluvial deposits, which may affect foundation design.

13.3 Excavations

A concrete slab is present on the west of site (approximately 2.5 m²) and given the previous development there is potential for obstructions to be present from old foundations, service runs, floor slabs and demolition material from the previous materials.

Bedrock may be shallow and considerations for excavating this type of material needs to be taken. Excavations will be subject to potential variability of thickness of made ground and superficial deposits. Generally, excavations should be possible with standard excavation machinery. An intrusive investigation will be required to provide further details on the material likely to be encountered during excavations on site. Under no circumstances should anyone enter unsupported excavations due to the risk of collapse.

13.4 Pavement / Hardstanding

It may be possible for potential hardstanding at the site to use traditional pavement design (dependant on an interpretive geotechnical report). Should such pavement be required then California Bearing Ratio (CBR) testing should be undertaken in the areas where this is proposed. Given the understood ground model at this stage, CBR insitu testing is recommended as part of the intrusive investigation.

13.5 Drainage

The drainage capacity for the site is unknown with Glaciofluvial and the shallow bedrock likely to have relatively poor and variable drainage characteristics. Other services on the site are likely to encounter potentially contaminated Made Ground and some, such as water mains, may require additional testing for the installation of any new buried services at the site. The service providers should be consulted for their requirements should new or additional services be required as part of the development.

As part of the development, any services and utilities which have become redundant should be decommissioned and pipe services sealed appropriately. The alteration and any extensions to the current service and utility network on and offsite should be carefully inspected to ensure their suitability. Due to the risk for contaminant intrusion into the pipework and infrastructure, all pipework must be appropriately located before any groundworks beginning at the site. Such groundwork should conform to best guidance and standards including 'PAS 128 - Specification for underground utility detection, verification and location' and 'HSG 47 – Avoiding danger from underground services'.

14 CONCLUSIONS AND RECOMMENDATIONS

14.1 Conclusions

Geoenvironmental and geotechnical hazards may both be encountered on this site – geotechnical hazards are likely to be low but potentially high if the coals seam outcropping beneath the site has been worked, while geoenvironmental hazards may pose moderate risk. A ground investigation should be carried out to confirm the ground conditions, groundwater levels and ground gas at the proposed development locations to provide information to allow for the assessment of geotechnical parameters to be used for preliminary design of foundations along with an assessment of potential contamination on and beneath the site.

14.1.1 Preliminary Risk Assessment

The information available at this stage indicates there are potential current and historical sources of contamination on or beneath the site. The sources of these are the hard standing, past mining, former railway sidings and mill pond(s). There are likely to be contaminated soils beneath the site and as the use of soft verges has not been ruled out (neither has the production of edible plants) there is a clear pathway linkage for these to pose a risk to the end users and maintenance workers post development and construction workers during development. The potential for a thicknesses of Made Ground, to be present also means that there is potential for ground gases to also pose a risk.

Further risks are also posed by the surrounding rail sidings further from the site, though the reduced likely pathways mean these pose a lower risk than those present on the site.

A ground investigation should be carried out to confirm the ground conditions and allow assessment of the contamination potentially present at the site. Based on these finding a full geoenvironmental assessment will be required to assess the risks posed to the development and its receptors.

14.1.2 Geotechnical Risk Assessment

The information at desk study stage indicates the site is underlain by coal bearing strata that has been subject to mining both in the area surrounding and directly beneath the site. There is a coal seam recorded as outcropping directly beneath the site and though this is not recorded as having been

worked its shallow nature means it may have been worked but not recorded. Therefore it may pose a potentially significant risk to the development. In addition the deeper worked and shallow seam are also potentially sources for the generation of ground gases.

A ground investigation should be carried out to confirm the ground conditions at the development. This will allow for the assessment of geotechnical parameters for the design of the new development and further assess the risk posed by the past mining.

14.2 Recommendations

It should be appreciated that the desk study can only give indications of the likely geotechnical and geoenvironmental conditions and consequently an intrusive investigation is recommended to confirm or otherwise the findings.

- Trial pits or dynamic windowless sampling on the site to acquire suitable geotechnical and geoenvironmental samples across the site.
- Depending on the nature of the proposed structure a combined dynamic sampling and rotary coring boreholes to 5 to 10 m for foundation design and to provide deeper samples for geotechnical and geoenvironmental testing. The requirement of these will depend on the final development.
- Deep (30 m) rotary probe holes to prove sufficient coverage of superficial deposits or competent bedrock and to allow an assessment of the risk posed by any potential past shallow mine workings.
- Combined groundwater and ground gas monitoring installations to allow long term monitoring.
- In situ soakaways in trial pits and/or boreholes if soakaways form part of the proposed development.
- Geoenvironmental testing to include asbestos, metals, hydrocarbons (including SVOC and VOCs), inorganic and organic compounds and potentially PCBs.
- Geotechnical lab testing and assessment of the soils for foundation design and risk from shallow mining.
- Geoenvironmental assessment of the soils beneath the site for human health risk assessment and waste disposal.

The scope of the investigation will be dependent on the final design of the structures and their location so should be reviewed once these are known.

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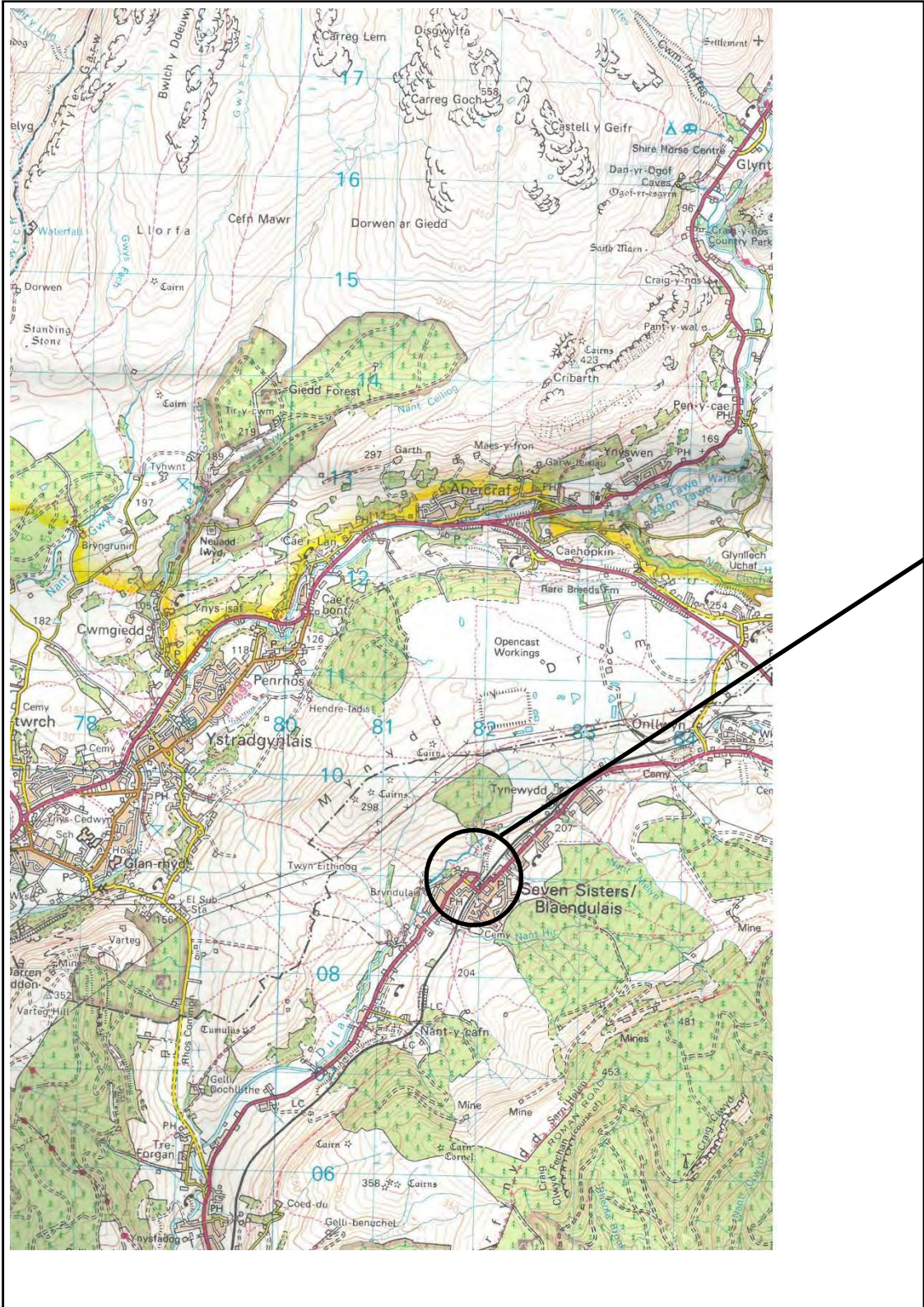
APPENDIX A

FIGURES AND DRAWINGS

Site Location Plan
Site Plan

A1
A2

Site Location Plan



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Notes: Scale 1:50 000	Project Childcare Unit Blaendulais Project No. H1061-21 Carried out for Neath Port Talbot Council	Figure A1
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Rev.	
Dwg No.	
Project	

NOTES

1. All dimensions in millimetres unless otherwise stated.

Rev	Details	Dr	Ch	Apr	Date
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County Borough Council Cyngor Bwrdeistref Sirol
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PROPERTY & REGENERATION
Nicola Pearce BSc(Hons) DipTP MRTPI
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Drawing Title

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Drawn		Checked		Approved	
Date		Date		Date	
Scales					
Drawing No.		A2			Rev.

APPENDIX B

HISTORICAL ORDNANCE SURVEY MAP EXTRACTS

Scale 1:2500 Historical Maps	1877, 1877-1879, 1899-1904, 1918, 1961-1962, 1987-1989, 1993 and 1988-1993
Scale 1:1,250 Historical Maps	2003
Scale 1:10,560 Historical Maps	1876-1877, 1877, 1901, 1903, 1913-1914, 1921, 1948, 1964-1965 and 1987-1988
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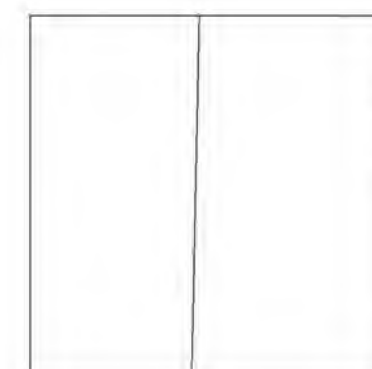
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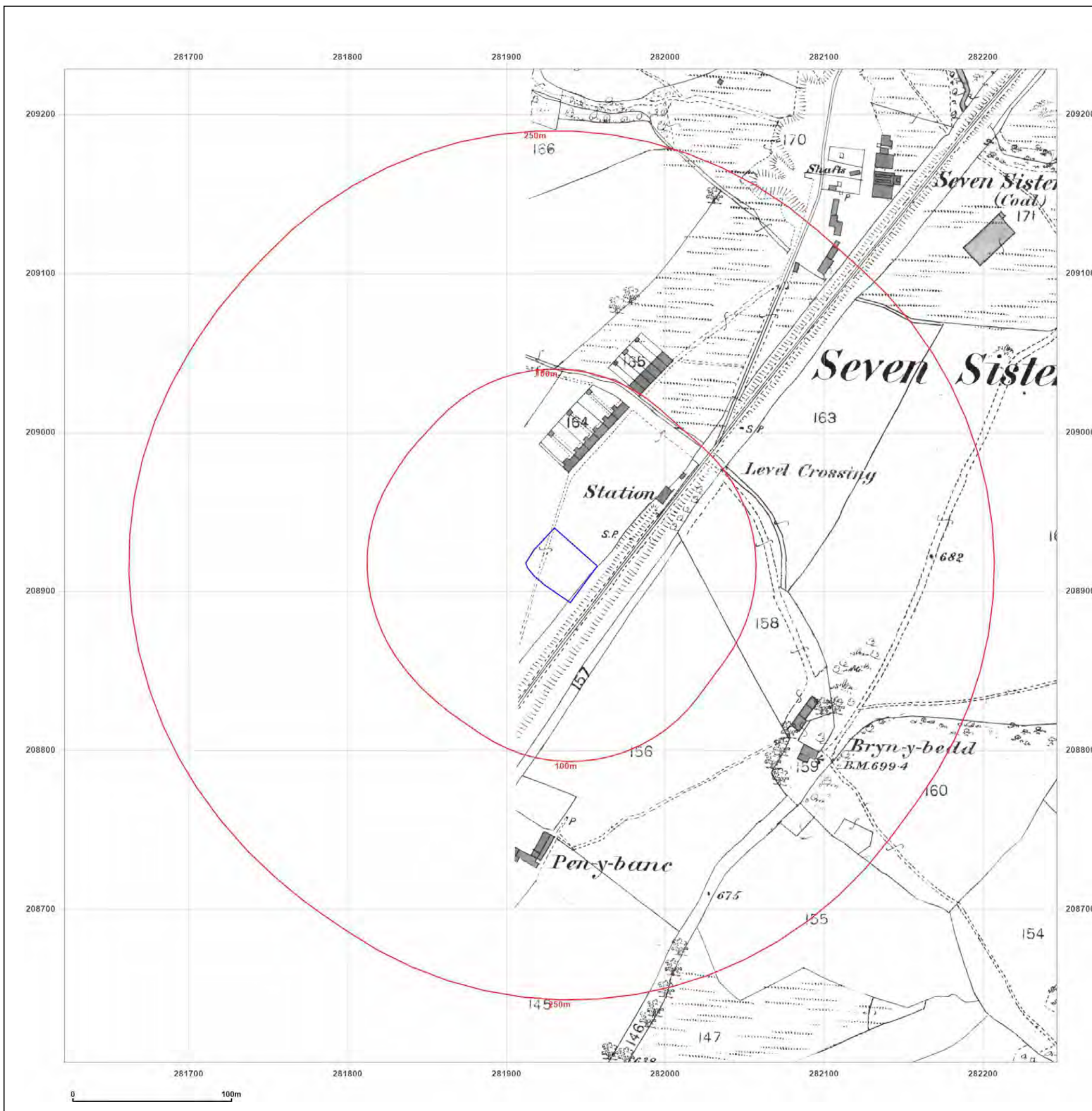


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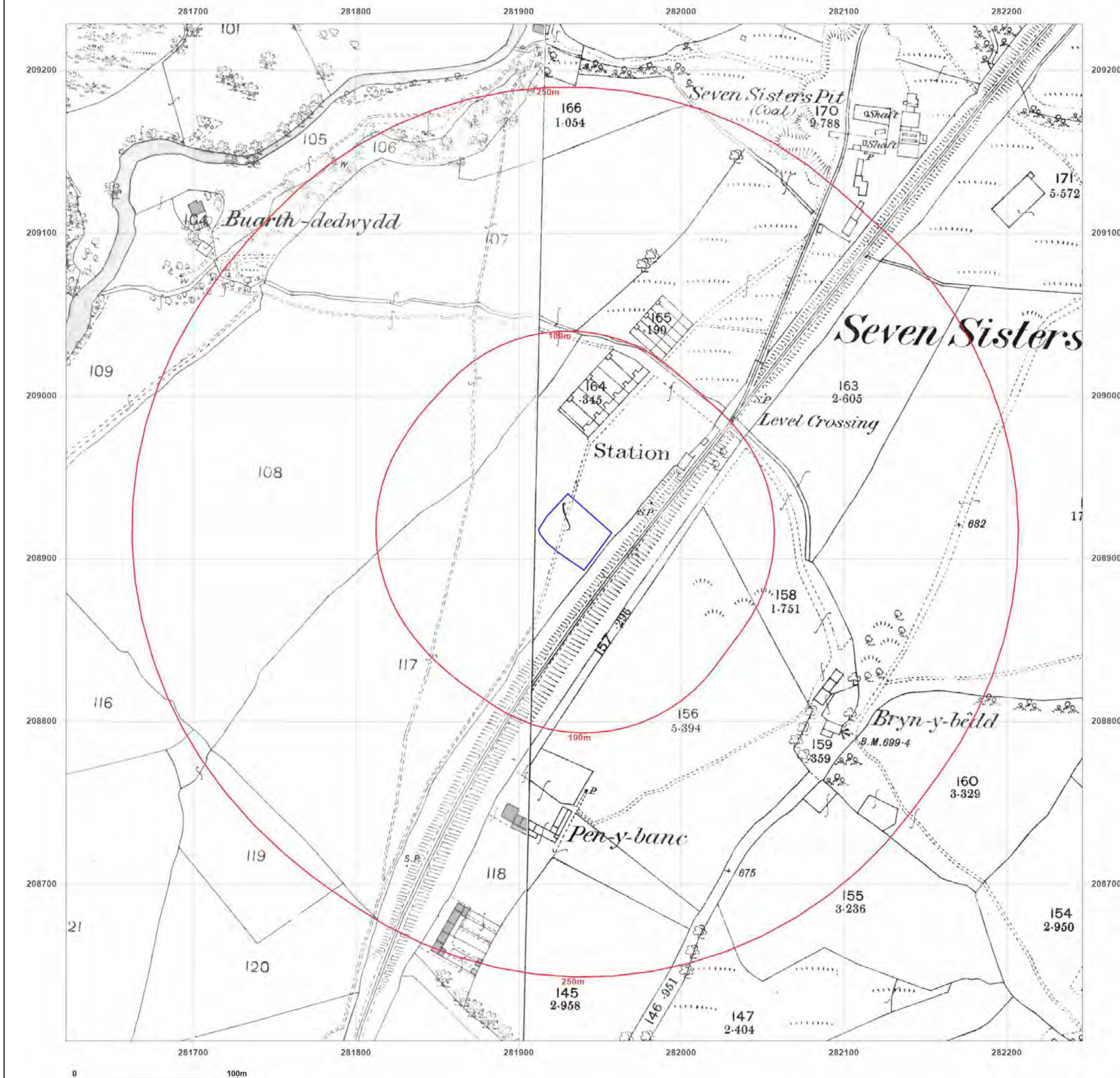


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Map Name: County Series

Map date: 1899-1904

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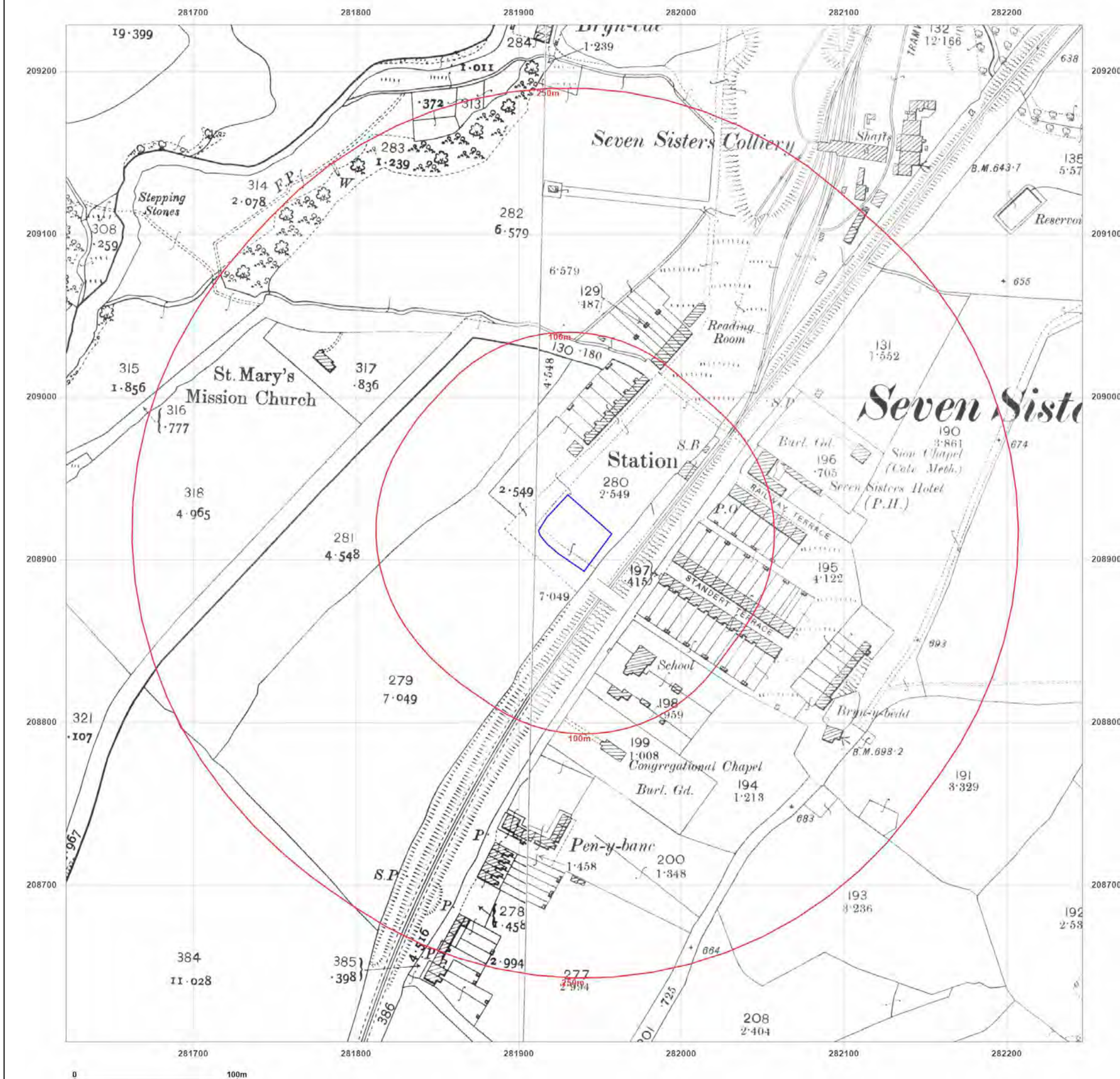


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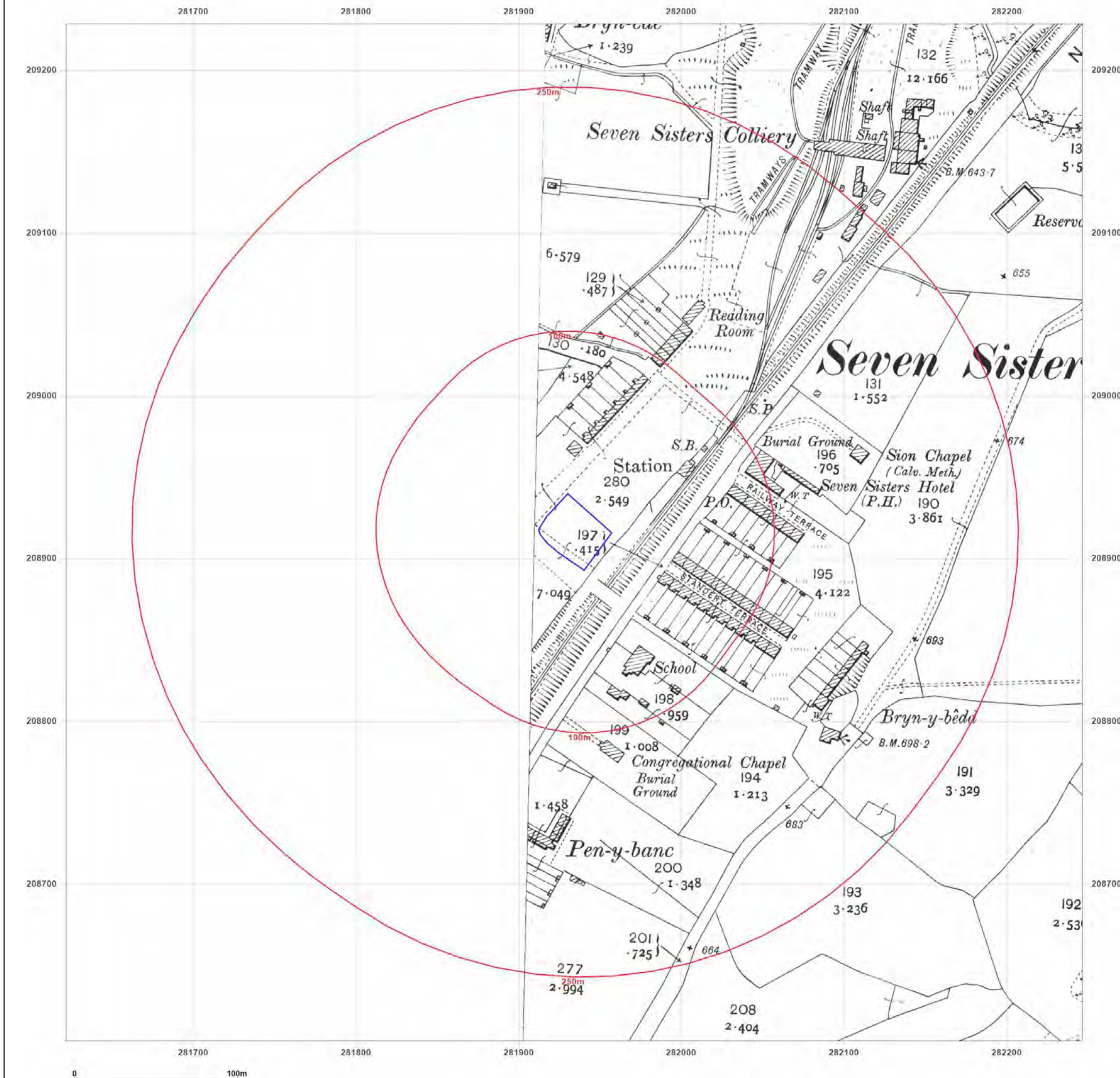


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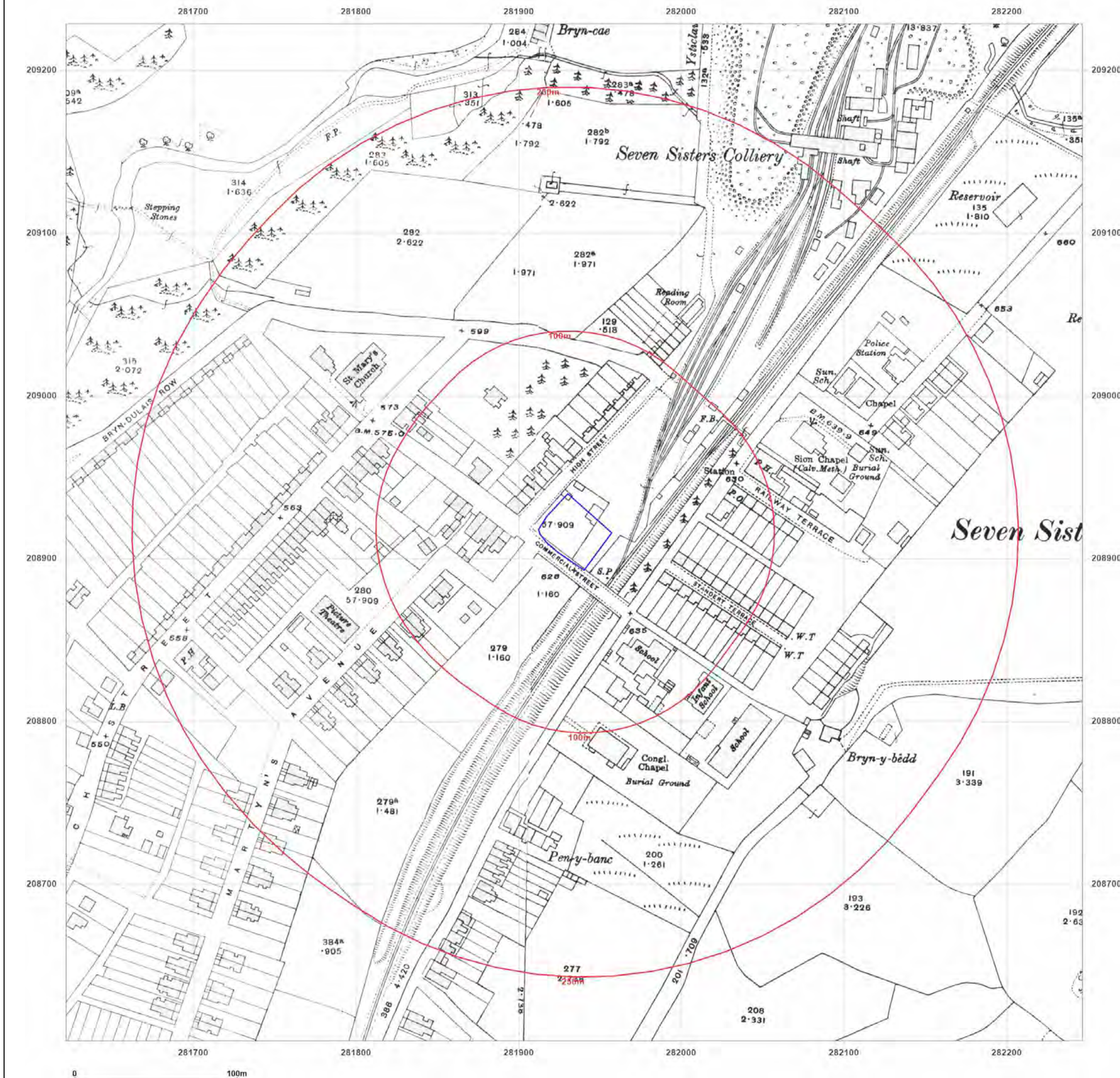


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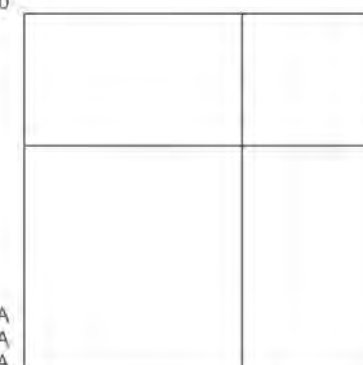
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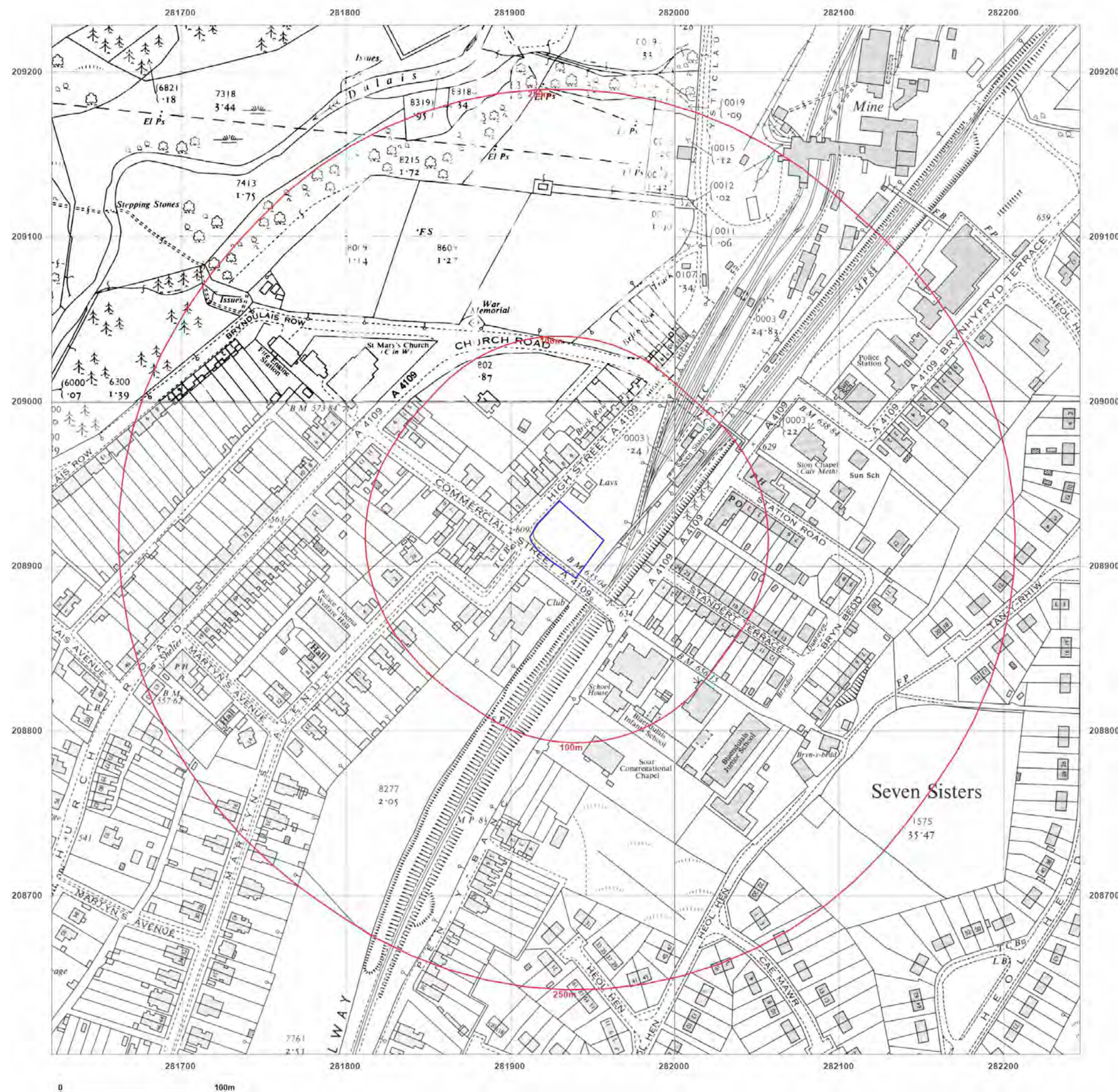


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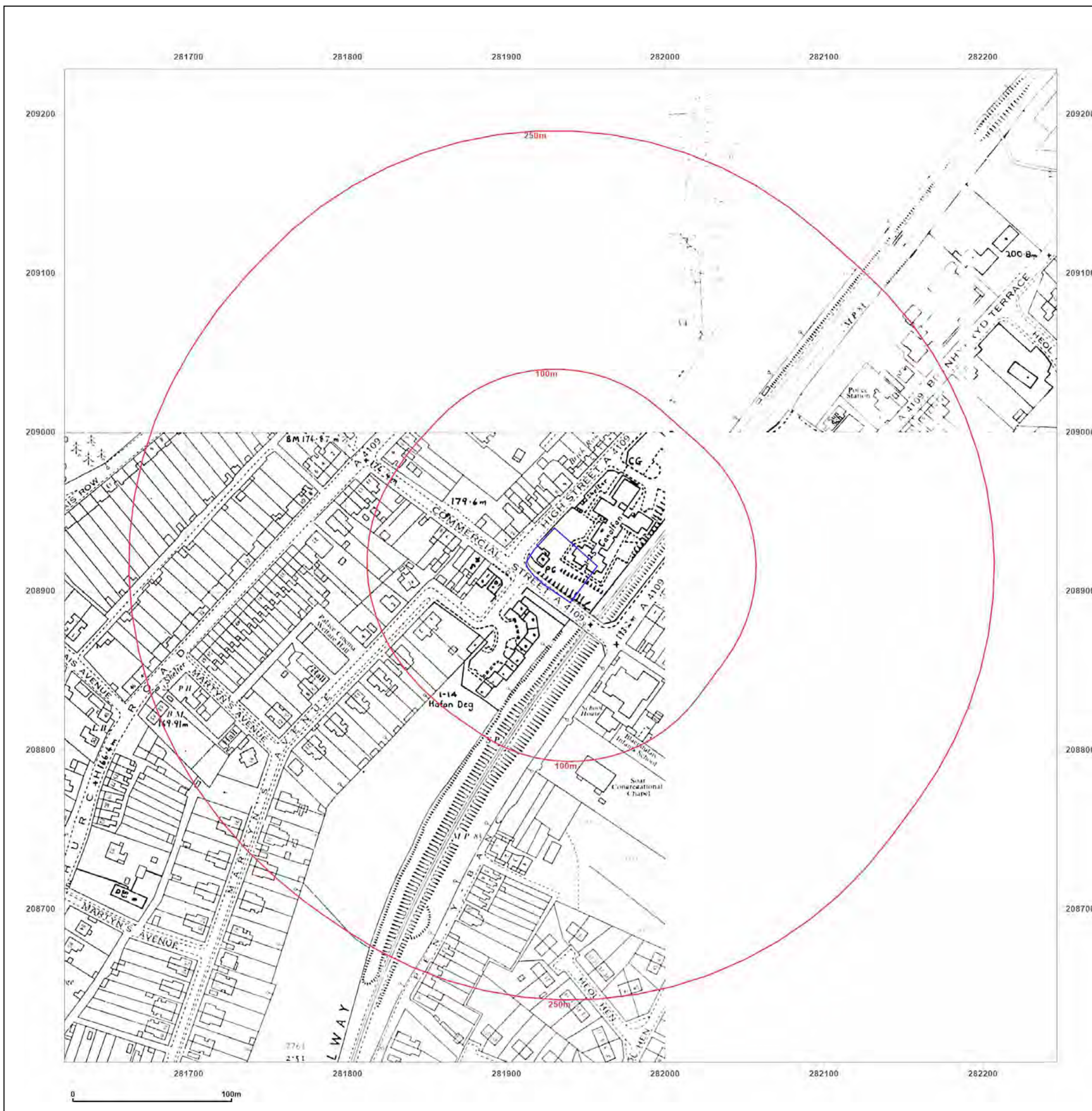


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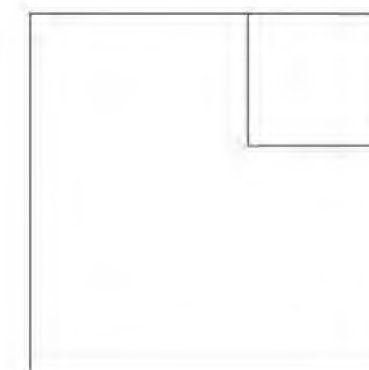
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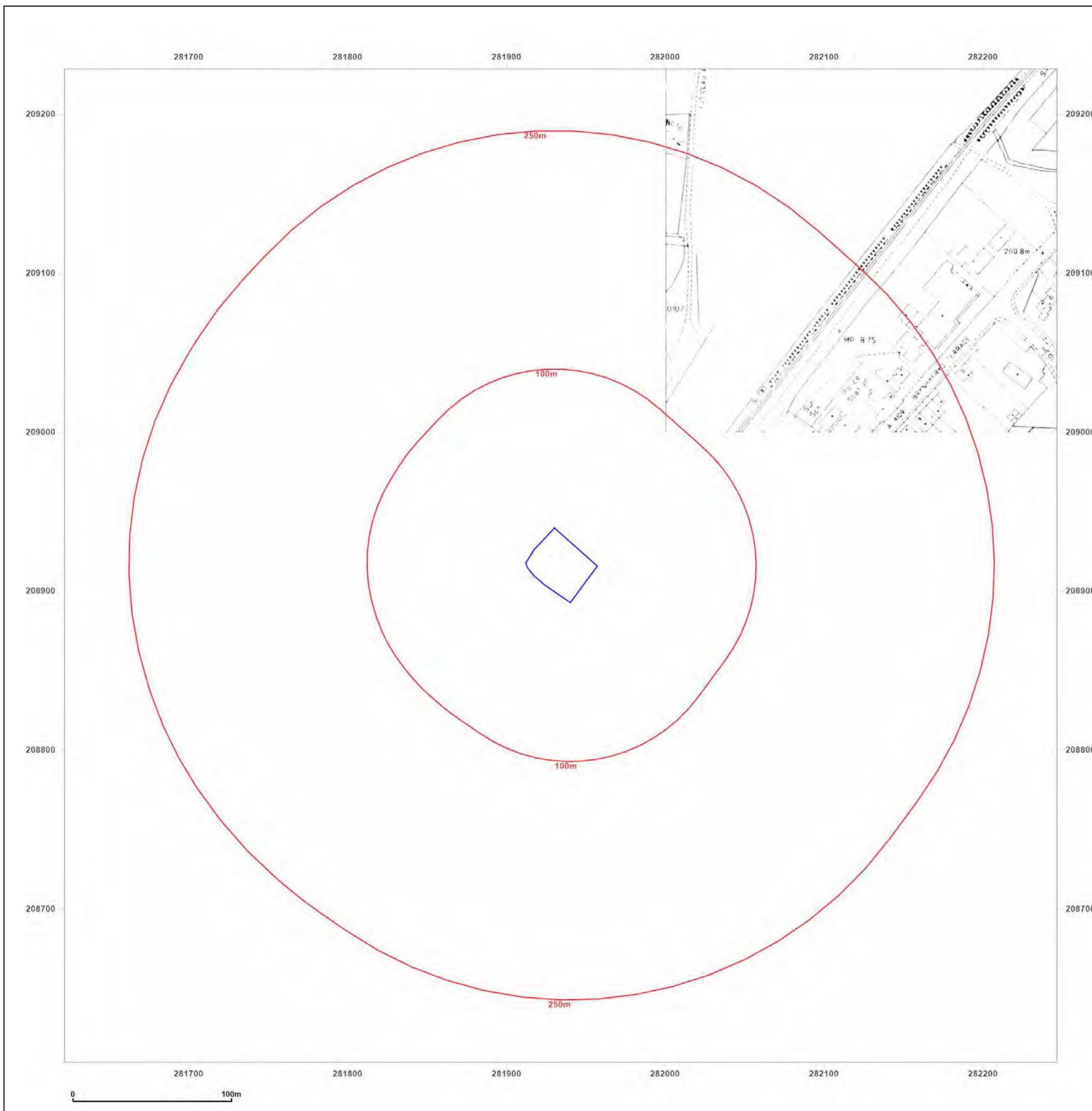


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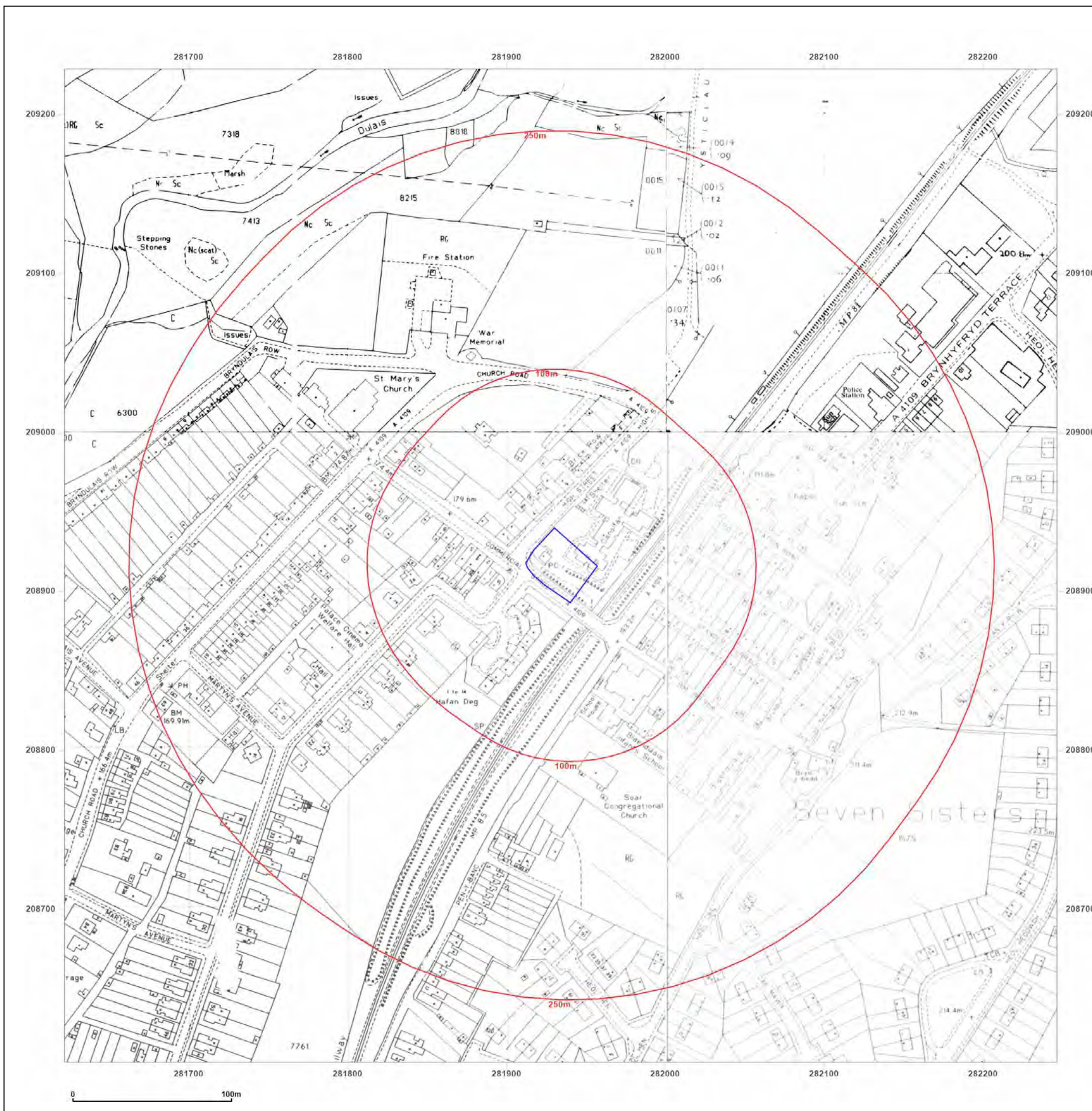


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Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

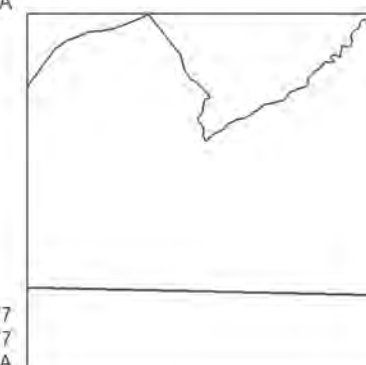
Map date: 1876-1877

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1878
Revised 1876
Edition N/A
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Surveyed 1877
Revised 1877
Edition N/A
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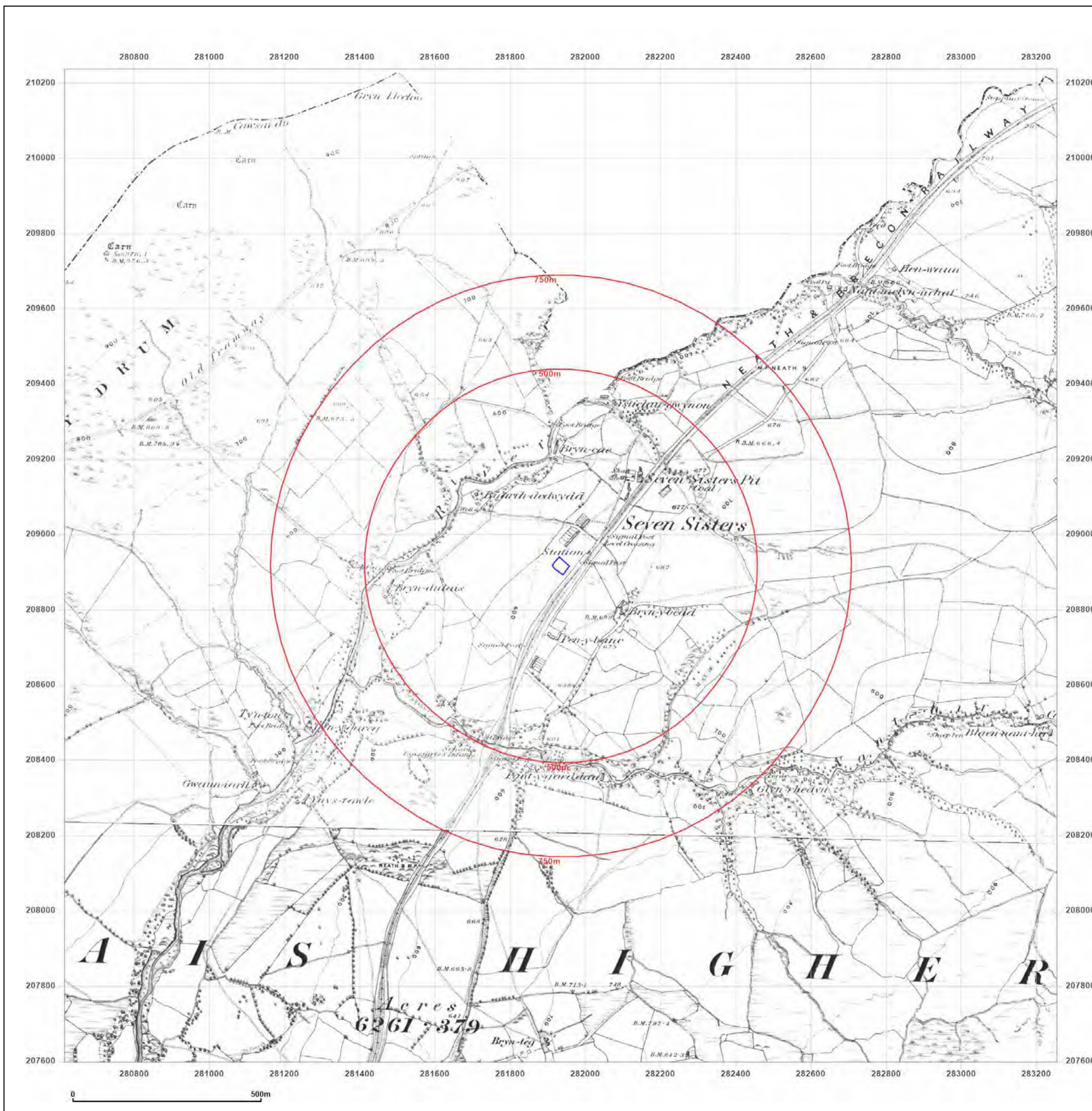


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Site Details:

LIVING ACCOMMODATION, 8,
HIGH STREET, SEVEN SISTERS,
SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

Map date: 1877

Scale: 1:10,560

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Revised 1877
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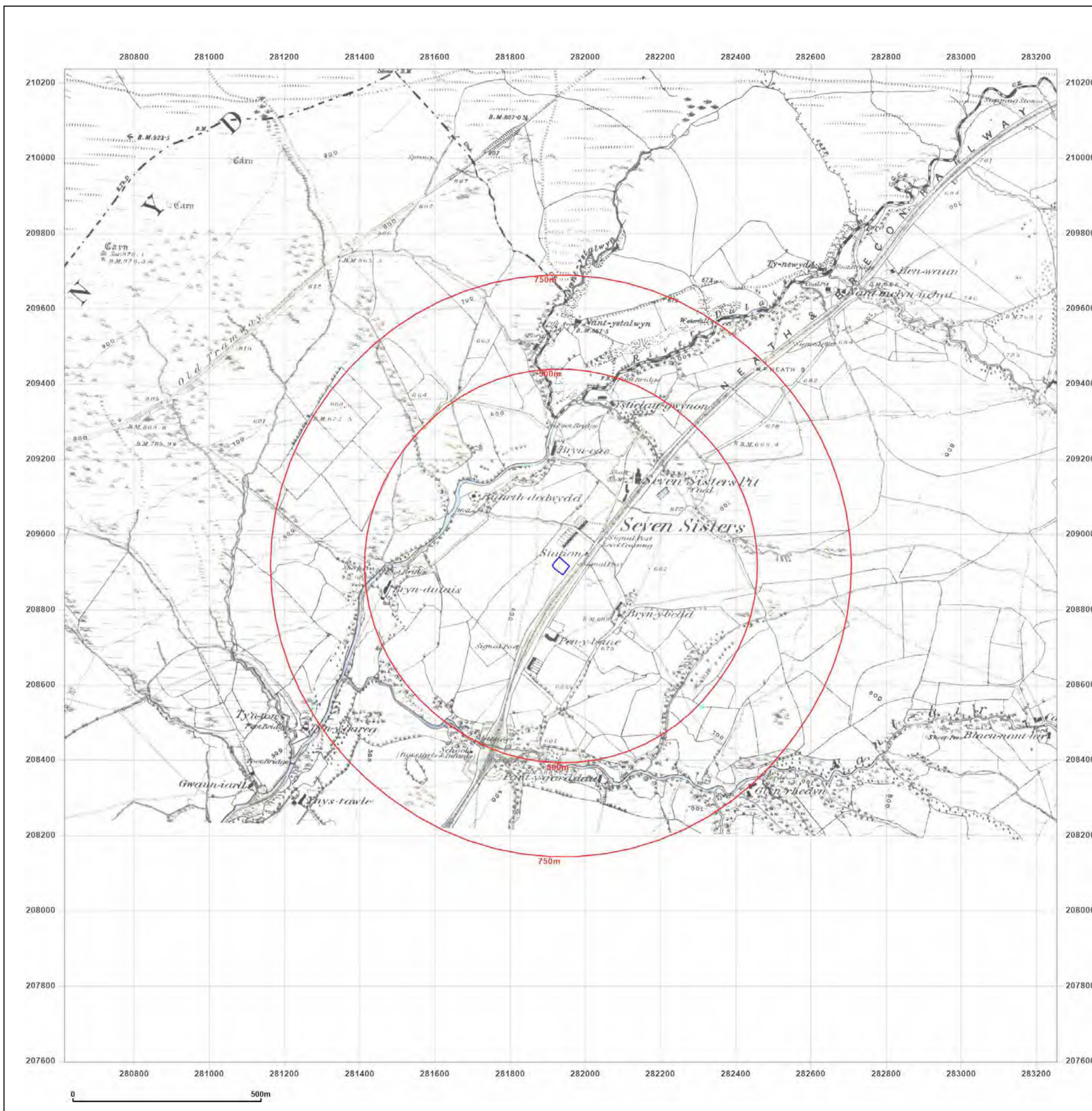


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Site Details:

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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

Map date: 1901

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1876
Revised 1901
Edition N/A
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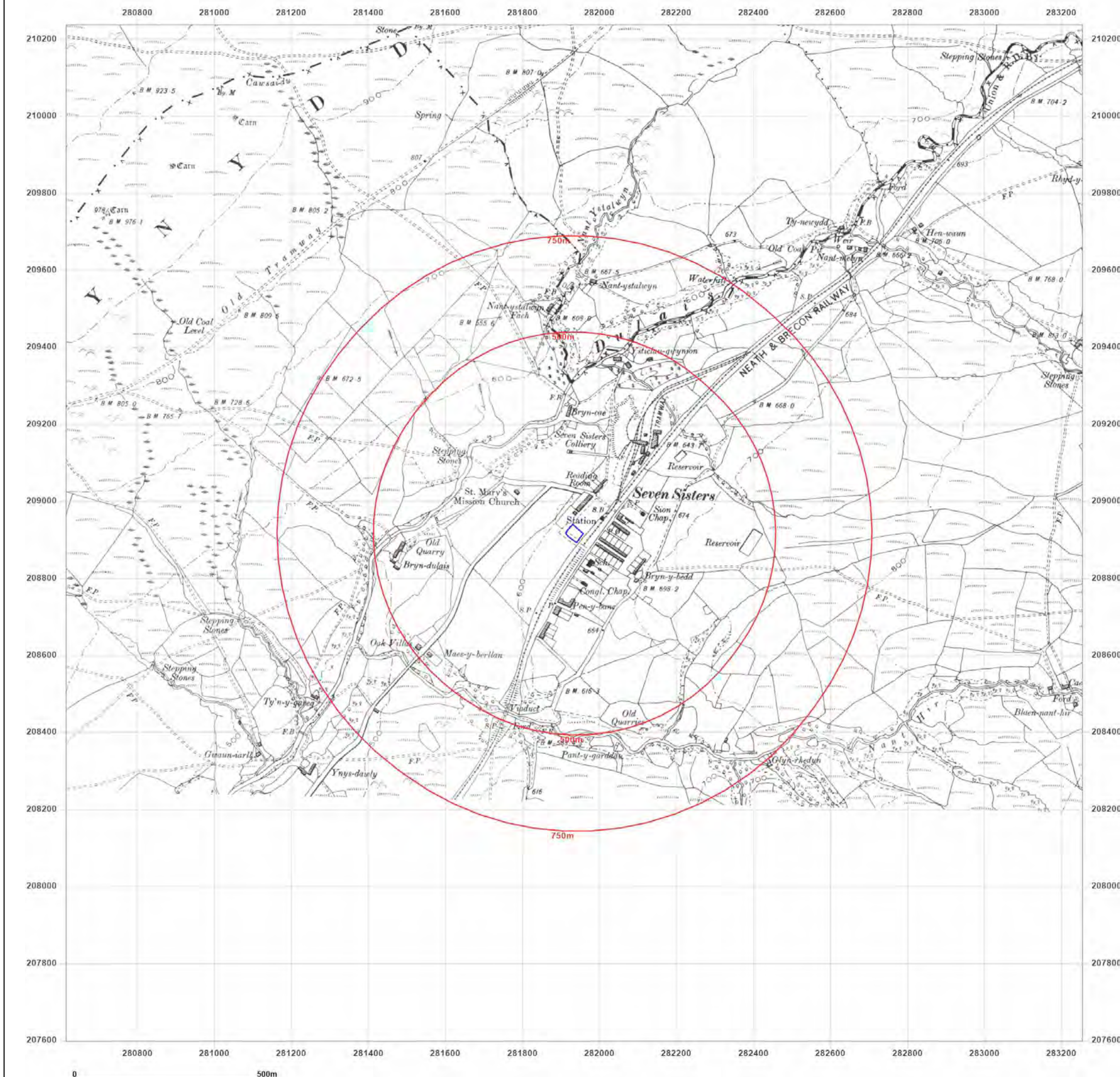


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Site Details:

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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

Map date: 1903

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1876
Revised 1903
Edition N/A
Copyright N/A
Levelled N/A

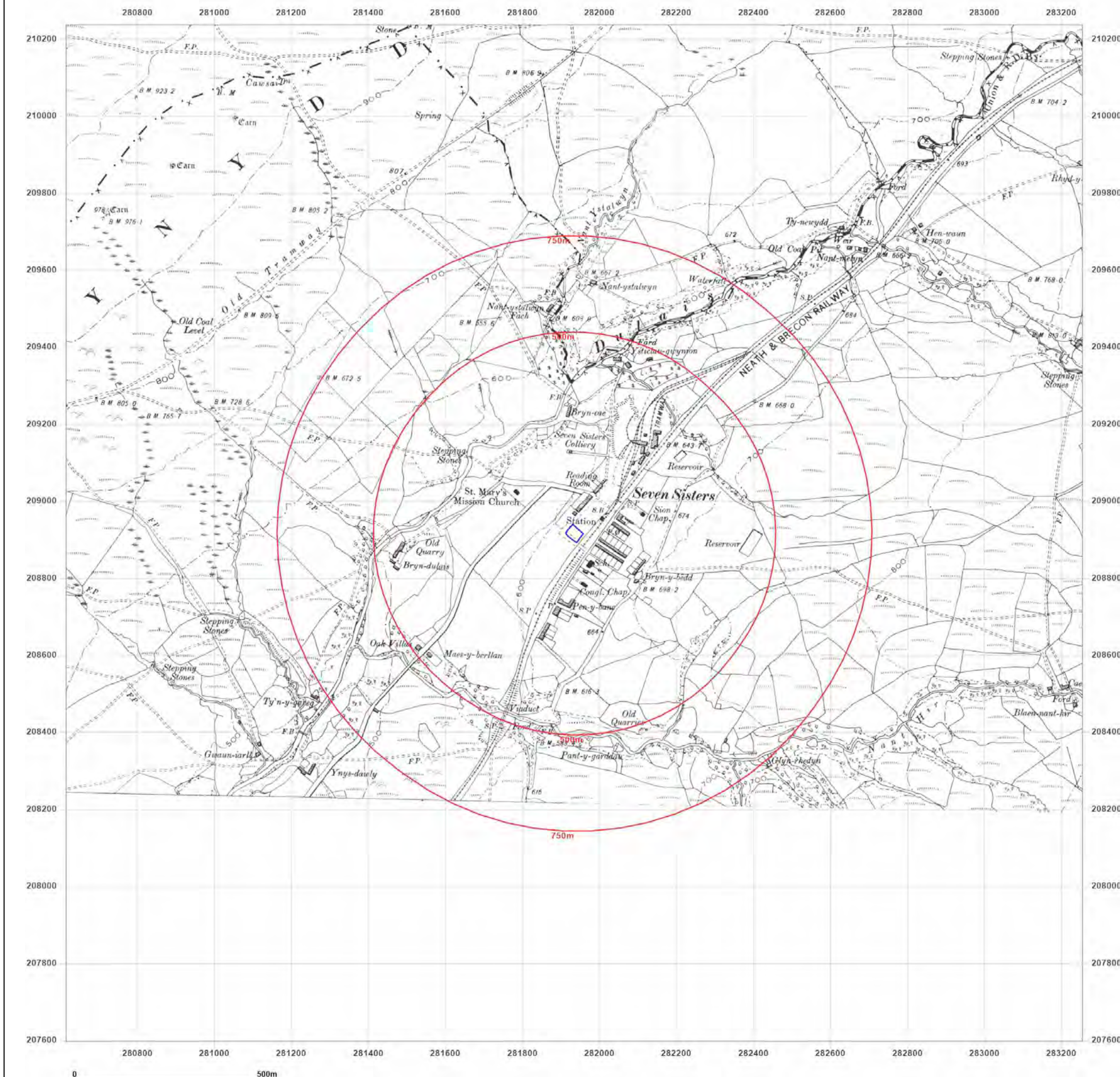


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HIGH STREET, SEVEN SISTERS,
SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

Map date: 1913-1914

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1876
Revised 1914
Edition N/A
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Levelled N/A

Surveyed 1876
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

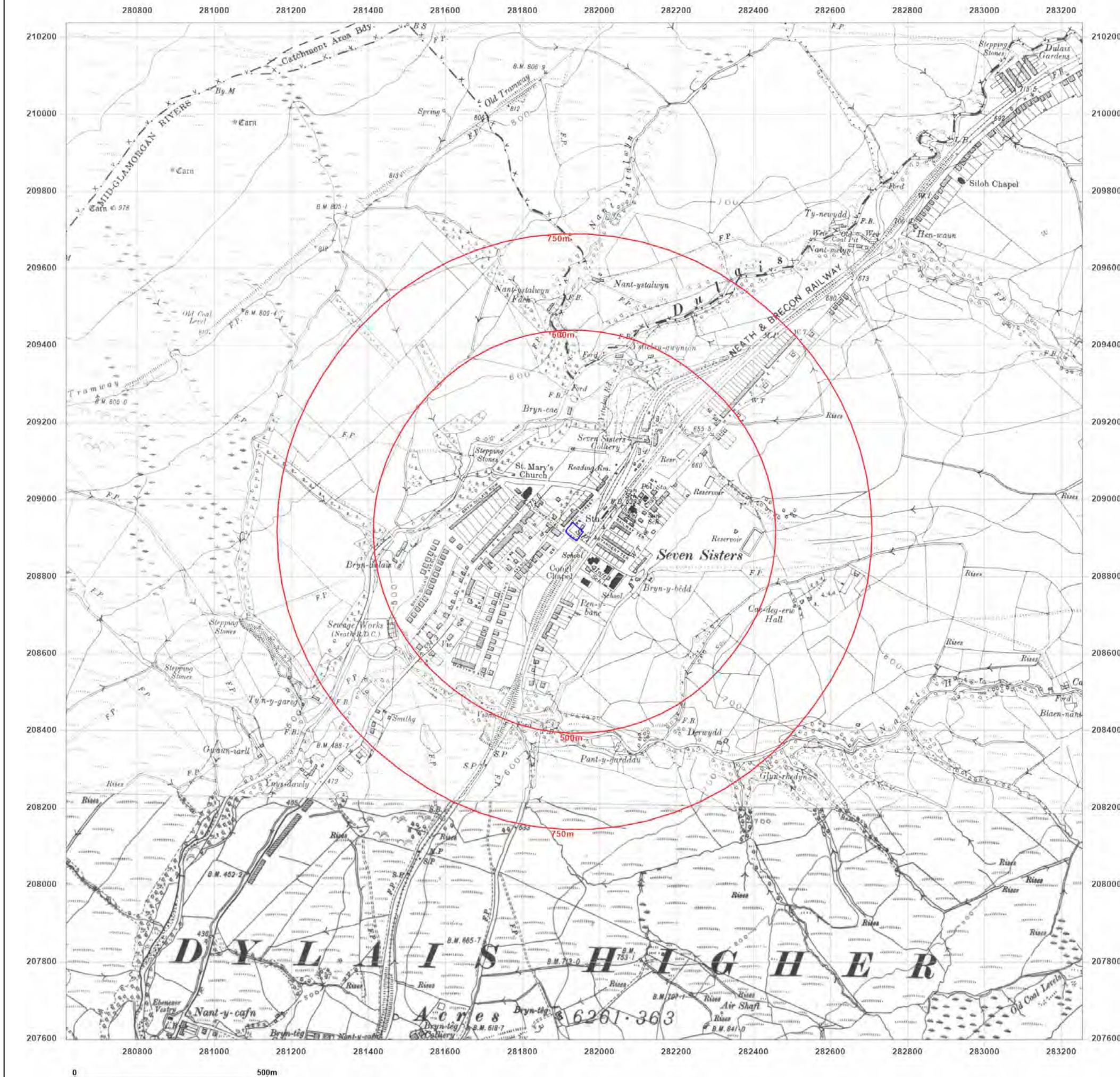


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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

Map date: 1921

Scale: 1:10,560

Printed at: 1:10,560



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

Surveyed 1877
Revised 1921
Edition N/A
Copyright N/A
Levelled N/A

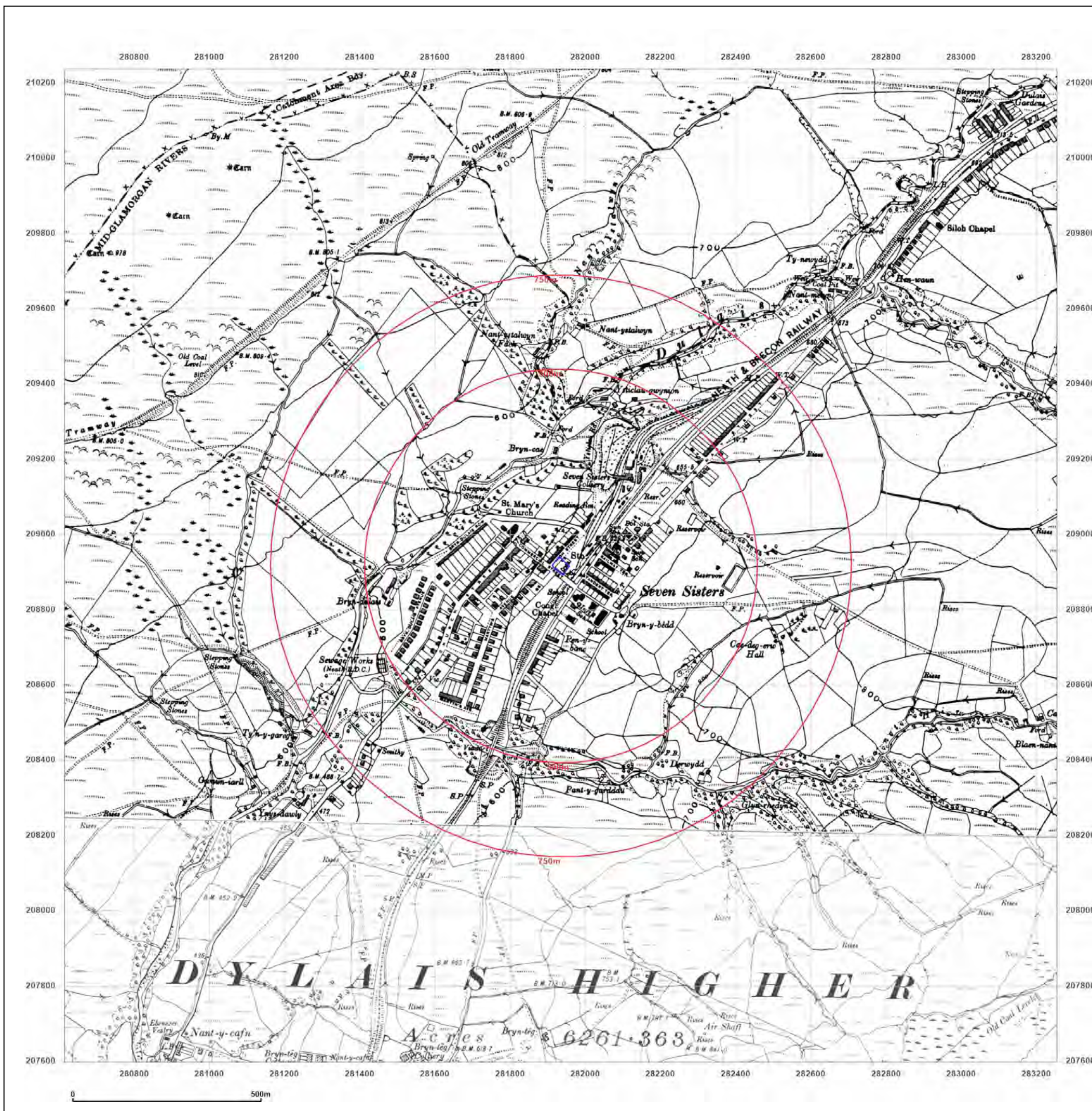


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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

Map date: 1921

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1921
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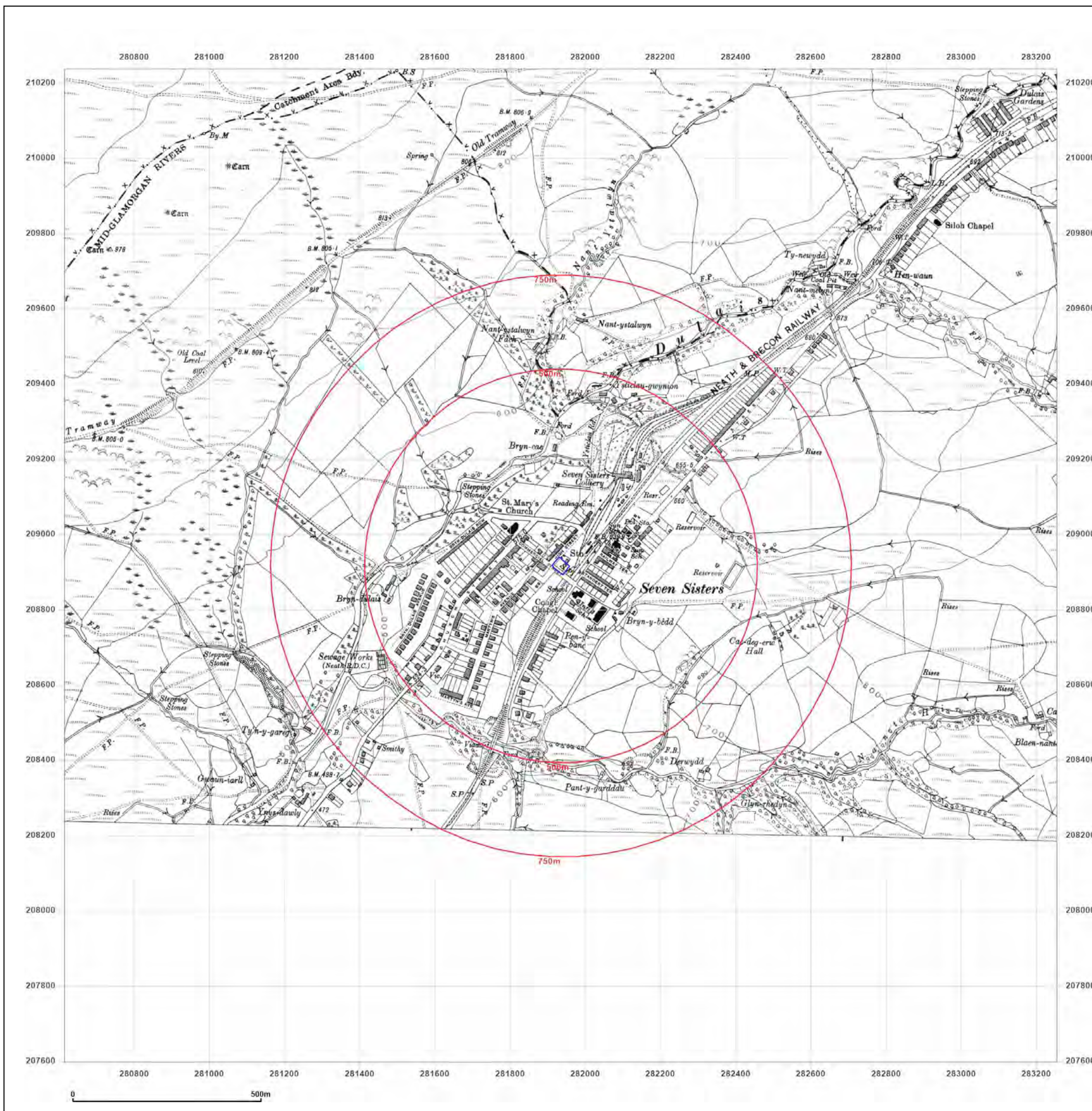


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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

Map date: 1921

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1876
Revised 1921
Edition 1921
Copyright N/A
Levelled N/A

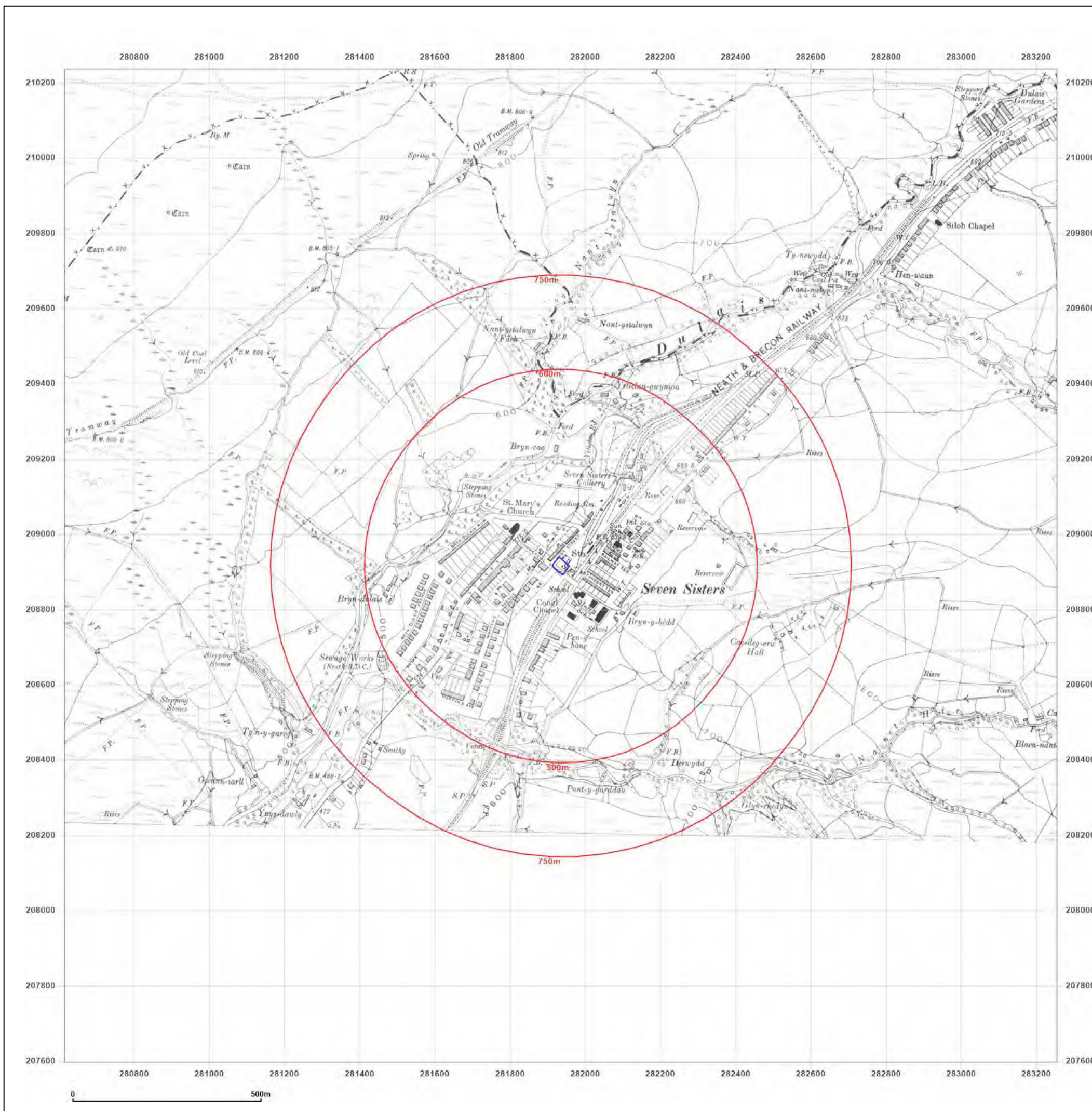


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Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: County Series

Map date: 1948

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1876
Revised 1948
Edition N/A
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Surveyed 1876
Revised 1948
Edition N/A
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Levelled N/A

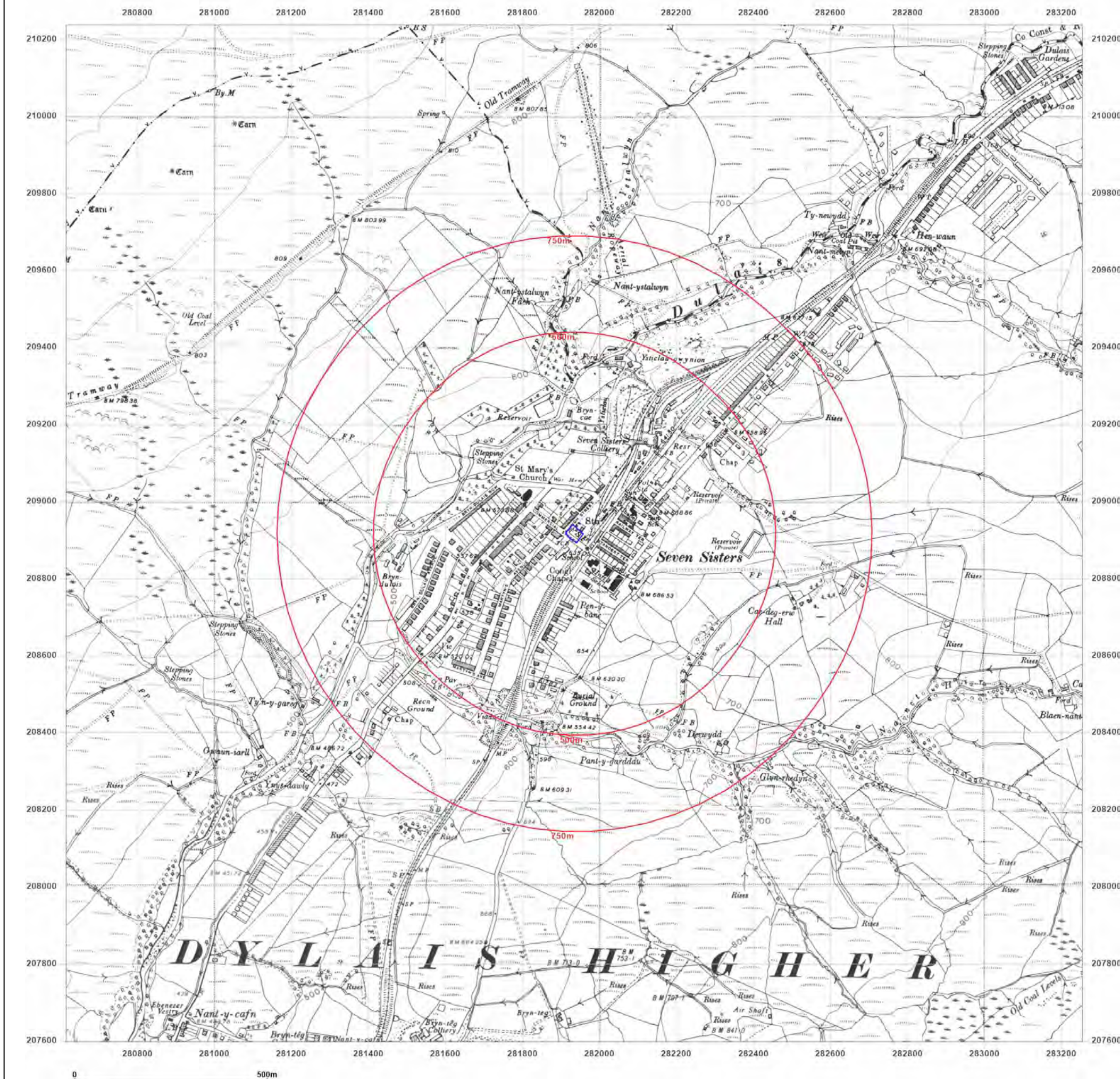


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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: Provisional

Map date: 1964-1965

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1965
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1964
Revised 1964
Edition N/A
Copyright N/A
Levelled N/A

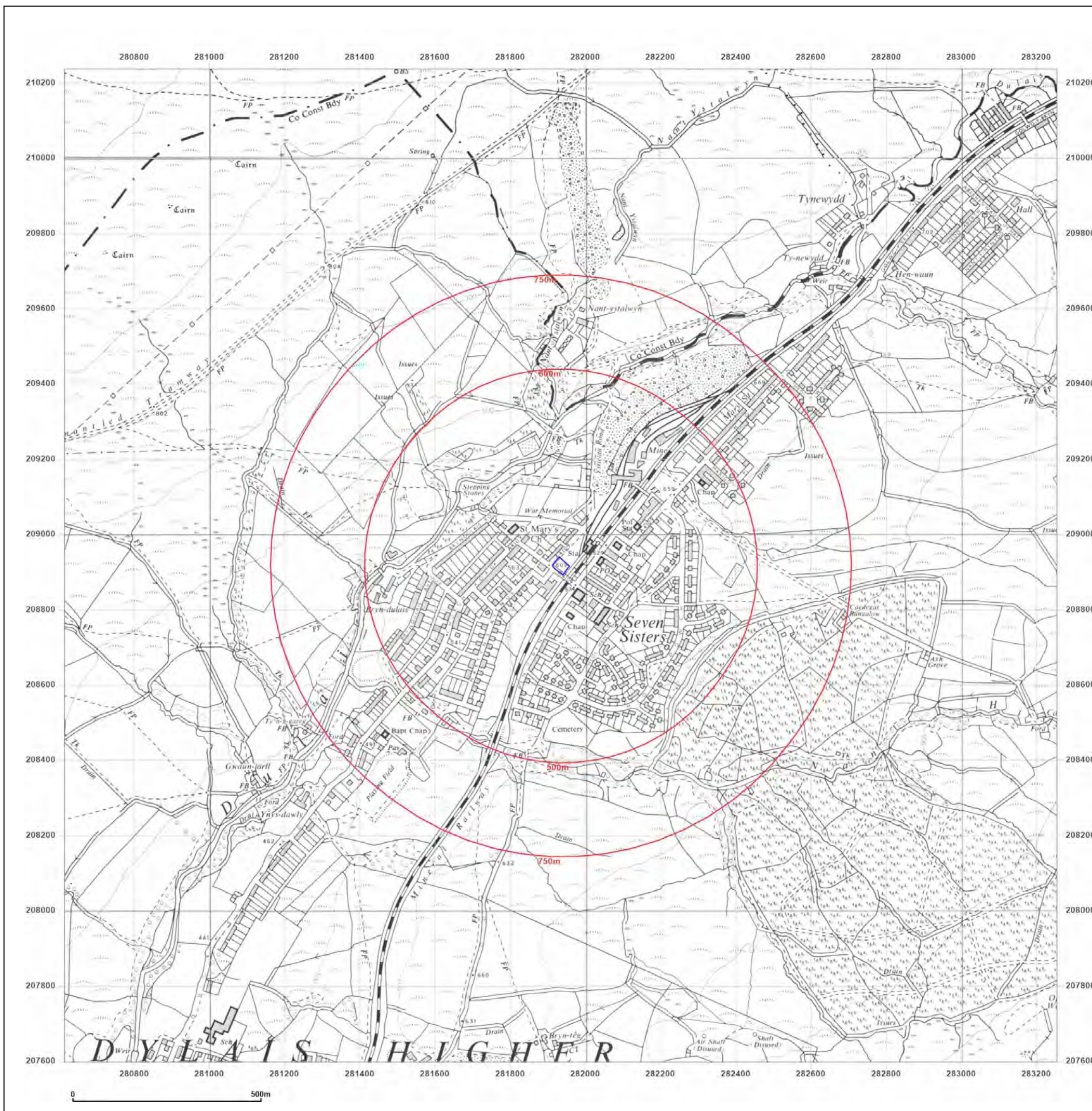


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Site Details:

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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: National Grid

Map date: 1987-1988

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1985
Revised 1987
Edition N/A
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Surveyed 1962
Revised 1988
Edition N/A
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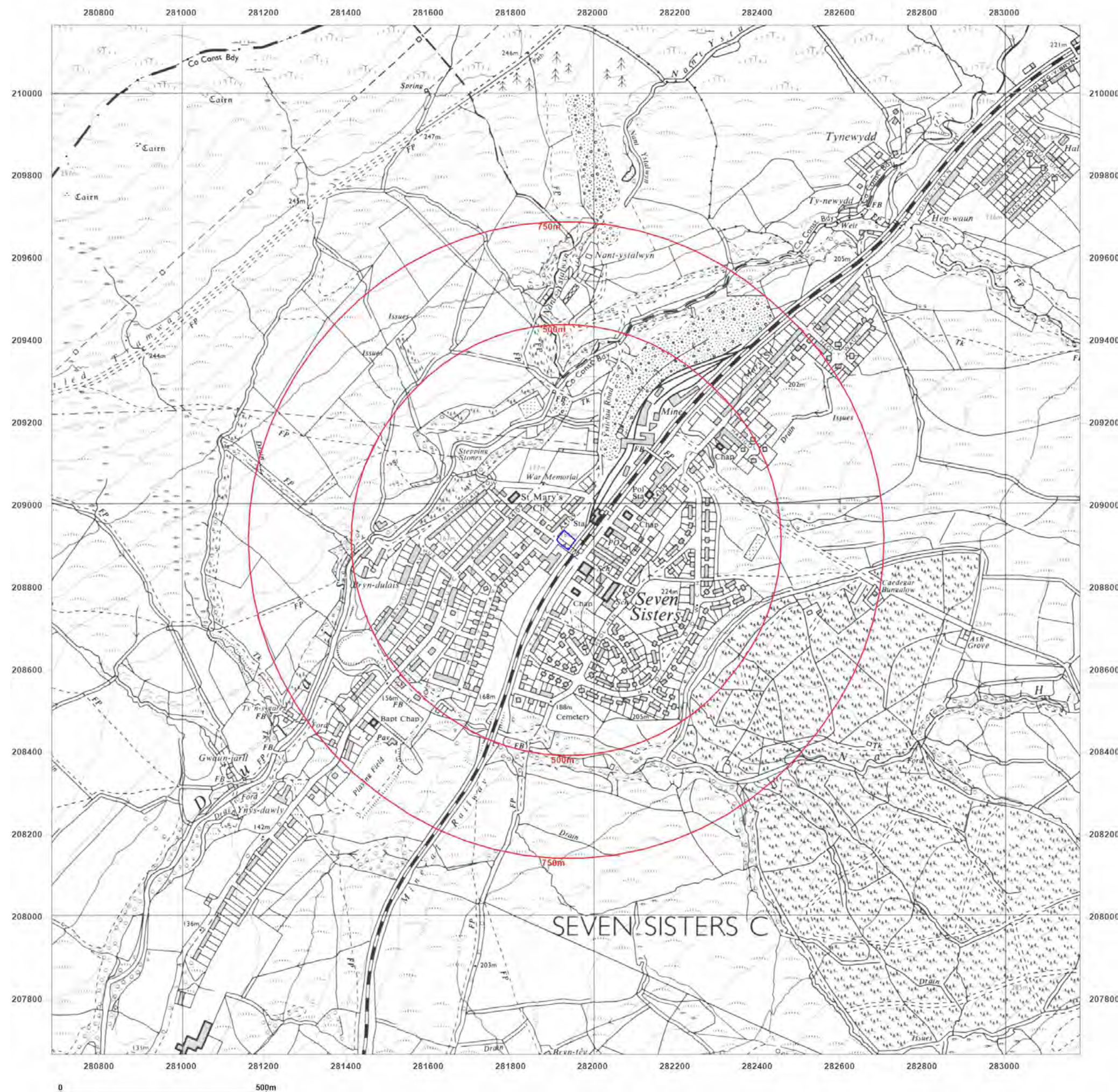


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Site Details:

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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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SA10 9DN

Client Ref: H1061-21_Childcare_Unit_Blaendulais
Report Ref: GS-8293534
Grid Ref: 281934, 208916

Map Name: National Grid

Map date: 2021

Scale: 1:10,000

Printed at: 1:10,000

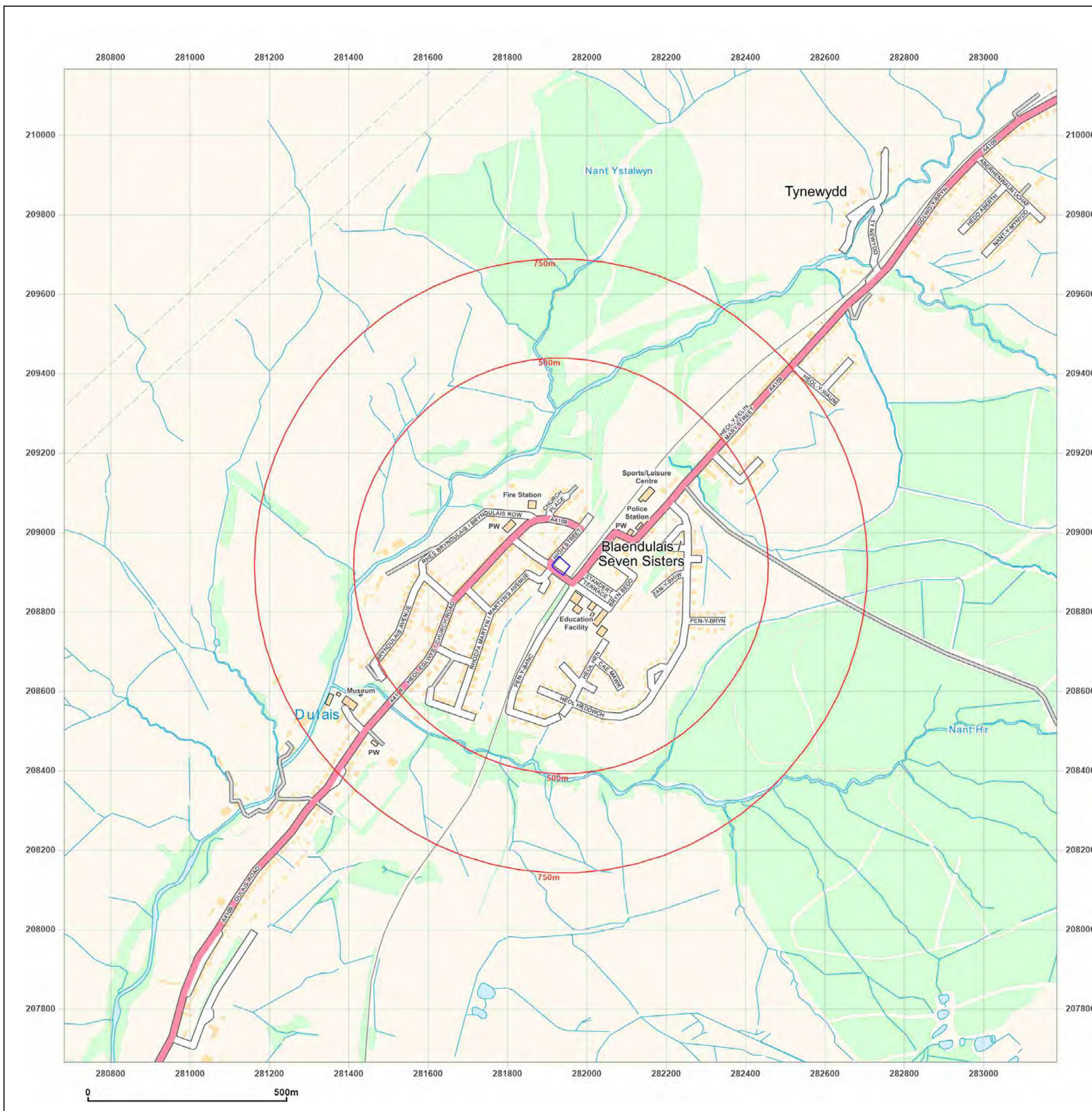


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APPENDIX C

GROUNDSURE ENVIROINSIGHT AND GEOINSIGHT

Groundsure Enviro Insight and Geo Insight Report

GS-8293536

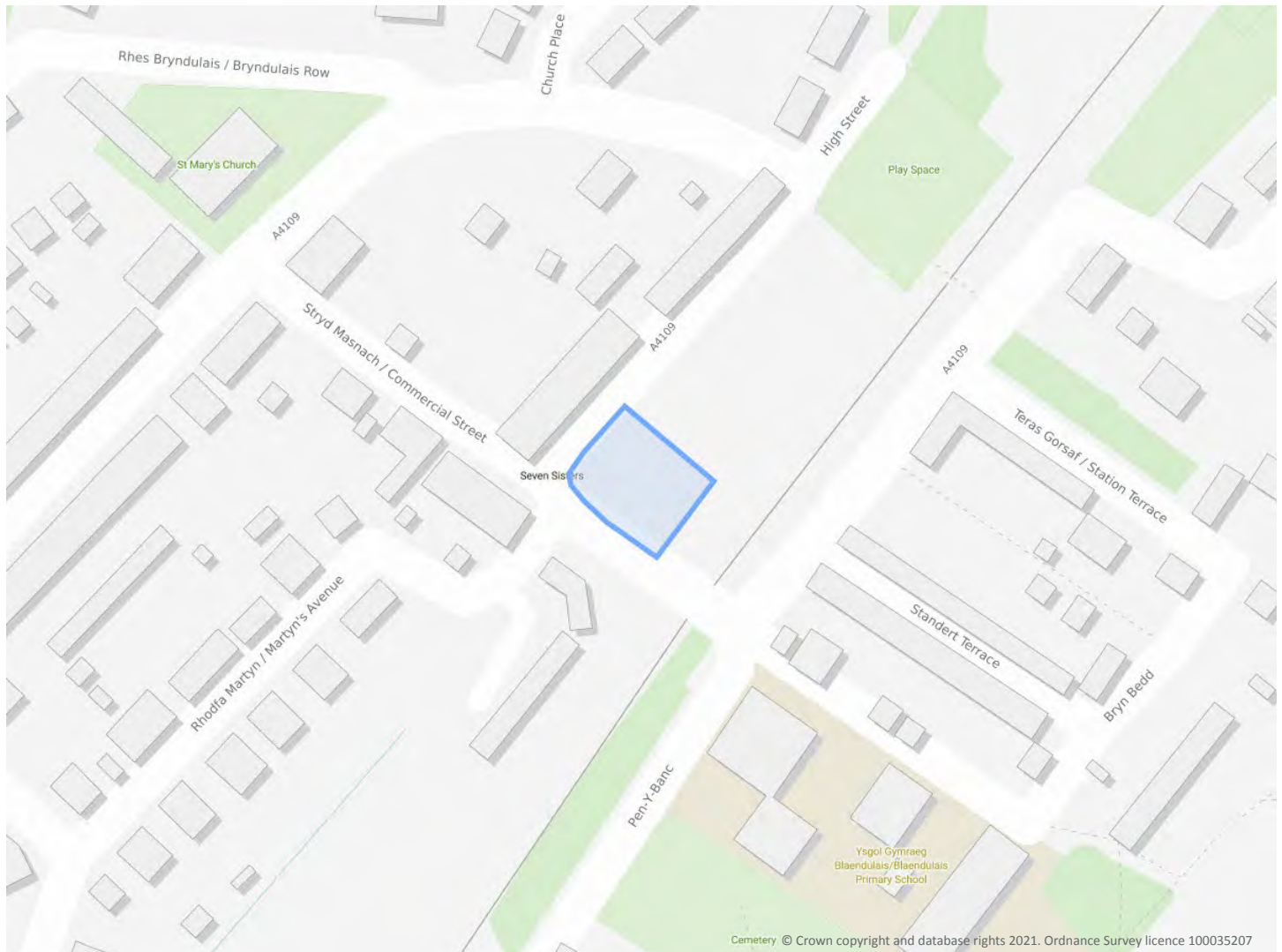
LIVING ACCOMMODATION, 8, HIGH STREET, SEVEN SISTERS, SA10 9DN

Order Details

Date: 27/10/2021
Your ref: H1061-21_Childcare_Unit_Blaendulais
Our Ref: GS-8293536
Client: SOCOTEC UK Limited

Site Details

Location: 281924 208915
Area: 0.11 ha
Authority: [Castell-nedd Port Talbot - Neath Port Talbot County Borough](#)



Summary of findings

p. 2 **Aerial image**

p. 8

OS MasterMap site plan

p.13 groundsure.com/insightuserguide

Contact us with any questions at:

info@groundsure.com

08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	<u>Historical industrial land uses</u>	2	17	29	18	-
17	1.2	<u>Historical tanks</u>	0	0	0	1	-
17	1.3	Historical energy features	0	0	0	0	-
18	1.4	Historical petrol stations	0	0	0	0	-
18	1.5	<u>Historical garages</u>	0	0	0	2	-
18	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
19	2.1	<u>Historical industrial land uses</u>	2	19	49	30	-
23	2.2	<u>Historical tanks</u>	0	0	0	1	-
24	2.3	Historical energy features	0	0	0	0	-
24	2.4	Historical petrol stations	0	0	0	0	-
24	2.5	<u>Historical garages</u>	0	0	0	3	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
25	3.1	Active or recent landfill	0	0	0	0	-
25	3.2	Historical landfill (BGS records)	0	0	0	0	-
26	3.3	<u>Historical landfill (LA/mapping records)</u>	0	0	1	1	-
26	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
26	3.5	Historical waste sites	0	0	0	0	-
26	3.6	Licensed waste sites	0	0	0	0	-
27	3.7	<u>Waste exemptions</u>	0	0	0	1	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
28	4.1	<u>Recent industrial land uses</u>	0	0	1	-	-
29	4.2	<u>Current or recent petrol stations</u>	0	0	1	0	-
29	4.3	Electricity cables	0	0	0	0	-
29	4.4	Gas pipelines	0	0	0	0	-
29	4.5	Sites determined as Contaminated Land	0	0	0	0	-



29	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
30	4.7	Regulated explosive sites	0	0	0	0	-
30	4.8	Hazardous substance storage/usage	0	0	0	0	-
30	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
30	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
30	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
31	4.12	Radioactive Substance Authorisations	0	0	0	0	-
31	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	0	2	-
31	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
32	4.15	Pollutant release to public sewer	0	0	0	0	-
32	4.16	List 1 Dangerous Substances	0	0	0	0	-
32	4.17	List 2 Dangerous Substances	0	0	0	0	-
32	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	3	13	-
34	4.19	Pollution inventory substances	0	0	0	0	-
35	4.20	Pollution inventory waste transfers	0	0	0	0	-
35	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
36	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
38	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
39	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
40	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
40	5.5	Groundwater vulnerability- local information	None (within 0m)				
41	5.6	Groundwater abstractions	0	0	0	0	0
42	5.7	<u>Surface water abstractions</u>	0	0	0	0	2
42	5.8	Potable abstractions	0	0	0	0	0
43	5.9	Source Protection Zones	0	0	0	0	-
43	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
44	6.1	<u>Water Network (OS MasterMap)</u>	0	0	4	-	-

45	6.2	<u>Surface water features</u>	0	0	3	-	-
45	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
46	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
46	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
47	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
47	7.2	Historical Flood Events	0	0	0	-	-
47	7.3	Flood Defences	0	0	0	-	-
48	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
48	7.5	Flood Storage Areas	0	0	0	-	-
49	7.6	Flood Zone 2	None (within 50m)				
49	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
50	8.1	Surface water flooding	Negligible (within 50m)				
Page	Section	Groundwater flooding					
51	9.1	<u>Groundwater flooding</u>	Low (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
52	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
53	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
53	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
53	10.4	Special Protection Areas (SPA)	0	0	0	0	0
53	10.5	National Nature Reserves (NNR)	0	0	0	0	0
54	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
54	10.7	<u>Designated Ancient Woodland</u>	0	0	1	2	10
55	10.8	Biosphere Reserves	0	0	0	0	0
55	10.9	Forest Parks	0	0	0	0	0
55	10.10	Marine Conservation Zones	0	0	0	0	0
55	10.11	Green Belt	0	0	0	0	0
55	10.12	Proposed Ramsar sites	0	0	0	0	0



56	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
56	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
56	10.15	Nitrate Sensitive Areas	0	0	0	0	0
56	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
57	10.17	SSSI Impact Risk Zones	0	-	-	-	-
57	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
58	11.1	World Heritage Sites	0	0	0	-	-
59	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
59	11.3	National Parks	0	0	0	-	-
59	11.4	Listed Buildings	0	0	1	-	-
60	11.5	Conservation Areas	0	0	0	-	-
60	11.6	Scheduled Ancient Monuments	0	0	0	-	-
60	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
61	12.1	Agricultural Land Classification	Grade 5 (within 250m)				
62	12.2	Open Access Land	0	0	0	-	-
62	12.3	Tree Felling Licences	0	0	0	-	-
62	12.4	Environmental Stewardship Schemes	0	0	0	-	-
62	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
64	13.1	Priority Habitat Inventory	0	0	0	-	-
64	13.2	Habitat Networks	0	0	0	-	-
64	13.3	Open Mosaic Habitat	0	0	0	-	-
64	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
65	14.1	10k Availability	Identified (within 500m)				
66	14.2	Artificial and made ground (10k)	0	0	0	0	-
67	14.3	Superficial geology (10k)	0	0	0	0	-

67	14.4	Landslip (10k)	0	0	0	0	-
68	14.5	Bedrock geology (10k)	0	0	0	0	-
68	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
69	15.1	<u>50k Availability</u>	Identified (within 500m)				
70	15.2	<u>Artificial and made ground (50k)</u>	0	0	1	1	-
71	15.3	Artificial ground permeability (50k)	0	0	-	-	-
72	15.4	<u>Superficial geology (50k)</u>	0	1	1	1	-
73	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
73	15.6	Landslip (50k)	0	0	0	0	-
73	15.7	Landslip permeability (50k)	None (within 50m)				
74	15.8	<u>Bedrock geology (50k)</u>	1	0	0	0	-
75	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
75	15.10	<u>Bedrock faults and other linear features (50k)</u>	0	0	0	1	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
76	16.1	<u>BGS Boreholes</u>	0	0	1	-	-
Page	Section	Natural ground subsidence					
77	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
78	17.2	<u>Running sands</u>	Very low (within 50m)				
80	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
81	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
82	17.5	<u>Landslides</u>	Low (within 50m)				
84	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
85	18.1	Natural cavities	0	0	0	0	-
86	18.2	<u>BritPits</u>	0	0	0	2	-
86	18.3	<u>Surface ground workings</u>	1	9	18	-	-
88	18.4	<u>Underground workings</u>	0	0	5	4	5
88	18.5	Historical Mineral Planning Areas	0	0	0	0	-

89	18.6	Non-coal mining	0	0	0	0	0
89	18.7	Mining cavities	0	0	0	0	0
89	18.8	JPB mining areas	None (within 0m)				
89	18.9	<u>Coal mining</u>	Identified (within 0m)				
90	18.10	Brine areas	None (within 0m)				
90	18.11	Gypsum areas	None (within 0m)				
90	18.12	Tin mining	None (within 0m)				
90	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
91	19.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
92	20.1	<u>BGS Estimated Background Soil Chemistry</u>	1	2	-	-	-
92	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
92	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
93	21.1	Underground railways (London)	0	0	0	-	-
93	21.2	Underground railways (Non-London)	0	0	0	-	-
94	21.3	Railway tunnels	0	0	0	-	-
94	21.4	<u>Historical railway and tunnel features</u>	1	7	15	-	-
95	21.5	Royal Mail tunnels	0	0	0	-	-
95	21.6	Historical railways	0	0	0	-	-
95	21.7	<u>Railways</u>	0	3	2	-	-
96	21.8	Crossrail 1	0	0	0	0	-
96	21.9	Crossrail 2	0	0	0	0	-
96	21.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 14/04/2020

Site Area: 0.11ha



Recent site history - 2017 aerial photograph



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Capture Date: 17/06/2017

Site Area: 0.11ha



Recent site history - 2013 aerial photograph



Capture Date: 14/07/2013

Site Area: 0.11ha



Recent site history - 2001 aerial photograph



Capture Date: 27/08/2001

Site Area: 0.11ha



Recent site history - 2000 aerial photograph



Capture Date: 18/06/2000

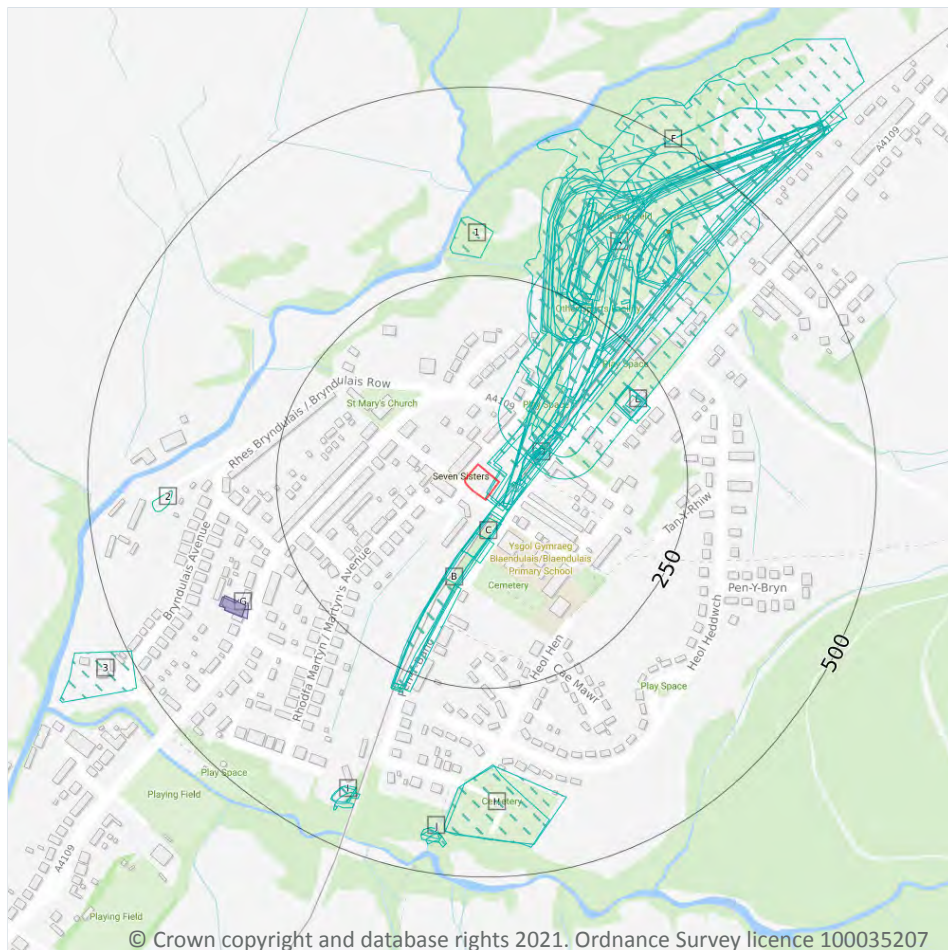
Site Area: 0.11ha

OS MasterMap site plan



Site Area: 0.11ha

1 Past land use



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

1.1 Historical industrial land uses

Records within 500m

66

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

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

ID	Location	Land use	Dates present	Group ID
A	On site	Mill Ponds	1921	270223

ID	Location	Land use	Dates present	Group ID
A	On site	Railway Sidings	1921	272350
A	3m SE	Colliery	1914 - 1948	272237
A	9m SE	Railway Sidings	1948	273793
A	13m E	Railway Sidings	1914	275243
A	13m E	Railway Sidings	1914	280847
A	15m E	Railway Sidings	1921	307330
B	15m SE	Cuttings	1877	280954
B	16m SE	Cuttings	1876	302120
B	17m SE	Cuttings	1914 - 1948	296377
C	20m S	Cuttings	1921	297880
B	25m S	Cuttings	1921	281222
D	27m E	Railway Station	1914	299292
D	27m E	Railway Station	1914	311906
D	28m E	Railway Station	1921	316041
A	32m NE	Railway Sidings	1988	280898
A	32m NE	Railway Sidings	1964	292390
C	46m S	Cuttings	1921 - 1948	298789
A	47m NE	Coal Pit	1876	279051
D	53m NE	Railway Station	1877	279311
D	53m NE	Railway Station	1903	296221
D	53m NE	Railway Station	1964 - 1988	316662
D	55m NE	Railway Station	1921 - 1948	294870
D	55m NE	Railway Station	1901	317398
D	56m NE	Railway Station	1921	313777
D	57m NE	Railway Station	1876	294278
A	72m NE	Colliery	1901 - 1903	293946
D	75m NE	Railway Building	1921 - 1948	273484
A	88m NE	Unspecified Mine	1964 - 1988	275866



ID	Location	Land use	Dates present	Group ID
A	89m NE	Railway Sidings	1876 - 1877	284708
A	98m NE	Colliery	1921	283221
A	99m NE	Railway Sidings	1903	313918
A	108m NE	Tramway Sidings	1901 - 1903	315580
B	117m SW	Cuttings	1921	287968
A	147m NE	Railway Sidings	1921	300431
E	184m NE	Police Station	1914 - 1921	276107
E	187m NE	Police Station	1948	284461
E	187m NE	Police Station	1921	290876
E	196m NE	Police Station	1964 - 1988	318244
A	197m NE	Railway Building	1948	256603
A	197m NE	Refuse Heap	1921	285638
F	198m NE	Refuse Heap	1964 - 1988	287032
A	200m NE	Refuse Heap	1921	310941
A	201m NE	Refuse Heap	1921	281268
A	205m NE	Unspecified Heap	1901	260008
A	224m NE	Coal Pit	1877	296543
F	246m NE	Refuse Heaps	1948	269370
A	249m NE	Railway Sidings	1921	316721
A	250m NE	Refuse Heap	1914	289470
A	271m NE	Unspecified Shafts	1877	256178
A	273m NE	Unspecified Shaft	1876	255580
1	273m N	Refuse Heap	1964 - 1988	310802
A	285m NE	Unspecified Shaft	1876 - 1877	310746
A	321m NE	Refuse Heap	1921	284368
A	330m NE	Refuse Heap	1914	312735
H	351m S	Cemetery	1964 - 1988	312771
H	353m S	Burial Ground	1948	264001

ID	Location	Land use	Dates present	Group ID
A	369m NE	Cuttings	1876	269023
2	388m W	Unspecified Old Quarry	1901 - 1903	303809
I	418m SW	Unspecified Pit	1914	303316
I	421m SW	Unspecified Ground Workings	1921	317086
I	424m SW	Unspecified Ground Workings	1921	303638
J	440m S	Unspecified Pit	1948	276529
J	444m S	Unspecified Pit	1921	288968
J	447m S	Unspecified Ground Workings	1921	267263
3	496m SW	Sewage Works	1914 - 1921	294639

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

1

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	396m NE	Unspecified Tank	1962	34162

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

0

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'.

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**2**

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
G	330m SW	Garage	1962 - 1993	6426
G	333m SW	Garage	1987	6014

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.

A map of Bryndafn, showing a network of paths (green lines) and various landmarks. The map includes a large circular boundary with a radius of 500 meters, centered on a point near the intersection of Rhes Bryndafn and Bryndafn Avenue. Key landmarks include St Mary's Church, Ysgol Gymraeg Blaendafnis/Blaendafnis Primary School, and a Cemetery. The map also shows residential streets, a playing field, and a play space. The map is overlaid with a grid of 100m squares, labeled A through J. The map is titled 'Bryndafn' and includes a scale bar and a north arrow.

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

Records within 500m	100
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Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
A	On site	Mill Ponds	1921	270223
A	On site	Railway Sidings	1921	272350
A	3m SE	Colliery	1921	272237

ID	Location	Land Use	Date	Group ID
A	9m SE	Railway Sidings	1948	273793
A	13m E	Railway Sidings	1914	275243
A	13m E	Railway Sidings	1914	280847
A	15m E	Railway Sidings	1921	307330
B	15m SE	Cuttings	1877	280954
B	16m SE	Cuttings	1876	302120
B	17m SE	Cuttings	1914	296377
B	17m SE	Cuttings	1914	296377
C	20m S	Cuttings	1921	297880
B	25m S	Cuttings	1921	281222
D	27m E	Railway Station	1914	311906
D	27m E	Railway Station	1914	299292
D	28m E	Railway Station	1921	316041
A	32m NE	Railway Sidings	1988	280898
A	32m NE	Railway Sidings	1964	292390
C	46m S	Cuttings	1948	298789
A	47m NE	Coal Pit	1876	279051
C	48m S	Cuttings	1921	298789
D	53m NE	Railway Station	1903	296221
D	53m NE	Railway Station	1877	279311
D	53m NE	Railway Station	1988	316662
D	53m NE	Railway Station	1964	316662
D	55m NE	Railway Station	1948	294870
D	55m NE	Railway Station	1901	317398
D	56m NE	Railway Station	1921	313777
D	57m NE	Railway Station	1921	294870
D	57m NE	Railway Station	1876	294278
A	72m NE	Colliery	1903	293946

ID	Location	Land Use	Date	Group ID
D	75m NE	Railway Building	1948	273484
D	76m NE	Railway Building	1921	273484
A	88m NE	Unspecified Mine	1988	275866
A	88m NE	Unspecified Mine	1964	275866
A	89m NE	Railway Sidings	1877	284708
A	98m NE	Colliery	1921	283221
A	98m NE	Colliery	1921	283221
A	99m NE	Railway Sidings	1903	313918
A	104m NE	Railway Sidings	1876	284708
A	108m NE	Tramway Sidings	1901	315580
B	115m SW	Cuttings	1948	296377
B	117m SW	Cuttings	1921	287968
B	120m SW	Cuttings	1921	296377
A	131m NE	Colliery	1948	272237
A	142m NE	Colliery	1901	293946
A	147m NE	Railway Sidings	1921	300431
A	147m NE	Colliery	1914	272237
A	147m NE	Colliery	1914	272237
E	184m NE	Police Station	1921	276107
E	187m NE	Police Station	1948	284461
E	187m NE	Police Station	1921	290876
E	188m NE	Police Station	1921	276107
E	188m NE	Police Station	1914	276107
E	188m NE	Police Station	1914	276107
E	196m NE	Police Station	1988	318244
E	196m NE	Police Station	1964	318244
A	197m NE	Railway Building	1948	256603
A	197m NE	Refuse Heap	1921	285638

ID	Location	Land Use	Date	Group ID
F	198m NE	Refuse Heap	1988	287032
F	198m NE	Refuse Heap	1964	287032
A	200m NE	Refuse Heap	1921	310941
A	201m NE	Refuse Heap	1921	281268
A	201m NE	Refuse Heap	1921	281268
A	205m NE	Unspecified Heap	1901	260008
A	224m NE	Railway Sidings	1921	272350
A	224m NE	Coal Pit	1877	296543
A	227m NE	Tramway Sidings	1903	315580
F	246m NE	Refuse Heaps	1948	269370
A	249m NE	Railway Sidings	1921	316721
A	250m NE	Refuse Heap	1914	289470
A	250m NE	Refuse Heap	1914	289470
A	271m NE	Unspecified Shafts	1877	256178
A	273m NE	Unspecified Shaft	1876	255580
G	273m N	Refuse Heap	1988	310802
G	273m N	Refuse Heap	1964	310802
A	285m NE	Unspecified Shaft	1877	310746
A	289m NE	Unspecified Shaft	1876	310746
A	321m NE	Refuse Heap	1921	284368
A	330m NE	Refuse Heap	1914	312735
A	330m NE	Refuse Heap	1914	312735
I	351m S	Cemetery	1988	312771
I	351m S	Cemetery	1964	312771
I	353m S	Burial Ground	1948	264001
A	369m NE	Cuttings	1876	269023
J	388m W	Unspecified Old Quarry	1901	303809
J	388m W	Unspecified Old Quarry	1903	303809

ID	Location	Land Use	Date	Group ID
K	418m SW	Unspecified Pit	1914	303316
K	418m SW	Unspecified Pit	1914	303316
K	421m SW	Unspecified Ground Workings	1921	317086
K	421m SW	Unspecified Ground Workings	1921	317086
K	424m SW	Unspecified Ground Workings	1921	303638
L	440m S	Unspecified Pit	1948	276529
L	444m S	Unspecified Pit	1921	288968
L	444m S	Unspecified Pit	1921	288968
L	447m S	Unspecified Ground Workings	1921	267263
M	496m SW	Sewage Works	1914	294639
M	496m SW	Sewage Works	1914	294639
M	498m SW	Sewage Works	1921	294639
M	498m SW	Sewage Works	1921	294639

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

1

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 19**

ID	Location	Land Use	Date	Group ID
A	396m NE	Unspecified Tank	1962	34162

This data is sourced from Ordnance Survey / Groundsure.



2.3 Historical energy features

Records within 500m**0**

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'.

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m**0**

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

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m**3**

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 19**

ID	Location	Land Use	Date	Group ID
H	330m SW	Garage	1993	6426
H	330m SW	Garage	1962	6426
H	333m SW	Garage	1987	6014

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical landfill (LA/OS)
- 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**2**

Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 25**

ID	Location	Site address	Source	Data type
1	197m NE	Refuse Tip	1962 mapping	Polygon
3	275m N	Refuse Tip	1961 mapping	Polygon

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

1

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.

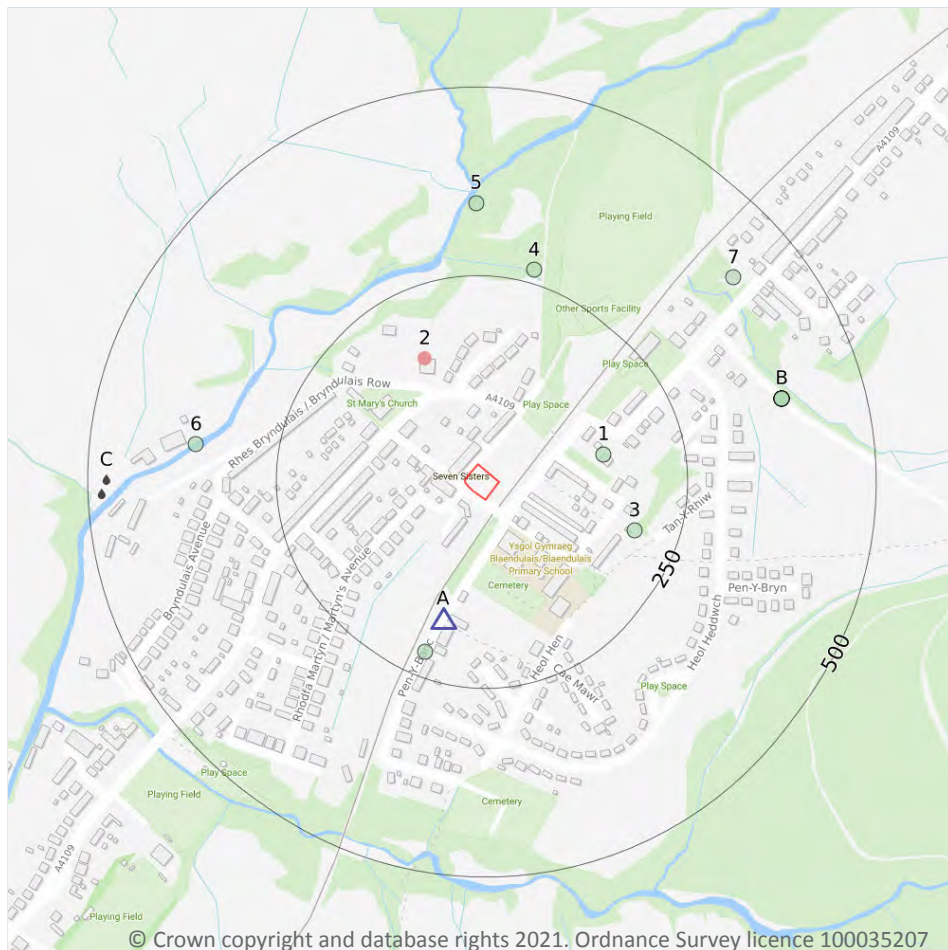
Features are displayed on the Waste and landfill map on **page 25**

ID	Location	Site	Reference	Category	Sub-Category	Description
2	254m W	Land opposite bryndulias row, SA109EB	NRW-WME062807	Using waste exemption	On a farm	Use of waste in construction

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
- △ Current or recent petrol stations
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

1

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 28**

ID	Location	Company	Address	Activity	Category
2	157m NW	Seven Sisters Fire Station	Bryndulais Row, Seven Sisters, Neath, West Glamorgan, SA10 9EA	Fire Brigade Stations	Central and Local Government

This data is sourced from Ordnance Survey.



4.2 Current or recent petrol stations

Records within 500m**1**

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 28**

ID	Location	Company	Address	LPG	Status
A	168m S	OBSOLETE	Church Road, Seven Sisters, Neath, Neath Port Talbot, SA10 9DT	Not Applicable	Obsolete

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

2

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 28**

ID	Location	Address	Details	
C	475m W	BRYNDULAI (SWO 2A), Bryndulais Farm, SEVEN SISTERS, Neath, SA10 9EE	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: BW2902901 Permit Version: 2 Receiving Water: RIVER DULAI	Status: Effective Issue date: 07/10/2019 Effective Date: 07/10/2019 Revocation Date: -
C	482m W	BRYNDULAI (SWO 2A)	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: BW2902901 Permit Version: 1 Receiving Water: RIVER DULAI	Status: Effective Issue date: 17/06/1963 Effective Date: 17/06/1963 Revocation Date: -

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

4.14 Pollutant release to surface waters (Red List)

Records within 500m

0

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

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

4.15 Pollutant release to public sewer

Records within 500m

0

Discharges of Special Category Effluents to the public sewer.

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

4.16 List 1 Dangerous Substances

Records within 500m

0

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

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

4.17 List 2 Dangerous Substances

Records within 500m

0

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

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m

16

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 28**

ID	Location	Details	
1	143m E	Incident Date: 03/01/2014 Incident Identification: 1189750 Pollutant: Contaminated Water Pollutant Description: Firefighting Run-Off	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
3	190m E	Incident Date: 13/02/2003 Incident Identification: 136726 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

ID	Location	Details	
A	216m S	Incident Date: 18/10/2002 Incident Identification: 115533 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
4	267m N	Incident Date: 12/06/2007 Incident Identification: 502566 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
5	346m N	Incident Date: 18/05/2001 Incident Identification: 5961 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
6	359m W	Incident Date: 11/06/2007 Incident Identification: 502089 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	390m E	Incident Date: 06/04/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Specific Waste Materials Specific Waste Materials Specific Waste Materials Specific Waste Materials Pollutant Description: Construction and Demolition Materials and Wastes Asbestos Commercial Waste Household Waste Tyres Vehicles and Vehicle Parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	390m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	390m E	Incident Date: 06/04/2001 Incident Identification: 7402 Pollutant: Inert Materials and Wastes : Specific Waste Materials Pollutant Description: Construction and Demolition Materials and Wastes :Asbestos :Commercial Waste :Household Waste :Tyres :Vehicles and Vehicle Parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	390m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Asbestos	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	390m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Household Waste	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)



ID	Location	Details	
B	390m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Vehicles and Vehicle Parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	390m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Tyres	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	390m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
B	390m E	Incident Date: 04/06/2001 Incident Identification: 7402 Pollutant: Inert Materials and Wastes:Specific Waste Materials:Specific Waste Materials:Specific Waste Materials Pollutant Description: Construction and Demolition Materials and Wastes:Asbestos:Commercial Waste:Household Waste:Tyres:Vehicles and Vehicle Parts	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
7	412m NE	Incident Date: 06/05/2015 Incident Identification: 1334992 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.

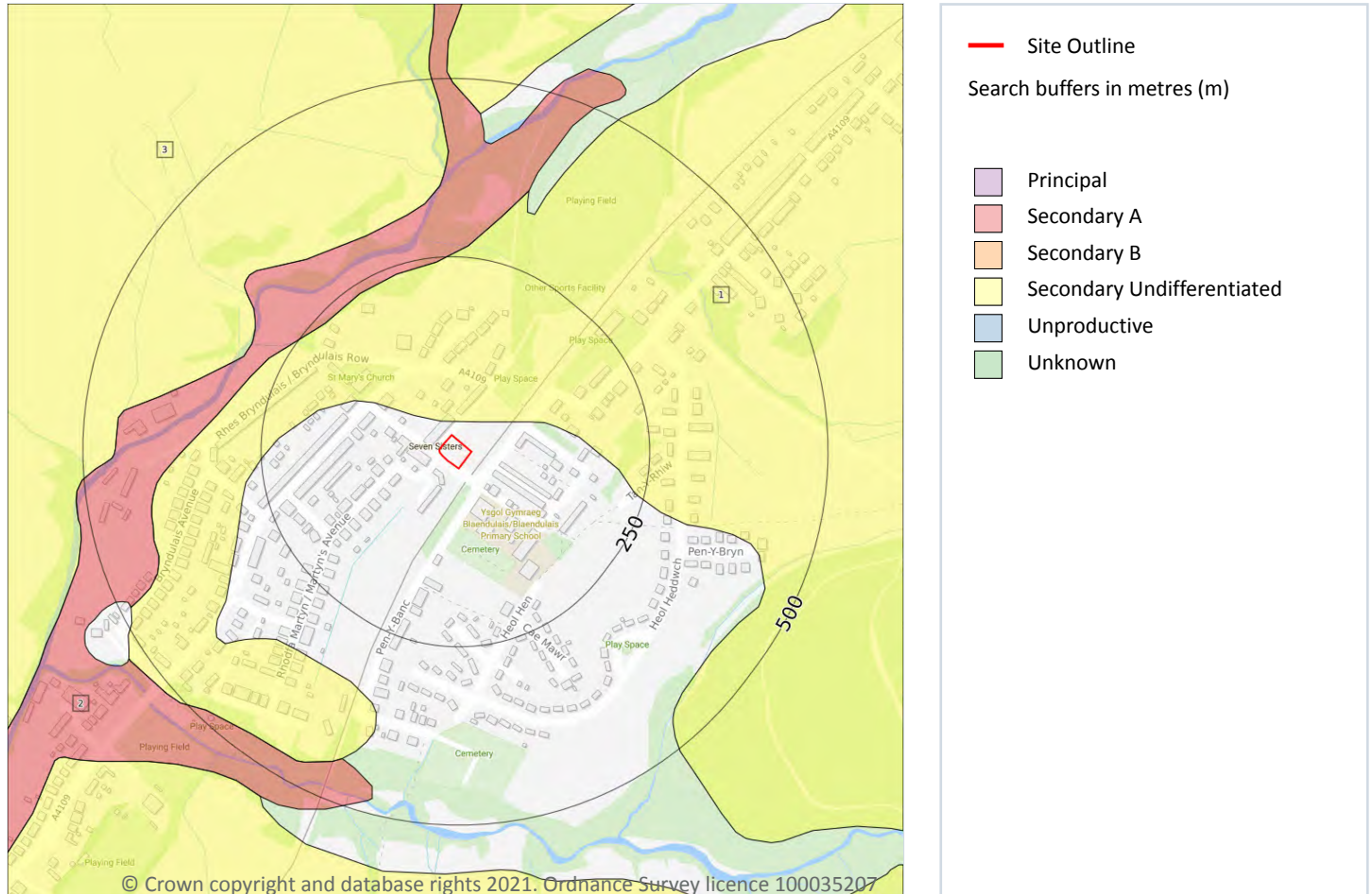
4.21 Pollution inventory radioactive waste

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



5.1 Superficial aquifer

Records within 500m

3

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 36**

ID	Location	Designation	Description
1	19m N	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	234m NW	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

ID	Location	Designation	Description
3	302m NW	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.



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-  Principal
-  Secondary A
-  Secondary B
-  Secondary Undifferentiated
-  Unproductive

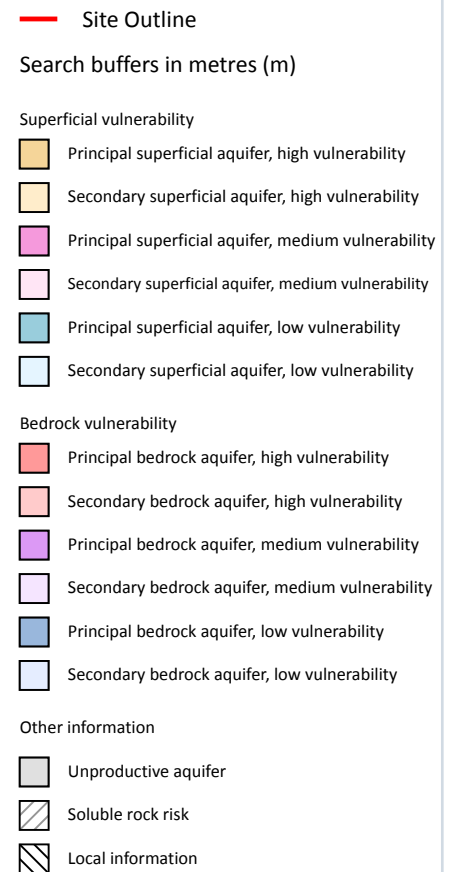
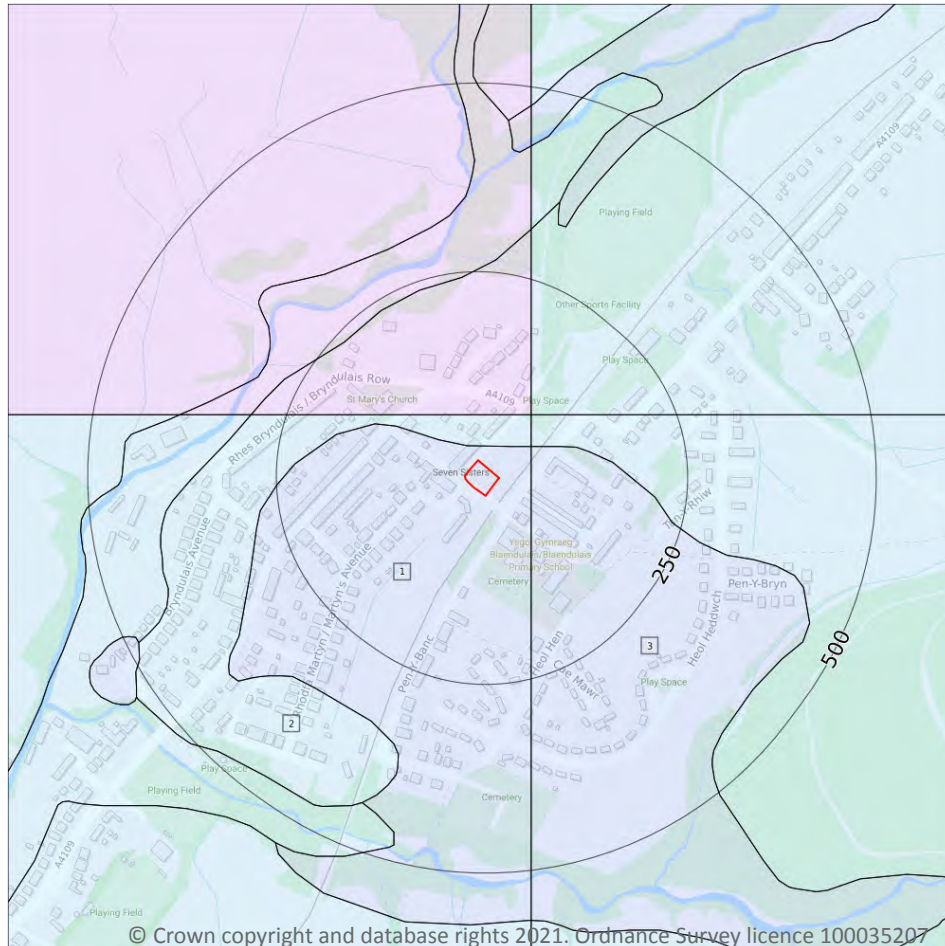
1

Features are displayed on the Bedrock aquifer map on **page 38**

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



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 39**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: >90% Recharge potential: Medium	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
2	19m N	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: <3m Patchiness value: >90% Recharge potential: Medium	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
3	42m E	Summary Classification: Secondary bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >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
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

0

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.

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 41**

ID	Location	Details	
-	1412m S	Status: Historical Licence No: 21/58/73/0019 Details: Make-Up or Top Up Water Direct Source: EAW Surface Water Point: TRIBUTARY OF NANT-Y-CAFN Data Type: Point Name: 3J's Coal Trading Company Ltd Easting: 281950 Northing: 207480	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 16/05/1994 Expiry Date: 30/11/2007 Issue No: 100 Version Start Date: 01/04/2000 Version End Date: -
-	1736m S	Status: Historical Licence No: 21/58/73/0019 Details: Make-Up or Top Up Water Direct Source: EAW Surface Water Point: TRIBUTARY OF NANT-Y-CAFN Data Type: Point Name: 3J's Coal Trading Company Ltd Easting: 282060 Northing: 207160	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 16/05/1994 Expiry Date: 30/11/2007 Issue No: 100 Version Start Date: 01/04/2000 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m

0

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.

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



5.9 Source Protection Zones

Records within 500m**0**

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

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

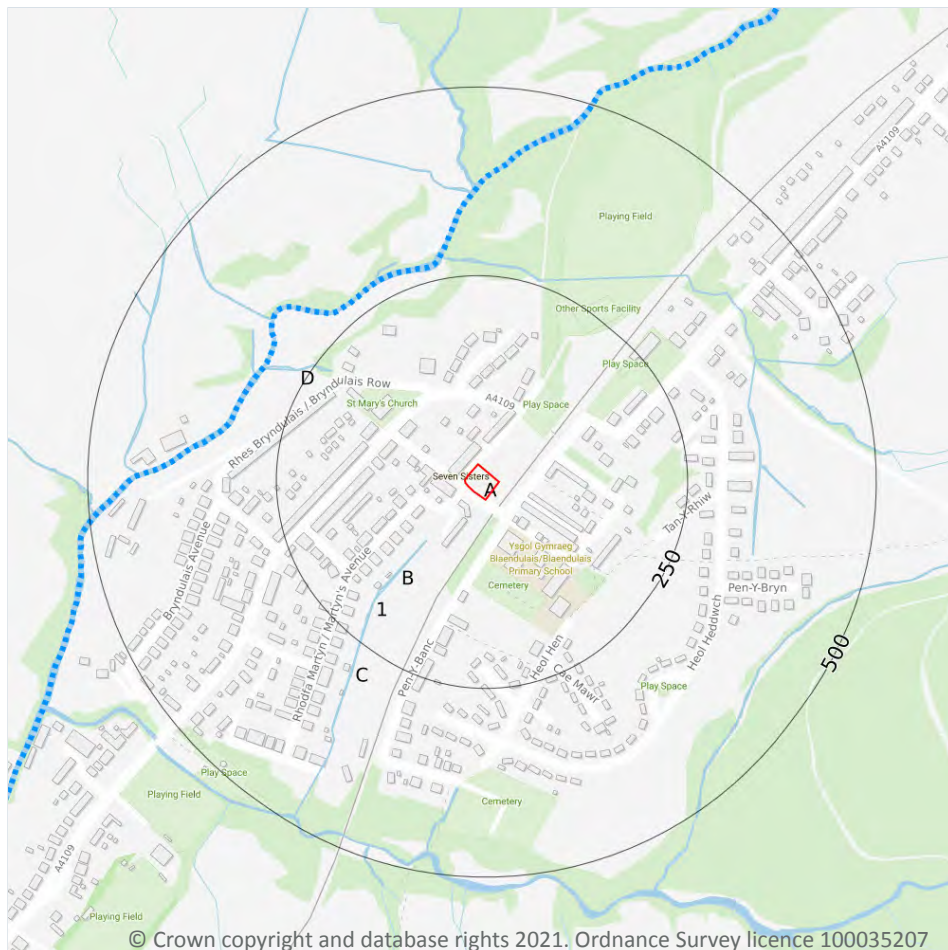
5.10 Source Protection Zones (confined aquifer)

Records within 500m**0**

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

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

6 Hydrology



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

6.1 Water Network (OS MasterMap)

Records within 250m

4

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 44**

ID	Location	Type of water feature	Ground level	Permanence	Name
B	90m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

ID	Location	Type of water feature	Ground level	Permanence	Name
1	195m SW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
C	198m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	227m NW	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

3

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 44**

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 44**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River WB catchment	Dulais - headwaters to confluence with River Neath	GB110058032360	Neath	Tawe to Cadoxton

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 44**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
3	269m N	River	Dulais - headwaters to confluence with River Neath	GB110058032360	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 44**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Swansea Carboniferous Coal Measures	GB41002G201000	Poor	Poor	Good	2016

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



7 River and coastal flooding

7.1 Risk of flooding from rivers and 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

Negligible

Highest risk within 50m

Negligible

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.

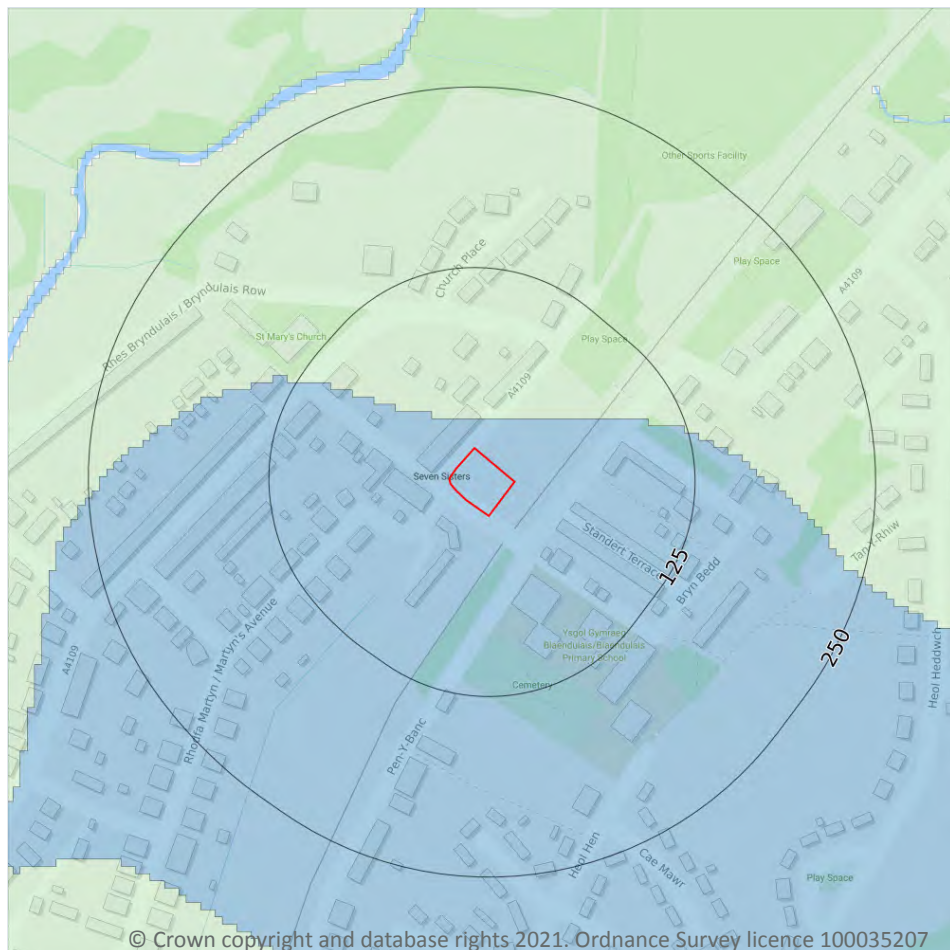
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the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

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiental 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

Negligible

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 51**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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.

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**

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**0**

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.

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

13

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 52**

ID	Location	Name	Woodland Type
1	201m N	Unknown	Ancient Semi Natural Woodland
2	356m N	Unknown	Ancient Semi Natural Woodland
3	499m N	Unknown	Ancient Semi Natural Woodland
4	519m N	Unknown	Ancient Semi Natural Woodland
5	578m SE	Unknown	Ancient Semi Natural Woodland
6	701m SE	Unknown	Plantation on Ancient Woodland Site
7	992m SE	Unknown	Ancient Semi Natural Woodland
8	995m SE	Unknown	Ancient Semi Natural Woodland
9	1078m SE	Unknown	Plantation on Ancient Woodland Site
10	1326m SW	Unknown	Ancient Semi Natural Woodland
-	1463m S	Unknown	Plantation on Ancient Woodland Site
-	1506m S	Unknown	Ancient Semi Natural Woodland
-	1667m S	Unknown	Plantation on Ancient Woodland Site

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



10.8 Biosphere Reserves

Records within 2000m

0

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

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

10.9 Forest Parks

Records within 2000m

0

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

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

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

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

10.11 Green Belt

Records within 2000m

0

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

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

10.12 Proposed Ramsar sites

Records within 2000m

0

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

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m**0**

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

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

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m**0**

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

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m**0**

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

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m**0**

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

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



SSSI Impact Zones and Units

10.17 SSSI Impact Risk Zones

Records on site

0

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.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m

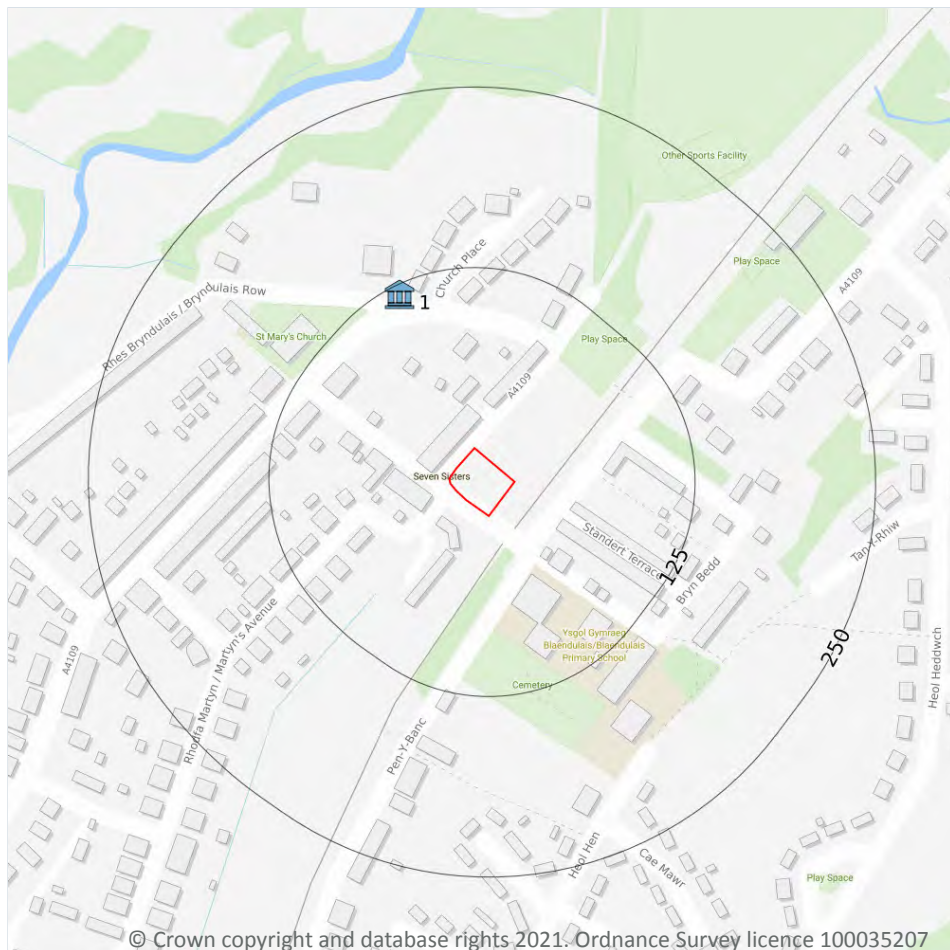
0

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

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



11 Visual and cultural designations



- Site Outline
- Search buffers in metres (m)
- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m

0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

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

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

11.3 National Parks

Records within 250m

0

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

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

11.4 Listed Buildings

Records within 250m

1

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 58**

ID	Location	Name	Grade	Reference Number	Listed date
1	118m NW	The War Memorial, In A Prominent Position On The N Side Of A Bend In The A4109 Near The Centre Of Seven Sisters	II	82050	06/11/2003

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.

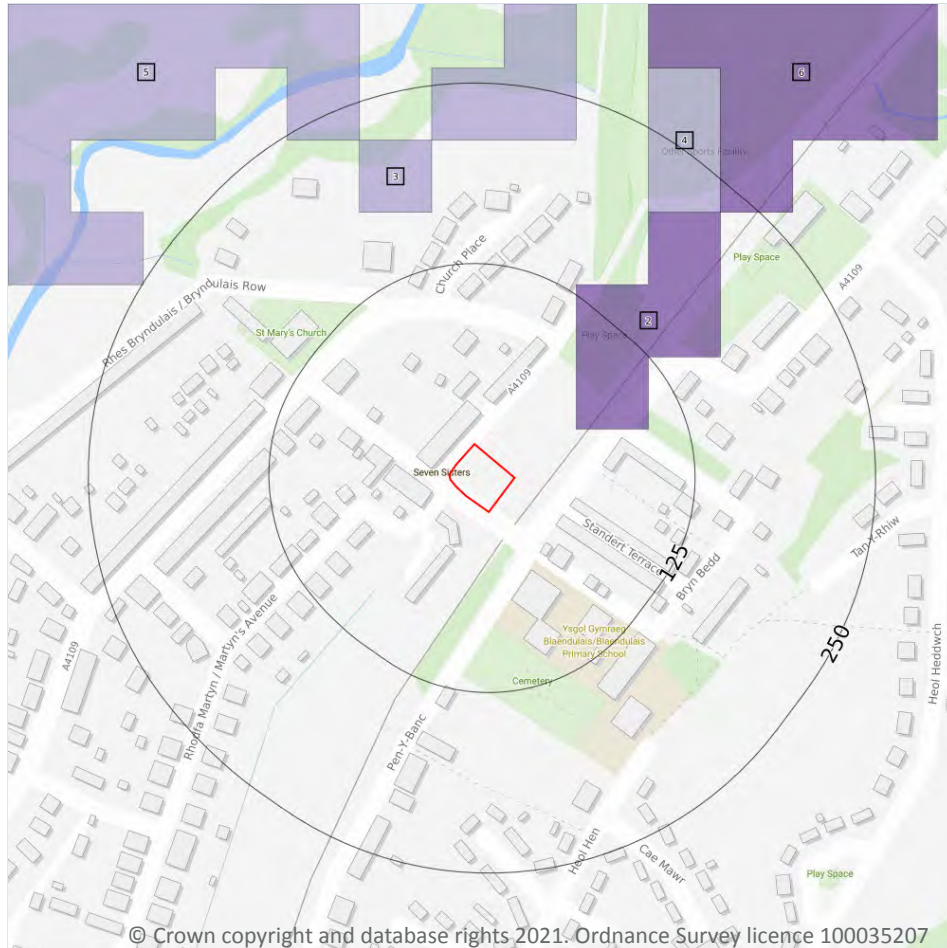
11.7 Registered Parks and Gardens

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

6

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 61**

ID	Location	Classification	Description
2	54m NE	Grade 5	Very poor quality agricultural land
3	163m N	Grade 4	Poor quality agricultural land
4	201m NE	Grade 4	Poor quality agricultural land

ID	Location	Classification	Description
A	210m N	Grade 4	Poor quality agricultural land
5	225m N	Grade 4	Poor quality agricultural land
6	232m NE	Grade 5	Very poor 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

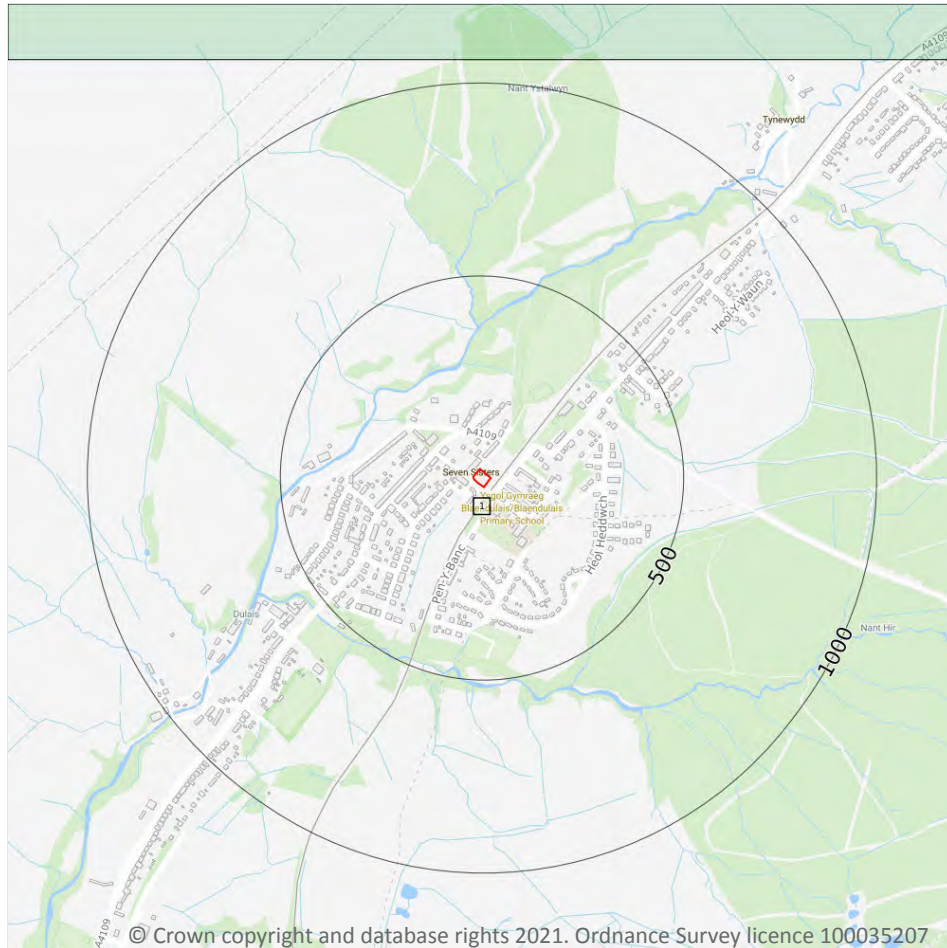
Records within 250m

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 65**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.



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

14.2 Artificial and made ground (10k)

Records within 500m

0

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.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

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.

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

14.5 Bedrock geology (10k)

Records within 500m

0

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.

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

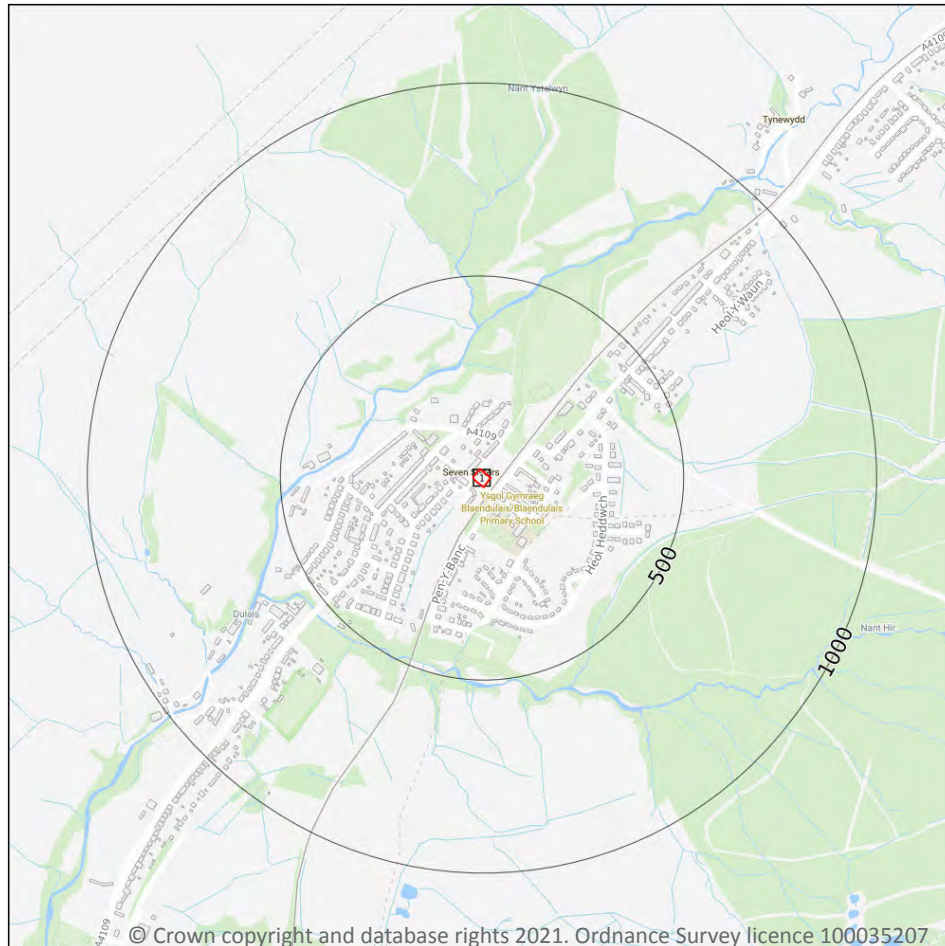
Records within 500m

0

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.

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

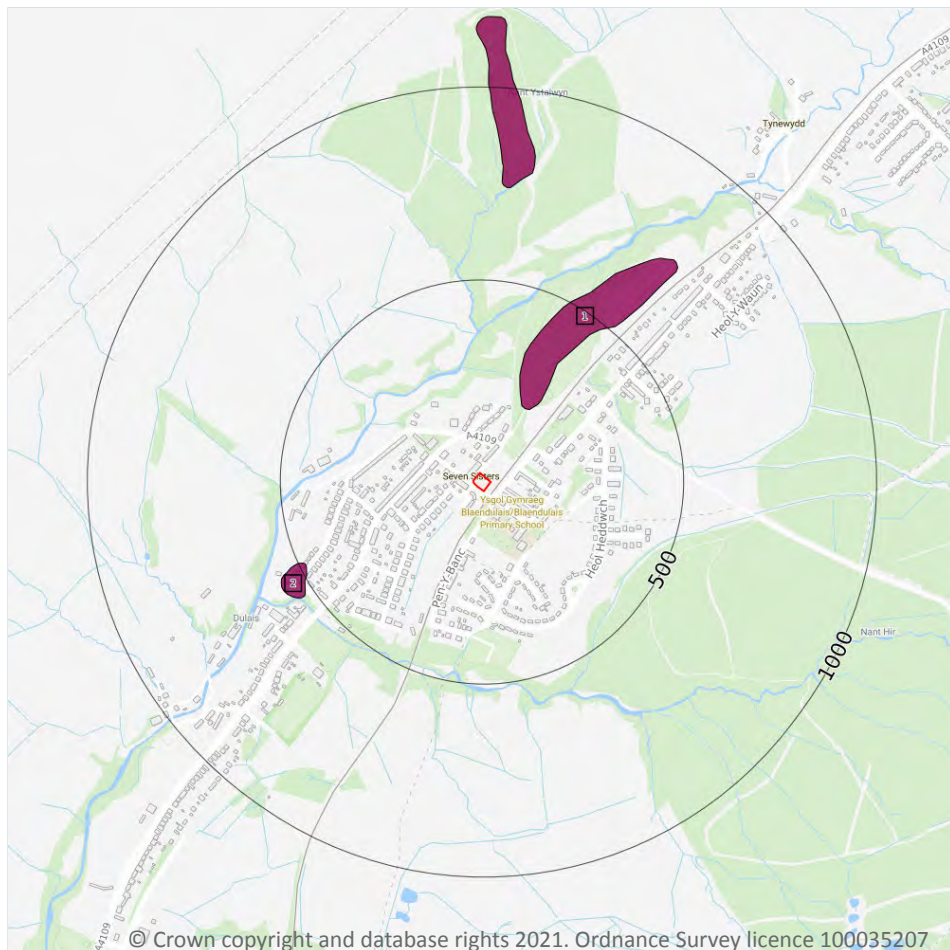
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme. Where 50k data is not available, this area has been filled in with 625k scale data.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 69**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW231_merthyr_v4

This data is sourced from the British Geological Survey.

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



- Site Outline
- Search buffers in metres (m)
- Made ground
 - Worked ground
 - Infilled ground
 - Disturbed ground
 - Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m

2

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

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 70**

ID	Location	LEX Code	Description	Rock description
1	204m NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	484m SW	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

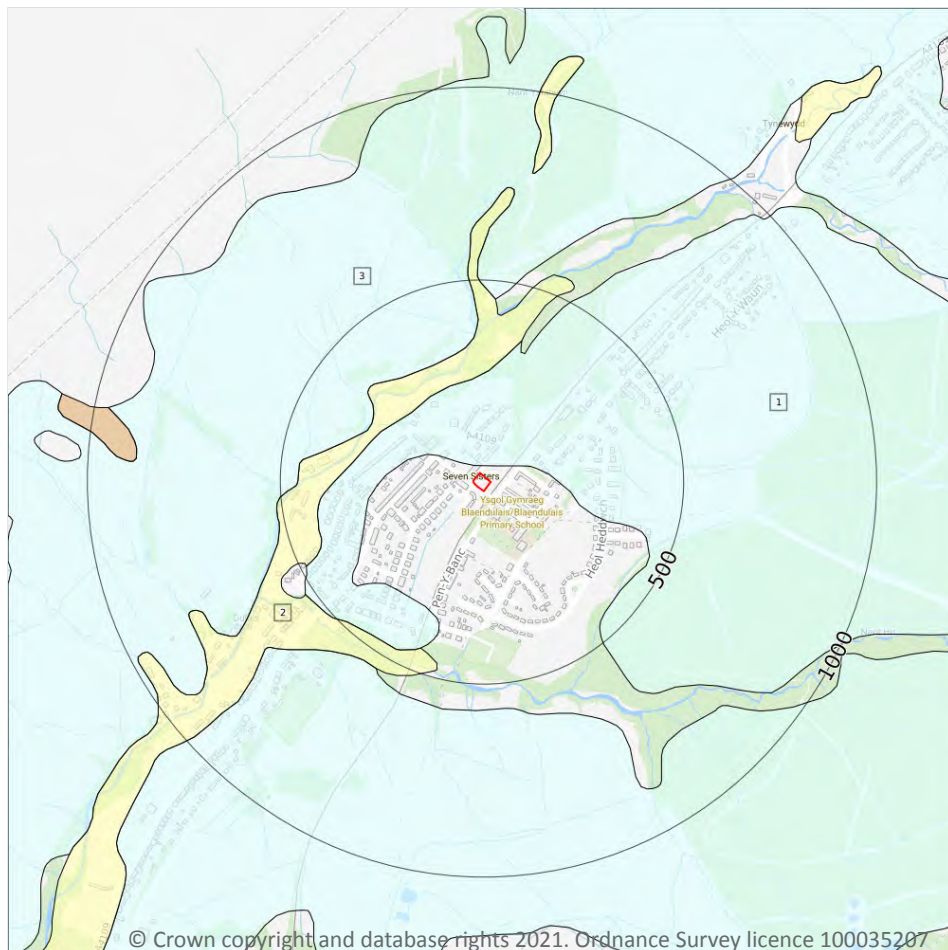
0

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

3

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 72**

ID	Location	LEX Code	Description	Rock description
1	19m N	TILLD-DMTN	TILL, DEVANSIAN	DIAMICTON
2	234m NW	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
3	302m NW	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
19m SE	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

1

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 74**

ID	Location	LEX Code	Description	Rock age
1	On site	SWMCM-MDSS	SOUTH WALES MIDDLE COAL MEASURES FORMATION - 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

1

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 74**

ID	Location	Category	Description
2	457m SE	FOSSIL_HORIZON	Marine band

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

1

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.

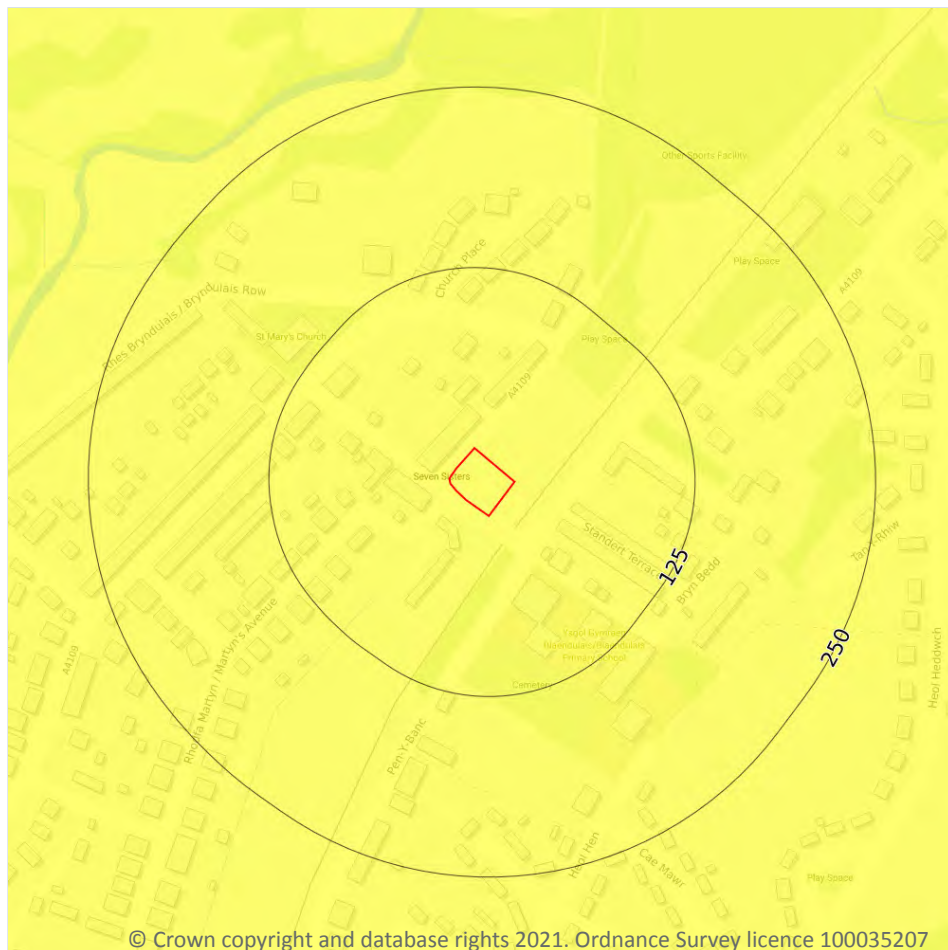
Features are displayed on the Boreholes map on **page 76**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	229m NE	282040 209140	SEVEN SISTERS PIT 1	217.86	N	258128

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

1

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).

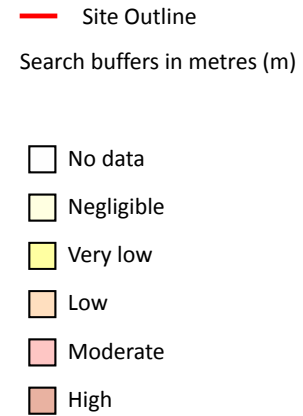
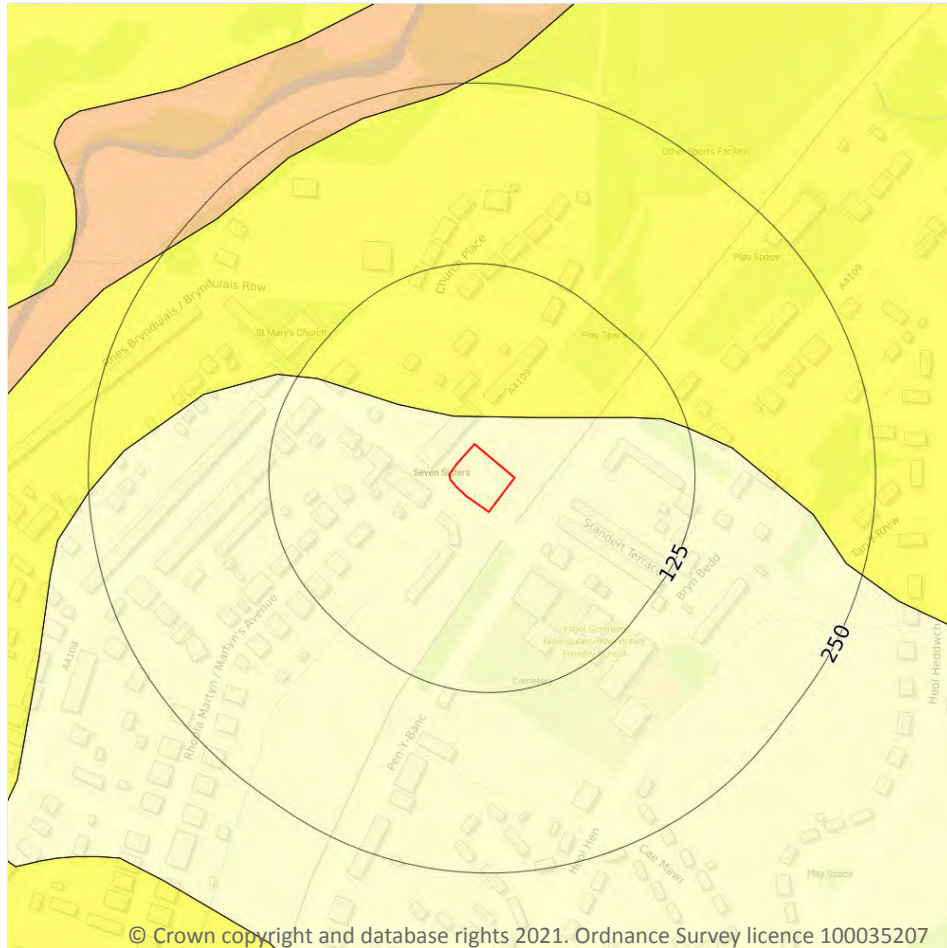
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 77**

Location	Hazard rating	Details
On site	Very low	Ground conditions predominantly low plasticity.

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 78**

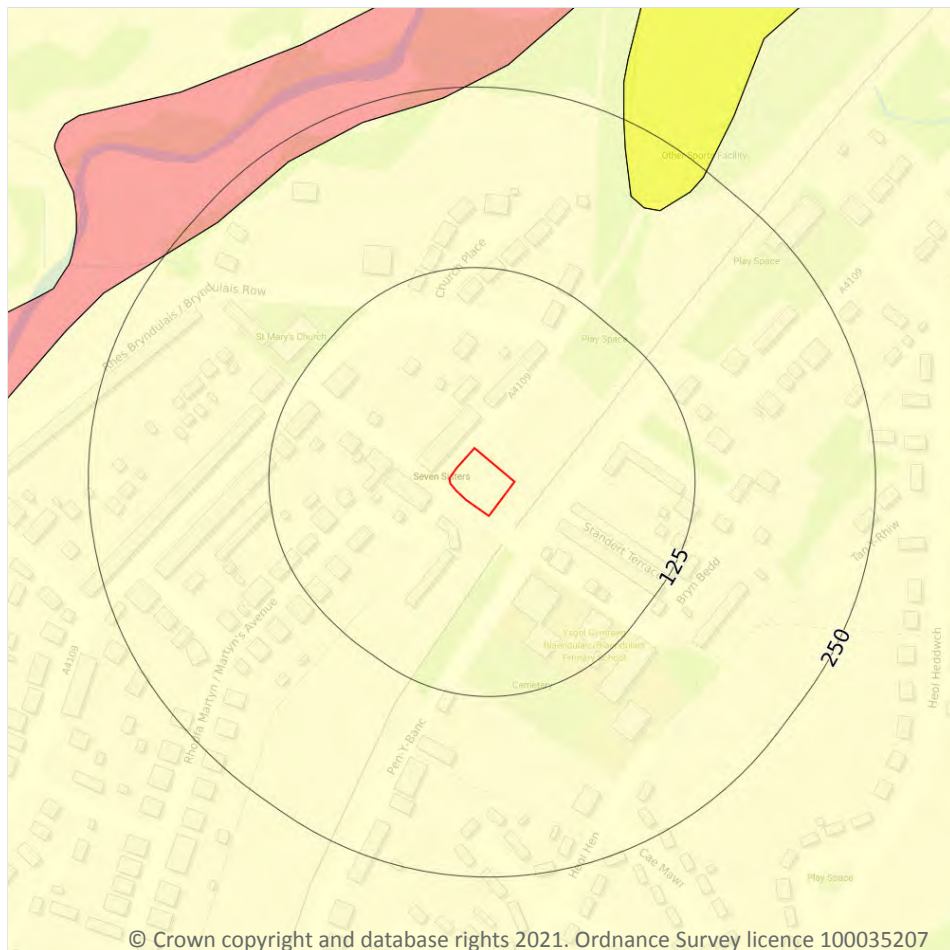
Location	Hazard rating	Details
On site	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

Location	Hazard rating	Details
19m N	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



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

17.3 Compressible deposits

Records within 50m

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.

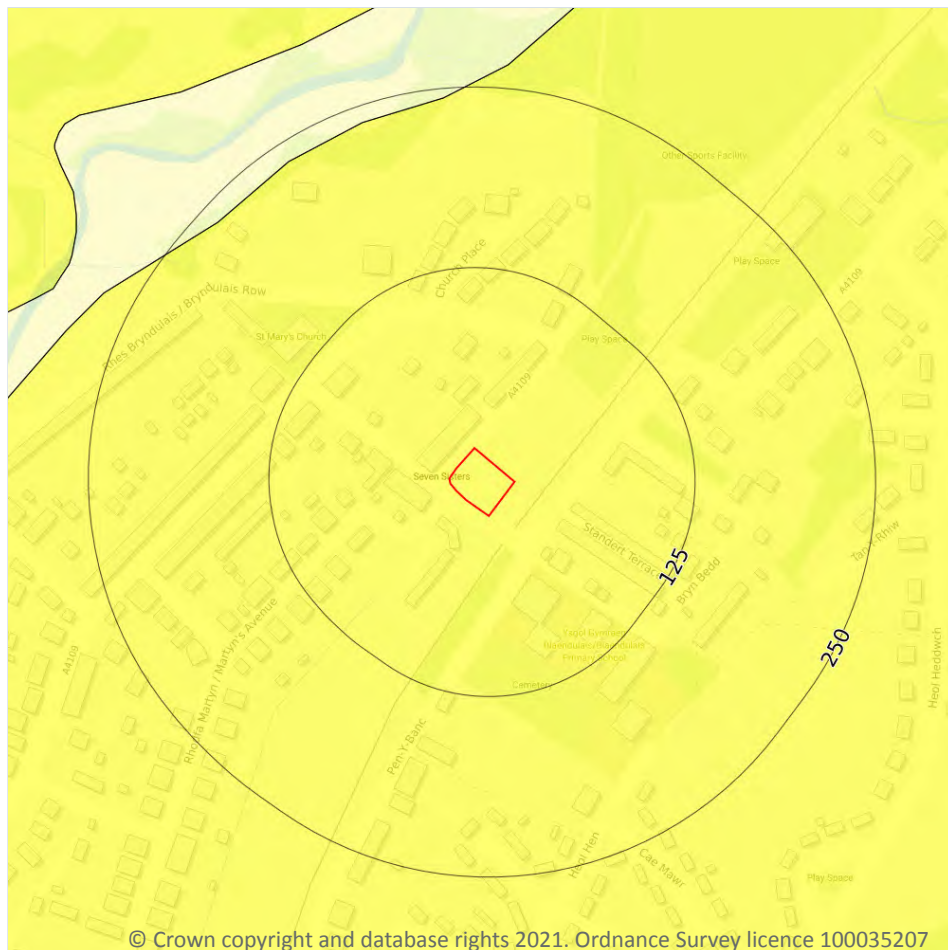
Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 80**

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

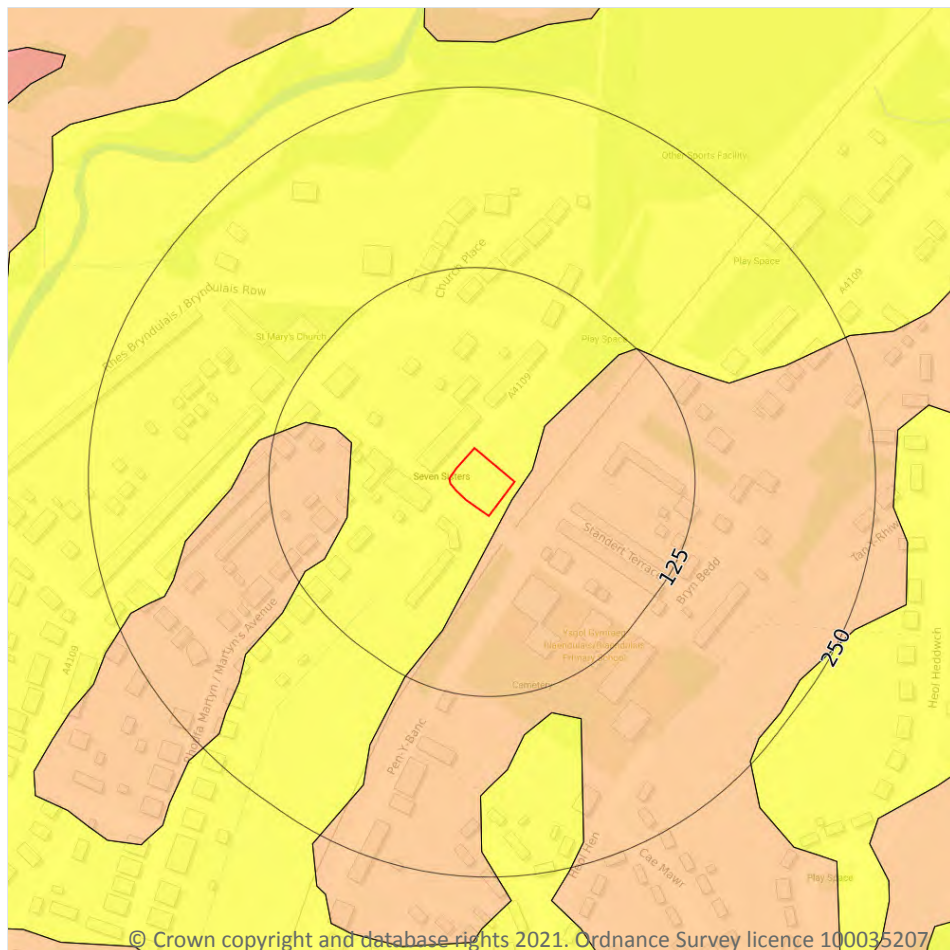
This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



Natural ground subsidence - Landslides



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

17.5 Landslides

Records within 50m

2

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

Features are displayed on the Natural ground subsidence - Landslides map on **page 82**

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

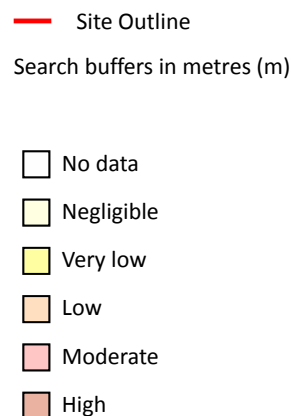
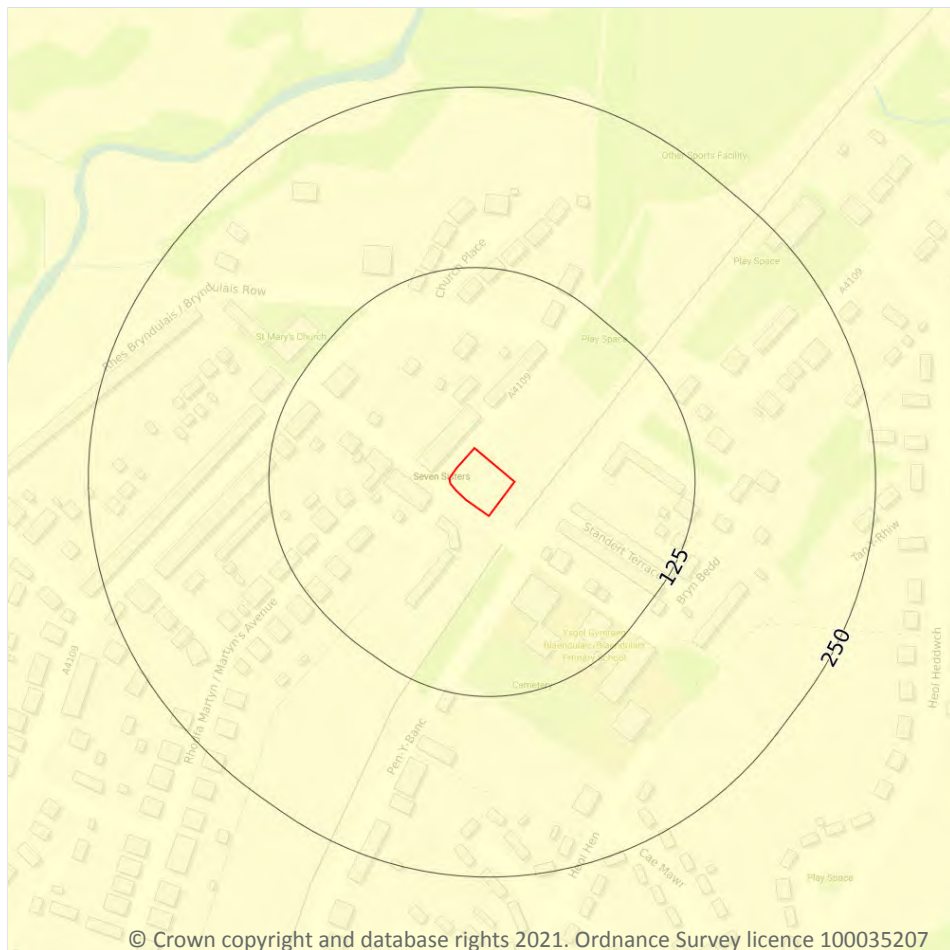


Location	Hazard rating	Details
6m SE	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

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.

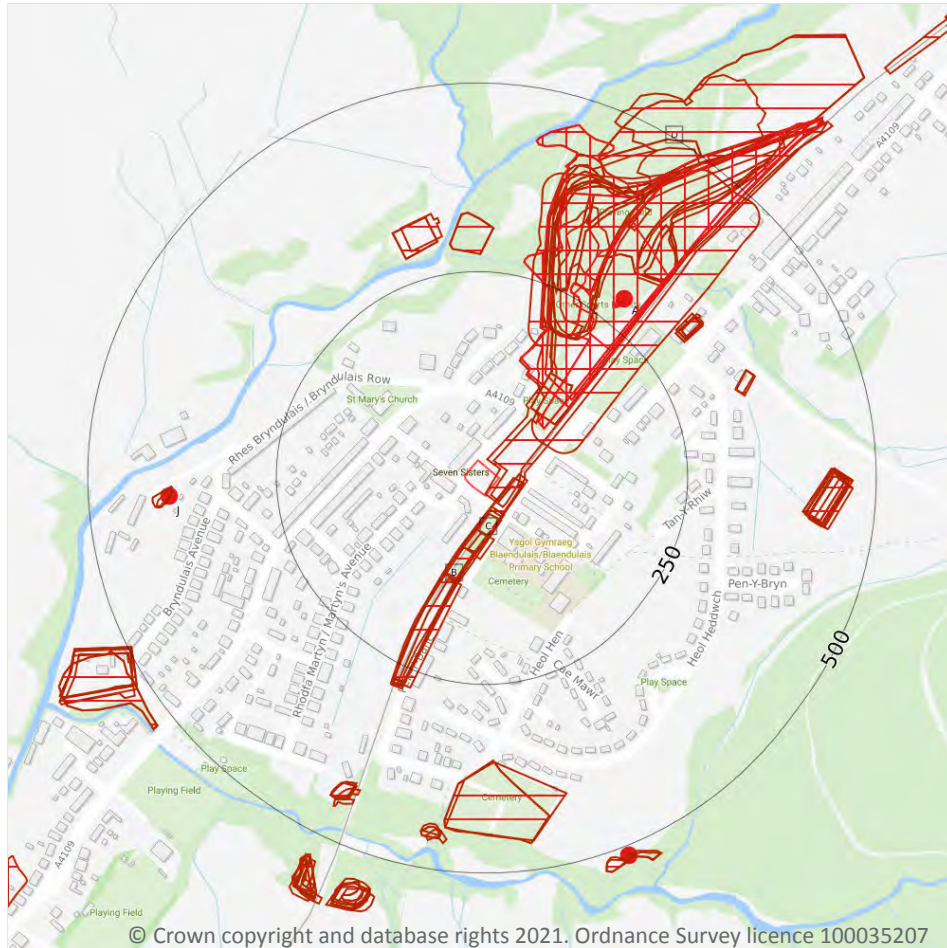
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 84**

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

2

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 85**

ID	Location	Details	Description
A	288m NE	Name: Seven Sisters Pit Address: Seven Sisters, NEATH, West Glamorgan 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
J	393m W	Name: Bryn-dulais Address: Seven Sisters, NEATH, West Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site 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

28

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 85**

ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Mill Ponds	1921	1:10560
A	3m SE	Colliery	1921	1:10560
B	15m SE	Cuttings	1877	1:10560
B	16m SE	Cuttings	1876	1:10560
B	17m SE	Cuttings	1914	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
B	17m SE	Cuttings	1914	1:10560
C	20m S	Cuttings	1921	1:10560
B	25m S	Cuttings	1921	1:10560
C	46m S	Cuttings	1948	1:10560
C	48m S	Cuttings	1921	1:10560
A	72m NE	Colliery	1903	1:10560
A	98m NE	Colliery	1921	1:10560
A	98m NE	Colliery	1921	1:10560
B	115m SW	Cuttings	1948	1:10560
B	117m SW	Cuttings	1921	1:10560
B	120m SW	Cuttings	1921	1:10560
A	131m NE	Colliery	1948	1:10560
A	142m NE	Colliery	1901	1:10560
A	147m NE	Colliery	1914	1:10560
A	147m NE	Colliery	1914	1:10560
A	197m NE	Refuse Heap	1921	1:10560
D	198m NE	Refuse Heap	1988	1:10000
D	198m NE	Refuse Heap	1964	1:10560
A	200m NE	Refuse Heap	1921	1:10560
A	201m NE	Refuse Heap	1921	1:10560
A	201m NE	Refuse Heap	1921	1:10560
A	205m NE	Unspecified Heap	1901	1:10560
D	246m NE	Refuse Heaps	1948	1:10560

This data is sourced from Ordnance Survey/Groundsure.



18.4 Underground workings

Records within 1000m

14

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 85**

ID	Location	Land Use	Year of mapping	Mapping scale
A	88m NE	Unspecified Mine	1988	1:10000
A	88m NE	Unspecified Mine	1964	1:10560
A	131m NE	Colliery	1948	1:10560
A	142m NE	Colliery	1901	1:10560
A	224m NE	Coal Pit	1877	1:10560
A	271m NE	Unspecified Shafts	1877	1:10560
A	273m NE	Unspecified Shaft	1876	1:10560
A	285m NE	Unspecified Shaft	1877	1:10560
A	289m NE	Unspecified Shaft	1876	1:10560
-	991m NE	Coal Pit	1877	1:10560
-	992m NE	Old Coal Pit	1901	1:10560
-	993m NE	Old Coal Pit	1948	1:10560
-	993m NE	Old Coal Pit	1903	1:10560
-	994m NE	Coal Pit	1876	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m

0

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

This data is sourced from the British Geological Survey.



18.6 Non-coal mining

Records within 1000m

0

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).

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

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.

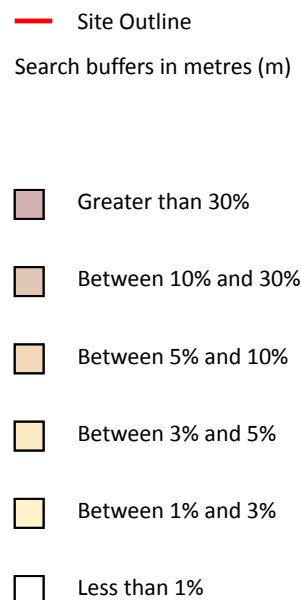
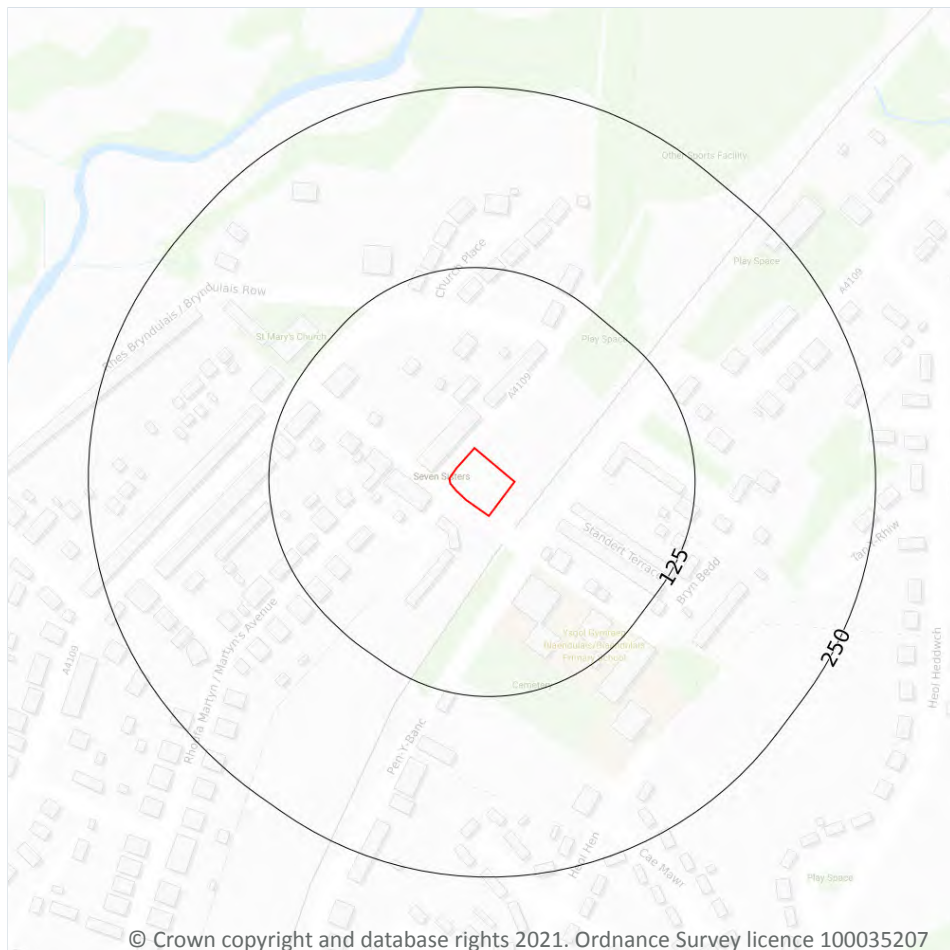
18.13 Clay mining

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 91**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None**

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

3

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

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
19m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
43m SE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

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

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m

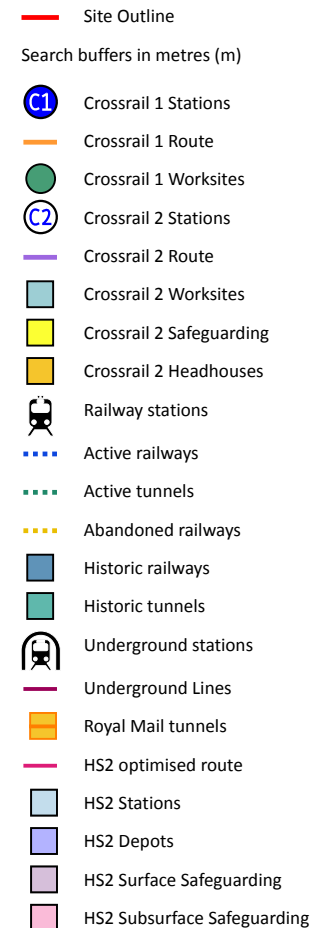
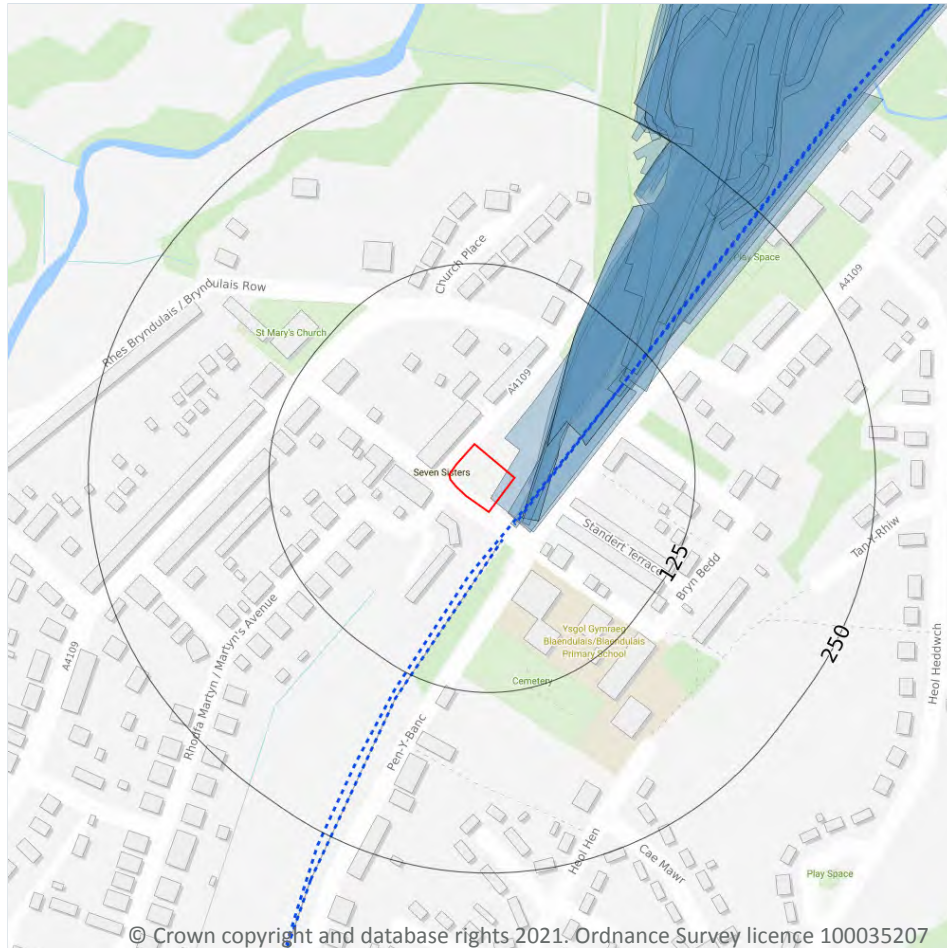
0

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

This data is sourced from the British Geological Survey.



21 Railway infrastructure and projects



21.1 Underground railways (London)

Records within 250m

0

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

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m

0

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

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m

23

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 93**

Location	Land Use	Year of mapping	Mapping scale
On site	Railway Sidings	1921	10560
9m SE	Railway Sidings	1948	10560
11m E	Railway Sidings	1918	2500
13m E	Railway Sidings	1914	10560
13m SE	Mineral Railway Sidings	1962	2500
15m E	Railway Sidings	1921	10560
32m NE	Railway Sidings	1988	10000
32m NE	Railway Sidings	1964	10560
89m NE	Railway Sidings	1877	10560
92m NE	Railway Sidings	1962	2500
97m NE	Railway Sidings	1899	2500
99m NE	Railway Sidings	1879	2500
99m NE	Railway Sidings	1903	10560
103m NE	Railway Sidings	1877	2500
104m NE	Railway Sidings	1876	10560
108m NE	Tramway Sidings	1901	10560
128m NE	Tramway Sidings	1904	2500



Location	Land Use	Year of mapping	Mapping scale
147m NE	Railway Sidings	1921	10560
206m NE	Tramway Sidings	1904	2500
224m NE	Railway Sidings	1921	10560
227m NE	Tramway Sidings	1903	10560
228m NE	Tramway Sidings	1899	2500
249m NE	Railway Sidings	1921	10560

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m

0

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

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m

0

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

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m

5

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways. Features are displayed on the Railway infrastructure and projects map on **page 93**

Location	Name	Type
18m SE		rail
20m SE	Not given	Single Track
21m SE	Not given	Single Track



Location	Name	Type
97m NE	Not given	Single Track
155m NE	Not given	Single Track

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/>.



APPENDIX D

CONSULTANTS COAL MINING REPORT

Consultants Coal Mining Report
The Coal Authority, Overview of Activity

GS-8293535
Summary of findings



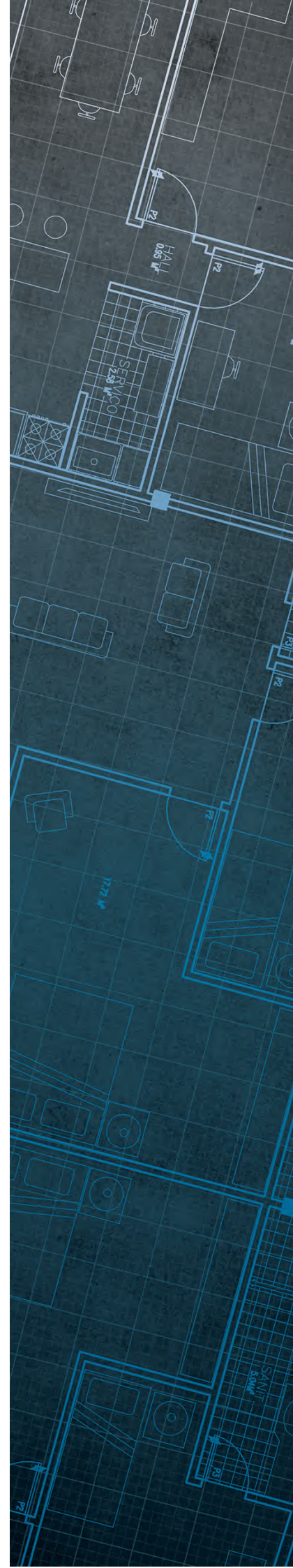
The Coal
Authority

Consultants Coal Mining Report

Accommodation, 8, High Street,
Seven Sisters, Sa10 9dn
East Sussex

Date of enquiry:	27 October 2021
Date enquiry received:	27 October 2021
Issue date:	27 October 2021

Our reference:	51002704201001
Your reference:	GS-8293535



Consultants

Coal Mining Report

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

Client name

GROUNDSURE LIMITED

Enquiry address

Accommodation, 8, High Street, Seven Sisters, Sa10
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Mansfield
Nottinghamshire
NG18 4RG

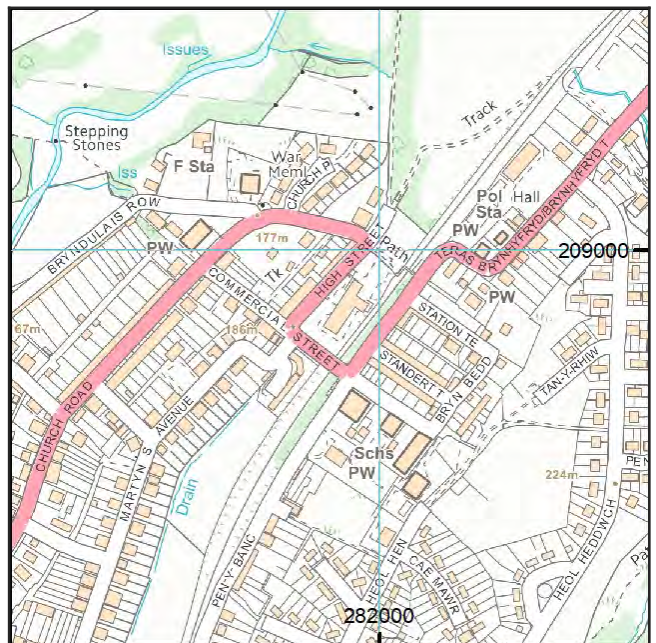
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
SEVEN SISTERS	RED VEIN	Coal	4T2K	150	Beneath Property	6.0	South-West	100	1908
unnamed	CAERAU	Coal	4HRR	153	North-East	0.0	East	80	1944
unnamed	RED VEIN	Coal	4GAF	155	East	5.1	South-West	110	1900
unnamed	CAERAU	Coal	4GH4	155	North	5.4	South	100	1941
unnamed	CAERAU	Coal	4GA9	155	North-East	0.0	East	80	1941
unnamed	CAERAU	Coal	4T2L	156	North-East	4.4	South-West	80	1941
SEVEN SISTERS	RED VEIN	Coal	4HR8	156	North-East	5.1	South	110	1900
unnamed	RED VEIN	Coal	4GH5	157	North	5.9	South	100	1915
SEVEN SISTERS	LOWER NINE FOOT	Coal	4T2I	200	Beneath Property	5.6	South	190	1892
unnamed	BUTE	Coal	4I60	203	North-West	5.1	South-West	150	1932
SEVEN SISTERS	LOWER NINE FOOT	Coal	4HRD	205	North-East	5.4	South-West	200	1905
unnamed	BUTE	Coal	4GHC	208	North	4.7	South	150	1934
unnamed	LOWER NINE FOOT	Coal	4GB4	208	East	0.0	East	300	1913
unnamed	LOWER NINE FOOT	Coal	4GB2	208	South-East	0.0	East	300	1913
unnamed	LOWER NINE FOOT	Coal	4GB5	208	North-East	0.0	East	300	1913
unnamed	BUTE	Coal	4T2F	211	Beneath Property	6.0	South-West	110	1930
unnamed	LOWER NINE FOOT	Coal	4GHI	215	North	4.4	South	190	1910
unnamed	BUTE	Coal	4HRI	217	North-East	0.0	East	100	1935
unnamed	LOWER NINE FOOT	Coal	4GHL	218	North-West	4.4	South	190	1896
unnamed	BUTE	Coal	4GAB	232	East	2.4	South-West	100	1939

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

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

SWA4030	SWR3722	SWR4023
SW483	SWR640	SW134
14355	10973	SWR641

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

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
GORLLWYN	Coal	Yes	Within	N/A	36

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

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

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

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

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

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

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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

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

Payments to owners of former copyhold land

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

Section 4 – Further information

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

Development advice

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

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

Section 5 – Data definitions

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

Past underground coal mining

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

Probable unrecorded shallow workings

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

Spine roadways at shallow depth

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

Mine entries

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

Abandoned mine plan catalogue numbers

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

Outcrops

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

Geological faults, fissures and breaklines

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

Opencast mines

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

Coal Authority managed tips

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

Site investigations

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

Remediated sites

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

Coal mining subsidence

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

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

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

Mine gas

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

Mine water treatment schemes

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

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

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

Future underground mining

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

Coal mining licensing

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

Court orders

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

Section 46 notices

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

Withdrawal of support notices

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

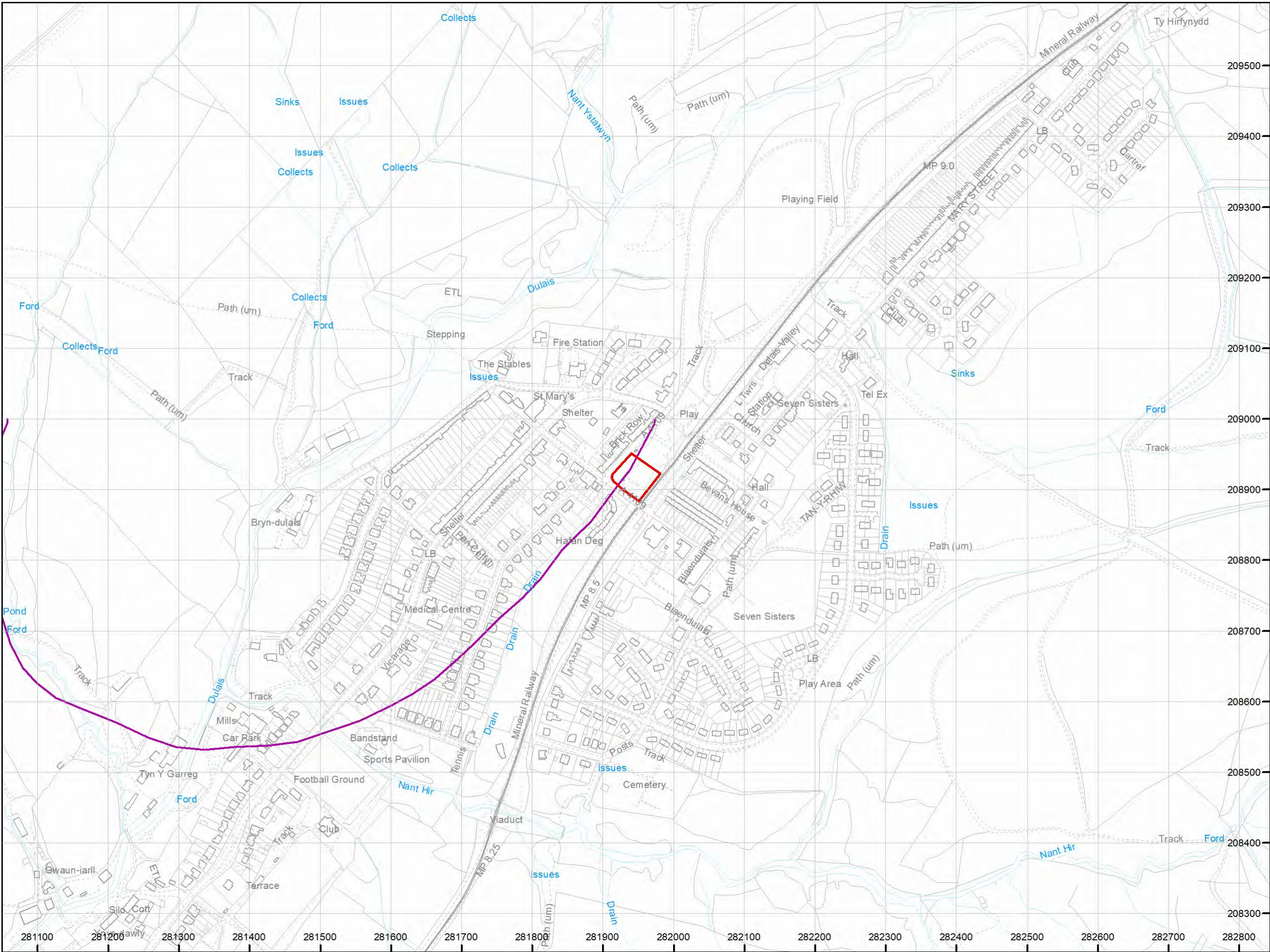
Payment to owners of former copyhold land

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

Key

Approximate position of the enquiry boundary shown 

Outcrop (Proven) 



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

APPENDIX E

SITE WALKOVER PHOTOGRAPHS AND SITE WALKOVER CHECKLIST

Site Walkover Photographs
Site Walkover Checklist

Sheets 1 to 9
H1061-21 SWC



1 - Looking south towards site from current vehicular entrance



2 - Centre of site (looking southwest)

Notes:	Project	Childcare Unit Blaendulais	Sheet 1
	Project No.	H1061-21	
	Carried out for	Neath Port Talbot Council	



3 - Centre of site (looking west)



4 - Centre of site (looking southeast)

Notes:	Project	Childcare Unit Blaendulais	Sheet 2
	Project No.	H1061-21	
	Carried out for	Neath Port Talbot Council	



5 - Southwest boundary of site (looking southeast)



6 - Southwest boundary of site (looking northwest)

Notes:	Project	Childcare Unit Blaendulais	Sheet 3
	Project No.	H1061-21	
	Carried out for	Neath Port Talbot Council	



7 - Electrical Substation located in west of site



8 - Electrical Substation

Notes:	Project	Childcare Unit Blaendulais	Sheet 4
	Project No.	H1061-21	
	Carried out for	Neath Port Talbot Council	



9 - Above ground gas pipe to south of site (looking southeast)

Notes:	Project	Childcare Unit Blaendulais	Sheet 5
	Project No.	H1061-21	
	Carried out for	Neath Port Talbot Council	



10 - Above ground gas pipe crossing railway, to southeast of site



11 - Railway running along southeast boundary of site (looking northeast)

Notes:	Project	Childcare Unit Blaendulais	Sheet 6
	Project No.	H1061-21	
	Carried out for	Neath Port Talbot Council	



12 - Land to southeast of site (beyond railway) (A4109) (looking southwest)



13 - Land to north of site (looking north)

Notes:	Project	Childcare Unit Blaendulais	Sheet 7
	Project No.	H1061-21	
	Carried out for	Neath Port Talbot Council	



14 - Land to northwest of site, High Street (A4109) (looking southwest)



15 - Area to north of site, current vehicular entrance (looking east)

Notes:	<table><tr><td>Project</td><td>Childcare Unit Blaendulais</td></tr><tr><td>Project No.</td><td>H1061-21</td></tr><tr><td>Carried out for</td><td>Neath Port Talbot Council</td></tr></table>	Project	Childcare Unit Blaendulais	Project No.	H1061-21	Carried out for	Neath Port Talbot Council	Sheet 8
Project	Childcare Unit Blaendulais							
Project No.	H1061-21							
Carried out for	Neath Port Talbot Council							



16 - Area to north of site, current vehicular entrance (looking east)



17 - Unused pedestrian entrance to northwest of site (looking southeast)

Notes:	Project	Childcare Unit Blaendulais	Sheet 9
	Project No.	H1061-21	
	Carried out for	Neath Port Talbot Council	

Site Walkover Checklist (H1061-21 SWC)

REFERENCES	
Project No.	H1061-21
Site Address	Land adjacent to: High Street Seven Sisters Neath SA10 9DN
Date of visit	1 st November 2021
Prepared by	Ruth Blair
SITE – GENERAL	
Plan of site	(See Appendix A)
Site size (area) : % building, % hardstanding, % open space / other	~ 90% Overgrown/trees ~ 5% concrete slab ~ 5% Electrical Substation
Current use (occupants and operations)	Unused, overgrown site Established trees located along the southern and eastern boundaries of the site.
SITE – BUILDINGS	
Age of building(s)	Electricity substation: unknown Concrete slab: unknown
Building appearance: no. of storeys, basement, roofing type, chimneys / stacks?, car park, service areas	N/A
Building Appearance Photo	N/A
Tanks: location (internal / external : above or below ground), age / condition, size / capacity, type, bunding (condition), refuelling point, evidence of stains / spills	Electricity substation, appeared to be working at time of walkover
Image of Tank(s)	See Appendix E (photographs 7 and 8)
Heating : electric/gas/oil	N/A
Chemical storage : drums, other chemical stores	N/A
Gas control measures (e.g. vents, cowls, monitoring / alarms)	N/A
Other evidence of industrial activity	None observed
Photo of industrial factors (if applicable)	N/A
Asbestos / deleterious materials – any asbestos surveys?, removal programmes?	Unknown. Previous buildings on site demolished. Potential asbestos containing materials within demolished material beneath existing ground.
Electrical equipment / Transformers – check for PCBs? Backup power supplies (generators)	Overhead cables observed along the northwest and southwest boundaries of the site.

Site Walkover Checklist (H1061-21 SWC)

SITE	
Site surfacing: type (asphalt/concrete etc.), staining, weathering, subsidence, repairs. Landscaped areas.	Onsite: Topography of site is stepped with the highest point being the southern boundary of the site, this slopes steeply down to a flat area extending approximately 5 m towards the northeast. The topography then steps down again parallel with the southern boundary. The remainder of the site is relatively flat. The nature of the topography (stepped) appears to be man-made, assumed to be related to the previous use of the site, or the construction of Commercial Road to the south. A substation is located within the site. This appeared to be functioning at the time of the site walkover. A concrete slab is located adjacent to (west of) the electrical substation. This is presumed to be associated with the previous use of the site (now demolished). The majority of the site is largely overgrown with established trees along the southern and eastern boundaries of the site. The ground (grassy areas) underfoot during the site walkover was damp with some areas that felt marshy.
Drainage: interceptors, disposal of storm water / waste water, mains water supply?	Drainage observed approximately 60 m to the northeast of the site. Cover not lifted during site walkover.
Site topography – flat / sloping?, level compared to surroundings, evidence of filling or raising, earthworks?	Discussed previously
Vehicle maintenance : wash down areas, workshops, refuelling points	None observed during site walkover
Waste: skips / compounds, any hazardous waste? Burning grounds or incinerators	None observed during site walkover
Sub-stations: age, condition, transformers, operator, servicing?	Substation present within site. Discussed previously
Trees – effects on buildings, condition, species and height	Established trees are located along the southern boundary and eastern boundaries of the site.
Sloping ground – any indication of instability (cracks in ground, bulges, leaning trees, walls or poles), rotational slip scars.	Discussed previously
Ecological features of note – Burrows, bats, nest sites, designated preservation areas	None observed during site walkover
Other features of note within site	

Site Walkover Checklist (H1061-21 SWC)

SURROUNDING LAND USES	
General site context – industrial, commercial, urban, agricultural etc.	The site is surrounded largely by residential and light commercial buildings. The southeast boundary of the site is bound by a railway which runs in a northeast southwest direction. The west and southern areas of the site are bound by roads.
Land use – north	North: overgrown extending approx. 45 m northeast of the site. Beyond this the land is hardstanding, extending from 45 m to 75 m.
Land use – south	South: road (Commercial Road) runs along the southern boundary of the site. Overhead cables run parallel with this road.
Land use – east	East: the railway runs along the southeast boundary of the site. An above ground gas pipeline is located to the southeast of the site, this travels over the railway towards the east.
Land use – west	West: road (High Street) runs along the western boundary of the site. A bus stop is also located on this road. Overhead cables run parallel with this road.
Nearby sources of pollution – landfills, filling stations, industrial activity.	No notable sources of pollution observed during site walkover within close proximity to the site
Nearby river / surface water features – culverted, banks, flood plain. If visible, condition of watercourse	No notable watercourses within close proximity to the site.
Adjacent geotechnical features of note – cuttings, quarries, embankments, slopes (particularly if failed), major excavations, deep basements, sources of vibrations (railway or heavy machinery)	The railway is located along the south-eastern boundary of the site. It runs in a northeast southwest direction. Where the railway is adjacent with the site, it is located within a cutting and travels beneath the road to the south (Commercial Road).
Other features of note adjacent to site	

APPENDIX F

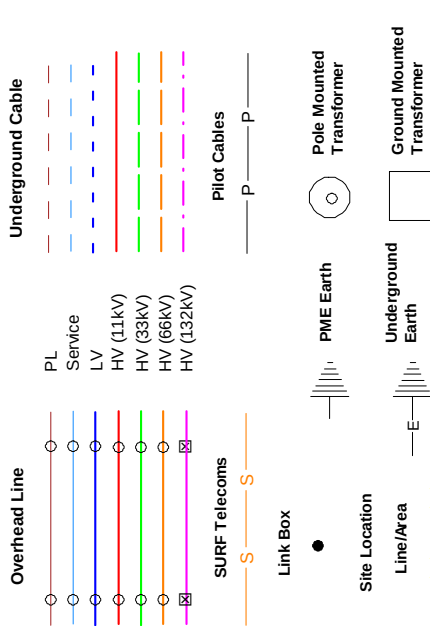
PUBLIC UTILITY SERVICE PLANS

Openreach (BT Apparatus)
Western Power Distribution (Electricity)
ESP Utilities Group (Gas)
Wales & West Utilities (Gas)
Virgin Media (Fibre optic cables)
Welsh Water Dwr Cymru (Water and drainage)

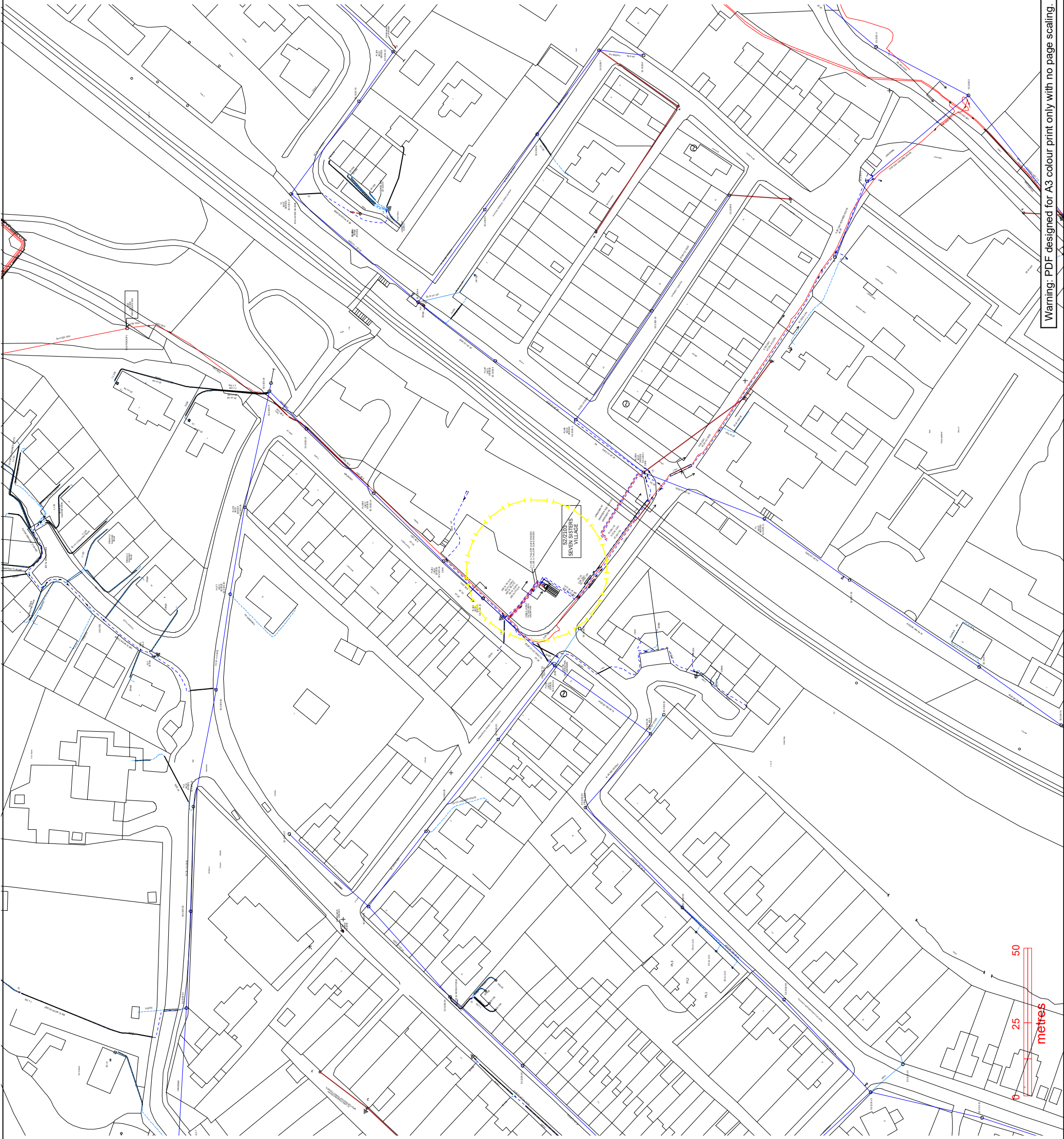
Report damage immediately – KEEP EVERYONE AWAY FROM THE AREA
0800 6783 105

1:500 line digit

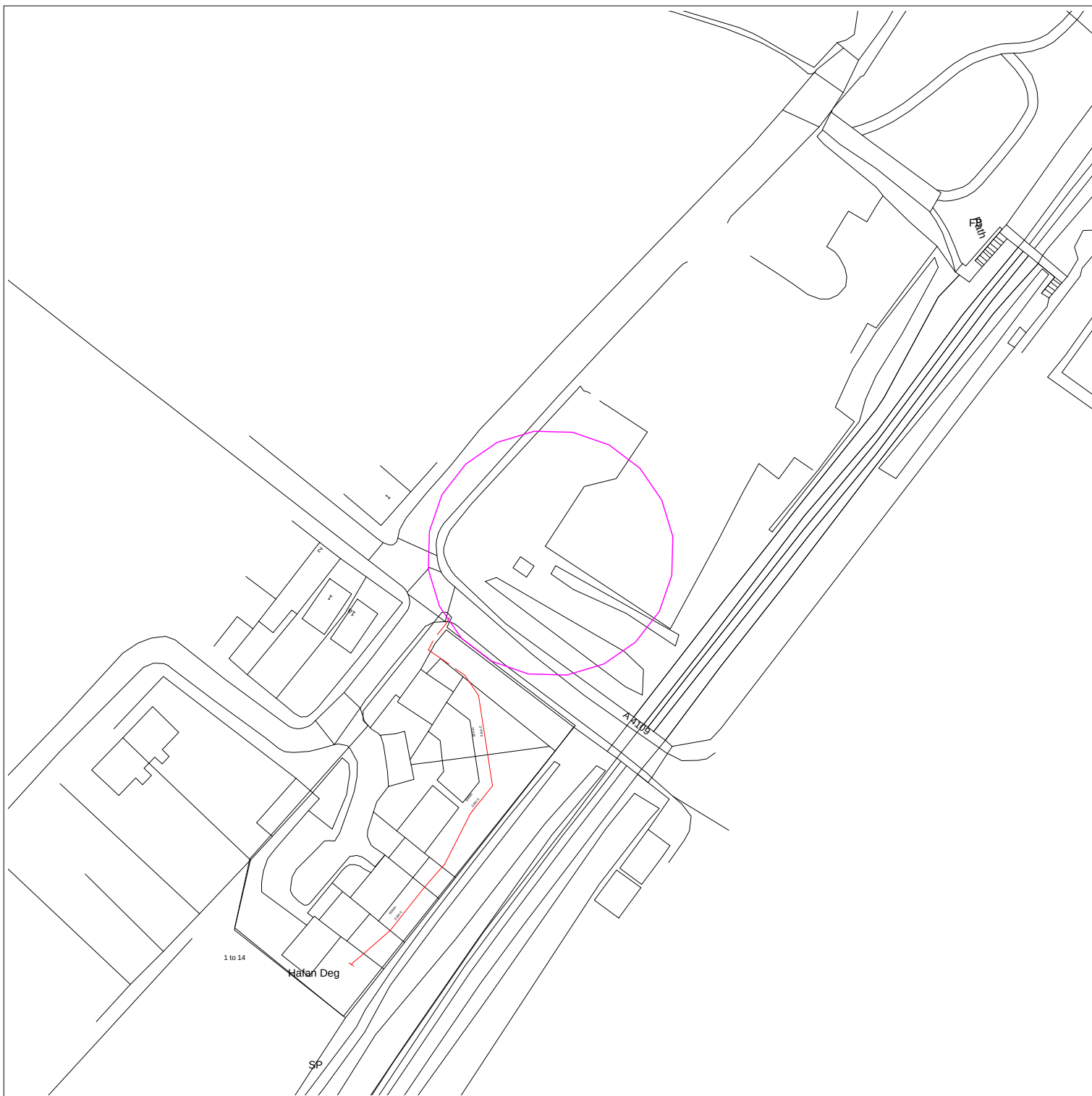
- Advice should be sought from the Western Power Distribution Contact Centre for any work that is to take place in proximity to 66kV or 132kV underground cables and 66kV 132kV overhead lines — 0800 096 3080



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Warning: PDF designed for A3 colour print only with no page scaling.



Date Requested: 10/12/2021

Requested by: Justin Hughes

Job Reference: 24138065

Company: Neath Port Talbot C.B.C.

Your Scheme/Reference: Blaendulais

Key for Mains & Service Pipework



Existing LP mains or services operating up to 75 millibar gauge



Existing MP mains or services operating between 75 millibar and 2 bar gauge



Existing IP mains or services operating between 2 bar and 7 bar gauge

Whilst ESP Utilities Group Ltd (ESP) try to ensure the asset information we provide is accurate, the information is provided Without Prejudice and ESP accept no liability for claims arising from any inaccuracy, omissions or errors contained in this response. The actual position of underground services must be verified and established on site before any mechanical plant is used. Authorities and contractors will be held liable for the full cost of repairs to ESP apparatus and all claims made against them by Third parties as a result of any interference or damage.

REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE SANCTION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE © CROWN COPYRIGHT RESERVED.

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ESP Utilities Group Ltd
Bluebird House
Mole Business Park
Leatherhead
Surrey
KT22 7BA
Phone: 01372 587500
Email: PlantResponses@espug.com

Dig Sites:

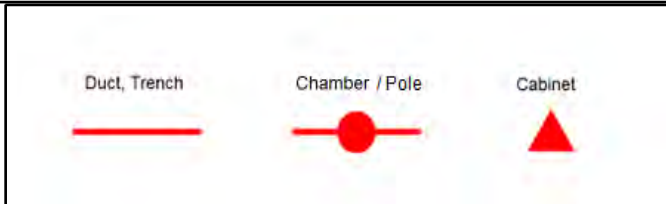
Area  Line 

Approx scale on A4 paper: 1:1000
(excluding Overview map)



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Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Postcodes.pdf", which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2021 Ordnance Survey 100019209.



j.hughes@npt.gov.uk
Blaendulais



**Company Address**

Wales and West Utilities Ltd,
Wales and West House,
Spooner Close, Celtic,
Springs, Coedkernew,
Newport, NP10 8FZ

Our Ref: 24138065 Blaendulais

Friday, 10 December 2021

Justin Hughes
The Quays Brunel Way Baglan Energy Park
Neath
Neath Port Talbot
SA11 2GG

Dear Justin Hughes

Thank you for contacting us regarding Wales & West Utilities equipment at the above site.

According to our mains records Wales & West Utilities has no apparatus in the area of your enquiry. However Gas pipes owned by other GT's and also privately owned may be present in this area. Information with regard to such pipes should be obtained from the owners.

Safe digging practices, in accordance with HS(G)47, Avoiding Danger from underground services must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. Safe working procedures should be defined and practiced.

If you require advice in connection with your proposals please contact the relevant number below.

Yours sincerely,
WWU Dig Team

Gas Emergency Number:

In an emergency call 0800 111 999, 24 hours a day.

Mapping Enquiries:

If you have an enquiry relating to this letter or the attached map plan, please contact us using the following information:

Telephone 02920 278912
Email dig@wwutilities.co.uk

General Enquiries:

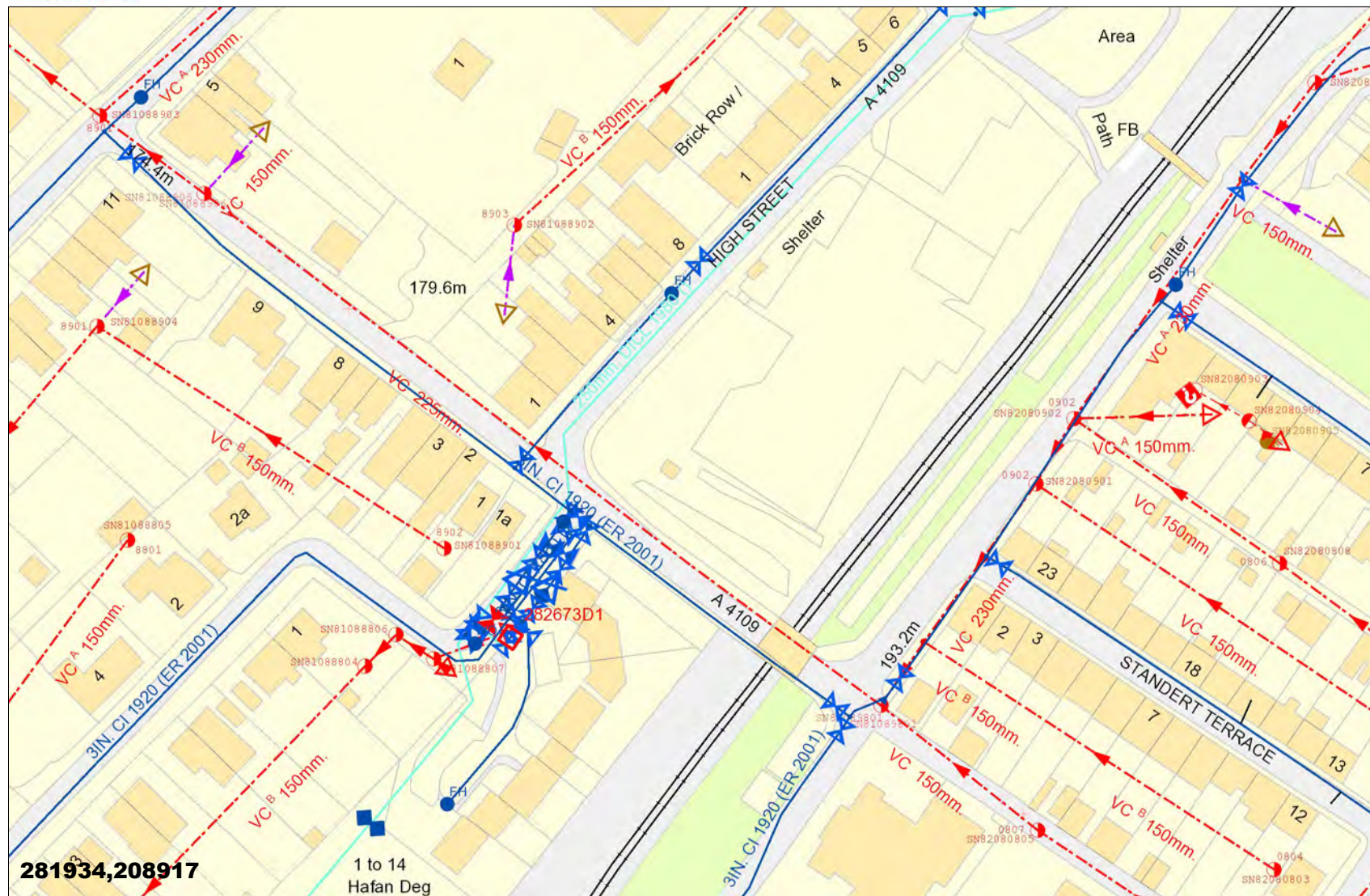
If you have a general enquiry, please call us on the following number

All areas 0800 912 29 99

LinesearchbeforeUdig:

If you have an enquiry relating to the use of the LinesearchbeforeUdig website please contact LinesearchbeforeUdig using the following information:

Telephone 0845 437 7365
Email enquiries@linesearchbeforeudig.co.uk
Website www.linesearchbeforeudig.co.uk



LEGEND

Clean Water

- Sluice Val
- Air Val, SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- BULK Meter
- FH
- Cap
- Existing Main
- NON COMPANY

Sewerage External

- Foul
- Surface Water
- Combined
- Rising Main
- Private
- Treatment Works
- Pumping Station
- Special Purpose
- Unknown End
- Change, Combined Overflow
- Outfall, FOUL
- Lamp Hole, Foul
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby the company, is done so in accordance with statutory requirements of sections 198 and 199 of the water industry Act 1991 based upon the best information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

**EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE**

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Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

WALKOVER SURVEY RECORD SHEET

Project: Blaendulais		Job No: 22181
Engineer: PL	Date: 15 August 2023	Weather: Dry
Contact: RHG		

Observations	Constructive comments must be made against each prompt	Further action required?
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1. Site Details

Access	Access via A4109 to the west of the site.	
Boundaries and adjacent land uses	The site is bounded by trees/shrubs to the west and eastern boundaries. A contractors compound was noted to the northern boundary. To the east is a north south rail line. The west and south are bounded by the A4109.	
Surface condition and safe walking	The entire surface is rough, with grass cover. A concrete road enters the site at the north western corner, heading towards the eastern boundary. There are mature trees in the eastern and western boundaries.	

2. Topography

Surface topography	Relatively flat, with no significant mounds or dips.	
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Surface slopes and steep faces, details of land reshaping	Site is relatively flat.	
Evidence of subsidence	None	
Evidence of landslip, slides or failures.	None	
Evidence of cuttings or toe slope excavations	None	
Evidence of imported soil, tipped material or rubbish	None	
Retaining walls/Slopes	None	

3. Geology

Surface Soils	Grass covered.	
Rock Outcrops	None	

4. Surface Water

Surface water features present	None	
Waterlogged ground	None	
Signs of flooding	None	
Are there any water loving plants?	None	
Signs of contamination	No visual or olfactory evidence.	

5. Groundwater

Groundwater conditions	None	
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Evidence of shallow water table	None	
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6. Vegetation

Areas and type of vegetation	Mostly grassed. Trees along western and eastern boundaries.	
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Evidence of distress	None	
Tree / Hedgerow species and height	Trees up to 5m in height.	
Evidence of former trees	None	

7. Historic & Current Development

Known history of site	Site known to have been open rough, and at some time a Canolfan Centre has been built, and since demolished. No evidence.	
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Previous structures	Large Canolfan and Lavs.	
Existing buildings/ structures	None	
Old foundations	None visible above ground	
Building dilapidation and distress	No buildings.	
Neighbouring structures under distress	None	
Underground services, manholes, drains, tanks or pits	Nothing visible.	

8. Additional Information

Visible surface Contamination	None	
Unusual odours, fumes or dust	None	
Spillages/ Accidents	None	
Waste Products	None	
Delivery and Storage	None	
Materials and processes currently carried out on site	None	

Plant or machinery on site	None	
Water supply	None	
Confined space or restricted working area	None	
Overhead cables	Not over site.	

9. Anecdotal Information

Local Knowledge / Interviews with residents/staff	None	
Further observations	Access will not be possible into tree line.	